CJ3

SUPPLEMENTAL MATERIAL

Training Manual

CJ3

6150 Corte Del Cedro Carlsbad, CA 92011
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LIST OF EFFECTIVE PAGES

DATE OF ISSUE FOR ORIGINAL AND CHANGED PAGES ARE

ORIGINAL.....0.....December 2024

NOTE

For printing purposes only, any revised pages will be noted at the footer with the current revision number.

SECTION	REVISION*
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LIMITATIONS AND MEMORY ITEMS	0
AIRWORK AND MANEUVERS	0
CRM	0
AFM EXTRACTS	0
EMERGENCY	0
ABNORMAL	0
NORMAL	0
PERFORMANCE	0
STANDARD CHARTS	0
WEIGHT AND BALANCE	0
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CE525B LIMITATIONS AND MEMORY ITEMS

SEE AFM FOR ALL LIMITATIONS

SPEED LIMITATIONS

M_{MO} Above 29,300' – 0.737 Mach

V_{MO} 8000' – 29,300' – 278 KIAS

V_{MO} below 8,000' – 260 KIAS

Max Autopilot – 278 KIAS / 0.737 Mach

Flaps Takeoff and Approach (15°) – 200 KIAS

Flaps Land (35°) – 161 KIAS

Flaps Failed to Ground (55°) inflight – 140 KIAS

Landing Gear Retracting (V_{LO}) – 200 KIAS

Landing Gear Extending (V_{LO}) – 200 KIAS

Landing Gear Extended (V_{LE}) – 200 KIAS

Max Tire Ground Speed – 165 KIAS

Min Speed in Sustained Icing – 180 KIAS

WEIGHT LIMITATIONS

Max Ramp – 14,070 lbs

Max Takeoff – 13,870 lbs

Max Landing – 12,750 lbs

Max Zero Fuel – 10,510 lbs

Nose Baggage – 400 lbs

Tailcone Baggage – 600 lbs

ENGINE START (GROUND) LIMITATIONS

ENG CTRL SYS FAULT L/R annunciators - Extinguished

Max ITT - 1000°C (see Figure 2-4 AFM)

Max Tailwind Component – 10 Kts

Max Crosswind Component – 10 Kts

Max Time to Light-off - 10 secs

Maximum Airport Elevation For Ground Battery/ EPU Start – 14,000 Feet

ENVIRONMENTAL

Maximum Operating Altitude - 45,000 Feet

Max T/O & Land - 14,000 ft.

Maximum Tailwind Component - 10 Knots

Minimum Ambient Temperature: -54°C (-65°F)

FUEL LIMITATIONS

Max Fuel Imbalance: 200 lbs. (600 lbs. Emer)

Min/Max Temp: -40° C / +57.2° C (JET A, A1)

Fuel Boost Pumps: On when FUEL LOW LEVEL L/R annunciators illuminate or at 210 pounds or less indicated

ELECTRICS

Engine Starter:

- 3/30 mins with 60 second rest between

Battery:

- Min Battery Volt for Start: 24 VDC
- Starts: 3 per hour
- Generator assisted start (cross starts) = 1/3 battery start

EPU: 800 - 1100 amps

Max Gen load:

- Ground: 200 amps
- < 41,000 ft.: 300 amps; > 41,000 ft.: 250 amps

GROUND OPERATION

Pitot/static: 2 minutes

> 75% N2 with engine, wing, and/or windshield anti-ice on is limited to two minutes. Do not operate with the wing anti-ice on more than one minute after the WING ANTI-ICE L/R annunciators have extinguished

OPERATING LIMITATIONS

NOTICE

CERTIFICATION AND OPERATIONAL LIMITATIONS ARE CONDITIONS OF THE TYPE AND AIRWORTHINESS CERTIFICATES AND MUST BE COMPLIED WITH AT ALL TIMES AS REQUIRED BY LAW.

CERTIFICATION STATUS

This airplane is certified in accordance with FAR 23.

ENGINE OPERATING LIMITS

OPERATING CONDITIONS	OPERATING LIMITS					
THRUST SETTING	TIME LIMIT (MINUTES)	ITT TEMP °C	N_2%	N_1%	OIL PRESSURE PSIG	OIL TEMP °C
START	-	1000 (REFER TO FIGURE 2-4 OF AFM)	-	-	-	-40 TO 135 (NOTE 7)
GROUND IDLE	CONTINUOUS	-	53.4 MIN.	-	35 MIN. 100 MAX. (NOTE 6)	-40 TO 135 (NOTE 7)
FLIGHT IDLE	CONTINUOUS	-	60.7	-	35 MIN. 100 MAX. (NOTE 6)	-40 TO 135 (NOTE 7)
TAKEOFF	5 (NOTE 1)	877 MAX.	100	102.8 (NOTE 1)	45 – 90 (NOTE 3)	10 TO 135
MAXIMUM CONTINUOUS	CONTINUOUS	840 MAX.	100	102.8 (NOTE 2)	45 – 90 (NOTE 3)	10 TO 135
TRANSIENT	-	REFER TO FIGURE 2-3 AFM	100.7 (20 SEC. MAX.)	103.9 (20 SEC. MAX.)	23 MIN. (NOTE 4) 100 MAX. (NOTE 5)	135

NOTE

1. Takeoff thrust settings that are nominally limited to 5 minutes duration may be used for up to 10 minutes for One Engine Inoperative operations. Time limit begins when throttle lever is advanced for takeoff thrust.
2. Maximum continuous thrust (MCT) for the airplane is defined by Figures 4-10 (single-engine) and Figure 4-11 (multi-engine) in the AFM and are more limiting than rotational limits.
3. Minimum oil pressure is 45 PSIG when operating at or above 80% N2; 35 PSIG when operating below 80% N2.
4. Minimum allowable oil pressure is 23 PSIG for up to 5 minutes when operating below 80% N2.
5. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes when operating at or above 80% N2.
6. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes with oil pressure returning to normal range.
7. The engine should not be operated above 80% N2 until oil temperature is above 10°C (+50°F).
8. Maximum oil temperature is 149°C (+300°F) for up to 5 minutes when operating below 80% N2.

EMERGENCY PROCEDURES

■ ENGINE FAILURE OR FIRE OR MASTER WARNING DURING TAKEOFF

● SPEED BELOW V_1 - TAKEOFF REJECTED

1. Brakes - AS REQUIRED.
2. Throttles - IDLE.
3. Speed Brakes - EXTEND.

● SPEED ABOVE V_1 - TAKEOFF CONTINUED

1. Maintain directional control.
2. Accelerate to V_R.
3. Rotate at VR, climb at V_2.
4. Landing Gear - UP (after positive rate-of-climb).
5. WING XFLOW Switch - WING XFLOW (if WING/ENGINE ANTI-ICE Switches are in WING/ENG).
6. Flaps - RETRACT (at level off altitude and V_2 + 10 KIAS). ACCELERATE to V_{ENR} (V_T).

■ ENGINE FAILURE DURING FINAL APPROACH

1. Thrust (Operating Engine) - INCREASE as required.
2. Airspeed - V_{APP}.
3. Flaps - TAKEOFF AND APPROACH.

■ ENG FIRE LH OR RH (ENGINE FIRE WARNING LIGHT ILLUMINATED)

1. THROTTLE (Affected Engine) - IDLE.

● **IF LIGHT REMAINS ILLUMINATED**

2. ENGINE FIRE Button (Affected Engine) - LIFT COVER and PUSH.
3. Either Illuminated BOTTLE ARMED Button - PUSH.

■ EMERGENCY RESTART - TWO ENGINES

1. L/R FUEL BOOST Switches - BOTH ON.
2. Throttles - OFF, then IDLE (24% N_2 MAXIMUM).
3. If Altitude Allows - INCREASE AIRSPEED TO 230 KIAS.

■ ELECTRICAL FIRE OR SMOKE

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

■ ENVIRONMENTAL SYSTEM SMOKE OR ODOR

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

■ SMOKE REMOVAL

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

■ CABIN ALT (CABIN ALTITUDE)

Indicates cabin altitude greater than 9500 ± 400 feet with the pressurization controller in the normal mode, or cabin altitude greater than 14,500 ± 400 feet with the pressurization controller in high altitude mode.

1. Oxygen Masks - DON and 100%.
2. Microphone Select Switches - MIC OXY MASK.
3. Emergency Descent - AS REQUIRED.
4. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.

■ EMERGENCY DESCENT

1. AP TRIM DISC Button - PRESS and RELEASE.
2. Throttles - IDLE.
3. Speed Brakes - EXTEND.
4. Airplane Pitch Attitude - INITIALLY TARGET 7.5 DEGREES NOSE DOWN.

■ BATT FAULT / BATT FAIL (BATTERY OVERTEMPERATURE)

1. Battery Volt/Amp - NOTE.
2. Battery Switch - EMER.
3. Volt/Amp - NOTE DECREASE.

■ AUTOPILOT MALFUNCTION

1. AP TRIM DISC Button - PRESS AND RELEASE.

■ ELECTRIC ELEVATOR TRIM RUNAWAY

1. AP TRIM DISC Button - PRESS and RELEASE.
2. Throttles - AS REQUIRED.
3. Speed Brakes - AS REQUIRED.
4. Manual Elevator Trim - AS REQUIRED.
5. PITCH TRIM Circuit Breaker (L Panel) - PULL.

■ EMERGENCY EVACUATION

1. Parking Brake - SET.
2. Throttles - BOTH OFF.
3. LH/RH ENGINE FIRE Buttons - BOTH PRESS.
4. Illuminated BOTTLE ARMED Buttons - BOTH PRESS (if fire suspected).
5. Battery Switch - OFF.
6. Emergency Locator Transmitter (ELT) - MAKE SURE SYSTEM IS ACTIVATED (if required for search and rescue services).
7. Airplane and Immediate Area - CHECK FOR BEST ESCAPE ROUTE.

● **IF THRU CABIN DOOR**

8. Cabin Door - OPEN.
9. Move away from airplane.

Procedure completed

● **IF THRU EMERGENCY EXIT**

8. Emergency Exit Door - REMOVE and THROW EXIT DOOR OUT OF AIRPLANE.
9. Move away from airplane.

Procedure completed

■ INADVERTENT STALL (STICK SHAKER, BUFFET, AND/OR ROLL-OFF)

1. Autopilot - DISCONNECT.
2. Pitch Attitude - REDUCE.
3. Roll Attitude - LEVEL.
4. Throttles - MAXIMUM THRUST.

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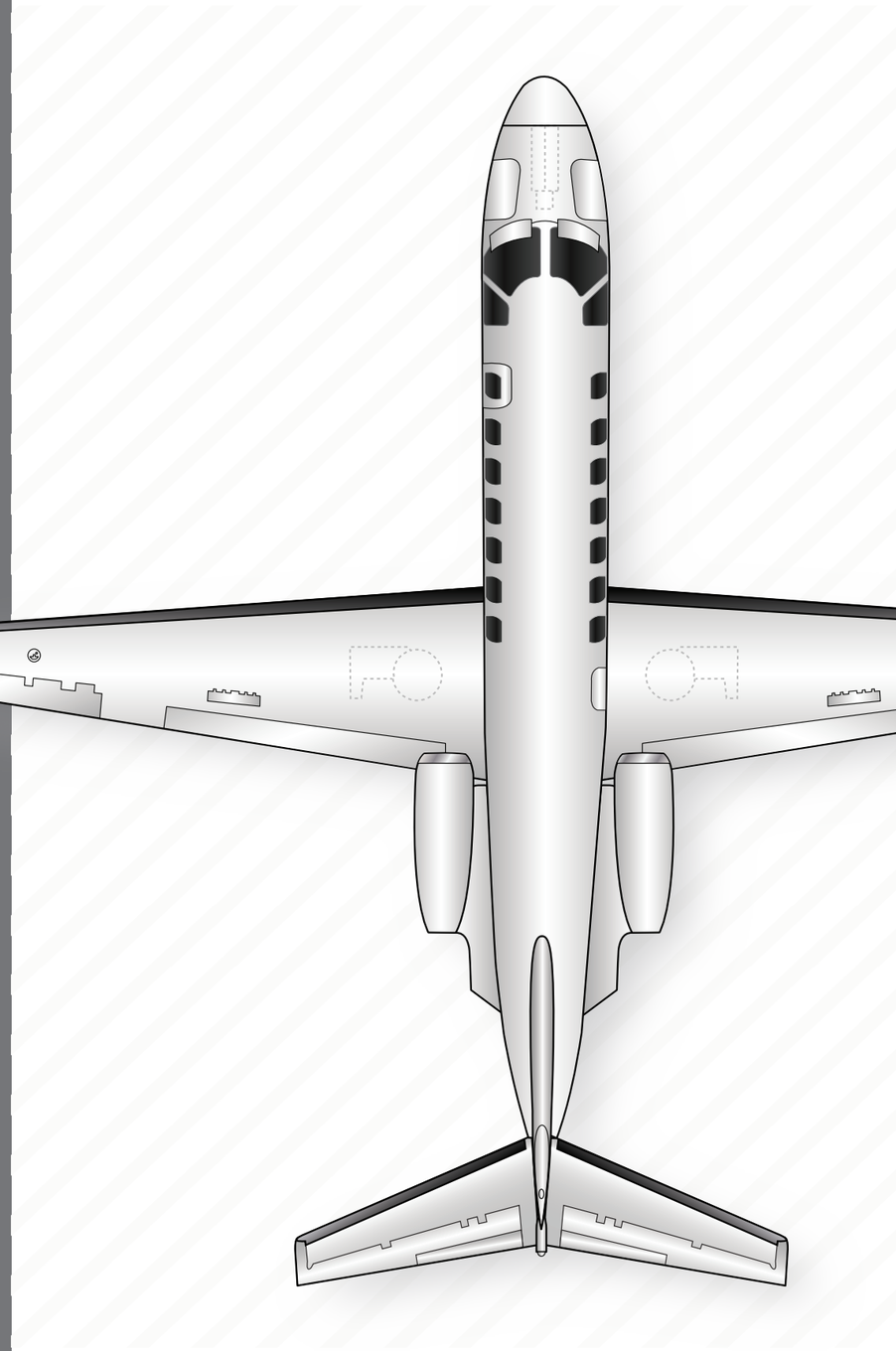
AIRWORK & MANEUVERS



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Maneuvers

Steep Turns

Stalls (Clean, Departure, Approach to Landing)

Unusual Attitude Recovery (Nose High, Nose Low)

Takeoff

Normal Takeoff

Rejected Takeoff

Engine Failure on Takeoff (V_1 cut)

Approaches

Visual Approach – Normal

Visual Approach – Flaps Inoperative

Precision Approach – Normal and S/E

Non-Precision Approaches – Normal and S/E

Circling Approach

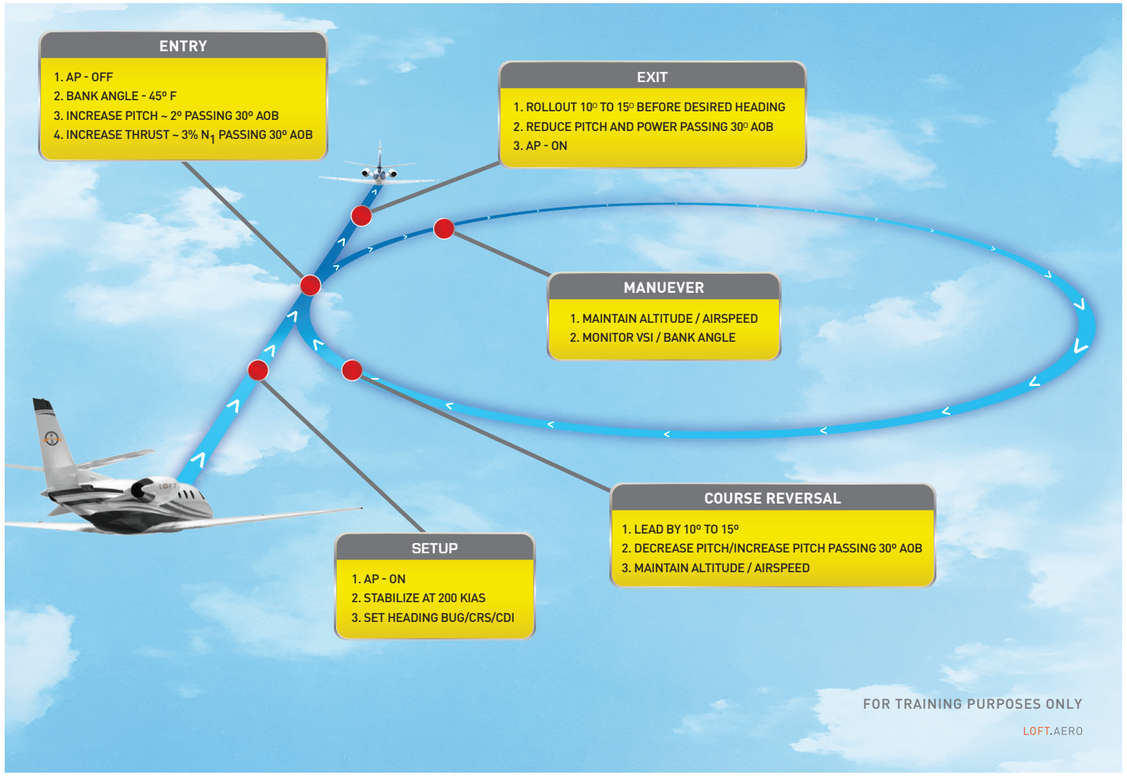
Missed Approach

Normal

Single - Engine

Maneuvers

Steep Turns



ACS Standards: ± 100 ft.; ± 5º Angle Of Bank (AOB); ± 10 kts; no assistance from PM

Set Up:

Stabilize at 200 KIAS (recommend engaging the autopilot; ~ 65% N_1)

Note reference heading (recommend rose mode, heading bug and course to reference heading, and green needle CDI)

Flt Director ON/OFF/Cross Pointers (personal preference)

Entry/Maneuver: (ensure stable at 200 kts.)

A/P OFF, begin roll, increase pitch ~ 2º (to ~2.5º up) and thrust ~3% N_1 passing 30º AOB

Bank: 45º AOB (sky pointer triangle should match 45º triangle on attitude indicator)

Pitch/Altitude: Recommend monitor VSI, Altitude "box", and bank angle; and make small corrections (NOTE: if the airspeed at the beginning of the maneuver is stable at 200 kts and the altitude remains within + 100 ft., power adjustments should not be required to remain within + 10 kts. Any power adjustments should be small – "walk" the throttles.)

Course Reversal:

Lead by 10º to 15º depending upon roll rate. The transition from one side to the next should be done quickly, no power change is required. As you roll through ~ 30º AOB, begin to pitch down slightly to avoid ballooning.

Bank to 45º AOB opposite direction (sky pointer on 45º triangle)

Pitch/Altitude: Same as above

Exit:

Lead by 10º to 15º depending upon roll rate, to original heading

As you roll through ~ 30º AOB, begin to pitch down ~ 2º (to ~0.5º up)

Reduce N_1 ~ 3%

A/P ON when stable

Stalls

ACS

- One must be induced while in a turn with a bank angle of 15-30 degrees
- One should be induced with the autopilot engaged
- An impending stall means the same as the first indication of a stall. As noted in AC 120-109A, an impending stall occurs when the angle of attack causes a stall warning furnished by inherent aerodynamics (e.g., buffet) or an acceptable stall warning device (e.g., stick shaker).
- Evaluation criteria for a recovery from an impending stall must not mandate a predetermined value for altitude loss and must not mandate maintaining altitude during recovery.

USE OF AOA

The AOA indicator and "donut" on the airspeed indicator are very useful in all phases of flight and particularly during stall recognition and recovery. An indication of 0.6 on the AOA indicator and the donut on the airspeed indicator is equal to 1.3VS. The stick shaker will activate at approximately 0.8 AOA, and a full stall will occur at 1.0 AOA (to be avoided!).

NOTE

For training purposes in the simulator, stalls are conducted between 3,000 to 10,000 ft. AGL. If a stall occurs at higher altitudes, it may be necessary to pitch the aircraft below the horizon to obtain sufficient airspeed to not encounter a secondary stall. Altitude loss is likely in order to increase airspeed.

Ignition – ON; clear the area

Clean Stall

Clean Stall Set Up: Maintain heading and altitude, reduce power to idle

Clean Stall Recovery: At first indication of stall:

1. A/P – DISCONNECT
2. Pitch Attitude - REDUCE (approx. 5º nose above horizon is usually sufficient)
3. Roll Attitude – LEVEL
4. Throttles – MAXIMUM THRUST
5. Airspeed – INCREASE (passing donut - Pitch to VBARS) (As the airspeed increases through 150 KIAS, reduce thrust to ~ 55% N_1)
6. Altitude – RETURN TO PREVIOUS ALTITUDE
7. A/P - ON

Departure Stall

Departure Stall Set Up:

- Stabilize (recommend engaging the autopilot); set ~ 55% N_1
- Select T/O and Approach flaps (15°)
- Roll into a 15°- 30° bank turn.
- Reduce power to idle
- Maintain altitude. (AP ON/OFF as directed by instructor)

Departure Stall Recovery: At first indication of stall:

1. A/P – DISCONNECT (if connected)
2. Pitch Attitude - REDUCE (approx. 5º nose above horizon is usually sufficient)
3. Roll Attitude – LEVEL
4. Throttles – MAXIMUM THRUST
5. Airspeed – INCREASE (passing donut - Pitch to VBARS)
6. Flaps - Retract (at donut + 10 kts.)
7. After Takeoff Check
8. Altitude – RETURN TO PREVIOUS ALTITUDE
9. Throttles – AS REQUIRED (As the airspeed increases through 150 KIAS, reduce thrust to ~ 55% N_1)
10. A/P – ON (Center Heading Bug first)

Approach to Landing Stall

Approach to Landing Stall Set Up:

- Stabilize (recommend engaging the autopilot); set ~ 55% N1
- Compute V speeds/ Post Reference Speeds
- Configure for landing: Flaps 15° / Landing Gear down / Flaps 35°.
- Reduce power to ~ 45% (or as directed by instructor.)
- Maintain altitude. (AP ON/OFF and turn as directed by instructor)

Approach to Landing Stall Recovery: At first indication of stall

1. A/P – DISCONNECT (if connected)
2. Pitch Attitude – REDUCE (on or slightly below the horizon is usually sufficient)
3. Roll Attitude – LEVEL
4. Throttles – MAXIMUM THRUST
5. Flaps - Approach (15º)
6. Airspeed – INCREASE (passing VAPP (Donut speed) - Pitch to VBARS)
7. Landing Gear – retract when positive rate
8. Flaps - Retract (at VAPP (donut) + 10 kts.)
9. Go-Around Checklist
11. Altitude – RETURN TO PREVIOUS ALTITUDE
12. Throttles – AS REQUIRED (As the airspeed increases through 150 KIAS, reduce thrust to ~ 55% N_1)
10. A/P - ON

NOTE

It is helpful to think of the Go-Around procedure for the Approach To Landing Stall Recovery, however do not use the TOGA button.)

Unusual Attitude Recovery

Before conducting an usual attitude recovery, confirm that an unusual attitude exists. For example, does the opposite PFD indicate an unusual attitude? Do airspeed and altitude changes confirm an usual attitude?

Nose High

Recovery:

1. A/P – DISCONNECT
2. Throttles – MAXIMUM THRUST
3. Pitch Attitude – REDUCE
    a. Push the yoke forward (slightly) to unload the wings. Continue to reduce pitch attitude.
    b. Roll in the shortest direction towards the horizon. (This aids in allowing the nose to come down. It is preferrable not to exceed 45º bank. If normal pitch control and roll control is ineffective, careful rudder input in the direction of the desired roll may be required to induce a rolling maneuver for recovery. Only a small amount of rudder is needed. Too much rudder applied too quickly or held too long may result in loss of lateral and directional control. Because of the low energy condition, pilots should exercise caution when applying rudder.)
4. Return to previous altitude. As the nose approaches the horizon level off while leveling the wings.
5. Reduce power when safe airspeed attained.

Nose Low

Recovery:

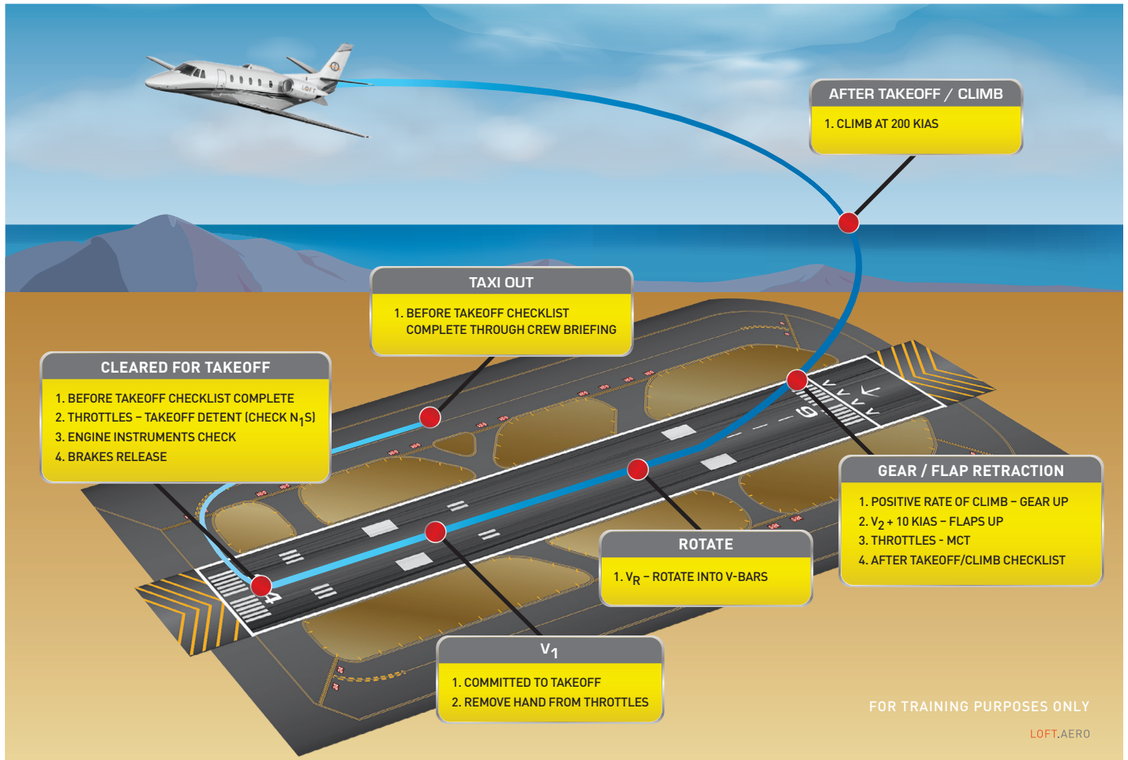
1. A/P – DISCONNECT
2. Throttles – Idle
3. Roll wings level
4. Pitch Attitude – raise the nose to stop the descent and climb.

Do not begin raising the nose until the wings are level as this will cause asymmetric g's.

5. Speed brakes – extend as necessary to control airspeed.
6. Return to the previous altitude. Add power and retract speedbrakes to maintain safe airspeed.

TAKEOFF

Normal Takeoff



Cleared For Takeoff

PF Continue Before Takeoff Checklist

PM Before Takeoff Checklist Complete

PF Set Takeoff Power

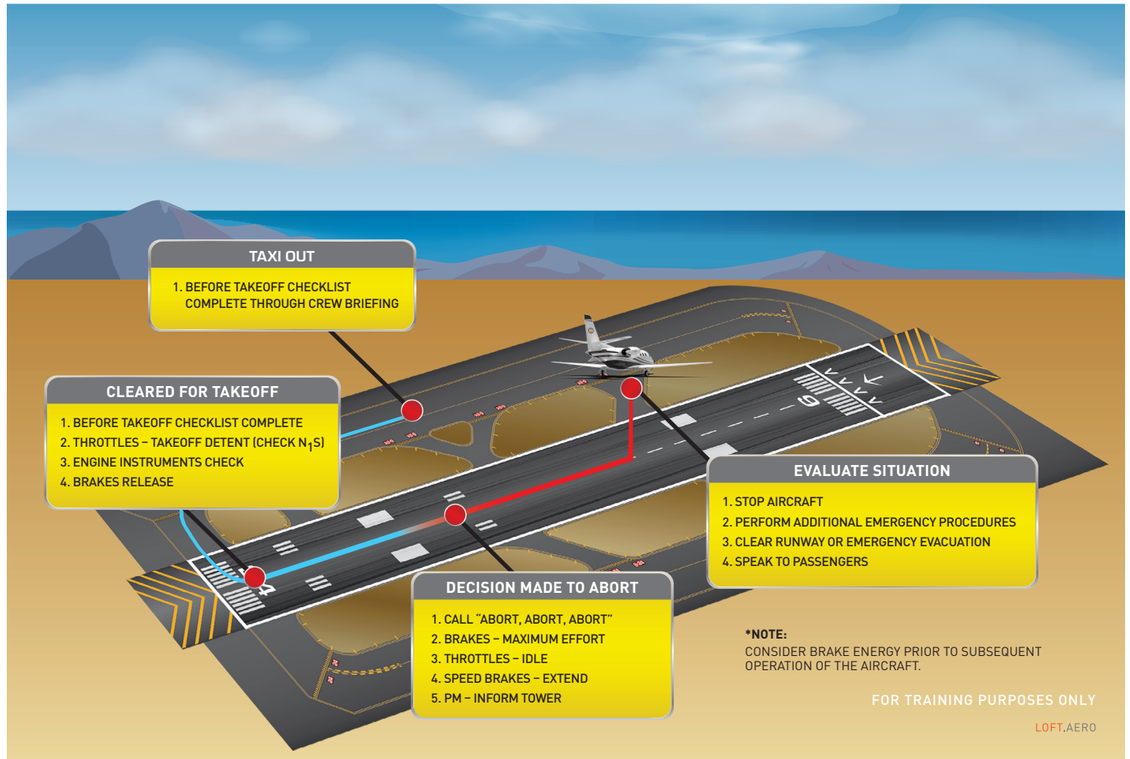
PM Takeoff Power Set, Airspeed Alive, 70 KIAS Crosscheck, V_1, Rotate, Positive Rate

PF Gear Up

PM V2 Plus 10

PF Flaps Up, MCT, After Takeoff / Climb Checklist

Rejected (Aborted) Takeoff



PF "Abort, Abort, Abort"

- Brakes – MAXIMUM EFFORT (or AS REQUIRED)
- Throttles – IDLE
- Speedbrakes – EXTEND

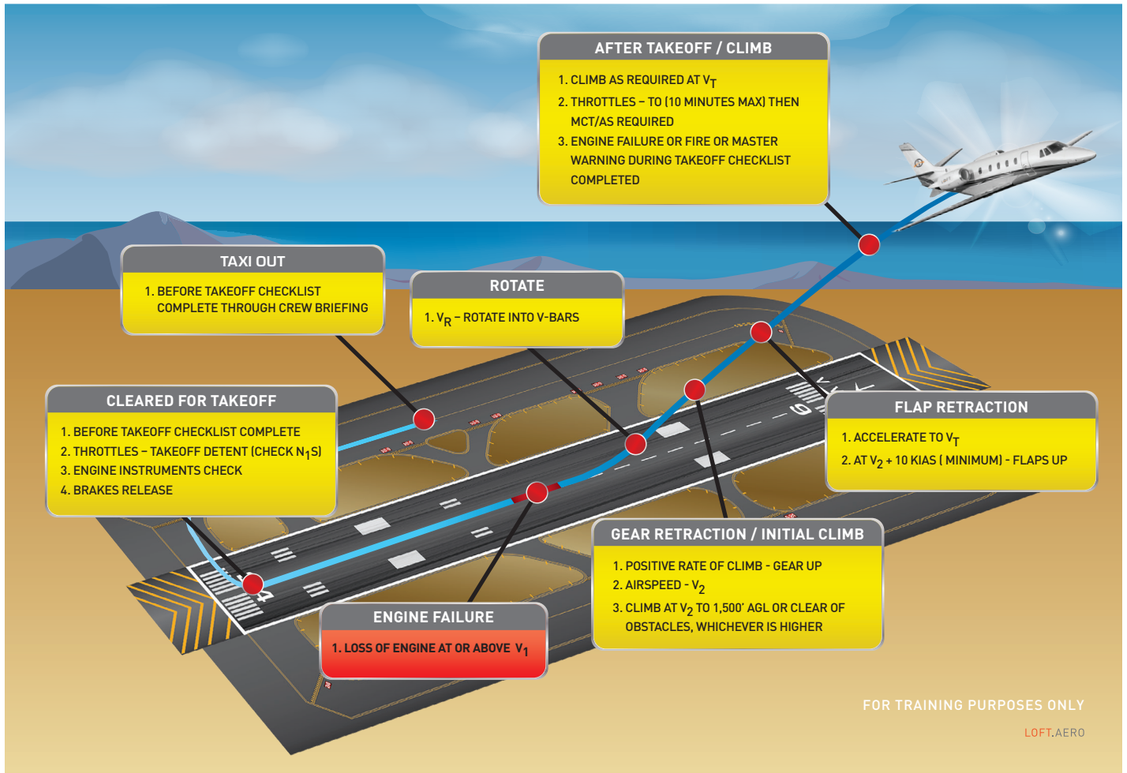
PM

- Ensure PF memory actions completed
- Notify Tower / Request assistance if required

PF (after aircraft has stopped)

- Perform additional emergency procedure(s) if required
- EVACUATE - if required
- Talk to Passengers

Engine Failure or Fire During Takeoff - V_1 Cut (Speed above V_1 Takeoff Continued)



Cleared for Takeoff:

PF Before Takeoff Checklist Complete

PF Set Takeoff Power

PM Takeoff Power is Set, Airspeed Alive, 70 KIAS Crosscheck, V1 (Lose Engine), Rotate, Positive Rate

PF Gear up, FLC V_2

At 1500 ft. AGL (or higher for obstacle clearance)

PF FLC VENR

PM V_2 + 10 (While accelerating to VT)

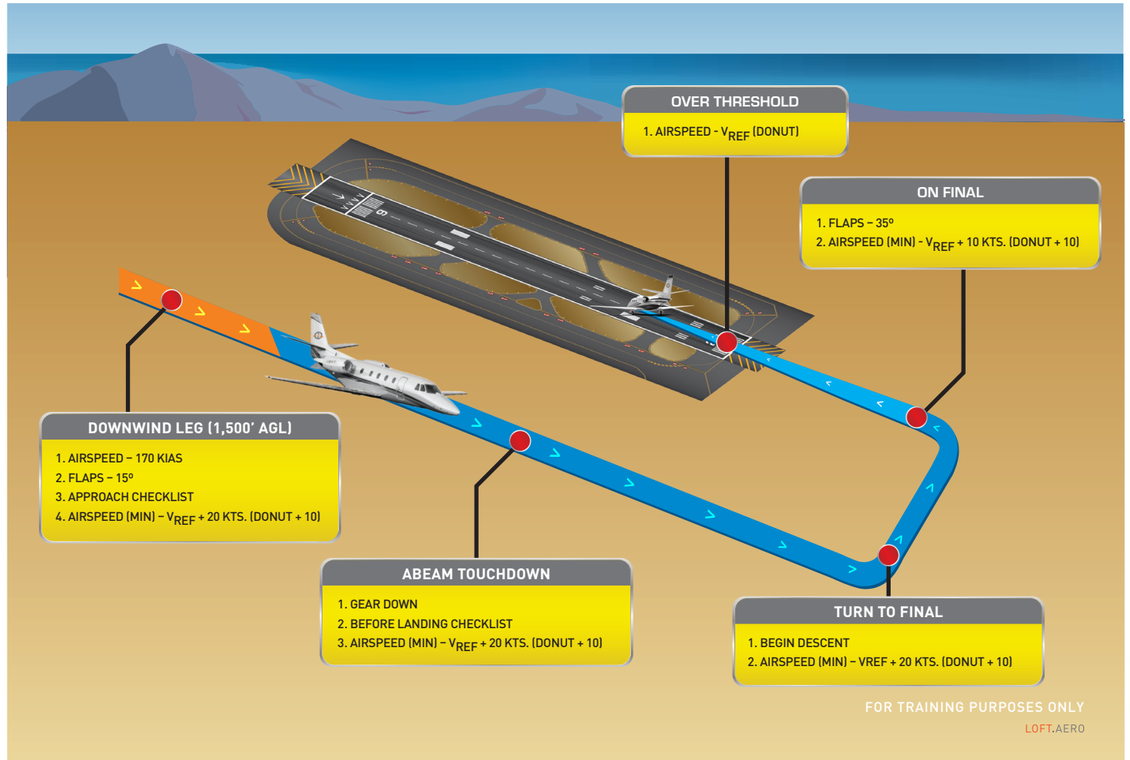
PF FLAPS UP, Engine Failure or Fire or Master Warning During Takeoff Checklist

NOTE

TO thrust can be maintained for up to 10 minutes for single engine operation. Then select MCT.

APPROACHES

VISUAL Approach



Downwind – 1500' AGL / 170 KIAS

PF Flaps Approach, Approach Checklist

Abeam Touchdown

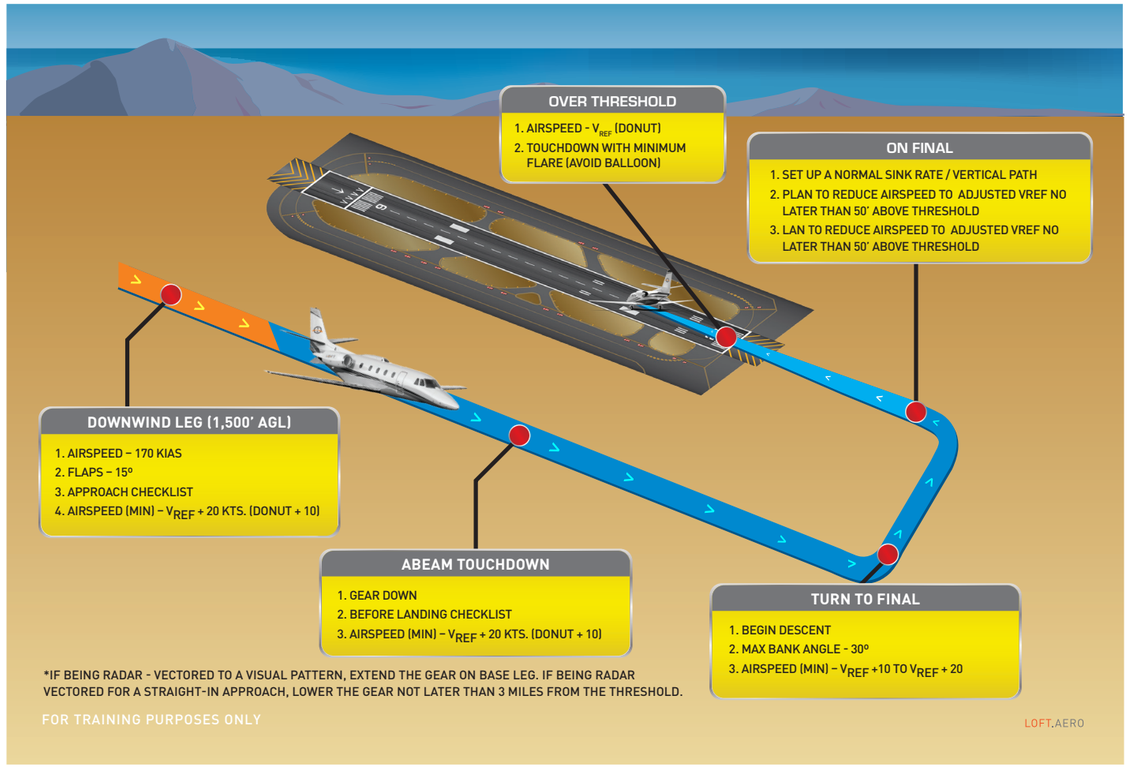
PF Gear Down, Before Landing Checklist

On Final

PF Flaps Land

PM Flaps Selected... Indicated, Before Landing Checklist Complete

VISUAL Approach – Flaps Inoperative



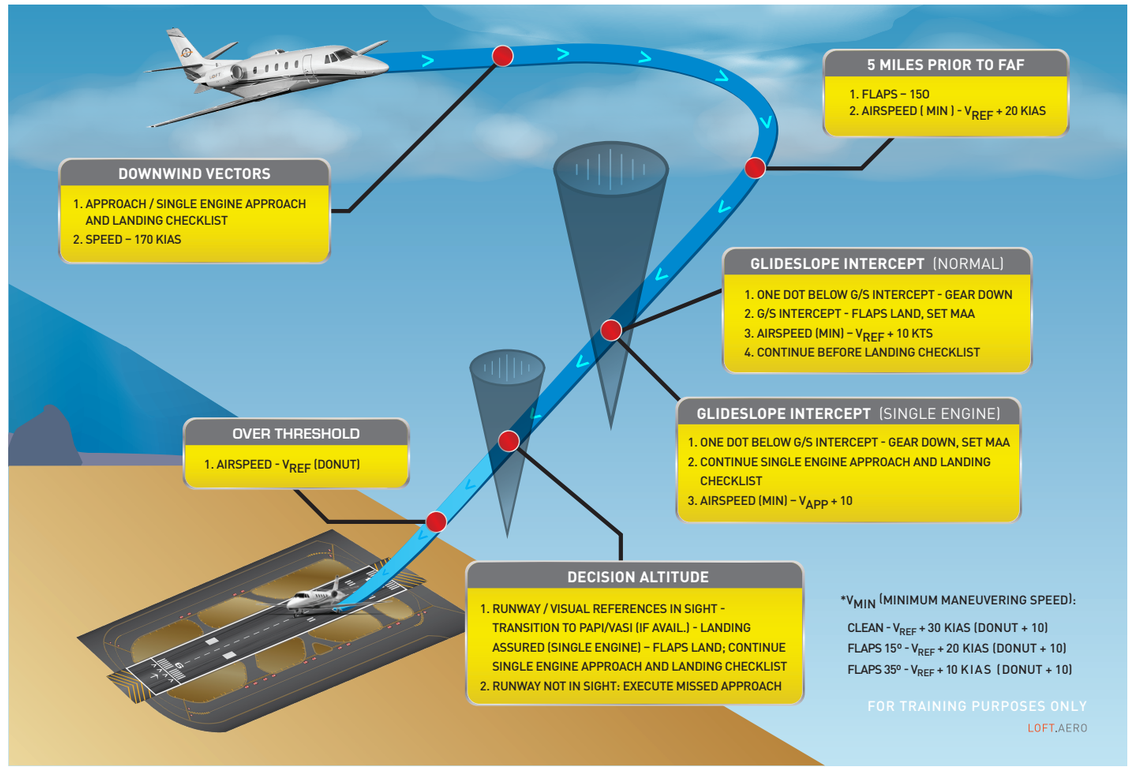
Downwind – 1500' AGL / Adjusted V_{REF} + 10 (Donut + 10)

Abeam Touchdown

PF Gear Down, Flaps Inoperative Approach and Landing Checklist

PM Flaps Inoperative Approach and Landing Checklist Complete

Precision Approach Normal and Single Engine



Precision Approach (ILS) – Two Engine

Downwind Leg 170 KIAS
- PF Approach Checklist

5 Miles Prior to FAF
- PF Flaps Approach
- PM Flaps selected... indicated

One Dot Below Glideslope
- PM One dot below
- PF Gear Down, Before Landing Checklist

Glideslope intercept
- PF Flaps Land
- PM Flaps selected... indicated, Before Landing Checklist Complete
- PF Set Missed Approach Altitude
- PM Missed Approach Altitude Set

FAF
- PM Glideslope, altitude checks, minimums XXX
- PF Checks

On Short approach
- PM 500' above minimums
- PM 100' above minimums, going outside

When runway or visual references in sight
- PM Lights (or runway) at _____ o'clock
- PF Landing
- PM Give speed, and VSI call outs

Minimums - If PM does not call runway or lights in sight by Minimums:
- PF Minimums - Go Around...

Precision Approach (ILS) – Single Engine

Downwind Leg – 170 kts.
- PF Single Engine Approach and Landing Checklist

5 Miles Prior to FAF
- PF Flaps Approach
- PM Flaps selected... indicated

One Dot Below Glideslope
- PM One dot below
- PF Gear Down, Continue Single Engine Approach and Landing Checklistt

Glideslope intercept
- PF Set Missed Approach Altitude
- PM Missed Approach Altitude Set

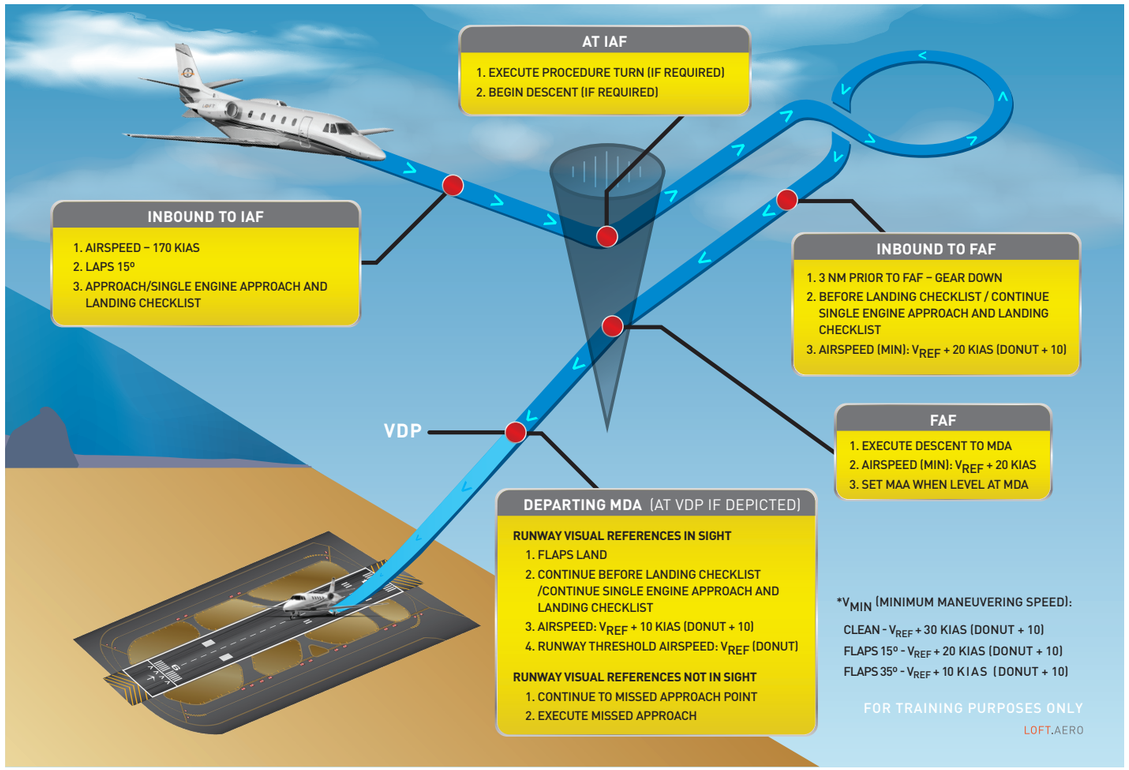
FAF
- PM Glideslope, altitude checks, minimums XXX
- PF Checks

On Short approach
- PM 500' above minimums
- PM 100' above minimums

When runway or visual references in sight
- PM Lights (or runway) at _____ o'clock
- PF Landing, Flaps Land, Continue Single Engine Approach and Landing Checklist
- PM Flaps selected... indicated, Single Engine Approach and Landing Checklist complete
- PM Give speed and VSI call outs

If PM does not call runway or lights in sight by Minimums:
- PF Minimums - Go Around...

Non-precision Approach – Two Engine and Single Engine



The SE Non-precision Approach is the same as the Two Engine with the exception that the Approach and Before Landing Checklists are combined into the Single-Engine Approach and Landing Checklist.

Inbound to IAF: 170 KIAS

PF Flaps Approach, Approach / Single-Engine Approach and Landing Checklist

PM Selected... indicated

3 Miles to FAF

PF - Gear Down, Before Landing Checklist or continue Single-Engine Approach and Landing Checklist (SE)

FAF

PM Minimums are XXX

PF Check

On approach

PM 500' above minimums

PM 100' above minimums

At MDA

PM Set Missed Approach Altitude

PM Approaching VDP (for straight-in approach)

When runway or visual references in sight

PM Runway (or lights) at _____ o'clock

PF Visual, landing

When in a position to make a normal approach to landing (at VDP if depicted)

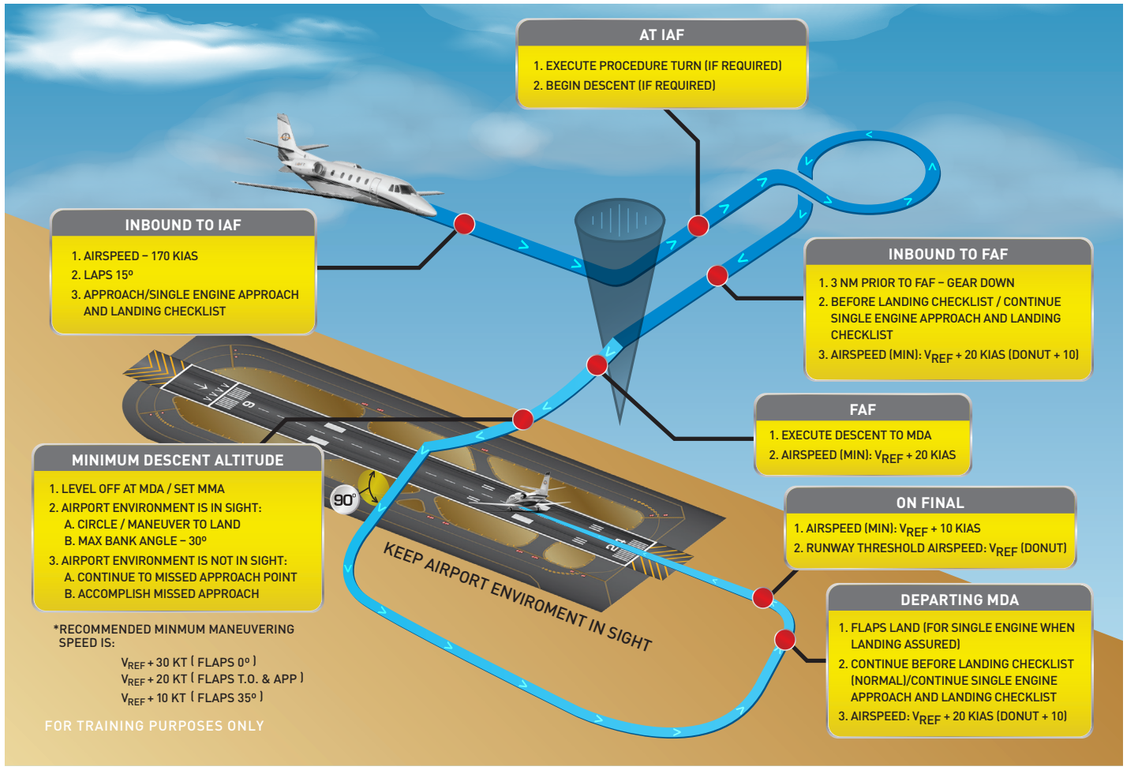
PF Flaps Land, Leaving MDA, Continue Before Landing Checklist or Single-Engine Approach and Landing Checklist

PF Selected... indicated, Before Landing Checklist or Single-Engine Approach and Landing Checklist Completed

If PM does not call runway or lights in sight by MAP

PF Minimums – Go Around...

CIRCLING Approach



Remember, a circling approach:

- Is an instrument approach procedure with a visual portion.
- Must remain clear of clouds while maneuvering.
- Must have the airport environment in sight while maneuvering except when banking.
- Must remain within circling distance to runways for the appropriate category.
- Remain at Circling Minimums until in normal landing position to the runway.

Since the Circling Approach is a non-precision approach, all items in the **Non-precision Approach** up to "When runway or visual references in sight" are the same.

When the airport or airport environment is in sight

PM Airport (Runway or lights) at _____ o'clock

PF I have the airport

When the aircraft is within the minimum circling distance and cleared to circle:

PF - Set heading XXX (establish heading changes for Circling Maneuver; maneuver the aircraft in the shortest path to intercept a base or downwind leg as appropriate.)

When the aircraft is within the minimum circling distance and cleared to circle:

PF - Set heading XXX (establish heading changes for Circling Maneuver; maneuver the aircraft in the shortest path to intercept a base or downwind leg as appropriate.)

When in a position to make a normal landing

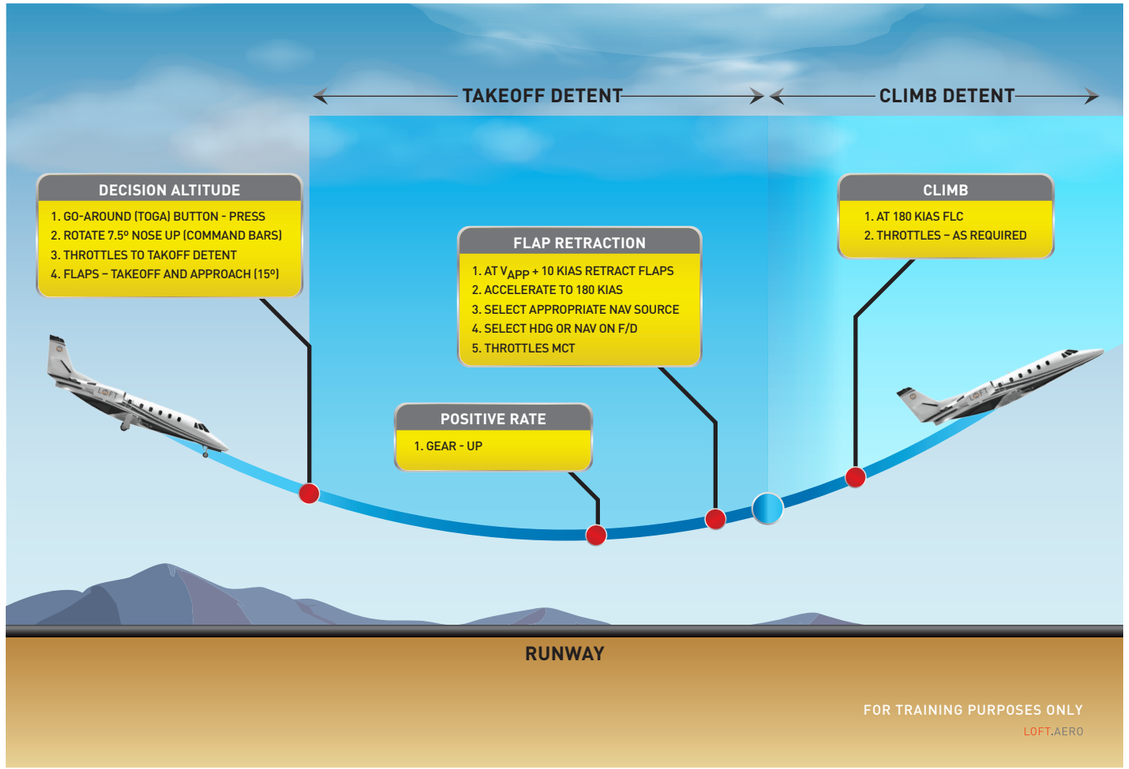
PF Flaps Land, Leaving MDA, Continue Before Landing Checklist or Single-Engine Approach and Landing Checklist

PF Selected... indicated, Before Landing Checklist or Single-Engine Approach and Landing Checklist Completed

If PM does not call the airport (runway or lights) in sight by MAP, or if visual references to the airport environment are lost during the circling maneuver:

PF Minimums, Go-Around...

Missed Approach (All Engine Go Around)



PF Go Around, TOGA, Pitch, Power, Flaps Approach

PM Positive Rate

PF Gear Up

PM V_{APP} + 10 (Donut + 10)

PF Flaps Up

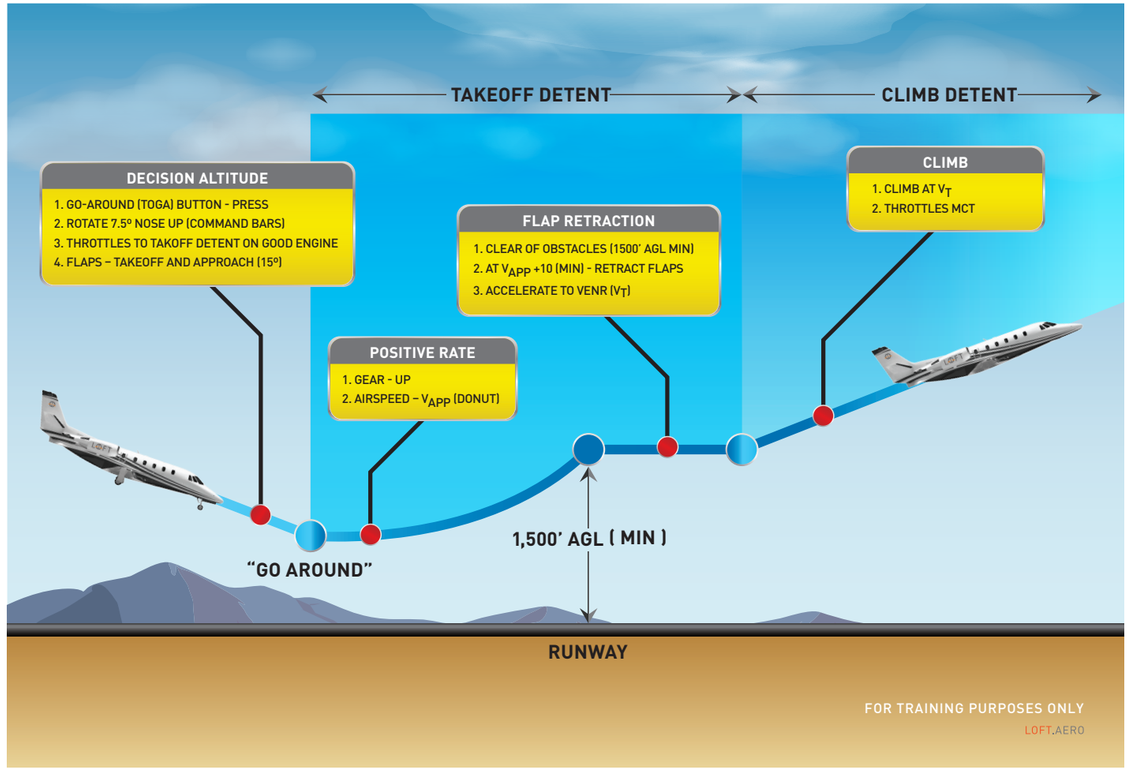
PF HDG or NAV

PF MCT, All Engine Go-Around Checklist

Approaching 180KIAS

PF FLC 180 KIAS

Single-Engine Missed Approach (Go-Around)



PF Go Around, TOGA, Pitch, Power, Flaps Approach

PM Positive Rate

PF Gear Up

PF FLC V_{APP}

Clear of Obstacles (1500' AGL minimum)

PF FLC V_{ENR}

PM V_{APP} + 10 (While accelerating to VENR)

PF Flaps Up

At V_{ENR} (V_T)

PF MCT, Single-Engine Go-Around Checklist

RECOMMENDED POWER SETTINGS

MANEUVER	PATTERN POSITION	CONFIGURATION	% N_1
Normal ILS (2 engines)	Downwind	Clean	60%
	Base	Flaps 15	60%
	2 miles from FAF (1 dot < G/S)	Gear / Flaps 15	60%
	Glide Slope Intercept	Gear / Flaps 35	60%
Single-Engine ILS	Downwind	Clean	70%
	Base	Flaps 15	70%
	2 miles from FAF (1 dot < G/S)	Gear / Flaps 15	60%
	Landing Assured	Landing Flaps	As Req
Non-Precision Approach	Downwind	Clean	60%
	Base	Flaps 15	60%
	Level Flight to FAF	Flaps 15	60%
	1-2 miles prior to FAF	Gear / Flaps 15	60%
	Descent to MDA	1000 fpm / Gear / Flaps 15	IDLE
	MDA	Level / Gear / Flaps 15	60%
	Landing Assured	Landing Flaps	As Req

1 AIRWORK & MANEUVERS

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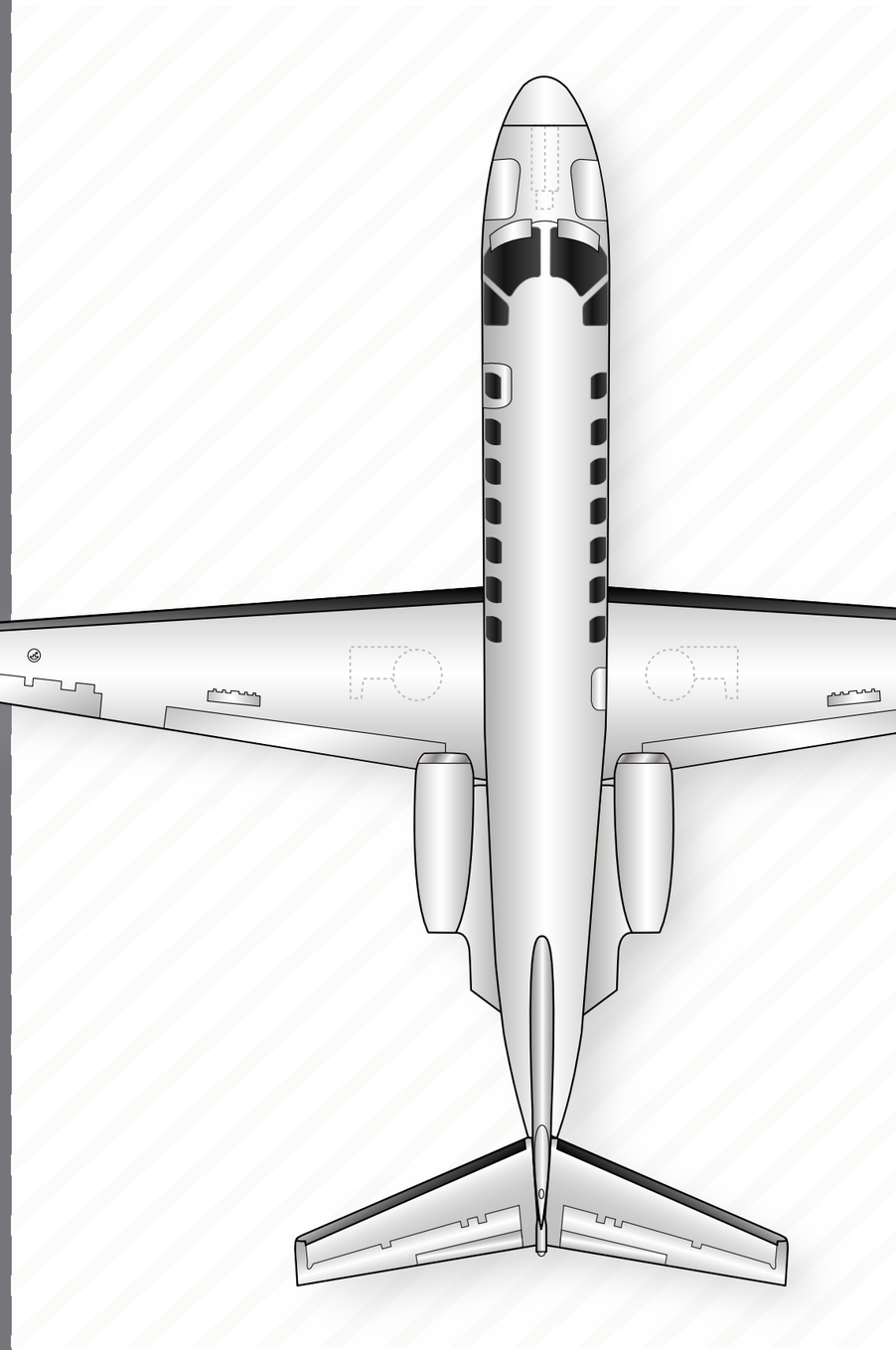
CREW RESOURCE MANAGEMENT



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CREW RESOURCE MANAGEMENT

CRM is normally intended to be used in a multi-pilot environment. The CE-525B is certified under FAR Part 23 and can be flown by a single pilot or two pilots, based on pilot certification and currency requirements. This section is intended to train a two pilot crew to increase overall flight safety and awareness.

The lessons, briefings, and standard callouts detailed in this section can be of benefit to every crew.

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BACKGROUND

The CRM concept originated in 1979 in response to a NASA workshop that examined the role of human error in aviation. CRM emphasizes the use of cooperative interaction to achieve flight efficiency and safety. The application of team management concepts in the flight deck environment was initially known as cockpit resource management. As CRM training evolved to include flight attendants, maintenance personnel, ATC and others, the phrase "Crew Resource Management" was adopted.

Investigations into the causes of aircraft accidents have shown that human error is a contributing factor in 60 to 80 percent of all incidents and accidents. Long-term NASA research has demonstrated that these events share common characteristics. Many problems encountered by flight crews have very little to do with the technical aspects of operating in a multi-person cockpit. Instead, problems are associated with poor group decision-making, ineffective communication, inadequate leadership, and poor task or resource management. Pilot training programs historically focused almost exclusively on the technical aspects of flying and on an individual pilot's performance; they did not effectively address crew management issues that are also fundamental to safe flight.

THE MISSION OF CRM TRAINING

CRM training has been conceived to prevent aviation accidents by improving crew performance through better crew coordination.

COMMUNICATION

The first thing that becomes obvious to the new jet pilot is the necessity that all tasks be performed as a "crew." This requires a constant, friendly communication between crewmembers involving all phases of the flight, from preflight planning to the "parking" checklist at the termination point. This communication can take the form of a simple question, such as, "What altitude did he say?" to "Did you notice that oil leak on the preflight?" This constant cross-referencing of data drastically reduces the possibility of error, which in turn reduces mistakes, and just might preclude an accident.

As a crewmember, it is your responsibility to bring any information that has an impact on operational safety to the attention of the other crewmember. You should ask questions, state recommendations, and test assumptions. If you have any doubt about the safety of the flight, you must speak up with appropriate persistence until there is some resolution.

The Captain is the final decision making authority on the aircraft, but it is the responsibility of all crewmembers to contribute to the decision making process to help ensure that the best decisions are made. All crewmembers should balance assertiveness with tact.

WHAT IS MY ROLE IN THE COCKPIT?

In a two pilot crew environment, there are two roles:

1. **Pilot Flying (PF)**
2. **Pilot Monitoring (PM)**

Pilot Flying (PF): As the PF, your role is to fly the airplane. If you need anything, just call for it from the PM. This includes gear, flaps, lights, and radio frequencies. The PF should always maintain vigilance monitoring ATC, even though the PM will be handling all communications.

Pilot Monitoring (PM): As the PM, you are responsible for everything except the physical manipulation of the controls. This responsibility includes all navigation, frequency changes, all radio communications, gear, flaps, checklists, etc. Stay ahead of the situation and try to anticipate the needs of your fellow crewmember.

It is important to remember that whatever role you are fulfilling it is your responsibility to maintain the "Big Picture" at all times and not become complacent.

BRIEFINGS

There are many different briefings to accomplish in a crew environment. We will focus on the standard crew briefing, departure briefing, and approach briefing.

Standard Crew Briefing

Prior to the first flight with a new crewmember, the Captain will conduct a Standard Crew Briefing. On subsequent days of a trip, the Standard Crew Briefing is not necessary, if there have been no crewmember changes, however, any item(s) of particular interest to the flight should be thoroughly covered. The following list is considered the minimum topics necessary to conduct a comprehensive Standard Crew Briefing:

- Introduce Crewmembers
- Evacuation Coordination
- Emergency/Abnormal Situations
- Customer Non-Compliance
- Inflight Security Incidents
- Questions

For each flight segment, the Captain will brief the other crewmember on the following:

- Estimated Time Enroute
- Weather and Turbulence Issues
- Special Passenger/Service Issues
- Significant irregularities or occurrences that may affect the safety and/or security of the flight

DEPARTURE BRIEFING

The Captain will designate the Pilot who accomplishes the departure briefing (PF) which should include but is not limited to a review of the following areas:

- Crew coordination in the event of an aborted takeoff (ATO)
- Crew coordination in the event of a malfunction after V_1
- The Departure Procedure or initial heading and altitude, including applicable frequencies, ourses and speeds
- Special Departure Procedures or Obstacle Departure Procedures, if published
- Any environmental condition that may affect takeoff and initial climb performance, including terrain considerations
- Any significant weather conditions that may affect the flight (icing, thunderstorms, etc.)
- Any unusual, non-standard, or abnormal condition that might affect the safety of the flight
- Whether or not an air return will result in an overweight landing
- Experience level and currency of the crew
- PF and PM duties
- Planned taxi routing to the expected departure runway, any applicable NOTAMs that may affect the taxi, takeoff and/or departure, including information concerning construction and/or taxiway/ runway closures

The departure briefing should be performed with the active participation of both Pilots. A briefing that consists of repetition of a memorized speech is not effective. Only changes to the above information must be briefed on subsequent flights with the same crew.

2 CREW RESOURCE MANAGEMENT

APPROACH BRIEFING

Normally the approach briefing will be accomplished prior to the descent from cruise altitude. However, if this proves impractical, the briefing should be accomplished prior to crossing 18,000 feet. The PF will brief the arrival. At all times, one pilot will fly the aircraft and a positive exchange of controls should be executed. In addition to the weather and actual approach plate, the STAR (if applicable), and planned runway turnoff and taxi plan should be briefed. Any NOTAMs that may affect the arrival, approach, landing and/or taxi should also be briefed, including information concerning construction and/or taxiway/runway closures.

If expecting an instrument approach, the full approach plate briefing should be conducted, even in VMC. This shall include, but not be limited to, the following:

- Verification of correct approach plate
- Airport Elevation
- Inbound Course/Track
- Procedure turn and/or FAF altitude
- Airspeed and rate of descent
- Decision Height (DH) or Minimum Descent Altitude (MDA)
- Time to MAP, when appropriate
- Missed approach procedure
- Minimum safe altitudes
- Navaids required for the procedure
- Applicable NOTAMs

STANDARD CALLS (CJ3)

Normal T/O:

PF Before Takeoff Checklist

PF Set Takeoff Power

PM Takeoff Power is Set, Airspeed Alive, 70 kts Crosscheck, V_1, Rotate, Positive Rate

PF Gear Up

PM V_2 Plus 10

PF Flaps Up, After Takeoff Checklist

T/O Single Engine:

Taking the Runway:

PF Before Takeoff Checklist

PF Set Takeoff Power

PM Takeoff Power is Set, Airspeed Alive, 70 kts Crosscheck, V_1 (Lose Engine), Rotate, Positive Rate

PF Gear Up

At 1,500'

PM 1500 ft

PM V_2 Plus 10

PF Flaps Up, After Takeoff Checklist, Engine Failure During T/O Checklist

In addition to the above standard call outs, the following conditions note a call out requirement by at least one, if not both pilots.

- Climbing/Descending through 10,000 feet MSL
- Climbing/Descending through 18,000 feet MSL
- During any climb/descent within 1,000 feet of leveling off (ex: 8,000 for 9,000)

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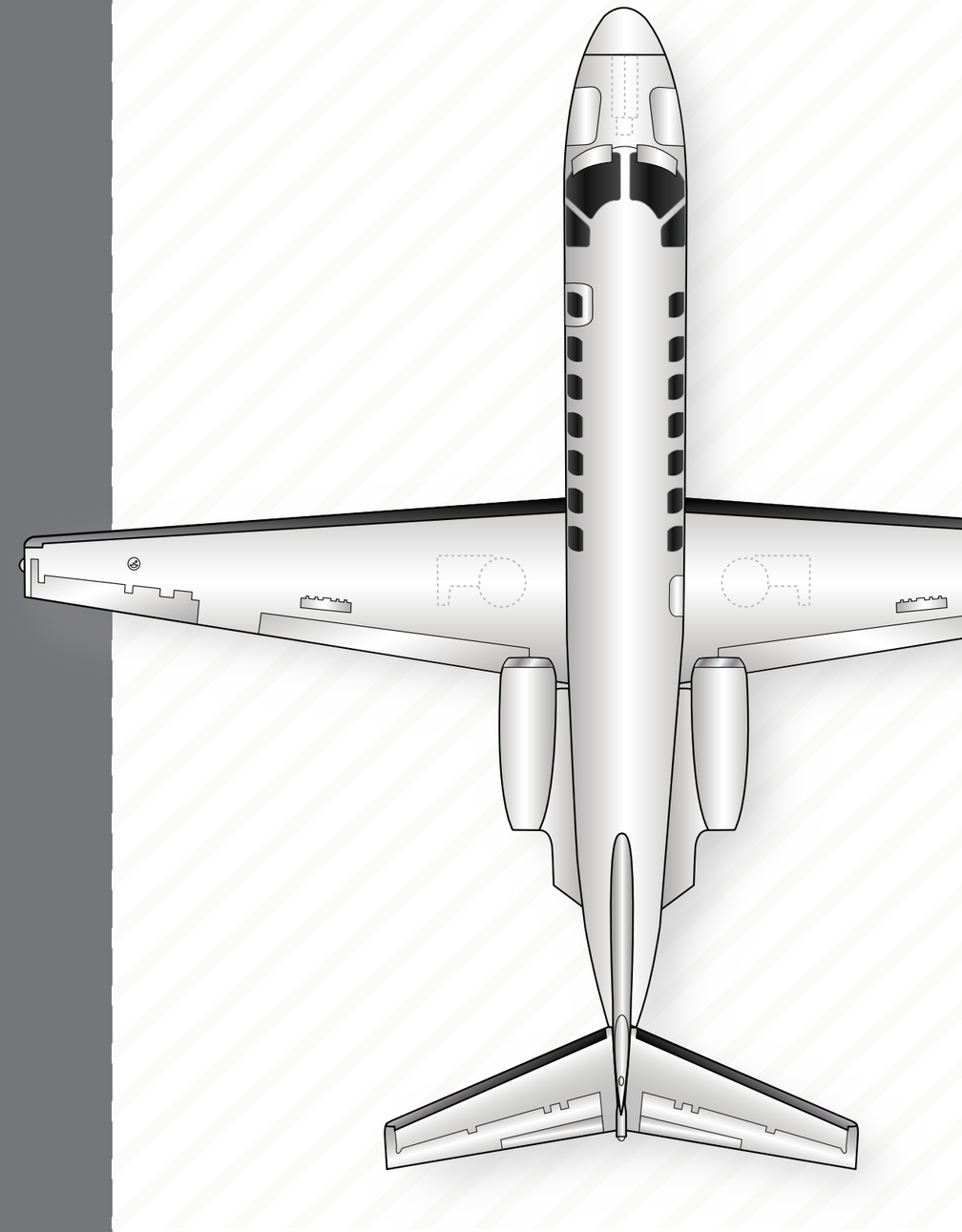
AFM EXTRACTS



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OPERATING LIMITATIONS

NOTICE

CERTIFICATION AND OPERATIONAL LIMITATIONS ARE CONDITIONS OF THE TYPE AND AIRWORTHINESS CERTIFICATES AND MUST BE COMPLIED WITH AT ALL TIMES AS REQUIRED BY LAW.

CERTIFICATION STATUS

This airplane is certified in accordance with 14 CFR, Part 23 Commuter Category, Part 34 (Fuel Venting and Exhaust Emissions), Part 36 (Noise Requirements) and Special Conditions as prescribed by the Administrator.

WEIGHT LIMITATIONS

Maximum Design Ramp Weight . . . . . 14,070 Pounds
Maximum Design Takeoff Weight . . . . . 13,870 Pounds
Maximum Design Landing Weight . . . . . 12,750 Pounds
Maximum Design Zero Fuel Weight . . . . . 10,510 Pounds

Takeoff weight is limited by the most restrictive of the following requirements:

Maximum Certified Takeoff Weight . . . . . 13,870 Pounds
Maximum Takeoff Weight Permitted by
Climb Requirements . . . . . Refer to Procedures for Use of Takeoff Performance Tables in Section IV
Takeoff Field Length . . . . . Refer to Procedures for Use of Takeoff Performance Tables in Section IV

Landing weight is limited by the most restrictive of the following requirements:

Maximum Certified Landing Weight . . . . . 12,750 Pounds
Maximum Landing Weight Permitted by Climb Requirements
or Brake Energy Limit . . . . . Refer to Procedures for Use of Approach and Landing Performance Tables in Section IV
Landing Distance . . . . . Refer to Procedures for Use of Approach and Landing Performance Tables in Section IV

CENTER-OF-GRAVITY LIMITS

Center-of-Gravity Limits Envelope . . . . . Refer to Figure 2-1

WEIGHT AND BALANCE DATA

The airplane must be operated in accordance with the approved loading schedule. (Refer to Weight and Balance Data in Section VI.)

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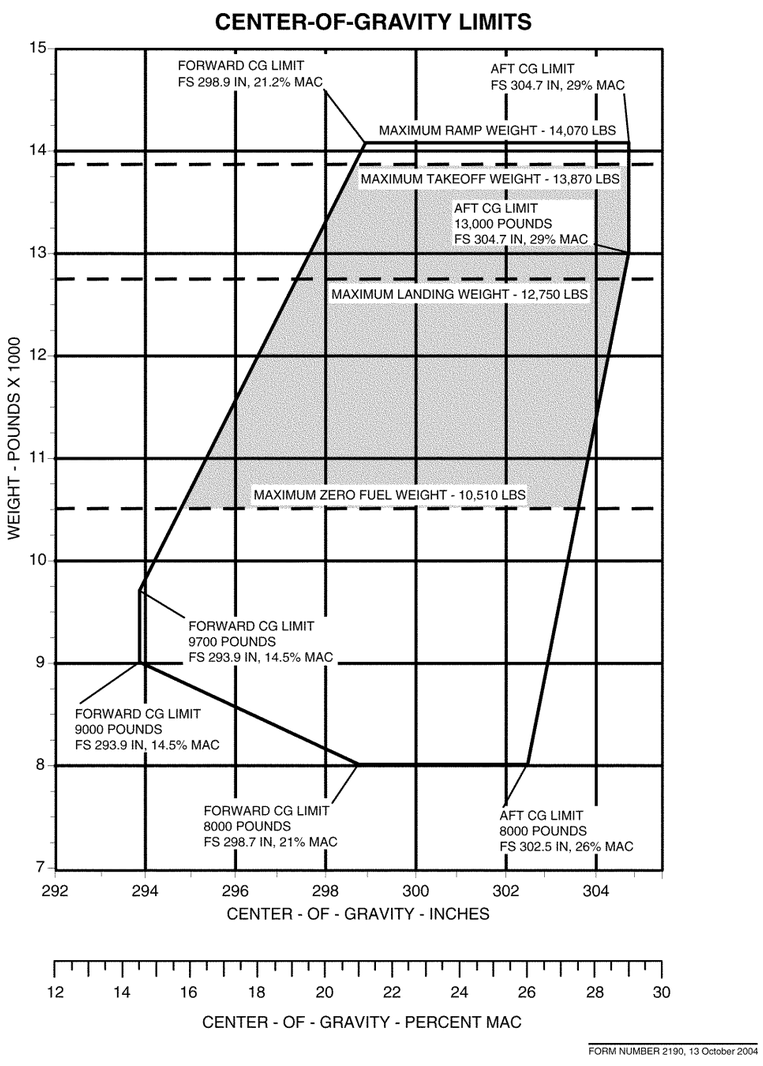

Figure 2-1

POWERPLANT LIMITATIONS

Engine Type . . . . . Williams International FJ44-3A Turbofan
Engine Operating Limits . . . . . Refer to Figure 2-2
Engine Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figures 2-3 and 2-4
Engine Overspeed Limits . . . . . Refer to Figures 2-5 and 2-6
Takeoff/Go-Around Thrust (TO Detent). . . . . Refer to Figures 4-8 and 4-9
Maximum Continuous Thrust Single-Engine (MCT Detent) . . . . . Refer to Figure 4-10
Maximum Continuous Thrust Multi-Engine (MCT Detent) . . . . . Refer to Figure 4-11

ENGINE OPERATING LIMITS

OPERATING CONDITIONS	OPERATING LIMITS					
THRUST SETTING	TIME LIMIT (MINUTES)	ITT TEMPERATURE °C	N_2% TURBINE RPM	N_1% FAN RPM	OIL PRESSURE PSIG	OIL TEMPURATURE °C
START	---	REFER TO FIGURE 2-4	---	---	---	-40 TO 135 (NOTE 7)
GND IDLE	CONTINUOUS	---	53.4 (MIN.)	---	35 MIN. 100 MAX. (NOTE 6)	-40 TO 135 (NOTE 7)
FLT IDLE	CONTINUOUS	---	60.7	---	35 MIN. 100 MAX. (NOTE 6)	-40 TO 135 (NOTE 7)
TAKEOFF	5 (NOTE 1)	877 MAX.	100	102.8 (NOTE 1)	45 - 90 (NOTE 3)	10 TO 135
MAXIMUM CONTINUOUS	CONTINUOUS	840 MAX.	100	102.8 (NOTE 2)	45 - 90 (NOTE 3)	10 TO 135
TRANSIENT	---	REFER TO FIGURE 2-3	100.7 (20 SEC. MAX.)	103.9 (20 SEC. MAX.)	23 MIN. (NOTE 4) 100 MAX. (NOTE 5)	149 (NOTE 8)

Figure 2-2

NOTE

1. Takeoff thrust settings that are nominally limited to 5 minutes duration may be used for up to 10 minutes for One Engine Inoperative operations. Time limit begins when throttle lever is advanced for takeoff thrust. The takeoff thrust (N_1) for the airplane is defined in Figure 4-8 and 4-9, and is more limiting than engine rotational limits and must be observed. Performance data, including V_{MCA} and V_{MCG} in Section IV, is based on use of the takeoff thrust setting.
2. Maximum continuous thrust (MCT) for the airplane is defined by Figures 4-10 (single-engine) and Figure 4-11 (multi-engine). These thrust settings (N_1) are more limiting than engine rotational limits and must be observed. Performance data in Section IV is based on the use of the appropriate MCT setting.
3. Minimum oil pressure is 45 PSIG when operating at or above 80% N_2; 35 PSIG when operating below 80% N_2.
4. Minimum allowable oil pressure is 23 PSIG for up to 5 minutes when operating below 80% N_2.
5. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes when operating at or above 80% N_2.
6. Maximum allowable oil pressure is 100 PSIG for up to 5 minutes with oil pressure returning to normal range.
7. The engine should not be operated above 80% N_2 until oil temperature is above 10°C (+50°F).
8. Maximum oil temperature is 149°C (+300°F) for up to 5 minutes when operating below 80% N_2.

INTER-TURBINE TEMPERATURE (ITT) LIMITS (EXCEPT STARTING OR SHUTDOWN)

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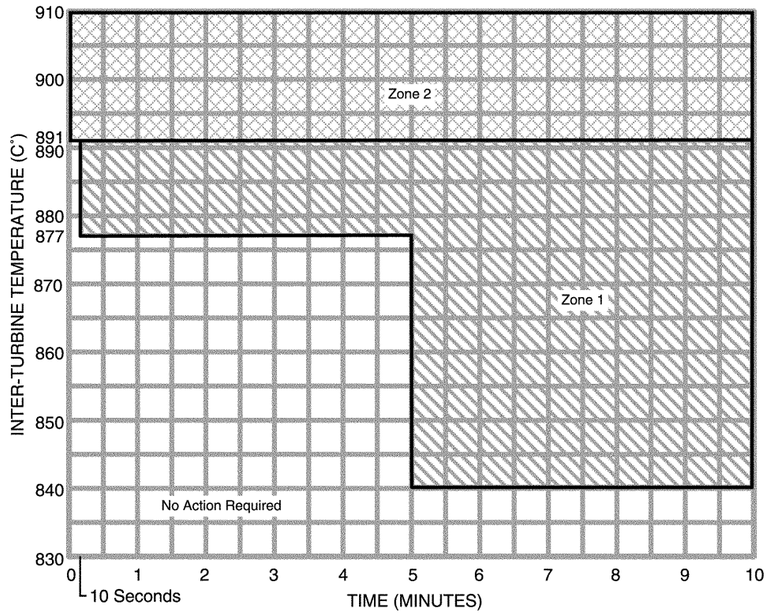

Figure 2-3

NOTE

Zone 1:

Determine and correct the cause of overtemperature.

Zone 2:

Perform inspection of hot section, (Ref. Maintenance Manual 71-00-01, P.B. 601) including NDI of HP turbine rotor assembly (Ref. Maintenance Manual 70-42-15, P.B. 601). If visual inspection reveals indications of overtemperature, disassemble LP turbine module and perform NDI inspection on LP turbine assembly.

INTER-TURBINE TEMPERATURE (ITT) LIMITS (STARTING AND SHUTDOWN)

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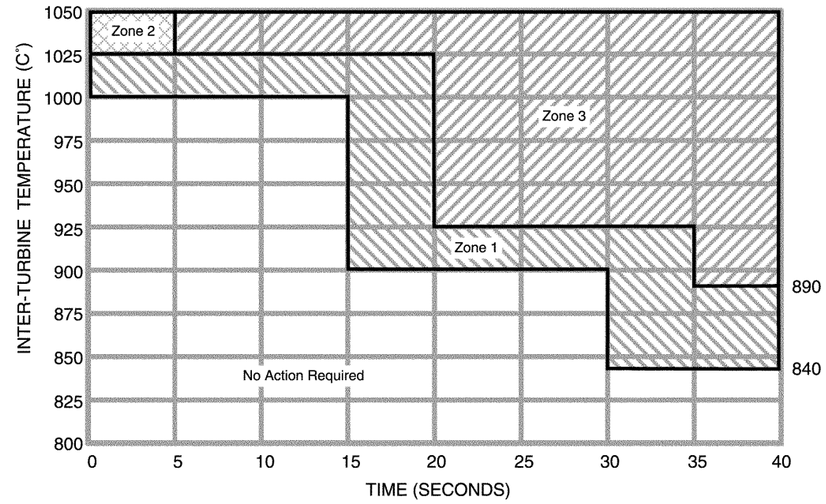

Figure 2-4

NOTE

Zone 1:

Determine and correct the cause of overtemperature.

Zone 2:

1. Perform a borescope inspection on the HP turbine area (Ref. Maintenance Manual 71-00-40, P.B. 601).
2. Perform a performance check ground run test (Ref. Maintenance Manual 71-00-00, P.B. 501).

Zone 3:

Perform inspection of hot section, (Ref. Maintenance Manual 71-00-01, P.B. 601) including NDI of HP turbine rotor assembly (Ref. Maintenance Manual 70-42-15, P.B. 601). If visual inspection reveals indications of overtemperature, disassemble LP turbine module and perform NDI inspection on LP turbine assembly.

N_2 ENGINE OVERSPEED LIMITS

A35732

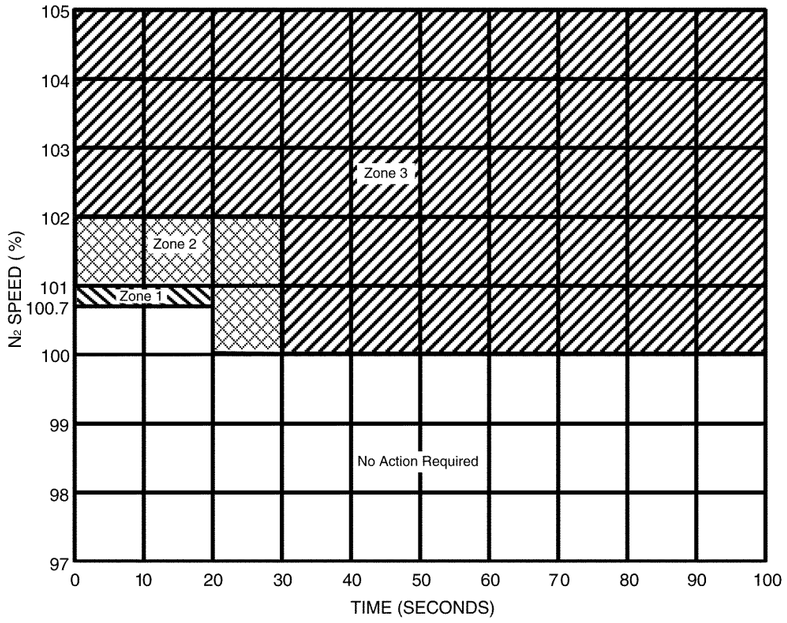

Figure 2-5

NOTE

Zone 1:

Determine and correct the cause of overspeed.

Zone 2:

Perform inspection of hot section, (Ref. Maintenance Manual 71-00-01, P.B. 601) including NDI of HP turbine rotor assembly (Ref. Maintenance Manual 70-42-15, P.B. 601). If visual inspection reveals indications of overtemperature, disassemble LP turbine module and perform NDI inspection on LP turbine assembly.

Zone 3:

Return to approved facility for inspection of compressor zone (Ref. Engine Manual 72-00-00, P.B. 801).

N_1 ENGINE OVERSPEED LIMITS

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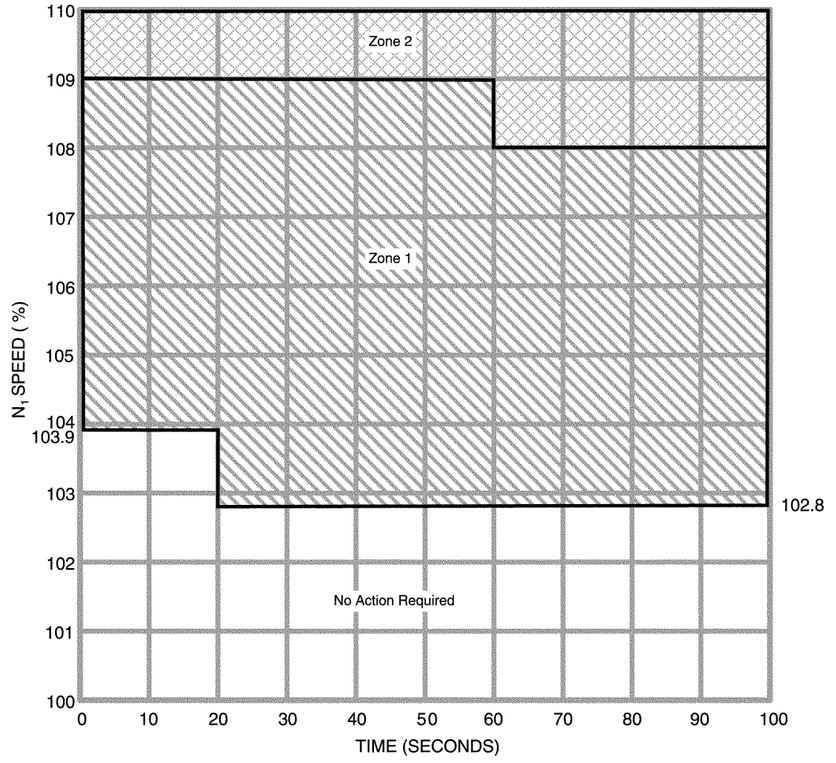

Figure 2-6

NOTE

Zone 1:

Determine and correct the cause of overspeed.

Zone 2:

Perform inspection of the first LP turbine rotor (Ref. Engine Manual 72-55-31, P.B. 801) and second LP turbine rotor (Ref. Engine Manual 72-55-33, P.B. 801).

Above 110% N_1, return to approved facility for inspection of compressor zone (Ref. Engine Manual 72-00-00, P.B. 801).

ENGINE START LIMITATIONS (Ground)

ENG CTRL SYS FAULT L/R Annunciators . . . . . Extinguished
Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-4
Maximum Tailwind Component . . . . . 10 Knots
Maximum Crosswind Component . . . . . 10 Knots
Maximum Time to Light-off . . . . . 10 Seconds

NOTE

Time to light-off is defined as the time after the throttle lever is moved from OFF to IDLE position until light-off is indicated.

Minimum Engine Oil Temperature (indicated on EIS) . . . . . -40°C

NOTE

- If engine oil temperature is below -40°C (-40°F), the engine must be preheated prior to conducting a start.
- If the battery has been cold soaked for 2 hours or longer at ambient surface temperature of -18°C (0°F) or lower, it must be preheated to above -18°C (0°F) prior to start.
- The Engine Indicating System (EIS) may take 1 to 6 minutes to become usable after power is applied when cold soaked below -10°C (+14°F).
- If ambient surface temperature is below -40°C (-40°F), the FADEC units may generate non-resettable ENG CTRL SYS FAULT annunciations upon power-up. Engine start with an ENG CTRL SYS FAULT annunciator illuminated is prohibited. Refer to COLD WEATHER OPERATIONS in Section III, Normal Procedures.

Maximum Temperature For Engine Start . . . . . Refer to Figure 2-9
Maximum Airport Elevation For Ground Battery Start . . . . . 14,000 Feet
Maximum Airport Elevation For Ground External Power Start . . . . . 14,000 Feet
Minimum Battery Voltage For Battery Start . . . . . 24 VDC
Minimum/Maximum External Power Current Capacity For Start . . . . . 800/1100 AMPS

NOTE

Normal starter current draw is approximately 1000 amperes peak. External power units with variable maximum current shutoff should be set to 1100 amperes. Use of an external power source with voltage in excess of 29VDC or current in excess of 1100 amps may damage the starter.

ENGINE START LIMITATIONS (Air)

Inter-Turbine Temperature (ITT) Limits . . . . . Refer to Figure 2-4
Airspeed/Altitude Limits (Airstart Envelope) . . . . . Refer to Figure 3-1

ENGINE OPERATION DURING LOW-G MANEUVERING FLIGHT

The engine is limited to 10 seconds of continuous flight at zero- or negative-g.

(Continued Next Page)

ENGINE OPERATION DURING LOW-G MANEUVERING FLIGHT

(Continued)

CAUTION

Oil pressure can decrease to below the transient oil pressure limit and reach zero when operating at zero- or negative-g. If the above time limit is exceeded during such maneuvering, engine damage can occur due to oil starvation.

ENGINE FAN INSPECTION

Prior to engine start, the Engine Fan Duct and Fan inspection in Section III, Normal Procedures, must be satisfactorily completed.

STARTER CYCLE LIMITATIONS

Starter Cycle Limitation . . . . . Three engine starts per 30 minutes. Three cycles of operation with a 60-second rest period between cycles is permitted.

NOTE

This limitation is independent of starter power source; i.e., battery, generator assisted cross start, or external power unit.

BATTERY LIMITATIONS

The battery temperature warning system must be operational for all ground and flight operations.

The battery temperature warning system preflight test (on the Rotary TEST Switch) in Section III, Normal Procedures, must be satisfactorily completed.

If the BATT O'TEMP warning light illuminates during ground operation, do not take off until the proper maintenance procedures have been accomplished.

Battery Cycle Limitations: Three engine starts per hour.

NOTE

- If battery limitation is exceeded, ground maintenance procedures are required. Refer to Chapter 24 of the Maintenance Manual for procedure.
- Three generator assisted cross starts are equal to one battery start.
- If an external power unit is used for start, no battery cycle is counted.

GROUND OPERATION

Continuous engine ground static operation up to and including five minutes at takeoff thrust is limited to ambient temperatures defined in Figure 2-9.

Maximum Generator Current (per generator) . . . . . 200 Amperes

Limit ground operation of pitot/static heat to two minutes to preclude damage to the pitot tubes and angle of attack vane.

Ground operation at greater than 75% N_2 engine RPM with engine, wing, and/or windshield anti-ice on is limited to two minutes. Do not operate with the wing anti-ice on more than one minute after the WING ANTI-ICE L/R annunciators have extinguished.

Ambient surface temperature must be obtained from the RAT display at the bottom of each PFD, with either or both engines operating, or from an appropriate ground station. The SAT display is unreliable on the ground.

WINDSHIELD ICE PROTECTION FLUID

Use TT-I-735 isopropyl alcohol for windshield anti-ice.

HYDRAULIC FLUID

Use MIL-PRF-83282 Type fluids only.

FUEL LIMITATIONS

Fuel Boost Pumps - ON; when FUEL LOW LEVEL L and/or R caution lights illuminate or at 210 pounds or less indicated fuel.

NOTE

If fuel transfer is required, VERIFY the fuel boost pump is not operating on the side to which the fuel is being transferred. (For example, to transfer from left tank to right tank, verify right boost pump is not operating).

Refer to Figure 2-7 for fuels that are approved for use.

Maximum approved fuel imbalance is 200 lbs. A fuel imbalance of 600 lbs. has been demonstrated for emergency return.

FUEL LIMITATIONS

GRADE (TYPE) REFER TO NOTE BELOW	SPECIFICATION	MINIMUM FUEL TEMPERATURE °C	MAXIMUM FUEL TEMPERATURE °C
JET A JET A1	ASTM-D1655	-40 -40	+57.2 +57.2
JET 3	GB6537-94	-25	+57.2
JP-5	MIL-PRF-5624	-40	+57.2
JP-8	MIL-T-83133	-40	+57.2
RT	GOST-10227-86	-35	+57.2
RT (Ukraine)	GSTU 320.00149943.007-97	-35	+57.2
TS-1	GOST-10227-86	-45	+57.2
TS-1 (Ukraine)	GSTU 320.00149943.011-99	-35/-31	+57.2/+135

Figure 2-7*

NOTE

- Dupont Stadis 450 antistatic additive or equivalent is permitted to bring fuel up to 300 conductive units, but not to exceed 1 ppm (parts per million).
- SOHIO Biobor JF biocide additive is approved at a concentration not to exceed 20 ppm (270 ppm total additive) of elemental boron.
- EGME/DIEGME additive is approved for use, but not required, at a concentration not to exceed 0.15 percent volume. Refer to Normal Procedures, ANTI-ICE ADDITIVES for blending instructions.

APPROVED OILS

APPROVED BRAND	SPECIFICATION
Mobil Jet II	MIL-L-23699
Mobil 254	MIL-L-23699

NOTE

Mixing of approved oils is permissible.

UNUSABLE FUEL

Fuel remaining in the fuel tanks when the fuel quantity indicator reads zero is not usable in flight.

SPEED LIMITATIONS

Maximum Operating Limit Speeds
- M_{MO} (Above 29,300 Feet) . . . . . 0.737 Mach (Indicated)
- V_{MO} (Between 8000 and 29,300 Feet). . . . . 278 KIAS
- V_{MO} (Below 8000 Feet) . . . . . 260 KIAS

The maximum operating limit speeds may not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test or pilot training.

Maximum Maneuvering Speeds - V_A. . . . . Refer to Figure 2-8

Full application of rudder and aileron controls as well as maneuvers that involve angle-of-attack near the stall should be confined to speeds below maximum maneuvering speed. Refer to LOAD FACTOR limitations for pitch maneuvering limitations.

Maximum Flap Extended Speed - V_{FE}
- TAKEOFF AND APPROACH Position (15°) . . . . . 200 KIAS
- LAND Position (35°) . . . . . 161 KIAS
- Maximum Speed With Flaps Failed to Ground Flaps (55°) . . . . . 140 KIAS

Maximum Landing Gear Extended Speed - V_{LE} . . . . . 200 KIAS
Maximum Landing Gear Operating Speed - V_{LO} (Extending) . . . . . 200 KIAS
Maximum Landing Gear Operating Speed - V_{LO} (Retracting) . . . . . 200 KIAS
Maximum Speed Brake Operation Speed - V_{SB} . . . . . No Limit
Maximum Autopilot Operation Speed . . . . . 278 KIAS or 0.737 Mach
Minimum Speed for Sustained Flight in Icing Conditions (except takeoff approach and landing) . . . . . 180 KIAS

NOTE

For minimum control speeds (V_{MCA} and V_{MCG}), refer to the respective definition in Section IV, Performance - General.

GROUND FLAPS LIMITATIONS

Intentional selection of Ground Flaps in flight is prohibited.

WARNING

The ground flaps position is not locked out in flight. Selection of ground flaps will significantly increase drag and sink rate.

TAKEOFF AND LANDING OPERATIONAL LIMITS

Maximum Altitude Limit. . . . . 14,000 Feet
Maximum Tailwind Component. . . . . 10 Knots
Maximum Ambient Temperature. . . . . Refer to Figure 2-9
Minimum Ambient Temperature . . . . . -54°C (-65°F)

The maximum approved fuel imbalance is 200 pounds; however, controllability for safe return and landing has been demonstrated with an emergency fuel imbalance of 600 pounds.

Cabin temperature must be held at or above 0°C (+32°F) for a minimum of 20 minutes prior to takeoff after a prolonged ground cold soak period (two hours or longer) at ambient temperatures of -10°C (+14°F) or colder (refer to Normal Procedures, COLD WEATHER OPERATIONS). This temperature ensures proper deployment and operation of the passenger oxygen masks. A handheld thermometer is acceptable to determine cabin temperature. This limitation does not apply if there are no passengers in the cabin.

Prior to takeoff, the following systems must be operational and must have satisfactorily completed the preflight checks in Section III, Normal Procedures: The Angle-of-Attack and Stall Warning System, Electric Elevator Trim, Rudder Bias, Flaps, and Flight Controls. In addition, channels A and B of the L and R FADECs must be verified operational prior to takeoff.

NOTE

- If the stick shaker does not operate during the warning system test, it must be repaired prior to flight. If the angle of attack system is otherwise inoperative it must be repaired prior to flight except when the airplane is operated in accordance with an approved Minimum Equipment List.
- If the elevator trim check is unsatisfactory or otherwise inoperative, it must be repaired prior to flight except when the airplane is operated in accordance with an approved Minimum Equipment List.

Takeoff is prohibited with an ENG CTRL SYS FAULT L/R caution light illuminated.

The autopilot and yaw damper must be OFF for takeoff and landing.

Engine synchronizer must be OFF for takeoff and landing.

Takeoff is prohibited if the antiskid system is inoperative.

Cabin must be depressurized for takeoff and landing.

Takeoffs and landings are limited to paved runway surfaces.

Speed brakes must be retracted prior to 50 feet AGL before landing.

Extending Ground Flaps during touch and go landings is prohibited.

The GROUND IDLE switch must be in the HIGH position when conducting touch and go landings. For normal takeoff operations, the GROUND IDLE switch must be in the NORMAL position.

Maximum Tire Ground Speed. . . . . 165 Knots

Takeoff is limited to the flaps up configuration when Type II, III, or IV anti-ice fluid has been applied to the airplane.

Takeoff may not be initiated with a warning annunciator displayed. Takeoff may not be initiated with a caution annunciator displayed unless the associated system or component has been deferred per an approved Minimum Equipment List (MEL). When dispatching in this manner, if the procedure associated with the caution annunciator includes "Land as soon as practical" as a step, the step may be ignored.

TAKEOFF AND LANDING OPERATIONAL LIMITS (Continued)

Takeoff is prohibited with the following forms of contamination:

1. With frost adhering to the following critical areas:
   a. Wing Leading Edge
   b. Upper Wing Surface
   c. Windshield
2. With ice, snow, or slush adhering to the following critical areas:
   a. Wing Leading Edge and Upper Wing Surface
   b. Flight Control Surfaces including all hinge gaps
   c. Horizontal Stabilizer
   d. Vertical Stabilizer
   e. Engine Inlets
   f. Top of Engine Pylons
   g. Top of Fuselage
   h. Windshield
   i. All Pitot Probes and Static Ports
   j. Angle of Attack Vanes
   k. Upper surface of nose forward of the windshield

NOTE

Refer to Section VII for information regarding Ground Deicing and Anti-icing procedures.

3. A visual and tactile (hand on surface) check of the wing leading edge and wing upper surface must be performed to ensure the wing is free from frost, ice, snow, or slush when the outside air temperature is less than 10°C (50°F) or if it cannot be determined that the wing fuel temperature is above 0°C (32°F) and any of the following conditions exist:
   a. There is visible moisture present (rain, drizzle, sleet, snow, fog, etc.); or
   b. Water is present on the upper wing surface; or
   c. The difference between the dew point and the outside air temperature is 3°C (5°F) or less; or
   d. The atmospheric conditions have been conducive to frost formation.

ENROUTE OPERATIONAL LIMITS

Maximum Operating Altitude. . . . . 45,000 Feet

NOTE

The cabin must be heated to a temperature of 0°C (+32°F) prior to operation above 24,000 feet. This temperature ensures proper deployment and operation of the passenger oxygen masks. A handheld thermometer is acceptable to determine cabin temperature. This limitation does not apply if there are no passengers in the cabin.

Maximum Ambient Temperature. . . . . Refer to Figure 2-9
Minimum Ambient Temperature . . . . . Refer to Figure 2-9
Maximum Generator Current (per generator) . . . . . 300 Amperes Up to 41,000 Feet
250 Amperes above 41,000 Feet

Maximum altitude for extension of flaps and/or landing gear . . . . . 18,000 Feet
Maximum operating altitude with inoperative Yaw Damper . . . . . 30,000 Feet

MAXIMUM MANEUVERING SPEEDS

A35973

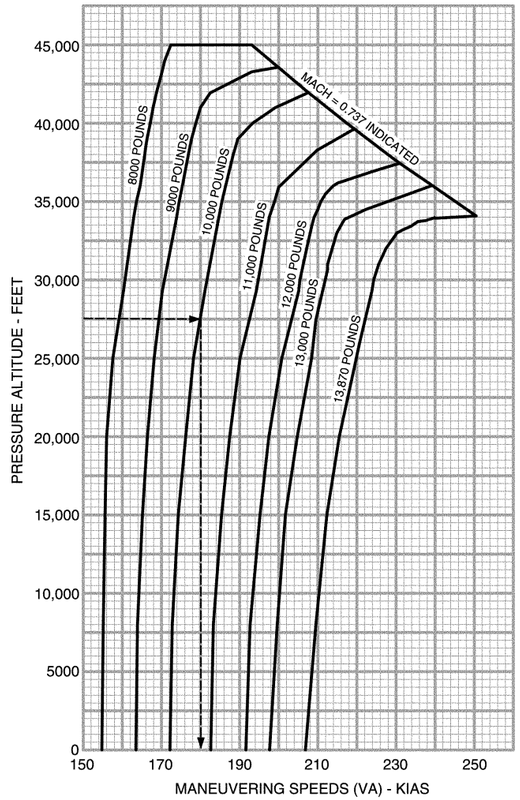

Figure 2-8

WARNING

Avoid rapid and large alternating control inputs, especially in combination with large changes in pitch, roll, or yaw (i.e., large sideslip angles) as they may result in structural failures at any speed, including below V_A.

EXAMPLE:
Pressure Altitude - 27,500 FEET
Weight - 10,000 POUNDS
Maximum Maneuvering Speed - 180 KIAS

TAKEOFF/LANDING/ENROUTE TEMPERATURE LIMITATIONS

A36570

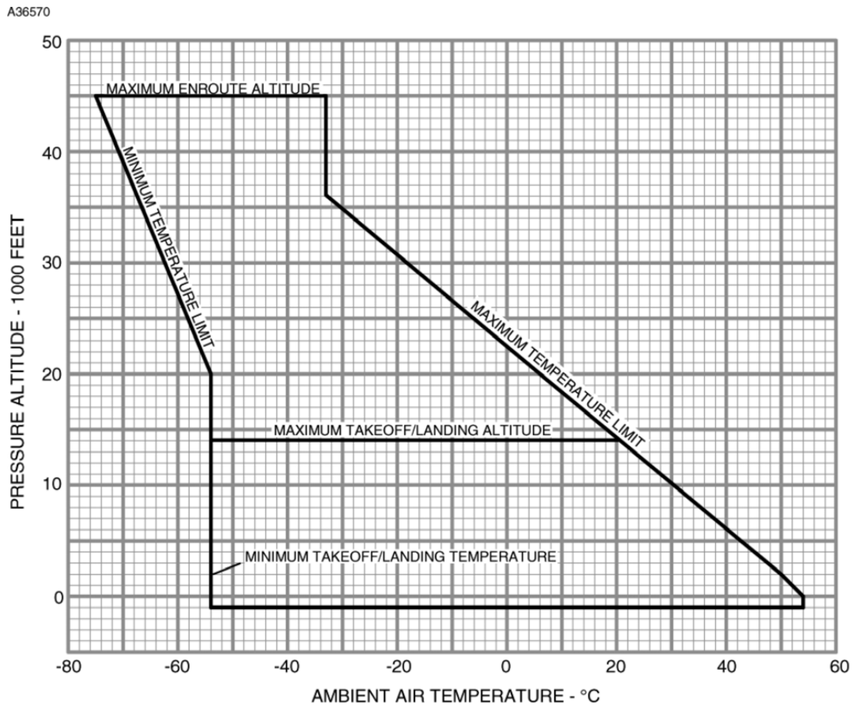

Figure 2-9*

NOTE

Maximum and Minimum Temperature Limits are the Ambient Air Temperature from Figure 2-9. In flight, ambient air temperature is obtained from the Static Air Temperature (SAT) display at the bottom of each PFD. On ground, ambient air temperature is obtained from the RAT display (with at least one engine running) or an appropriate ground station.

OPERATIONS AUTHORIZED

This airplane is approved for day and night, VFR and IFR operations, and flight into known icing conditions when the required equipment is installed as defined within the Kinds of Operations Equipment List.

Acrobatic maneuvers, including spins, are prohibited. Intentional stalls are prohibited above 18,000 feet.

MINIMUM CREW

Except where otherwise prescribed by applicable operating limitations,

Minimum crew for all operations:

1 Pilot, provided:

1. The pilot holds a CE525(S), single pilot, type rating.
2. The airplane is equipped for single pilot operation as specified in the Kinds of Operations Equipment List.
3. The pilot must occupy the left pilot's seat.

Or

1 Pilot and 1 Copilot provided:

1. The pilot in command holds a CE525(S) or CE525 (second-in-command required) type rating.

LOAD FACTOR

In Flight

Flaps UP Position (0°). . . . . –1.44 to +3.6G at 13,870 Pounds
Flaps TAKEOFF AND APPROACH to
LAND Position (15° to 35°) . . . . . 0.0 to +2.0G at 13,870 Pounds

These accelerations limit the angle-of-bank in turns and limit the severity of pull-up and push-over maneuvers.

CABIN PRESSURIZATION LIMITATIONS

Normal Cabin Pressurization Limitations . . . . . 0.0 to 8.9 PSI ± 0.1 PSI Differential

PASSENGER SEATING

For all takeoffs and landings, adjustable seats must be fully upright and outboard and passenger seat belts and shoulder harnesses must be fastened.

Maximum passenger seating, not including 2 crew seats, is seven (eight with optional belted toilet installed).

INSTRUMENT MARKINGS

ENGINE INDICATING SYSTEM

FAN (N_1) RPM INDICATORS

Scale Markings	Red Line	102.9% RPM
Tape/Pointer/Digital Readout	Red	≥ 104.0% RPM
		102.9 - 103.9% RPM for ≥ 20 Sec
	Yellow	102.9 - 103.9% RPM for < 20 Sec
Tape/Pointer	White	≤ 102.8% RPM
Digital Readout	Green	≤ 102.8% RPM

NOTE

- Tape, Pointer and Digital Readout will turn red or yellow if outside normal operating limits.
- Pointer and Digital Readout will flash for 5 seconds and then remain steady if outside normal operating limits.
- White Tape Pointer represents Green band.

INTER-TURBINE TEMPERATURE INDICATORS

Engine Start

Scale Markings	Red Triangle	1001°C
	Red Line	878°C
	Yellow Band	841°C - 877°C
Tape/Pointer	Red	> 1000°C
	White	≤ 1000°C

NOTE

- Tape will turn red and Pointer will flash red for five seconds and then remain steady red if outside normal starting operating limits.
- Engine Running Red Line and Yellow Band do not apply while ITT Start Limit (Red Triangle) is in view.
- White Tape Pointer represents Green band.

(Continued Next Page)

INSTRUMENT MARKINGS (Continued)

One Engine Running

Scale Markings	Red Line	878°C
	Yellow Band	841°C - 877°C
Tape/Pointer	Red	≥ 878°C
		841°C - 877°C for ≥ 10min
	Yellow	841°C - 877°C for ≥ 3 min, < 10min
	White	≤ 840°C
		841°C - 877°C for < 3min

NOTE

- Tape will turn red or yellow, the Pointer will flash red or yellow for five seconds and then remain steady if outside normal operating limits.
- White Tape Pointer represents Green band.

Two Engines Running

Scale Markings	Red Line	878°C
	Yellow Band	841°C - 877°C
Tape/Pointer	Red	≥ 878°C
		841°C - 877°C for ≥ 5 min
	Yellow	841°C - 877°C for ≥ 3 min, < 5 min
	White	≤ 840°C
		841°C - 877°C for < 3 min

NOTE

- Tape will turn red or yellow, the Pointer will flash red or yellow for five seconds and then remain steady if outside normal operating limits.
- White Tape Pointer represents Green band.

(Continued Next Page)

INSTRUMENT MARKINGS (Continued)

TURBINE (N_2) RPM INDICATORS

Digital Readout	Red	≥ 100.8% RPM
		100.1 - 100.7% ≥ 20 sec
	Yellow	100.1 - 100.7% < 20 sec
	Green	≤ 100.0% RPM

NOTE

Digital Readout will flash red or yellow for five seconds and then remain steady if outside normal operating limits.

OIL TEMPERATURE INDICATORS

Scale Markings	Red Band	≥ 150°C
	Upper Yellow Band	136°C - 149°C
	Lower Yellow Band	≤ 9°C
	Green Band	10°C - 135°C
Pointer	Red	≥ 150°C
		136°C - 149°C ≥ 5 min
	Yellow	136°C - 149°C < 5 min
		≤ 9°C
	Green	10°C - 135°C
Digital Readout	Red	≥ 150°C
		136°C - 149°C ≥ 5 min
	Yellow	136°C - 149°C < 5 min
		≤ 9°C

NOTE

- Pointer and Digital Readout will flash red or yellow for five seconds and then remain steady if outside normal operating limits.
- Digital Readout is displayed only when temperature is outside normal operating limits.

OIL PRESSURE INDICATORS

Scale Markings	Red Band	≤ 22 PSI
		≥ 101 PSI
	Yellow Band	23 - 34 PSI
		91 - 100 PSI
	Green Band	35 - 90 PSI

NOTE

Oil Pressure Indicator Scale Markings do not change with varying N_2.

(Continued Next Page)

INSTRUMENT MARKINGS (Continued)

OIL PRESSURE INDICATORS (Continued)

N_2 < 80%

Pointer	Red	≤ 22 PSI
		23 - 34 PSI ≥ 5 min
		91 - 100 PSI ≥ 5 min
		≥ 101 PSI
	Yellow	23 - 34 PSI < 5 min
		91 - 100 PSI < 5 min
	Green	35 - 90 PSI
Digital Readout	Red	≤ 22 PSI
		23 - 34 PSI ≥ 5 min
		91 - 100 PSI ≥ 5 min
		≥ 101 PSI
	Yellow	23 - 34 PSI < 5 min
		91 - 100 PSI < 5 min

N_2 ≥ 80%

Pointer	Red	≤ 44 PSI
		91 - 100 PSI ≥ 5 min
		≥ 101 PSI
	Yellow	91 - 100 PSI < 5 min
	Green	45 - 90 PSI
Digital Readout	Red	≤ 44 PSI
		91 - 100 PSI ≥ 5 min
		≥ 101 PSI
	Yellow	91 - 100 PSI < 5 min

NOTE

- Pointer and Digital Readout will flash red or yellow for five seconds and then remain steady if outside normal operating limits, with one exception: For oil pressure 91-100 PSI, the pointer will change to yellow but digits will not be displayed until 4 minutes have elapsed, at which time both yellow digits and pointer will flash for 5 seconds then remain steady.
- Digital Readout is displayed only when pressure is outside normal operating limits.

(Continued Next Page)

INSTRUMENT MARKINGS (Continued)

OTHER INSTRUMENTS

Airspeed Indicator	Red Line	278 KIAS (0.737 Mach) 260 KIAS (Below 8000 Feet)
Ammeter Indicators	Red Line	300 Amps
	Yellow Arc	250 - 300 Amps
Cabin Differential Pressure Indicator	Red Line	> 8.9 PSI
	Green Arc	0.0 - 8.9 PSI
Oxygen Pressure Indicator	Red Line	2000 PSI
	Yellow Arc	0 - 400 PSI
	Green Arc	1600 - 1800 PSI
Brake and Gear Pneumatic Pressure Indicator	Wide Red Arc	> 2050 PSI
	Narrow Red Arc	0 - 1600 PSI
	Wide Yellow Arc	1600 - 1800 PSI
	Wide Green Arc	1800 - 2050 PSI
Brake Hydraulic Accumulator Pressure Indicator	Narrow Red Arc	Underpressure
	Light Green Arc	Precharge Pressure
	Yellow Arc	Caution
	Wide Green Arc	Normal Operating Range
	Wide Red Arc	Overpressure

ROCKWELL COLLINS FCS-3000 INTEGRATED FLIGHT CONTROL SYSTEM

The Rockwell Collins Pro Line 21 Avionics System Operator's Guide for Cessna Citation CJ3 Publication Number 523-0806480, Edition 1 (1 is a variable and changes with revision number), dated 30 April 2004 or later revision, must be immediately available to the flight crew. The following limitations do not address any installed Flight Management Systems or GPS units. Refer to the appropriate supplement(s) in Section V for applicable operating limitations.

1. One pilot must remain seated with seat belt fastened during all autopilot operations.
2. Operating in the composite mode is limited to training and display failure conditions.
3. The pilot's PFD, copilot's PFD and MFD must be installed and operational in the normal mode for takeoff.
4. The FCS-3000 system must be verified to be operational by a satisfactory automatic preflight test (no messages on power up) prior to each flight in which the autopilot is to be used.

(Continued Next Page)

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0096 thru -0134 not incorporating SB525B-23-01.
Description of Change:	Section II, Operating Limitations, STANDBY HSI ON RTU1. Use of the ADF bearing pointer on the standby HSI is prohibited.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and on) basic FAA Approved Airplane Flight Manual adjacent to page 2-24.
Removal Instructions:	This temporary change must be removed and discarded when SB525B-23-01 has been complied with or when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section II, Operating Limitations, after paragraph STANDBY FLIGHT DISPLAY and before paragraph OXYGEN MASK, insert the following paragraph:

STANDBY HSI ON RTU1

Use of the ADF bearing pointer displayed on the HSI is prohibited. The ADF bearing pointer may lock at a fixed bearing and cease to provide usable navigation guidance. The ADF bearing pointers on either PFD are not affected and remain usable for navigation.

APPROVED BY Kim Hackett

John Bouma, Lead ODA Administrator
Cessna Aircraft Company
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 29 APRIL 2013

525BFM TC-R07-01

ROCKWELL COLLINS FCS-3000 INTEGRATED FLIGHT CONTROL SYSTEM (Continued)

5. The autopilot minimum engage height, during climb following takeoff or go-around, is 350 feet AGL.
6. The autopilot minimum use height is:
   a. ILS Approach (CAT I) 180 Feet AGL
   b. Non-precision Approaches 350 Feet AGL
   c. Cruise 1000 Feet AGL
7. Category II approaches are not approved.
8. VOR approaches must not be conducted in the NAV mode of the flight director. Use the APPR mode, or manually track the approach course using the HDG mode. This limitation applies to both flight director only and autopilot coupled operation.
9. Autopilot coupled operation is prohibited during any portion of a VOR approach in which the VOR is located behind the airplane by more than 15 miles, unless the HDG mode of the flight director is being used to manually track the approach course.
10. It is prohibited to display the non-coupled side Flight Director unless the coupled side Flight Director is being displayed. Failure to adhere to this limitation will result in incorrect Flight Director guidance. Use of the coupled side Flight Director by itself will operate correctly.

STANDBY FLIGHT DISPLAY

A satisfactory preflight test must be accomplished on the standby flight display in accordance with Section III, Normal Procedures. The standby flight display must be functioning prior to takeoff.

OXYGEN MASK

Prior to flight, the crew oxygen mask must be checked and stowed properly in its receptacle to qualify as a quick donning oxygen mask.

Cabin temperature must be held at or above 0°C (+32°F) for a minimum of 20 minutes prior to takeoff after a prolonged ground cold soak period (two hours or longer) at ambient temperatures of -10°C (+14°F) or colder (refer to Normal Procedures, COLD WEATHER OPERATIONS). If the aircraft is not cold soaked for two hours or longer, the cabin must be heated to a temperature of 0°C (+32°F) prior to operation above 24,000 feet. This temperature ensures proper deployment and operation of the passenger oxygen masks. A handheld thermometer is acceptable to determine cabin temperature. This limitation does not apply if there are no passengers in the cabin.

NOTE

- Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.
- Unless carefully trimmed, mustaches and/or beards worn by crew members may interfere with proper sealing of the oxygen mask. Mask fit and seal should be checked on the ground prior to flight.

Continuous use of the supplemental oxygen system above 25,000 feet cabin altitude, with passengers, or above 40,000 feet cabin altitude, crew only, is prohibited.

For single pilot operations, a crew oxygen mask must be available for a passenger occupying the right crew seat. The mask must be checked during preflight and passenger briefed on its use.

ICING LIMITATIONS

NOTE

- Icing conditions may exist when the indicated RAT in flight is +10°C (+50°F) or below, and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet, or ice crystals).
- Icing conditions on the ground exist when the OAT or indicated RAT is +10°C (+50°F) or below and, where surface snow, slush, ice or standing water may be ingested by the engines or freeze on engine nacelles, or engine sensor probes.

Minimum airspeed for sustained flight in icing conditions (except approach and landing) is 180 KIAS.

In icing conditions, operating the airplane at other than flaps 0 for an extended period of time (except approach and landing) is prohibited.

Minimum engine N_2 speed for effective wing anti-icing . . . . . 75% N_2

Minimum temperature for operation of tail deicing boots (Indicated RAT) . . . . . -35°C (-31°F)

The WING/ENGINE ANTI-ICE switches must be ENG ON or WING/ENG for operations with indicated RAT of +10°C (+50°F) or below when flight free of visible moisture cannot be assured. Failure to observe this limitation may result in ENG CTRL SYS FAULT L/R annunciations due to ice accumulation on the engine PT2/TT2 probe.

Engine anti-ice must be ON during ground operations in icing conditions, except selection of anti-ice on is prohibited for 1 minute after ground engine start (to ensure accurate RAT for takeoff). If engine anti-ice was inadvertently turned ON prior to 1 minute of engine operation, the anti-ice must be turned off for 2 minutes before turning it back on. If minor engine vibrations are felt or heard during ground operations, the crew must momentarily increase engine speed (typically 20-30% N1) to assist with shedding the accumulated ice from the spinner, fan, and stators.

OPERATIONS IN SEVERE ICING CONDITIONS

WARNING

Severe icing may result from environmental conditions outside of those for which the airplane is certified. flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system or may result in ice forming aft of the protected surfaces.

(Continued Next Page)

OPERATIONS IN SEVERE ICING CONDITIONS (Continued)

WARNING

This ice may not shed when the ice protection systems are used and may seriously degrade the performance and controllability of the airplane. in some icing conditions, it is normal for runback ice to extend approximately 12 to 18 inches aft of the heated leading edge on the wing upper surface and/or to build in a ridge on the lower wing surface just behind the heated leading edge. Satisfactory performance and controllability has been demonstrated with this type of ice accumulation and it should not be considered an indication of severe icing.

All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night.

Severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues:

1. Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.
2. Accumulation of ice on the upper surface of the wing that extends more than 12 to 18 inches aft of the heated leading edge.

If one or more of these visual cues exist:

1. Use of the autopilot is prohibited.
2. Immediately request priority handling from Air Traffic Control to facilitate a route or altitude change to exit the icing conditions.
3. Leave flaps in current position, do not extend or retract.
4. Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
5. If unusual or uncommanded roll control movement is observed, reduce angle-of-attack.

Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when:

1. Unusual lateral trim is required while the airplane is in icing conditions.
2. Autopilot trim warnings are encountered while the airplane is in icing conditions.

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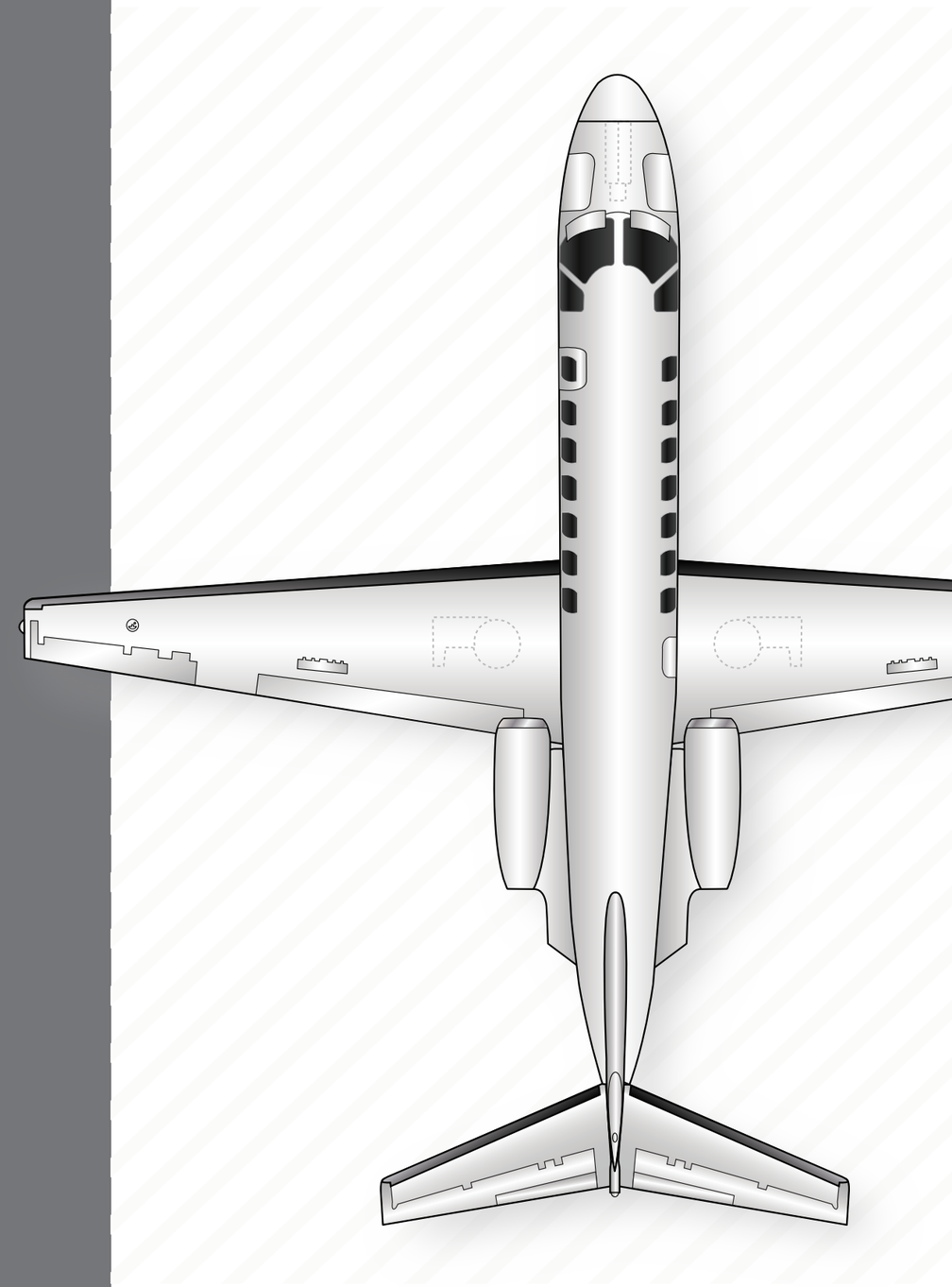
EMERGENCY



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EMERGENCY PROCEDURES

■ ENGINE FAILURE OR FIRE OR MASTER WARNING DURING TAKEOFF

● SPEED BELOW V_1 - TAKEOFF REJECTED

1. Brakes - AS REQUIRED.
2. Throttles - IDLE.
3. Speed Brakes - EXTEND.

NOTE

- To obtain maximum braking performance from the antiskid system, the pilot must apply continuous maximum effort (no modulation) to the brake pedals.
- The Takeoff Field Lengths assume that the pilot has maximum effort applied to the brakes at the scheduled V_1 speed during the aborted takeoff.

☐ IF ENGINE FIRE

4. Refer to Emergency Procedures, ENG FIRE LH or RH (Engine Fire Warning Light Illuminated).

Procedure completed

☐ IF ENGINE FAILURE

4. Refer to Emergency Procedures, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

● SPEED ABOVE V_1 - TAKEOFF CONTINUED

1. Maintain directional control.
2. Accelerate to V_R.
3. Rotate at V_R, climb at V_2.
4. Landing Gear - UP (after positive rate-of-climb).
5. WING XFLOW Switch - WING XFLOW (if WING/ENGINE ANTI-ICE Switches are in WING/ENG).
6. Flaps - RETRACT (at level off altitude and V_2 + 10 KIAS). ACCELERATE to V_{ENR} (V_T).

☐ IF ENGINE FIRE

7. Refer to Emergency Procedures, ENG FIRE LH or RH (Engine Fire Warning Light Illuminated).

Procedure completed

☐ IF ENGINE FAILURE

7. Refer to Emergency Procedures, EMERGENCY RESTART - ONE ENGINE or ENGINE FAILURE / PRECAUTIONARY SHUTDOWN.

Procedure completed

■ ENGINE FAILURE/PRECAUTIONARY SHUTDOWN

1. Throttle (Affected Engine) - OFF.
2. IGNITION Switch (Affected Engine) - NORM.
3. ENGINE SYNC Knob - OFF.
4. GEN Switch (Affected Engine) - OFF.
5. Electrical Load - REDUCE as required; 300 amperes maximum.
6. FUEL TRANSFER Knob - AS REQUIRED.
7. ENGINE FIRE Button (Affected Engine) - LIFT COVER and PUSH (If severe engine failure or fire occurred).

● IF ICING CONDITIONS EXIST

8. WING XFLOW Switch - WING XFLOW.

NOTE

- The WING/ENGINE ANTI-ICE switch on the affected side may remain OFF. Selecting WING XFLOW will activate all wing temperature sensors. L and R WING ANTI-ICE annunciators will function normally.
- At high altitude, throttle may need to be increased to maintain pressurization.

9. WING/ENGINE ANTI-ICE Switch (Operating Engine) - ENG ON or WING/ENG as required.
10. WINDSHIELD ANTI-ICE and TAIL DEICE Switches - AS REQUIRED.
11. Leave icing environment as soon as possible.
12. Land as soon as possible. Refer to Abnormal Procedures, SINGLE-ENGINE APPROACH AND LANDING.

Procedure completed

● IF ICING CONDITIONS DO NOT EXIST

8. Land as soon as possible. Refer to Abnormal Procedures, SINGLE-ENGINE APPROACH AND LANDING.

Procedure completed

■ ENGINE FAILURE DURING FINAL APPROACH

1. Thrust (Operating Engine) - INCREASE as required.
2. Airspeed - V_{APP}.
3. Flaps - TAKEOFF AND APPROACH.

4. Rudder Trim - TRIM toward operating engine as desired.
5. Throttle (Affected Engine) - OFF.
6. Landing Gear - DOWN and LOCKED.
7. Flaps - LAND (when landing assured).
8. Pressurization - CHECK ZERO DIFFERENTIAL.
9. Autopilot and Yaw Damper - OFF (at or above minimums).
10. Airspeed - V_{REF}.
11. Speed Brakes - RETRACTED PRIOR TO 50 FEET AGL.

Procedure completed

■ ENG FIRE LH OR RH (ENGINE FIRE WARNING LIGHT ILLUMINATED)

1. THROTTLE (Affected Engine) - IDLE.

● IF LIGHT REMAINS ILLUMINATED

2. ENGINE FIRE Button (Affected Engine) - LIFT COVER and PUSH.
3. Either Illuminated BOTTLE ARMED Button - PUSH.

4. IGNITION Switch (Affected Engine) - NORM.
5. Throttle (Affected Engine) - OFF.
6. Electrical Load - REDUCE AS REQUIRED; 300 amperes maximum.
7. FUEL BOOST Switch (Affected Engine) - OFF then NORM.
8. WING XFLOW Switch - WING XFLOW (if icing conditions exist).

NOTE

- The WING/ENGINE ANTI-ICE switch on the affected side may remain OFF. Selecting WING XFLOW will activate all wing temperature sensors. L and R WING ANTI-ICE annunciators will function normally.
- At high altitude, throttle may need to be increased to maintain pressurization.

9. WING/ENGINE ANTI-ICE Switch (Operating Engine) - ENG ON or WING/ENG as required.
10. Windshield ANTI-ICE and TAIL DE-ICE - AS REQUIRED.
11. If icing conditions exist, leave icing environment as soon as possible.

□ IF FIRE WARNING LIGHT REMAINS ILLUMINATED AFTER 30 SECONDS

12. Remaining Illuminated BOTTLE ARMED Light - PUSH.

(Continued Next Page)

■ ENG FIRE LH OR RH (ENGINE FIRE WARNING LIGHT ILLUMINATED) (Continued)

13. Land as soon as possible. Refer to Abnormal Procedures, SINGLE-ENGINE APPROACH AND LANDING.

Procedure completed

☐ IF FIRE WARNING LIGHT EXTINGUISHES

12. Land as soon as possible. Refer to Abnormal Procedures, SINGLE-ENGINE APPROACH AND LANDING.

Procedure completed

● IF LIGHT EXTINGUISHES AND SECONDARY INDICATIONS ARE NOT PRESENT

2. WING/ENGINE ANTI-ICE Switches - ENG ON or WING/ENG as required.
3. Windshield ANTI-ICE and TAIL DE-ICE - AS REQUIRED.
4. If icing conditions exist, leave icing environment as soon as possible.
5. Land as soon as practical.

Procedure completed

■ EMERGENCY RESTART - ONE ENGINE (Refer to Figure 3-1 for Airstart Envelope)

● FOLLOWING SHUTDOWN - WITH STARTER ASSIST (200 KIAS maximum if altitude is above 15,000 feet thru FL200)

1. Throttle (Affected Engine) - OFF.

NOTE

Throttles must be placed to OFF to reset FADEC start logic.

2. GEN Switch (Affected Engine) - GEN.
3. WING/ENGINE ANTI-ICE Switch (Affected Engine) and AIR CONDITIONING Switch - OFF.
4. Firewall Shutoff (Affected Engine) - CHECK OPEN.
5. FUEL BOOST Switch (Affected Engine) - NORM.
6. Engine Start Button (Affected Engine) - PRESS momentarily.
7. Throttle (Affected Engine) - IDLE at 8% N_2 (minimum), 24% N_2 (maximum).
8. Engine Instruments - MONITOR.

☐ IF START OCCURS

9. WING/ENGINE ANTI-ICE Switch and AIR CONDITIONING Switch - AS DESIRED.

Procedure completed

☐ IF START DOES NOT OCCUR

9. START DISG Button - PRESS.
10. Refer to Emergency Procedures, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

● FOLLOWING SHUTDOWN - WINDMILLING WITH AIRSPEED ABOVE 230 KIAS (Altitude must be 15,000 feet or below)

1. Throttle (Affected Engine) - OFF.

NOTE

Throttles must be placed to OFF to reset FADEC start logic.

2. GEN Switch (Affected Engine) - OFF.
3. WING/ENGINE ANTI-ICE Switch (Affected Engine) and AIR CONDITIONING Switch - OFF.
4. Firewall Shutoff (Affected Engine) - CHECK OPEN.
5. FUEL BOOST Switch (Affected Engine) - ON.
6. Throttle (Affected Engine) - IDLE at 8% N_2 (minimum), 24% N_2 (maximum).
7. Engine Instruments - MONITOR.

(Continued Next Page)

■ EMERGENCY RESTART - ONE ENGINE (Refer to Figure 3-1 for Airstart Envelope) (Continued)

☐ IF START OCCURS

8. FUEL BOOST Switch (Affected Engine) - NORM (after engine stabilizes).
9. GEN Switch (Affected Engine) - GEN.
10. WING/ENGINE ANTI-ICE Switches and AIR CONDITIONING Switch - AS DESIRED.

Procedure completed

☐ IF START DOES NOT OCCUR

8. Refer to Emergency Procedures, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

■ EMERGENCY RESTART - TWO ENGINES (Refer to Figure 3-1 for Airstart Envelope)

1. L/R FUEL BOOST Switches - BOTH ON.
2. Throttles - OFF, then IDLE (24% N_2 MAXIMUM).
3. If Altitude Allows - INCREASE AIRSPEED TO 230 KIAS.

NOTE

Throttles must be placed to OFF to reset FADEC start logic.

4. Firewall Shutoff - CHECK BOTH OPEN.
5. WING/ENGINE ANTI-ICE Switches and AIR CONDITIONER Switch - OFF.

● IF START DOES NOT OCCUR

6. Either Engine Start Button - PRESS momentarily.

☐ IF NEITHER ENGINE STARTS

7. START DISG Button - PRESS.
8. Refer to Emergency Procedures, MAXIMUM GLIDE - EMERGENCY LANDING.

Procedure completed

☐ IF EITHER OR BOTH ENGINES START

7. START DISG Button - PRESS (if required).
8. FUEL BOOST Switches - NORM (after engine(s) stabilize).
9. GEN Switch(es) - GEN.
10. WING/ENGINE ANTI-ICE Switches and AIR CONDITIONING Switch - AS DESIRED.

(Continued Next Page)

■ EMERGENCY RESTART - TWO ENGINES (Refer to Figure 3-1 for Airstart Envelope) (Continued)

O IF ONLY ONE ENGINE STARTS

11. Refer to Emergency Procedures, EMERGENCY RESTART - ONE ENGINE or ENGINE FAILURE/PRECAUTIONARY SHUTDOWN .

Procedure completed

O IF BOTH ENGINES START

Procedure completed

● IF START OCCURS

6. After Engine(s) Stabilize - FUEL BOOST Switches - NORM.
7. GEN Switch(es) - GEN.
8. WING/ENGINE ANTI-ICE Switch(es) and AIR CONDITIONING Switch - AS DESIRED.

☐ IF ONLY ONE ENGINE STARTS

9. Refer to Emergency Procedures, EMERGENCY RESTART - ONE ENGINE or ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

☐ IF BOTH ENGINES START

Procedure completed

AIRSTART ENVELOPE

A38186

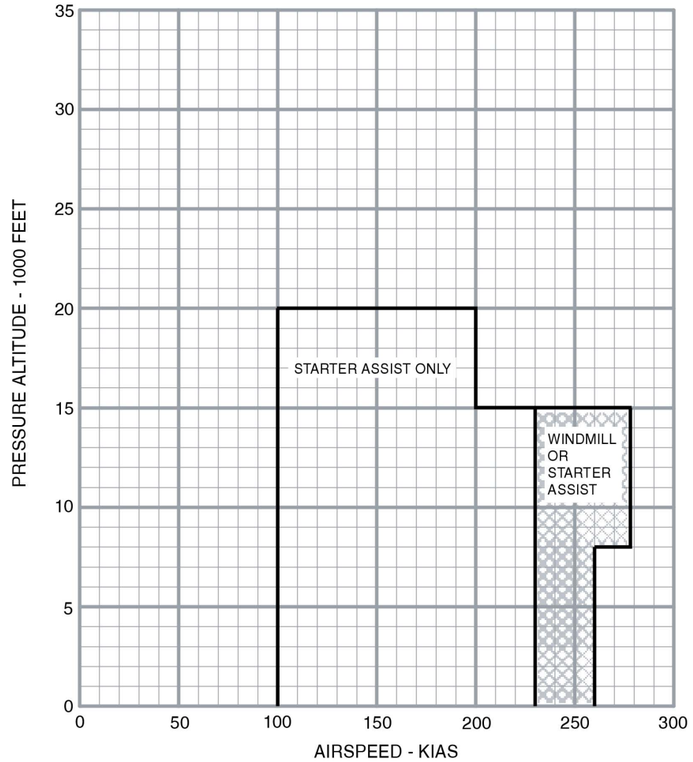

Figure 3-1*

NOTE

- If the engine is to be shut down for intentional airstarts, it should be allowed to cool at idle for three minutes prior to shutdown.
- The throttle should be placed in IDLE with N_2 between 8-16%. If the initial throttle movement occurs between 16-24% N_2, the chance of a successful restart is significantly reduced. Initial throttle movement above 24% N_2 will result in an unsuccessful restart.

■ MAXIMUM GLIDE - EMERGENCY LANDING

1. Airspeed - 150 KIAS.

NOTE

Maximum glide airspeed is 140 KIAS at 13,000 pounds, decreasing approximately 3.5 KIAS per 500 pound decrease in weight. However, the turbines may not windmill to provide hydraulic pressure below 150 KIAS. Maintain 150 KIAS or above if possible until landing gear and flaps are extended and speed brakes are retracted.

2. Speed Brakes - RETRACT.
3. Transponder - EMERGENCY.
4. ATC - ADVISE.
5. Crew Briefing - COMPLETE.
6. Passenger Advisory Switch - PASS SAFETY.
7. Seats, Seat Belts and Shoulder Harnesses - SECURE.
8. Landing Gear and Flaps - AS REQUIRED (above 150 KIAS).

NOTE

Landing gear, flaps and speed brakes will operate slowly above 150 KIAS and may not operate below 150 KIAS. Plan on the possibility of flaps inoperative landing and use of emergency gear extension procedures.

Procedure completed

■ LOW OIL PRESSURE INDICATION (RED POINTER AND DIGITS, OIL PRESS WARNING LIGHT)

1. Throttle (Affected Engine) - REDUCE THRUST (below 80% N_2).

● IF POINTER AND DIGITS CHANGE TO AMBER OR GREEN

2. Throttle (Affected Engine) - MAINTAIN below 80% N_2.
3. Land as soon as practical.

NOTE

Engine operation with oil pressure in the amber range is permitted for up to 5 minutes, with N_2 less than 80%. The Engine Indicating System (EIS) monitors elapsed time and will turn the pointer and digits red if 5 minutes in the amber range is exceeded.

Procedure completed

● IF POINTER AND DIGITS REMAIN RED OR RETURN TO RED

2. Throttle (Affected Engine) - OFF.
3. Refer to Emergency Procedure, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

■ OIL PRESS WARN L OR R (LOW OIL PRESSURE WARNING)

1. Throttle (Affected Engine) - REDUCE.

● IF OIL PRESSURE INDICATION DOES NOT RESPOND TO THROTTLE MOVEMENT OR POINTER TURNS RED

2. Throttle (Affected Engine) - OFF.
3. Refer to Emergency Procedures, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

● IF OIL PRESSURE INDICATION RESPONDS TO THROTTLE MOVEMENT AND POINTER REMAINS GREEN

2. Throttle (Affected Engine) - IDLE or AS REQUIRED.
3. Monitor EIS oil pressure indication.
4. Land as soon as practical.

Procedure completed

■ ELECTRICAL FIRE OR SMOKE

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

3. Smoke Goggles - DON (if required).
4. OXYGEN CONTROL VALVE Knob - MANUAL DROP.
5. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.
6. Passenger Advisory Switch - PASS SAFETY.
7. AIR SOURCE SELECT Knob - BOTH.

● UNKNOWN SOURCE

8. FLOOD LTS Knob - FULL BRIGHT.
9. Battery Switch - EMER.
10. EMERGENCY LIGHTING Switch - OFF.

NOTE

With generators OFF, the emergency lighting batteries will be recharging from the airplanes main battery. Failure to select emergency lighting to OFF within two minutes of selecting the battery switch to EMER, and generators to OFF, will decrease the time power is supplied to items on the emergency bus.

11. L/R GEN Switches - OFF. With the battery switch in the EMER position and the generators OFF, power is supplied for at least 30 minutes to the following equipment:

COMM 1	Standby Flight Display (internal battery)
NAV 1 and DME 1	Standby Air Data Computer
Transponder 1	Standby Pitot Heat
ADF1	Copilots Pitot Heat
RTU 1 (Standby HSI displayed)	Copilots Air Data Computer
RTU 2	Flap Control
RIU L-B	Landing Gear Control
Pilot's and Copilot's Audio Panels	Landing Gear Monitor
FMS 2 (GPS 500 only, if installed)	Overhead Floodlights
Copilot's AHRS (for Standby HSI)	Voltmeter

WARNING

Automatic pressurization control, cabin dump and source selection are inoperative. cabin altitude must be manually controlled using the press system select manual lever. Injury may occur if cabin pressure differential is greater than 0 PSID when cabin door is opened.

(Continued Next Page)

■ ELECTRICAL FIRE OR SMOKE (Continued)

CAUTION

- The antiskid/power brake system is inoperative; only the emergency brake system is available.
- Flight guidance system, including autopilot, is inoperative.
- EFIS displays (both PFDS and MFD) will be inoperative, refer to standby instruments.
- The engine, wing, and windshield anti-ice valves will be open. FADECS will revert to anti-ice on idle speeds and thrust schedules.
- All external and internal lights (except overhead flood lights) will be inoperative.
- All warning, caution and advisory lights will be inoperative.
- Rudder Bias is inoperative. Rudder pedal force and/or directional trim required for single engine operation will be significantly increased.

NOTE

- Selecting emergency power (battery switch - EMER and both generators OFF) for more than five minutes, with the engines running, will result in both L and R ENG CTRL SYS FAULT. It is not possible to reset these faults with either the FADEC RESET button or by completely cycling power to the FADEC.
- The standby flight display will continue to operate on its own emergency battery pack. This battery pack also provides 5-volt emergency instrument lighting for the standby flight display.

12. WINDSHIELD BLEED AIR Manual Valves - OFF or MINIMUM for clear vision.
13. Fire Extinguisher - UNSTOW and REMOVE SAFETY PIN (left side of copilot's seat or in cabin).
14. Fire - LOCATE and EXTINGUISH (if able).
15. Land as soon as possible.

(Continued Next Page)

■ ELECTRICAL FIRE OR SMOKE (Continued)

WARNING

Whether or not smoke has dissipated, if it cannot be visually confirmed that any fire has been extinguished following fire suppression and/or smoke evacuation, land immediately at the nearest suitable airport.

☐ IF SMOKE REMOVAL IS NECESSARY

16. PRESS SYSTEM SELECT MANUAL Lever - UP to obtain maximum cabin altitude.
17. Emergency Descent - AS REQUIRED.

WHEN LANDING ASSURED

18. Landing Gear - DOWN AND LOCKED.
19. Flaps - LAND.
20. Airspeed - V_{REF}.
21. Landing - Refer to Abnormal Procedure, WHEEL BRAKE FAILURE.

Procedure completed

☐ IF SMOKE REMOVAL IS NOT NECESSARY

WHEN LANDING ASSURED

16. Landing Gear - DOWN AND LOCKED.
17. Flaps - LAND.
18. Airspeed - V_{REF}.
19. Landing - Refer to Abnormal Procedures, WHEEL BRAKE FAILURE.

Procedure completed

● KNOWN SOURCE

8. Faulty Circuit(s) - PULL CIRCUIT BREAKER(S) TO ISOLATE (if possible).
9. INTERIOR MASTER Switch - OFF (if cabin equipment is known fault).
10. Fire Extinguisher - UNSTOW and REMOVE SAFETY PIN (left side of copilot's seat or in cabin).
11. Fire - LOCATE and EXTINGUISH.
12. Land as soon as possible.

WARNING

Whether or not smoke has dissipated, if it cannot be visually confirmed that any fire has been extinguished following fire suppression and/or smoke evacuation, land immediately at the nearest suitable airport.

(Continued Next Page)

■ ELECTRICAL FIRE OR SMOKE (Continued)

☐ IF SMOKE REMOVAL IS NECESSARY

13. CABIN DUMP Switch - DUMP (cabin altitude will not exceed approximately 15,000 feet with AIR SOURCE SELECT in L, R, or BOTH).

NOTE

The BAGGAGE SMOKE annunciator may illuminate due to smoke or other contaminants entering the tailcone baggage compartment as it exits the cabin.

14. Emergency Descent - AS REQUIRED.

Procedure completed

☐ IF SMOKE REMOVAL IS NOT NECESSARY

Procedure completed

■ ENVIRONMENTAL SYSTEM SMOKE OR ODOR

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

3. Smoke Goggles - DON (if required).
4. OXYGEN CONTROL VALVE Knob - MANUAL DROP.
5. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.
6. Passenger Advisory Switch - PASS SAFETY.
7. AIR CONDITIONING Switch - OFF.
8. DEFOG Fan Switch - OFF.
9. AIR SOURCE SELECT Knob - L (allow time for smoke to dissipate).

● IF SMOKE CONTINUES

10. AIR SOURCE SELECT Knob - R (allow time for smoke to dissipate).

☐ IF SMOKE STILL CONTINUES

11. Altitude - DESCEND.
12. Refer to Emergency Procedures, EMERGENCY DESCENT, if required.
13. AIR SOURCE SELECT Knob - FRESH AIR (cabin will depressurize).
14. Accomplish Emergency Procedures, SMOKE REMOVAL (if required).

Procedure completed

☐ IF SMOKE DISSIPATES

Procedure completed

● IF SMOKE DISSIPATES

Procedure completed

■ SMOKE REMOVAL

1. Oxygen Masks - DON and EMER.
2. Microphone Select Switches - MIC OXY MASK.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

3. Smoke Goggles - DON (if required).
4. OXYGEN CONTROL VALVE Knob - MANUAL DROP.
5. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.
6. Passenger Advisory Switch - PASS SAFETY.
7. AIR CONDITIONING Switch - OFF.

● IF NORMAL DC POWER IS AVAILABLE

8. CABIN DUMP Switch - DUMP (cabin altitude will not exceed approximately 15,000 feet with AIR SOURCE SELECT in L, R, or BOTH).

NOTE

The BAGGAGE SMOKE annunciator may illuminate due to smoke or other contaminants entering the tailcone baggage compartment as it exits the cabin.

9. Emergency Descent - AS REQUIRED.
10. Land as soon as possible.

Procedure completed

● IF NORMAL DC POWER IS NOT AVAILABLE

8. PRESS SYSTEM SELECT Manual Lever - UP to obtain maximum cabin altitude.
9. Emergency Descent - AS REQUIRED.
10. Land as soon as possible.

Procedure completed

■ OVERPRESSURIZATION

1. PRESS SYSTEM SELECT Switch - MANUAL.
2. PRESS SYSTEM SELECT MANUAL Lever - UP (to decrease pressure and raise cabin altitude).

● IF STILL OVERPRESSURIZED

3. AIR SOURCE SELECT Knob - L or R. (Control cabin pressure with the throttle corresponding to the selected source).

☐ IF UNABLE TO CONTROL

4. Oxygen Masks - DON and 100%.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

(Continued Next Page)

■ OVERPRESSURIZATION (Continued)

5. Microphone Select Switches - MIC OXY MASK.
6. OXYGEN CONTROL VALVE Knob - MANUAL DROP.
7. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.
8. Passenger Advisory Switch - PASS SAFETY.
9. AIR SOURCE SELECT Knob - OFF.
10. Emergency Descent - AS REQUIRED.

O IF STILL OVERPRESSURIZED

11. CABIN DUMP Switch - DUMP.

Procedure completed

O IF CABIN PRESSURE BELOW MAXIMUM LIMIT

11. Depressurize cabin before landing; CABIN DUMP Switch - DUMP.

Procedure completed

☐ IF ABLE TO CONTROL WITH THROTTLE

4. Depressurize cabin before landing; CABIN DUMP Switch - DUMP.

Procedure completed

● IF ABLE TO CONTROL MANUALLY

3. Depressurize cabin before landing; CABIN DUMP Switch - DUMP.

Procedure completed

■ CABIN ALT (CABIN ALTITUDE)

Indicates cabin altitude greater than 9500 ± 400 feet with the pressurization controller in the normal mode, or cabin altitude greater than 14,500 ± 400 feet with the pressurization controller in high altitude mode.

1. Oxygen Masks - DON and 100%.
2. Microphone Select Switches - MIC OXY MASK.
3. Emergency Descent - AS REQUIRED.
4. Passenger Oxygen - MAKE SURE passengers are receiving oxygen.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

5. Transponder - EMERGENCY.

● IF NOT ARRESTED BY 15,000 FEET CABIN ALTITUDE

6. AIR SOURCE SELECT Knob - EMER.

NOTE

Emergency Pressurization should activate when cabin altitude reaches 14,500 ± 500 and will turn off when cabin altitude is approximately 1000 feet lower unless air source has been manually selected to EMER.

(Continued Next Page)

■ CABIN ALT (CABIN ALTITUDE) (Continued)

7. WINDSHIELD BLEED AIR Manual Valves - OFF (AS REQUIRED in icing conditions).

NOTE

Use of EMER pressurization will reduce effectiveness of windshield anti-ice system.

8. Refer to Abnormal Procedures, USE OF SUPPLEMENTAL OXYGEN.

Procedure completed

● IF ARRESTED BY 15,000 FEET CABIN ALTITUDE

Procedure completed

■ EMERGENCY DESCENT

1. AP TRIM DISC Button - PRESS and RELEASE.
2. Throttles - IDLE.
3. Speed Brakes - EXTEND.
4. Airplane Pitch Attitude - INITIALLY TARGET 7.5 DEGREES NOSE DOWN.

CAUTION

If structural damage is suspected, limit airspeed to a reasonable value and limit maneuvering loads until damage assessment can be made.

5. Airspeed - M_{MO}/V_{MO}.
6. Transponder - EMERGENCY.
7. Passenger Advisory Switch - PASS SAFETY.
8. ATC - ADVISE and obtain local altimeter setting.
9. Altitude - 15,000 feet MSL or Minimum Safe Altitude, whichever is higher.
10. ANTI-ICE/DE-ICE Switches- AS REQUIRED.
11. Passengers - BRIEF.
12. Land as soon as possible.

■ BATT O'TEMP (BATTERY OVERTEMPERATURE)

1. Volt/Amp - NOTE.
2. Battery Switch - EMER.
3. Volt/Amp - NOTE DECREASE.

NOTE

If current decreases and battery voltage is 1 volt less than generator voltage in 30seconds to 2 minutes, monitor battery overheat annunciator for possible change.

● IF VOLT / AMP DECREASE

4. Battery Switch - OFF (Voltmeter will be inoperative).

☐ IF BATT O'TEMP LIGHT DOES NOT EXTINGUISH OR >160° WARNING LIGHT ILLUMINATES

5. Battery Switch - LEAVE OFF.
6. Land as soon as possible.

Procedure completed

☐ IF BATT O'TEMP LIGHT EXTINGUISHES

5. Battery Switch - BATT.

Procedure completed

● IF NO VOLT/AMP DECREASE (BATTERY RELAY STUCK)

4. Battery Switch - BATT.
5. BATTERY Disconnect Switch - LIFT GUARD AND DISCONNECT.

CAUTION

Do not use the BATTERY Disconnect Switch for extended periods of time (approximately 12 hours). The battery disconnect relay will continue to draw a small amount of current from the battery until the battery is completely discharged. The battery disconnect relay will then close resulting in a very high charge rate and probable overheat.

6. Amperage - NOTE DECREASE.

☐ IF BATT O'TEMP LIGHT DOES NOT EXTINGUISH OR >160° WARNING LIGHT ILLUMINATES

7. Land as soon as possible.

Procedure completed

☐ IF BATT O'TEMP LIGHT EXTINGUISHES

7. BATTERY Disconnect Switch - CLOSE GUARD.
8. Land as soon as practical.

Procedure completed

■ GEN OFF L AND R (GENERATORS INOPERATIVE - DUAL)

1. AIR CONDITIONING Switch - OFF or FAN.
2. GEN Switches - RESET then OFF
3. VOLTAGE SEL Knob - CHECK Generator Voltages.
4. Generator closest to 29V - GEN.

● IF NEITHER GENERATOR COMES ON-LINE

5. FLOOD LTS - FULL BRIGHT.
6. EMERGENCY LIGHTING Switch - OFF.

NOTE

With generators OFF, the emergency lighting batteries will be recharging from the airplane's main battery. Failure to select emergency lighting to OFF within two minutes of selecting the battery switch to EMER and generators to OFF, will decrease the time power is supplied to items on the emergency bus.

7. Battery Switch - EMER. With the battery switch in EMER position and the generators OFF, power is supplied for at least 30 minutes to the following equipment:

COMM 1	Standby Flight Display (internal battery)
NAV 1 and DME 1	Standby Air Data Computer
Transponder 1	Standby Pitot Heat
ADF1	Copilot's Pitot Heat
RTU 1 (Standby HSI displayed)	Copilot's Air Data Computer
RTU 2	Flap Control
RIU L-B	Landing Gear Control
Pilot's and Copilot's Audio Panels	Landing Gear Monitor
FMS 2 (GPS 500 only, if installed)	Overhead Floodlights
Copilot's AHRS (for Standby HSI)	Voltmeter

WARNING

Automatic pressurization control, cabin dump and source selection are inoperative. cabin altitude must be manually controlled using the manual toggle switch. Injury may occur if cabin pressure differential is greater than 0 psid when cabin door is opened.

CAUTION

- The antiskid/power brake system is inoperative; only the emergency brake system is available.
- Flight guidance system, including autopilot, is inoperative.
- EFIS displays (both PFDs and MFD) will be inoperative, refer to standby instruments.

(Continued Next Page)

■ GEN OFF L AND R (GENERATORS INOPERATIVE - DUAL)
(Continued)

CAUTION

- The engine, wing, and windshield anti-ice valves will be open. FADECs will revert to anti-ice on idle speed and thrust schedules.
- All external and internal lights (except overhead flood lights) will be inoperative.
- All warning, caution and advisory lights will be inoperative.
- Rudder Bias is inoperative. Rudder pedal force and/or directional trim required for single engine operation will be significantly increased.

NOTE

- Selecting emergency power (battery switch - EMER and both generators OFF) for more than five minutes, with the engines running, will result in both L and R ENG CTRL SYS FAULT. It is not possible to reset these faults with either the FADEC RESET button or by completely recycling power to the FADEC.
- The standby flight display will continue to operate on its own emergency battery pack. This battery pack also provides 5-volt emergency instrument lighting for the standby flight display.

8. WINDSHIELD BLEED AIR Manual Valves - OFF or MINIMUM for clear vision.
9. Land as soon as possible.

WHEN LANDING ASSURED

10. Landing Gear - DOWN and LOCKED.
11. Flaps - LAND.
12. Airspeed - V_{REF}.
13. Landing - Refer to Abnormal Procedures, WHEEL BRAKE FAILURE.

Procedure completed

● IF ONLY ONE GENERATOR COMES ON-LINE

5. Electrical Load - REDUCE as required; 300 amperes maximum.
6. Land as soon as practical.

Procedure completed

■ AUTOPILOT MALFUNCTION

1. AP TRIM DISC Button - PRESS AND RELEASE.

NOTE

The autopilot monitors normally detect failures and automatically disengage the autopilot.

Procedure completed

■ ELECTRIC ELEVATOR TRIM RUNAWAY

1. AP TRIM DISC Button - PRESS and RELEASE.
2. Throttles - AS REQUIRED.
3. Speed Brakes - AS REQUIRED.
4. Manual Elevator Trim - AS REQUIRED.
5. PITCH TRIM Circuit Breaker (L Panel) - PULL.

NOTE

Do not attempt to use the autopilot if the electric trim is inoperative. The autopilot will not be able to trim out servo torque, and disengaging the autopilot could result in a significant pitch upset.

Procedure completed

■ RED ATT, AMBER AP AND WHITE XAHS DISPLAYED ON ONE PFD (ATTITUDE/AHRS FAILURE-SINGLE)

1. AHRS Reversion (affected side) - AHRS REV.
2. AP XFR - PUSH. Select side with operating AHRS.
3. Flight Director Mode Selectors - SELECT MODES AS DESIRED.

NOTE

Autopilot will not engage. Flight director will not be displayed unless side with operating AHRS is selected.

4. Land as soon as practical.

Procedure completed

■ RED ATT, AMBER AP AND WHITE XAHS DISPLAYED ON BOTH PFDS (ATTITUDE/AHRS FAILURE-DUAL)

1. Airplane Attitude - CONTROL BY REFERENCE TO STANDBY FLIGHT DISPLAY.
2. Heading - REFERENCE MAGNETIC COMPASS.
3. Land as soon as practical.

Procedure completed

■ RED HDG, AMBER AP AND WHITE XAHS DISPLAYED ON ONE PFD (HEADING/AHRS FAILURE-SINGLE)

1. AHRS Reversion (Affected Side) - AHRS REV.
2. AP XFR - PUSH. Select side with operating AHRS.
3. Flight Director Mode Selectors - SELECT MODES AS DESIRED.

NOTE

Autopilot will not engage. Flight director will not be displayed unless side with operating AHRS is selected.

4. Land as soon as practical.

Procedure completed

■ RED HDG, AMBER AP AND WHITE XAHS DISPLAYED ON BOTH PFDS (HEADING/AHRS FAILURE-DUAL)

1. Heading - REFERENCE MAGNETIC COMPASS.
2. Land as soon as practical.

Procedure completed

■ RED IAS/ALT/VS DISPLAYED ON ONE PFD (AIR DATA COMPUTER FAILURE-SINGLE)

1. DADC REV Switch (Affected Side) - REV.
2. AP XFR Button - PUSH. Select side with operating ADC.
3. Autopilot Mode Selector - SELECT MODES AS DESIRED.

NOTE

The flight director will not display and the autopilot will engage only in basic pitch and roll mode unless the side with operating ADC is selected with AP XFR.

4. RTU - Select XPNDR on side with operating ADC.
5. Land as soon as practical. Refer to Abnormal Procedures, CABIN PRESSURIZATION CONTROLLER FAILURE.

CAUTION

Depending on the cause of the failure, the pressurization controller may be in isobaric mode. Structural damage is possible if the landing is accomplished with the cabin pressurized.

NOTE

A failed ADC will result in both L and R ENG CTRL SYS FAULT illuminating within one to six minutes. Engine operation, however, will remain normal.

Procedure completed

■ RED IAS/ALT/VS DISPLAYED ON BOTH PFDS (AIR DATA COMPUTER FAILURE-DUAL)

1. Airspeed and Altitude - MONITOR by reference to standby flight display.
2. Land as soon as practical. Refer to Abnormal Procedures, CABIN PRESSURIZATION CONTROLLER FAILURE.

CAUTION

Depending on the cause of the failure, the pressurization controller may be in isobaric mode. Structural damage is possible if the landing is accomplished with the cabin pressurized.

NOTE

- The flight director will not display and the autopilot will engage only in basic pitch and roll mode. Transponder altitude reporting will be inoperative.
- Dual ADC failure will result in both L and R ENG CTRL SYS FAULT illuminating within one minute. Engine operation will remain normal unless anti-ice is selected on. With anti-ice on, the engines may experience degraded operating characteristics and significant thrust differences from the normal schedule.

Procedure completed

■ RED BOXED FD DISPLAYED ON PFD (FLIGHT GUIDANCE COMPUTER FAILURE)

NOTE

- Failure of AHRS or DADC on the coupled side during normal operation will result in Flight Guidance Computer failure.
- Loss of glideslope information when in the APPR mode will result in Flight Guidance Computer failure.
- Vertical/Lateral modes with an amber strike through line indicate the autopilot is in basic pitch and roll.

1. AP XFR Button - PUSH (if required); select side with operating AHRS and ADC.
2. Flight Director Modes - RESELECT as desired.
3. Autopilot - ENGAGE as desired (if an AHRS failure occurred, autopilot will not engage).

Procedure completed

■ RED AOA1 OR AOA2 DISPLAYED ON PFD (LOW SPEED CUE (LSC) AOA FAILURE)

Indicates AOA information is not valid.

1. Airspeed - V_{REF} (during approach).

NOTE

The default LSC indication is a default amber vertical line displayed on top of the ISS (Impending Stall Speed) checkerboard. The amber vertical line represents the minimum and maximum stall speeds, 71 KIAS to 103 KIAS.

Procedure completed

■ RED DCP 1 OR DCP 2 DISPLAYED ON PFD (DISPLAY CONTROL PANEL FAILURE)

● IF DCP1 DISPLAYED

1. AP XFR Button - PUSH (if required). Select Copilot side.
2. Copilot DCP - UTILIZE to control DCP functions displayed on Copilot PFD and reference speeds on both PFDs.

NOTE

The course heading panel (CHP) will be inoperative.

Procedure completed

● IF DCP 2 DISPLAYED

1. AP XFR Button - PUSH (if required). Select Pilot side.
2. Pilot DCP and CHP - UTILIZE to control DCP functions displayed on Pilot PFD and reference speeds on both PFDs.

NOTE

The copilot course knob panel (CKP) will be inoperative.

Procedure completed

■ MASTER WARNING LIGHT ON STEADY OR FLASHING, NO WARNING LIGHTS ILLUMINATED

1. MASTER WARNING RESET Button - PRESS TO RESET.
2. WARNING LTS I and II Circuit Breakers (L Panel) - RESET.
3. Instruments (Electrical and Engine) - MONITOR.

Procedure completed

■ EMERGENCY EVACUATION

1. Parking Brake - SET.
2. Throttles - BOTH OFF.
3. LH/RH ENGINE FIRE Buttons - BOTH PRESS.
4. Illuminated BOTTLE ARMED Buttons - BOTH PRESS (if fire suspected).
5. Battery Switch - OFF.
6. Emergency Locator Transmitter (ELT) - MAKE SURE SYSTEM IS ACTIVATED (if required for search and rescue services).
7. Airplane and Immediate Area - CHECK FOR BEST ESCAPE ROUTE.

● IF THRU CABIN DOOR

8. Cabin Door - OPEN.
9. Move away from airplane.

Procedure completed

● IF THRU EMERGENCY EXIT

8. Emergency Exit Door - REMOVE and THROW EXIT DOOR OUT OF AIRPLANE.
9. Move away from airplane.

Procedure completed

■ DITCHING

Ditching is not approved and was not conducted during certification testing of the airplane. Should ditching be required, the following procedure is recommended:

PRELIMINARY

1. AIR SOURCE SELECT Knob - OFF.
2. Transponder - EMERGENCY.
3. Emergency Locator Transmitter (ELT) - ON.
4. ATC - ADVISE.
5. Passenger Advisory Switch - PASS SAFETY.
6. Prepare passengers for ditching.
7. Rate-of-Descent - 200 TO 300 FEET PER MINUTE.
8. Ditching Heading - PARALLEL TO MAJOR SWELL SYSTEM.

APPROACH

9. Landing Gear - UP.
10. Flaps - LAND.
11. Approach Speed - VREF.

NOTE

Plan approach to parallel any uniform swell pattern and attempt to touch down along a wave crest or just behind it. If the surface wind is very strong or the water surface rough and irregular, ditch into the wind on the back side of a wave.

(Continued Next Page)

■ DITCHING (Continued)

WATER CONTACT

12. Aircraft Pitch Attitude - SLIGHTLY HIGHER THAN NORMAL LANDING ATTITUDE.
13. Reduce airspeed and rate-of-descent to a minimum, but do not stall the airplane.
14. Throttles - OFF just prior to water contact and contact water on a crest of a swell, parallel to the major swell.

AFTER WATER CONTACT

Under reasonable ditching conditions, the aircraft should remain afloat an adequate time to launch and board life rafts in an orderly manner.

WARNING

The main cabin door should remain closed and evacuation made through the emergency exit.

Procedure completed

■ BAGGAGE SMOKE

Indicates smoke has been detected in the nose and/or tailcone baggage compartment(s).

1. Land as soon as possible.

Procedure completed

■ INADVERTENT STALL (STICK SHAKER, BUFFET, AND/OR ROLL-OFF)

1. Autopilot - DISCONNECT.
2. Pitch Attitude - REDUCE.
3. Roll Attitude - LEVEL.
4. Throttles - MAXIMUM THRUST.

NOTE

Pitch attitude should be promptly reduced to at least 0 - 5° nose down. Prompt aileron input may be required to maintain wings level flight.

5. Airspeed - INCREASE.
6. Altitude - RETURN TO PREVIOUS ALTITUDE.
7. Throttles - AS REQUIRED.

Procedure completed

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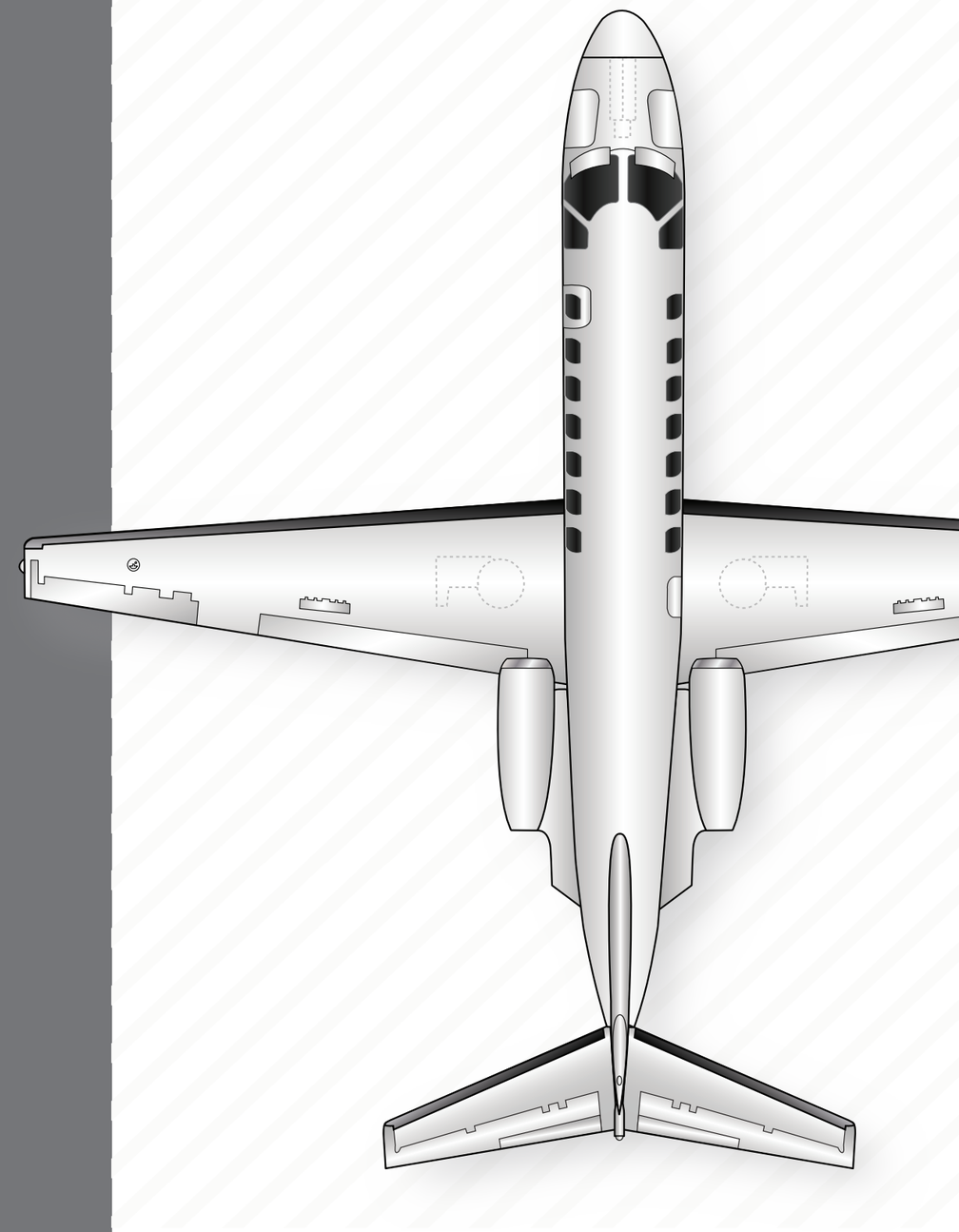
ABNORMAL



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ABNORMAL PROCEDURES

■ FALSE ENGINE START (ENGINE DOES NOT LIGHT)

1. Throttle - OFF.
2. START DISG Button - PRESS 15 seconds after throttle OFF.

Procedure completed

■ ENGINE START BUTTON ILLUMINATED AFTER ENGINE START (ENGINE STARTER WILL NOT DISENGAGE)

1. START DISG Button - PRESS.

● IF STARTER DOES NOT DISENGAGE AND ENGINE START BUTTON REMAINS ILLUMINATED (START RELAY STUCK)

2. GEN Switches - OFF.
3. External Power - DISCONNECT.
4. BATTERY Disconnect Switch - LIFT GUARD AND DISCONNECT.
5. Throttle(s) - OFF.
6. Battery (Located In Tailcone) - DISCONNECT.

Procedure completed

● IF STARTER DISENGAGES

Procedure completed

■ HIGH SUSTAINED ITT DURING GROUND SHUTDOWN

1. Throttle - CHECK OFF.
2. Engine Start Button - PRESS momentarily.
3. START DISG Button - PRESS after 15 seconds.

Procedure completed

■ FUEL LOW PRESS L OR R (LOW FUEL PRESSURE)

1. FUEL BOOST Switch (affected side) - ON.
2. L or R BOOST Circuit Breaker (L Panel) - RESET.
3. Fuel Quantity - CHECK.
4. FUEL TRANSFER Knob - AS REQUIRED.

NOTE

In order to transfer fuel, the FUEL BOOST switch on the receiving side must be in the OFF position.

5. Land as soon as practical.

Procedure completed

■ FUEL LOW LEVEL L OR R (LOW FUEL QUANTITY)

Indicates that the remaining fuel in the respective tank is 190 ±20 pounds (86 ±9 kilograms) or less.

1. FUEL BOOST Switches - ON.
2. Land as soon as possible.

Procedure completed

■ FUEL BOOST ON L OR R (FUEL BOOST PUMP ON)

Indicates that the respective fuel boost pump was either automatically or manually turned on.

● IF FUEL BOOST PUMP WAS NOT MANUALLY SELECTED TO ON

1. FUEL BOOST Switch (Affected Engine) - ON then NORM (check for FUEL LOW PRESS light to illuminate and extinguish. MASTER CAUTION may flash).

CAUTION

If FUEL BOOST ON light remains illuminated and/or FUEL LOW PRESS light and MASTER CAUTION flash, leave the fuel boost switch in NORM with pump running. If low fuel pressure has caused the boost pump to trip on, turning the boost pump off could possibly result in engine flameout.

Procedure completed

● IF FUEL BOOST PUMP WAS MANUALLY SELECTED TO ON

Procedure completed

■ FUEL FLTR BYPASS L OR R (FUEL FILTER BYPASS)

Indicates impending bypass of the respective fuel filter.

WARNING

It is possible that contaminated fuel has been introduced into both fuel tanks. Do not transfer fuel unless absolutely required. Monitor engine indications and consider possibility of partial or total loss of thrust from both engines.

● IF BOTH SIDES INDICATE BYPASS

1. Land as soon as possible.

Procedure completed

● IF ONE SIDE INDICATES BYPASS

1. Land as soon as practical.

Procedure completed

■ FUEL GAUGE L OR R (FUEL GAUGING SYSTEM FAULT)

Indicates that a fault has been detected in the respective fuel gauging system. Record fuel quantity at the time of fault and monitor the respective fuel gauge for proper indication. Check fuel quantity after landing and record the fuel gauging B.I.T.E. control box indications prior to battery switch OFF.

Procedure completed

■ FUEL TEMP (AMBER INDICATION)

Indicates fuel temperature is close to, or has exceeded, fuel temperature limits. Refer to Section II, FUEL LIMITATIONS.

● ON THE GROUND

1. Determine if the actual fuel temperature limit is exceeded for the fuel currently in use (Refer to Section II).
2. If fuel temperature is outside published limits, correct prior to flight.

Procedure completed

● IN FLIGHT

☐ IF FUEL TEMPERATURE IS BELOW MINIMUM LIMIT

1. Engine Instruments - CONTINUE TO MONITOR fuel and oil temperatures.
2. Land as soon as practical.

NOTE

- May indicate a failure of the fuel-oil heat exchanger (engine oil is not being cooled by the fuel).
- Higher than normal oil temperatures on affected side may occur.

Procedure completed

☐ IF FUEL TEMPERATURE IS ABOVE MAXIMUM LIMIT

1. Throttle (Affected Engine) - REDUCE, if practical.
2. Engine Instruments - CONTINUE TO MONITOR fuel and oil temperatures.

NOTE

Hot fuel may be the result of abnormally high engine temperatures on affected side.

(Continued Next Page)

■ FUEL TEMP (AMBER INDICATION) (Continued)

3. Land as soon as practical.

NOTE

- If fuel temperature is high, consider possible engine flameout due to vaporization.
- Expect fuel temperatures to increase as fuel quantity decreases.

Procedure completed

■ ENG CTRL SYS FAULT L OR R (ENGINE CONTROL SYSTEM FAULT)

Indicates an input to the FADEC has failed or exceeded tolerances, or a FADEC channel is inoperative.

● IF ON GROUND

1. FADEC RESET Button (affected side) – PRESS and RELEASE.

☐ IF ENG CTRL SYS FAULT L OR R REMAINS ILLUMINATED

2. Wait approximately 1 minute.
3. FADEC RESET Button (affected side) – PRESS and RELEASE.

O IF ENG CTRL SYS FAULT L OR R REMAINS ILLUMINATED

4. Takeoff Prohibited – Maintenance required.

Procedure completed

☐ IF ENG CTRL SYS FAULT L OR R EXTINGUISHES

Procedure completed

● IF IN FLIGHT

1. FADEC RESET Button (affected side) – PRESS and RELEASE.

☐ IF ENG CTRL SYS FAULT L OR R REMAINS ILLUMINATED

2. Wait approximately 1 minute.
3. FADEC RESET Button (affected side) – PRESS and RELEASE.

O IF ENG CTRL SYS FAULT L OR R REMAINS ILLUMINATED

If any operation in visible moisture has taken place and RAT is now 15°C or colder, the engine PT2/TT2 probe may have accumulated ice.

4. WING/ENGINE ANTI-ICE Switch (affected side) – ENG ON or WING/ENG.
5. FADEC RESET Button (affected side) – PRESS (after 2 minutes).
6. WING/ENGINE ANTI-ICE Switch (affected side) – AS REQUIRED.

(Continued Next Page)

■ ENG CTRL SYS FAULT L OR R (ENGINE CONTROL SYSTEM FAULT) (Continued)

O IF N_1 BUG IS MISSING

CAUTION

Incorrect engine power setting can be expected when operating in throttle detents.

NOTE

Primary air data used for engine power setting may be in error.

7. Land as soon as practical.

Procedure completed

O IF N_1 BUG IS AMBER

7. Indicates a failed FADEC channel. Land as soon as practical.

Procedure completed

O IF N_1 BUG IS CYAN

7. Land as soon as practical

CAUTION

Rapid throttle movements should be avoided. Degraded engine operating characteristics can be experienced.

Procedure completed

☐ IF ENG CTRL SYS FAULT L OR R EXTINGUISHES

Procedure completed

■ FUEL TRANSFER (FUEL TRANSFER VALVE OPEN)

Indicates normal operation of the fuel transfer system. The supply tank FUEL BOOST ON annunciator will also be illuminated during normal operation.

● IF FUEL TRANSFER ILLUMINATES WHEN TRANSFER IS NOT SELECTED

1. FUEL BOOST Switches - BOTH ON or BOTH OFF.
2. Fuel Balance - MONITOR (200 pounds (90 kilograms) maximum imbalance).
3. Land as soon as practical.

Procedure completed

(Continued Next Page)

■ FUEL TRANSFER (FUEL TRANSFER VALVE OPEN) (Continued)

● IF FUEL TRANSFER ILLUMINATES WHEN TRANSFER IS SELECTED

1. Fuel Balance - MONITOR (200 pounds (90 kilograms) maximum imbalance).

Procedure completed

■ F/W SHUTOFF L OR R (FIREWALL SHUTOFF VALVE(S) CLOSED)

Indicates applicable ENGINE FIRE switch has been activated. All electrical, fuel and hydraulic systems are closed at applicable firewall.

Procedure completed

■ GROUND IDLE (FADECS IN GROUND IDLE MODE)

● ON THE GROUND

1. Indicates normal operation with GND IDLE switch in NORMAL.

Procedure completed

● IN FLIGHT

Indicates the engines may reduce to ground idle speed if the throttle is retarded to the IDLE stop. Engine acceleration time to go-around thrust may be increased in this condition.

1. GND IDLE Switch - HIGH.
2. ENGINE SYNC Knob - OFF.

AFTER LANDING

3. GND IDLE Switch - NORMAL.

Procedure completed

■ N_1, N_2 FLAG (AMBER DASHES IN DIGITAL READOUT)

Indicates data from the FADEC is not available to the EIS.

1. Refer to standby N_1 indicator as required.

Procedure completed

■ ITT FAILURE (NO POINTER AND FAIL DISPLAYED ON ITT TAPE)

Indicates data from the FADEC is not available to the EIS.

Procedure completed

■ LOSS OF OIL PRESSURE INDICATION (NO POINTERS DISPLAYED)

1. DCU PRI and DCU SEC Circuit Breakers (Affected Side Panel) - RESET.
2. Throttle (Affected Engine) - REDUCE THRUST as desired.

● IF OIL PRESS WARN L OR R LIGHT ILLUMINATED AND MASTER WARNING

3. Throttle (Affected Engine) - OFF.
4. Refer to Emergency Procedures, ENGINE FAILURE/PRECAUTIONARY SHUTDOWN.

Procedure completed

● IF OIL PRESS WARN L OR R LIGHT EXTINGUISHED

Procedure completed

■ LOSS OF OIL TEMPERATURE INDICATION (NO POINTERS DISPLAYED)

1. DCU PRI and DCU SEC Circuit Breakers (Affected Side Panel) - RESET.

Procedure completed

■ LOSS OF FUEL QUANTITY INDICATION (NO POINTER AND AMBER DASHES DISPLAYED IN DIGITAL READOUT)

1. DCU PRI, DCU SEC and FUEL QTY Circuit Breakers (Affected Side Panel) - RESET.

Procedure completed

■ LOSS OF FUEL FLOW INDICATION (AMBER DASHES DISPLAYED IN DIGITAL READOUT)

1. DCU PRI, DCU SEC, and FUEL FLOW Circuit Breakers (Affected Side Panel) - RESET.

Procedure completed

■ GEN OFF L OR R (GENERATOR INOPERATIVE - SINGLE)

1. Electrical Load - REDUCE as required; 300 amperes maximum.
2. AIR CONDITIONING Switch - OFF or FAN.
3. Failed Generator - RESET then OFF.
4. VOLTAGE SEL Knob - CHECK Failed Generator Voltage.

● IF FAILED GENERATOR VOLTAGE IS 28.5-29.5 V

5. Failed Generator - GEN.

Procedure completed

● IF FAILED GENERATOR VOLTAGE IS NOT 28.5-29.5 V OR WILL NOT COME ON

5. Failed Generator - OFF.
6. Land as soon as practical.

Procedure completed

■ AFT J-BOX CB (OPEN AFT J-BOX START CONTROL CIRCUIT BREAKER)

Indicates an open start control circuit breaker in the Aft junction box.

● ON THE GROUND

1. Correct prior to flight. Respective engine cannot be started.

Procedure completed

● IN FLIGHT

1. Respective engine can be started only using a windmilling airstart.

Procedure completed

■ AFT J-BOX LMT (OPEN AFT J-BOX 225 AMP CURRENT LIMITER)

Indicates an open 225 amp current limiter in the Aft junction box. Normal generated power is available to the respective busses, but the cross-tie bus will not supply power to the respective bus from the battery or from the opposite generator in the event of a generator failure.

1. Be prepared for loss of left or right extension and associated busses in the event of a generator failure.

Procedure completed

■ BLD AIR O'HEAT L OR R (BLEED AIR OVERHEAT)

Indicates that a malfunction has caused the bleed air leaving the respective precooler to exceed allowable temperature. This would likely occur if engine, wing and/or windshield anti-ice is on and engine power is high.

1. Throttle (Affected Engine) - REDUCE IF PRACTICAL (Maintain >75% N_2 if WING/ENG ANTI-ICE is selected ON).
2. ENGINE SYNC Knob - OFF.

NOTE

- When the overheat occurs, the wing anti-ice valve on the side of the overheat, if wing anti-ice is on, will automatically shutoff and cycle.
- If overheat occurs during single-engine operation when throttle reduction is not practical, and all anti-ice systems are on, the copilot's WINDSHIELD BLEED AIR manual valve should be closed to reduce the amount of bleed air required.
- If the annunciator will not extinguish when engine RPM is reduced, the problem is likely to be a faulty temperature sensor.

Procedure completed

■ FRESH AIR (FRESH AIR SELECTED)

Indicates the AIR SOURCE SELECT knob is set to the FRESH AIR position.

NOTE

The airplane will not pressurize in the fresh air mode.

Procedure completed

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 and On.
Description of Change:	Section III, Operating Procedures, Abnormal Procedures, Cabin Pressurization Controller Failure, page 3-48, revise the procedure title, second division titles and add a statement below the title.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-48.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section III, Operating Procedures, Abnormal Procedures, page 3-48, CABIN PRESSURIZATION CONTROLLER FAILURE procedure, revise the procedure title, second division titles and add a statement below the title as follows:

■ CABIN PRESSURIZATION CONTROLLER FAILURE (RED LED AND BLANK DISPLAY; OR AMBER LED)

If the pressurization controller display is blank, and the red LED in the upper left corner of the controller face is ON, an internal fault exists. No commands are received from the pressurization controller for maintaining cabin pressure.

● IF CABIN ALTITUDE IS NOT BEING MAINTAINED (RED LED AND BLANK DISPLAY)

1. PRESS SYSTEM SELECT Switch - MANUAL. Control cabin altitude with the PRESS SYSTEM SELECT MANUAL Lever.

Procedure completed

● IF CABIN PRESSURE IS MAINTAINED, BUT AMBER LED IN PRESSURE CONTROLLER IS ILLUMINATED (PROBABLE LOSS OF AIR DATA COMPUTER INPUT, AUTO-SCHEDULE INOPERATIVE)

1. Pressurization Controller - SELECT CA (cabin altitude) or FL (flight level).
2. Pressurization SET ALT Knob - AS DESIRED (FL or CA)
3. Prior to Descent - SET ALT Knob - CA, DESTINATION ELEVATION +200 FEET.

Procedure completed

525BFM TC-R07-05

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

APPROVED BY for Mark Fuller
Stephen Gielisch, Lead ODA Administrator
Textron Aviation Inc.
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 01 August 2017

525BFM TC-R07-05

■ AIR DUCT O'HEAT (ENVIRONMENTAL SYSTEM AIR DUCT OVERHEAT)

1. AIR CONDITIONING Switch - FAN or AUTO.
2. TEMP Circuit Breaker (L Panel) - RESET.
3. TEMPERATURE SELECT Knob - SELECT LOWER TEMPERATURE.

● IF LIGHT REMAINS ILLUMINATED (30 SECONDS MAXIMUM)

4. TEMPERATURE SELECT Knob - MANUAL.
5. TEMPERATURE SELECT MANUAL Switch - COLD; hold for approximately 30 seconds for MAX COLD.

☐ IF LIGHT REMAINS ILLUMINATED

6. AIR SOURCE SELECT Knob - L or R, control temperature with throttle on selected side.
7. ENGINE SYNC Knob - OFF.

Procedure completed

☐ IF LIGHT EXTINGUISHES

Procedure completed

● IF LIGHT EXTINGUISHES

4. TEMPERATURE SELECT Knob - AUTO (adjust as required).

NOTE

If the AIR DUCT O'HEAT light illuminates again, select MANUAL on TEMPERATURE SELECT Knob, and control temperature with the TEMPERATURE SELECT MANUAL Switch.

Procedure completed

■ CABIN PRESSURIZATION CONTROLLER FAILURE

● IF CABIN ALTITUDE IS NOT BEING MAINTAINED

1. PRESS SYSTEM SELECT Switch - MANUAL. Control cabin altitude with the PRESS SYSTEM SELECT MANUAL Lever.

Procedure completed

● IF CABIN PRESSURE IS MAINTAINED, BUT AMBER FAIL ANNUNCIATOR IN PRESSURE CONTROLLER IS ILLUMINATED (PROBABLE LOSS OF AIR DATA COMPUTER INPUT, AUTO-SCHEDULE INOPERATIVE)

1. Pressurization Controller - SELECT CA (cabin altitude) or FL (flight level).
2. Pressurization SET ALT Knob - AS DESIRED (FL or CA)
3. Prior to Descent - SET ALT Knob - CA, DESTINATION ELEVATION +200 FEET.

Procedure completed

■ DOOR SEAL (CABIN DOOR PRESSURE SEAL FAILURE)

Indicates cabin door primary seal pressure is too low to maintain door seal integrity. Secondary seal should maintain pressurization.

1. Altitude - Descend to 31,000 feet (or lower).
2. Oxygen Masks - DON and NORMAL (if above 24,000 feet).
3. Passenger Advisory Switch - PASS SAFETY.
4. Altitude - Descend to 15,000 feet MSL as soon as practical or Minimum Safe Altitude, whichever is higher.
5. Cabin Pressure - MONITOR.
6. Land as soon as practical.

Procedure completed

■ EMER PRESS ON (EMERGENCY PRESSURIZATION ON)

Indicates the emergency pressurization system has been turned on at the AIR SOURCE SELECT knob or automatically activated due to high cabin altitude.

● IF CABIN ALT LIGHT ILLUMINATED

1. Refer to Emergency Procedures, CABIN ALT.

Procedure completed

● IF CABIN ALT LIGHT DID NOT ILLUMINATE

1. EMER PRESS Circuit Breaker - PULL.
2. Altitude - DESCEND TO 41,000 feet or lower.

Procedure completed

■ ENVIRONMENTAL SYSTEM CABIN OVERHEAT

1. TEMP Circuit Breaker (L Panel) - RESET.
2. TEMPERATURE SELECT Knob - MANUAL.
3. TEMPERATURE SELECT MANUAL Switch - COLD; hold for approximately 30 seconds for max cold.

● IF NO CHANGE IN TEMPERATURE OCCURS

4. AIR SOURCE SELECT Knob - L or R, control temperature with throttle on selected engine.
5. ENGINE SYNC Knob - OFF.

☐ IF STILL NO CHANGE IN TEMPERATURE

6. WINDSHIELD BLEED AIR Manual Valves - OFF or MINIMUM for clear vision.
7. AIR SOURCE SELECT Knob - EMER.

NOTE

Pressurization air will enter the cabin through the cockpit air distribution system (foot warmers, side panels, defog). EMER Pressurization will be controlled at approximately 49°C (120°F).

(Continued Next Page)

■ ENVIRONMENTAL SYSTEM CABIN OVERHEAT (Continued)

O IF STILL NO CHANGE IN TEMPERATURE

8. Altitude - DESCEND as soon as practical.
9. AIR SOURCE SELECT Knob - FRESH AIR if necessary (cabin will depressurize).

Procedure completed

O IF TEMPERATURE RETURNS TO NORMAL

Procedure completed

☐ IF TEMPERATURE RETURNS TO NORMAL

Procedure completed

● IF TEMPERATURE RETURNS TO NORMAL

Procedure completed

■ USE OF SUPPLEMENTAL OXYGEN (UNPRESSURIZED)

1. Oxygen Masks- EMER for FIRE, SMOKE, or ODOR.
   - 100% at or above 25,000 feet cabin altitude.
   - NORMAL below 25,000 feet cabin altitude.
   - Make sure crew and passengers are receiving oxygen.
2. Cabin Altitude - MAX 25,000 FEET with passengers.
   - MAX 40,000 FEET crew only.
3. Oxygen - CHECK ENDURANCE (Refer to Figure 3-4).
4. Range - COMPUTE (based on oxygen endurance and revised fuel flow and ground speed).

Procedure completed

■ ELECTRIC ELEVATOR TRIM INOPERATIVE

1. PITCH TRIM Circuit Breaker (L Panel) - RESET.

● IF STILL INOPERATIVE

2. Manual Elevator Trim - AS REQUIRED.

NOTE

Do not attempt to use the autopilot if the electric trim is inoperative. The autopilot will not be able to trim out servo torque, and disengaging the autopilot could result in a significant pitch upset.

Procedure completed

● IF OPERATIVE

Procedure completed

■ JAMMED ELEVATOR TRIM TAB

● CRUISE

NOTE

The procedure required will vary with the airspeed at the time the jammed condition occurs. It is best to maintain the trimmed speed as long as possible without exceeding 275 KIAS or approximately 10 pounds elevator force. When nearing the airport or when more than 10 pounds of force is required, regardless of altitude, initiate the following procedures:

1. Throttles - IDLE.
2. Speed Brakes - DEPLOY.
3. Landing Gear - DOWN AND LOCKED (Below 200 KIAS).
4. Airspeed - REDUCE (elevator force will reduce as airspeed is reduced).

NOTE

Expect elevator force to initially increase significantly; however, as airspeed is reduced, elevator force will peak then begin to decrease.

5. Wing Flaps - TAKEOFF AND APPROACH (Below 200 KIAS).
6. Speed Brakes - RETRACT (Below 140 KIAS speed brakes may be used as desired. Elevator force will increase slightly).
7. Airspeed - 140 KIAS.
8. Flaps - LAND (elevator force will increase slightly when flaps LAND is selected).

NOTE

Do not attempt to use the autopilot if the electric trim is inoperative. The autopilot will not be able to trim out servo torque, and disengaging the autopilot could result in a significant pitch upset.

Procedure completed

● TAKEOFF OR GO-AROUND

1. Pitch and Thrust - As required to maintain 140 KIAS or less.
2. Flaps - Place in position that jam occurred.
3. Airspeed - Flaps UP (0°) or Unknown, V_{REF} +22 KIAS.
   - Flaps TAKEOFF and APPROACH (15°), V_{REF} +11 KIAS.
   - Flaps LAND (35°), V_{REF}.
4. Landing Gear - Do not retract.
5. Land as soon as practical.

Procedure completed

■ RUDDER BIAS (RUDDER BIAS SYSTEM VALVE CLOSED)

● ON THE GROUND

1. RUDDER BIAS Circuit Breaker (L Panel) - PULL.
2. Correct prior to flight.

Procedure completed

● IN FLIGHT

1. RUDDER BIAS Circuit Breaker (L Panel) - PULL.
2. Flight may be continued in a normal manner.

NOTE

With the rudder bias system inoperative, rudder pedal force and/or directional trim required for single engine operation will be significantly increased.

Procedure completed

■ RUDDER BIAS UNCOMMANDED MOTION (L OR R RUDDER PEDAL MOVED FORWARD)

● UNCOMMANDED MOTION DURING GROUND OPERATION

1. Rudder Pedal Deflection - OVERPOWER as required to maintain directional control.
2. RUDDER BIAS Circuit Breaker (L Panel) - PULL.
3. Correct prior to flight.

Procedure completed

● UNCOMMANDED MOTION DURING TAKEOFF OR IN FLIGHT

1. Rudder Pedal Deflection - OVERPOWER AS REQUIRED to maintain directional control.
2. Climb to and/or maintain a safe altitude.
3. RUDDER BIAS Circuit Breaker (L Panel) - PULL.
4. Flight may be continued in a normal manner.

NOTE

With the rudder bias system inoperative, rudder pedal force and/or directional trim required for single engine operation will be significantly increased.

Procedure completed

■ ENG AND/OR WING ANTI-ICE L OR R (ENGINE AND/OR WING ANTI-ICE FAILURE)

Indicates engine inlet or wing leading edge temperature is below safe level for satisfactory ice protection. This is normal when WING/ENGINE anti-ice is first actuated, until normal temperature is achieved, and if engine speed is reduced below approximately 75% N_2. Once the engine inlet and/or wing leading edge has obtained normal temperature, subsequent illumination of the annunciator will illuminate the MASTER CAUTION.

1. Throttle - INCREASE THRUST (Above 75% N_2).
2. Affected ENGINE Anti-Ice Circuit Breakers (L Panel) - RESET.

● IF ENGINE ONLY OR ENG AND WING ANTI-ICE LIGHTS REMAIN ILLUMINATED (AFTER TWO MINUTES)

3. Affected ENGINE Anti-Ice Circuit Breaker (L Panel) - PULL.

NOTE

Respective ENG and WING ANTI-ICE annunciators will be inoperative and the wing/ engine anti-ice valves will be open.

4. Monitor engine inlet and wing leading edge. If ice is accumulating, leave icing environment as soon as possible. If ice is accumulating on the wing leading edge, refer to IF ONLY WING ANTI-ICE LIGHT REMAINS ILLMINATED (AFTER TWO MINUTES) below.
5. Affected ENGINE Anti-Ice Circuit Breaker (L Panel) - RESET (after leaving icing environment).

● IF ONLY WING ANTI-ICE LIGHT REMAINS ILLUMINATED (AFTER TWO MINUTES)

3. WING XFLOW Switch - WING XFLOW.
4. Monitor wing leading edge for ice accumulation.

☐ IF ICE IS ACCUMULATING ON ONLY ONE WING

5. Both WING/ENGINE Anti-Ice Switches - ENG ON.
6. Leave icing environment as soon as possible.

WARNING

IF ICE IS ACCUMULATING ON THE WING LEADING EDGE OF THE AFFECTED SIDE, THE ANTI-ICE SYSTEM MUST BE CONSIDERED INOPERATIVE. BOTH SIDES MUST BE SWITCHED TO ENGINE ANTI-ICE ONLY TO AVOID ASYMMETRIC WING ICE ACCUMULATION AND TO RETAIN AIRPLANE CONTROL.

NOTE

- Minor airframe buffet may be present during operation with ice on both wing leading edges.
- After an icing encounter with failed wing anti-ice, the crew should visually confirm the presence of ice on the wing leading edges. If no ice is present on either wing, the following BEFORE LANDING procedure is not applicable and normal landing procedures should be used.

(Continued Next Page)

■ ENG AND/OR WING ANTI-ICE L OR R (ENGINE AND/OR WING ANTI-ICE FAILURE) (Continued)

● BEFORE LANDING (WITH ICE ON WING LEADING EDGES)

7. Landing Data - CONFIRM.
8. Seats, Seat Belts, Shoulder Harnesses and Rudder Pedals - ADJUST and SECURE.
9. Avionics and Flight Instruments - CHECK.
10. Minimums - SET.
11. Passenger Seats - CHECK FULL UPRIGHT and OUTBOARD.
12. Passenger Advisory Switch - PASS SAFETY.
13. FUEL TRANSFER Knob - CHECK.
14. Flaps - TAKEOFF AND APPROACH.
15. ENGINE SYNC Knob - OFF.
16. ANTISKID Switch - ON.
17. L/R LANDING Light Switches - ON.
18. Annunciator Panel - CHECK.
19. Pressurization - CHECK (Destination Elevation Set).
20. Crew Briefing - COMPLETE.
21. Landing Gear - DOWN and LOCKED.
22. Flaps - LAND.
23. Pressurization - CHECK ZERO DIFFERENTIAL.
24. Autopilot and Yaw Damper - OFF.
25. Speed Brakes - RETRACTED PRIOR TO 50 FEET AGL.
26. Airspeed - V_{REF} + 10 KIAS.
27. Landing Distance - Multiply by 1.3.

Procedure completed

☐ IF NO ICE IS ACCUMULATING

Procedure completed

■ WING O'HEAT L OR R (WING OVERHEAT)

The WING O'HEAT annunciator indicates wing overtemperature. In this case the wing anti-ice will automatically shut off and cycle back on once the overtemperature condition has cleared. This condition should only occur on the ground at high thrust settings with WING/ENGINE ANTI-ICE Switches on.

● CONTINUOUS ILLUMINATION

1. Throttle (Affected Side) - REDUCE THRUST (as required).

☐ IF LIGHT REMAINS ILLUMINATED

2. WING/ENGINE ANTI-ICE Switch (Affected Side) - ENG ON.
3. WING XFLOW Switch - WING XFLOW.
4. Throttle (Affected Side) - THRUST AS REQUIRED.
5. Throttle (Opposite Side) - REDUCE THRUST AS MUCH AS FEASIBLE.
6. Leave icing environment as soon as practical.

Procedure completed

● MOMENTARY ILLUMINATION

☐ IF LIGHT EXTINGUISHES

Procedure completed

■ WINDSHIELD BLEED AIR FAILURE

● LOSS OF HOT AIR SUPPLY (VALVE WILL NOT OPEN OR POSSIBLE LINE FAILURE)

1. WINDSHIELD Bleed Switch and WINDSHIELD BLEED AIR Manual Valves - OFF.
2. WINDSHIELD Alcohol Switch - AS REQUIRED.
3. Leave icing environment as soon as possible.

NOTE

Ten minutes of alcohol is available to the pilot's windshield only.

Procedure completed

● HOT AIR SUPPLY NORMAL

Procedure completed

■ W/S AIR O'HEAT (WINDSHIELD AIR OVERHEAT)

● WINDSHIELD BLEED SWITCH LOW OR HIGH

☐ AIR FLOW CYCLES OFF AND ON

1. WINDSHIELD Bleed Switch - SELECT LOW.

NOTE

If the controller has detected an overtemperature and has shut off the windshield bleed air, the system will cycle back on when the air temperature cools. Increasing airspeed and selecting warmer cabin may improve controller efficiency and eliminate the overtemperature condition. Satisfactory anti-ice will be provided under most icing conditions while the system cycles.

O IF SATISFACTORY ANTI-ICE IS NOT MAINTAINED

2. WINDSHIELD Bleed Switch - SELECT HI.
3. WINDSHIELD BLEED AIR Manual Valves - ADJUST TO MINIMUM FLOW.

CAUTION

Monitor windshield for evidence of heat damage and close windshield bleed air manual valves if evidence occurs.

4. WINDSHIELD Alcohol Switch - AS REQUIRED.

NOTE

Ten minutes of alcohol is available to the pilot's windshield only.

5. Leave icing environment as soon as possible.

Procedure completed

O IF SATISFACTORY ANTI-ICE IS MAINTAINED

Procedure completed

☐ AIR FLOW NOT CYCLING (PROBABLE CONTROLLER FAILURE)

1. WINDSHIELD BLEED AIR Manual Valves - OFF or REDUCE (maintain adequate visibility).

(Continued Next Page)

■ W/S AIR O'HEAT (WINDSHIELD AIR OVERHEAT) (Continued)

CAUTION

Monitor windshield for evidence of heat damage and close windshield bleed air manual valves if evidence occurs.

2. WINDSHIELD Alcohol Switch - AS REQUIRED.

NOTE

Ten minutes of alcohol is available to the pilot's windshield only.

3. Leave icing environment as soon as possible.
4. Visually inspect windshield for damage after landing.

Procedure completed

● WINDSHIELD BLEED SWITCH OFF

1. WINDSHIELD BLEED AIR Manual Valves - OPEN.

NOTE

This should release trapped air that may be triggering the pressure switch.

☐ IF W/S AIR O'HEAT CAUTION LIGHT REMAINS ILLUMINATED

NOTE

Indicates a possible failure of the windshield bleed air valve to an open position.

2. WINDSHIELD BLEED AIR Manual Valves - OFF or REDUCE (maintain adequate visibility).

CAUTION

Monitor windshield for evidence of heat damage and close windshield bleed air manual valves if evidence occurs.

3. Visually inspect windshield for damage after landing.

Procedure completed

☐ IF W/S AIR O'HEAT CAUTION LIGHT EXTINGUISHES

2. WINDSHIELD BLEED AIR Manual Valves - AS REQUIRED.

Procedure completed

■ P/S HTR OFF L OR R, OR STBY P/S HTR OFF (PITOT-STATIC HEATER FAILURE OR STANDBY PITOT-STATIC HEATER FAILURE)

1. Pitot-Static Switch - CHECK ON.
2. L PITOT STATIC, R PITOT STATIC, and STBY PITOT STATIC Circuit Breakers (L Panel) - RESET.
3. Leave icing environment as soon as practical (if affected heater remains failed).

Procedure completed

■ AOA HTR FAIL (ANGLE-OF-ATTACK HEATER FAILURE)

1. Pitot-Static Switch - CHECK ON.
2. AOA HEATER Circuit Breaker (L Panel) - RESET.
3. Leave icing environment as soon as practical (if AOA heater remains failed).

WARNING

Do not reduce airspeed below V_{REF} (flaps LAND), V_{REF} +11 KIAS (flaps TAKEOFF AND APPROACH) or V_{REF} +22 KIAS (flaps UP). If the AOA probe becomes iced, the AOA data will be invalid. The stick shaker may activate above or below normal airspeeds. If the stick shaker fails to function, the autopilot will not disconnect when the airplane becomes excessively slow.

Procedure completed

■ ENG T2 HTR FAIL L OR R (ENGINE T2 HEATER FAILURE)

Indicates either the T2 heater is inoperative when WING/ENGINE Anti-Ice Switch has been selected ON for that side, or the T2 heater is on with the WING/ENGINE Anti-Ice Switch selected OFF.

● ON THE GROUND

☐ IF WING/ENGINE ANTI-ICE SWITCH IS OFF

1. Correct prior to flight.

CAUTION

The T2 probe heats rapidly with no air flow. Failure to remove electrical power to the T2 heater will result in damage to the probe. If the affected engine is running at the time of failure, normal ground operations are permissible until engine shutdown. When shutting down the engine, be prepared to remove all electrical power to the airplane within 10 seconds using the following steps.

2. Throttles - OFF.
3. Battery Switch - OFF.

Procedure completed

☐ IF WING/ENGINE ANTI-ICE SWITCH IS ON

1. Correct prior to flight.

Procedure completed

(Continued Next Page)

■ ENG T2 HTR FAIL L OR R (ENGINE T2 HEATER FAILURE)
(Continued)

● IN FLIGHT

☐ IF WING/ENGINE ANTI-ICE SWITCH IS OFF

1. Operate engine normally. After landing follow ON THE GROUND procedure.

Procedure completed

☐ IF WING/ENGINE ANTI-ICE SWITCH IS ON

1. Leave icing environment as soon as possible.

Procedure completed

■ TAIL DEICE PRESS L OR R (TAIL DEICE TIMER FAILURE, TAIL DEICE PRESS FAILS TO ILLUMINATE OR CYCLES CONTINUOUSLY)

Normal operation is indicated by illumination cycles of 6 seconds L, 6 seconds off, 6 seconds R, then off, repeating approximately every 3 minutes.

● IF ADVISORY LIGHT(S) FAILS TO ILLUMINATE

1. TAIL DEICE Switch - CHECK POSITION.
2. TAIL DEICE Circuit Breaker (L Panel) - RESET.
3. TAIL DEICE Switch - MANUAL (Repeat at 3 to 5 minute intervals).

☐ IF TAIL DEICE BOOTS FAIL TO INFLATE

4. Throttles - INCREASE THRUST (as required above 75% N_2).
5. TAIL DEICE Switch - OFF, then AUTO or MANUAL.

O IF TAIL DEICE BOOTS STILL FAIL TO INFLATE

6. Leave icing environment as soon as possible.

Procedure completed

O IF TAIL DEICE BOOTS INFLATE

6. Leave icing environment as soon as practical.

Procedure completed

☐ IF TAIL DEICE BOOTS INFLATE

4. Leave icing environment as soon as practical.

Procedure completed

● IF TAIL DEICE PRESS ADVISORY LIGHT CYCLES CONTINUOUSLY OR REMAINS ILLUMINATED WITH TAIL DEICE SWITCH IN OFF POSITION

1. TAIL DEICE Circuit Breaker (L Panel) - PULL.
2. Reset TAIL DEICE Circuit Breaker as needed to actuate the system. (Repeat at 3 to 5 minute intervals).
3. Leave icing environment as soon as practical.

Procedure completed

■ TAIL DEICE FAIL (TAIL DEICE FAILURE)

1. Throttles - INCREASE THRUST (as required above 75% N_2).
2. TAIL DEICE Switch - OFF, then AUTO or MANUAL.

● IF TAIL DEICE FAIL LIGHT REMAINS ILLUMINATED

3. Leave icing environment as soon as possible.

Procedure completed

● IF TAIL DEICE FAIL LIGHT EXTINGUISHES

Procedure completed

■ INADVERTENT ICING ENCOUNTER

1. WING/ENGINE ANTI-ICE Switches - ENG ON or WING/ENG.
2. Windshield Anti-ice and Tail Deice - AS REQUIRED.

Procedure completed

■ SEVERE ICING ENCOUNTER

Severe icing may be encountered at temperatures as cold as -18°C (0°F). Increased vigilance is required at temperatures around 0°C (+32°F) ambient air temperature with visible moisture present.

NOTE

The following weather conditions may be conducive to severe in-flight icing:

- Visible rain at temperatures colder than 0°C (+32°F) ambient air temperature.
- Droplets that splash or splatter at temperatures colder than 0°C ambient air temperature.

(Continued Next Page)

■ SEVERE ICING ENCOUNTER (Continued)

NOTE

Severe icing conditions are indicated by one or more of the following visual cues:

- Unusually extensive ice accumulations on the airframe and windshield in areas not normally observed to collect ice.
- Accumulation of ice on the upper surface of the wing that extends more than 12 to 18 inches aft of the heated leading edge.

1. Immediately request priority handling from Air Traffic Control to facilitate exiting the severe icing conditions.
2. Flaps - LEAVE IN CURRENT POSITION (Do not extend or retract).
3. Autopilot - DISENGAGE.

NOTE

Be prepared for larger than normal control wheel forces.

4. Avoid abrupt and excessive maneuvering that may aggravate control problems.
5. If unusual or uncommanded roll is encountered - REDUCE ANGLE OF ATTACK.

Procedure completed

■ BLANK PILOT PFD (PILOT PFD FAILURE)

1. Display Reversion - Select REV TO MFD.

Procedure completed

■ BLANK COPILOT PFD (COPILOT PFD FAILURE)

1. Continue flight referring to pilot PFD and standby flight display.
2. AP XFR - PUSH to select pilot's side, if required.
3. PFD2 PRI and HTR Circuit Breakers (R Panel) - RESET.

Procedure completed

■ BLANK MFD (MFD FAILURE)

1. Display Reversion - Select REV TO PFD.
2. Engine Instruments - MONITOR PFDs and/or standby N_1 indicator.

Procedure completed

■ BLANK PFDs/MFD (DUAL PFD AND MFD FAILURE)

1. Continue flight referring to standby flight display.
2. Engine Instruments - MONITOR standby N_1 indicator.
3. Land as soon as practical.

Procedure completed

■ AMBER BOXED "E↑,↓" OR "A←,→" DISPLAYED ON PFDS (AUTOPILOT OUT OF TRIM)

NOTE

Do not manually overpower the autopilot. Overpowering the autopilot does not cancel the autotrim. The autotrim will trim against flight crew inputs to the column/wheel. This could lead to a severe out-of-trim condition. If manual control of the airplane is required, disengage the autopilot with the autopilot/trim disengage button.

● MOMENTARY ILLUMINATION

Indication of an elevator (Amber Boxed E) or aileron (Amber boxed A) mistrim condition.

1. AP/TRIM DISC Button - PRESS AND RELEASE (if elevator trim not in motion).

NOTE

Be prepared for larger than normal control wheel forces.

2. Elevator or Aileron Trim - ADJUST as required.
3. Autopilot - ENGAGE as desired.

Procedure completed

● CONTINUOUS ILLUMINATION

1. Control Wheel - GRIP WITH BOTH HANDS.

NOTE

Be prepared for larger than normal control wheel forces.

2. AP/TRIM DISC Button - PRESS AND RELEASE.
3. Elevator or Aileron Trim - ADJUST as required.
4. Autopilot - ENGAGE as desired.

Procedure completed

■ AMBER FLC OVRSPD MODE (AUTOPILOT OVERSPEED RECOVERY)

1. Throttles - REDUCE.
2. Speed Brakes - EXTEND (as desired).
3. Autopilot - RESELECT Vertical Mode after FLC OVRSPD extinguishes.

NOTE

- IAS or Mach reference can not be adjusted by the Pitch Wheel in FLC OVRSPD.
- The selection of any vertical mode except Altitude Hold is inhibited in FLC OVRSPD.
- FLC OVRSPD provides a pitch up command to decelerate the aircraft and maintain slightly less than V_{MO}/M_{MO}.

Procedure completed

■ WHITE ATT/HDG ALIGNING (INFLIGHT AHRS ALIGNING)

1. Maintain CONSTANT airspeed with straight and level attitude.
2. Valid attitude and heading information should be available within 45 seconds.

Procedure completed

■ WHITE XAHS OR XADC (LOSS OF COMPARATOR MONITOR ALERTS)

Indicates lack of comparator monitor capability.

1. Pilot and Copilot Attitude, Altitude, and Airspeed - MONITOR.

Procedure completed

■ AMBER ROL, PIT, ATT, HDG, ALT OR IAS (COMPARATOR MONITOR ALERT)

Indicates that data between the appropriate systems does not agree within comparator limits.

1. Pilot and Copilot Attitude, Altitude and Airspeed - MONITOR AND COMPARE TO STANDBY (heading compare to magnetic compass).
2. ADC or AHRS Reversion (affected side) - DADC REV or AHRS REV.
3. AP XFR Button - PUSH. Select side with operating ADC and AHRS.

Procedure completed

■ AMBER FD1 OR FD2 DISPLAYED ON PFD (FLIGHT DIRECTOR ALERT)

Indicates lack of dual independent flight guidance during an ILS approach or go-around.

● DURING ILS APPROACH

1. Nav Radios - Select ILS frequency on off-side NAV.

Procedure completed

● DURING GO-AROUND

1. Flight Directors - Utilize flight director with GA mode annunciated.

Procedure completed

■ AMBER XTLK DISPLAYED ON PFD (CROSSTALK BETWEEN PFD'S AND/OR MFD HAS FAILED)

Indicates data displayed on PFDs and MFD may not be synchronized.

1. PFDs/MFD -Verify information is set as desired.

Procedure completed

■ AMBER FREQUENCIES DISPLAYED IN RTU (RIU OR RTU FAILURE)

Indicates a Radio Interface Unit (RIU), Radio Tuning Unit (RTU) or specific equipment has failed.

● IF ONLY ONE FREQUENCY IS AMBER

1. Affected equipment is inoperative; continue using remaining operative equipment.

Procedure completed

● IF ALL OR MULTIPLE FREQUENCIES ARE AMBER

1. Either the affected RIU or RTU is inoperative.
2. Affected RTU BRT Knob - OFF.
3. Opposite RTU 1/2 Button - PUSH as required to tune frequencies; or tune via the FMS.

Procedure completed

■ LANDING GEAR WILL NOT EXTEND

1. Airspeed - BELOW V_{LO} (200 KIAS).
2. GEAR CONTROL Circuit Breaker (L Panel) - RESET.
3. Landing Gear Handle - CHECK DOWN.

● IF HANDLE FAILS TO MOVE (FROM UP POSITION) OR GEAR WILL NOT EXTEND

4. GEAR CONTROL Circuit Breaker (L Panel) - PULL.
5. Auxiliary Gear Control - PULL T-HANDLE AND ROTATE TO LOCK.
6. Auxiliary Gear Control - PULL KNOB TO BLOW DOWN (for positive lock).
7. Auxiliary Gear Control - STOW (knob and T-handle).

CAUTION

- Prior to using the emergency extension, the landing gear handle must be down and/or the gear control circuit breaker pulled, to prevent possible energizing of the gear hydraulic system to the retract position.
- Once the emergency gear extension system has been used, do not attempt to raise the gear.

NOTE

Pneumatic pressure should be used to assure positive locking of all three gear actuators.

☐ IF THE LANDING GEAR HANDLE REMAINS UP

CAUTION

Power brakes and antiskid are inoperative.

8. Refer to Abnormal Procedures, WHEEL BRAKE FAILURE.

Procedure completed

☐ IF THE LANDING GEAR HANDLE IS DOWN

Procedure completed

● IF HANDLE MOVES AND GEAR EXTENDS

Procedure completed

■ LANDING GEAR WILL NOT RETRACT (GEAR UNLOCK LIGHT REMAINS ON)

1. Airspeed - BELOW V_{LO} (200 KIAS).
2. GEAR CONTROL Circuit Breaker (L Panel) - RESET.
3. Landing Gear Handle - CHECK UP.

● IF GEAR DOES NOT RETRACT

4. Landing Gear Handle - DOWN.
5. Downlock Lights - VERIFY ALL ILLUMINATED.
6. Land as soon as practical.

NOTE

Do not exceed 200 KIAS or 18,000 feet MSL.

Procedure completed

● IF GEAR RETRACTS

4. Continue flight.

Procedure completed

■ HYD FLOW LOW L AND/OR R (LOW HYDRAULIC FLOW)

Indicates inoperative or cavitated hydraulic pump(s).

NOTE

One or both pumps may cavitate for a short time following maneuvering at near zero or less than zero G. Cavitated pumps should be inspected for damage prior to next flight.

● SINGLE FAILED PUMP

1. Land as soon as practical (to preclude further pump damage).

Procedure completed

● BOTH PUMPS FAILED (TOTAL HYDRAULIC FAILURE)

NOTE

Landing gear, flaps and speed brakes will be inoperative.

1. Land as soon as practical (to preclude further pump damage).
2. Altitude - DESCEND to 41,000 feet or below.
3. Refer to Abnormal Procedures, LANDING GEAR WILL NOT EXTEND and FLAPS INOPERATIVE APPROACH AND LANDING.

Procedure completed

■ HYD PRESS ON (HYDRAULIC PRESSURE ON, SYSTEM REMAINS PRESSURIZED AFTER CYCLE IS COMPLETED)

Indicates that the hydraulic system is pressurized. The white HYD PRESS ON advisor light will illuminate normally when the speed brakes, landing gear or flaps are in transit. If the HYD PRESS ON light remains illuminated after a cycle of one of these systems is complete or illuminates continuously at any other time, action must be taken to preclude damage to the hydraulic system. If this failure occurs on the ground, dispatch is prohibited.

1. Last System Used - RECYCLE (speed brakes, landing gear and/or flaps).

● HYD PRESS ON LIGHT REMAINS ILLUMINATED

2. SPEED BRAKE, GEAR CONTROL and FLAP CONTROL Circuit Breakers (L Panel) - PULL. (Note if the system depressurizes when a circuit breaker is pulled).

☐ IF HYDRAULIC SYSTEM REMAINS PRESSURIZED

3. HYD CONTROL Circuit Breaker (L Panel) - PULL.

O IF HYDRAULIC SYSTEM STILL PRESSURIZED

4. Circuit Breakers (L Panel) - RESET.
5. Land as soon as possible. Be prepared to perform procedures for HYD FLOW LOW.

CAUTION

With high thrust settings, the hydraulic system can operate for approximately 10 minutes before overheating. With low thrust settings, the hydraulic system may be pressurized for up to 30 minutes without overheating.

Procedure completed

O IF HYDRAULIC SYSTEM DEPRESSURIZES

4. Altitude - DESCEND to 41,000 feet or below.
5. Land as soon as practical. Reset pulled circuit breakers prior to landing.

CAUTION

With high thrust settings, the hydraulic system can operate for approximately 10 minutes before overheating. With low thrust settings, the hydraulic system may be pressurized for up to 30 minutes without overheating.

Procedure completed

☐ IF HYDRAULIC SYSTEM DEPRESSURIZES

3. Circuit Breakers (L Panel) - RESET. (Leave circuit breaker that caused system to depressurize - PULLED).

O IF SPEED BRAKE CIRCUIT BREAKER REMAINED PULLED

4. Altitude - DESCEND to 41,000 feet or below.
5. Land as soon as practical.

Procedure completed

(Continued Next Page)

■ HYD PRESS ON (HYDRAULIC PRESSURE ON, SYSTEM REMAINS PRESSURIZED AFTER CYCLE IS COMPLETED)

(Continued)

O IF SPEED BRAKE CIRCUIT BREAKER NOT PULLED

4. Land as soon as practical. Reset pulled circuit breaker prior to landing.

CAUTION

With high thrust settings, the hydraulic system can operate for approximately 10 minutes before overheating. With low thrust settings, the hydraulic system may be pressurized for up to 30 minutes without overheating.

Procedure completed

● IF HYDRAULIC SYSTEM RETURNS TO NORMAL

Procedure completed

■ ANTISKID INOP (ANTISKID SYSTEM FAILURE)

1. ANTISKID Switch - ON.
2. SKID CONTROL and BRAKE SYSTEM Circuit Breakers (L Panel) - RESET.

● IF LIGHT REMAINS ILLUMINATED

3. ANTISKID Switch - OFF.
4. Landing Distance - Multiply by 1.5.

CAUTION

Differential power braking is available. However, since the antiskid is inoperative, excessive pressure on the brake pedals may cause wheel brakes to lock, resulting in tire blowout.

5. Be prepared to use the emergency brake system.

NOTE

If the antiskid hydraulic pump fails after the accumulator pressure exceeds 900 psi, the POWER BRAKE LOW PRESS light may not illuminate until normal brakes are used.

Procedure completed

● IF LIGHT EXTINGUISHES

Procedure completed

■ PWR BRK LOW PRESS AND ANTISKID INOP (POWER BRAKE SYSTEM FAILURE)

1. SKID CONTROL and BRAKE SYSTEM Circuit Breakers (L Panel) - RESET.

● IF LIGHTS REMAIN ILLUMINATED

2. Plan to use the emergency brake system for landing.
3. Landing Distance - Multiply by 1.7.

(Continued Next Page)

■ PWR BRK LOW PRESS AND ANTISKID INOP (POWER BRAKE SYSTEM FAILURE) (Continued)

4. Brake Pedals - REMOVE FEET FROM BRAKE PEDALS.
5. Emergency Brake Handle - PULL AS REQUIRED.

CAUTION

Antiskid system does not function during emergency braking. Excessive pressure on emergency brake handle can cause both wheel brakes to lock, resulting in blowout of both tires. After landing, clear the runway and stop. Do not attempt to taxi onto ramp using emergency brakes.

NOTE

Best performance can be obtained using a smooth, steady, continuous pull of handle to obtain the desired deceleration rate. Multiple pulls and releases of the handle will deplete the nitrogen charge.

Procedure completed

● IF LIGHT EXTINGUISHES

Procedure completed

■ WHEEL BRAKE FAILURE

1. Brake Pedals - REMOVE FEET FROM BRAKE PEDALS.
2. Emergency Brake Handle - PULL AS REQUIRED.

CAUTION

Antiskid system does not function during emergency braking. Excessive pressure on emergency brake handle can cause both wheel brakes to lock, resulting in blowout of both tires. After landing, clear the runway and stop. Do not attempt to taxi onto ramp using emergency brakes. Landing distance will increase by a factor of 1.7.

NOTE

Best performance can be obtained using a smooth, steady, continuous pull of handle to obtain the desired deceleration rate. Multiple pulls and releases of the handle will deplete the nitrogen charge.

Procedure completed

■ SPD BRK EXTEND (SPEED BRAKES EXTENDED)

Indicates that the speed brakes are in the fully extended position.

■ FLAPS INOPERATIVE APPROACH AND LANDING

1. FLAP CONTROL Circuit Breaker (L Panel) - RESET.

● IF FLAPS REMAIN INOPERATIVE

2. Landing Data - CONFIRM. Reduce the maximum landing weight and multiply the FLAPS LAND landing distance by applicable amount from Figure 3-3.
3. Airspeed - Flaps UP (0°) or Unknown, V_{REF} +22 KIAS.
   - Flaps TAKEOFF and APPROACH (15°), V_{REF} +11 KIAS.
   - Flaps GROUND (55°), V_{REF}.

NOTE

If flaps are positioned between detents, use the data and airspeeds applicable to the next lesser flap deflection.

4. Seats, Seat Belts, Shoulder Harnesses and Rudder Pedals - ADJUST and SECURE.

CAUTION

If a flap system failure causes the flaps to extend to the ground flap (55°) position in flight and the flaps will not retract, execute a normal landing. Use caution not to reduce power early, as a high sink rate may result. Do not exceed 140 KIAS with flaps 55°.

5. Avionics and Flight Instruments - CHECK.
6. Minimums - SET.
7. Passenger Advisory Switch - PASS SAFETY.
8. Passenger Seats - CHECK FULL UPRIGHT and OUTBOARD.
9. FUEL TRANSFER Knob - OFF.
10. ENGINE SYNC Knob - OFF.
11. ANTISKID Switch - CHECK ON.
12. LANDING Light Switches - ON.
13. Annunciator Panel - CHECK.

(Continued Next Page)

■ FLAPS INOPERATIVE APPROACH AND LANDING (Continued)

14. Crew Briefing - COMPLETE.
15. Landing Gear - DOWN and LOCKED.

NOTE

Refer to Abnormal Procedures, LANDING GEAR WILL NOT EXTEND if both hydraulic pumps have failed.

16. Pressurization - CHECK ZERO DIFFERENTIAL.
17. Autopilot and Yaw Damper - OFF.
18. Speed Brakes - RETRACTED PRIOR TO 50 FEET AGL.

NOTE

When landing with flaps up it may be necessary to apply forward pressure on the elevator to lower the nose at touchdown.

FLAPS DEGREES	ALTITUDE - FEET							
	SL THRU 3000		3001 THRU 6000		6001 THRU 10000		10001 THRU 14000	
	Reduce weight by (lbs)	Multiply distance by	Reduce weight by (lbs)	Multiply distance by	Reduce weight by (lbs)	Multiply distance by	Reduce weight by (lbs)	Multiply distance by
0°*	290	1.5	840	1.5	1130	1.5	1220	1.5
15°*	0	1.4	0	1.4	0	1.4	0	1.4
35°**	0	1.03	0	1.03	0	1.03	0	1.03
55°*	0	1.0	0	1.0	0	1.0	0	1.0

FIT525B-06-00

* Downhill and/or Tailwind Landing Prohibited
** Inoperative Ground Flaps

Figure 3-3*

Procedure completed

● IF FLAPS OPERATE NORMALLY

Procedure completed

■ FLAPS >35° (FLAPS GREATER THAN 35°)

The FLAPS >35° and MASTER CAUTION annunciators will illuminate if the flaps are extended beyond 35° and both throttles are advanced above 85% N_2.

● ON THE GROUND

1. TAKEOFF PROHIBITED.
2. Flaps - SET AS APPROPRIATE.

NOTE

The FLAPS >35° annunciator is disabled on the ground with throttles below approximately 85% N_2.

Procedure completed

● IN FLIGHT

1. Flap Selector Position - VERIFY.

☐ IF FLAPS HAVE EXCEEDED 35°

2. Flaps - SELECT LESS THAN 35°.
3. Airspeed - 140 KIAS OR LESS.

O IF FLAPS REMAIN BEYOND 35°

4. Land as soon as possible. Refer to Abnormal Procedures, FLAPS INOPERATIVE APPROACH AND LANDING.

Procedure completed

O IF FLAPS RETURN TO 35° OR LESS

4. Flaps - ADJUST to 35° (Flap lever may need to be set less than 35°).
5. Land as soon as practical.

Procedure completed

☐ IF FLAPS HAVE NOT EXCEEDED 35°

Procedure completed

■ LANDING WITH FAILED PRIMARY FLIGHT CONTROL CABLE

● RUDDER

1. Utilize rudder trim.
2. If possible, choose a runway with least possible crosswind.
3. After touchdown, lower the nose and deploy ground flaps as soon as possible.

Procedure completed

● AILERON

1. Use rudder for directional control limiting bank angle to 15° maximum. Do not use aileron trim except for gross adjustments.
2. If possible, choose a runway with least possible crosswind.
3. After touchdown, lower the nose and deploy ground flaps as soon as possible.

Procedure completed

● ELEVATOR

1. Use manual elevator trim wheel for primary pitch control. Do not use electric trim.
2. Make small pitch and power changes and set up landing configuration early.
3. After landing, select ground flaps and apply wheel brakes as soon as possible.

Procedure completed

■ SINGLE-ENGINE APPROACH AND LANDING

1. Landing Data - CONFIRM.
2. Seats, Seat Belts, Shoulder Harnesses and Rudder Pedals - ADJUST and SECURE.
3. Avionics and Flight Instruments - CHECK.
4. Minimums - SET.
5. Passenger Seats - CHECK FULL UPRIGHT and OUTBOARD.
6. Passenger Advisory Switch - PASS SAFETY.
7. FUEL TRANSFER Knob - CHECK.
8. Anti-Ice/Deice Systems - AS REQUIRED.
9. Flaps - TAKEOFF AND APPROACH.
10. ENGINE SYNC Knob - OFF.
11. ANTISKID Switch - ON.
12. L/R LANDING Light Switches - ON.
13. Annunciator Panel - CHECK.
14. Pressurization - CHECK (Destination Elevation Set).
15. Crew Briefing - COMPLETE.
16. Landing Gear - DOWN and LOCKED.
17. Pressurization - CHECK ZERO DIFFERENTIAL.
18. Autopilot and Yaw Damper - OFF.
19. Airspeed - V_{APP} MINIMUM.
20. Speed Brakes - RETRACTED PRIOR TO 50 FEET AGL.
21. Flaps - LAND (when landing assured).
22. Airspeed - V_{REF}.

Procedure completed

■ SINGLE-ENGINE GO-AROUND

1. Throttle (Operating Engine) - TO Detent.
2. Airplane Pitch Attitude - +7.5° INITIALLY (Use go-around mode on flight director for reference).
3. Flaps - TAKEOFF AND APPROACH.

NOTE

The landing gear warning horn cannot be silenced if the landing gear is retracted prior to the flaps reaching the TAKEOFF AND APPROACH position.

4. Climb Speed - V_{APP} MINIMUM.
5. Landing Gear - UP (when positive rate-of-climb is established).
6. Flaps (when clear of obstacles) - UP accelerating to V_{ENR} (VT).
7. Climb Speed - V_{ENR} (VT).
8. Throttle (Operating Engine) - MCT DETENT (AS REQUIRED).

Procedure completed

■ CABIN DOOR (CABIN DOOR NOT LOCKED)

Indicates failure or improper position of one or more door switches and/or possible disengagement of the lower forward cabin door pin.

1. PRESS SYSTEM SELECT Switch - MANUAL.
2. PRESS SYSTEM SELECT MANUAL Lever - UP, increase cabin altitude to 9000 feet or airplane altitude, whichever is lower.
3. Airspeed - REDUCE TO A SAFE AIRSPEED below 200 KIAS.
4. Passenger Advisory Switch - PASS SAFETY.
5. Cabin Door - KEEP CLEAR.
6. Altitude - DESCEND TO 41,000 FEET OR BELOW.
7. Land as soon as practical.

Procedure completed

■ BAGGAGE DOOR FWD OR AFT (BAGGAGE DOOR NOT LOCKED)

Indicates unlocked (key) nose or tailcone baggage doors.

1. Airspeed - REDUCE TO A SAFE AIRSPEED below 200 KIAS.
2. Passenger Advisory Switch - PASS SAFETY.

Procedure completed

■ MASTER CAUTION LIGHT ON STEADY, NO CAUTION LIGHTS ILLUMINATED

1. MASTER CAUTION RESET Button - PRESS TO RESET.
2. WARNING LTS I and II Circuit Breakers (L Panel) - RESET.
3. Instruments (Electrical and Engine) - MONITOR.

Procedure completed

■ VIDEO FAIL (ANNUNCIATOR VIDEO FAILURE)

VIDEO FAIL will be illuminated for approximately 120 seconds when power is first applied to the airplane while the system completes its self-test. At any other time, illumination of the VIDEO FAIL annunciator indicates a level of redundancy is inoperative. There is no impact to the ability to display faults.

Procedure completed

■ AUDIO FAIL (ANNUNCIATOR AUDIO FAILURE)

AUDIO FAIL will be illuminated for approximately 120 seconds when power is first applied to the airplane while the system completes its self-test. At any other time, illumination of the AUDIO FAIL annunciator indicates a level of redundancy is inoperative. There is no impact to the ability to generate audio/tone warnings.

Procedure completed

■ EMER EXIT (EMERGENCY EXIT DOOR NOT SECURE)

1. Passenger Advisory Switch - PASS SAFETY.
2. Emergency Exit Door - KEEP CLEAR.
3. Altitude - DESCEND to 41,000 feet or below.
4. Land as soon as practical.

Procedure completed

■ NO TAKEOFF (NO TAKEOFF CAUTION)

1. Takeoff - ABORT.
2. Elevator Trim - CHECK.
3. Flap Position - CHECK.
4. Speed Brakes - RETRACT.

Procedure completed

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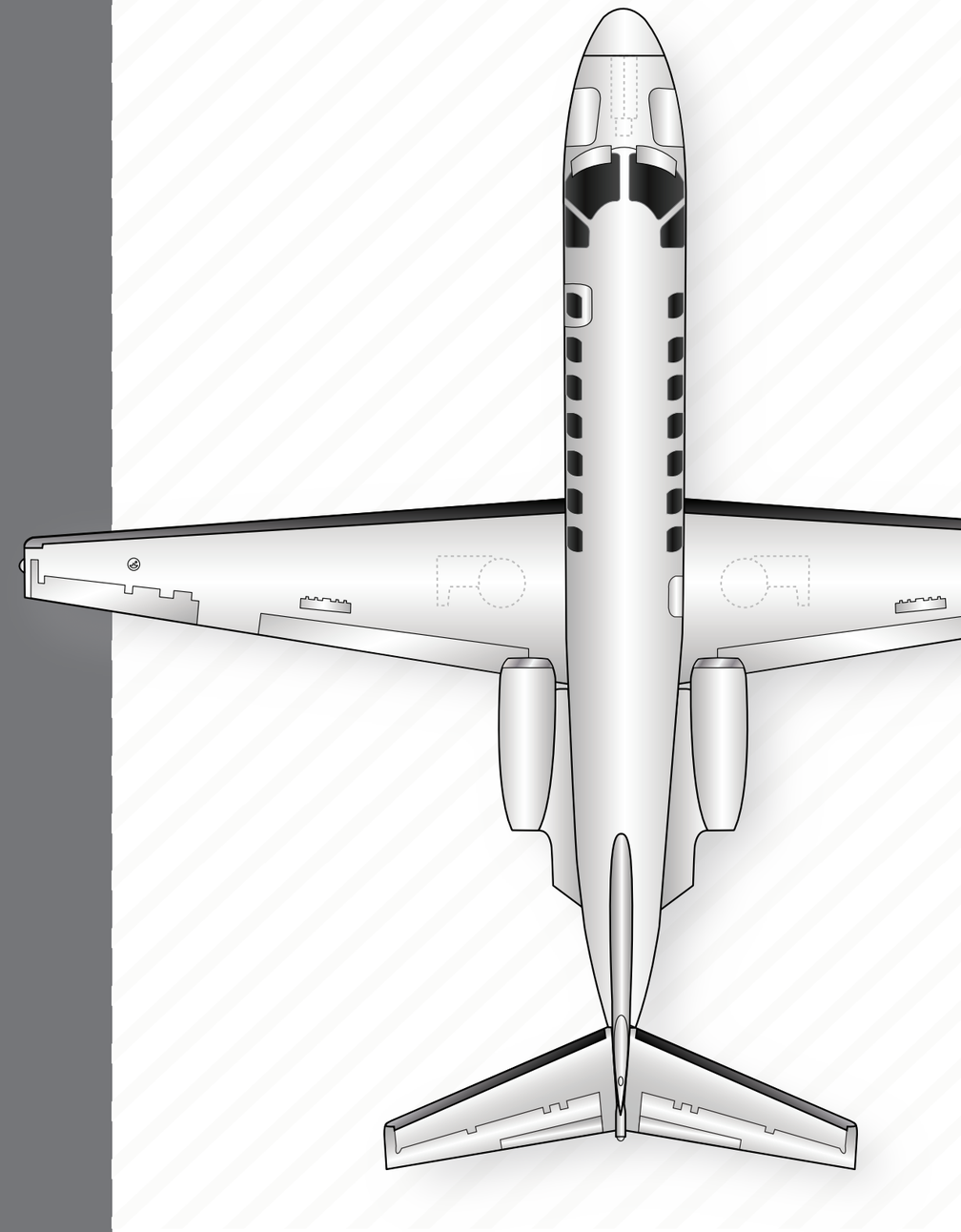
NORMAL



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NORMAL PROCEDURES

PREFLIGHT INSPECTION

PRELIMINARY EXTERIOR INSPECTION

1. Battery - CONNECTED.
2. Engine Covers (4) - REMOVED.
3. Pitot Covers (3) - REMOVED.

COCKPIT/CABIN INSPECTION

NOTE

If operating from or to extreme cold surface temperatures (below -15°C (+5°F)) refer to Normal Procedures, COLD WEATHER OPERATIONS.

1. Documents, Manuals and Charts - CHECK ABOARD.
   a. To be displayed in the airplane at all times:
      (1) Airworthiness and Registration Certificates.
      (2) Transmitter License(s).
   b. To be carried in the airplane at all times:
      (1) FAA Approved Airplane Flight Manual.
      (2) Collins ProLine 21 Avionics System Operator's Guide.
      (3) Collins FMS 3000 Flight Management System Pilot's Guide.
      (4) Other applicable pilot's manuals as required in Section II, Operating Limitations or applicable AFM Supplement.
2. Required Equipment - ONBOARD and SERVICED.
3. Cabin - CHECK.
   a. Emergency Exit - SECURE/CLEAR/LOCK PIN REMOVED/COVER IN PLACE.
   b. Passenger Seats - UPRIGHT/OUTBOARD/CONDITION.
   c. Door Entry Lights - OFF.
   d. Exit Placards - SECURE.
4. Portable Fire Extinguisher (left side of copilot's seat) - SERVICED and SECURE.
5. Oxygen System - CHECK.
   a. Masks - TEST/100% SELECTED/PROPERLY STOWED.
   b. Smoke Goggles - STOWED.
   c. OXYGEN CONTROL VALVE Knob - NORMAL.
   d. Microphone Select Switches - MIC HEAD SET.
   e. Oxygen Pressure - GREEN ARC (1600-1800 PSI).

NOTE

Refer to Normal Procedures, Oxygen System, Figure 3-5 for dispatch pressures with less than full oxygen bottle.

6. BATTERY Disconnect Switch - DISCONNECT.
7. Battery Switch - BATT (no voltage indication).

(Continued Next Page)

COCKPIT/CABIN INSPECTION (Continued)

8. BATTERY Disconnect Switch - NORMAL/COVER DOWN (24 volts minimum).

NOTE

External power must be disconnected to complete items 6, 7 and 8. Voltmeter will indicate external power unit voltage, if used, when Battery Switch is placed in BATT position, item 7.

9. INTERIOR MASTER Switch - NORMAL/COVER DOWN.
10. Circuit Breakers - IN.
11. Pitot-Static Switch - ON - 30 seconds - OFF.
12. EMERGENCY LIGHTING Switch - ON (Check illumination - OFF, if seen from cockpit).
13. L/R LANDING Light Switches - ON (Check illumination on ground - OFF, if seen from cockpit).
14. Other Exterior Light Switches - ON (Check illumination - OFF, if seen from cockpit).
15. Passenger Advisory Switch - PASS SAFETY (Check illumination - OFF).
16. Control Lock - UNLOCKED.
17. Landing Gear Handle - DOWN; THREE GREEN LIGHTS/NO RED LIGHT.
18. Fuel Quantity and Balance - CHECK.
19. Elevator Trim - POSITION trim tab indicator within TO trim range.
20. Flap Handle - AGREES WITH FLAP POSITION.
21. Throttles - OFF.
22. Aileron and Rudder Trim - POSITION trim tab indicators to neutral.

NOTE

- Expedite all checks with electrical power on and make sure that the air conditioner switch is OFF, if external power is not used.
- Landing and nav lights may be omitted if night flight is not anticipated.

EXTERIOR INSPECTION

During inspection, make a general check for security, condition and cleanliness of the airplane and components. Check particularly for damage; fuel, oil and hydraulic fluid leakage; security of access panels; and removal of keys from locks.

1. Hot Items/Lights - CHECK.
   a. Left and Right Static Ports - CLEAR and WARM.
   b. Left, Right and Standby Pitot Tubes - CLEAR and HOT.
   c. Landing Lights - BOTH ON (if not observed from cockpit).
   d. Angle-of-Attack Vane - FREE and HOT.
   e. Beacon - ON and FLASHING (if not observed from cockpit).
   f. Emergency Exit Light - ON (if not observed from cockpit).
   g. Right Navigation and Strobe Lights - ON (if not observed from cockpit).
   h. Tail Navigation Light - ON.
   i. Left Wing Inspection, Navigation and Strobe Lights - ON (if not observed from cockpit).
   j. Lights and Battery Switches - OFF.

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TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 thru -0410 incorporating SB525B-57-02 and Airplanes 525B-0411 and On.
Description of Change:	Section III, Operating Procedures, Normal Procedures, Exterior Inspection, replace a step.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-81.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section III, Operating Procedures, Normal Procedures, Exterior Inspection, page 3-81, replace step 4.a. as follows:

4. Right Wing - CHECK.
   a. Wing Leading Edge Vent and Exhaust - CLEAR.

APPROVED BY Kim Hackett
for **John Bouma, Lead ODA Administrator**
Cessna Aircraft Company
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 19 AUGUST 2013

525BFM TC-R07-02

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 thru -0056 and -0058 thru -0450.
Description of Change:	Section III, Operating Procedures, Normal Procedures, Exterior Inspection, update a step.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-81.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section III, Operating Procedures, Normal Procedures, Exterior Inspection, page 3-81, update step 4.n. as follows:

4. Right Wing - CHECK.
   n. Static Wicks - CHECK.

APPROVED BY Mark Fuller
for Stephen Gielisch, Lead ODA Administrator
Textron Aviation Inc.
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D
DATE OF APPROVAL 18 March 2020

525BFM TC-R07-10

EXTERIOR INSPECTION (Continued)

2. Left Nose - CHECK.
   a. Baggage Door - SECURE and LOCKED.
   b. Nose Gear, Doors, Wheel and Tire - CONDITION and SECURE.
3. Right Nose and Fuselage Right Side - CHECK.
   a. Windshield Alcohol Reservoir Sight Gage - FLUID VISIBLE.
   b. Gear and Brake Emergency Pneumatic Pressure Gage - GREEN ARC.
   c. Power Brake Accumulator Charge - LIGHT GREEN ARC (precharged pressure) or DARK GREEN ARC (operating pressure if battery was turned on and BRAKE SYSTEM circuit breaker was in during cockpit inspection).
   d. Brake Fluid Reservoir Sight Gages - FLUID VISIBLE.
   e. Baggage Door - SECURE and LOCKED.
   f. Oxygen Blowout Disc - GREEN.
   g. Temperature Probe - CONDITION.
   h. Overboard Vent Lines - CLEAR.
   i. Landing Light - CONDITION.
   j. Top and Bottom Antennas - CONDITION and SECURE.
4. Right Wing - CHECK.
   a. Wing Leading Edge Vent - CLEAR.
   b. Fuel Quick Drains - DRAIN and CHECK FOR CONTAMINATION.
   c. Main Gear Door, Wheel and Tire - CONDITION and SECURE.
   d. Engine Air Inlet - CLEAR.
   e. Engine Fan Duct and Fan - CHECK for bent blades, nicks and blockage of fan stators.
   f. Engine PT2/TT2 Probe - CONDITION.
   g. Generator Cooling Air Inlet - CLEAR.
   h. Pylon Inlet - CLEAR.
   i. Emergency Exit - SECURE.
   j. Stall Strip - CONDITION (no nicks or dents), SECURE.
   k. Heated Leading Edge - CONDITION and EXHAUST CLEAR.
   l. Fuel Tank Vent - CLEAR.
   m. Fuel Filler Cap - SECURE.
   n. Static Wicks - CHECK (Three installed. One may be missing. No more than two total missing on entire airplane).
   o. Aileron, Flap and Speed Brakes - CONDITION and SECURE. Make sure flap position matches indicator.
   p. Hydraulic Reservoir - CHECK.
   q. Air Condition Exhaust, Lower Antenna and Drains - CONDITION and CLEAR.
5. Right Nacelle - CHECK.
   a. Engine Fluid Drains - CLEAR.
   b. Generator Cooling Air Exhaust - CLEAR.
   c. Oil Filter Differential Pressure Indicator - NOT EXTENDED.
   d. Oil Level - CHECK.
   e. Filler Cap and Access Door - SECURE.
   f. Engine Exhaust and Bypass Ducts - CONDITION and CLEAR.
6. Empennage - CHECK.
   a. Right Horizontal Stabilizer Deice Boot - CONDITION.
   b. Right Horizontal Stabilizer, Elevator and Trim Tab - CONDITION. Make sure trim tab position matches elevator trim tab indicator.
   c. Rudder and Trim Tab - SECURE.

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TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 thru -0410 incorporating SB525B-57-02 and Airplanes 525B-0411 and On.
Description of Change:	Section III, Operating Procedures, Normal Procedures, Exterior Inspection, replace a step.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-82.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section III, Operating Procedures, Normal Procedures, Exterior Inspection, page 3-82, replace step 9.n. as follows:

9. Left Wing - CHECK.
   n. Wing Leading Edge Vent and Exhaust - CLEAR.

APPROVED BY Kim Hackett

for John Bouma, Lead ODA Administrator
Cessna Aircraft Company
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 19 AUGUST 2013

525BFM TC-R07-03

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 thru -0056 and -0058 thru -0450.
Description of Change:	Section III, Operating Procedures, Normal Procedures, Exterior Inspection, update two steps.
Filing Instructions:	Insert this temporary change in the Model 525B (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-82.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

In Section III, Operating Procedures, Normal Procedures, Exterior Inspection, page 3-82, update steps 6.d. and 9.b. as follows:

6. Empennage - CHECK.
   d. Static Wicks (Rudder, Both Elevators and Tailcone) - CHECK.

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.

9. Left Wing - CHECK.
   b. Static Wicks - CHECK.

for **APPROVED BY** Mark Fuller

Stephen Gielisch, Lead ODA Administrator
Textron Aviation Inc.
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 18 March 2020

525BFM TC-R07-11

EXTERIOR INSPECTION (Continued)

d. Static Wicks (Rudder, Both Elevators and Tailcone) - CHECK (Nine installed. One may be missing. No more than two total missing on entire airplane.).
e. Vortex Generators - CHECK (Five each side of vertical stabilizer).
f. Left Horizontal Stabilizer, Elevator and Trim Tab - CONDITION. Make sure trim tab position matches elevator trim tab position indicator.
g. Left Horizontal Stabilizer Deice Boot - CONDITION.

7. Aft Compartment - CHECK.
   a. Fire Bottle Pressure Gages - CHECK per placard.
   b. Junction Box Circuit Breakers - IN.
   c. Equipment and Junction Box Access Doors - SECURE.

NOTE

If battery compartment is checked and FADEC Time Limited Dispatch (TLD) lights are illuminated, normal operations are permitted until the next scheduled maintenance inspection.

   d. Aft Compartment Baggage - SECURE.
   e. Aft Compartment Light - OFF.
   f. Aft Compartment Access Door - SECURE and LOCKED.
   g. External Power Service Door - SECURE.
   h. Battery Cooling Intake and Vent Lines - CLEAR.

8. Left Nacelle - CHECK.
   a. Engine Exhaust and Bypass Ducts - CONDITION and CLEAR.
   b. Engine Fluid Drains - CLEAR.
   c. Generator Cooling Air Exhaust - CLEAR.
   d. Oil Level - CHECK.
   e. Filler Cap and Access Door - SECURE.
   f. Oil Filter Differential Pressure Indicator - NOT EXTENDED.

9. Left Wing - CHECK.
   a. Flap, Speed Brakes, Aileron and Trim Tab - CONDITION and SECURE. Make sure flap position matches indicator.
   b. Static Wicks - CHECK (Three installed. One may be missing. No more than two total missing on entire airplane.).
   c. Fuel Tank Vent - CLEAR.
   d. Fuel Filler Cap - SECURE.
   e. Heated Leading Edge - CONDITION and EXHAUST CLEAR.
   f. Stall Strip - CONDITION (no nicks or dents) and SECURE.
   g. Engine Air Inlet - CLEAR.
   h. Engine Fan Duct and Fan - CHECK for bent blades, nicks and blockage of fan stators.
   i. Engine PT2/TT2 Probe - CONDITION.
   j. Generator Cooling Air Inlet - CLEAR.
   k. Pylon Inlet - CLEAR.
   l. Main Gear Door, Wheel and Tire - CONDITION and SECURE.
   m. Fuel Quick Drains - DRAIN and CHECK FOR CONTAMINATION.
   n. Wing Leading Edge Vent - CLEAR.

10. Fuselage Left Side - CHECK.
    a. Wing Inspection Light - CONDITION.
    b. Landing Light - CONDITION.
    c. Cabin Door Seals (primary and secondary) - CHECK for RIPS and TEARS.

COCKPIT PREPARATION

1. L/R GEN Switches - GEN (OFF if external power is to be used for start).
2. STBY FLT DISPLAY Switch - TEST (momentarily); GREEN LIGHT ON.
3. STBY FLT DISPLAY Switch - ON; AMBER LIGHT ON.
4. Battery Switch - BATT (24 volts minimum).

NOTE

The FADECs initiate a self-test (approximately 15 seconds duration) each time power is applied. The following indications will be observed:

- L/R ENG Channel Select Switches will alternate between illumination of FADEC CH A and FADEC CH B.
- ENG CTRL SYS FAULT L/R annunciator will illuminate.
- Do not press channel select switches during FADEC self test.
- Satisfactory self-test completion will be indicated by the ENG CTRL SYS FAULT L/R annunciator extinguishing, and steady illumination of either FADEC CH A or FADEC CH B in the L/R ENG channel select switches.

5. AVIONICS POWER Switch - ON (wait for both AHRS to fully initialize).
6. Radar - STBY.
7. ATIS/Clearance - CHECK (if required).
8. TCAS - TEST (Refer to applicable AFM Supplement).
9. TAWS - TEST (Refer to applicable AFM Supplement).
10. Rotary TEST Switch - WARNING SYSTEMS CHECKED.
11. Battery Switch - EMER (check power to emergency bus items and DC/DC converter operation). With the battery switch in EMER, power should be supplied to:

COMM 1	Standby Flight Display (internal battery)
NAV 1 and DME 1	Standby Air Data Computer
Transponder 1	Standby Pitot Heat
RTU 1 (Standby HSI displayed)	Copilot's Pitot Heat
RTU 2	Copilot's Air Data Computer
RIU L-B	Flap Control
Pilot's and Copilot's Audio Panels	Landing Gear Control
FMS 2 (GPS 500 only, if installed)	Landing Gear Monitor
Copilot's AHRS (for Standby HSI)	Overhead Floodlights
Standby Engine N_1 indicators	Voltmeter

NOTE

- COMM-1/NAV-1 can be used on emergency bus for clearance/ATIS, without operating other airplane equipment, if needed prior to start.
- Make sure proper operation of DC/DC converter by verifying standby HSI HDG flag not present when switching from BATT to EMER.

(Continued Next Page)

COCKPIT PREPARATION

1. L/R GEN Switches - GEN (OFF if external power is to be used for start).
2. STBY FLT DISPLAY Switch - TEST (momentarily); GREEN LIGHT ON.
3. STBY FLT DISPLAY Switch - ON; AMBER LIGHT ON.
4. Battery Switch - BATT (24 volts minimum).

NOTE

The FADECs initiate a self-test (approximately 15 seconds duration) each time power is applied. The following indications will be observed:

- L/R ENG Channel Select Switches will alternate between illumination of FADEC CH A and FADEC CH B.
- ENG CTRL SYS FAULT L/R annunciator will illuminate.
- Do not press channel select switches during FADEC self test.
- Satisfactory self-test completion will be indicated by the ENG CTRL SYS FAULT L/R annunciator extinguishing, and steady illumination of either FADEC CH A or FADEC CH B in the L/R ENG channel select switches.

5. AVIONICS POWER Switch - ON (wait for both AHRS to fully initialize).
6. Radar - STBY.
7. ATIS/Clearance - CHECK (if required).
8. TCAS - TEST (Refer to applicable AFM Supplement).
9. TAWS - TEST (Refer to applicable AFM Supplement).
10. Rotary TEST Switch - WARNING SYSTEMS CHECKED.
11. Battery Switch - EMER (check power to emergency bus items and DC/DC converter operation). With the battery switch in EMER, power should be supplied to:

COMM 1	Standby Flight Display (internal battery)
NAV 1 and DME 1	Standby Air Data Computer
Transponder 1	Standby Pitot Heat
ADF1	Copilot's Pitot Heat
RTU 1 (Standby HSI displayed)	Copilot's Air Data Computer
RTU 2	Flap Control
RIU L-B	Landing Gear Control
Pilot’s and Copilot’s Audio Panels	Landing Gear Monitor
FMS 2 (GPS 500 only, if installed)	Overhead Floodlights
Copilot's AHRS (for Standby HSI)	Voltmeter
Standby Engine N_1 indicators	

NOTE

- COMM-1/NAV-1 can be used on emergency bus for clearance/ATIS, without operating other airplane equipment, if needed prior to start.
- Make sure proper operation of DC/DC converter by verifying standby HSI HDG flag not present when switching from BATT to EMER.

(Continued Next Page)

COCKPIT PREPARATION (Continued)

12. Battery Switch - BATT.
13. AVIONICS POWER Switch - OFF.
14. FUEL TRANSFER Knob - OFF.
15. L/R FUEL BOOST Switches - NORM.
16. L/R IGNITION Switches - NORM.
17. All ANTI-ICE/DE-ICE Switches - OFF.
18. Tail De-Ice System - CHECK.
    a. TAIL De-Ice Switch - AUTO.
    b. Annunciator Panel - TAIL DEICE FAIL (allow annunciator to illuminate, then extinguish for approximately 6 seconds, then illuminate again to verify left and right low pressure switches).
    c. TAIL De-Ice Switch - OFF.
19. L AHRS SLAVE Switches - AUTO.
20. Exterior Lights - AS REQUIRED.
21. Parking Brake - SET.
22. NIGHT DIM Switch - AS REQUIRED.
23. WINDSHIELD BLEED AIR Manual Valves - OFF.
24. EMERGENCY LIGHTING Switch - ARMED; AMBER LIGHT EXTINGUISHED.
25. Pilot's AHRS REV Switch - NORM.
26. Pilot's DADC REV Switch - NORM.
27. Display Reversion Switch - NORM.
28. L ENG/R ENG Channel Select Switches - FADEC CH A or FADEC CH B Illuminated.
29. Landing Gear Handle - DOWN; THREE GREEN LIGHTS/NO RED LIGHT.
30. ANTISKID Switch - ON.
31. Engine Instrument Warning Indicators - NO FLAGS.
32. Fuel Quantity and Balance - CHECK.
33. CABIN DUMP Switch - COVER DOWN.
34. PRESS SYSTEM SELECT Switch - AUTO.
35. AIR CONDITIONING Switch - OFF.
36. GND IDLE Switch - NORMAL.
37. R AHRS SLAVE Switches - AUTO.
38. Copilot's AHRS REV Switch - NORM.
39. Copilot's DADC REV Switch - NORM.
40. Cockpit Voice Recorder (if installed) TEST Button - PUSH and HOLD for 5 seconds; TEST LIGHT ILLUMINATES.
41. Throttles - OFF.
42. ENGINE SYNC Knob - OFF.

DELAY BEFORE FLIGHT WITHOUT GPU

1. EMERGENCY LIGHTING Switch - OFF.
2. STBY FLT DISPLAY Switch - OFF.
3. Battery Switch - OFF.

BEFORE STARTING ENGINES

1. Preflight Inspection - COMPLETE.
2. Wheel Chocks - REMOVED.
3. Cabin Door - CLOSE and LOCK; CHECK green indicators for proper door pin position, handle vertical and in detent.
4. Passenger Briefing - COMPLETE (include seat/seat belt adjustment, emergency exits, smoking and emergency use of oxygen).
5. Seats, Seat Belts, Shoulder Harnesses and Rudder Pedals - ADJUST and SECURE.
6. Battery Switch - BATT.
7. STBY FLT DISPLAY Switch - ON.
8. EMERGENCY LIGHTING Switch - ARMED.
9. BEACON Light Switch - ON.
10. AIR CONDITIONING Switch - OFF.
11. Annunciator Panel - CHECK.

STARTING ENGINES

1. Flood Lights and Panel Light Controls - FULL BRIGHT (for night operation).
2. ENGINE START Button - PRESS momentarily; VERIFY button - ILLUMINATES.
3. Throttle - IDLE at 8% turbine RPM (N_2) minimum.

NOTE

Lower start ITT can be obtained by allowing turbine RPM to achieve 10-12% N_2 prior to advancing the throttle lever to idle.

4. ITT - CHECK for rise. Abort start if ITT rapidly approaches 1000°C or showing no rise within 10 seconds. Do not exceed 900°C for more than 15 seconds. Abort start if N_1 does not indicate fan rotation by 25% N_2.

CAUTION

If engine maintenance has been performed, air in fuel lines may cause a hot start. Make sure that proper purging procedures have been accomplished prior to attempting a start. Be prepared to abort the start.

5. Engine Instruments - CHECK NORMAL.
6. Fuel, Oil, Generator and Hydraulic Annunciators - EXTINGUISHED.
7. Other Engine - START; repeat steps 2 through 6.
8. External Power - DISCONNECTED (if applicable).
9. L/R GEN Switches - GEN (if external power was used for start).
10. DC Amperes and Volts - CHECK.
    a. L GEN Switch - OFF - check L AMP decrease, R AMP increase, voltage 29 ±.5 Volts.
    b. R GEN Switch - OFF - VERIFY voltage decrease to battery voltage (24 volts minimum).
    c. L GEN Switch - GEN - check on-line, AMPS increase, voltage 29 ±.5 Volts.
    d. R GEN Switch - GEN - check generators parallel and voltage 29 ±.5 Volts.
    e. Battery Switch - OFF - check L AMP and R AMP decrease, volt meter reads 0 Volts.
    f. Battery Switch - BATT - check voltage 29 ±.5 Volts.

BEFORE TAXI

1. AVIONICS POWER Switch - ON.
2. EXTERIOR LIGHT Switches - AS REQUIRED.

NOTE

Bulb life is extended considerably by using the RECOG/TAXI position of the L/R LANDING light switches for taxi.

3. Passenger Advisory Switch - PASS SAFETY.
4. L/R ENG Channel Select Switches - PUSH (verify ability to select opposite FADEC channel on both engines).
5. Pressurization - SET DESTINATION ELEVATION.
6. COCKPIT AIR DIST Knob - AS REQUIRED.
7. AIR SOURCE SELECT Knob - AS REQUIRED.
8. AIR CONDITIONING, FANS AND TEMPERATURE SELECT CONTROLS - AS REQUIRED.

NOTE

AIR CONDITIONING switch must be in AUTO or FAN and the aft fan must be operating for the automatic cabin temperature control system to function.

9. Electric Elevator Trim - CHECK (both pilot's and copilot's) and SET.
   a. Push both sides of trim switch DOWN - verify correct trim wheel and pointer movement; press AP/TRIM DISC Switch - verify trim wheel stops moving.
   b. Push both sides of trim switch UP - verify correct trim wheel and pointer movement; press AP/TRIM DISC Switch - verify trim wheel stops moving.
   c. Push each half of trim switch independently and verify no trim wheel movement (check both UP and DOWN).
   d. Set trim as required for center-of-gravity.
10. Flight Controls - FREE and CORRECT.
11. Flaps - CHECK and SET.
    a. Set flaps to GROUND FLAPS and verify both speed brakes extend.
    b. Advance throttles to above 85% N_2; verify speed brakes retract and the FLAPS >35° annunciator illuminates.
    c. Retard throttles to IDLE; verify FLAPS >35° annunciator extinguishes and speed brakes extend.
    d. Set flaps to TAKEOFF AND APPROACH; verify speed brakes retract.
12. Rudder Bias System - CHECK.
    a. Advance left throttle to approximately 70% N_1.
    b. Verify left rudder pedal moves forward.
    c. Return left throttle to IDLE.
    d. Advance right throttle to approximately 70% N_1.
    e. Verify right rudder pedal moves forward.
    f. Return right throttle to IDLE.

(Continued Next Page)

BEFORE TAXI (Continued)

13. Flight Management System and Charts - CHECK.
14. Takeoff Data (V_1, V_R, V_2, V_{ENR} (V_T), Takeoff Field Length and Weight Limits) - CONFIRM for appropriate takeoff flap setting.
15. Avionics - CHECK and SET.
16. Annunciator Panel - CHECK.

CLEARED/READY FOR TAXI

17. Brakes - APPLY and HOLD.
18. Parking Brake - RELEASE.

TAXI

1. Brakes - CHECK.

CAUTION

If during taxi a no braking condition is encountered, operate the emergency brake system. Maintenance is required before flight.

NOTE

If the ANTISKID switch is turned OFF prior to or during taxiing, it must be turned ON prior to takeoff. The antiskid system must be turned on and the self-testing sequence completed (ANTISKID INOP annunciator extinguished) while the airplane is stationary. If the airplane is taxiing when the ANTISKID switch is cycled to ON, wheel brakes will be inoperative during the self-test, the antiskid test sequence may not be completed successfully and the antiskid may not be operational during takeoff.

2. Nosewheel Steering - CHECK.
3. Flight Instruments - CHECK.

BEFORE TAKEOFF

1. Anti-Ice/Deice Systems (if desired) - CHECK.
   a. Engine Speed at or above 75% N_2.
   b. L/R Anti-Ice Switches - WING/ENG.
   c. L/R WING and ENG ANTI-ICE Annunciators - ILLUMINATE, then EXTINGUISH (within approximately one minute or less).

NOTE

If ambient temperature is approximately 15°C (59°F) or warmer, ENG ANTI-ICE annunciators may not illuminate when anti-ice is selected ON.

   d. L/R Anti-Ice Switches - OFF.
   e. TAIL Deice Switch - AUTO; verify TAIL DEICE annunciator sequences properly.
   f. TAIL Deice Switch - OFF.
   g. L/R WINDSHIELD BLEED AIR Manual Valves - MAX.
   h. WINDSHIELD BLEED Anti-Ice Switch - LOW; CHECK for bleed air flow.
   i. WINDSHIELD BLEED Anti-Ice Switch - OFF.
   j. L/R WINDSHIELD BLEED AIR Manual Valves - OFF.

CAUTION

- Do not operate windshield anti-ice on the ground at high engine RPM.
- Limit ground operation of pitot-static heat to two minutes to preclude damage to the pitot-static heater.
- Do not continue operating WING/ENG anti-ice on the ground at high engine RPM after anti-ice annunciators have extinguished.
- If left and right engine ITT split is greater than 50°C with both WING/ENG switches On, and throttles matched, there may be excessive bleed air flow to the wing (on the side with higher ITT) and wing damage may occur. If this ITT split is observed, select both WING/ENG switches to OFF. Maintenance is required before flight.
- Do not operate deice boots when ambient air temperature is below -35°C (-31°F).

2. Passenger Seats - CHECK FULL UPRIGHT AND OUTBOARD.
3. AIR SOURCE SELECT Knob - BOTH.
4. Flaps - SET FOR TAKEOFF.
5. Trim - SET FOR TAKEOFF.
6. Crew Briefing - COMPLETE.

(Continued Next Page)

BEFORE TAKEOFF (Continued)

CLEARED/READY FOR TAKEOFF

7. Pitot-Static Switch - ON.
8. Anti-Collision Light Switch - ON.

NOTE

Do not operate the anti-collision lights in conditions of fog, clouds or haze as the reflection of the light beam can cause disorientation or vertigo.

9. L/R LANDING Light Switches - AS DESIRED.
10. Transponder - ALT.
11. TCAS - ON.
12. Radar - AS REQUIRED.
13. Annunciator Panel - CHECKED.

NOTE

The GROUND IDLE advisory light will be illuminated with GND IDLE switch in the NORMAL position.

TAKEOFF

1. Throttles - TO detent (FADEC Mode Indicator - green TO).
2. Engine Instruments - CHECK NORMAL (N_1 matches command bug).
3. Anti-Ice/Deice Systems - ON (if required).

NOTE

- Turning anti-ice/deice systems ON after N_1 has stabilized at takeoff thrust will prevent momentary ITT excursions over the red line displayed on the EIS (Engine Indicating System).
- To ensure proper thrust, the engine needs to be operating for at least 1 minute before engine anti-ice is turned on.

4. Brakes - RELEASE.
5. Elevator Control - ROTATE at V_R to +10° initial pitch attitude (use flight director TO mode).

AFTER TAKEOFF/CLIMB

1. Landing Gear - UP.
2. Flaps - UP.
3. Throttles - MCT detent.
4. ENGINE SYNC Knob - AS DESIRED.
5. Yaw Damper - AS REQUIRED.
6. Anti-Ice/Deice Systems - AS REQUIRED.
7. Passenger Advisory Switch - AS REQUIRED.
8. L/R LANDING Light Switches - AS REQUIRED.
9. Pressurization - CHECK.
10. Altimeters - SET to 29.92 (1013 mb) at transition altitude and CROSSCHECK.

CRUISE

1. Throttles - CRU detent or AS DESIRED.
2. Anti-Ice/Deice Systems - AS REQUIRED.

CAUTION

Do not operate deice boots when indicated RAT is below -35°F (-31°F).

DESCENT

1. Defog Systems - AS REQUIRED.
   a. DEFOG Fan Switch - HI (at start of descent).
   b. COCKPIT AIR DIST Knob - MAX.
   c. WINDSHIELD BLEED AIR Manual Valves - MAX
   d. WINDSHIELD BLEED Switch - LOW below 18,000 feet if landing with temperature/dewpoint spread of less than 5°C or 10°F.
2. Pressurization - SET DESTINATION ELEVATION.
3. Anti-Ice/Deice Systems - AS REQUIRED.
4. Throttles - AS REQUIRED; maintain sufficient power for wing anti-ice, 75% N_2 minimum.
5. Altimeters - SET at transition level and CROSSCHECK.
6. Landing Data (V_{APP}, V_{REF}, Landing Distance, Weight and Factors) - CONFIRM.
7. L/R LANDING Light Switches - AS REQUIRED.

NOTE

Bulb life is extended considerably by using the RECOG/TAXI position.

APPROACH

1. Seats, Seat Belts, Shoulder Harnesses and Rudder Pedals - ADJUST and SECURE.
2. Avionics and Flight Instruments - CHECK.
3. Minimums - SET.
4. Passenger Seats - CHECK FULL UPRIGHT and OUTBOARD.
5. Passenger Advisory Switch - PASS SAFETY.
6. FUEL TRANSFER Knob - OFF.
7. Anti-Ice/Deice Systems - AS REQUIRED.
8. Flaps - TAKEOFF AND APPROACH.
9. ENGINE SYNC Knob - OFF.
10. ANTISKID Switch - ON.
11. L/R LANDING Light Switches - ON.
12. Annunciator Panel - CHECK.
13. Pressurization - CHECK (Destination Elevation Set).
14. Crew Briefing - COMPLETE.

BEFORE LANDING

1. Landing Gear - DOWN and LOCKED.
2. Flaps - LAND.
3. Pressurization - CHECK ZERO DIFFERENTIAL.
4. Autopilot and Yaw Damper - OFF.
5. Airspeed - V_{REF}.
6. Speed Brakes - RETRACTED PRIOR TO 50 FEET AGL.

LANDING

1. Throttles - IDLE.
2. brakes - apply (after nosewheel touchdown).

CAUTION

If during landing a no braking condition is encountered, operate the emergency brake system. Maintenance is required before the next flight.

NOTE

- To obtain maximum braking performance from the antiskid system, the pilot must apply continuous maximum effort (no modulation) to the brake pedals.
- The antiskid system does not provide wheel skid protection below approximately 12 knots groundspeed.
- The NO TAKEOFF annunciator will illuminate at touchdown with flaps in the LAND (35°) position.

3. Flaps - GROUND FLAPS.

NOTE

The FLAPS >35° annunciator may illuminate if the nose is held up for aerodynamic braking.

ALL ENGINES GO-AROUND

1. Throttles - TO Detent.
2. Airplane Pitch Attitude - POSITIVE ROTATION TO +7.5° (reference go-around mode on flight director).
3. Flaps - TAKEOFF AND APPROACH.
4. Climb Speed - V_{APP}.
5. Landing Gear - UP (when positive rate-of-climb is established).
6. Flaps - UP.
7. Throttles - MCT Detent or AS REQUIRED.

AFTER LANDING

1. Flaps - UP.
2. Pitot-Static Switch - OFF.
3. Anti-Collision Light Switch - AS REQUIRED.
4. L/R LANDING Light Switches - AS REQUIRED.

NOTE

Bulb life is extended considerably by using the RECOG/TAXI position for taxi.

5. Anti-Ice/Defog Systems - AS REQUIRED.

NOTE

High humidity conditions may require the defog and windshield bleed systems to remain on.

6. Transponder - STBY (if desired).
7. Radar - OFF or STBY.

SHUTDOWN

1. Parking Brake - SET or Wheels - CHOCK.

NOTE

If brakes are suspected of being hot, do not set parking brake.

2. All ANTI-ICE/DEICE Switches - OFF (minimum of two minutes prior to throttles OFF).

NOTE

Engine shutdown with a hot PT2/TT2 probe may result in illumination of ENG CTRL SYS FAULT. Delaying engine shutdown for two minutes after selecting anti-ice OFF will allow sufficient time for probe cooling.

3. Flaps - TAKEOFF AND APPROACH.
4. DEFOG Fan Switch - OFF.
5. AIR CONDITIONING Switch - OFF.
6. L/R LANDING Light Switches - OFF.
7. Passenger Advisory Switch - OFF.
8. EMERGENCY LIGHTING Switch - OFF.
9. STBY FLT DISPLAY Switch - OFF.
10. AVIONICS POWER Switch - OFF.
11. EXTERIOR LIGHT Switches - OFF.
12. Throttles - OFF after allowing ITT to stabilize at minimum value for two minutes.
13. Beacon Light Switch - OFF.
14. Battery Switch - OFF.
15. Control Lock - ENGAGE (unless airplane will be towed).

CAUTION

Towing airplane with control lock engaged will damage nosewheel steering mechanism.

16. Engine Oil Level - CHECK (10 minutes after shutdown).
17. Engine Covers - INSTALL (after engines have cooled).

TURBULENT AIR PENETRATION

Flight through severe turbulence should be avoided if possible. The following procedures are recommended for flight in severe turbulence.

1. Airspeed - APPROXIMATELY 180 KIAS (do not chase airspeed).
2. Maintain a constant attitude without chasing the altitude. Avoid sudden large control movements.
3. Operation of autopilot is recommended in basic modes only (ROL and PIT only).
4. Passenger Advisory Switch - PASS SAFETY.

FLIGHT INTO ICING

Flight into known icing is the intentional flight into icing conditions that are known to exist by either visual observation or pilot weather report information. Icing conditions may exist when indicated RAT is +10°C or below, and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet, or ice crystals). Icing conditions also may exist when the OAT (indicated RAT) on the ground and for takeoff is +10°C or below when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on the engines, nacelles, or engine sensor probes. The Citation CJ3, equipped with properly operating anti-ice equipment, is approved to operate in maximum intermittent and maximum continuous icing conditions as defined by 14 CFR Part 25, Appendix C, when that equipment is in operation. The equipment has not been designed, or certified, to provide protection against freezing rain or severe conditions of mixed or clear ice. During all operations, the pilot is expected to exercise good judgment and is to be prepared to alter the flight plan (i.e. exit icing) if conditions exceed the capability of the airplane and equipment.

Ice accumulations will significantly alter the shape of the airfoils of any aerodynamic surface. The resulting change in shape of the airfoil and, to a lesser extent, the added weight of the ice, can affect the stall speed and possibly change the normal handling characteristics and performance of the airplane. During periods of high angle-of-attack (low airspeed) flight conditions, an increase in drag may be experienced due to a build up of ice on the undersurface of the wing aft of those areas that are protected by the leading edge anti-ice system. To keep the angle-of-attack low, the minimum airspeed for sustained flight in icing conditions (except takeoff, approach and landing) is 180 KIAS. Prolonged flight in icing conditions with the flaps and/or landing gear extended is prohibited. Trace or light amounts of icing on the horizontal stabilizer can alter airfoil characteristics that will affect stability and control of the airplane.

In some icing conditions, it is normal for runback ice to extend approximately 12 to 18 inches aft of the heated leading edge on the wing upper surface and/or to build in a ridge on the lower wing surface just behind the heated leading edge.

NOTE

With residual ice on the airplane, stall characteristics are degraded and stall speeds are increased slightly, though not enough to warrant an increase in approach or landing speeds.

Freezing rain and clear ice will be deposited in layers over the entire surface of the airplane and can “run back” over control surfaces before freezing. Rime ice is an opaque, granular and rough deposit of ice that usually forms on the leading edges of wings, tail surfaces, pylons, engine inlets, antennas, etc.

Flight crews are to make sure that the aircraft is free from ice prior to dispatch.

COLD WEATHER OPERATIONS

Airplane power-up, engine starts, and subsequent ground and flight operations have been demonstrated following cold soak down to -40°C (-40°F). Cold soak is defined as a continuous period of longer than 2 hours, at surface temperatures below -15°C (+5°F), in which the airplane is parked without engines and systems operating. If cold soak is anticipated, refer to maintenance manual procedures to prepare the airplane for the cold soak. Following a cold soak, refer to maintenance manual procedures to prepare the airplane for flight.

NOTE

If surface temperature is below -40°C (-40°F), the FADEC units may generate non-resettable ENG CTRL SYS FAULT annunciations upon power-up. Engine start with an ENG CTRL SYS FAULT annunciator illuminated is prohibited. Engine Control System maintenance may be required to clear faults for dispatch. Do not apply power to FADECs until it can be assured that they have been warmed to -40°C (-40°F).

The following operational procedures are recommended if the airplane is anticipated to be exposed to cold soak.

COLD SOAK PREPARATION

- Do not set control lock as release may not be possible after cold soak.
- Remove crew oxygen masks, if temperature will be less than 0°C, and drain all cabin fluids.
- Chock airplane wheels as parking brake may bleed down during cold soak.
- When the airplane is parked in any conditions of falling or blowing snow, regardless of temperature, the engine and pitot covers should be installed. The airplane should be parked with flaps retracted. Prior to flight, the airplane must be cleared of snow and if wing, empennage or control surfaces are frosted, they must be deiced.
- The airplane batteries should be moved to a warm environment, or batttery heaters installed and connected. Below -20°C, batteries may be inert and will not charge or discharge.

POST COLD SOAK PREFLIGHT

- Do not apply power to FADECs until it can be assured that they have been warmed to -40°C (-40°F). If the operator is uncertain of FADEC temperature, it is recommended to warm the airplane in a hangar having a temperature of at least 0°C (32°F) for at least 4 hours. Failure to adequately warm FADECs prior to application of power may result in ENG CTRL SYS FAULTs. Warming of FADEC units may be facilitated by directing warm air into open tail baggage liner door.
- ENG CTRL SYS FAULT annunciations must be extinguished prior to engine start.
- Service fluids, pneumatics, and systems as required for flight.
- Reinstall crew oxygen masks and verify operation after cabin temperatures have warmed above 0°C.

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COLD WEATHER OPERATIONS (Continued)

The following operational procedures are recommended after cold soak:

Hydraulic accumulators, pneumatic storage bottles, and oxygen cylinders will indicate a lower pressure because of the temperature drop. Refer to the appropriate temperature charge placards. It should be noted that hydraulic and pneumatic systems are more prone to leaks in extreme cold. A significantly lower charge may indicate a leak. Prior to preflight, the flaps should be extended to allow inspection of the wing trailing edge for hydraulic leaks.

Operating in extremely cold temperatures super cools and reduces the solubility of any water particles in the fuel, increasing the possibility of fuel system icing. The tank and fuel filter drains under each wing should be drained frequently and thoroughly. It is possible for water to settle in the sump and freeze, which would block the drain. Heat should be applied until fuel flows freely. Maintain heat after flow begins to ensure that all particles have melted. Collect the drainage in a clear, clean container to inspect for water globules.

ENGINE START PREPARATION

If the airplane has been cold soaked to a temperature below -15°C, the Engine Indicating System (EIS) display may take up to 6 minutes after application of power before it becomes useable. Preheating the cabin to 0°C or above will reduce this delay to 1 minute or less.

Use a GPU after extended cold soak. If a start is attempted using an external power unit and/or preheated battery and the starter will not motor to 8% N_2 minimum, terminate the starting sequence. Advancing the throttle to idle below 8% N_2 can be damaging to the engine and the battery. Battery voltage below 11 volts after the start button is pressed indicates a potential for an unsuccessful start.

Apply preheat to engines, tailcone, cabin and cockpit. Engine preheating is best accomplished by installing the engine covers and directing hot air through the oil filler access door. A warm battery provides significant benefit and the heater hose can be placed in the tailcone with the door propped as far closed as possible to minimize heat loss.

NOTE

If the airplane has been cold soaked below -18°C, and the battery has been removed and kept warm, a battery start may be made if the engines have not been cold soaked below -40°C. If the airplane is cold soaked below -40°C, it must be preheated or warmed in a heated hangar prior to engine start. If a start is attempted and the starter will not motor to 8% N_2 minimum, terminate the start sequence.

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COLD WEATHER OPERATIONS (Continued)

Engine starts using ground power or battery should be normal except that some flame and smoke will be visible initially and engine oil pressure will be high. Engine oil pressure up to 100 psi for five minutes is normal during cold starts. Once engine oil temperature is above 10°C, the engine may be operated above 80% N_2. Fuel tank temperature limits for the type of fuel being used must be observed. Refer to Operating Limitations, FUEL LIMITATIONS.

AFTER ENGINE START

Following engine start, all flight controls and speed brakes should be cycled through full travel several times to verify that all controls reach full travel and operate normally.

Cabin temperature must be held at or above 0°C (+32°F) for a minimum of 20 minutes prior to takeoff after a prolonged ground cold soak period (two hours or longer) at ambient temperatures of -10°C (+14°F) or colder (refer to Normal Procedures, COLD WEATHER OPERATIONS). If the aircraft is not cold soaked for two hours or longer, the cabin must be heated to a temperature of 0°C (+32°F) prior to operation above 24,000 feet. This temperature ensures proper deployment and operation of the passenger oxygen masks. A handheld thermometer is acceptable to determine cabin temperature. This limitation does not apply if there are no passengers in the cabin.

Maximum heat is obtained with the right/left or both engine(s) operating and the AIR SOURCE SELECT in BOTH. Switching the TEMPERATURE SELECT to MANUAL and selecting MANUAL HOT for 10 seconds ensures that the temperature mixing valve is in the hot position. Turning the COCKPIT AIR DIST knob to MAX will increase air circulation in the cockpit. Operating the engine(s) above idle RPM increases temperature and airflow. The engine should not be operated above 80% N_2 until the engine oil temperature is above 10°C. It is not recommended to operate air conditioning in AUTO, and defog should be off to prevent the air conditioning system from operating.

Most effective overall cabin heating is achieved by selecting the COCKPIT AIR DIST knob to MAX and the FAN to LOW or HI until the cockpit is comfortable. Then move the COCKPIT AIR DIST knob toward NORM. Warming the cabin first may tend to cause the temperature controller to stabilize before the cockpit warms. This is due to the temperature sensor being located in the cabin.

After cold soak at extremely cold temperatures, the W/S AIR O'HEAT annunciator may not illuminate when W/S TEMP is selected on the Rotary Test Switch during the Cockpit inspection. If this occurs, repeat the test after the cabin has warmed up. A satisfactory test of the W/S AIR O'HEAT annunciator must be accomplished prior to flight.

Some electrical systems and avionics computers and displays may be slow to warm up. The glareshield auxiliary panel lighting should be turned on and allowed to reach full brightness. Cabin fluorescent lighting will also be slow to illuminate and should be turned on if its use is anticipated. LCD displays may require several minutes to reach full brightness.

NOTE

Dispatch is prohibited until all required avionics systems are verified to be functioning properly.

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ANTI-ICE AND DEICE SYSTEMS

The anti-ice system consists of bleed air heated engine inlets, wing leading edge, windshield, and pylon inlet ducts. The pitot tubes, static ports, and angle-of-attack probe are electrically heated. Windshield alcohol anti-ice is also provided as a backup system for the left windshield. The horizontal stabilizer is deiced by pneumatic boots.

All anti-ice systems and tail deice systems should be turned on when operating in visible moisture and the indicated RAT is +10°C or below. The wing/engine anti-ice systems may be operated in the ENG ON position and the windshield anti-ice and tail deice may be OFF provided it can be visually verified that no ice is accumulating.

When operating at altitudes below approximately FL300, selection of any bleed air anti-ice system ON will result in the engine idle speed increasing to approximately 70.4% N_2 (referred to as “anti-ice idle”). The anti-ice idle speed improves the engines ability to supply bleed air and also increases idle thrust. Flight crews should plan accordingly when conducting descents and approaches with bleed air anti-ice systems operating. The engine idle speed will reset from anti-ice idle back to normal flight idle when the landing gear is extended, or all bleed air anti-ice systems are turned OFF.

CAUTION

The tail deice boots should not be activated at indicated RAT below -35°C (-31°F). Boot cracking may result.

NOTE

Failure to operate the Wing/Engine Anti-ice System in either ENG ON or WING/ENG when operating in visible moisture at an indicated RAT of +10°C or below may result in ENG CTRL SYS FAULT L/R annunciations due to ice accumulation on the engine PT2/TT2 probe.

ENGINE ANTI-ICE SYSTEM

When the wing/engine anti-ice switches are placed to either the ENG ON or WING/ENG position, hot bleed air flows through the respective engine inlet providing anti-ice protection to the engine inlet and generator cooling air inlet. The engine fan, stators and spinner are aerodynamically deiced. Ice will build on the spinner, engine fan, and stators, and shed due to centrifugal and aerodynamic forces. Minor acoustical vibrations may be evident at some power settings as this ice builds and sheds. Momentarily increasing engine speed will assist with shedding the accumulated ice. The engine antiice system is monitored by temperature sensors which will illuminate the ENG ANTI-ICE L/R annunciator should the engine inlet temperature fall below 10°C (50°F). The MASTER CAUTION will illuminate approximately 50 seconds after illumination of the ENG ANTI-ICE L/R annunciator. The MASTER CAUTION is disabled when the system is initially turned on, until the ENG ANTI-ICE annunciators extinguish.

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ANTI-ICE AND DEICE SYSTEMS (Continued)

WING LEADING EDGE ANTI-ICE SYSTEM

When the wing/engine anti-ice switches are placed to the WING/ENG position, precooled bleed air flows to the respective wing leading edge, exiting through louvers on the lower surface of the wing tip. The wing anti-ice system is monitored by temperature switches in each wing tip. When the wing leading edge temperature is less than 30°C (86°F), the respective WING ANTI-ICE L/R annunciator will illuminate. The MASTER CAUTION will illuminate approximately 50 seconds after illumination of the WING ANTI-ICE annunciator. The MASTER CAUTION is disabled when the system is initially turned on, until the WING ANTI-ICE annunciators extinguish.

A 71°C (160°F) switch monitors wing skin temperature and will shut the respective wing anti-ice system off and illuminate the respective WING O'HEAT L/R annunciator should an overheat condition occur. This condition will occur during sustained ground operation at high engine thrust, but should not occur in flight.

In the event of an engine failure, bleed air can be supplied to the wing and pylon inlet on the affected side from the operating engine. Placing the wing XFLOW switch to wing XFLOW will supply bleed air through a crossflow line. Higher N_2 may be required to prevent the WING ANTI-ICE annunciators from illuminating. The ENG ANTI-ICE annunciators on the affected engine side will be on continuously after one minute.

PYLON AIR INLET DUCT ANTI-ICE SYSTEM

When the wing/engine anti-ice switches are placed to the WING/ENG position, engine bleed air is supplied to the pylon air inlet duct to prevent ice from blocking cooling air supply to the cabin and windshield heat exchangers. Blockage of these ducts will result in loss of cabin and windshield bleed temperature control.

TAIL DEICE

The horizontal tail is deiced by pneumatic boots controlled by the tail deice AUTO/OFF/MANUAL switch. Selecting the switch to AUTO will activate a controller which will inflate the boots one side at a time and then repeat this cycle after 3 minutes, continuously, providing automatic deice of the stabilizer. Selecting the momentary MANUAL position will inflate both boots as long as the pilot holds the switch in the MANUAL position. Manual mode will cause a slight pitch bump at boot inflation that will vary in intensity with the amount of ice accumulated prior to boot activation. Vacuum is supplied to deflate the boots after each cycle and keep them deflated between cycles and when OFF.

Proper activation of the deice boots is annunciated by a white TAIL DEICE L/R advisory light on the annunciator panel which illuminates when proper inflation pressure is reached in each deice boot.

CAUTION

The tail deice boots should not be activated at indicated rat below -35°C (-31°F). boot cracking may result.

(Continued Next Page)

ANTI-ICE AND DEICE SYSTEMS (Continued)

WINDSHIELD ANTI-ICE

The windshield bleed air system provides windshield anti-ice under all normal operating conditions. This system also provides external windshield defog and rain removal. The system supplies engine bleed air through an electrically actuated pressure regulating shutoff valve in the tailcone and manually positioned regulating valves to each windshield. The manual valves are located at each bleed air nozzle and are in the OFF position for all normal operation. A check should be made to ensure that the rain removal handle is pushed down for windshield anti-icing. When windshield anti-icing is required, the WINDSHIELD BLEED AIR valves are turned on and the WINDSHIELD BLEED switch is turned to LOW if the indicated RAT is above -18°C or to HI if the indicated RAT is -18°C or below. Normal system operation is indicated by an increase in air noise. A temperature sensor is located near the discharge nozzles. The temperature controller automatically controls the windshield bleed air temperature by modulating cross flow air through a heat exchanger in the tailcone. An additional temperature sensor is located in the bleed air line, which automatically actuates the electrical shutoff valve and illuminates the W/S AIR O'HEAT annunciator light should the bleed air temperature exceed the normal control value. As windshield air temperature decreases, the controller will automatically open the shutoff valve again. This condition should not occur unless a sustained high power, low airspeed condition is maintained or a system malfunction occurs. If the W/S AIR O'HEAT light illuminates, the manual bleed air valves should be modulated to reduce the flow or closed. The W/S AIR O'HEAT light will also illuminate if the electrical shutoff valve in the tailcone opens with the WINDSHIELD BLEED switch in the OFF position and the manual valves are closed.

Self-test of the temperature monitor system is normally accomplished during the preflight warning systems check by turning the WINDSHIELD BLEED switch to either the HI or LOW position and selecting the W/S TEMP position on the rotary test switch. Proper system function is verified by illumination of the W/S AIR O'HEAT annunciator light. Selftests may also be accomplished in flight, if desired.

If the windshield bleed air anti-ice system fails, a backup alcohol anti-ice system is provided for the left windshield only. Sufficient alcohol is provided for ten minutes of operation; therefore, plans should be made to leave the icing environment without delay.

PITOT-STATIC/ANGLE-OF-ATTACK ANTI-ICE

Electric heating elements are provided in the pilot's, copilot's and standby pitot tubes, static ports and the angle-of-attack probe. The pitot-static anti-ice switch actuates all of these elements. Operation may be checked on preflight by turning the switch ON for approximately 30 seconds, then OFF; then feeling each element during the external inspection. Ground operation of the pitot-static heat should be limited to less than two minutes to avoid damage. Failures of pitot and static heating elements are annunciated by the P/S HTR OFF and STBY P/S HTR OFF caution lights, on the annunciator panel. Failure of the angle-of-attack heating element is annunciated by the AOA HTR FAIL caution light on the annunciator panel.

RAIN REMOVAL

The windshield bleed air system provides rain removal during low airspeed flight (i.e. approach and landing) and ground operations. At higher airspeeds, rain is naturally removed due to airflow over the curvature of the windshield. This system also serves as the windshield anti-ice system when used as described in the windshield anti-ice paragraph of this section.

When rain removal is desired, the rain removal handle should be pulled up and the WINDSHIELD BLEED switch should be positioned to LOW. A check should be made to ensure the WINDSHIELD BLEED AIR rotary controls are in the MAX position.

WATER/SLUSH OPERATION

The airplane has been demonstrated to safely operate in standing water/slush depths up to 0.75 inch.

WARNING

Takeoff and landing distances will be significantly influenced by standing water, slush, snow or ice on the runway.

NOTE

- Refer to Section VII for corrections to takeoff and landing data.
- The following procedure may be followed to help remove slush and/or frozen water from the landing gear. If able, do not immediately retract the gear to allow centrifugal force and airflow to remove excess fluid and slush. After initial gear retraction, extend and retract the gear one additional time.

HYDRAULIC SYSTEM

The open center hydraulic system supplies pressure from one pump on each engine to operate the landing gear, flaps and speed brakes. Actuating any of these systems closes the main system bypass valve pressurizing the hydraulic system and supplying 1500 psi hydraulic pressure to the individual system control valves. Normal activation is indicated by the white HYD PRESS ON advisory annunciator. When the cycle is complete, the light will extinguish. If the light remains illuminated after a cycle is completed, a system problem exists. It may be necessary to pull the landing gear, flap or speed brake circuit breaker to preclude overheating of the hydraulic system. Only MIL-H-83282 hydraulic fluid is approved.

NOTE

Momentary illumination of the white HYD PRESS ON annunciator may occur at times when operation of landing gear, flaps, or speedbrakes has not been commanded. This is not indicative of a system operational problem and does not require crew action.

(Continued Next Page)

HYDRAULIC SYSTEM (Continued)

LANDING GEAR

The landing gear is actuated by positioning the landing gear lever to either the extend or retract position. During gear extension, hydraulic pressure retracts the uplocks and then extends the gear actuators. The actuators mechanically lock in the extend position. Upon retraction, hydraulic pressure unlocks the actuators and retracts the gear into the uplocks. Hydraulic pressure automatically shuts off when the gear are down and locked on extension or up and locked on retraction.

Three green annunciators illuminate when the nose, left main or right main gear are down and locked. These lights are not illuminated in the retracted position. A red GEAR UNLOCKED annunciator is illuminated anytime all landing gear are not locked in the position selected by the landing gear handle.

A “LANDING GEAR” or tone audio warning is provided by the warning/caution advisory system if either of the following conditions occur and the landing gear are not down.

1. Airspeed below 130 KIAS, and either throttle is below approximately 85% N_2. Warning can be silenced.
2. Flaps are extended beyond the Takeoff and Approach Setting. Warning cannot be silenced.

Emergency landing gear extension is provided by two emergency gear handles located below the landing gear handle. Pulling the “T” handle retracts the uplocks, allowing the landing gear to free fall to the extend position. Some yawing may be required to achieve green lights on all gear. Rotating the extended “T” handle 1/4 turn clockwise will lock the handle. After the “T” handle has been pulled, the round collar handle can be pulled to discharge the nitrogen blow down system. Nitrogen will retract the uplocks, in the event they did not release mechanically, and then extend the gear. After the gear is extended, the collar and “T” handle can be pushed in for knee clearance. If significant resistance is encountered, the handle should be left extended to prevent cable crimping.

CAUTION

- Prior to using the emergency extension system, the landing gear handle must be down to prevent possible energizing of the gear hydraulic system to the retract position.
- Once the emergency gear extension system has been used, do not attempt to raise the gear.

FLAP/GROUND FLAPS 55°/SPEED BRAKES

The flaps can be selected to the UP (0°), TAKEOFF AND APPROACH (15°), LAND (35°) and GROUND FLAPS (55°) positions using the flap select handle. A slight downward pressure is required to move the handle beyond the TAKEOFF AND APPROACH gate to the landing position. The handle must be lifted at the landing gate before it can be moved aft to the GROUND FLAPS (55°) position.

(Continued Next Page)

HYDRAULIC SYSTEM (Continued)

The GROUND FLAPS (55°) flap position provides increased aerodynamic drag for landing rollout. After touchdown, with both throttles at idle, the flaps may be selected to GROUND FLAPS (55°). The flap handle must be moved to the full aft stop. As the flaps pass 38° the speed brakes will automatically extend. This 38° switch will shut off hydraulic extend pressure stopping the flaps if the flap handle is not full aft. The 38° switch will illuminate the FLAPS >35 annunciator and MASTER CAUTION if the flaps are beyond 38° and both throttles are advanced beyond approximately 85% N_2, (on the ground), or the right squat switch is not on-ground.

WARNING

The ground flap position is not locked out in flight. Continued safe flight and landing with flaps in ground flaps has been demonstrated. Selection of ground flaps for takeoff or in-flight is prohibited.

The speed brakes are automatically extended with GROUND FLAPS (55°) but may also be extended in-flight or on the ground using the speed brake switch. A white SPD BRK EXTEND annunciator light will illuminate when the speed brakes are fully extended. The speed brakes will be automatically retracted if either throttle is advanced beyond a position corresponding to approximately 85% N_2. Extension of speed brakes will be accompanied by a slight buffet which varies in intensity with airspeed and a slight nosedown pitch.

CAUTION

To preclude high sink rate in the landing flare, the speed brakes must be retracted prior to 50 feet on landing approach.

ELECTRICAL SYSTEM

DC power is supplied by external power, a 300-ampere starter-generator unit on each engine or a (44 ampere-hour) battery. DC power is controlled by a battery BATT/OFF/EMER switch and two GEN ON/OFF/RESET switches. One generator is capable of supplying all standard electrical requirements should a generator fail. Each generator feeds its respective L or R FEED electrical bus. The L AND R FEED busses are connected by 225 ampere current limiters to a crossfeed bus to provide crossfeed power from either generator. DC power is routed from each feed bus through three 80 amp current limiters to three 75 ampere circuit breakers on each extension bus in the circuit breaker panels. Cockpit circuit breakers control power to individual systems. Each circuit breaker panel has a 35 ampere crossover breaker to the opposite side to provide for more logical grouping of circuit breakers. Battery power is supplied to a Hot battery bus and then through the battery relay to the crossfeed bus and the L and R feed busses.

Emergency DC power is supplied from the hot battery bus through the emergency power relay, to emergency bus circuit breakers on each cockpit circuit breaker panel, when the battery switch is in either the BATT or EMER position. If the battery switch is in the BATT position, generator power is supplied through the battery relay to the hot battery bus to charge the battery and from the hot battery bus through the emergency relay to the emergency power busses. With the battery switch in the EMER position, power should be supplied to the following:

- COMM 1
- NAV 1 and DME 1
- Transponder 1
- RTU 1 (Standby HSI displayed)
- RTU 2
- RIU L-B
- Pilot's and Copilot's Audio Panels
- FMS 2 (GPS 500 only, if installed)
- Copilot's AHRS (for Standby HSI)
- Standby Engine N_1 indicators
- Standby Flight Display (internal battery)
- Standby Air Data Computer
- Standby Pitot Heat
- Copilot's Pitot Heat
- Copilot's Air Data Computer
- Flap Control
- Landing Gear Control
- Landing Gear Monitor
- Overhead Floodlights
- Voltmeter

Power is available for these items for at least 30 minutes from a normally charged battery. Power is also supplied to the standby flight display by its own battery. An engine start/attempt will reduce available normally charged battery endurance approximately 20%.

A battery disconnect, BAT DISC/NORM guarded switch, located above the pilot's armrest, disconnects the battery in the event that a start relay sticks during an engine start. This switch provides a direct loop from the power to the ground side of the battery to open the battery disconnect relay if the battery switch is in the BATT (not EMER or OFF) position and the battery disconnect switch is selected to BAT DISC. The battery ground is opened and the battery cannot supply electrical power to the airplane or be charged by the generators.

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SECTION III - OPERATING PROCEDURES
NORMAL PROCEDURES

MODEL 525B

ELECTRICAL SYSTEM

DC power is supplied by external power, a 300-ampere starter-generator unit on each engine or a (44 ampere-hour) battery. DC power is controlled by a battery BATT/OFF/EMER switch and two GEN ON/OFF/RESET switches. One generator is capable of supplying all standard electrical requirements should a generator fail. Each generator feeds its respective L or R FEED electrical bus. The L AND R FEED busses are connected by 225 ampere current limiters to a crossfeed bus to provide crossfeed power from either generator. DC power is routed from each feed bus through three 80 amp current limiters to three 75 ampere circuit breakers on each extension bus in the circuit breaker panels. Cockpit circuit breakers control power to individual systems. Each circuit breaker panel has a 35 ampere crossover breaker to the opposite side to provide for more logical grouping of circuit breakers. Battery power is supplied to a Hot battery bus and then through the battery relay to the crossfeed bus and the L and R feed busses.

Emergency DC power is supplied from the hot battery bus through the emergency power relay, to emergency bus circuit breakers on each cockpit circuit breaker panel, when the battery switch is in either the BATT or EMER position. If the battery switch is in the BATT position, generator power is supplied through the battery relay to the hot battery bus to charge the battery and from the hot battery bus through the emergency relay to the emergency power busses. With the battery switch in the EMER position, power should be supplied to the following:

- COMM 1
- NAV 1
- RTU 1
- RIU L-B
- Pilot’s and Copilot’s Audio Panels
- Standby HSI (Copilot's AHRS)
- Standby Engine N_1 indicators
- Standby Flight Display (internal battery)
- Standby Air Data Computer
- Standby Pitot Heat
- Copilot's Pitot Heat
- Copilot's Air Data Computer
- Flap Control
- Landing Gear Control
- Landing Gear Monitor
- Overhead Floodlights
- Voltmeter

Power is available for these items for at least 30 minutes from a normally charged battery. Power is also supplied to the standby flight display by its own battery. An engine start/attempt will reduce available normally charged battery endurance approximately 20%.

A battery disconnect, BAT DISC/NORM guarded switch, located above the pilot’s armrest, disconnects the battery in the event that a start relay sticks during an engine start. This switch provides a direct loop from the power to the ground side of the battery to open the battery disconnect relay if the battery switch is in the BATT (not EMER or OFF) position and the battery disconnect switch is selected to BAT DISC. The battery ground is opened and the battery cannot supply electrical power to the airplane or be charged by the generators.

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SECTION III - OPERATING PROCEDURES
NORMAL PROCEDURES

MODEL 525B

ELECTRICAL SYSTEM

DC power is supplied by external power, a 300-ampere starter-generator unit on each engine or a (44 ampere-hour) battery. DC power is controlled by a battery BATT/OFF/EMER switch and two GEN ON/OFF/RESET switches. One generator is capable of supplying all standard electrical requirements should a generator fail. Each generator feeds its respective L or R FEED electrical bus. The L AND R FEED busses are connected by 225 ampere current limiters to a crossfeed bus to provide crossfeed power from either generator. DC power is routed from each feed bus through three 80 amp current limiters to three 75 ampere circuit breakers on each extension bus in the circuit breaker panels. Cockpit circuit breakers control power to individual systems. Each circuit breaker panel has a 35 ampere crossover breaker to the opposite side to provide for more logical grouping of circuit breakers. Battery power is supplied to a Hot battery bus and then through the battery relay to the crossfeed bus and the L and R feed busses.

Emergency DC power is supplied from the hot battery bus through the emergency power relay, to emergency bus circuit breakers on each cockpit circuit breaker panel, when the battery switch is in either the BATT or EMER position. If the battery switch is in the BATT position, generator power is supplied through the battery relay to the hot battery bus to charge the battery and from the hot battery bus through the emergency relay to the emergency power busses. With the battery switch in the EMER position, power should be supplied to the following:

- COMM 1
- NAV 1 and DME 1
- Transponder 1
- ADF 1
- RTU 1 (Standby HSI displayed)
- RTU 2
- RIU L-B
- Pilot’s and Copilot’s Audio Panels
- FMS 2 (GPS 500 only, if installed)
- Copilot's AHRS (for Standby HSI)
- Standby Engine N_1 indicators
- Standby Flight Display (internal battery)
- Standby Air Data Computer
- Standby Pitot Heat
- Copilot's Pitot Heat
- Copilot's Air Data Computer
- Flap Control
- Landing Gear Control
- Landing Gear Monitor
- Overhead Floodlights
- Voltmeter

Power is available for these items for at least 30 minutes from a normally charged battery. Power is also supplied to the standby flight display by its own battery. An engine start/attempt will reduce available normally charged battery endurance approximately 20%.

A battery disconnect, BAT DISC/NORM guarded switch, located above the pilot’s armrest, disconnects the battery in the event that a start relay sticks during an engine start. This switch provides a direct loop from the power to the ground side of the battery to open the battery disconnect relay if the battery switch is in the BATT (not EMER or OFF) position and the battery disconnect switch is selected to BAT DISC. The battery ground is opened and the battery cannot supply electrical power to the airplane or be charged by the generators.

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ELECTRICAL SYSTEM

DC power is supplied by external power, a 300-ampere starter-generator unit on each engine or a (44 ampere-hour) battery. DC power is controlled by a battery BATT/OFF/EMER switch and two GEN ON/OFF/RESET switches. One generator is capable of supplying all standard electrical requirements should a generator fail. Each generator feeds its respective L or R FEED electrical bus. The L AND R FEED busses are connected by 225 ampere current limiters to a crossfeed bus to provide crossfeed power from either generator. DC power is routed from each feed bus through three 80 amp current limiters to three 75 ampere circuit breakers on each extension bus in the circuit breaker panels. Cockpit circuit breakers control power to individual systems. Each circuit breaker panel has a 35 ampere crossover breaker to the opposite side to provide for more logical grouping of circuit breakers. Battery power is supplied to a Hot battery bus and then through the battery relay to the crossfeed bus and the L and R feed busses.

Emergency DC power is supplied from the hot battery bus through the emergency power relay, to emergency bus circuit breakers on each cockpit circuit breaker panel, when the battery switch is in either the BATT or EMER position. If the battery switch is in the BATT position, generator power is supplied through the battery relay to the hot battery bus to charge the battery and from the hot battery bus through the emergency relay to the emergency power busses. With the battery switch in the EMER position, power should be supplied to the following:

- COMM 1
- NAV 1 and DME 1
- Transponder 1
- ADF 1
- RTU 1 (Standby HSI displayed)
- RTU 2
- RIU L-B
- Pilot's and Copilot's Audio Panels
- FMS 2 (GPS 500 only, if installed)
- Copilot's AHRS (for Standby HSI)
- Standby Flight Display (internal battery)
- Standby Air Data Computer
- Standby Pitot Heat
- Copilot's Pitot Heat
- Copilot's Air Data Computer
- Flap Control
- Landing Gear Control
- Landing Gear Monitor
- Overhead Floodlights
- Voltmeter

Power is available for these items for at least 30 minutes from a normally charged battery. Power is also supplied to the standby flight display by its own battery. An engine start/attempt will reduce available normally charged battery endurance approximately 20%.

A battery disconnect, BAT DISC/NORM guarded switch, located above the pilot's armrest, disconnects the battery in the event that a start relay sticks during an engine start. This switch provides a direct loop from the power to the ground side of the battery to open the battery disconnect relay if the battery switch is in the BATT (not EMER or OFF) position and the battery disconnect switch is selected to BAT DISC. The battery ground is opened and the battery cannot supply electrical power to the airplane or be charged by the generators.

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ELECTRICAL SYSTEM (Continued)

CAUTION

Do not use the battery disconnect switch for extended time. The battery disconnect relay will continue to draw a small current from the battery until the battery is discharged. The battery disconnect relay will then close resulting in a very high charge rate and probable overheat.

A battery overheat warning system is provided to warn the pilot in the event of abnormally high battery temperatures. An internal temperature of 63°C (145°F) will cause the red BATT O'TEMP and MASTER WARNING lights to flash, (accompanied by a audio "BATTERY OVERTEMP" warning if the airplane is equipped with the verbal warning system). If the temperature reaches 71°C (160°F) the red >160 light and MASTER WARNING, (if reset), will flash, (and the audio warning repeat rate will increase if the airplane is equipped with the verbal warning system). These functions can be tested using the rotary test switch.

Loss of a single generator is annunciated by flashing amber GEN OFF L or R lights and steady MASTER CAUTION light with no audio warning. Failure of the second generator is annunciated by flashing GEN OFF and the other (L or R) light flashing, a flashing red MASTER WARNING, (accompanied by an audio "GENERATOR FAIL" warning, if the airplane is equipped with the verbal warning system).

EXTERNAL POWER

External power is supplied from the external power receptacle aft of the tailcone door. When using external power for prolonged ground operation, the battery should be disconnected to preclude overheating the battery. Do not use the battery disconnect switch. External power can be used for engine start by selecting the generator switches to OFF. When the starter is engaged, the battery disconnect relay opens and all start current will be supplied by the external power unit. The external power unit voltage should be 28 to 29 volts and it should have a capacity of 800 to 1100 amperes if being used to start engines. An over-voltage sensor will open the external power relay should voltage exceed limits. If the external power unit has a variable automatic over current feature, it should be set to 1100 amps.

CAUTION

If the battery is charged using the external power unit, it must be visually monitored. current from most external power units is not regulated and a battery overheat may occur.

ELECTRICAL SYSTEM (Continued)

ENGINE STARTS

The first engine start will be accomplished from the battery unless external power is used. The second start can be accomplished with external power, (if the first generator switch is OFF); from the battery, (if the first generator switch is off and external power is not connected); or from the battery with assist from the first generator (ground only) if the first generator is on. Generator assist start capability is disabled in flight; therefore, all starter assist airstarts are from the battery.

CAUTION

If automatic ignition does not occur during start and ignition circuit breaker is pulled, do not attempt to reset the circuit breaker until the start has been aborted.

AHRS OPERATION AT NEAR-POLAR LATITUDES

Near-polar latitudes are defined as those latitudes north of approximately 63.5° N and south of approximately 63.5° S. The AHS-3000 system is not designed for use as a polar navigator, and flying in or around the fringe of low magnetic flux areas can cause temporary dropouts in required flux levels for the system. The AHC-3000 computer internally monitors the flux level intensity and will display a red HDG flag on the HSI when the magnetic flux level is below the threshold for reliable magnetic navigation. Also, in areas of magnetic anomalies or low magnetic flux, the slaved magnetic heading error may be larger than normal. If operating in or around near-polar latitudes, the appearance of the red HDG flag due to known low magnetic flux may be corrected by use of the DG mode (MANUAL position of the L and R AHRS Slave switches), as described in the following operational scenarios.

RED HDG FLAG DISPLAYED WHILE ENROUTE

If the red HDG flag is displayed intermittently during transit of a low flux area, the suggested corrective action is as follows:

Select the MANUAL position of the L and R AHRS Slave switches and verify the red HDG flag is removed. Periodically return to AUTO, while in straight and level flight at constant airspeed, to check for absence of the red HDG flag. If the red HDG flag is not displayed, remain in AUTO. If the red HDG flag reappears, reselect MANUAL. If the MANUAL (DG) mode is selected for an extended period of time (based on the 24 degree/hour drift rate of the DG mode), then other means to verify navigation must be used as required.

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AHRS OPERATION AT NEAR-POLAR LATITUDES (Continued)

RED HDG FLAG DISPLAYED PRIOR TO DEPARTURE

Airports that are located just inside low flux areas may have sufficient flux during approach and departure, but not on the field. The suggested corrective action is as follows:

Select the MANUAL position of the L and R AHRS Slave switches and slew to a known heading reference (for example, runway heading when lined up on centerline). After departure, periodically return to AUTO, while in straight and level flight at constant airspeed, to check for absence of the red HDG flag. If the red HDG flag is not displayed, remain in AUTO. If the red HDG flag reappears, reselect MANUAL. If the MANUAL (DG) mode is selected for an extended period of time (based on the 24 degree/hour drift rate of the DG mode), then other means to verify navigation must be used as required.

RED HDG FLAG DISPLAYED DURING TAKEOFF ROLL

Some airports are located in fringe areas that have insufficient flux levels only during some dynamic conditions. The acceleration during a takeoff roll on a southerly heading in the northern hemisphere may cause the red HDG flag to display because of the pendulum movement of the flux detector coils. The red HDG flag will go out of view when the acceleration is reduced. The suggested corrective action is as follows:

Perform normal initialization in the AUTO mode. Just prior to the takeoff roll, select the MANUAL position of the L and R AHRS Slave switches. After departure, return to AUTO, while in straight and level flight at constant airspeed, and verify the red HDG flag is not displayed.

ROCKWELL COLLINS PRO LINE 21 FLIGHT CONTROL SYSTEM

FLIGHT GUIDANCE

The Rockwell Collins Pro Line 21 Flight Control System (FCS) is an integrated three-axis autopilot with yaw damper, flight guidance, and automatic pitch trim. The FCS provides fail-safe autopilot and dual flight guidance functions. The system consists of two identical FGC-3000 Flight Guidance Computers (FGCs), three SVO-3000 Primary Servos, an APP- 85 Autopilot Panel, and a MSP-85 Mode Select Panel. An additional copilot MSP-85, a CKP-3000 copilot course knob, and a APP-85 with AP XFR is installed for the dual PFD. The Rockwell Collins "Pro Line 21 Avionics System Pilot's Guide For Cessna Citation CJ3" is provided with the airplane and must be on board the airplane immediately available to the crew.

The FGC receives Flight Director mode select data from the MSP and vertical speed/pitch wheel input, autopilot engage logic from the Autopilot Panel (APP), attitude and heading data from the onside Attitude Heading Computer, and cross-side data from the opposite FGS. The controls integrated in the APP include the ROLL knob, vertical speed/pitch wheel, autopilot engage lever, yaw damper engage lever, TURB and AP XFR controls. Control inputs from the APP are applied to both FGCs.

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ROCKWELL COLLINS PRO LINE 21 FLIGHT CONTROL SYSTEM
(Continued)

Mode Selection

The MSP-85 Mode Select Panel (MSP) provides push buttons used by the pilot to select and deselect flight guidance modes. The lateral and vertical mode select controls as well as the flight director on/off control are located on this panel.

Several additional flight controls are external to the APP and MSP. These include an AP DISC Button, GA Button, pitch synchronization switch (AP Sync), and pitch trim control.

The pilot's and copilot's flight director modes are synchronized so that either pilot may select the new mode from the associated MSP.

NOTE

- When the NAV mode is engaged for enroute navigation, and VOR is the source, it is recommended that the HDG mode be engaged prior to changing the active VOR frequency. After positive acquisition of the new VOR frequency, reselect the NAV mode and verify capture and tracking of the new course.
- Both MSP-85 mode select panels are active at all times. Use caution, and good crew coordination procedures, to avoid unexpected changes to the selected flight director modes.
- Coupled VOR navigation should be switched to HDG mode if CDI wandering is encountered. This wandering is caused by VOR azimuth sensitivity.

Autopilot Control Panel

The APP-85 autopilot control panel, mounted on the center pedestal, provides the means of engaging the autopilot and yaw damper, as well as manually controlling the autopilot through the turn knob and pitch wheel.

The AP XFR button switches control of the autopilot from the pilot's flight director to the copilot's flight director. To operate, push the button once to switch control from the pilot's to copilot's side. Push the button again to switch control of the autopilot back from the copilot's flight director to the pilot's flight director. The arrow at the top of the PFD indicates which flight director is in control.

The pitch wheel allows control of the flight director vertical mode. Rotate the pitch wheel to change the existing vertical command reference to the flight guidance system. Rotating the wheel toward UP increases the existing reference value. Rotating the wheel toward DN decreases the existing reference value. The wheel is spring loaded and will return to the center detent if released.

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ROCKWELL COLLINS PRO LINE 21 FLIGHT CONTROL SYSTEM
(Continued)

Autopilot Control Panel

The APP-85 autopilot system features a turbulence mode that is used to soften the airplane ride in turbulent weather conditions. When in turbulence mode, the aileron and elevator channel gains are reduced. The turbulence mode is selectable in any approach mode, but will automatically deselect during either VOR or LNV (FMS) approaches, returning to approach gains.

The turn knob is used to input a bank command to the flight guidance system. The amount of airplane bank is proportional to the amount of knob rotation. The knob is not spring loaded and will remain in the position selected by the pilot. If flight director modes cannot be engaged, check that the turn knob is centered.

The YD engage lever is used to select the yaw damper mode for the flight guidance system. Push the lever up and hold for one second to engage the mode.

NOTE

Engaging the yaw damper does not engage the autopilot.

If the flight guidance system turns the yaw damper off via an automatic yaw damper disconnect, the lever will drop and the green YD on the primary flight display changes to flashing yellow. Push the yoke mounted AP/YD DISC switch to change YD to steady white. For manual yaw damper disconnect, push the YD engage lever down or push the yoke-mounted AP/YD DISC switch.

NOTE

Disengaging the yaw damper also disengages the autopilot, if not already disengaged.

The CHP-3000 Course Heading Panel, located in the center pedestal, is used to input desired course, altitude, and heading reference to the flight guidance system. The ALT (altitude) knob sets the desired altitude reference in the flight guidance system.

The PUSH CANCEL switch deactivates the 200 foot altitude warning. The PUSH DIRECT switch automatically selects a course direct to the tuned left side NAV station and returns the left side course deviation to zero. The PUSH SYNC switch is used to synchronize the heading reference to the current airplane heading. This switch simultaneously synchronizes the heading bug on the left PFD and right PFD.

A second CKP-3000 Course Knob Panel is located on the copilot instrument panel below the right Display Control Panel. The course knob panel is used by the copilot to input the desired course reference to the right side flight guidance system. Desired altitude and heading references to the right side flight guidance are input using the course heading panel.

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ROCKWELL COLLINS PRO LINE 21 FLIGHT CONTROL SYSTEM
(Continued)

DISPLAY CONTROL PANEL/CONTROLS

The two DCP-3000 Display Control Panels are located on the instrument panel adjacent to the primary flight displays. The left display control panel controls the data being shown on the left PFD and MFD. The right display control panel controls the data being shown on the right PFD.

The BARO knob is used to set the barometric pressure reference value, which is displayed below the PFD altitude scale. The PUSH STD button in the center of the BARO knob selects the standard barometric pressure reference of 29.92 inches of Mercury or 1013 hecto Pascals.

The REFS button is pushed to display the V speed menu (appropriate to either takeoff or landing) on the PFD. The landing V speed menu also displays the approach minimums selection for either radio altitude or barometric altitude. Individual items on the V speed menu are set by first boxing the item by pressing the adjacent line select key, then using the MENU SET KNOB to change the value. Alternatively, repeatedly pressing the PUSH MENU ADV button (in the center of the MENU SET KNOB) will cycle the box outline through the individual menu items; then again use the MENU SET KNOB to set the desired values.

When not being used within a V speed menu, the MENU SET knob is used to select the navigation source in the PRESET box for the CDI. The PUSH MENU ADV button, when pressed, swaps the PRESET source to the CDI and the current navigation source to the PRESET box. This function is also accomplished by pressing the line select key adjacent to the PRESET box. The NAV/BRG button is pushed to display the BRG SOURCE and NAV SOURCE menus on the PFD. Line select keys adjacent to the menu items toggle between selections for the bearing pointers and CDI navigation source.

The RADAR button is pushed to display the weather radar menu on the PFD. Line select keys are used to select STBY, WX and MAP modes and turn STAB on and off. The MENU SET knob is used to adjust GAIN. The GCS button is pushed to activate/deactivate the ground clutter suppression circuitry in the weather radar system. The TILT and RANGE knobs control radar antenna tilt angle and the desired display range for radar coverage, respectively.

Additional items displayed on the PFD, with adjacent line select keys, include FORMAT, RDR, and TFC. FORMAT toggles the HSI between a full compass rose, an arc, and a map display. RDR selects/deselects the radar display to the HSI (radar is selectable only in the arc and map modes of the HSI display). TFC selects/deselects the TCAS traffic display to the HSI. The traffic display range is controlled by the RANGE knob and is limited to 25 nm when in the full compass mode of the HSI and 150 nm in the arc and map modes. Note that changing the TCAS traffic display range on the pilot's PFD also changes the MFD map range.

STANDBY FLIGHT DISPLAY

The Goodrich GH-3000 Electronic Standby Instrument System (ESIS) standby flight display (SFD) is located in the center instrument panel between the pilot PFD and MFD. This active-matrix liquid crystal display (AMLCD) provides airplane attitude and slip/skid on a single display. Airplane attitude is provided by an internal 3-axis inertial sensor cluster. Airspeed and altitude are provided by a dedicated Air Data Unit.

Power to the system is controlled by a switch marked STBY FLT DISPLAY ON/OFF/TEST located on the upper right of the switch panel. A separate 2.5 Ampere hour BF Goodrich Avionics Systems Model PS-855A sealed lead acid battery pack is located in the tail of the aircraft. When fully charged, the PS-855A allows for at least 88 minutes of operation in the event of total loss of airplane electrical power. The battery pack is constantly charged by the airplane's electrical system, and should therefore be fully charged in the event of an electrical power failure. The STBY FLT DISPLAY switch must be ON for automatic transfer to battery power to occur. An amber ON light next to the STBY FLT DISPLAY switch illuminates when the SFD is turned ON and the airplane's electrical system is not charging the emergency power supply battery. When the SFD switch is held to the spring loaded TEST position, a self-test of the battery and circuits is accomplished. The application of 28V DC power to the display system initiates the attitude initialization process, which is identified by the display of the message "attitude initializing" on the SFD. The duration of the initialization process is usually less than 180 seconds.

A light sensor is located on the bottom left side of the instrument case. It provides ambient light level data to the backlight control system to optimize display brightness.

The lighting level can still be manually controlled from the SET BRIGHTNESS OFFSET function by pressing the [M] menu access button and the adjustment knob for the submenu. Rotate the knob to adjust, then press the knob to finish setting the brightness offset. The brightness of the [M] menu access button is controlled from the center instrument panel light rheostat control.

SELF-TEST

The unit has a built-in test feature, which automatically detects any failure of the display at power up and during continuous operation. If a failure is detected, a message, red 'X' or blank screen will appear. Where it is not possible for the diagnostics feature to automatically correct a failure, the system will prompt the crew to intervene by resetting power.

NOTE

All power resets should only be accomplished while in straight and level, unaccelerated flight.

MENU FUNCTIONS

Pressing the MENU [M] button will bring the submenus into view. Select a submenu function by turning the adjustment knob to highlight the desired function. Enable that highlighted function by pressing the adjustment knob in.

(Continued Next Page)

STANDBY FLIGHT DISPLAY (Continued)

NOTE

ILS, VOR, FMS and TACAN information is not available on the CJ3 GH-3000 installation.

Other menu functions configured on the CJ3 are:
FAST ERECT
SET BRIGHTNESS OFFSET
BARO TYPE

STANDBY HORIZONTAL SITUATION INDICATOR

The Standby HSI is automatically displayed on RTU 1 when the battery switch is placed in the EMER position. During normal operations, the standby HSI may be selected for display by use of the HSI line select key on page 2 of RTU 1. When the standby HSI is displayed, CDI course selection and tuning capability for COM 1, NAV 1, and XPDR 1 are available through the line select keys on RTU 1. For those airplanes which include ADF 1 on the emergency bus, tuning capability and bearing pointer are also included on the standby HSI. Some airplanes have FMS 2 (Garmin 500 only) available on the emergency bus for navigation information, but it is not selectable to the CDI on the standby HSI. RTU 2 is also powered on the emergency bus and may be used for tuning COM 1, NAV 1, XPDR 1, and ADF 1 (if applicable) by first pressing the 1/2 line select key.

RADIO ALTIMETER

COLLINS ALT-55B

The Collins ALT-55B radio altimeter displays radio altitude at all times up to an absolute altitude of 2500 feet. The system becomes operational when the airplane electrical system is powered up and it remains operational throughout the flight. Radio altitude is displayed in the bottom center of the attitude sphere in the ADI displays.

WEATHER RADAR

WXR-800 WEATHER RADAR SYSTEM

The Collins Pro Line 21 Weather Radar System, or the RTA-800, is a fully integrated radar system that utilizes the airplane's Electronic Flight Instrument Systems (EFIS) equipment to provide the crew with a display of radar indications of precipitation. The standard configuration consists of a receiver, transmitter and antenna. The RTA-800 operates on X-band frequency and is capable of detecting wet precipitation along the flight path and in front of the airplane within an arc of the heading angle plus or minus 60°, at a selectable display range of up to 300 nautical miles.

(Continued Next Page)

WEATHER RADAR (Continued)

An optional installation configuration, the RTA-852, is physically and functionally identical to the RTA-800 except for featuring auto-tilt operation and the additional capability of detecting moisture-based turbulence. Both the RTA-800 and RTA-852 accept radar control data from the left PFD/MFD and the right PFD. The weather radar system may be operated in a split mode, where the radar functions like two independent radars, each updating on alternate sweeps of the antenna.

WARNING

- **The system performs only the functions of weather detection and ground mapping. It should not be used or relied upon for proximity warning, anti-collision or terrain avoidance.**
- **The area within the scan arc (+/- 60 DEG) and within 0.65 meters (2 feet) of an operating RTA-800/852 weather radar can be a hazardous area. Do not operate the system in any mode other than standby (stby) or test (test) when personnel or combustible materials are within that range.**

FUEL SYSTEM

The fuel system consists of a single tank feeding the right engine and a single tank feeding the left engine. No lateral fuel management is required in normal operation of the airplane. Transfer capability is provided in the event a lateral imbalance occurs. A white FUEL TRANSFER annunciator will illuminate when the transfer valve is open. Fuel is transferred in the direction of the arrow on the FUEL TRANSFER selector (i.e. if the selector is turned clockwise, the arrow points to R TANK and fuel is transferred from the left tank). Fuel is transferred at a rate of approximately 10 pounds per minute (rate varies with engine(s) fuel flow). If the opposite side tank is at or near maximum capacity, care should be taken to assure fuel is not being lost through the fuel vents.

NOTE

Fuel transfer will not occur if the fuel boost pump is operating in the receiving tank. The Fuel Boost Switches must be in NORM, or the Fuel Boost switch for the tank at the head of the arrow on the FUEL TRANSFER selector must be OFF, and for the opposite tank, ON.

An amber FUEL FLTR BYPASS annunciator and MASTER CAUTION will indicate an impending bypass of the fuel filter if the differential pressure across the fuel filter reaches approximately 10 PSI.

An amber FUEL LOW LEVEL L or R annunciator will illuminate when the respective fuel quantity is less than approximately 190 ± 20 pounds. The MASTER CAUTION for this annunciator is delayed 4 seconds to minimize inadvertent MASTER CAUTION illumination in turbulent conditions with low fuel.

NOTE

The Fuel Boost Switches should be positioned to ON if the FUEL LOW LEVEL annunciator is illuminated or indicated fuel quantity is below 210 pounds.

ANTI-ICE ADDITIVES

NOTE

EGME and DIEGME additives are not required but may be used if desired, in accordance with the following procedures.

PROCEDURE FOR ADDING ETHYLENE GLYCOL MONOMETHYL ETHER (EGME) FUEL ADDITIVE

Use the following procedure to blend anti-icing additive as the airplane is being refueled through the wing filler caps:

1. Attach MIL-I-27686 additive to refuel nozzle, making sure blender tube discharges in the refueling stream.
2. Start refueling while simultaneously fully depressing and slipping ring over trigger of blender.

WARNING

Anti-icing additives containing ethylene glycol monomethyl ether (egme) are harmful if inhaled, swallowed or absorbed through the skin, and will cause eye irritation. Also, it is combustible. Before using this material, refer to all safety information on the container.

CAUTION

Assure that the additive is directed into the flowing fuel stream and that the additive flow is started after the fuel flow starts and is stopped before fuel flow stops. Do not allow concentrated additive to contact coated interior of fuel tank or airplane painted surface. Use not less than 20 fluid ounces of additive per 156 gallons of fuel or more than 20 fluid ounces of additive per 104 gallons of fuel.

PROCEDURE FOR ADDING DIETHYLENE GLYCOL MONOMETHYL ETHER (DIEGME) FUEL ADDITIVE

NOTE

Service experience has shown that DiEGME has provided acceptable protection from bacterial growth in fuel systems.

(Continued Next Page)

ANTI-ICE ADDITIVES (Continued)

Use the following procedure to blend anti-icing additive as the airplane is being refueled through the wing filler caps:

1. Attach MIL-I-85470 additive to refuel nozzle, making sure blender tube discharges in the refueling stream.
2. Start refueling while simultaneously fully depressing and slipping ring over trigger of blender.

CAUTION

- Diethylene glycol monomethyl ether (diegme) is slightly toxic if swallowed and may cause eye redness, swelling and irritation. It is also combustible. before using this material, refer to all safety information on the container. Assure the additive is directed into the flowing fuel stream with the additive flow started after the fuel flow starts and stopped before fuel flow stops. Do not allow concentrated additive to contact coated interior of fuel tank or airplane painted surface.
- Use not less than 20 fluid ounces of additive per 156 gallons of fuel or more than 20 fluid ounces of additive per 104 gallons of fuel.

PROCEDURE FOR CHECKING FUEL ADDITIVES

1. Prolonged storage of the airplane will result in a water buildup in the fuel which “leaches out” the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration of additive can be checked using an anti-icing additive concentration test kit available from Cessna Aircraft Company, Citation Marketing Division, Wichita, KS 67277. It is imperative that the instructions for the test kit be followed explicitly when checking the additive concentration. The additive concentrations by volume for EGME/DIEGME shall be 0.10% minimum and 0.15% maximum, either individually or mixed in a common tank. Fuel, when added to the tank, should have a minimum concentration of 0.10% by volume.

ENGINE

The Williams FJ44-3A engines each produce 2780 pounds of static takeoff thrust at sea level, flat-rated to 22°C (72°F). Engine thrust must be managed by the pilot within the limits prescribed in this manual.

Thrust is managed by throttle lever input to a Full Authority Digital Engine Control (FADEC). A Fuel Delivery Unit (FDU) is gearbox mounted and provides four functions:

Fuel Conditioning, Fuel Metering, Inducer Bleed Valve Actuation and FADEC Power Generation.

Ejector pumps in each wing reservoir supply fuel pressure to the engine driven fuel pump which supplies fuel to the Fuel Delivery Unit (FDU). Metered fuel is then supplied to a slinger ring in the engine combustor section. Fuel is also supplied to a start nozzle which sprays atomized fuel into the combustor to aid in starting.

NOTE

Start nozzle fuel is supplied continuously at a flow rate of approximately 9 lbs/hr while the engine is operating and is accounted for in the fuel flow indication. Excess unmetered fuel is returned to the wing as motive flow fuel to operate the ejector pumps.

Should fuel supply pressure to the engine driven pump fall below approximately 4 ±0.5 PSI, a pressure switch will illuminate the amber FUEL LOW PRESS L or R annunciator and MASTER CAUTION. If the fuel boost switch is in NORM, the fuel boost pump will be automatically switched on. The white FUEL BOOST ON annunciator will illuminate and the FUEL LOW PRESS annunciator should extinguish. The fuel boost pump and annunciator can be reset by selecting the fuel boost switch to OFF or ON and back to NORM if the low pressure condition has been corrected.

ENGINE OPERATION IN HAIL OR HEAVY RAIN

Engine parameters may fluctuate during flight through areas of hail and/or heavy rain, but will return to normal after exiting these conditions.

ENGINE INDICATING SYSTEM (EIS)

The EIS displays N_1, ITT, N_2, oil pressure, oil temperature, fuel temperature, fuel flow, and fuel quantity (individually for each engine). A compressed format of the EIS is automatically selected for certain enhanced display modes of the MFD. The ENG button, located on each Display Control Panel (DCP), alternately toggles between the normal and compressed formats. In the compressed format, placing either throttle in the Takeoff detent will automatically cause the EIS to display the normal format.

Digital data for N_1, N_2, and ITT are provided to the EIS by the respective engine FADEC. The FADEC also provides analog N_1 information (untrimmed) to the standby N_1 display, which may differ from the EIS value by as much as 1.2% N_1. Analog data for oil pressure, oil temperature, fuel temperature, fuel flow, and fuel quantity are provided to the EIS by the respective Data Concentrator Unit (DCU).

N_1 REF

In the normal (non-compressed) EIS format only, a digital N_1 reference window for takeoff/go-around thrust is displayed whenever the landing gear is extended, or either throttle is placed in the TO detent. Individual N_1 reference bugs are displayed full-time on each N_1 scale, in both the normal and compressed formats, provided the respective engine is operating. The N_1 reference window and associated N_1 bugs are controlled by the FADEC and require no pilot input.

INTERSTAGE TURBINE TEMPERATURE (ITT) - ENGINE START

During engine starts, a red ITT Start Limit Mark is positioned at the ITT red Start Limit. ITT START Redline is 1001°C. The ITT pointer is white when less than 1001°C and red when equal to or greater than 1001°C.

NOTE

ITT Normal Limit and Transient Limit do not apply while ITT Start Limit Mark is in view, but become active when ITT Start Limit Mark is removed.

N_2

The N_2 for each engine is displayed in digital format only. The N_2 digits are green when N_2 is equal to or less than 100.0%, yellow for 100.1% to 100.7% (for less than 20 seconds, otherwise red for greater than or equal to 20 seconds), and red for greater than or equal to 100.8% N2.

OIL PRESSURE

The Oil Pressure display consists of an analog and part time digital display for each engine. A digital readout of Oil Pressure is displayed if an over limit condition is detected with any oil parameter. Minimum oil pressure limits are lower when engine speed is below 80% N_2. The Oil Pressure display automatically accomodates these differences. If low oil pressure is indicated, the LOW OIL PRESSURE INDICATION procedure should be strictly followed.

ENGINE INDICATING SYSTEM (EIS) (Continued)

OIL TEMPERATURE

The Oil Temperature display consists of an analog and part time digital display for each engine. Digital readout Oil Temperature is only displayed when Oil Temperature pointer is yellow or red and is the same color as the pointer. The Oil Temperature readout is removed when Oil Temperature is no longer yellow or red. A minus sign (-) is displayed for negative values.

FUEL FLOW

Fuel Flow is normally in Pounds Per Hour (PPH). Optional Kilograms Per Hour (KPH) may be displayed. The fuel flow displays consist of digital readouts for each engine. A white Fuel Flow legend is displayed between the left and right digital readouts. Fuel flow values are displayed in green.

FUEL QUANTITY

The Fuel Quantity display consists of an analog and digital display for the fuel in each wing tank. Fuel quantity is normally in pounds (lbs). Optional Kilograms may be displayed. The scale range is from 0 to 2800 pounds with large tick marks at 500, 1000, 1500, 2000 and 2500 pounds. Smaller tick marks indicate 100 pound increments up to the maximum range. The fuel quantity scale pointer is always white.

The Fuel Quantity Digital Readout is displayed below the associated analog scale. The Fuel Quantity Digital Readout has the same source of data as the Fuel Quantity analog pointer. The boxed Fuel Quantity readout is green.

IGNITION OPERATING

A green 'IGN' legend is displayed adjacent to the upper center of the applicable analog ITT scale when the respective engine's ignition discrete is received by a DCU (from the on-side ignition system).

MISCOMPARE WARNINGS

Miscompare warnings are used to alert the pilots that redundant data from dual independent systems does not agree within specified limits. Comparator monitoring is performed full time for N_1, N_2 and ITT.

The miscompare warning annunciations are displayed in yellow, flash for 5 seconds when a miscompare condition first exists, and then are steady. They are removed when the miscompare condition is removed. For the N_1, N_2 and ITT Comparator Warns, the respective Legend associated with each parameter is removed and replaced with a yellow N_1, N_2, or ITT, as appropriate, and a direction arrow pointing to the side with the engine that is causing the Comparator Warn. If both engines have a miscomparing parameter, the direction arrows show on both sides.

PRESSURIZATION SYSTEM

Pressurization air, pre-cooled compressor bleed air from each engine is supplied to a single flow control shutoff valve. Pressurization sources can be selected L, BOTH, R or EMER, using the AIR SOURCE SELECT knob on the pressurization/environmental control panel. The bleed air passes through a cabin heat exchanger and into the cabin floor and armrest air ducts.

Cabin pressure is maintained by regulating the outflow of cabin air through two outflow valves in the aft pressure bulkhead. These outflow valves are controlled by the pressurization system controls on the pressurization/environmental control panel and can be controlled automatically or manually. Automatic control requires 29 VDC and is not available during emergency electrical power operations.

Selecting AUTO mode with the air data sensor operating generates an auto-schedule based on the departure field elevation, the maximum altitude reached on the current flight, and the operator input of landing field elevation in the controller. Maximum cabin differential pressure is 8.9±0.1 PSID. The controller will bring the cabin to zero pressure at the destination airport elevation as set in the controller.

The high altitude airport mode is automatically selected when a field elevation above 8,000 feet is set into the cabin pressurization controller. In this mode, the cabin will climb at an increased rate, if needed, to the selected elevation after the airplane descends through FL250. Prior to departure, set the departure field elevation. After climbing through FL250, the cabin will descend to intersect the auto schedule. After takeoff the controller may be set to the destination field elevation.

NOTE

In high altitude airport mode, it is possible that the cabin altitude may exceed the altitude where supplemental oxygen is required for the flight crew. If the airplane is to hold above 12,000 feet, the cabin altitude must be selected at or below 12,000 feet until holding is completed; otherwise one pilot must wear an oxygen mask and use oxygen.

Should the controller fail to obtain air data information from the air data sensor, the controller will automatically switch from auto-schedule to isobaric control and a yellow warning indicator on the pressurization control will illuminate. The SET ALT window will change elevation to flight level and the pilot can select the desired flight level using the SET ALT knob. Cabin pressure will be maintained near maximum differential pressure based on this selected altitude. Pressing the flight level (FL) button will replace the flight level with the destination cabin altitude selected by the pilot, allowing the pilot to change the desired cabin altitude prior to landing. The isobaric mode can be checked, prior to turning the avionics power on, during the engine start procedures.

A manual pressurization mode is provided in the event that 29 VDC power is lost. In the manual mode, the pilot directly controls the position of the outflow valves through the MANUAL toggle valve on the pressurization/environmental control panel. Selecting the PRESS SYSTEM SELECT AUTO/MANUAL switch to MANUAL removes 29 VDC from the outflow valves, disabling the automatic controller. Should normal 29 VDC power fail, the outflow valves will remain in their preset position. The pilot must use the MANUAL toggle valve to control pressurization. Normal pressurization is not available on an emergency bus.

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PRESSURIZATION SYSTEM (Continued)

A CABIN DUMP system is provided in event that the outflow valves cannot be opened by either the normal or manual systems. The cabin dump system requires 29 VDC electrical power. Activating the guarded CABIN DUMP switch opens the outflow valves. Maximum limit valves will prevent complete depressurization to cabin altitude above 14,500 ±500 feet.

The pressurization system can be preflight tested on the ground. Pressing the EXER button on the controller and holding for approximately 2 minutes will pressurize to 200 feet below field elevation. Releasing the button will conduct a display test and gradually depressurize the cabin.

Temperature controlled bleed air is supplied to the glareshield defog ducts, cockpit foot warmers, and the cabin side window diffusers. To enhance cockpit comfort, a diverter valve switch labeled COCKPIT AIR DIST is provided on the tilt panel to allow the crew to proportion the amount of bleed air between the cabin and cockpit. When the defog fan is selected to either HI or LOW, the bleed air supply to the defog duct is shut off, and the forward evaporator diverter closes. The evaporator air from the forward floor diffuser is then redirected to the defog fan which supplies air to the glareshield defog duct. The air conditioner assists in drying the flow of air on to the windshield when reaching humid conditions at lower altitudes.

NOTE

Cruise descent is recommended for optimum cabin and cockpit heating because bleed supply temperatures will be higher.

Windshield bleed should be used on LOW when descending into high humidity to aid in warming the windshield's outer surface. If the windshield temperature is below the dew point, the outer surface will fog over after landing.

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PRESSURIZATION SYSTEM (Continued)

ENVIRONMENTAL CONTROL SYSTEM

The Model 525 Environmental Control system is designed to be as fully automatic as possible. The cabin temperature sensor is located in the inlet to the aft evaporator fan. Air must be moving across the sensor for it to operate. The aft evaporator fan operates any time the DC electrical power is on and the air conditioner switch is not off.

Cabin environment, airflow and temperature is controlled by switches on the pressurization/ environmental control panel. Normal settings for the PRESSURIZATION/Environmental Panel are:

AIR SOURCE SELECT	BOTH	COCKPIT AIR DIST	NORM
AFT FAN	LOW	AIR CONDITIONING	AUTO
DEFOG FAN	OFF	FWD FAN	AUTO
		TEMPERATURE SELECT	AUTO (1 O'CLOCK)

If the cabin is initially cool or cold, the controls should be positioned as above. If the cabin is initially warm, or hot, the FWD FAN should be placed to HI. The AFT FAN should be placed to HI or FLOOD. Once the cabin temperature has stabilized, the TEMPERATURE SELECT control should not be changed. To maintain cockpit comfort, a flow divider is provided to allow the crew to proportion, to a certain extent, the amount of bleed air provided to the cockpit verses the cabin. The flow divider is controlled by a four position selector mounted on the tilt panel labeled COCKPIT AIR DIST. The COCKPIT AIR DIST does not select cockpit temperature; it proportions the flow of bleed air to the cockpit and cabin. The four positions may be selected as required to maintain cockpit comfort. The NORM and second positions are recommended for day operations and the third and MAX positions for night operations. If the cockpit is warm, set the FWD FAN switch to LOW or HI and set the COCKPIT AIR DIST to NORM. If the cockpit is cool, set the FWD FAN switch to AUTO and the COCKPIT AIR DIST to the third position or MAX.

The AIR SOURCE SELECT switch controls the source of pressurization or ventilation air. Selecting L, BOTH or R will pressurize the cabin with temperature controlled bleed air. Selecting EMER will pressurize the airplane with warm bleed air. Selecting FRESH AIR will not pressurize the airplane and is intended for ground use if fresh air is desired.

Cabin temperature can be controlled manually or automatically. Selecting the TEMPERATURE SELECT knob to AUTO will allow the temperature controller to control cabin temperature. Temperature is sensed at a cabin temperature sensor in the inlet of the aft evaporator fan at the bottom of the aft bulkhead. Temperature range selectable is approximately 65°F to 85°F. If sensed temperature differs from selected, the controller commands a ram air modulating valve on the cabin heat exchanger and the bleed air precooler doors open or close thus providing more or less crossflow air to cool the cabin bleed air. If the temperature difference is significant, selecting the controller FULL COLD or FULL HOT will not result in faster temperature change, but will result in overshoot.

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PRESSURIZATION SYSTEM (Continued)

Best results are obtained with a constant setting. When the TEMPERATURE SELECT knob is in the AUTO range on the ground and the throttle positions are less than approximately 70% N_2, pressurization bleed air is shut off if the controller is demanding cooling.

The MANUAL position of the TEMPERATURE SELECT knob enables manual cabin temperature control using the MANUAL HOT/COLD switch. This switch takes about 15 seconds to drive the ram air modulating valve on the cabin heat exchanger from one extreme to the other.

Cabin air can be further cooled by an air conditioner if the AIR CONDITIONING AUTO/OFF/FAN switch is in the AUTO mode. When the ram air modulating valve is driven approximately 100% open, either automatically or manually, the air conditioner compressor automatically cycles on. Cabin air is circulated through two evaporators, one in the aft bulkhead and one in the forward cabin under the side facing seat. The aft evaporator provides conditioned air to the overhead wemacs or the flood cooling. The forward evaporator diffuser is located between the pilot and copilot's seat. A green COMPRESSOR ON light on the pressurization/environmental panel indicates that the compressor has been turned on. The compressor will not run with the air conditioning switch in OFF or FAN, unless DEFOG has been selected.

Cabin air is circulated by the two evaporator fans. The AFT fan can be selected to LOW, HI and FLOOD. Selecting FLOOD runs the fan in HI speed, shuts off wemac air, and the air is discharged through the flood cooling diffuser at the top of the aft bulkhead. Selecting HI or LOW with an engine running will close the flood door and supply air to the wemacs. The aft fan will run anytime the AIR CONDITIONING switch is in AUTO or FAN or DEFOG HI/LO. The forward fan will run at LOW or HI speed if the AIR CONDITIONING switch is in AUTO or FAN or DEFOG HI/LO. Placing the FWD FAN switch in AUTO will cause it to run in the LOW speed if the air conditioner compressor is on. Additionally, the forward fan will run in HI/LO speed when the DEFOG HI/LO is selected.

NOTE

The cabin temperature sensor is in the inlet to the aft fan. The aft fan must be operating in LOW, HI, or FLOOD for the automatic temperature control system to function.

The defog system will operate any time the DEFOG switch is not OFF and aircraft DC electrical power is on. The DEFOG FAN switch should be OFF except during descent and approach after cold soak at high altitude. With the DEFOG FAN selected OFF, some of the air supply entering the cockpit bypasses the defog fan flowing directly to the glare shield outlets. The DEFOG FAN should be selected to HI prior to descent. Also, the WINDSHIELD BLEED air valves should be opened and the WINDSHIELD BLEED air switch set to LOW to avoid exterior windshield fogging. When the defog system is operating, power is supplied to the air conditioner regardless of the position of the AIR CONDITIONING AUTO/OFF/FAN switch. When in the HI or LOW position, the DEFOG switch activates the defog fan, the forward evaporator fan, the forward evaporator diffuser diverter door, and the air conditioner (the compressor may or may not operate, as indicated by the COMPRESSOR ON light, depending on altitude and ambient air temperature). The evaporator air is routed to the defog fan which supplies air to the glareshield defog duct.

OXYGEN SYSTEM

Oxygen for the flight crew and passengers is supplied from a 50 cubic foot oxygen cylinder. The oxygen cylinder pressure gage is located on the instrument panel. Refer to the oxygen utilization chart for duration of oxygen supply (Figure 3-4).

A three position oxygen control switch (OXYGEN CONTROL VALVE) is located on the pilot's left console. The three positions are CREW ONLY/NORMAL/MANUAL DROP. In the NORMAL position, if the cabin altitude exceeds approximately 14,500 ±500 feet, the passenger mask will automatically deploy. If the passenger masks are cold, when they deploy, a streamer will drop within view of the passenger. Pulling the streamer will free the mask from storage. If the masks are warm, the passenger masks will drop within view of the passenger. Oxygen will flow to these masks when the lanyard is pulled as the mask is donned. Therapeutic oxygen may be supplied to the passengers at any cabin altitude by placing the OXYGEN CONTROL VALVE selector in the MANUAL DROP position. This will cause all masks in the cabin to deploy. Oxygen flow may be shut off from passenger masks by positioning the oxygen priority valve to the CREW ONLY position.

WARNING

- **No smoking when oxygen is being used or following use of passenger oxygen until lanyards have been reinstalled.**
- **Due to human physiological limitations, the passenger oxygen system is not satisfactory for continuous operation above 25,000 feet cabin altitude and the crew oxygen system is not satisfactory for continuous operation above 40,000 feet cabin altitude. Individual physiological limitations may vary. If crew or passengers experience hypoxia symptoms, descend to a lower cabin altitude.**

Cabin temperature must be held at or above 0°C (+32°F) for a minimum of 20 minutes prior to takeoff and operations above 24,000 feet after a prolonged ground cold soak period (two hours or longer) at ambient temperatures of -10°C (+14°F) or colder (refer to Normal Procedures, COLD WEATHER OPERATIONS). This temperature ensures proper deployment and operation of the passenger oxygen masks. This limitation does not apply if there are no passengers in the cabin.

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TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

Publication Affected:	Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual, Revision 7, dated 29 April 2013.
Airplane Serial Numbers Affected:	Airplanes 525B-0001 thru -0056 and -0058 thru -0450.
Description of Change:	Section III, Operating Procedures, Normal Procedures, Oxygen System, replace Figure 3-4.
Filing Instructions:	Insert this temporary change in the Model 525B Citation CJ3 (525B-0001 and On) basic FAA Approved Airplane Flight Manual adjacent to page 3-124.
Removal Instructions:	This temporary change must be removed and discarded when Revision 8 has been collated into the basic FAA Approved Airplane Flight Manual.

Section III, Operating Procedures, Normal Procedures, Oxygen System, replace Figure 3-4 with the figure on the following page:

APPROVED BY _____

for Randy Shields, Lead ODA Administrator
Textron Aviation Inc.
Organization Delegation Authorization ODA-100129-CE
FAA Approved Under 14 CFR Part 183 Subpart D

DATE OF APPROVAL 04 NOVEMBER 2016

TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE

OXYGEN SUPPLY CHART (FULL 50 FT³ BOTTLE)

AVAILABLE TIME IN MINUTES									
CABIN ALTITUDE	1 COCKPIT 0 CABIN	1 COCKPIT 1 CABIN	1 COCKPIT 2 CABIN	1 COCKPIT 3 CABIN	1 COCKPIT 4 CABIN	1 COCKPIT 5 CABIN	1 COCKPIT 6 CABIN	1 COCKPIT 7 CABIN	1 COCKPIT 8 CABIN
8,000	867	202	114	80	61	50	42	36	32
10,000	995	210	117	81	62	50	42	37	32
15,000	995	213	120	83	64	52	43	37	33
20,000	786	204	118	82	64	52	44	38	33
25,000	435	171	106	77	60	50	42	37	32
30,000	571								
34,000	728								
35,000	772								
37,000	879								
39,000	1071								
40,000	1089								

AVAILABLE TIME IN MINUTES									
CABIN ALTITUDE	2 COCKPIT 0 CABIN	2 COCKPIT 1 CABIN	2 COCKPIT 2 CABIN	2 COCKPIT 3 CABIN	2 COCKPIT 4 CABIN	2 COCKPIT 5 CABIN	2 COCKPIT 6 CABIN	2 COCKPIT 7 CABIN	2 COCKPIT 8 CABIN
8,000	433	164	101	73	57	47	40	35	31
10,000	498	173	105	75	59	48	41	35	31
15,000	498	176	107	77	60	49	41	36	32
20,000	391	162	102	75	59	48	41	36	32
25,000	212	121	84	65	53	44	38	34	30
30,000	286								
34,000	364								
35,000	386								
37,000	439								
39,000	535								
40,000	544								

Figure 3-4

OXYGEN SYSTEM (Continued)

OXYGEN SUPPLY CHART 50 FT³

CABIN ALTITUDE	1 COCKPIT 0 CABIN	1 COCKPIT 1 CABIN	1 COCKPIT 2 CABIN	1 COCKPIT 3 CABIN	1 COCKPIT 4 CABIN	1 COCKPIT 5 CABIN	1 COCKPIT 6 CABIN	1 COCKPIT 7 CABIN	1 COCKPIT 8 CABIN
AVAILABLE TIME IN MINUTES									
8,000	867	202	202	114	80	61	50	42	36
10,000	995	210	210	117	81	62	50	42	37
15,000	995	213	213	120	83	64	52	43	37
20,000	782	204	204	117	82	63	52	43	38
25,000	425	169	169	105	77	60	50	42	37
30,000	571								
34,000	728								
35,000	772								
37,000	879								
39,000	1071								
40,000	1089								

CABIN ALTITUDE	2 COCKPIT 0 CABIN	2 COCKPIT 1 CABIN	2 COCKPIT 2 CABIN	2 COCKPIT 3 CABIN	2 COCKPIT 4 CABIN	2 COCKPIT 5 CABIN	2 COCKPIT 6 CABIN	2 COCKPIT 7 CABIN	2 COCKPIT 8 CABIN
AVAILABLE TIME IN MINUTES									
8,000	433	164	101	73	57	47	40	35	31
10,000	498	173	105	75	59	48	41	35	31
15,000	498	176	107	77	60	49	41	36	32
20,000	391	162	102	75	59	48	41	36	32
25,000	212	121	84	65	53	44	38	34	30
30,000	286								
34,000	364								
35,000	386								
37,000	439								
39,000	535								
40,000	544								

Figure 3-4

Both EROS and B/E Aerospace crew oxygen masks are approved. These are quick donning masks of the diluter/pressure demand type, with a built in microphone and regulator. Each mask is capable of supplying 100% oxygen in either pressure demand or pressure breathing (EMER) modes of operation. Crewmembers are responsible to become familiar with the specific type of mask installed in the airplane and it's operation, including the proper method of stowing and donning the mask and the means of selecting 100% oxygen and EMER modes. The crew member is assured that oxygen is being received when no restriction to breathing is present with the mask donned and 100% selected. Selecting EMER will provide a steady flow of pressurized oxygen to the face cone. To qualify as a quick donning mask, the mask must be properly stowed in the receptacle located behind and outboard of each crew member on the forward cabin divider and set to 100%.

NOTE

Headsets or hats worn by the crew may interfere with the quick donning capability of the oxygen mask.

At cabin altitudes above 25,000 feet, 100% oxygen must be selected. To conserve oxygen when using the mask, the regulator may be set to normal if the cabin altitude is at or below 25,000 feet. When using the oxygen mask for smoke protection, the EMER position should be selected. The oxygen supply chart, Figure 3-4, is not applicable to mask use with EMER selected.

OXYGEN MASK MIC AND HEADSET MIC

A two-position toggle switch is provided on the pilot's and copilot's side consoles. The switch is marked MIC OXY MASK and MIC HEAD SET. Depressing the microphone button on the appropriate control wheel allows a crew member to transmit through the headset microphone or oxygen mask microphone, whichever is selected.

OXYGEN SYSTEM (Continued)

NOTE

This chart is based on a decompression incident at the aircraft ceiling altitude, a 10 minute emergency descent to 10,000 feet MSL, and then cruise between 10,000 feet MSL and FL250. The duration line starting point is the minimum pressure required to dispatch, assuming a 10 minute emergency descent to 10,000 feet MSL and cruising below 10,000 feet MSL. All durations include 2 crew consumption after depressurization. The chart does not take into account pilot usage requirement for normal flight above FL350. Crew respiratory rate is assumed 20 lpm-btps for 10 minute emergency descent and 10 lpm-bpts thereafter.

OXYGEN DURATION OF 50 CU. FT. BOTTLE

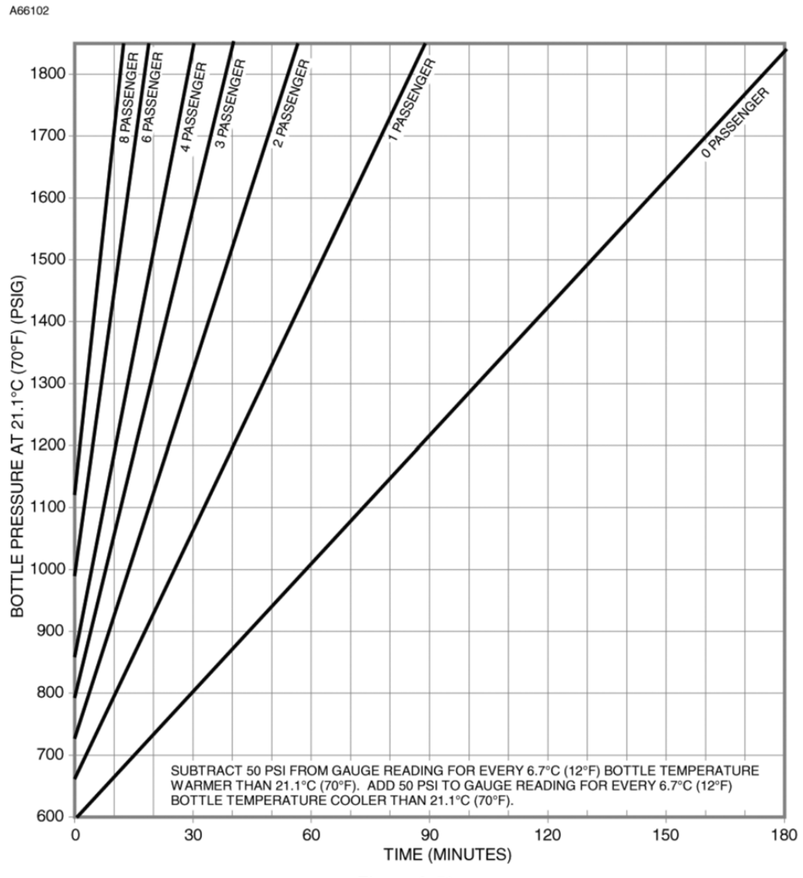

Figure 3-5*

ANTISKID SYSTEM

The antiskid system provides power assisted braking with skid protection. It is designed to provide maximum braking efficiency on all runway surfaces. The system consists of two wheel speed generators, power brake relay/antiskid valve, control box, oversize reservoir, accumulator and an electrically-driven hydraulic pump.

CAUTION

Do not pull the brake system circuit breaker to prevent the power brake pump from cycling. With the circuit breaker disengaged, the power brake system is inoperative and the rudder pedal toe brakes are disabled. Braking is then available only by use of the pneumatic brake system.

NOTE

If a low brake pressure condition occurs on the ground, the PWR BRK LOW PRESS annunciator will illuminate flashing and the MASTER CAUTION will illuminate steady, but will not cancel when pressed. These visual alerts will continue until the low brake pressure condition is corrected.

System operation is conventional with power braking available at all speeds while antiskid protection is available at speeds above approximately 12 knots. The antiskid protection feature is designed to operate with maximum pilot applied brake pressure. Do not modulate brake pressure when maximum braking is desired.

To ensure proper braking on water, snow and ice-covered, hard-surfaced runways and all unimproved surfaces, it is necessary for the pilot to apply maximum effort to the brake pedals throughout the braking run. When the system detects a skid and releases the applied brake pressure, any attempt by the pilot to modulate braking can result in an interruption of the applied brake signal and may increase stopping distance significantly.

COPILOT'S ELECTRIC ELEVATOR TRIM

An electric elevator trim switch installed on the copilot's control wheel provides the copilot with electric elevator trim. The pilot's electric elevator trim switch, however, has priority and will operate the trim interrupting and overriding actuation of the copilot's switch. Both control wheels contain the trim disconnect function, full time, for the trim runaway condition.

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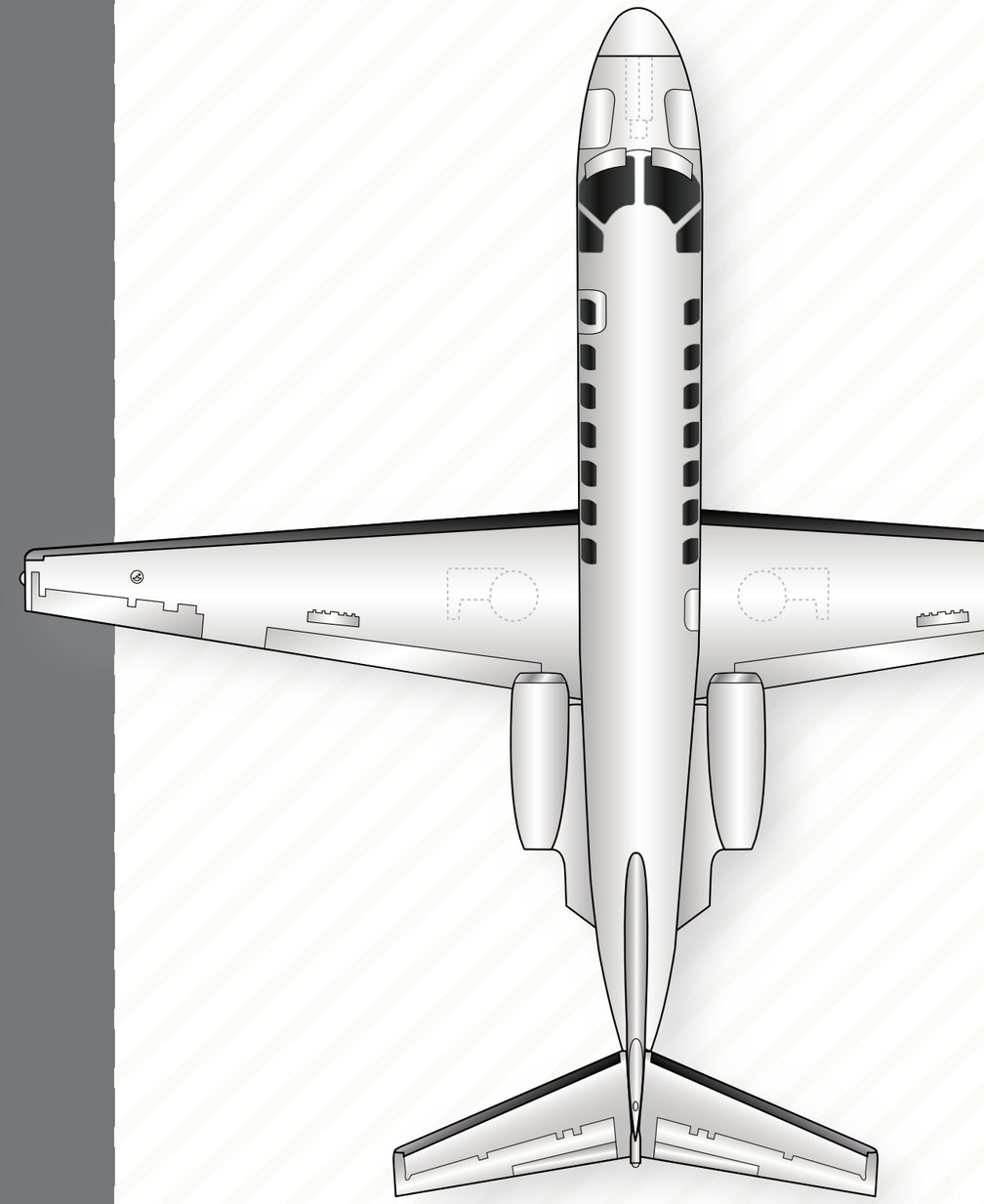
PERFORMANCE



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PERFORMANCE
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PERFORMANCE - GENERAL

REGULATORY COMPLIANCE

Information in this section is presented for the purpose of compliance with the appropriate performance criteria and certification requirements of 14 CFR Part 23 and applicable special conditions.

STANDARD PERFORMANCE CONDITIONS

All performance in this manual is based on flight test data and the following conditions:

1. Thrust ratings include the installation, bleed air and accessory losses.
2. Full temperature accountability within the operational limits for which the airplane is certified.

NOTE

Should ambient air temperature or altitude be below the lowest temperature or altitude shown on the performance charts, use the performance at the lowest value shown.

3. Wing flap positions as follows:

	Flap Handle Position	Flap Deflection
a. Takeoff	UP and TO/APPR	0° and 15°
b. Enroute	UP	0°
c. Approach	TO/APPR	15°
d. Landing	LAND	35°
	GROUND FLAPS	55°

4. All takeoff and landing performance is based on a paved, dry runway.
5. The takeoff performance was obtained using the following procedures and conditions:

SINGLE ENGINE TAKEOFF - ACCELERATE GO

a. The thrust was set to takeoff detent, N_1's were stabilized, then the brakes were released.
b. The pilot recognized engine failure at V_1.
c. The airplane continued to accelerate to V_R at which time positive rotation (3° to 5° per second) to +10 degrees nose up pitch attitude was made. Pitch attitude was adjusted as required to achieve V_2 upon reaching 35 feet AGL.
d. The landing gear was retracted after reaching 35 feet AGL.
e. V_2 was maintained from the 35-foot point above the runway to 1500 feet AGL.

(Continued Next Page)

STANDARD PERFORMANCE CONDITIONS (Continued)

SINGLE ENGINE TAKEOFF - ACCELERATE STOP

a. The thrust was set to takeoff detent, N_1's were stabilized, then the brakes were released.
b. The pilot recognized the necessity to stop because of engine failure or other reasons just prior to V_1.
c. Maximum pilot braking effort was started at V_1 and continued until the airplane came to a stop.
d. Both throttles were brought to idle immediately after brake application.
e. Directional control was maintained through the rudder pedals and differential braking as required.
f. Antiskid was ON during all tests.
g. Speedbrakes and ground flaps were not used.

MULTI-ENGINE TAKEOFF

a. The thrust was set to takeoff detent, N_1's were stabilized, then the brakes were released.
b. Positive rotation (3° to 5° per second) to +10 degrees was made at V_R accelerating to V_2 +12 KIAS (Flaps 15°) or V_2 +15 KIAS (Flaps 0°) and pitch adjusted as required to maintain V_2 +12 KIAS (Flaps 15°) or V_2+15 KIAS (Flaps 0°) (V_{35}).
c. The landing gear was retracted when a positive climb rate was established.
d. V_2 +12 KIAS (Flaps 15°) or V_2 +15 KIAS (Flaps 0°) was maintained from the 35-foot point above the runway until the obstacle was cleared, at which time, the airplane was accelerated and the flaps were retracted.

6. The landing performance was obtained using the following procedures and conditions:

LANDING

a. Landing preceded by a steady three degree angle approach down to the 50-foot height point with airspeed at V_{REF} in the landing configuration.
b. Two engine thrust setting during approach was selected to maintain the three degree approach angle at V_{REF}.
c. Idle thrust was established at the 50-foot height point and throttles remained in that setting until the airplane had stopped.
d. Rotation to a landing attitude was accomplished at a normal rate.
e. Maximum wheel braking was initiated immediately on nose wheel contact and continued throughout the landing roll. Ground flaps were selected immediately after brake application.
f. The antiskid system was ON during all tests.
g. Speed brakes were disabled (i.e. no performance credit).

7 PERFORMANCE

VARIABLE FACTORS AFFECTING PERFORMANCE

Details of variables affecting performance are given with tables to which they apply. Assumptions which relate to all performance calculations, unless otherwise stated, are:

- Cabin pressurization.
- Anti-ice off.
- Humidity corrections on thrust have been applied according to the applicable regulations.
- Winds, for which correction information is presented on the charts, are to be taken as the tower winds 32.8 feet (10 meters) above runway surface. Factors have been applied as prescribed in the applicable regulations. In the tables, negative represents tailwind and positive represents headwind.
- Gradient correction factors can be applied to gradients less than or equal to 2 percent downhill or 2 percent uphill. In the tables, negative represents downhill gradients and positive represents uphill gradients.

DEFINITIONS

Accelerate-Stop Distance:	The distance required to accelerate to V_1, and abort the takeoff and come to a complete stop with maximum braking applied at V_1.
Airport Barometric Altitude:	Indicated altitude with altimeter set to airport altimeter setting while at airport elevation.
Altitude:	All altitudes used in this manual are pressure altitudes unless otherwise stated.
Anti-Ice Systems:	The following systems comprise the anti-ice systems which affect performance in this section: a. Windshield Bleed Air Anti-Ice. b. Engine Anti-Ice. c. Wing Anti-Ice. d. Pylon Inlet Anti-ice. Performance, when referred to ANTI-ICE ON, is based on all the above systems being operated at the same time. Additionally, the pitot-static and angle-of-attack anti-ice systems are anti-ice systems which do not affect performance.
Calibrated Airspeed (KCAS):	Indicated airspeed (knots) corrected for position error and assumes zero instrument error.
Climb Gradient:	The ratio of the change in height during a portion of a climb, to the horizontal distance transversed in the same time interval.

(Continued Next Page)

DEFINITIONS (Continued)

Deice Systems:	The horizontal stabilizer tail deice system is the only deice system.
Demonstrated Crosswind:	The demonstrated crosswind velocity of 25 knots (measured at 32.8 feet (10 meters) above the runway surface) is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. This is not limiting.
Engine Out Accelerate-Go Distance:	The horizontal distance from brake release to the point at which the airplane attains a height of 35 feet above the runway surface, on a takeoff during which an engine is recognized to have failed at V_1 and the takeoff is continued.
Gross Climb Gradient:	The climb gradient that the airplane can actually achieve with ideal ambient conditions (smooth air).
Gross Takeoff Flight Path:	The takeoff flight path that the airplane can actually achieve under ideal conditions.
Indicated Airspeed (KIAS):	Airspeed indicator readings (knots). Zero instrument error is assumed.
ISA:	International Standard Atmosphere.
Landing Distance:	The distance from a point 50 feet above the runway surface to the point at which the airplane would come to a full stop on the runway.
Level Off Altitude:	The barometric altitude at which second segment climb ends.
Mach Number:	The ratio of true airspeed to the speed of sound.
Net Climb Gradient:	The gross climb gradient reduced by 0.8% during the takeoff and enroute phase.
Net Takeoff Flight Path:	Takeoff flight path used to determine obstacle clearance. Uses net climb gradients to climb to a height of 1500 feet above the runway surface.

(Continued Next Page)

DEFINITIONS (Continued)

Position Correction:	A correction applied to indicated airspeed or altitude to eliminate the effect of the location of the static pressure source on the instrument reading. No position corrections are required when using performance section charts in Section IV since all airspeeds and altitudes in this section are presented as “indicated” values except for stall speeds which are presented as “calibrated” values.
RAT:	Ram Air Temperature. RAT is displayed on each PFD. RAT is ambient air temperature increased by ram rise due to Mach Number. On the ground with engine(s) operating, RAT is ambient temperature.
Reference Zero:	The point in the takeoff flight path at which the airplane is 35 feet above the takeoff surface and at the end of the takeoff distance required.
SAT:	Static (ambient) Air Temperature. SAT is displayed on each PFD. SAT is the temperature of the air, undisturbed by the presence or motion of the airplane. The SAT display is unreliable on the ground.
Takeoff Climb Increment (TCI):	Altitude increment to be added to the airport barometric altitude to obtain level off altitude. This increment includes corrections for non-standard temperature.
Takeoff Field Length:	The Takeoff Field Length given for each combination of gross weight, ambient temperature, altitude, wind and runway gradients is the greatest of the following: a. 115 percent of the two-engine horizontal takeoff distance from start to a height of 35 feet above runway surface. b. Accelerate-stop distance. c. The engine-out accelerate-go distance. No specific identification is made on the charts as to which of these distances governs a specific case.
TEMP:	Ambient temperature used to determine airplane performance from performance charts. For takeoff performance, use RAT displayed on each PFD with engine(s) operating. For landing performance, use reported temperature from an appropriate ground station.
True Airspeed (KTAS):	The airspeed (knots) of an airplane relative to undisturbed air.

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DEFINITIONS (Continued)

V_1:	Takeoff Decision Speed. The distance to continue the takeoff to 35 feet will not exceed the scheduled takeoff field length if recognition occurred at V_1 (accelerated-go). The distance to bring the airplane to a full stop (accelerated-stop) will not exceed the scheduled takeoff field length provided that the brakes are applied at V_1.
V_2:	Takeoff Safety Speed. This climb speed is the actual speed at 35 feet above the runway surface as demonstrated in flight during takeoff with one engine inoperative.
V_{35}:	This climb speed is the actual speed at 35 feet above the runway surface as demonstrated in flight during takeoff with both engines operating.
V_A:	The maneuvering speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_{APP}:	The landing approach climb airspeed (1.3 V_{S1}) with the approach flap position, landing gear UP.
V_{ENR}:	Single-engine enroute climb speed. Utilize the speed bug V_T for display of V_{ENR} on the PFD.
V_{FE}:	Maximum flap extended speed. The highest speed permissible with wing flaps in a prescribed extended position.
V_{LE}:	Maximum landing gear extended speed. The maximum speed at which an airplane can be safely flown with the landing gear extended.
V_{LO}:	Maximum landing gear operating speed. The maximum speed at which the landing gear can be safely extended or retracted.
V_{MCA}:	Minimum airspeed in the air at which directional control can be maintained, when one engine is suddenly made inoperative. V_{MCA} is a function of engine thrust which varies with altitude and temperature. The V_{MCA} presented was determined for maximum takeoff thrust. Flaps 0° V_{MCA} = 88 KIAS Flaps 15° V_{MCA} = 81 KIAS
V_{MCG}:	Minimum airspeed on the ground at which directional control can be maintained, when one engine is suddenly made inoperative, using only aerodynamic controls. V_{MCG} is a function of engine thrust which varies with altitude and temperature. The V_{MCG} presented was determined for maximum takeoff thrust with the rudder bias system operational: V_{MCG} = 89 KIAS

(Continued Next Page)

DEFINITIONS (Continued)

V_{MO}/M_{MO}:	Maximum operating limit speed.
V_R:	The rotation speed is the speed at which rotation is initiated during takeoff to attain the V_2 climb speed at or before a height of 35 feet above runway surface has been reached.
V_{REF}:	The airspeed equal to the landing 50-foot point speed (1.3 V_{SO}) with the landing flap position and landing gear extended.
V_{SO}:	The stalling speed or the minimum steady flight speed in the landing configuration.
V_{S1}:	The stalling speed or the minimum steady flight speed obtained in a specified configuration.
V_X:	Best angle of climb speed (Multi-engine, flaps 15°) 110 KIAS.
V_Y:	Best rate of climb speed (Multi-engine, flaps 15°) 160 KIAS.
Visible Moisture:	Visible moisture includes, but is not limited to, the following conditions: fog with visibility less than one mile, wet snow and rain.
Wind:	The wind velocities recorded as variables on the charts of this section are to be understood as the headwind or tailwind components of the actual winds at 32.8 feet (10 meters) above the runway surface (tower winds).

CONFIGURATIONS

	NUMBER OF OPERATING ENGINES	THRUST	FLAP SETTING (DEGREE)	GEAR
1st SEGMENT TAKEOFF CLIMB	1	TAKEOFF	UP, 0° OR 15°	DOWN
2ND SEGMENT TAKEOFF CLIMB	1	TAKEOFF	UP, 0° OR 15°	UP
3rd SEGMENT HORIZONTAL ACCELERATION	1	TAKEOFF (10 MINUTES MAXIMUM) THEN MAXIMUM CONTINUOUS SINGLE ENGINE THRUST	15° UP	UP
ENROUTE CLIMB	1	MAXIMUM CONTINUOUS SINGLE ENGINE THRUST	UP	UP
APPROACH CLIMB	1	TAKEOFF	15°	UP
LANDING CLIMB	2	TAKEOFF	35° OR LAND	DOWN

Figure 4-1

NOISE CHARACTERISTICS

CERTIFICATED NOISE LEVELS

The following noise levels comply with 14 CFR 36, Appendix B, Stage 4 maximum noise level requirements and were obtained by analysis of approved data from noise tests conducted under the provision of 14 CFR 36, Amendment 28. The noise measurement and evaluation procedures used to obtain these noise levels are considered by the FAA to be equivalent to the Chapter 4 noise levels required by the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, Appendix 2, Amendment 7, effective March 21, 2002.

NOISE REFERENCE	EPNdB
FLYOVER	74.0
LATERAL	88.7
APPROACH	88.6

Flyover and lateral noise levels were obtained at a takeoff weight of 13,870 pounds with flaps 15° and climb speed of 124 KIAS. For takeoff, thrust was cutback from takeoff N1 to 80.9% N1 at 3486 feet AGL. Approach data was obtained at 12,750 pounds, landing gear down, flaps 35° and 117 KIAS.

No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

Refer to Section VII, Advisory Information, for Supplemental A-Weighted Noise Levels.

FLIGHT PLANNING

NOTE

Refer to Section I, TAKEOFF AND LANDING OPERATIONAL LIMITS and ENROUTE OPERATIONAL LIMITS for any serial number specific altitude restrictions.

Thorough flight planning suggests establishing a preflight goal such as maximum range, minimum time enroute, or maximum fuel reserve within the parameters defined by the basic FAA Approved Airplane Flight Manual takeoff, climb and landing requirements. Tables for Maximum Cruise Thrust, Normal Cruise Thrust, and Long Range Cruise are presented in this chapter to aid the crew in determining how best to achieve that goal. Maximum cruise thrust results in minimum time, long range cruise in optimum fuel consumption, and Normal Cruise represents a balance between the two.

Maximum range at a given altitude is dependent upon airframe efficiency and can be defined in still air as that point on the total drag curve where the relationship of velocity to total airplane drag is most favorable. The cruise angle-of-attack necessary to achieve that point is constant, but airspeed required is affected by airplane weight. The higher the weight, the higher the airspeed necessary to achieve optimum cruise angle-of-attack. This is in evidence when the long range cruise FLIGHT PLANNING tables are used and result in longer block times for the lighter weights. Enroute, as fuel burnoff occurs, thrust and airspeed required for best range will decrease as specific range increases due to improved performance at the lower operating weights. This should be considered when planning short stage lengths to avoid carrying excessive weight in stored fuel not operationally necessary.

Wind existing at cruise altitudes requires a more involved planning process to realize best range, because it requires a true airspeed faster or slower than that at which optimum range angle-of-attack is achieved in still air. This minimizes the effects of a headwind, or takes maximum advantage of a tailwind. The airplane's broad altitude capability also brings into consideration engine efficiency. Since the fuel flow necessary for a given true airspeed decreases with an increase in altitude, a higher headwind component may be tolerated at the upper flight level with best results in terms of ground distance covered to fuel consumed. Conversely, large increases in headwind velocity with altitude may dictate a lower cruise level to obtain the best fuel to distance relationship.

To assist altitude selection taking into account upper winds, Cruise Tables in the Performance Section present specific range as nautical miles per 100 pounds of fuel for different winds. In comparative calculations, the highest number always represents best specific range. The Maximum Range mode will generally result in optimum specific range, but high headwinds may suggest an increased power setting to realize a shorter trip time without affecting total fuel burn appreciably. At 35,000 feet and 13,000 pounds gross weight with a 100-knot headwind, as an example, Maximum Range and Maximum Cruise Thrust give 31.0 and 26.2 nautical miles/100 pounds, respectively. In that case, Maximum Range will produce only 4.8 nautical miles more distance per 100 pounds of fuel while the ground speed at Maximum Cruise Thrust would be approximately 111 knots faster. For the absolute best range or maximum fuel reserve goal however, cruising at the altitude/wind/thrust combination with the highest specific range number will produce optimum results.

Climb and descent at maximum speed available to achieve desired vertical rate can be used in conjunction with Maximum Cruise Thrust for the minimum time goal. Fuel economy, however, is better served by using the climb and descent schedules presented in the PERFORMANCE chapter of this section.

Once the cruise mode and altitude has been determined, enroute time and fuel required can be approximated from the appropriate FLIGHT PLANNING tables. The following criteria are used:

1 95 pounds of taxi fuel.
2. Multi-engine climb at 222 Knots / 0.56 Mach
3. 60% of the cruise wind factor applied to climb; 40% to descent.
4. Descent to 10,000 feet from cruise altitude using high speed descent profile.
5. 30 nautical miles from destination at 10,000 feet and long range cruise airspeed.
6. Ten minutes approach fuel based on 10,000 feet and 150 KCAS.
7. No reserve fuel.

FUEL RANGE TABLE USAGE

Entering the table at the planned stage length, read the fuel and time required for the conditions. If the fuel required is in excess of fuel available or if fuel reserves are inadequate, it may be advantageous to utilize one of the more economical cruise airspeed profiles and repeat the flight planning process. Specific data are presented in the PERFORMANCE chapter for separate computation of the climb, cruise and descent phases. If taxi time is known, 5 pounds per minute fuel flow can be used in lieu of the 95-pound figure. After airplane loading and flight plan fuel requirements are determined, takeoff, climb and landing gross weights should be rechecked for compliance with Flight Manual criteria.

FLIGHT PLANNING
MAX CRUISE

STANDARD DAY — **CRUISE ALTITUDE 37000 FEET**

FAN SETTING FOR MAX CRUISE - PERCENT N1

CRUISE WEIGHT - LBS										
13500	13000	12500	12000	11500	11000	10500	10000	9500	9000	8500
98.5	98.5	98.5	98.5	98.2	98.0	97.8	97.6	97.4	97.2	97.0

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	823	0.70	864	0.75	889	0.77	919	0.80	954	0.84	996	0.88	1117	1.02
	11000	758	0.69	800	0.74	826	0.77	856	0.80	892	0.84	937	0.90	1072	1.07
	9000	718	0.68	760	0.73	786	0.77	817	0.80	854	0.85	900	0.91	1047	1.12
300	13870	1038	0.90	1103	0.96	1141	1.00	1186	1.05	1239	1.10	1301	1.16	1472	1.34
	11000	969	0.89	1034	0.95	1073	1.00	1118	1.04	1171	1.10	1235	1.18	1419	1.39
	9000	925	0.88	989	0.95	1028	1.00	1074	1.05	1127	1.11	1192	1.19	1389	1.46
400	13870	1253	1.10	1341	1.18	1394	1.23	1454	1.29	1523	1.36	1605	1.44	1827	1.67
	11000	1180	1.08	1267	1.17	1319	1.23	1379	1.29	1449	1.36	1532	1.45	1765	1.72
	9000	1132	1.07	1218	1.17	1270	1.23	1330	1.29	1400	1.37	1484	1.47	1730	1.79
500	13870	1468	1.29	1579	1.40	1646	1.46	1721	1.54	1808	1.62	1909	1.72	2181	2.00
	11000	1390	1.28	1500	1.39	1565	1.45	1640	1.53	1727	1.62	1829	1.73	2110	2.05
	9000	1338	1.27	1447	1.39	1512	1.46	1586	1.54	1672	1.63	1775	1.75	2070	2.13
600	13870	1683	1.49	1818	1.62	1897	1.69	1988	1.78	2092	1.88	2213	2.00	2535	2.33
	11000	1600	1.47	1732	1.60	1810	1.68	1900	1.78	2003	1.88	2124	2.01	2454	2.39
	9000	1544	1.47	1674	1.60	1752	1.68	1841	1.78	1944	1.89	2065	2.03	2409	2.47
700	13870	1898	1.69	2056	1.83	2149	1.92	2255	2.02	2376	2.14	2517	2.28	2888	2.65
	11000	1809	1.67	1963	1.82	2055	1.91	2159	2.02	2279	2.14	2419	2.29	2797	2.72
	9000	1750	1.66	1902	1.82	1992	1.91	2095	2.03	2214	2.16	2355	2.31	2749	2.81
800	13870	2113	1.88	2294	2.05	2401	2.15	2522	2.27	2660	2.40	2820	2.56	3240	2.98
	11000	2018	1.86	2195	2.04	2299	2.14	2418	2.26	2554	2.40	2712	2.57	3139	3.05
	9000	1955	1.86	2129	2.04	2232	2.14	2349	2.27	2485	2.42	2644	2.60		
900	13870	2328	2.08	2532	2.27	2652	2.38	2788	2.51	2944	2.66	3124	2.83	3592	3.30
	11000	2226	2.06	2425	2.26	2543	2.37	2676	2.51	2828	2.66	3005	2.85	3481	3.39
	9000	2159	2.05	2355	2.25	2471	2.37	2603	2.51	2754	2.68				
1000	13870	2543	2.27	2770	2.48	2903	2.61	3055	2.75	3227	2.92	3426	3.11	3942	3.63
	11000	2435	2.25	2655	2.47	2785	2.60	2933	2.75	3101	2.93	3298	3.13	3822	3.72
	9000	2364	2.25	2581	2.47	2710	2.61	2856	2.76						
1100	13870	2758	2.47	3007	2.70	3154	2.84	3321	3.00	3510	3.18	3728	3.39	4288	3.96
	11000	2642	2.45	2885	2.69	3028	2.83	3190	3.00	3374	3.19	3589	3.41	4161	4.06
	9000	2568	2.44	2807	2.69										
1200	13870	2972	2.66	3245	2.92	3405	3.07	3587	3.24	3791	3.44	4026	3.67	4633	4.29
	11000	2849	2.65	3114	2.91	3270	3.06	3446	3.24	3647	3.45	3880	3.69	4501	4.40
	9000	2772	2.64												
1300	13870	3187	2.86	3482	3.13	3655	3.30	3849	3.48	4069	3.70	4322	3.95	4978	4.62
	11000	3056	2.84	3342	3.12	3511	3.29	3701	3.48	3918	3.71	4170	3.97		
	9000														
1400	13870	3401	3.05	3718	3.35	3902	3.53	4110	3.73	4346	3.96	4618	4.23	5321	4.95
	11000	3263	3.04	3570	3.34	3752	3.52	3956	3.73	4189	3.97	4459	4.25		
	9000														
1500	13870	3615	3.25	3951	3.57	4148	3.75	4370	3.97	4623	4.22	4913	4.51		
	11000	3469	3.23	3798	3.56	3992	3.75	4210	3.97	4459	4.23				
	9000														
1600	13870	3826	3.44	4184	3.78	4394	3.98	4630	4.21	4899	4.48				
	11000	3674	3.43	4025	3.78	4231	3.98	4464	4.22						
	9000														
1700	13870	4036	3.64	4415	4.00	4638	4.21	4889	4.46						
	11000	3880	3.62	4252	3.99	4471	4.21								
	9000														
1800	13870	4246	3.83	4647	4.22	4883	4.44								
	11000	4085	3.82	4478	4.21										
	9000														
1900	13870	4455	4.03	4878	4.43										
	11000	4289	4.02												
	9000														
2000	13870	4664	4.22	5109	4.65										
	11000	4493	4.21												
	9000														
2100	13870	4873	4.42												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-7 (Sheet 9)

FLIGHT PLANNING
MAX CRUISE

STANDARD DAY — **CRUISE ALTITUDE 39000 FEET**

FAN SETTING FOR MAX CRUISE - PERCENT N1

CRUISE WEIGHT - LBS										
10800	10600	10400	10200	10000	9800	9600	9400	9200	9000	8800	8600
98.2	98.2	98.1	98.0	97.9	97.8	97.7	97.6	97.5	97.4	97.4	97.3

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	1243	0.89	1196	0.85	1169	0.82	1141	0.80	1110	0.77	1077	0.74	1012	0.69
	11000	762	0.70	799	0.74	821	0.77	848	0.80	880	0.84	920	0.89	1043	1.05
	9000	716	0.69	754	0.74	777	0.77	804	0.81	838	0.85	880	0.91	1017	1.11
300	13870	1439	1.09	1413	1.06	1399	1.05	1385	1.04	1370	1.03	1356	1.02	1337	1.02
	11000	957	0.90	1015	0.96	1050	1.00	1090	1.05	1138	1.10	1196	1.17	1364	1.38
	9000	907	0.89	965	0.96	1000	1.00	1041	1.05	1090	1.11	1150	1.19	1332	1.45
400	13870	1635	1.28	1631	1.28	1629	1.28	1629	1.29	1630	1.29	1634	1.30	1661	1.35
	11000	1152	1.09	1231	1.18	1278	1.23	1332	1.29	1395	1.36	1470	1.45	1683	1.71
	9000	1097	1.08	1176	1.17	1223	1.23	1278	1.29	1342	1.37	1419	1.47	1647	1.78
500	13870	1832	1.48	1848	1.50	1859	1.51	1873	1.53	1890	1.55	1912	1.58	1985	1.68
	11000	1347	1.29	1446	1.39	1505	1.46	1573	1.53	1651	1.62	1744	1.73	2002	2.04
	9000	1288	1.28	1386	1.39	1445	1.46	1513	1.54	1592	1.63	1687	1.75	1960	2.12
600	13870	2028	1.68	2066	1.72	2089	1.74	2116	1.78	2149	1.81	2189	1.86	2309	2.00
	11000	1540	1.48	1660	1.61	1731	1.69	1813	1.78	1907	1.88	2017	2.01	2320	2.37
	9000	1477	1.47	1596	1.61	1667	1.69	1748	1.78	1842	1.89	1954	2.03	2272	2.45
700	13870	2224	1.87	2283	1.94	2319	1.97	2360	2.02	2409	2.07	2467	2.14	2632	2.33
	11000	1734	1.68	1874	1.83	1958	1.92	2052	2.02	2161	2.14	2289	2.29	2637	2.70
	9000	1666	1.67	1805	1.82	1888	1.92	1982	2.03	2091	2.15	2220	2.31	2584	2.79
800	13870	2419	2.07	2500	2.15	2548	2.21	2603	2.26	2668	2.34	2744	2.42	2954	2.66
	11000	1927	1.87	2088	2.05	2183	2.15	2291	2.27	2415	2.40	2560	2.57	2952	3.03
	9000	1855	1.86	2014	2.04	2109	2.15	2216	2.27	2340	2.41	2486	2.59		
900	13870	2615	2.26	2717	2.37	2777	2.44	2846	2.51	2926	2.60	3021	2.70	3276	2.99
	11000	2120	2.07	2301	2.26	2408	2.38	2529	2.51	2669	2.66	2831	2.84	3267	3.36
	9000	2044	2.06	2223	2.26	2329	2.38	2449	2.51	2588	2.68	2751	2.87		
1000	13870	2811	2.46	2933	2.59	3006	2.67	3089	2.75	3185	2.86	3297	2.98	3599	3.32
	11000	2312	2.26	2513	2.48	2632	2.61	2767	2.75	2921	2.92	3101	3.12	3582	3.70
	9000	2232	2.26	2431	2.48	2548	2.61	2682	2.76	2835	2.94				
1100	13870	3006	2.66	3150	2.81	3235	2.89	3332	3.00	3444	3.12	3574	3.26	3920	3.64
	11000	2504	2.46	2725	2.70	2856	2.84	3004	3.00	3173	3.18	3370	3.40	3895	4.03
	9000	2420	2.45	2638	2.69	2767	2.84								
1200	13870	3202	2.85	3367	3.02	3464	3.12	3575	3.24	3702	3.38	3850	3.54	4242	3.97
	11000	2695	2.66	2936	2.91	3079	3.07	3240	3.24	3424	3.44	3638	3.68	4208	4.37
	9000	2607	2.65												
1300	13870	3397	3.05	3583	3.24	3693	3.35	3817	3.48	3960	3.64	4126	3.81	4561	4.30
	11000	2886	2.85	3147	3.13	3302	3.30	3476	3.49	3675	3.70	3905	3.96	4520	4.71
	9000	2794	2.84												
1400	13870	3593	3.24	3799	3.46	3921	3.58	4060	3.73	4218	3.90	4400	4.09	4880	4.63
	11000	3076	3.05	3358	3.35	3524	3.53	3711	3.73	3925	3.97	4172	4.24		
	9000														
1500	13870	3788	3.44	4015	3.67	4150	3.81	4301	3.97	4474	4.16	4674	4.37	5198	4.96
	11000	3266	3.24	3568	3.56	3745	3.76	3945	3.97	4174	4.23	4438	4.53		
	9000														
1600	13870	3983	3.63	4231	3.89	4377	4.04	4541	4.22	4729	4.42	4946	4.65		
	11000	3456	3.44	3777	3.78	3966	3.99	4179	4.22						
	9000														
1700	13870	4178	3.83	4446	4.11	4603	4.27	4781	4.46						
	11000	3646	3.63	3986	4.00	4187	4.21								
	9000														
1800	13870	4372	4.02	4660	4.32	4829	4.50								
	11000	3835	3.83	4195	4.22										
	9000														
1900	13870	4565	4.22	4873	4.54										
	11000	4023	4.02												
	9000														
2000	13870	4758	4.42												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-7 (Sheet 10)

FLIGHT PLANNING
MAX CRUISE

STANDARD DAY — **CRUISE ALTITUDE 41000 FEET**

FAN SETTING FOR MAX CRUISE - PERCENT N1

CRUISE WEIGHT - LBS			
9200	9000	8800	8600
97.7	97.7	97.6	97.6

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
600	13870	2408	1.79	2390	1.77	2380	1.76	2371	1.75	2362	1.75	2355	1.74	2356	1.76
	11000	1695	1.60	1759	1.67	1798	1.72	1843	1.78	1896	1.84	1960	1.93	2147	2.18
	9000	1431	1.48	1538	1.61	1601	1.69	1674	1.78	1759	1.89	1860	2.02	2151	2.43
700	13870	2586	1.98	2587	1.99	2589	1.99	2593	2.00	2599	2.01	2608	2.03	2652	2.09
	11000	1872	1.79	1956	1.89	2006	1.95	2063	2.02	2130	2.10	2210	2.21	2439	2.51
	9000	1606	1.68	1731	1.83	1806	1.92	1891	2.03	1989	2.15	2106	2.30	2439	2.76
800	13870	2764	2.18	2785	2.21	2798	2.23	2815	2.25	2835	2.27	2861	2.31	2947	2.42
	11000	2050	1.99	2152	2.11	2213	2.18	2283	2.27	2364	2.37	2461	2.48	2731	2.84
	9000	1781	1.88	1924	2.05	2009	2.15	2107	2.27	2219	2.41	2352	2.58	2727	3.10
900	13870	2942	2.38	2982	2.43	3007	2.46	3036	2.49	3071	2.54	3114	2.59	3242	2.76
	11000	2227	2.18	2348	2.33	2420	2.41	2503	2.51	2598	2.63	2711	2.76	3023	3.16
	9000	1955	2.07	2117	2.26	2213	2.38	2322	2.51	2448	2.67	2597	2.86		
1000	13870	3120	2.58	3180	2.65	3216	2.69	3258	2.74	3307	2.80	3367	2.87	3537	3.09
	11000	2404	2.38	2544	2.54	2627	2.64	2722	2.75	2832	2.88	2961	3.04	3314	3.50
	9000	2129	2.27	2309	2.48	2416	2.61	2537	2.76	2677	2.93				
1100	13870	3298	2.77	3377	2.87	3425	2.92	3479	2.99	3543	3.06	3619	3.16	3832	3.42
	11000	2580	2.58	2740	2.76	2834	2.87	2942	3.00	3065	3.14	3210	3.32	3605	3.83
	9000	2302	2.46	2501	2.70	2618	2.84								
1200	13870	3476	2.97	3574	3.09	3633	3.15	3700	3.23	3779	3.33	3871	3.44	4126	3.75
	11000	2757	2.77	2935	2.98	3041	3.10	3160	3.24	3298	3.41	3458	3.60	3894	4.17
	9000	2475	2.66												
1300	13870	3653	3.17	3771	3.30	3841	3.39	3921	3.48	4014	3.59	4123	3.72	4419	4.08
	11000	2934	2.97	3130	3.19	3247	3.33	3378	3.49	3529	3.67	3705	3.88	4182	4.50
	9000	2648	2.85												
1400	13870	3831	3.36	3958	3.52	4049	3.62	4142	3.72	4249	3.85	4374	4.00	4712	4.41
	11000	3110	3.16	3325	3.41	3452	3.56	3596	3.73	3760	3.93	3952	4.16		
	9000														
1500	13870	4009	3.56	4165	3.74	4257	3.85	4363	3.97	4484	4.11	4625	4.28	5005	4.74
	11000	3285	3.36	3519	3.63	3657	3.79	3812	3.97	3991	4.19	4198	4.44		
	9000														
1600	13870	4186	3.76	4361	3.96	4465	4.08	4583	4.21	4719	4.37	4876	4.56		
	11000	3461	3.55	3712	3.84	3861	4.02	4028	4.22						
	9000														
1700	13870	4363	3.95	4558	4.18	4673	4.31	4804	4.46						
	11000	3635	3.75	3905	4.06	4064	4.25								
	9000														
1800	13870	4541	4.15	4754	4.39	4881	4.54								
	11000	3810	3.94												
	9000														
1900	13870	4718	4.35												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-7 (Sheet 11)

FLIGHT PLANNING
MAX CRUISE

STANDARD DAY — **CRUISE ALTITUDE 43000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	512	0.65	544	0.68	563	0.71	586	0.73	614	0.77	648	0.81	748	0.93
	11000	517	0.65	547	0.69	567	0.72	590	0.75	617	0.79	652	0.84	762	0.99
	9000	521	0.66	551	0.70	570	0.73	593	0.76	621	0.80	657	0.86	777	1.05
400	13870	837	1.05	904	1.13	945	1.18	992	1.24	1047	1.31	1113	1.39	1293	1.62
	11000	839	1.05	905	1.14	945	1.19	992	1.25	1046	1.32	1111	1.41	1299	1.66
	9000	842	1.05	907	1.14	947	1.19	992	1.25	1047	1.33	1112	1.42	1310	1.72
600	13870	1161	1.45	1265	1.58	1327	1.66	1398	1.75	1480	1.85	1577	1.97	1836	2.30
	11000	1161	1.45	1263	1.58	1324	1.65	1393	1.74	1474	1.85	1569	1.97	1835	2.33
	9000	1163	1.45	1263	1.58	1323	1.65	1391	1.75	1471	1.85	1567	1.98	1843	2.39
800	13870	1485	1.85	1625	2.03	1708	2.13	1803	2.25	1912	2.39	2040	2.55	2378	2.98
	11000	1483	1.84	1620	2.02	1701	2.12	1794	2.24	1901	2.38	2027	2.54	2369	3.00
	9000	1484	1.84	1618	2.01	1698	2.12	1790	2.24	1895	2.38	2021	2.55	2373	3.05
1000	13870	1809	2.26	1985	2.48	2089	2.61	2207	2.75	2343	2.92	2502	3.12	2918	3.65
	11000	1805	2.24	1977	2.46	2079	2.59	2195	2.73	2328	2.90	2483	3.11	2902	3.67
	9000	1804	2.23	1973	2.45	2073	2.58	2187	2.72	2319	2.90	2473	3.11	2905	3.73
1200	13870	2132	2.66	2344	2.92	2469	3.08	2611	3.26	2774	3.46	2963	3.70	3457	4.33
	11000	2127	2.64	2333	2.90	2456	3.05	2594	3.23	2754	3.43	2939	3.67	3435	4.34
	9000	2124	2.62	2328	2.88	2448	3.03	2585	3.21	2742	3.42				
1400	13870	2456	3.06	2703	3.37	2849	3.55	3014	3.76	3204	3.99	3423	4.27	3994	5.00
	11000	2448	3.03	2689	3.33	2832	3.51	2994	3.72	3179	3.95	3394	4.23	3967	5.00
	9000	2444	3.01	2682	3.31	2822	3.49								
1600	13870	2779	3.46	3061	3.81	3228	4.02	3417	4.25	3633	4.53	3882	4.84	4530	5.67
	11000	2769	3.42	3045	3.77	3208	3.98	3393	4.21	3603	4.48	3848	4.79	4498	5.67
	9000	2764	3.40												
1800	13870	3102	3.86	3419	4.25	3607	4.49	3819	4.75	4061	5.06	4340	5.41	5065	6.34
	11000	3090	3.82	3401	4.21	3584	4.44	3791	4.70	4027	5.00	4301	5.35		
	9000														
1900	13870	3263	4.06	3598	4.47	3796	4.72	4020	5.00	4275	5.32	4569	5.69	5331	6.67
	11000	3250	4.01	3578	4.42	3772	4.67	3990	4.94	4239	5.26	4527	5.63		
	9000														
2000	13870	3424	4.26	3777	4.69	3986	4.95	4221	5.25	4489	5.58	4798	5.98		
	11000	3411	4.21	3756	4.64	3959	4.90	4189	5.19	4450	5.52				
	9000														
2100	13870	3585	4.45	3956	4.92	4175	5.19	4421	5.50	4702	5.85	5026	6.26		
	11000	3571	4.41	3933	4.86	4147	5.13	4387	5.43	4662	5.78				
	9000														
2200	13870	3747	4.65	4135	5.14	4363	5.42	4622	5.74	4916	6.11				
	11000	3731	4.60	4110	5.08	4334	5.36	4586	5.68						
	9000														
2300	13870	3908	4.85	4313	5.36	4552	5.65	4822	5.99						
	11000	3891	4.80	4288	5.29	4521	5.59								
	9000														
2400	13870	4069	5.05	4492	5.58	4741	5.89								
	11000	4051	4.99	4465	5.51										
	9000														
2500	13870	4230	5.25	4670	5.80	4930	6.12								
	11000	4211	5.19	4642	5.73										
	9000														
2600	13870	4391	5.45	4849	6.02										
	11000	4371	5.39												
	9000														
2700	13870	4552	5.65	5027	6.24										
	11000	4531	5.58												
	9000														
2800	13870	4712	5.84												
	11000														
	9000														

525BOM-00-00

NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-7 (Sheet 12)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 37000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
100	13870	586	0.51	607	0.53	621	0.54	637	0.56	657	0.59	682	0.61	761	0.70
	11000	533	0.49	554	0.52	568	0.54	585	0.56	606	0.59	633	0.62	723	0.75
	9000	500	0.49	521	0.52	535	0.54	552	0.56	573	0.59	602	0.64	702	0.80
200	13870	805	0.70	850	0.75	877	0.77	909	0.81	946	0.84	992	0.89	1121	1.03
	11000	744	0.69	789	0.74	816	0.77	847	0.80	885	0.85	932	0.90	1071	1.08
	9000	707	0.68	751	0.73	778	0.77	809	0.81	848	0.85	895	0.92	1045	1.13
300	13870	1023	0.90	1091	0.96	1132	1.00	1180	1.05	1234	1.10	1300	1.17	1479	1.36
	11000	955	0.88	1022	0.95	1063	1.00	1109	1.05	1164	1.11	1230	1.18	1418	1.40
	9000	914	0.88	980	0.95	1020	1.00	1066	1.05	1121	1.11	1188	1.20	1387	1.46
400	13870	1240	1.09	1332	1.18	1387	1.23	1449	1.29	1521	1.36	1606	1.45	1835	1.68
	11000	1166	1.08	1256	1.17	1309	1.23	1371	1.29	1442	1.37	1527	1.46	1764	1.73
	9000	1121	1.07	1209	1.17	1262	1.23	1323	1.29	1394	1.38	1479	1.48	1728	1.80
500	13870	1457	1.29	1572	1.40	1640	1.46	1718	1.54	1807	1.62	1912	1.73	2190	2.01
	11000	1376	1.28	1488	1.39	1555	1.46	1631	1.53	1719	1.63	1823	1.74	2109	2.06
	9000	1328	1.27	1438	1.39	1504	1.46	1579	1.54	1666	1.64	1771	1.76	2069	2.13
600	13870	1674	1.48	1812	1.61	1893	1.69	1986	1.78	2092	1.88	2216	2.00	2543	2.34
	11000	1586	1.47	1721	1.60	1800	1.69	1891	1.78	1996	1.89	2119	2.02	2453	2.39
	9000	1534	1.46	1666	1.60	1744	1.69	1834	1.78	1938	1.90	2061	2.04	2409	2.48
700	13870	1889	1.68	2050	1.83	2145	1.92	2253	2.02	2376	2.14	2519	2.28	2895	2.66
	11000	1796	1.67	1952	1.82	2045	1.92	2150	2.02	2272	2.15	2413	2.30	2796	2.73
	9000	1739	1.66	1893	1.82	1985	1.92	2089	2.03	2209	2.16	2351	2.32	2749	2.82
800	13870	2105	1.87	2288	2.05	2397	2.15	2519	2.27	2659	2.40	2821	2.56	3245	2.99
	11000	2005	1.86	2183	2.04	2289	2.14	2409	2.27	2547	2.41	2707	2.58	3138	3.06
	9000	1945	1.86	2121	2.04	2225	2.15	2344	2.27	2480	2.42	2640	2.60		
900	13870	2319	2.07	2526	2.26	2647	2.38	2784	2.51	2941	2.66	3122	2.84	3594	3.32
	11000	2213	2.06	2414	2.26	2533	2.37	2667	2.51	2821	2.67	3000	2.86	3480	3.39
	9000	2150	2.05	2348	2.25	2465	2.38	2597	2.52	2750	2.68				
1000	13870	2534	2.26	2762	2.48	2897	2.61	3049	2.75	3222	2.92	3422	3.12	3942	3.65
	11000	2421	2.25	2644	2.47	2775	2.60	2924	2.75	3095	2.93	3292	3.14	3820	3.73
	9000	2355	2.25	2574	2.47	2704	2.61	2851	2.76						
1100	13870	2747	2.46	2998	2.70	3146	2.84	3313	3.00	3502	3.18	3721	3.40	4289	3.97
	11000	2629	2.45	2873	2.69	3018	2.83	3181	3.00	3367	3.19	3584	3.42		
	9000	2559	2.44	2800	2.69										
1200	13870	2960	2.66	3233	2.91	3394	3.07	3576	3.24	3782	3.44	4019	3.68	4634	4.31
	11000	2836	2.64	3103	2.91	3260	3.06	3437	3.24	3640	3.45	3874	3.70		
	9000	2763	2.64												
1300	13870	3173	2.85	3468	3.13	3642	3.30	3838	3.49	4060	3.70	4317	3.95		
	11000	3043	2.84	3331	3.12	3501	3.29	3693	3.49	3911	3.71				
	9000														
1400	13870	3385	3.05	3702	3.35	3889	3.53	4099	3.73	4338	3.96				
	11000	3250	3.03	3559	3.34	3742	3.52	3947	3.73						
	9000														
1500	13870	3596	3.24	3936	3.56	4135	3.76	4360	3.97						
	11000	3456	3.23	3787	3.56	3982	3.75								
	9000														
1600	13870	3807	3.44	4168	3.78	4381	3.99								
	11000	3661	3.43	4014	3.78										
	9000														
1700	13870	4018	3.63	4401	4.00										
	11000	3866	3.62												
	9000														
1800	13870	4228	3.83												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 9)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 39000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
100	13870	599	0.52	619	0.54	631	0.55	647	0.57	666	0.59	690	0.62	765	0.71
	11000	539	0.50	559	0.53	572	0.54	588	0.57	608	0.59	634	0.63	721	0.75
	9000	504	0.49	524	0.52	537	0.54	553	0.57	574	0.60	601	0.64	699	0.80
200	13870	799	0.71	840	0.76	866	0.78	895	0.81	930	0.85	972	0.90	1094	1.03
	11000	735	0.70	776	0.74	801	0.77	831	0.81	867	0.85	910	0.91	1043	1.08
	9000	695	0.69	736	0.74	761	0.77	791	0.81	827	0.86	871	0.92	1015	1.13
300	13870	999	0.91	1062	0.97	1100	1.01	1143	1.06	1194	1.11	1255	1.18	1423	1.36
	11000	930	0.89	992	0.96	1030	1.00	1073	1.05	1125	1.11	1186	1.18	1364	1.40
	9000	886	0.88	948	0.96	985	1.00	1028	1.05	1079	1.12	1141	1.20	1330	1.46
400	13870	1199	1.10	1283	1.19	1334	1.24	1392	1.30	1459	1.37	1538	1.45	1752	1.68
	11000	1125	1.09	1208	1.18	1258	1.23	1315	1.30	1382	1.37	1461	1.46	1684	1.73
	9000	1077	1.08	1159	1.17	1208	1.23	1264	1.30	1330	1.38	1410	1.48	1645	1.80
500	13870	1398	1.30	1505	1.41	1568	1.47	1640	1.54	1723	1.63	1820	1.73	2081	2.01
	11000	1319	1.28	1423	1.39	1485	1.46	1556	1.54	1638	1.63	1735	1.74	2003	2.06
	9000	1267	1.27	1369	1.39	1430	1.46	1500	1.54	1581	1.64	1678	1.76	1958	2.13
600	13870	1598	1.49	1726	1.62	1802	1.70	1888	1.79	1987	1.89	2103	2.01	2410	2.34
	11000	1513	1.48	1638	1.61	1712	1.69	1796	1.78	1893	1.89	2008	2.02	2320	2.39
	9000	1457	1.47	1579	1.61	1652	1.69	1735	1.79	1831	1.90	1946	2.04	2271	2.47
700	13870	1798	1.69	1948	1.84	2036	1.93	2137	2.03	2252	2.15	2386	2.29	2739	2.66
	11000	1707	1.67	1852	1.83	1938	1.92	2036	2.03	2148	2.15	2280	2.30	2637	2.72
	9000	1646	1.67	1789	1.82	1873	1.92	1970	2.03	2081	2.16	2213	2.32	2584	2.81
800	13870	1998	1.88	2169	2.06	2271	2.16	2385	2.27	2516	2.41	2669	2.57	3069	2.99
	11000	1900	1.87	2065	2.04	2163	2.15	2274	2.27	2402	2.41	2551	2.58	2953	3.05
	9000	1836	1.86	1998	2.04	2094	2.15	2204	2.27	2330	2.42	2479	2.60		
900	13870	2198	2.08	2391	2.27	2505	2.39	2634	2.52	2781	2.67	2952	2.84	3396	3.32
	11000	2093	2.06	2278	2.26	2388	2.38	2513	2.51	2655	2.67	2822	2.86	3268	3.39
	9000	2024	2.06	2207	2.26	2315	2.38	2437	2.52	2579	2.68	2744	2.88		
1000	13870	2399	2.27	2613	2.49	2739	2.62	2882	2.76	3046	2.93	3234	3.12	3719	3.65
	11000	2285	2.26	2491	2.48	2612	2.61	2750	2.76	2908	2.93	3091	3.14	3582	3.72
	9000	2213	2.25	2415	2.48	2535	2.61	2671	2.76	2827	2.94				
1100	13870	2599	2.47	2834	2.71	2973	2.85	3131	3.00	3308	3.19	3512	3.40	4040	3.97
	11000	2477	2.45	2703	2.70	2836	2.84	2987	3.00	3160	3.19	3360	3.42	3895	4.05
	9000	2401	2.45	2623	2.69	2754	2.84								
1200	13870	2799	2.66	3056	2.92	3207	3.08	3375	3.25	3567	3.45	3788	3.68	4360	4.30
	11000	2668	2.65	2914	2.91	3059	3.07	3224	3.25	3411	3.45	3629	3.70		
	9000	2589	2.64	2830	2.91										
1300	13870	2999	2.86	3275	3.14	3437	3.30	3618	3.49	3825	3.71	4063	3.96	4679	4.63
	11000	2859	2.85	3125	3.13	3282	3.30	3459	3.49	3662	3.71	3896	3.98		
	9000	2776	2.84												
1400	13870	3198	3.06	3492	3.36	3666	3.53	3861	3.74	4083	3.97	4338	4.24		
	11000	3049	3.04	3336	3.35	3504	3.53	3694	3.73	3911	3.97				
	9000														
1500	13870	3394	3.25	3709	3.57	3894	3.76	4102	3.98	4339	4.23				
	11000	3240	3.24	3546	3.56	3726	3.76	3929	3.98						
	9000														
1600	13870	3590	3.45	3925	3.79	4122	3.99	4343	4.22						
	11000	3429	3.43	3755	3.78	3947	3.99								
	9000														
1700	13870	3785	3.64	4140	4.01	4349	4.22								
	11000	3619	3.63	3964	4.00										
	9000														
1800	13870	3980	3.84	4355	4.22										
	11000	3808	3.82												
	9000														
1900	13870	4174	4.03												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 10)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 41000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	798	0.72	835	0.77	859	0.79	886	0.82	918	0.86	957	0.91	1071	1.04
	11000	728	0.70	766	0.75	790	0.78	818	0.81	851	0.86	893	0.91	1020	1.08
	9000	686	0.69	724	0.74	748	0.78	776	0.81	809	0.86	852	0.92	990	1.13
300	13870	978	0.92	1036	0.98	1070	1.02	1110	1.07	1157	1.12	1213	1.18	1369	1.36
	11000	909	0.90	967	0.97	1002	1.01	1043	1.06	1091	1.12	1149	1.19	1318	1.41
	9000	863	0.89	920	0.96	954	1.01	994	1.06	1042	1.12	1101	1.20	1281	1.46
400	13870	1159	1.11	1236	1.20	1282	1.25	1335	1.31	1396	1.38	1469	1.46	1666	1.69
	11000	1090	1.09	1167	1.18	1214	1.24	1267	1.30	1329	1.38	1404	1.47	1614	1.73
	9000	1039	1.09	1114	1.18	1160	1.24	1213	1.30	1275	1.38	1349	1.48	1571	1.79
500	13870	1340	1.31	1436	1.42	1494	1.48	1560	1.55	1635	1.64	1724	1.74	1964	2.01
	11000	1270	1.29	1367	1.40	1424	1.47	1490	1.55	1567	1.64	1658	1.75	1910	2.06
	9000	1215	1.28	1309	1.40	1365	1.46	1430	1.55	1506	1.64	1597	1.76	1860	2.13
600	13870	1521	1.50	1637	1.63	1706	1.71	1784	1.80	1875	1.90	1980	2.02	2262	2.34
	11000	1450	1.49	1566	1.62	1635	1.70	1713	1.79	1804	1.90	1911	2.02	2204	2.39
	9000	1390	1.48	1503	1.61	1570	1.69	1648	1.79	1737	1.90	1844	2.04	2149	2.46
700	13870	1702	1.70	1837	1.85	1918	1.94	2009	2.04	2114	2.16	2236	2.29	2560	2.67
	11000	1630	1.68	1764	1.83	1844	1.93	1935	2.03	2040	2.16	2163	2.30	2497	2.72
	9000	1565	1.67	1696	1.83	1775	1.92	1864	2.03	1968	2.16	2090	2.32	2437	2.80
800	13870	1883	1.90	2038	2.07	2130	2.17	2234	2.28	2353	2.42	2492	2.57	2858	2.99
	11000	1808	1.88	1962	2.05	2053	2.16	2156	2.28	2275	2.42	2414	2.58	2789	3.05
	9000	1739	1.87	1889	2.05	1979	2.15	2080	2.28	2198	2.42	2336	2.60	2725	3.14
900	13870	2064	2.09	2238	2.28	2342	2.40	2459	2.53	2593	2.68	2748	2.85	3156	3.32
	11000	1987	2.07	2159	2.27	2261	2.39	2377	2.52	2509	2.68	2664	2.86	3081	3.38
	9000	1913	2.06	2082	2.26	2182	2.38	2296	2.52	2427	2.68	2581	2.88		
1000	13870	2245	2.29	2439	2.50	2554	2.63	2683	2.77	2832	2.94	3004	3.13	3454	3.64
	11000	2165	2.27	2356	2.48	2469	2.61	2597	2.76	2743	2.94	2914	3.14	3371	3.71
	9000	2087	2.26	2274	2.48	2385	2.61	2511	2.77	2655	2.95	2825	3.16		
1100	13870	2426	2.48	2639	2.72	2766	2.86	2908	3.01	3071	3.19	3260	3.41	3753	3.97
	11000	2343	2.46	2552	2.70	2676	2.84	2816	3.01	2976	3.20	3163	3.42	3661	4.05
	9000	2261	2.45	2466	2.70	2587	2.84	2725	3.01						
1200	13870	2607	2.68	2840	2.93	2978	3.08	3133	3.26	3311	3.45	3516	3.68	4051	4.30
	11000	2520	2.66	2748	2.92	2882	3.07	3035	3.25	3209	3.46	3411	3.70	3949	4.38
	9000	2434	2.65	2657	2.91	2789	3.07								
1300	13870	2788	2.87	3041	3.15	3190	3.31	3358	3.50	3550	3.71	3772	3.96	4349	4.63
	11000	2696	2.85	2943	3.14	3088	3.30	3253	3.49	3440	3.72	3658	3.98		
	9000	2607	2.85												
1400	13870	2969	3.07	3241	3.37	3402	3.54	3583	3.74	3790	3.97	4028	4.24	4648	4.95
	11000	2873	3.05	3138	3.35	3294	3.53	3470	3.74	3671	3.98	3904	4.26		
	9000	2779	3.04												
1500	13870	3150	3.26	3442	3.58	3614	3.77	3808	3.99	4029	4.23	4285	4.52		
	11000	3049	3.24	3332	3.57	3499	3.76	3687	3.98	3902	4.24				
	9000														
1600	13870	3331	3.46	3642	3.80	3826	4.00	4033	4.23	4269	4.49				
	11000	3224	3.44	3526	3.79	3703	3.99	3903	4.23						
	9000														
1700	13870	3512	3.65	3843	4.02	4038	4.23	4258	4.47						
	11000	3399	3.64	3719	4.00	3907	4.22								
	9000														
1800	13870	3693	3.85	4044	4.23	4250	4.46								
	11000	3574	3.83	3912	4.22										
	9000														
1900	13870	3875	4.04	4245	4.45										
	11000	3748	4.03												
	9000														
2000	13870	4056	4.24	4445	4.67										
	11000	3922	4.22												
	9000														
2100	13870	4237	4.44												
	11000														
	9000														

525BOM-00-00

NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 11)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 43000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	802	0.74	837	0.78	858	0.81	883	0.84	913	0.87	949	0.92	1056	1.05
	11000	723	0.71	759	0.76	781	0.79	806	0.82	838	0.86	876	0.92	997	1.08
	9000	680	0.70	715	0.75	737	0.78	763	0.82	795	0.87	836	0.93	968	1.13
400	13870	1129	1.13	1199	1.21	1241	1.27	1289	1.32	1345	1.39	1411	1.47	1594	1.70
	11000	1051	1.10	1122	1.19	1164	1.25	1213	1.31	1271	1.38	1340	1.47	1537	1.74
	9000	1006	1.09	1077	1.18	1119	1.24	1168	1.31	1226	1.39	1297	1.48	1507	1.79
500	13870	1293	1.33	1380	1.43	1432	1.49	1492	1.57	1561	1.65	1643	1.75	1863	2.02
	11000	1215	1.30	1303	1.41	1356	1.48	1417	1.55	1488	1.64	1572	1.75	1807	2.06
	9000	1169	1.29	1257	1.40	1309	1.47	1370	1.55	1441	1.65	1526	1.76	1774	2.13
600	13870	1456	1.52	1561	1.65	1624	1.72	1695	1.81	1778	1.91	1874	2.03	2133	2.35
	11000	1379	1.49	1485	1.63	1548	1.70	1620	1.80	1704	1.90	1803	2.03	2077	2.39
	9000	1331	1.48	1436	1.62	1499	1.70	1571	1.79	1655	1.91	1754	2.04	2041	2.46
700	13870	1620	1.72	1743	1.86	1816	1.95	1899	2.05	1994	2.17	2105	2.30	2402	2.67
	11000	1543	1.69	1666	1.84	1740	1.93	1824	2.04	1921	2.16	2035	2.31	2348	2.72
	9000	1493	1.68	1615	1.83	1688	1.93	1771	2.04	1868	2.17	1982	2.32	2308	2.79
800	13870	1784	1.91	1924	2.08	2007	2.18	2102	2.30	2210	2.43	2337	2.58	2671	3.00
	11000	1707	1.89	1848	2.06	1932	2.16	2028	2.28	2138	2.42	2267	2.59	2618	3.05
	9000	1655	1.87	1794	2.05	1877	2.16	1971	2.28	2081	2.43	2210	2.60	2574	3.13
900	13870	1947	2.11	2105	2.30	2199	2.41	2305	2.54	2427	2.69	2568	2.86	2941	3.32
	11000	1871	2.08	2030	2.28	2124	2.39	2231	2.53	2354	2.68	2499	2.86	2889	3.38
	9000	1816	2.07	1972	2.27	2065	2.39	2171	2.53	2293	2.69	2436	2.88	2839	3.47
1000	13870	2111	2.30	2287	2.51	2391	2.64	2509	2.78	2643	2.95	2800	3.14	3211	3.65
	11000	2035	2.28	2211	2.49	2316	2.62	2435	2.77	2571	2.94	2731	3.14	3160	3.71
	9000	1977	2.27	2150	2.49	2253	2.62	2370	2.77	2504	2.95	2662	3.16		
1100	13870	2275	2.50	2468	2.73	2582	2.87	2712	3.03	2860	3.21	3032	3.42	3481	3.97
	11000	2198	2.47	2393	2.71	2508	2.85	2638	3.01	2788	3.20	2962	3.42	3431	4.04
	9000	2137	2.46	2327	2.70	2440	2.85	2568	3.01	2715	3.21				
1200	13870	2438	2.69	2649	2.95	2774	3.10	2915	3.27	3076	3.46	3263	3.69	3751	4.30
	11000	2362	2.67	2574	2.93	2700	3.08	2842	3.26	3005	3.46	3194	3.70	3703	4.37
	9000	2297	2.66	2504	2.92	2627	3.08	2766	3.26						
1300	13870	2602	2.89	2831	3.16	2966	3.33	3119	3.51	3293	3.72	3495	3.97	4020	4.63
	11000	2526	2.86	2756	3.14	2892	3.31	3046	3.50	3222	3.72	3426	3.98	3974	4.70
	9000	2457	2.85	2681	3.14	2813	3.31								
1400	13870	2766	3.08	3012	3.38	3158	3.56	3322	3.76	3510	3.98	3726	4.25	4290	4.95
	11000	2690	3.06	2938	3.36	3084	3.54	3249	3.74	3439	3.98	3658	4.26		
	9000	2617	3.05												
1500	13870	2930	3.28	3194	3.60	3350	3.79	3526	4.00	3726	4.24	3958	4.53	4561	5.28
	11000	2854	3.25	3119	3.58	3276	3.77	3453	3.99	3655	4.24	3890	4.54		
	9000	2776	3.24												
1600	13870	3093	3.47	3375	3.81	3541	4.01	3729	4.24	3943	4.50	4190	4.81		
	11000	3018	3.45	3301	3.79	3468	4.00	3657	4.23	3872	4.50				
	9000														
1700	13870	3257	3.67	3557	4.03	3733	4.24	3933	4.49	4160	4.76	4422	5.08		
	11000	3182	3.64	3483	4.01	3660	4.23	3860	4.48	4089	4.76				
	9000														
1800	13870	3421	3.86	3738	4.25	3925	4.47	4136	4.73	4376	5.02				
	11000	3346	3.84	3664	4.23	3852	4.46	4064	4.72						
	9000														
1900	13870	3585	4.06	3920	4.46	4117	4.70	4340	4.97						
	11000	3510	4.03	3846	4.44	4044	4.69								
	9000														
2000	13870	3749	4.26	4101	4.68	4309	4.93								
	11000	3674	4.23	4028	4.66										
	9000														
2100	13870	3913	4.45	4283	4.90										
	11000	3838	4.43												
	9000														
2200	13870	4076	4.65	4464	5.11										
	11000	4003	4.62												
	9000														
2300	13870	4240	4.84												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 12)

FLIGHT PLANNING
LONG RANGE CRUISE

STANDARD DAY — **CRUISE ALTITUDE 37000 FEET**

CRUISE WEIGHT LBS	FAN SETTING FOR LONG RANGE CRUISE - PERCENT N1						
	TAILWIND			ZERO WIND	HEADWIND		
	100 KT	50 KT	25 KT		25 KT	50 KT	100 KT
13870	85.4	86.0	86.6	87.1	87.8	88.6	90.4
13000	84.2	84.6	85.0	85.6	86.3	87.1	89.4
12000	82.5	83.1	83.5	83.9	84.6	85.5	87.9
11000	80.5	81.4	81.8	82.3	82.9	83.9	86.3
10000	77.8	79.4	80.0	80.6	81.2	82.0	84.9
9000	73.7	75.5	76.7	78.3	79.6	80.5	83.3

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	833	0.69	867	0.74	888	0.77	914	0.81	945	0.85	985	0.90	1102	1.04
	11000	742	0.71	777	0.76	799	0.80	826	0.84	859	0.89	901	0.95	1035	1.13
	9000	683	0.72	718	0.79	740	0.83	768	0.87	802	0.93	846	1.00	993	1.22
400	13870	1142	1.20	1222	1.32	1272	1.38	1331	1.45	1400	1.53	1484	1.62	1718	1.85
	11000	1010	1.25	1089	1.37	1138	1.44	1196	1.53	1266	1.63	1351	1.74	1601	2.03
	9000	922	1.30	999	1.44	1047	1.52	1106	1.61	1176	1.72	1263	1.84	1529	2.19
600	13870	1447	1.71	1571	1.89	1649	1.99	1740	2.10	1847	2.22	1974	2.36	2322	2.68
	11000	1274	1.80	1396	1.98	1472	2.09	1560	2.23	1666	2.38	1792	2.55	2158	2.94
	9000	1158	1.89	1275	2.11	1350	2.23	1438	2.36	1545	2.51	1673	2.69	2056	3.17
800	13870	1747	2.23	1916	2.47	2020	2.61	2143	2.76	2285	2.92	2456	3.10	2915	3.52
	11000	1535	2.35	1699	2.60	1800	2.75	1919	2.93	2059	3.13	2227	3.36	2705	3.87
	9000	1389	2.48	1547	2.78	1647	2.95	1766	3.13	1907	3.32	2079	3.54	2575	4.17
1000	13870	2043	2.74	2255	3.06	2385	3.23	2538	3.42	2716	3.63	2929	3.86	3499	4.38
	11000	1793	2.90	1997	3.23	2122	3.42	2270	3.65	2446	3.89	2654	4.18	3244	4.82
	9000	1617	3.08	1815	3.46	1939	3.68	2087	3.90	2264	4.14	2476	4.41		
1200	13870	2335	3.26	2588	3.64	2745	3.86	2927	4.10	3140	4.35	3394	4.63	4074	5.26
	11000	2047	3.46	2289	3.87	2437	4.12	2615	4.37	2828	4.66	3075	5.01	3777	5.79
	9000	1842	3.68	2078	4.15	2227	4.42	2404	4.70	2615	4.98				
1400	13870	2623	3.78	2918	4.23	3099	4.49	3310	4.78	3557	5.07	3851	5.40	4638	6.16
	11000	2296	4.02	2578	4.51	2750	4.81	2954	5.11	3203	5.44	3490	5.85	4301	6.77
	9000	2063	4.29	2337	4.85	2510	5.17								
1600	13870	2908	4.30	3243	4.82	3448	5.12	3686	5.47	3965	5.81	4301	6.19	5193	7.07
	11000	2542	4.59	2862	5.16	3059	5.50	3290	5.86	3572	6.22	3898	6.69		
	9000	2281	4.91	2591	5.56										
1800	13870	3188	4.83	3564	5.41	3793	5.76	4058	6.15	4367	6.56	4743	6.99		
	11000	2784	5.17	3142	5.81	3364	6.19	3624	6.58	3936	7.01				
	9000	2495	5.53												
2000	13870	3465	5.35	3879	6.01	4131	6.41	4424	6.84	4767	7.32				
	11000	3023	5.75	3418	6.47	3664	6.89	3953	7.31						
	9000														
2200	13870	3737	5.89	4189	6.62	4465	7.05	4785	7.54						
	11000	3259	6.33	3690	7.14	3959	7.60								
	9000														
2300	13870	3871	6.16	4343	6.92	4630	7.38	4963	7.89						
	11000	3375	6.63	3825	7.48	4105	7.96								
	9000														
2400	13870	4005	6.42	4496	7.23	4794	7.71								
	11000	3491	6.92	3958	7.82										
	9000														
2500	13870	4137	6.69	4647	7.53	4957	8.03								
	11000	3605	7.22	4090	8.16										
	9000														
2600	13870	4268	6.96	4797	7.84										
	11000	3719	7.52												
	9000														
2700	13870	4399	7.24	4946	8.15										
	11000	3832	7.82												
	9000														
2800	13870	4529	7.51	5094	8.46										
	11000	3945	8.12												
	9000														
2900	13870	4658	7.78	5241	8.77										
	11000	4056	8.42												
	9000														
3000	13870	4787	8.06												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-9 (Sheet 9)

FLIGHT PLANNING
LONG RANGE CRUISE

STANDARD DAY — **CRUISE ALTITUDE 39000 FEET**

CRUISE WEIGHT LBS	FAN SETTING FOR LONG RANGE CRUISE - PERCENT N1						
	TAILWIND			ZERO WIND	HEADWIND		
	100 KT	50 KT	25 KT		25 KT	50 KT	100 KT
11000	82.7	83.2	83.6	84.0	84.9	85.7	88.0
10500	81.8	82.3	82.7	83.1	83.8	84.8	87.2
10000	80.7	81.5	81.8	82.3	82.8	83.9	86.3
9500	79.0	80.5	81.0	81.4	82.0	82.8	85.5
9000	76.8	78.5	79.7	80.6	81.2	81.9	84.8
8500	74.6	76.3	77.6	79.1	80.4	81.1	83.8

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	1917	0.19	1818	0.09	1761	0.03	1694	-0.01	1616	0.00	1533	-0.02	1350	0.07
	11000	780	0.68	808	0.73	827	0.76	849	0.80	877	0.85	913	0.90	1030	1.08
	9000	710	0.70	740	0.76	759	0.79	783	0.84	813	0.89	853	0.96	987	1.18
400	13870	2203	0.70	2148	0.66	2117	0.63	2082	0.63	2042	0.66	2001	0.69	1929	0.85
	11000	1041	1.21	1110	1.32	1153	1.39	1204	1.47	1266	1.57	1342	1.67	1566	1.94
	9000	942	1.26	1010	1.39	1054	1.46	1106	1.54	1170	1.65	1248	1.77	1491	2.11
600	13870	2485	1.20	2473	1.23	2468	1.24	2464	1.27	2460	1.34	2462	1.41	2499	1.65
	11000	1297	1.73	1406	1.92	1474	2.03	1553	2.15	1648	2.29	1764	2.44	2093	2.82
	9000	1169	1.83	1277	2.03	1344	2.14	1424	2.26	1521	2.42	1638	2.59	1986	3.06
800	13870	2762	1.72	2792	1.80	2813	1.85	2839	1.92	2872	2.02	2915	2.13	3059	2.46
	11000	1550	2.26	1698	2.51	1789	2.67	1897	2.84	2023	3.03	2178	3.23	2611	3.71
	9000	1394	2.40	1538	2.68	1630	2.83	1737	3.00	1866	3.19	2021	3.42	2475	4.03
1000	13870	3036	2.23	3107	2.38	3153	2.47	3208	2.58	3276	2.72	3359	2.87	3610	3.29
	11000	1799	2.80	1986	3.12	2101	3.31	2235	3.53	2393	3.77	2584	4.03	3121	4.63
	9000	1615	2.98	1796	3.33	1910	3.53	2045	3.74	2205	3.98	2398	4.27		
1100	13870	3171	2.49	3263	2.67	3321	2.78	3391	2.91	3475	3.07	3579	3.25	3882	3.72
	11000	1922	3.07	2128	3.42	2254	3.63	2402	3.87	2576	4.15	2784	4.43	3373	5.09
	9000	1724	3.27	1923	3.66	2049	3.88	2197	4.12	2371	4.37	2584	4.69		
1200	13870	3305	2.75	3417	2.96	3488	3.09	3571	3.25	3672	3.42	3796	3.62	4151	4.14
	11000	2043	3.35	2269	3.72	2407	3.96	2568	4.22	2757	4.52	2983	4.84	3623	5.56
	9000	1832	3.56	2050	3.99	2186	4.24	2348	4.50	2537	4.77				
1300	13870	3439	3.00	3570	3.25	3653	3.41	3751	3.58	3868	3.78	4011	4.00	4418	4.58
	11000	2164	3.63	2408	4.03	2558	4.28	2732	4.57	2936	4.90	3181	5.25	3872	6.03
	9000	1940	3.85	2175	4.33	2323	4.60	2497	4.88						
1400	13870	3571	3.26	3722	3.55	3817	3.72	3929	3.92	4062	4.14	4225	4.39	4683	5.01
	11000	2285	3.90	2547	4.33	2708	4.61	2895	4.92	3115	5.28	3377	5.66	4118	6.51
	9000	2046	4.15	2299	4.67	2458	4.96	2645	5.27						
1500	13870	3702	3.53	3873	3.84	3980	4.03	4105	4.25	4254	4.50	4436	4.77	4945	5.46
	11000	2405	4.17	2685	4.64	2857	4.94	3057	5.27	3292	5.66	3571	6.08		
	9000	2152	4.44	2423	5.01	2592	5.32								
1600	13870	3833	3.79	4023	4.14	4141	4.35	4280	4.59	4445	4.87	4646	5.16	5205	5.90
	11000	2524	4.45	2822	4.95	3004	5.27	3218	5.63	3468	6.04	3764	6.50		
	9000	2257	4.74	2545	5.35										
1700	13870	3962	4.05	4171	4.44	4301	4.67	4454	4.93	4635	5.23	4854	5.55		
	11000	2642	4.72	2956	5.27	3149	5.61	3377	5.98	3642	6.42				
	9000	2361	5.04												
1800	13870	4090	4.31	4319	4.73	4460	4.99	4626	5.27	4822	5.60				
	11000	2760	5.00	3091	5.59	3293	5.95	3536	6.34						
	9000	2465	5.34												
1900	13870	4218	4.58	4465	5.03	4618	5.31	4797	5.62						
	11000	2877	5.27	3225	5.91	3437	6.29								
	9000	2567	5.64												
2000	13870	4344	4.84	4610	5.33	4774	5.63								
	11000	2992	5.55	3357	6.22										
	9000														
2100	13870	4470	5.11	4754	5.63										
	11000	3107	5.84												
	9000														
2200	13870	4595	5.38	4897	5.93										
	11000	3221	6.12												
	9000														
2300	13870	4718	5.65												
	11000														
	9000														

525BOM-00-00

NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-9 (Sheet 10)

FLIGHT PLANNING
LONG RANGE CRUISE

STANDARD DAY **CRUISE ALTITUDE 41000 FEET**

CRUISE WEIGHT	FAN SETTING FOR LONG RANGE CRUISE - PERCENT N1						
	TAILWIND			ZERO	HEADWIND		
LBS	100 KT	50 KT	25 KT	WIND	25 KT	50 KT	100 KT
9200	81.2	81.9	82.3	82.7	83.3	84.3	86.7
9000	80.3	81.5	81.9	82.3	82.9	83.9	86.4
8800	79.3	81.0	81.5	82.0	82.5	83.4	86.0
8600	78.4	80.1	81.0	81.6	82.2	83.0	85.7
8400	77.5	79.2	80.2	81.2	81.8	82.5	85.3
8200	76.6	78.3	79.4	80.5	81.5	82.2	84.9

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
600	13870	3237	0.90	3144	0.78	3090	0.74	3029	0.70	2967	0.73	2893	0.79	2746	0.97
	11000	1885	1.38	1916	1.47	1938	1.52	1964	1.59	1999	1.67	2042	1.77	2191	2.08
	9000	1210	1.75	1305	1.93	1365	2.04	1435	2.16	1519	2.31	1623	2.48	1936	2.91
700	13870	3367	1.14	3295	1.06	3252	1.04	3206	1.02	3160	1.06	3106	1.14	3010	1.36
	11000	2004	1.64	2054	1.76	2087	1.83	2127	1.92	2176	2.02	2239	2.15	2437	2.51
	9000	1319	2.03	1432	2.24	1502	2.37	1586	2.52	1685	2.69	1806	2.89	2168	3.37
800	13870	3496	1.39	3444	1.34	3414	1.34	3382	1.34	3352	1.40	3318	1.49	3273	1.76
	11000	2122	1.91	2191	2.06	2235	2.15	2288	2.26	2352	2.39	2433	2.54	2680	2.95
	9000	1427	2.31	1557	2.56	1639	2.70	1735	2.87	1849	3.07	1987	3.29	2397	3.84
900	13870	3625	1.63	3592	1.63	3574	1.64	3557	1.67	3543	1.74	3528	1.85	3533	2.16
	11000	2240	2.17	2327	2.35	2382	2.47	2448	2.60	2527	2.75	2626	2.92	2921	3.38
	9000	1535	2.59	1682	2.87	1774	3.03	1883	3.22	2012	3.45	2167	3.70	2626	4.31
1000	13870	3752	1.88	3739	1.91	3733	1.94	3730	1.99	3732	2.08	3736	2.20	3792	2.56
	11000	2356	2.44	2461	2.65	2527	2.79	2606	2.94	2700	3.11	2818	3.31	3161	3.83
	9000	1641	2.87	1806	3.19	1908	3.37	2030	3.58	2173	3.83	2345	4.12		
1100	13870	3879	2.13	3884	2.20	3891	2.25	3901	2.32	3919	2.42	3942	2.57	4048	2.97
	11000	2472	2.70	2594	2.95	2672	3.11	2763	3.28	2872	3.48	3007	3.71	3399	4.28
	9000	1747	3.15	1928	3.51	2042	3.71	2175	3.94	2333	4.21				
1200	13870	4004	2.39	4029	2.48	4047	2.56	4071	2.64	4105	2.77	4147	2.93	4302	3.38
	11000	2586	2.97	2727	3.25	2815	3.43	2919	3.62	3042	3.85	3195	4.10	3634	4.73
	9000	1852	3.43	2050	3.83	2174	4.05	2319	4.30						
1300	13870	4129	2.64	4173	2.77	4202	2.86	4240	2.97	4289	3.11	4350	3.30	4553	3.80
	11000	2700	3.24	2859	3.55	2957	3.75	3074	3.97	3212	4.22	3381	4.51	3868	5.19
	9000	1956	3.72	2171	4.15										
1400	13870	4253	2.89	4315	3.06	4356	3.17	4407	3.30	4472	3.47	4551	3.67	4803	4.22
	11000	2813	3.51	2989	3.86	3098	4.08	3228	4.32	3379	4.59	3565	4.91		
	9000	2059	4.01												
1500	13870	4376	3.15	4457	3.35	4509	3.48	4573	3.64	4653	3.82	4751	4.05		
	11000	2925	3.78	3118	4.16	3239	4.40	3380	4.67	3546	4.97				
	9000	2162	4.29												
1600	13870	4498	3.41	4597	3.65	4661	3.80	4738	3.97	4833	4.18				
	11000	3037	4.06	3247	4.47	3378	4.72								
	9000														
1700	13870	4619	3.67	4736	3.94	4811	4.11								
	11000	3147	4.33												
	9000														
1800	13870	4739	3.93												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-9 (Sheet 11)

FLIGHT PLANNING
LONG RANGE CRUISE

STANDARD DAY **CRUISE ALTITUDE 43000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
1600	13870	2412	3.73	2683	4.12	2877	4.59	3068	4.91	3287	5.15	3571	5.25	4257	6.00
	11000	2193	4.09	2454	4.55	2621	4.94	2806	5.28	3023	5.62	3298	5.89	4007	6.77
	9000	2010	4.40	2261	4.91	2417	5.23	2598	5.59	2809	5.98	3066	6.45	3805	7.45
1800	13870	2672	4.19	2976	4.63	3191	5.16	3405	5.52	3651	5.81	3969	5.93	4736	6.78
	11000	2420	4.61	2712	5.12	2898	5.57	3105	5.95	3347	6.34	3654	6.67		
	9000	2209	4.95	2490	5.54	2664	5.89								
2000	13870	2929	4.66	3266	5.15	3503	5.75	3738	6.15	4010	6.47	4361	6.62	5209	7.59
	11000	2644	5.12	2967	5.70	3172	6.20	3400	6.63	3667	7.07	4003	7.45		
	9000	2405	5.51												
2200	13870	3184	5.12	3552	5.68	3810	6.33	4067	6.78	4365	7.15	4749	7.32		
	11000	2865	5.64	3218	6.29	3441	6.83	3690	7.31	3981	7.81				
	9000	2599	6.07												
2400	13870	3436	5.60	3836	6.21	4113	6.92	4392	7.41	4715	7.83				
	11000	3083	6.17	3466	6.89	3706	7.47	3977	8.00						
	9000														
2600	13870	3685	6.07	4116	6.74	4413	7.52	4713	8.06						
	11000	3298	6.70	3710	7.49	3968	8.12								
	9000														
2800	13870	3932	6.55	4393	7.29	4708	8.12	5030	8.70						
	11000	3510	7.23	3951	8.09	4226	8.77								
	9000														
3000	13870	4175	7.04	4667	7.83	5001	8.72								
	11000	3720	7.77	4189	8.71										
	9000														
3200	13870	4416	7.53	4937	8.39										
	11000	3927	8.31												
	9000														
3400	13870	4655	8.02	5205	8.95										
	11000	4131	8.86												
	9000														
3600	13870	4891	8.52												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-9 (Sheet 12)

CLIMB

Climb performance for 222 KIAS/0.56 indicated Mach is presented in tabular form on the following pages.

This performance is based on maximum continuous climb thrust setting on both engines, gear and flaps up, speed brakes retracted, and anti-ice systems OFF. The performance is also presented for anti-ice systems ON.

The time, distance, fuel and rate-of-climb used to any given altitude is based on the climb starting at sea level. If the climb is initiated at some other altitude, it is necessary to go into the data twice, once at the initial altitude and once at the final altitude. The difference in time, distance, and fuel between these two altitudes provides the proper values for the climb. The data allows for fuel burnoff in the climb; therefore, the weight presented is at the start of the climb.

The climb data for the conditions requiring a step climb are based on climbing direct to the highest obtainable altitude as shown in the step climb weight table, cruising at the altitude until the desired weight is achieved, and then climbing to the desired altitude or the next step altitude per the step climb weight table.

Consult the buffet onset chart in Section IV, Performance, Standard Charts, of the basic FAA Approved Airplane Flight Manual to ensure adequate maneuver margin during the climb phase of flight.

CRUISE CLIMB

222 KIAS/0.56 INDICATED MACH

TIME, DISTANCE, FUEL, AND RATE OF CLIMB **ANTI-ICE SYSTEMS OFF**

T.O WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F						10000 FEET ISA = -5°C = 23°F						15000 FEET ISA = -15°C = 6°F					
	MIN	2	2	2	2	1	1	4	4	4	3	3	3	7	7	6	5	5	4
ISA	NM	8	7	7	6	5	5	18	16	15	13	12	11	30	28	25	23	20	18
+20°C	LB	71	65	60	54	48	43	143	133	121	109	98	87	221	204	185	167	150	133
	FPM	2315	2504	2752	3042	3386	3803	2013	2184	2408	2669	2978	3351	1676	1826	2023	2251	2521	2847
	MIN	2	1	1	1	1	1	3	3	3	3	2	2	5	5	4	4	4	3
ISA	NM	6	6	5	5	4	4	13	12	11	10	9	8	22	20	18	17	15	13
+10°C	LB	61	57	52	47	42	38	122	113	103	94	85	75	185	171	156	142	127	114
	FPM	3060	3299	3613	3980	4418	4949	2744	2964	3252	3589	3990	4476	2387	2585	2844	3147	3507	3941
	MIN	1	1	1	1	1	1	3	2	2	2	2	2	4	4	4	3	3	3
ISA	NM	5	4	4	4	3	3	10	9	9	8	7	6	17	16	14	13	12	10
	LB	54	51	46	42	38	34	108	101	92	84	76	68	163	151	138	126	113	101
	FPM	3858	4149	4534	4985	5522	6175	3509	3779	4135	4553	5049	5652	3065	3308	3627	4001	4445	4983
	MIN	1	1	1	1	1	1	2	2	2	2	2	1	4	3	3	3	3	2
ISA	NM	4	4	4	3	3	3	9	8	7	7	6	5	14	13	12	11	10	9
-10°C	LB	52	48	44	40	37	33	102	95	87	79	72	64	152	142	130	118	107	95
	FPM	4474	4806	5245	5760	6375	7122	4186	4501	4916	5404	5985	6691	3557	3832	4194	4619	5124	5737
PRESSURE ALTITUDE		17000 FEET ISA = -19°C = -2°F						19000 FEET ISA = -23°C = -9°F						21000 FEET ISA = -27°C = -16°F					
	MIN	8	8	7	6	6	5	10	9	8	7	7	6	11	10	9	8	8	7
ISA	NM	36	33	30	27	24	22	43	40	36	32	29	25	51	47	42	38	34	30
+20°C	LB	254	234	212	191	172	152	289	266	241	217	194	173	326	300	271	244	218	194
	FPM	1527	1668	1853	2067	2320	2624	1369	1500	1672	1871	2105	2387	1216	1338	1497	1682	1898	2157
	MIN	6	6	5	5	4	4	7	7	6	5	5	4	8	7	7	6	6	5
ISA	NM	26	24	22	20	18	16	31	28	26	23	21	18	36	33	30	27	24	22
+10°C	LB	211	195	178	161	145	129	237	220	200	181	163	145	265	245	223	202	182	162
	FPM	2212	2399	2645	2931	3269	3678	2030	2206	2436	2704	3021	3404	1877	2044	2261	2515	2814	3175
	MIN	5	4	4	4	3	3	5	5	5	4	4	3	6	6	5	5	4	4
ISA	NM	20	18	17	15	14	12	23	22	20	18	16	14	27	25	23	21	18	16
	LB	185	172	157	143	129	115	208	193	176	160	144	129	231	214	196	178	160	143
	FPM	2976	3214	3527	3892	4327	4853	2784	3010	3307	3654	4065	4564	2527	2737	3012	3333	3714	4174
	MIN	4	4	4	3	3	3	5	4	4	4	3	3	5	5	5	4	4	3
ISA	NM	17	16	14	13	12	10	20	18	17	15	14	12	23	22	20	18	16	14
-10°C	LB	173	161	147	134	121	108	194	181	165	150	136	121	216	201	184	167	151	135
	FPM	3284	3542	3882	4279	4752	5324	3019	3260	3577	3947	4388	4921	2754	2979	3273	3618	4026	4521
PRESSURE ALTITUDE		23000 FEET ISA = -31°C = -23°F						25000 FEET ISA = -35°C = -30°F						27000 FEET ISA = -38°C = -37°F					
	MIN	13	12	11	10	9	8	15	14	12	11	10	9	17	16	14	13	11	10
ISA	NM	60	55	50	45	40	35	71	65	59	53	47	41	84	77	69	61	54	48
+20°C	LB	366	336	304	273	244	216	411	377	340	305	272	241	459	419	377	338	301	266
	FPM	1062	1176	1323	1493	1692	1931	908	1013	1148	1303	1485	1702	958	1073	1221	1391	1590	1826
	MIN	9	8	8	7	6	6	10	10	9	8	7	6	12	11	10	9	8	7
ISA	NM	41	38	35	31	28	25	48	44	40	36	32	29	55	51	46	42	37	33
+10°C	LB	294	272	247	224	201	179	325	300	273	246	221	197	357	329	299	270	242	215
	FPM	1727	1885	2092	2331	2614	2955	1535	1681	1872	2093	2354	2667	1580	1736	1939	2175	2452	2784
	MIN	7	7	6	5	5	4	8	7	7	6	6	5	9	8	8	7	6	6
ISA	NM	31	29	26	24	21	19	36	33	30	28	25	22	42	39	35	32	28	25
	LB	255	237	216	196	176	157	281	260	237	215	194	173	307	285	259	235	211	188
	FPM	2260	2453	2706	3002	3351	3773	1990	2166	2397	2666	2983	3366	1976	2159	2397	2673	2999	3392
	MIN	6	6	5	5	4	4	7	7	6	5	5	4	8	7	7	6	6	5
ISA	NM	27	25	23	21	19	16	31	29	26	24	21	19	36	34	31	28	25	22
-10°C	LB	239	222	203	184	166	148	262	244	222	202	182	163	287	266	243	220	198	177
	FPM	2487	2695	2968	3287	3664	4120	2222	2414	2665	2957	3303	3720	2244	2443	2704	3008	3366	3799
PRESSURE ALTITUDE		29000 FEET ISA = -42°C = -44°F						31000 FEET ISA = -46°C = -52°F						33000 FEET ISA = -50°C = -59°F					
	MIN	19	17	16	14	12	11	21	19	17	15	13	12	23	21	18	16	14	13
ISA	NM	95	86	77	69	61	53	104	95	85	75	67	59	115	104	93	82	73	64
+20°C	LB	497	453	407	364	324	286	530	483	433	387	344	303	564	513	459	410	364	321
	FPM	1156	1294	1471	1674	1912	2195	1127	1267	1448	1655	1896	2184	1010	1147	1323	1526	1761	2040
	MIN	13	12	11	10	9	8	14	13	12	11	9	8	16	14	13	12	10	9
ISA	NM	62	57	52	46	41	37	69	63	57	51	46	41	76	70	63	56	50	44
+10°C	LB	384	354	321	289	259	230	411	378	342	308	276	245	437	402	363	327	292	259
	FPM	1656	1827	2048	2304	2604	2964	1546	1714	1932	2183	2477	2828	1426	1591	1805	2051	2338	2681
	MIN	10	9	8	8	7	6	11	10	9	8	8	7	12	11	10	9	8	7
ISA	NM	47	43	39	36	32	28	52	48	44	39	35	31	58	54	49	44	39	35
	LB	331	306	278	252	227	202	353	326	297	268	241	215	376	347	315	285	255	227
	FPM	2059	2256	2512	2810	3159	3580	1921	2114	2364	2653	2993	3401	1750	1936	2178	2457	2784	3175
	MIN	9	8	8	7	6	5	10	9	8	7	7	6	11	10	9	8	7	7
ISA	NM	41	38	34	31	28	25	46	42	38	35	31	28	52	48	43	39	35	31
-10°C	LB	308	285	260	236	212	190	329	305	278	252	226	202	352	325	296	268	240	214
	FPM	2233	2440	2711	3025	3395	3840	1968	2162	2415	2708	3052	3465	1692	1873	2108	2379	2697	3076

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Figure 4-10 (Sheet 1 of 4)

CRUISE CLIMB
222 KIAS/0.56 INDICATED MACH
TIME, DISTANCE, FUEL, AND RATE OF CLIMB
ANTI-ICE SYSTEMS OFF

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F						37000 FEET ISA = -57°C = -70°F						39000 FEET ISA = -57°C = -70°F					
	MIN	25	22	20	18	16	14	27	24	22	19	17	15	30	27	24	21	18	16
ISA	NM	126	114	101	90	79	69	138	124	110	97	86	75	154	137	121	106	93	81
+20°C	LB	599	543	485	432	383	337	633	573	511	454	402	353	674	608	540	479	423	371
	FPM	982	1124	1305	1512	1754	2039	822	958	1130	1326	1553	1822	595	725	889	1072	1282	1529
	MIN	17	16	14	13	11	10	19	17	15	14	12	11	21	19	17	15	13	12
ISA	NM	84	77	69	62	55	49	93	85	76	68	60	53	105	95	85	75	66	58
+10°C	LB	464	425	384	345	308	273	492	450	406	364	325	287	525	478	430	385	342	302
	FPM	1297	1460	1670	1910	2191	2525	1061	1214	1408	1629	1886	2191	824	971	1156	1363	1602	1884
	MIN	13	12	11	10	9	8	15	14	12	11	10	9	17	15	14	12	11	10
ISA	NM	65	60	54	48	43	38	73	67	60	54	48	42	83	75	67	60	53	47
	LB	399	368	334	301	270	240	425	391	354	319	285	253	454	416	375	337	301	267
	FPM	1482	1657	1882	2141	2443	2804	1188	1348	1552	1785	2057	2379	964	1120	1316	1537	1792	2093
	MIN	12	11	10	9	8	7	14	13	11	10	9	8	16	14	13	11	10	9
ISA	NM	58	54	48	43	39	34	66	61	55	49	43	38	76	69	62	55	49	43
-10°C	LB	375	346	314	284	255	227	401	369	334	301	270	240	430	394	356	320	286	254
	FPM	1431	1601	1820	2071	2365	2715	1145	1301	1499	1726	1989	2302	927	1079	1269	1484	1732	2024
PRESSURE ALTITUDE		41000 FEET ISA = -57°C = -70°F						43000 FEET ISA = -57°C = -70°F						45000 FEET ISA = -57°C = -70°F					
	MIN	34	30	26	23	20	17	42	35	30	26	22	19	* 194	* 118	38	31	26	22
ISA	NM	177	156	135	118	103	89	223	186	156	134	115	99	1114	676	202	161	134	113
+20°C	LB	730	652	575	507	446	390	830	717	620	541	473	412	2488	1621	708	593	509	438
	FPM	365	490	648	821	1017	1244	136	257	407	574	758	969	100	100	115	265	435	623
	MIN	24	21	19	17	15	13	28	25	21	19	16	14	* 44	31	25	22	19	16
ISA	NM	120	108	95	84	74	65	144	126	109	95	83	72	237	159	131	111	95	82
+10°C	LB	565	512	457	407	361	319	621	555	490	434	383	336	811	624	535	467	408	356
	FPM	576	717	895	1091	1314	1573	334	476	646	836	1047	1289	100	209	375	553	754	978
	MIN	19	17	15	14	12	11	22	20	17	15	14	12	27	24	20	17	15	13
ISA	NM	95	86	76	67	60	52	112	99	87	76	67	58	139	119	101	88	76	66
	LB	488	445	399	358	319	282	530	478	427	380	337	297	591	523	460	406	358	314
	FPM	741	892	1084	1295	1537	1820	508	662	847	1054	1285	1551	292	431	615	815	1040	1294
	MIN	18	16	15	13	11	10	21	19	17	15	13	11	27	23	20	17	15	13
ISA	NM	89	80	71	63	55	49	106	94	82	72	63	55	133	113	96	83	72	62
-10°C	LB	464	423	380	341	304	269	506	457	407	363	322	284	566	501	440	388	343	301
	FPM	718	865	1053	1259	1495	1771	492	642	823	1025	1251	1511	285	420	600	796	1016	1265

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* INDICATES STEP CLIMB REQUIRED
NOTE: STEP CLIMB DATA INCLUDES TIME, DISTANCE, AND FUEL USED IN CRUISE PORTION. BASED ON MAXIMUM CRUISE THRUST.

CRUISE CLIMB SPEED - KIAS

PRESSURE ALTITUDE - FEET									
0	5000	10000	15000	20000	25000	30000	35000	40000	45000
222	222	222	222	222	222	205	183	162	144

WIND EFFECT ON CLIMB DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME	WIND		
(MIN)	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

NOTE: FOR CLIMB CONDITIONS REQUIRING A STEP CLIMB. THE FOLLOWING TABLE GIVES THE WEIGHT AT THE END OF THE STEP CRUISE AT THE STEP ALTITUDE, REQUIRED TO CONTINUE CLIMB.

	TEMPERATURE	
STEP CLIMB ALT IN FEET	ISA +10°C	ISA +20°C
43000	13170	11473

Figure 4-10 (Sheet 2)

CRUISE CLIMB
222 KIAS/0.56 INDICATED MACH
TIME, DISTANCE, FUEL, AND RATE OF CLIMB
ANTI-ICE SYSTEMS ON

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F						10000 FEET ISA = -5°C = 23°F						15000 FEET ISA = -15°C = 6°F					
	MIN	2	2	2	1	1	1	4	4	3	3	3	2	6	6	5	5	4	4
ISA	NM	7	7	6	6	5	5	16	15	13	12	11	10	26	24	22	20	18	16
+10°C	LB	72	67	61	55	49	44	142	132	120	109	98	87	215	199	181	164	147	131
	FPM	2576	2782	3053	3370	3746	4202	2357	2550	2804	3101	3452	3878	1960	2129	2350	2608	2913	3282
	MIN	1	1	1	1	1	1	3	3	3	2	2	2	5	4	4	4	3	3
ISA	NM	6	5	5	4	4	3	12	11	10	9	8	7	19	18	16	15	13	12
	LB	61	57	52	47	43	38	120	112	102	93	84	75	181	168	153	139	125	112
	FPM	3450	3715	4063	4471	4957	5547	3167	3415	3740	4121	4575	5125	2710	2929	3216	3552	3952	4435
	MIN	1	1	1	1	1	1	2	2	2	2	2	2	4	3	3	3	3	2
ISA	NM	4	4	4	3	3	3	9	9	8	7	6	6	15	14	13	11	10	9
-10°C	LB	55	51	47	43	38	34	108	101	92	84	76	68	162	151	138	125	113	101
	FPM	4257	4575	4994	5487	6074	6787	3907	4203	4594	5052	5598	6262	3514	3786	4145	4565	5064	5671
PRESSURE ALTITUDE		17000 FEET ISA = -19°C = -2°F						19000 FEET ISA = -23°C = -9°F						21000 FEET ISA = -27°C = -16°F					
	MIN	7	7	6	6	5	4	9	8	7	6	6	5	10	9	8	7	7	6
ISA	NM	31	29	26	24	21	19	37	34	31	28	25	22	44	40	37	33	29	26
+10°C	LB	246	228	207	187	168	150	279	258	234	211	190	169	314	289	262	237	212	189
	FPM	1775	1932	2139	2378	2661	3003	1611	1758	1951	2175	2439	2756	1433	1570	1748	1954	2197	2489
	MIN	5	5	5	4	4	3	6	6	5	5	4	4	7	7	6	5	5	4
ISA	NM	23	21	19	17	16	14	27	25	22	20	18	16	31	29	26	24	21	19
	LB	206	191	174	158	142	127	232	215	196	178	160	143	258	239	218	198	178	159
	FPM	2515	2722	2993	3310	3686	4141	2325	2520	2776	3074	3427	3855	2111	2293	2531	2808	3136	3533
	MIN	4	4	4	3	3	3	5	5	4	4	3	3	6	5	5	4	4	4
ISA	NM	18	16	15	14	12	11	21	19	17	16	14	13	24	22	20	18	16	15
-10°C	LB	184	171	156	142	128	115	206	191	175	159	144	128	229	212	194	177	159	142
	FPM	3265	3522	3860	4255	4725	5295	3005	3245	3560	3929	4368	4899	2744	2968	3262	3605	4012	4505
PRESSURE ALTITUDE		23000 FEET ISA = -31°C = -23°F						25000 FEET ISA = -35°C = -30°F						27000 FEET ISA = -38°C = -37°F					
	MIN	11	10	9	9	8	7	13	12	11	10	9	8	15	14	13	11	10	9
ISA	NM	52	47	43	39	35	31	61	56	51	46	41	36	74	67	60	54	48	42
+10°C	LB	351	324	293	264	237	210	394	362	328	295	264	234	443	406	366	329	294	260
	FPM	1211	1334	1494	1679	1897	2157	985	1094	1236	1399	1589	1817	909	1020	1163	1327	1519	1747
	MIN	8	8	7	6	6	5	9	9	8	7	6	6	11	10	9	8	7	6
ISA	NM	36	33	30	27	25	22	42	39	35	32	29	25	49	45	41	37	33	29
	LB	287	265	242	219	197	176	317	293	267	241	217	193	349	322	293	265	238	212
	FPM	1893	2062	2282	2539	2842	3207	1647	1801	2001	2233	2507	2836	1619	1777	1983	2221	2502	2838
	MIN	6	6	5	5	4	4	7	7	6	6	5	5	8	8	7	6	6	5
ISA	NM	28	26	23	21	19	17	32	30	27	25	22	20	37	34	31	28	25	22
-10°C	LB	252	234	214	195	175	157	277	257	235	213	192	172	303	281	256	233	209	187
	FPM	2479	2687	2959	3276	3653	4108	2213	2404	2654	2945	3290	3706	2189	2384	2640	2938	3289	3713
PRESSURE ALTITUDE		29000 FEET ISA = -42°C = -44°F						31000 FEET ISA = -46°C = -52°F						33000 FEET ISA = -50°C = -59°F					
	MIN	17	16	14	13	11	10	20	18	16	14	13	11	22	20	18	16	14	12
ISA	NM	85	78	69	62	55	48	97	88	78	70	62	54	109	98	87	78	69	60
+10°C	LB	487	445	400	359	319	282	528	481	432	386	343	303	569	518	463	413	367	323
	FPM	995	1121	1282	1468	1683	1940	924	1049	1211	1395	1609	1864	874	1001	1163	1350	1566	1822
	MIN	12	11	10	9	8	7	13	12	11	10	9	8	14	13	12	11	10	8
ISA	NM	55	51	46	42	37	33	62	57	52	46	41	37	69	63	57	51	46	40
	LB	377	348	316	286	256	228	405	373	339	305	274	243	431	397	359	324	290	258
	FPM	1659	1828	2049	2303	2602	2960	1553	1720	1937	2187	2480	2831	1639	1817	2047	2314	2626	2999
	MIN	9	8	8	7	6	6	10	9	9	8	7	6	11	10	9	9	8	7
ISA	NM	42	39	35	32	28	25	47	44	40	36	32	28	53	49	44	40	36	32
-10°C	LB	326	302	276	250	225	200	350	324	295	267	240	214	375	346	315	285	256	228
	FPM	2127	2328	2589	2891	3248	3677	1845	2031	2273	2553	2881	3275	1579	1752	1976	2235	2538	2900

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Figure 4-10 (Sheet 3)

CRUISE CLIMB

222 KIAS/0.56 INDICATED MACH

TIME, DISTANCE, FUEL, AND RATE OF CLIMB — **ANTI-ICE SYSTEMS ON**

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F						37000 FEET ISA = -57°C = -70°F						39000 FEET ISA = -57°C = -70°F					
	MIN	24	22	19	17	15	13	27	24	21	19	17	14	31	28	24	21	18	16
ISA	NM	122	109	97	86	76	66	136	122	107	95	83	73	161	142	123	107	94	81
+10°C	LB	610	553	494	440	389	343	655	591	526	467	412	362	721	644	568	501	440	385
	FPM	813	941	1105	1293	1510	1767	602	721	872	1042	1239	1470	297	405	539	688	857	1054
	MIN	16	14	13	12	10	9	17	16	14	13	11	10	19	17	16	14	12	11
ISA	NM	76	69	62	56	50	44	84	77	69	62	55	48	95	86	77	68	61	53
	LB	458	421	380	342	306	272	487	446	403	362	323	287	521	476	428	384	342	302
	FPM	1379	1545	1760	2007	2296	2640	1094	1247	1442	1665	1923	2230	874	1022	1209	1419	1662	1948
	MIN	13	12	11	10	9	8	14	13	12	11	9	8	17	15	13	12	11	9
ISA	NM	61	56	50	45	40	35	69	63	57	51	45	40	80	73	65	58	51	45
-10°C	LB	401	370	336	303	272	242	430	396	358	323	289	257	465	425	383	344	308	272
	FPM	1326	1488	1697	1937	2218	2551	1050	1199	1388	1604	1855	2153	837	981	1163	1368	1604	1882
PRESSURE ALTITUDE		41000 FEET ISA = -57°C = -70°F																	
	MIN	——	36	30	25	21	18												
ISA	NM	——	188	153	129	110	94												
+10°C	LB	——	753	637	551	479	415												
	FPM	——	101	220	350	495	661												
	MIN	22	20	18	16	14	12												
ISA	NM	112	100	88	78	68	60												
	LB	567	514	459	409	364	321												
	FPM	457	588	753	934	1138	1376												
	MIN	19	17	15	14	12	11												
ISA	NM	94	84	75	66	58	51												
-10°C	LB	505	459	411	368	327	289												
	FPM	632	773	951	1148	1372	1634												

CRUISE CLIMB SPEED - KIAS

PRESSURE ALTITUDE - FEET									
0	5000	10000	15000	20000	25000	30000	35000	40000	41000
222	222	222	222	222	222	205	183	162	158

WIND EFFECT ON CLIMB DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME (MIN)	WIND		
	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

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Figure 4-10 (Sheet 4)

CRUISE

Specific performance data are presented on the following pages for various combinations of fan speeds, weights, temperature, altitudes and winds to enable the calculation of the cruise portion of a range profile.

The various fan speeds presented provide the specific ranges between maximum cruise thrust (maximum TAS) and the approximate maximum range thrust. It should be noted that reducing thrust to maintain a constant indicated airspeed as the airplane weight decreases during cruise results in a significant increase in range. The best range, however, results from decreasing thrust to fly a constantly decreasing airspeed as airplane weight decreases per the values shown in the tabulated data.

When the anti-ice systems are ON, increase the fuel flows and decrease the specific ranges that are presented for each altitude by 15 percent. The cruise speeds will remain the same for a given fan RPM (N1). The maximum allowable fan speeds with anti-ice systems ON are presented on each chart for each altitude. Only fan speeds equal to or lower than these values can be used.

The one engine specific range data is presented for use in the event of an enroute engine failure.

CRUISE
37000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
13870	ISA+20°C	-19	(1)	95.4	893	203	.65	380	31.3	36.9	39.7	42.5	45.3	48.1	53.7
	-36°C	-20		94.4	855	198	.630	371	31.7	37.5	40.5	43.4	46.3	49.2	55.1
		-21		93.3	812	191	.610	360	32.0	38.2	41.2	44.3	47.4	50.5	56.6
		-22		92.2	773	185	.590	348	32.1	38.6	41.8	45.1	48.3	51.5	58.0
		-23	(2)	90.9	729	176	.56	333	32.0	38.9	42.3	45.8	49.2	52.6	59.5
	ISA+10°C	-27	(1)	97.1	1011	219	.69	398	29.5	34.5	37.0	39.4	41.9	44.4	49.3
	-46°C	-29		94.4	908	208	.660	380	30.8	36.3	39.1	41.8	44.6	47.3	52.8
		-30		92.5	831	198	.630	363	31.7	37.7	40.7	43.7	46.7	49.8	55.8
		-32		90.8	769	188	.600	346	32.1	38.6	41.8	45.1	48.3	51.6	58.1
		-33	(2)	89.1	711	177	.57	328	32.0	39.0	42.6	46.1	49.6	53.1	60.1
	ISA+0°C	-36	(1)	98.5	1096	231	.73	408	28.1	32.7	35.0	37.2	39.5	41.8	46.4
	-56°C	-38		94.7	971	218	.690	388	29.6	34.8	37.4	40.0	42.5	45.1	50.3
		-40		91.7	854	205	.650	366	31.2	37.0	40.0	42.9	45.8	48.7	54.6
		-42		89.4	765	191	.610	344	31.9	38.5	41.7	45.0	48.3	51.6	58.1
		-44	(2)	87.1	690	177	.57	320	31.9	39.1	42.8	46.4	50.0	53.6	60.9
	ISA-10°C	-47	(1)	96.7	1075	232	.73	401	28.0	32.6	34.9	37.3	39.6	41.9	46.6
	-66°C	-49		92.6	940	218	.690	379	29.6	35.0	37.6	40.3	42.9	45.6	50.9
		-51		89.6	828	205	.650	357	31.1	37.1	40.2	43.2	46.2	49.2	55.3
		-53		87.4	742	191	.610	336	31.8	38.6	41.9	45.3	48.7	52.0	58.8
		-55	(2)	85.2	671	177	.57	313	31.8	39.2	42.9	46.7	50.4	54.1	61.6
13000	ISA+20°C	-19	(1)	95.3	893	205	.65	384	31.8	37.4	40.2	43.0	45.8	48.6	54.2
	-36°C	-20		93.9	837	198	.630	371	32.4	38.4	41.4	44.3	47.3	50.3	56.3
		-21		92.1	773	188	.600	354	32.9	39.3	42.6	45.8	49.0	52.3	58.7
		-23		90.4	717	178	.570	337	33.0	40.0	43.5	47.0	50.4	53.9	60.9
		-24	(2)	89.4	683	171	.55	325	32.9	40.2	43.9	47.5	51.2	54.9	62.2
	ISA+10°C	-27	(1)	97.1	1014	221	.70	402	29.8	34.7	37.1	39.6	42.1	44.5	49.5
	-46°C	-29		93.9	891	208	.660	380	31.4	37.0	39.8	42.7	45.5	48.3	53.9
		-31		91.3	791	195	.620	358	32.6	38.9	42.1	45.2	48.4	51.6	57.9
		-33		89.0	714	182	.580	335	33.0	40.0	43.5	47.0	50.5	54.0	61.0
		-34	(2)	87.5	666	172	.55	318	32.8	40.3	44.1	47.9	51.6	55.4	62.9
	ISA+0°C	-36	(1)	98.5	1099	232	.73	411	28.3	32.8	35.1	37.4	39.6	41.9	46.4
	-56°C	-38		94.2	955	218	.690	388	30.1	35.3	38.0	40.6	43.2	45.8	51.0
		-41		90.6	812	201	.640	361	32.1	38.3	41.3	44.4	47.5	50.6	56.8
		-43		87.6	711	185	.590	333	32.8	39.9	43.4	46.9	50.4	53.9	61.0
		-45	(2)	85.6	646	172	.55	311	32.7	40.4	44.3	48.2	52.0	55.9	63.6
	ISA-10°C	-47	(1)	96.8	1080	233	.74	403	28.1	32.7	35.0	37.3	39.6	42.0	46.6
	-66°C	-49		92.1	926	218	.690	379	30.1	35.5	38.2	40.9	43.6	46.3	51.7
		-51		88.5	787	201	.640	352	32.0	38.4	41.6	44.7	47.9	51.1	57.4
		-54		85.7	689	185	.590	325	32.7	40.0	43.6	47.2	50.8	54.5	61.7
		-55	(2)	83.7	628	172	.55	304	32.5	40.5	44.5	48.5	52.4	56.4	64.4
12000	ISA+20°C	-18	(1)	95.2	893	207	.66	387	32.2	37.8	40.6	43.4	46.2	49.0	54.6
	-36°C	-20		93.2	818	198	.630	371	33.1	39.3	42.3	45.4	48.4	51.5	57.6
		-21		91.3	753	188	.600	354	33.7	40.4	43.7	47.0	50.3	53.7	60.3
		-23		89.6	695	178	.570	337	34.1	41.2	44.8	48.4	52.0	55.6	62.8
		-24	(2)	87.6	634	166	.53	315	33.9	41.8	45.8	49.7	53.6	57.6	65.5
	ISA+10°C	-27	(1)	97.1	1017	223	.70	405	30.0	34.9	37.3	39.8	42.3	44.7	49.6
	-46°C	-29		93.4	872	208	.660	380	32.1	37.8	40.7	43.5	46.4	49.3	55.0
		-31		90.6	772	195	.620	358	33.4	39.9	43.1	46.4	49.6	52.8	59.3
		-33		88.3	693	182	.580	335	33.9	41.2	44.8	48.4	52.0	55.6	62.8
		-35	(2)	85.7	617	166	.53	308	33.8	41.9	46.0	50.0	54.1	58.1	66.2
	ISA+0°C	-36	(1)	98.5	1103	233	.74	413	28.4	32.9	35.2	37.5	39.7	42.0	46.5
	-56°C	-38		93.6	939	218	.690	388	30.6	36.0	38.6	41.3	44.0	46.6	52.0
		-41		90.0	794	201	.640	361	32.8	39.1	42.3	45.4	48.6	51.7	58.0
		-43		86.9	691	185	.590	333	33.7	41.0	44.6	48.2	51.8	55.4	62.7
		-45	(2)	83.9	600	166	.53	302	33.7	42.0	46.2	50.3	54.5	58.7	67.0
	ISA-10°C	-47	(1)	96.3	1067	233	.74	403	28.4	33.1	35.4	37.8	40.1	42.5	47.2
	-66°C	-49		91.5	910	218	.690	379	30.6	36.1	38.9	41.6	44.4	47.1	52.6
		-51		88.0	770	201	.640	352	32.8	39.2	42.5	45.7	49.0	52.2	58.7
		-54		84.9	671	185	.590	325	33.6	41.1	44.8	48.5	52.2	56.0	63.4
		-56	(2)	82.0	582	166	.53	295	33.5	42.1	46.4	50.7	54.9	59.2	67.8
11000	ISA+20°C	-18	(1)	95.1	893	209	.66	391	32.5	38.1	40.9	43.7	46.5	49.3	54.9
	-36°C	-20		92.6	801	198	.630	371	33.9	40.1	43.2	46.3	49.5	52.6	58.8
		-22		90.1	714	185	.590	348	34.8	41.8	45.3	48.8	52.3	55.8	62.8
		-24		87.6	640	172	.550	325	35.2	43.0	46.9	50.8	54.8	58.7	66.5
		-25	(2)	85.9	595	162	.52	308	35.1	43.5	47.7	51.9	56.1	60.3	68.7
	ISA+10°C	-26	(1)	97.0	1019	224	.71	407	30.2	35.1	37.5	40.0	42.4	44.9	49.8
	-46°C	-29		92.9	856	208	.660	380	32.7	38.6	41.5	44.4	47.3	50.2	56.1
		-31		89.4	733	191	.610	352	34.4	41.2	44.6	48.0	51.4	54.8	61.6
		-34		86.4	639	175	.560	324	35.1	42.9	46.8	50.7	54.6	58.5	66.4
		-35	(2)	84.2	579	162	.52	302	34.9	43.6	47.9	52.2	56.5	60.9	69.5
	ISA+0°C	-36	(1)	98.0	1089	233	.74	413	28.7	33.3	35.6	37.9	40.2	42.5	47.1
	-56°C	-39		92.4	890	214	.680	382	31.7	37.3	40.1	43.0	45.8	48.6	54.2
		-41		88.7	755	198	.630	355	33.8	40.4	43.7	47.1	50.4	53.7	60.3
		-43		85.6	655	182	.580	328	34.8	42.4	46.2	50.0	53.8	57.7	65.3
		-46	(2)	82.3	562	162	.52	295	34.7	43.6	48.1	52.5	57.0	61.4	70.3
	ISA-10°C	-47	(1)	95.9	1055	233	.74	403	28.8	33.5	35.9	38.2	40.6	43.0	47.7
	-66°C	-50		90.3	863	214	.680	373	31.7	37.5	40.4	43.3	46.2	49.1	54.9
		-52		86.7	732	198	.630	347	33.7	40.5	44.0	47.4	50.8	54.2	61.0
		-54		83.7	636	182	.580	320	34.6	42.5	46.4	50.3	54.3	58.2	66.1
		-56	(2)	80.4	545	162	.52	288	34.5	43.7	48.3	52.9	57.4	62.0	71.2

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Figure 4-11 (Sheet 27)

CRUISE
37000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
10000	ISA+20°C	-18	(1)	95.1	893	211	.67	393	32.8	38.4	41.2	44.0	46.8	49.6	55.2
	-36°C	-20		92.1	785	198	.630	371	34.5	40.9	44.1	47.3	50.5	53.6	60.0
		-22		89.4	696	185	.590	348	35.6	42.8	46.4	50.0	53.6	57.2	64.4
		-24		86.8	620	172	.550	325	36.3	44.4	48.4	52.4	56.4	60.5	68.5
		-25	(2)	84.3	556	158	.51	302	36.3	45.2	49.7	54.2	58.7	63.2	72.2
	ISA+10°C	-26	(1)	97.0	1022	226	.71	410	30.3	35.2	37.7	40.1	42.6	45.0	49.9
	-46°C	-29		92.5	841	208	.660	380	33.3	39.2	42.2	45.2	48.1	51.1	57.1
		-31		88.8	718	191	.610	352	35.1	42.1	45.6	49.1	52.5	56.0	63.0
		-34		85.7	621	175	.560	324	36.1	44.1	48.2	52.2	56.2	60.2	68.3
		-36	(2)	82.3	539	158	.51	294	36.1	45.3	50.0	54.6	59.2	63.9	73.2
	ISA+0°C	-36	(1)	97.6	1077	233	.74	413	29.1	33.7	36.0	38.3	40.7	43.0	47.6
	-56°C	-39		92.0	875	214	.680	382	32.2	38.0	40.8	43.7	46.5	49.4	55.1
		-42		87.5	718	195	.620	350	34.8	41.8	45.2	48.7	52.2	55.7	62.7
		-44		83.8	603	175	.560	317	35.9	44.2	48.4	52.5	56.7	60.8	69.1
		-46	(2)	80.6	525	158	.51	288	35.9	45.4	50.2	54.9	59.7	64.5	74.0
	ISA-10°C	-47	(1)	95.4	1043	233	.74	403	29.1	33.9	36.3	38.7	41.1	43.5	48.3
	-66°C	-50		89.9	849	214	.680	373	32.2	38.1	41.0	44.0	46.9	49.9	55.8
		-52		85.6	696	195	.620	341	34.7	41.9	45.4	49.0	52.6	56.2	63.4
		-55		81.9	585	175	.560	309	35.8	44.3	48.6	52.9	57.1	61.4	70.0
		-57	(2)	78.8	510	158	.51	282	35.6	45.4	50.3	55.3	60.2	65.1	74.9
9000	ISA+20°C	-17	(1)	95.1	894	212	.67	396	33.1	38.7	41.5	44.3	47.1	49.9	55.5
	-36°C	-20		91.6	771	198	.630	371	35.2	41.6	44.9	48.1	51.4	54.6	61.1
		-22		88.2	660	182	.580	343	36.7	44.3	48.1	51.9	55.7	59.5	67.0
		-25		84.7	569	165	.530	314	37.6	46.4	50.8	55.2	59.6	63.9	72.7
		-26	(2)	82.0	511	152	.49	291	37.3	47.1	52.0	56.9	61.8	66.7	76.5
	ISA+10°C	-26	(1)	97.0	1023	227	.72	412	30.5	35.4	37.8	40.3	42.7	45.1	50.0
	-46°C	-29		92.0	828	208	.660	380	33.8	39.9	42.9	45.9	48.9	51.9	58.0
		-32		87.6	682	188	.600	346	36.1	43.5	47.1	50.8	54.5	58.1	65.5
		-35		83.6	570	168	.540	313	37.3	46.1	50.5	54.9	59.3	63.7	72.4
		-37	(2)	80.4	499	153	.49	286	37.2	47.2	52.2	57.2	62.2	67.2	77.2
	ISA+0°C	-36	(1)	97.2	1066	233	.74	413	29.3	34.0	36.4	38.7	41.1	43.4	48.1
	-56°C	-39		91.6	863	214	.680	382	32.7	38.5	41.4	44.3	47.2	50.1	55.9
		-42		87.0	704	195	.620	350	35.5	42.6	46.1	49.7	53.2	56.8	63.9
		-44		83.1	587	175	.560	317	36.9	45.4	49.7	54.0	58.2	62.5	71.0
		-47	(2)	78.3	486	153	.49	279	36.9	47.2	52.4	57.5	62.7	67.8	78.1
	ISA-10°C	-47	(1)	95.0	1033	233	.74	403	29.4	34.2	36.6	39.1	41.5	43.9	48.7
	-66°C	-50		89.6	837	214	.680	373	32.7	38.6	41.6	44.6	47.6	50.6	56.6
		-52		85.1	683	195	.620	341	35.3	42.7	46.3	50.0	53.6	57.3	64.6
		-55		81.2	570	175	.560	309	36.7	45.5	49.9	54.3	58.7	63.1	71.8
		-57	(2)	76.5	472	153	.49	273	36.7	47.3	52.6	57.9	63.2	68.5	79.1

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(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX FAN % RPM		
-46°C	-56°C	-66°C
97.1	98.3	96.1
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 18%		

Figure 4-11 (Sheet 28)

CRUISE
39000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL: HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
13870	ISA+20°C	-20	(1)	95.4	812	189	.63	371	33.4	39.5	42.6	45.7	48.8	51.9	58.0
	-36°C	-20		94.9	792	186	.620	365	33.5	39.8	43.0	46.1	49.3	52.5	58.8
		-21		94.4	773	182	.610	360	33.6	40.1	43.3	46.5	49.8	53.0	59.5
		-21		93.9	756	179	.600	354	33.6	40.2	43.5	46.8	50.1	53.4	60.0
		-22	(2)	93.5	742	177	.59	349	33.6	40.3	43.7	47.0	50.4	53.8	60.5
	ISA+10°C	-28	(1)	96.9	915	205	.68	392	31.9	37.4	40.1	42.8	45.6	48.3	53.8
	-46°C	-29		95.2	858	198	.660	380	32.6	38.4	41.4	44.3	47.2	50.1	55.9
		-30		93.9	810	192	.640	369	33.2	39.3	42.4	45.5	48.6	51.7	57.9
		-31		92.8	769	186	.620	358	33.5	40.0	43.3	46.5	49.8	53.0	59.5
		-32	(2)	91.4	719	176	.59	341	33.5	40.5	44.0	47.4	50.9	54.4	61.4
	ISA+0°C	-37	(1)	98.4	997	217	.72	404	30.5	35.5	38.0	40.5	43.0	45.6	50.6
	-56°C	-38		95.6	911	208	.690	388	31.6	37.1	39.8	42.6	45.3	48.1	53.6
		-40		93.1	833	198	.660	371	32.6	38.6	41.6	44.6	47.6	50.6	56.6
		-41		91.4	765	189	.630	355	33.4	39.9	43.2	46.4	49.7	53.0	59.5
		-43	(2)	89.5	699	177	.59	334	33.5	40.6	44.2	47.8	51.4	54.9	62.1
	ISA-10°C	-47	(1)	96.6	977	218	.72	397	30.4	35.5	38.0	40.6	43.2	45.7	50.8
	-66°C	-49		93.5	882	208	.690	379	31.6	37.3	40.1	42.9	45.8	48.6	54.3
		-50		91.0	807	198	.660	363	32.6	38.8	41.9	45.0	48.1	51.1	57.3
		-52		89.3	742	189	.630	347	33.3	40.0	43.4	46.8	50.1	53.5	60.3
		-54	(2)	87.5	679	177	.59	326	33.4	40.7	44.4	48.1	51.8	55.5	62.8
13000	ISA+20°C	-19	(1)	95.3	812	192	.64	377	34.0	40.2	43.3	46.4	49.4	52.5	58.7
	-36°C	-20		94.1	771	186	.620	365	34.4	40.9	44.2	47.4	50.7	53.9	60.4
		-21		93.1	734	179	.600	354	34.6	41.4	44.8	48.2	51.6	55.0	61.8
		-22		92.1	702	173	.580	343	34.6	41.7	45.3	48.8	52.4	55.9	63.1
		-23	(2)	91.8	692	171	.57	339	34.5	41.8	45.4	49.0	52.6	56.2	63.4
	ISA+10°C	-27	(1)	96.9	918	207	.69	396	32.2	37.7	40.4	43.1	45.8	48.6	54.0
	-46°C	-29		94.6	839	198	.660	380	33.4	39.3	42.3	45.3	48.3	51.3	57.2
		-30		92.7	768	189	.630	363	34.3	40.8	44.0	47.3	50.5	53.8	60.3
		-32		91.1	713	179	.600	346	34.6	41.6	45.1	48.6	52.1	55.6	62.6
		-33	(2)	89.8	672	171	.57	332	34.5	41.9	45.7	49.4	53.1	56.8	64.3
	ISA+0°C	-36	(1)	98.3	998	219	.73	407	30.7	35.7	38.3	40.8	43.3	45.8	50.8
	-56°C	-38		94.9	894	208	.690	388	32.2	37.8	40.6	43.4	46.1	48.9	54.5
		-40		91.9	789	195	.650	366	33.7	40.1	43.2	46.4	49.6	52.7	59.1
		-42		89.6	708	182	.610	344	34.5	41.5	45.1	48.6	52.1	55.6	62.7
		-44	(2)	87.9	654	171	.57	325	34.4	42.1	45.9	49.7	53.5	57.4	65.0
	ISA-10°C	-47	(1)	96.7	983	220	.73	400	30.5	35.6	38.1	40.7	43.2	45.8	50.9
	-66°C	-49		92.8	866	208	.690	379	32.2	37.9	40.8	43.7	46.6	49.5	55.3
		-51		89.8	765	195	.650	357	33.7	40.2	43.5	46.7	50.0	53.3	59.8
		-53		87.6	687	182	.610	336	34.4	41.6	45.3	48.9	52.6	56.2	63.5
		-54	(2)	85.9	635	172	.58	318	34.3	42.2	46.1	50.0	54.0	57.9	65.8
12000	ISA+20°C	-19	(1)	95.2	813	195	.65	382	34.7	40.8	43.9	47.0	50.1	53.2	59.3
	-36°C	-20		94.0	770	189	.630	371	35.2	41.7	45.0	48.2	51.5	54.7	61.2
		-21		92.8	730	182	.610	360	35.6	42.4	45.8	49.3	52.7	56.1	63.0
		-22		91.7	694	176	.590	348	35.8	43.0	46.6	50.2	53.8	57.4	64.6
		-23	(2)	89.8	637	165	.55	327	35.7	43.5	47.5	51.4	55.3	59.2	67.1
	ISA+10°C	-27	(1)	96.9	922	210	.70	400	32.6	38.0	40.7	43.4	46.1	48.8	54.2
	-46°C	-29		94.0	818	198	.660	380	34.2	40.3	43.4	46.4	49.5	52.5	58.7
		-31		91.4	727	186	.620	358	35.4	42.3	45.7	49.2	52.6	56.1	62.9
		-33		89.2	657	173	.580	335	35.8	43.4	47.2	51.0	54.8	58.6	66.2
		-34	(2)	87.9	621	165	.56	321	35.7	43.7	47.7	51.8	55.8	59.8	67.9
	ISA+0°C	-36	(1)	98.3	999	221	.73	409	31.0	36.0	38.5	41.0	43.5	46.0	51.0
	-56°C	-38		94.2	877	208	.690	388	32.8	38.5	41.4	44.2	47.1	49.9	55.6
		-40		91.3	769	195	.650	366	34.6	41.1	44.4	47.6	50.9	54.1	60.6
		-42		88.8	688	182	.610	344	35.5	42.8	46.4	50.1	53.7	57.3	64.6
		-45	(2)	86.0	602	165	.55	314	35.5	43.8	48.0	52.1	56.3	60.4	68.7
	ISA-10°C	-47	(1)	96.8	989	223	.74	403	30.7	35.7	38.2	40.8	43.3	45.8	50.9
	-66°C	-49		92.1	849	208	.690	379	32.8	38.7	41.7	44.6	47.5	50.5	56.4
		-51		88.6	723	192	.640	352	34.9	41.8	45.2	48.7	52.1	55.6	62.5
		-54		85.8	635	176	.590	325	35.5	43.4	47.3	51.3	55.2	59.2	67.0
		-55	(2)	84.1	585	165	.56	307	35.3	43.9	48.2	52.4	56.7	61.0	69.5
11000	ISA+20°C	-18	(1)	95.1	813	197	.66	386	35.2	41.4	44.4	47.5	50.6	53.7	59.8
	-36°C	-20		93.3	750	189	.630	371	36.1	42.8	46.1	49.5	52.8	56.1	62.8
		-21		91.4	691	179	.600	354	36.7	44.0	47.6	51.2	54.8	58.4	65.7
		-23		89.7	639	170	.570	337	37.1	44.9	48.8	52.7	56.6	60.5	68.3
		-24	(2)	87.9	589	159	.54	317	36.9	45.4	49.7	53.9	58.2	62.4	70.9
	ISA+10°C	-27	(1)	96.8	925	212	.70	404	32.8	38.2	40.9	43.6	46.3	49.0	54.4
	-46°C	-29		93.4	799	198	.660	380	35.0	41.3	44.4	47.5	50.6	53.8	60.0
		-31		90.6	708	186	.620	358	36.4	43.5	47.0	50.5	54.0	57.6	64.6
		-33		88.3	636	173	.580	335	37.0	44.8	48.7	52.7	56.6	60.5	68.4
		-35	(2)	86.0	571	159	.54	310	36.8	45.6	50.0	54.3	58.7	63.1	71.9
	ISA+0°C	-36	(1)	98.2	1000	222	.73	412	31.2	36.2	38.7	41.2	43.7	46.2	51.2
	-56°C	-39		92.8	830	205	.680	382	34.0	40.0	43.0	46.1	49.1	52.1	58.1
		-41		89.3	707	189	.630	355	36.1	43.2	46.7	50.2	53.8	57.3	64.4
		-43		86.4	618	173	.580	328	36.8	44.9	49.0	53.0	57.1	61.1	69.2
		-45	(2)	84.0	554	159	.54	303	36.7	45.7	50.2	54.7	59.2	63.7	72.8
	ISA-10°C	-47	(1)	96.3	976	223	.74	403	31.1	36.2	38.7	41.3	43.9	46.4	51.6
	-66°C	-49		91.5	833	208	.690	379	33.5	39.5	42.5	45.5	48.5	51.5	57.5
		-51		87.9	706	192	.640	352	35.7	42.8	46.3	49.9	53.4	56.9	64.0
		-54		85.0	616	176	.590	325	36.6	44.7	48.8	52.9	56.9	61.0	69.1
		-56	(2)	82.1	538	159	.54	296	36.5	45.7	50.4	55.0	59.7	64.3	73.6

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Figure 4-11 (Sheet 29)

CRUISE
39000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL: HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
10000	ISA+20°C	-18	(1)	95.0	813	199	.66	390	35.7	41.8	44.9	48.0	51.0	54.1	60.3
	-36°C	-20		92.6	733	189	.630	371	37.0	43.8	47.2	50.6	54.0	57.4	64.3
		-22		90.1	654	176	.590	348	38.0	45.6	49.4	53.2	57.1	60.9	68.5
		-24		87.7	586	164	.550	325	38.4	46.9	51.2	55.5	59.7	64.0	72.5
		-25	(2)	86.1	547	155	.52	309	38.2	47.4	51.9	56.5	61.1	65.7	74.8
	ISA+10°C	-26	(1)	96.8	928	214	.71	407	33.1	38.4	41.1	43.8	46.5	49.2	54.6
	-46°C	-29		92.8	783	198	.660	380	35.8	42.2	45.3	48.5	51.7	54.9	61.3
		-31		89.4	672	182	.610	352	37.5	45.0	48.7	52.4	56.1	59.9	67.3
		-34		86.4	585	167	.560	324	38.3	46.8	51.1	55.4	59.7	63.9	72.5
		-35	(2)	84.2	531	155	.52	302	38.1	47.5	52.2	57.0	61.7	66.4	75.8
	ISA+0°C	-36	(1)	97.9	995	223	.74	413	31.5	36.5	39.0	41.5	44.0	46.5	51.6
	-56°C	-39		92.3	814	205	.680	382	34.7	40.8	43.9	47.0	50.1	53.1	59.3
		-41		88.7	691	189	.630	355	36.9	44.2	47.8	51.4	55.0	58.7	65.9
		-43		85.6	600	173	.580	328	38.0	46.3	50.5	54.6	58.8	63.0	71.3
		-46	(2)	82.3	516	155	.52	296	37.9	47.6	52.5	57.3	62.2	67.0	76.7
	ISA-10°C	-47	(1)	95.8	964	223	.74	403	31.5	36.7	39.3	41.9	44.5	47.0	52.2
	-66°C	-50		90.2	789	205	.680	373	34.7	41.0	44.2	47.3	50.5	53.7	60.0
		-52		86.7	670	189	.630	347	36.8	44.3	48.0	51.8	55.5	59.2	66.7
		-54		83.7	582	173	.580	320	37.8	46.4	50.7	55.0	59.3	63.6	72.2
		-56	(2)	80.4	501	155	.52	289	37.7	47.7	52.7	57.7	62.6	67.6	77.6
9000	ISA+20°C	-18	(1)	95.0	814	201	.67	393	36.0	42.2	45.2	48.3	51.4	54.4	60.6
	-36°C	-20		92.0	717	189	.630	371	37.8	44.8	48.3	51.7	55.2	58.7	65.7
		-22		89.4	637	176	.590	348	39.0	46.9	50.8	54.7	58.6	62.6	70.4
		-24		86.8	567	164	.550	325	39.7	48.5	52.9	57.3	61.8	66.2	75.0
		-26	(2)	84.2	506	150	.51	301	39.6	49.5	54.4	59.4	64.3	69.2	79.1
	ISA+10°C	-26	(1)	96.8	930	215	.71	409	33.3	38.6	41.3	44.0	46.7	49.4	54.8
	-46°C	-29		92.3	768	198	.660	380	36.4	43.0	46.2	49.5	52.7	56.0	62.5
		-31		88.7	656	182	.610	352	38.4	46.1	49.9	53.7	57.5	61.3	68.9
		-34		85.6	567	167	.560	324	39.5	48.3	52.7	57.1	61.6	66.0	74.8
		-36	(2)	82.3	493	151	.51	295	39.5	49.6	54.7	59.8	64.8	69.9	80.1
	ISA+0°C	-36	(1)	97.4	983	223	.74	413	31.8	36.9	39.5	42.0	44.5	47.1	52.2
	-56°C	-39		91.9	799	205	.680	382	35.3	41.6	44.7	47.8	51.0	54.1	60.3
		-42		87.4	656	186	.620	350	38.1	45.7	49.5	53.3	57.1	61.0	68.6
		-44		83.6	551	167	.560	317	39.4	48.4	53.0	57.5	62.1	66.6	75.7
		-46	(2)	80.6	479	151	.51	288	39.3	49.7	54.9	60.2	65.4	70.6	81.0
	ISA-10°C	-47	(1)	95.3	952	223	.74	403	31.9	37.1	39.7	42.4	45.0	47.6	52.9
	-66°C	-50		89.8	775	205	.680	373	35.3	41.7	45.0	48.2	51.4	54.6	61.1
		-52		85.5	636	186	.620	341	38.0	45.8	49.8	53.7	57.6	61.6	69.4
		-55		81.7	534	167	.560	309	39.2	48.5	53.2	57.9	62.6	67.2	76.6
		-57	(2)	78.8	466	151	.51	282	39.0	49.8	55.1	60.5	65.9	71.2	82.0

525BOM-00-00

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX FAN % RPM		
-46°C	-56°C	-66°C
96.9	98.2	96.5
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 18%		

Figure 4-11 (Sheet 30)

CRUISE
41000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL: HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
13870	ISA+10°C	-29	(1)	96.7	823	190	.66	382	34.3	40.3	43.4	46.4	49.4	52.5	58.6
	-46°C	-29		95.7	794	186	.650	374	34.5	40.8	44.0	47.1	50.3	53.4	59.7
		-30		95.1	775	183	.640	369	34.7	41.1	44.4	47.6	50.8	54.0	60.5
		-30		94.6	757	180	.630	363	34.8	41.4	44.7	48.0	51.3	54.6	61.2
		-31	(2)	93.8	727	174	.61	353	34.8	41.7	45.1	48.6	52.0	55.5	62.3
	ISA+0°C	-37	(1)	97.9	893	202	.70	395	33.1	38.7	41.5	44.3	47.1	49.9	55.5
	-56°C	-39		95.9	835	195	.680	382	33.8	39.8	42.8	45.8	48.8	51.8	57.8
		-40		94.3	791	189	.660	371	34.3	40.7	43.8	47.0	50.1	53.3	59.6
		-41		93.0	752	183	.640	361	34.7	41.3	44.6	48.0	51.3	54.6	61.3
		-42	(2)	91.7	705	175	.61	345	34.8	41.9	45.5	49.0	52.5	56.1	63.2
	ISA-10°C	-48	(1)	96.5	885	205	.71	391	32.8	38.5	41.3	44.1	46.9	49.8	55.4
	-66°C	-49		94.6	831	198	.690	379	33.5	39.5	42.6	45.6	48.6	51.6	57.6
		-50		93.0	786	192	.670	368	34.1	40.5	43.6	46.8	50.0	53.2	59.5
		-51		91.4	746	186	.650	357	34.5	41.2	44.6	47.9	51.3	54.6	61.3
		-53	(2)	89.6	684	175	.61	337	34.7	42.1	45.7	49.4	53.0	56.7	64.0
13000	ISA+20°C	-20	(1)	95.2	731	176	.62	364	36.1	42.9	46.3	49.8	53.2	56.6	63.4
	-36°C	-21		94.9	720	174	.610	360	36.1	43.0	46.5	50.0	53.5	56.9	63.9
		-21	(2)	94.4	702	171	.60	353	36.1	43.2	46.8	50.3	53.9	57.4	64.6
	ISA+10°C	-28	(1)	96.7	829	193	.67	388	34.8	40.8	43.8	46.9	49.9	52.9	58.9
	-46°C	-29		95.5	795	189	.660	380	35.2	41.5	44.6	47.8	50.9	54.1	60.4
		-30		94.3	752	183	.640	369	35.8	42.4	45.7	49.1	52.4	55.7	62.4
		-31		93.3	715	177	.620	358	36.0	43.0	46.5	50.0	53.5	57.0	64.0
		-32	(2)	92.3	680	170	.60	345	36.0	43.4	47.1	50.7	54.4	58.1	65.4
	ISA+0°C	-37	(1)	97.9	896	205	.71	400	33.4	39.0	41.8	44.6	47.4	50.2	55.7
	-56°C	-39		95.0	816	195	.680	382	34.6	40.7	43.8	46.8	49.9	53.0	59.1
		-40		92.8	749	186	.650	366	35.5	42.2	45.5	48.9	52.2	55.5	62.2
		-42		91.2	693	177	.620	350	36.0	43.3	46.9	50.5	54.1	57.7	64.9
		-43	(2)	90.3	661	171	.60	338	36.0	43.6	47.4	51.2	54.9	58.7	66.3
	ISA-10°C	-47	(1)	96.6	893	208	.72	395	33.1	38.7	41.5	44.3	47.1	49.9	55.5
	-66°C	-49		93.8	814	198	.690	379	34.2	40.4	43.5	46.5	49.6	52.7	58.8
		-50		91.3	747	189	.660	363	35.2	41.9	45.2	48.6	51.9	55.3	62.0
		-52		89.6	688	180	.630	347	35.9	43.2	46.8	50.4	54.1	57.7	65.0
		-53	(2)	88.2	641	171	.60	330	35.9	43.7	47.6	51.5	55.4	59.3	67.1
12000	ISA+20°C	-20	(1)	95.0	732	180	.63	372	37.2	44.0	47.4	50.8	54.2	57.6	64.5
	-36°C	-20		94.4	711	177	.620	365	37.3	44.4	47.9	51.4	54.9	58.4	65.5
		-21		93.9	694	174	.610	360	37.4	44.7	48.3	51.9	55.5	59.1	66.3
		-21		93.4	678	171	.600	354	37.5	44.9	48.6	52.2	55.9	59.6	67.0
		-22	(2)	92.4	647	165	.58	342	37.4	45.1	49.0	52.9	56.7	60.6	68.3
	ISA+10°C	-28	(1)	96.7	833	197	.69	394	35.3	41.3	44.3	47.3	50.3	53.3	59.3
	-46°C	-29		94.7	772	189	.660	380	36.3	42.7	46.0	49.2	52.5	55.7	62.2
		-30		92.9	708	180	.630	363	37.2	44.2	47.7	51.3	54.8	58.3	65.4
		-32		91.4	658	171	.600	346	37.5	45.1	48.9	52.7	56.5	60.3	67.9
		-33	(2)	90.4	628	165	.58	335	37.4	45.4	49.3	53.3	57.3	61.3	69.3
	ISA+0°C	-37	(1)	97.8	899	207	.72	404	33.8	39.3	42.1	44.9	47.7	50.5	56.0
	-56°C	-39		94.1	797	195	.680	382	35.4	41.7	44.9	48.0	51.1	54.3	60.6
		-40		92.0	726	186	.650	366	36.6	43.5	47.0	50.4	53.9	57.3	64.2
		-42		90.3	669	177	.620	350	37.3	44.8	48.5	52.3	56.0	59.8	67.2
		-43	(2)	88.4	611	165	.58	328	37.3	45.5	49.6	53.7	57.8	61.9	70.1
	ISA-10°C	-47	(1)	96.7	900	210	.73	400	33.3	38.8	41.6	44.4	47.2	49.9	55.5
	-66°C	-49		92.9	795	198	.690	379	35.0	41.3	44.5	47.6	50.8	53.9	60.2
		-51		89.9	704	186	.650	357	36.6	43.7	47.3	50.8	54.4	57.9	65.0
		-53		87.7	633	174	.610	336	37.3	45.2	49.2	53.1	57.1	61.0	68.9
		-54	(2)	86.3	592	165	.58	320	37.2	45.7	49.9	54.1	58.3	62.5	71.0
11000	ISA+20°C	-19	(1)	94.9	733	184	.64	378	38.0	44.8	48.2	51.6	55.0	58.4	65.3
	-36°C	-20		93.6	688	177	.620	365	38.6	45.8	49.4	53.1	56.7	60.3	67.6
		-21		92.4	655	171	.600	354	38.8	46.4	50.3	54.1	57.9	61.7	69.3
		-22		91.3	623	165	.580	343	38.9	46.9	50.9	54.9	58.9	63.0	71.0
		-23	(2)	90.2	590	158	.56	329	38.8	47.2	51.5	55.7	59.9	64.2	72.6
	ISA+10°C	-27	(1)	96.6	837	199	.69	399	35.7	41.6	44.6	47.6	50.6	53.6	59.5
	-46°C	-29		94.0	751	189	.660	380	37.3	43.9	47.3	50.6	53.9	57.2	63.9
		-30		92.1	687	180	.630	363	38.3	45.6	49.2	52.9	56.5	60.2	67.4
		-32		90.4	635	171	.600	346	38.8	46.7	50.6	54.5	58.5	62.4	70.3
		-34	(2)	88.3	575	158	.56	323	38.7	47.4	51.8	56.1	60.5	64.8	73.5
	ISA+0°C	-36	(1)	97.8	901	209	.73	407	34.1	39.6	42.4	45.2	47.9	50.7	56.3
	-56°C	-39		93.3	777	195	.680	382	36.3	42.7	46.0	49.2	52.4	55.6	62.0
		-41		90.7	685	183	.640	361	38.1	45.4	49.0	52.7	56.3	60.0	67.3
		-43		88.4	616	171	.600	339	38.7	46.9	50.9	55.0	59.0	63.1	71.2
		-44	(2)	86.3	559	159	.56	316	38.6	47.6	52.0	56.5	61.0	65.5	74.4
	ISA-10°C	-47	(1)	96.8	906	212	.74	403	33.5	39.0	41.7	44.5	47.3	50.0	55.5
	-66°C	-49		92.1	778	198	.690	379	35.8	42.2	45.5	48.7	51.9	55.1	61.5
		-51		89.2	684	186	.650	357	37.7	45.0	48.6	52.3	55.9	59.6	66.9
		-53		86.9	612	174	.610	336	38.6	46.7	50.8	54.9	59.0	63.0	71.2
		-55	(2)	84.3	542	159	.56	309	38.5	47.7	52.3	56.9	61.5	66.1	75.4

525BOM-00-00

Figure 4-11 (Sheet 31)

CRUISE
41000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL: HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
10000	ISA+20°C	-19	(1)	94.9	734	187	.65	384	38.7	45.5	48.9	52.3	55.7	59.1	65.9
	-36°C	-20		92.7	669	177	.620	365	39.7	47.2	50.9	54.7	58.4	62.1	69.6
		-22		91.0	617	168	.590	348	40.2	48.3	52.4	56.4	60.5	64.5	72.6
		-23		89.3	572	159	.560	331	40.4	49.1	53.5	57.9	62.3	66.6	75.4
		-24	(2)	88.1	541	152	.54	318	40.2	49.5	54.1	58.7	63.4	68.0	77.2
	ISA+10°C	-27	(1)	96.6	841	201	.70	403	36.0	41.9	44.9	47.9	50.8	53.8	59.8
	-46°C	-29		93.4	732	189	.660	380	38.2	45.1	48.5	51.9	55.3	58.7	65.5
		-31		90.7	649	177	.620	358	39.7	47.4	51.3	55.1	59.0	62.8	70.5
		-33		88.4	584	165	.580	335	40.3	48.9	53.1	57.4	61.7	66.0	74.6
		-35	(2)	86.1	525	152	.54	311	40.1	49.7	54.4	59.2	64.0	68.7	78.3
	ISA+0°C	-36	(1)	97.7	903	211	.73	410	34.3	39.8	42.6	45.4	48.1	50.9	56.4
	-56°C	-39		92.7	759	195	.680	382	37.2	43.8	47.1	50.3	53.6	56.9	63.5
		-41		89.3	647	180	.630	355	39.4	47.2	51.0	54.9	58.7	62.6	70.3
		-43		86.4	567	165	.580	328	40.2	49.0	53.4	57.8	62.3	66.7	75.5
		-45	(2)	84.2	511	152	.54	304	40.0	49.8	54.7	59.6	64.5	69.4	79.2
	ISA-10°C	-47	(1)	96.2	892	212	.74	403	34.0	39.6	42.4	45.2	48.0	50.8	56.4
	-66°C	-49		91.4	762	198	.690	379	36.6	43.1	46.4	49.7	53.0	56.3	62.8
		-51		87.9	646	183	.640	352	39.0	46.7	50.6	54.5	58.3	62.2	69.9
		-54		84.9	564	168	.590	325	40.0	48.8	53.3	57.7	62.1	66.6	75.4
		-56	(2)	82.2	495	152	.54	297	39.8	49.9	54.9	60.0	65.0	70.1	80.2
9000	ISA+20°C	-18	(1)	94.8	734	189	.66	388	39.2	46.0	49.4	52.8	56.2	59.6	66.4
	-36°C	-20		92.0	651	177	.620	365	40.8	48.5	52.3	56.1	60.0	63.8	71.5
		-22		90.1	598	168	.590	348	41.5	49.9	54.0	58.2	62.4	66.6	74.9
		-23		88.3	551	159	.560	331	41.9	51.0	55.6	60.1	64.6	69.2	78.3
		-25	(2)	86.1	499	148	.52	309	41.8	51.8	56.8	61.8	66.8	71.9	81.9
	ISA+10°C	-26	(1)	96.6	844	203	.71	406	36.3	42.2	45.2	48.1	51.1	54.0	60.0
	-46°C	-29		92.8	716	189	.660	380	39.1	46.1	49.6	53.1	56.6	60.1	67.1
		-31		89.4	614	174	.610	352	41.1	49.2	53.3	57.3	61.4	65.5	73.6
		-34		86.4	535	159	.560	324	41.9	51.2	55.9	60.6	65.2	69.9	79.3
		-35	(2)	84.2	485	148	.52	302	41.7	52.0	57.2	62.3	67.5	72.6	82.9
	ISA+0°C	-36	(1)	97.7	905	212	.74	412	34.5	40.0	42.8	45.6	48.3	51.1	56.6
	-56°C	-39		92.2	743	195	.680	382	38.0	44.7	48.1	51.4	54.8	58.2	64.9
		-41		88.6	631	180	.630	355	40.4	48.4	52.3	56.3	60.2	64.2	72.1
		-43		85.6	548	165	.580	328	41.6	50.7	55.2	59.8	64.4	68.9	78.0
		-46	(2)	82.3	472	148	.52	296	41.5	52.1	57.4	62.7	68.0	73.3	83.9
	ISA-10°C	-47	(1)	95.6	880	212	.74	403	34.5	40.2	43.0	45.8	48.7	51.5	57.2
	-66°C	-50		90.1	720	195	.680	373	38.0	44.9	48.4	51.8	55.3	58.8	65.7
		-52		86.6	612	180	.630	347	40.3	48.5	52.6	56.7	60.7	64.8	73.0
		-54		83.6	532	165	.580	320	41.4	50.8	55.5	60.2	64.9	69.6	79.0
		-56	(2)	80.4	457	148	.52	289	41.3	52.2	57.7	63.1	68.6	74.1	85.0

525BOM-00-00

(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

ANTI-ICE SYSTEMS ON		
MAX FAN % RPM		
-46°C	-56°C	-66°C
96.7	97.8	96.7
INCREASE FUEL FLOWS AND DECREASE SPECIFIC RANGES BY 18%		

Figure 4-11 (Sheet 32)

CRUISE
43000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
13870	ISA+0°C	-38	(1)	97.8	804	187	.69	385	35.5	41.7	44.8	47.9	51.0	54.1	60.4
	-56°C	-39		96.8	775	183	.670	377	35.7	42.2	45.4	48.6	51.9	55.1	61.5
		-40		96.1	758	180	.660	371	35.8	42.4	45.7	49.0	52.3	55.6	62.2
		-40		95.5	741	177	.650	366	35.9	42.6	46.0	49.4	52.8	56.1	62.9
		-41	(2)	94.8	723	174	.64	359	35.9	42.8	46.2	49.7	53.2	56.6	63.5
	ISA-10°C	-49	(1)	96.3	799	190	.70	381	35.2	41.5	44.6	47.8	50.9	54.0	60.3
	-66°C	-50		95.2	768	186	.680	373	35.6	42.1	45.4	48.6	51.9	55.1	61.6
		-50		94.5	750	183	.670	368	35.7	42.4	45.7	49.1	52.4	55.7	62.4
		-50		93.9	733	180	.660	363	35.8	42.7	46.1	49.5	52.9	56.3	63.1
		-51	(2)	92.7	702	174	.64	352	35.9	43.0	46.6	50.1	53.7	57.3	64.4
13000	ISA+10°C	-29	(1)	96.5	741	178	.65	375	37.1	43.9	47.3	50.6	54.0	57.4	64.1
	-46°C	-30		95.7	722	174	.640	369	37.2	44.2	47.6	51.1	54.5	58.0	64.9
		-30		95.2	706	172	.630	363	37.3	44.4	47.9	51.4	55.0	58.5	65.6
		-31	(2)	94.7	690	169	.62	357	37.3	44.5	48.2	51.8	55.4	59.0	66.3
	ISA+0°C	-38	(1)	97.6	805	190	.69	390	36.1	42.3	45.4	48.5	51.6	54.7	60.9
	-56°C	-39		96.4	773	186	.680	382	36.5	43.0	46.2	49.4	52.7	55.9	62.4
		-40		94.9	734	180	.660	371	37.0	43.8	47.2	50.6	54.0	57.4	64.2
		-41		93.6	700	174	.640	361	37.2	44.3	47.9	51.5	55.0	58.6	65.8
		-42	(2)	92.4	665	168	.62	348	37.2	44.8	48.5	52.3	56.0	59.8	67.3
	ISA-10°C	-48	(1)	96.4	808	194	.71	388	35.7	41.8	44.9	48.0	51.1	54.2	60.4
	-66°C	-49		95.0	769	189	.690	379	36.2	42.7	46.0	49.2	52.5	55.7	62.2
		-50		93.4	729	183	.670	368	36.8	43.7	47.1	50.5	54.0	57.4	64.2
		-51		92.0	693	177	.650	357	37.1	44.3	47.9	51.6	55.2	58.8	66.0
		-52	(2)	90.4	647	168	.62	341	37.2	45.0	48.8	52.7	56.5	60.4	68.1
12000	ISA+20°C	-21	(1)	94.9	656	164	.60	356	39.0	46.6	50.5	54.3	58.1	61.9	69.5
	-36°C	-21	(2)	94.9	656	164	.60	356	39.0	46.6	50.4	54.2	58.1	61.9	69.5
	ISA+10°C	-29	(1)	96.4	748	182	.67	384	38.0	44.7	48.0	51.4	54.7	58.1	64.7
	-46°C	-29		95.2	713	177	.650	374	38.5	45.5	49.0	52.5	56.0	59.5	66.6
		-30		94.1	676	172	.630	363	38.9	46.3	50.0	53.7	57.4	61.1	68.5
		-31		93.1	646	166	.610	352	39.0	46.8	50.6	54.5	58.4	62.2	70.0
		-32	(2)	92.8	635	163	.60	348	39.0	46.9	50.8	54.7	58.7	62.6	70.5
	ISA+0°C	-37	(1)	97.5	807	193	.70	396	36.6	42.8	45.9	49.0	52.1	55.2	61.4
	-56°C	-39		95.3	752	186	.680	382	37.6	44.2	47.5	50.9	54.2	57.5	64.2
		-40		93.0	691	177	.650	366	38.5	45.7	49.3	52.9	56.6	60.2	67.4
		-42		91.5	640	169	.620	350	39.0	46.8	50.7	54.6	58.5	62.4	70.2
		-42	(2)	90.7	616	164	.60	340	39.0	47.1	51.2	55.2	59.3	63.3	71.4
	ISA-10°C	-48	(1)	96.6	818	198	.72	395	36.0	42.2	45.2	48.3	51.3	54.4	60.5
	-66°C	-49		93.9	749	189	.690	379	37.2	43.9	47.2	50.6	53.9	57.3	63.9
		-50		91.5	688	180	.660	363	38.2	45.5	49.1	52.8	56.4	60.0	67.3
		-52		89.8	635	172	.630	347	38.9	46.8	50.7	54.6	58.6	62.5	70.4
		-53	(2)	88.7	599	164	.60	333	38.9	47.3	51.4	55.6	59.8	64.0	72.3
11000	ISA+20°C	-20	(1)	94.8	658	169	.62	367	40.5	48.1	51.9	55.7	59.5	63.3	70.9
	-36°C	-21		94.1	639	166	.610	360	40.7	48.5	52.4	56.3	60.2	64.2	72.0
		-21		93.6	624	163	.600	354	40.7	48.7	52.7	56.7	60.7	64.7	72.8
		-22		93.2	610	160	.590	348	40.7	48.9	53.0	57.1	61.2	65.3	73.4
		-22	(2)	92.9	602	158	.58	345	40.6	48.9	53.1	57.2	61.4	65.5	73.8
	ISA+10°C	-28	(1)	96.4	752	186	.68	391	38.6	45.3	48.6	51.9	55.3	58.6	65.2
	-46°C	-29		94.9	710	180	.660	380	39.4	46.5	50.0	53.5	57.1	60.6	67.6
		-30		93.7	669	174	.640	369	40.2	47.6	51.4	55.1	58.8	62.6	70.0
		-31		92.6	635	169	.620	358	40.6	48.4	52.4	56.3	60.2	64.2	72.1
		-33	(2)	90.8	583	158	.58	337	40.6	49.2	53.5	57.8	62.1	66.4	74.9
	ISA+0°C	-37	(1)	97.3	808	196	.71	400	37.1	43.3	46.4	49.5	52.6	55.7	61.9
	-56°C	-39		94.3	731	186	.680	382	38.6	45.4	48.9	52.3	55.7	59.1	65.9
		-40		92.2	668	177	.650	366	39.8	47.3	51.1	54.8	58.6	62.3	69.8
		-42		90.5	615	169	.620	350	40.6	48.7	52.8	56.8	60.9	64.9	73.1
		-43	(2)	88.8	567	158	.58	330	40.6	49.4	53.8	58.2	62.6	67.0	75.9
	ISA-10°C	-47	(1)	96.7	825	200	.73	400	36.3	42.4	45.4	48.4	51.4	54.5	60.5
	-66°C	-49		93.0	730	189	.690	379	38.2	45.0	48.5	51.9	55.3	58.8	65.6
		-51		90.0	647	177	.650	357	39.8	47.6	51.4	55.3	59.2	63.0	70.8
		-53		87.9	582	166	.610	336	40.6	49.2	53.5	57.8	62.1	66.3	74.9
		-54	(2)	86.7	549	158	.58	322	40.4	49.5	54.1	58.6	63.2	67.7	76.8
10000	ISA+20°C	-19	(1)	94.6	659	173	.64	374	41.6	49.2	53.0	56.8	60.6	64.4	72.0
	-36°C	-20		93.7	632	169	.620	365	42.0	49.9	53.9	57.9	61.8	65.8	73.7
		-21		92.6	601	163	.600	354	42.3	50.6	54.7	58.9	63.1	67.2	75.5
		-22		91.5	573	157	.580	343	42.4	51.1	55.5	59.8	64.2	68.6	77.3
		-23	(2)	90.4	544	151	.56	330	42.2	51.4	56.0	60.6	65.2	69.8	78.9
	ISA+10°C	-27	(1)	96.3	756	189	.69	396	39.2	45.8	49.1	52.4	55.7	59.0	65.6
	-46°C	-29		94.2	688	180	.660	380	40.7	47.9	51.6	55.2	58.8	62.5	69.7
		-30		92.2	630	172	.630	363	41.8	49.7	53.7	57.7	61.6	65.6	73.5
		-32		90.5	583	163	.600	346	42.3	50.9	55.1	59.4	63.7	68.0	76.6
		-34	(2)	88.5	529	151	.56	323	42.2	51.7	56.4	61.1	65.8	70.5	80.0
	ISA+0°C	-37	(1)	97.2	811	198	.72	404	37.5	43.7	46.8	49.9	53.0	56.0	62.2
	-56°C	-39		93.5	712	186	.680	382	39.6	46.7	50.2	53.7	57.2	60.7	67.7
		-41		90.8	628	174	.640	361	41.5	49.5	53.4	57.4	61.4	65.4	73.4
		-43		88.5	565	163	.600	339	42.2	51.1	55.5	59.9	64.4	68.8	77.6
		-44	(2)	86.5	515	152	.56	317	42.1	51.8	56.7	61.6	66.4	71.3	81.0
	ISA-10°C	-47	(1)	96.7	830	203	.74	403	36.6	42.6	45.6	48.6	51.6	54.6	60.7
	-66°C	-49		92.1	712	189	.690	379	39.1	46.2	49.7	53.2	56.7	60.2	67.2
		-51		89.3	626	177	.650	357	41.1	49.1	53.1	57.1	61.1	65.1	73.0
		-53		86.9	562	166	.610	336	42.0	50.9	55.4	59.8	64.3	68.7	77.6
		-55	(2)	84.5	499	152	.56	309	42.0	52.0	57.0	62.0	67.0	72.0	82.0

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Figure 4-11 (Sheet 33)

CRUISE
43000 FEET

ANTI-ICE SYSTEMS OFF — **TWO ENGINES**

WT LBS	TEMP	RAT °C		FAN PERCENT RPM	FUEL FLOW LBS/HR	KIAS	IND MACH	KTAS	NAUTICAL MILES / 100 LBS FUEL HEADWIND 100 KT	HEADWIND 50 KT	HEADWIND 25 KT	ZERO WIND	TAILWIND 25 KT	TAILWIND 50 KT	TAILWIND 100 KT
9000	ISA+20°C	-19	(1)	94.5	660	176	.65	381	42.5	50.1	53.9	57.7	61.5	65.2	72.8
	-36°C	-20		92.8	612	169	.620	365	43.4	51.6	55.6	59.7	63.8	67.9	76.1
		-22		91.0	565	160	.590	348	43.9	52.8	57.2	61.6	66.0	70.5	79.3
		-23		89.4	523	152	.560	331	44.1	53.7	58.5	63.2	68.0	72.8	82.3
		-24	(2)	88.1	494	145	.54	317	43.9	54.1	59.1	64.2	69.2	74.3	84.4
	ISA+10°C	-27	(1)	96.3	759	191	.70	400	39.6	46.2	49.5	52.8	56.1	59.4	66.0
	-46°C	-29		93.5	670	180	.660	380	41.8	49.3	53.0	56.7	60.5	64.2	71.7
		-31		90.8	594	169	.620	358	43.4	51.8	56.0	60.2	64.5	68.7	77.1
		-33		88.5	534	157	.580	335	44.0	53.4	58.1	62.8	67.5	72.1	81.5
		-35	(2)	86.2	481	145	.54	311	43.9	54.3	59.5	64.7	69.9	75.1	85.5
	ISA+0°C	-36	(1)	97.2	814	200	.73	408	37.8	44.0	47.0	50.1	53.2	56.2	62.4
	-56°C	-39		92.8	695	186	.680	382	40.6	47.8	51.4	55.0	58.6	62.2	69.4
		-41		89.3	592	172	.630	355	43.1	51.6	55.8	60.0	64.2	68.4	76.9
		-43		86.5	518	157	.580	328	44.0	53.6	58.4	63.3	68.1	72.9	82.6
		-45	(2)	84.2	466	145	.54	304	43.7	54.5	59.8	65.2	70.6	75.9	86.7
	ISA-10°C	-47	(1)	96.1	815	203	.74	403	37.2	43.3	46.4	49.5	52.5	55.6	61.7
	-66°C	-49		91.4	696	189	.690	379	40.0	47.2	50.8	54.4	58.0	61.6	68.8
		-51		87.9	591	174	.640	352	42.7	51.2	55.4	59.6	63.9	68.1	76.6
		-54		84.9	516	160	.590	325	43.7	53.4	58.3	63.1	68.0	72.8	82.5
		-56	(2)	82.1	451	145	.54	296	43.5	54.6	60.1	65.7	71.2	76.8	87.9

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(1) MAXIMUM CRUISE THRUST

(2) THRUST FOR MAXIMUM RANGE (APPROXIMATE)

Figure 4-11 (Sheet 34)

DESCENT

Performance for two types of descent is presented on the following pages. Time, distance and fuel information are provided for a normal descent of 2000 feet per minute; and a high speed descent of 3000 feet per minute for maximum speed.

This performance is based on controlling the fan speed to obtain the fuel flows, airspeed and rates of descent presented with gear and flaps up, speed brakes retracted and anti-ice systems OFF or ON.

The time, distance and fuel used from a given altitude is based on descending to sea level. If the descent is to another altitude, the difference in time, distance and fuel used between the initial and the final altitude must be determined.

Begin descent at MMO -10 KIAS, and maintain desired rate of descent when obtained.

The data is based on three weights at standard day temperature.

NORMAL DESCENT

2000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS OFF

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
45,000	183	22.6	132	184	22.5	131	202	22.5	131	226
43,000	192	21.6	125	180	21.5	125	198	21.5	125	221
41,000	202	20.6	119	175	20.5	118	193	20.5	118	215
39,000	212	19.6	112	170	19.5	112	187	19.5	112	208
37,000	223	18.6	105	163	18.5	105	180	18.5	105	201
35,000	234	17.6	99	156	17.5	99	172	17.5	99	192
33,000	246	16.6	92	146	16.5	92	162	16.5	92	182
31,000	258	15.6	85	136	15.5	85	151	15.5	85	170
29,000	268	14.6	79	124	14.5	78	138	14.5	78	157
27,000	268	13.6	72	114	13.5	72	127	13.5	72	144
25,000	268	12.6	65	103	12.5	65	116	12.5	65	132
23,000	268	11.6	59	94	11.5	59	105	11.5	59	121
21,000	268	10.6	53	84	10.5	53	95	10.5	53	109
19,000	268	9.6	47	74	9.5	47	84	9.5	47	97
17,000	268	8.6	41	65	8.5	41	74	8.5	41	86
15,000	268	7.6	36	56	7.5	36	64	7.5	35	74
10,000	253	5.0	22	34	5.0	22	41	5.0	22	48
5,000	253	2.5	11	17	2.5	11	20	2.5	11	24

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NORMAL DESCENT

2000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS ON

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
41,000	202	20.8	119	207	20.6	119	222	20.5	118	243
39,000	212	19.8	113	200	19.6	112	214	19.5	112	235
37,000	223	18.8	106	193	18.6	105	206	18.5	105	226
35,000	234	17.8	100	184	17.6	99	197	17.5	99	216
33,000	246	16.8	93	173	16.6	92	186	16.5	92	205
31,000	258	15.8	86	162	15.6	85	174	15.5	85	191
29,000	268	14.8	79	149	14.6	79	160	14.5	78	177
27,000	268	13.8	73	137	13.6	72	147	13.5	72	163
25,000	268	12.8	66	126	12.6	65	135	12.5	65	150
23,000	268	11.8	60	115	11.6	59	123	11.5	59	137
21,000	268	10.8	54	104	10.6	53	112	10.5	53	124
19,000	268	9.8	48	93	9.6	47	100	9.5	47	111
17,000	268	8.8	42	83	8.6	41	88	8.5	41	99
15,000	268	7.8	37	72	7.6	36	77	7.5	35	86
10,000	253	5.2	23	46	5.0	22	49	5.0	22	56
5,000	253	2.7	11	25	2.5	11	25	2.5	11	28

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WIND EFFECT ON DESCENT DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

TIME (MIN)	WIND		
	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 4-13

HIGH SPEED DESCENT

3000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS OFF

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
45,000	183	16.6	96	85	15.9	92	94	15.2	88	108
43,000	192	15.8	90	82	15.0	86	91	14.4	84	105
41,000	202	15.0	85	80	14.3	82	89	13.8	79	103
39,000	212	14.2	80	78	13.6	77	87	13.1	75	100
37,000	223	13.5	75	75	13.0	73	84	12.4	70	97
35,000	234	12.9	71	72	12.3	68	80	11.8	66	92
33,000	246	12.2	67	68	11.6	64	75	11.1	61	87
31,000	258	11.5	62	63	11.0	59	70	10.4	57	80
29,000	268	10.9	58	57	10.3	55	63	9.8	52	73
27,000	268	10.2	53	53	9.6	50	58	9.1	48	67
25,000	268	9.6	49	49	9.0	46	53	8.4	44	61
23,000	268	8.9	45	45	8.3	42	48	7.8	40	55
21,000	268	8.2	41	41	7.6	38	44	7.1	35	49
19,000	268	7.6	37	38	7.0	34	39	6.4	32	43
17,000	268	6.9	33	35	6.3	30	35	5.8	28	38
15,000	268	6.2	29	32	5.6	26	31	5.1	24	32
10,000	253	4.3	19	23	3.8	17	20	3.3	15	19
5,000	253	2.2	10	12	2.0	8	11	1.7	7	10

525BOM-00-00

HIGH SPEED DESCENT

3000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS ON

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
41,000	202	15.9	89	118	15.0	85	121	14.2	81	130
39,000	212	15.1	84	115	14.3	80	118	13.5	77	126
37,000	223	14.5	80	112	13.6	76	114	12.9	72	122
35,000	234	13.8	75	108	13.0	71	110	12.2	68	117
33,000	246	13.1	71	103	12.3	67	104	11.5	63	111
31,000	258	12.5	66	97	11.6	62	98	10.9	59	103
29,000	268	11.8	62	91	11.0	58	91	10.2	54	95
27,000	268	11.2	57	86	10.3	53	85	9.5	50	88
25,000	268	10.5	53	81	9.6	49	79	8.9	46	81
23,000	268	9.8	49	77	9.0	45	74	8.2	42	75
21,000	268	9.2	45	72	8.3	41	68	7.5	37	68
19,000	268	8.5	41	68	7.6	37	63	6.9	34	62
17,000	268	7.8	37	64	7.0	33	58	6.2	30	56
15,000	268	7.1	33	59	6.3	30	53	5.6	26	49
10,000	253	5.1	23	44	4.5	20	39	3.8	17	33
5,000	253	2.6	11	24	2.3	10	21	2.0	8	18

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WIND EFFECT ON DESCENT DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

TIME (MIN)	WIND		
	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 4-14

HOLDING

Holding fuel in total pounds per hour is presented for various weights at several altitudes.

This data is based on a nominal holding speed with gear and flaps up and speed brakes retracted.

HOLDING FUEL

ANTI-ICE SYSTEMS OFF

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

WEIGHT LBS	KIAS	TOTAL POUNDS PER HOUR PRESSURE ALTITUDE - FEET SEA LEVEL	1,500	5,000	10,000	15,000	20,000	25,000	30,000
13,000	185	911	896	861	820	793	768	750	720
12,000	180	862	848	814	775	750	725	707	676
11,000	175	815	801	769	732	707	683	665	635
10,000	170	769	755	724	689	665	642	625	595
9,000	165	724	711	682	648	625	602	586	557

525BOM 00-00

WHEN ANTI-ICE SYSTEMS ARE ON, INCREASE FUEL FLOWS BY 14%.

Figure 4-15

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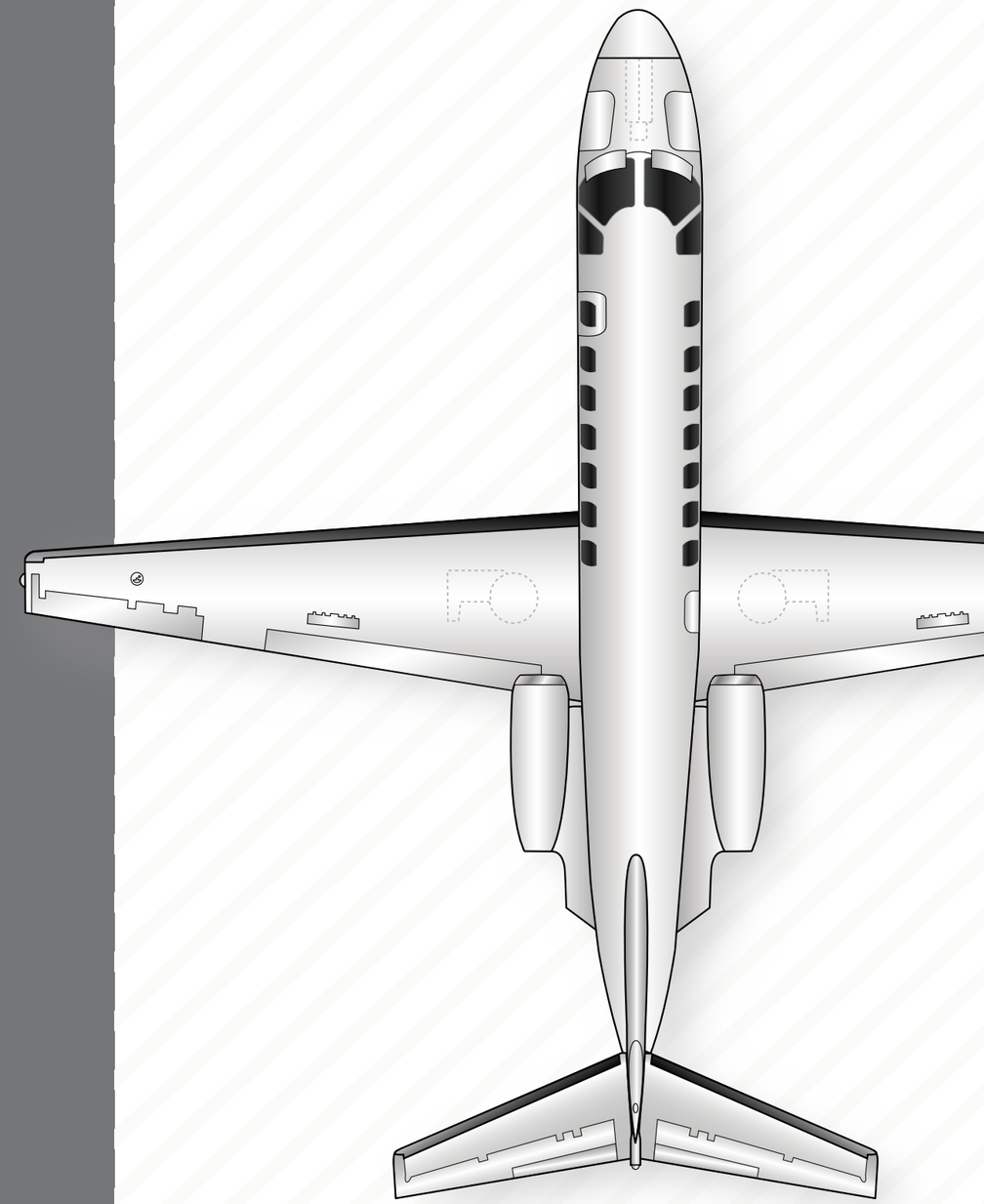
STANDARD CHARTS



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TEMPERATURE CONVERSION

CELSIUS TO FAHRENHEIT

DEG. C	DEG. F	DEG. C	DEG. F	DEG. C	DEG. F	DEG. C	DEG. F	DEG. C	DEG. F	DEG. C	DEG. F
-100	-148	-74	-101	-48	-54	-22	-8	4	39	30	86
-99	-146	-73	-99	-47	-53	-21	-6	5	41	31	88
-98	-144	-72	-98	-46	-51	-20	-4	6	43	32	90
-97	-143	-71	-96	-45	-49	-19	-2	7	45	33	91
-96	-141	-70	-94	-44	-47	-18	0	8	46	34	93
-95	-139	-69	-92	-43	-45	-17	1	9	48	35	95
-94	-137	-68	-90	-42	-44	-16	3	10	50	36	97
-93	-135	-67	-89	-41	-42	-15	5	11	52	37	99
-92	-134	-66	-87	-40	-40	-14	7	12	54	38	100
-91	-132	-65	-85	-39	-38	-13	9	13	55	39	102
-90	-130	-64	-83	-38	-36	-12	10	14	57	40	104
-89	-128	-63	-81	-37	-35	-11	12	15	59	41	106
-88	-126	-62	-80	-36	-33	-10	14	16	61	42	108
-87	-125	-61	-78	-35	-31	-9	16	17	63	43	109
-86	-123	-60	-76	-34	-29	-8	18	18	64	44	111
-85	-121	-59	-74	-33	-27	-7	19	19	66	45	113
-84	-119	-58	-72	-32	-26	-6	21	20	68	46	115
-83	-117	-57	-71	-31	-24	-5	23	21	70	47	117
-82	-116	-56	-69	-30	-22	-4	25	22	72	48	118
-81	-114	-55	-67	-29	-20	-3	27	23	73	49	120
-80	-112	-54	-65	-28	-18	-2	28	24	75	50	122
-79	-110	-53	-63	-27	-17	-1	30	25	77	51	124
-78	-108	-52	-62	-26	-15	0	32	26	79	52	126
-77	-107	-51	-60	-25	-13	1	34	27	91	53	127
-76	-105	-50	-58	-24	-11	2	36	28	82	54	129
-75	-103	-49	-56	-23	-9	3	37	29	84	55	131

PRESSURE CONVERSION

INCHES OF MERCURY TO MILLIBARS

INCHES OF MERCURY	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	29.0
MILLIBARS	948	951	955	958	962	965	968	972	975	979	982
INCHES OF MERCURY	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	30.0	
MILLIBARS	985	989	992	995	999	1002	1006	1009	1012	1016	
INCHES OF MERCURY	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	31.0	
MILLIBARS	1019	1023	1026	1029	1033	1036	1040	1043	1046	1050	

Figure 4-2 (Sheet 1 of 3)

FUEL QUANTITY CONVERSION
U.S. GALLONS TO LITERS

U.S. GALLONS	LITERS	U.S. GALLONS	LITERS	U.S. GALLONS	LITERS
10	37.9	260	984.1	510	1930.4
20	75.7	270	1022.0	520	1968.2
30	113.6	280	1059.8	530	2006.1
40	151.4	290	1097.7	540	2043.9
50	189.3	300	1135.5	550	2081.8
60	227.1	310	1173.4	560	2119.6
70	265.0	320	1211.2	570	2157.5
80	302.8	330	1249.1	580	2195.3
90	340.7	340	1286.9	590	2233.2
100	378.5	350	1324.8	600	2271.0
110	416.4	360	1362.6	610	2308.9
120	454.2	370	1400.5	620	2346.7
130	492.1	380	1438.3	630	2384.6
140	529.9	390	1476.2	640	2422.4
150	567.8	400	1514.0	650	2460.3
160	605.6	410	1551.9	660	2498.1
170	643.5	420	1589.7	670	2536.0
180	681.3	430	1627.6	680	2573.8
190	719.2	440	1665.4	690	2611.7
200	757.0	450	1703.3	700	2649.5
210	794.9	460	1741.1	710	2687.4
220	832.7	470	1779.0	720	2725.2
230	870.6	480	1816.8	730	2763.1
240	908.4	490	1854.7	740	2800.9
250	946.3	500	1892.5	750	2838.8

WEIGHT CONVERSION
POUNDS TO KILOGRAMS

POUNDS	KILOGRAMS	POUNDS	KILOGRAMS	POUNDS	KILOGRAMS
14200	6441	10800	4899	7000	3175
14000	6350	10600	4808	6800	3084
13800	6260	10400	4717	6600	2994
13600	6169	10200	4627	6400	2903
13400	6078	10000	4536	6200	2812
13200	5988	9800	4445	6000	2721
13000	5897	9600	4354	5800	2630
12800	5806	9400	4263	5600	2540
12600	5715	9200	4173	5400	2449
12400	5625	9000	4082	5200	2358
12200	5534	8800	3991	5000	2268
12000	5443	8600	3900	4800	2177
11800	5352	8400	3810	4600	2086
11600	5262	8200	3719	4400	1995
11400	5171	8000	3628	4200	1905
11200	5080	7800	3538	4000	1814
11000	4990	7600	3447	3800	1723
		7400	3356	3600	1633
		7200	3265	3400	1542

Figure 4-2 (Sheet 2)

HORIZONTAL LENGTH CONVERSION
FEET TO METERS

FEET	METERS	FEET	METERS
15000	4572	7400	2256
14800	4511	7200	2195
14600	4450	7000	2134
14400	4389	6800	2073
14200	4328	6600	2012
14000	4267	6400	1951
13800	4206	6200	1890
13600	4145	6000	1829
13400	4084	5800	1768
13200	4023	5600	1707
13000	3962	5400	1646
12800	3901	5200	1585
12600	3840	5000	1524
12400	3780	4800	1463
12200	3719	4600	1402
12000	3658	4400	1341
11800	3597	4200	1280
11600	3536	4000	1219
11400	3475	3800	1158
11200	3414	3600	1097
11000	3353	3400	1036
10800	3292	3200	975
10600	3231	3000	914
10400	3170	2800	853
10200	3109	2600	792
10000	3048	2400	732
9800	2987	2200	671
9600	2926	2000	610
9400	2865	1800	549
9200	2804	1600	488
9000	2743	1400	427
8800	2682	1200	366
8600	2621	1000	305
8400	2560	800	244
8200	2499	600	183
8000	2438	400	122
7800	2377	200	61
7600	2316	0	0

Figure 4-2 (Sheet 3)

RAM AIR TEMPERATURE RISE - DEGREES CELSIUS

NOTE

Static Air Temperature is displayed, therefore this chart is not required

Figure 4-3

AIRSPEED AND MACHMETER CALIBRATION

AIRSPEED CALIBRATION GEAR UP

KIAS	KCAS
80	80
90	90
100	100
110	110
120	120
130	130
140	139
150	149
160	159
170	169
180	179
190	189
200	198
210	208
220	218
230	228
240	238
250	247
260	257
270	267
278	275

AIRSPEED CALIBRATION GEAR DOWN

KIAS	KCAS
80	80
90	90
100	100
110	110
120	119
130	129
140	138
150	148
160	157
170	167
180	176
190	186
200	195

GROUND AIRSPEED CALIBRATION

KIAS	KCAS
70	70
80	79
90	89
100	99
110	109
120	119
130	129

MACHMETER CALIBRATION

Ind. Mach	True Mach
0.400	0.397
0.425	0.421
0.450	0.446
0.475	0.470
0.500	0.494
0.525	0.519
0.550	0.543
0.575	0.567
0.600	0.591
0.625	0.614
0.650	0.638
0.675	0.662
0.700	0.685
0.725	0.709
0.737	0.720

Figure 4-4

ALTIMETER POSITION CORRECTION - FEET

PILOT'S, COPILOT'S AND STANDBY SYSTEMS (GEAR UP)
INDICATED ALTITUDE = CALIBRATED ALTITUDE

ALTIMETER POSITION CORRECTION - FEET

PILOT'S, COPILOT'S AND STANDBY SYSTEMS (GEAR DOWN)

EXAMPLE:
A. Airspeed = 200 KIAS
B. Indicated Pressure Altitude = 5,000 FEET
C. Altimeter Position Correction = -30 FEET
D. Actual Pressure Altitude = 4,970 FEET

ALT	AIRSPEED - KIAS																	
FEET	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280
0	0	0	0	0	0	0	-10	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-80
1000	0	0	0	0	0	0	-10	-10	-10	-20	-20	-20	-30	-40	-40	-50	-60	-70	-90
2000	0	0	0	0	0	0	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-80	-90
3000	0	0	0	0	0	-10	-10	-10	-10	-20	-20	-30	-40	-40	-50	-60	-70	-80	-100
4000	0	0	0	0	0	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-80	-90	-100
5000	0	0	0	0	0	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-80	-100	-110
6000	0	0	0	0	0	-10	-10	-10	-20	-20	-30	-40	-40	-50	-60	-70	-90	-100	-120
7000	0	0	0	0	-10	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-80	-90	-110	-130
8000	0	0	0	0	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-90	-100	-120	-130
9000	0	0	0	0	-10	-10	-10	-20	-20	-30	-40	-40	-50	-70	-80	-90	-110	-120	-140
10000	0	0	0	0	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-80	-100	-110	-130	-150
11000	0	0	0	-10	-10	-10	-20	-20	-30	-30	-40	-50	-60	-70	-90	-100	-120	-140	-160
12000	0	0	0	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-80	-100	-110	-130	-150	-170
13000	0	0	0	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-90	-100	-120	-140	-160	-190
14000	0	0	0	-10	-10	-10	-20	-30	-30	-40	-50	-60	-80	-90	-110	-130	-150	-170	-200
15000	0	0	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-80	-100	-120	-140	-160	-180	-210
16000	0	0	-10	-10	-10	-20	-20	-30	-40	-50	-60	-70	-90	-110	-120	-150	-170	-200	-230

Note: Shaded areas are above V_{MO}/M_{MO} and are for interpolation only.

Figure 4-5

STALL SPEEDS - KCAS

CONDITIONS:

Landing Gear - UP or DOWN
Engines - IDLE THRUST

ANGLE OF BANK DEG	FLAP SETTING - UP WEIGHT - LBS												
	13870	13600	13400	13200	13000	12800	12600	12400	12200	12000	11000	10000	9000
0	102	101	101	100	99	98	97	97	96	95	91	87	83
10	103	102	101	101	100	99	98	97	97	96	92	88	84
20	106	105	104	103	102	101	101	100	99	98	94	90	86
30	110	109	108	107	106	106	105	104	103	102	98	94	89
40	117	116	115	114	113	112	111	110	110	109	104	100	95
50	128	126	125	124	123	123	122	121	120	119	114	109	104
60	145	143	142	141	140	139	138	137	136	134	129	123	118

ANGLE OF BANK DEG	FLAP SETTING - 15 DEG WEIGHT - LBS												
	13870	13600	13400	13200	13000	12800	12600	12400	12200	12000	11000	10000	9000
0	94	93	92	92	91	90	89	89	88	87	84	80	77
10	95	94	93	92	92	91	90	89	89	88	84	81	77
20	97	96	95	94	94	93	92	92	91	90	86	83	79
30	101	100	99	98	98	97	96	95	95	94	90	86	83
40	107	106	105	105	104	103	102	101	101	100	96	92	88
50	117	116	115	114	113	112	112	111	110	109	105	100	96
60	133	131	130	129	128	127	127	126	125	124	119	114	109

ANGLE OF BANK DEG	FLAP SETTING - FULL WEIGHT - LBS												
	13870	13600	13400	13200	13000	12800	12600	12400	12200	12000	11000	10000	9000
0	86	85	85	84	83	83	82	82	81	80	78	75	72
10	87	86	85	85	84	83	83	82	82	81	78	75	72
20	89	88	87	87	86	85	85	84	84	83	80	77	74
30	92	92	91	90	90	89	88	88	87	86	83	80	77
40	98	97	97	96	95	95	94	93	93	92	89	85	82
50	107	106	106	105	104	103	103	102	101	100	97	93	89
60	122	120	120	119	118	117	116	115	115	114	110	105	101

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Figure 4-6

INTERNATIONAL STANDARD ATMOSPHERE (ISA)

ALTITUDE FEET	ISA DEGREES C	ALTITUDE FEET	ISA DEGREES C
SEA LEVEL	15.0	23000	-30.5
1000	13.0	24000	-32.5
2000	11.0	25000	-34.5
3000	9.1	26000	-36.5
4000	7.1	27000	-38.4
5000	5.1	28000	-40.4
6000	3.1	29000	-42.4
7000	1.1	30000	-44.4
8000	-0.8	31000	-46.3
9000	-2.8	32000	-48.3
10000	-4.8	33000	-50.3
11000	-6.8	34000	-52.3
12000	-8.8	35000	-54.2
13000	-10.7	36000	-56.2
14000	-12.7	37000	-56.5
15000	-14.7	38000	-56.5
16000	-16.7	39000	-56.5
17000	-18.7	40000	-56.5
18000	-20.6	41000	-56.5
19000	-22.6	43000	-56.5
20000	-24.6	45000	-56.5
21000	-26.6		
22000	-28.5		

Figure 4-7

TAKEOFF/GO-AROUND THRUST

EXAMPLE 1:

Anti-Ice = OFF

A. Ambient Temperature = 15°C
B. Pressure Altitude = 2000 FEET
C. N_1 = 99.4% RPM

EXAMPLE 2:

Anti-Ice = ON - ALL (Engine, Wing, and Windshield)

A. Ambient Temperature = 0°C
B. Pressure Altitude = 2000 FEET
C. N_1 = 96.8% RPM

TAKEOFF/GO AROUND THRUST SETTINGS ANTI-ICE - OFF (TO DETENT)

A36567

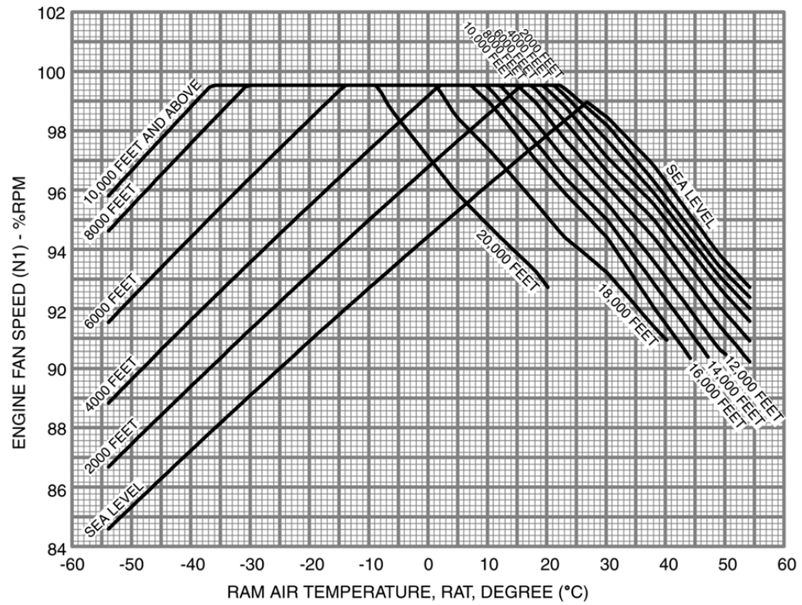


Figure 4-8

TAKEOFF/GO AROUND THRUST SETTINGS
ANTI-ICE - ON (TO DETENT)

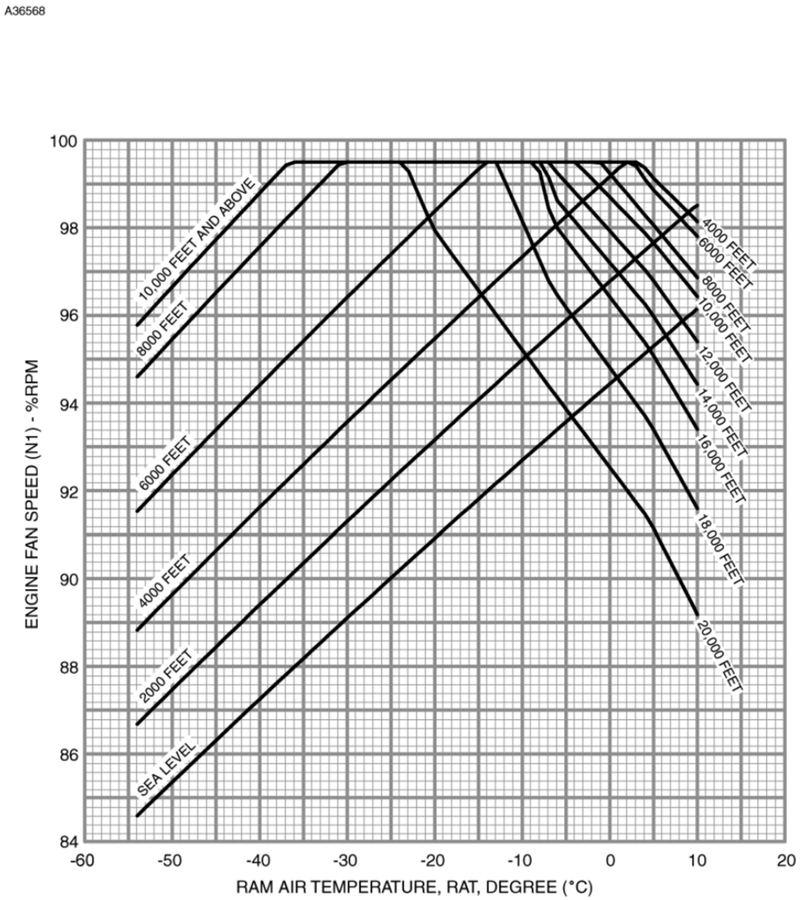


Figure 4-9

MAXIMUM CONTINUOUS THRUST

EXAMPLE 1: (SINGLE ENGINE CLIMB)

Anti-Ice = OFF

A. Indicated RAT = 0°C
B. Pressure Altitude = SEA LEVEL
C. N_1 = 93.7% RPM (Refer to Figure 4-10)

EXAMPLE 2: (SINGLE ENGINE CLIMB)

Anti-Ice = ON - ALL (ENGINE, WING, AND WINDSHIELD)

A. Indicated RAT = -10°C
B. Pressure Altitude = SEA LEVEL
C. N_1 = 92.0% RPM (Refer to Figure 4-10)

EXAMPLE 3: (MULTI ENGINE)

Anti-Ice = OFF

A. Indicated RAT = 0°C
B. Pressure Altitude = 5000 FEET
C. N_1 = 97.6% RPM (Refer to Figure 4-11)

EXAMPLE 4: (MULTI ENGINE)

Anti-Ice = ON

A. Indicated RAT = –30°C
B. Pressure Altitude = 5000 FEET
C. N_1 = 91.9% RPM (Refer to Figure 4-11)

MAXIMUM CONTINUOUS THRUST SETTINGS

SINGLE ENGINE (MCT DETENT)

ANTI-ICE OFF

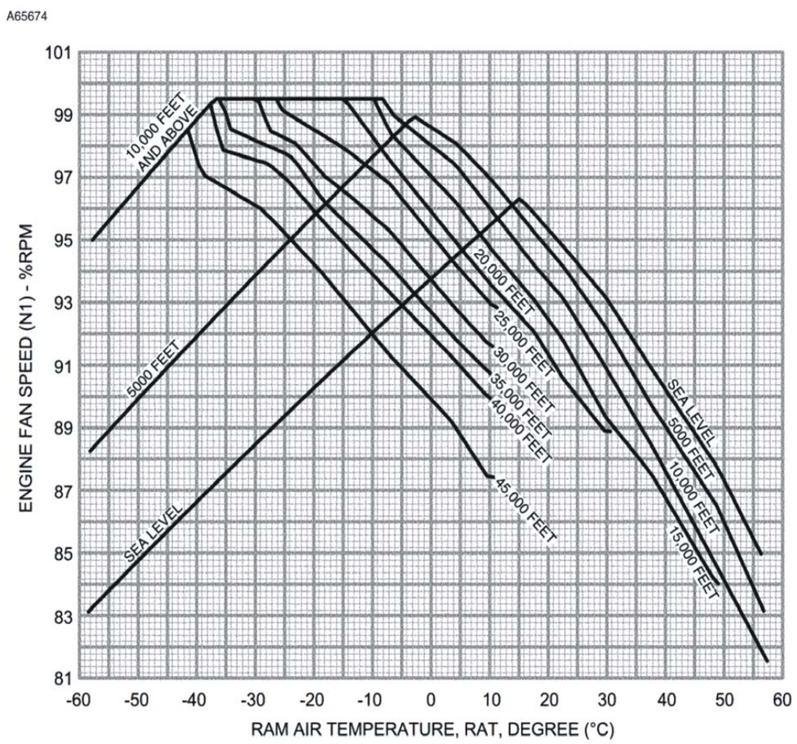


Figure 4-10 (Sheet 1 of 2)

MAXIMUM CONTINUOUS THRUST SETTINGS

SINGLE ENGINE (MCT DETENT)

ANTI-ICE ON

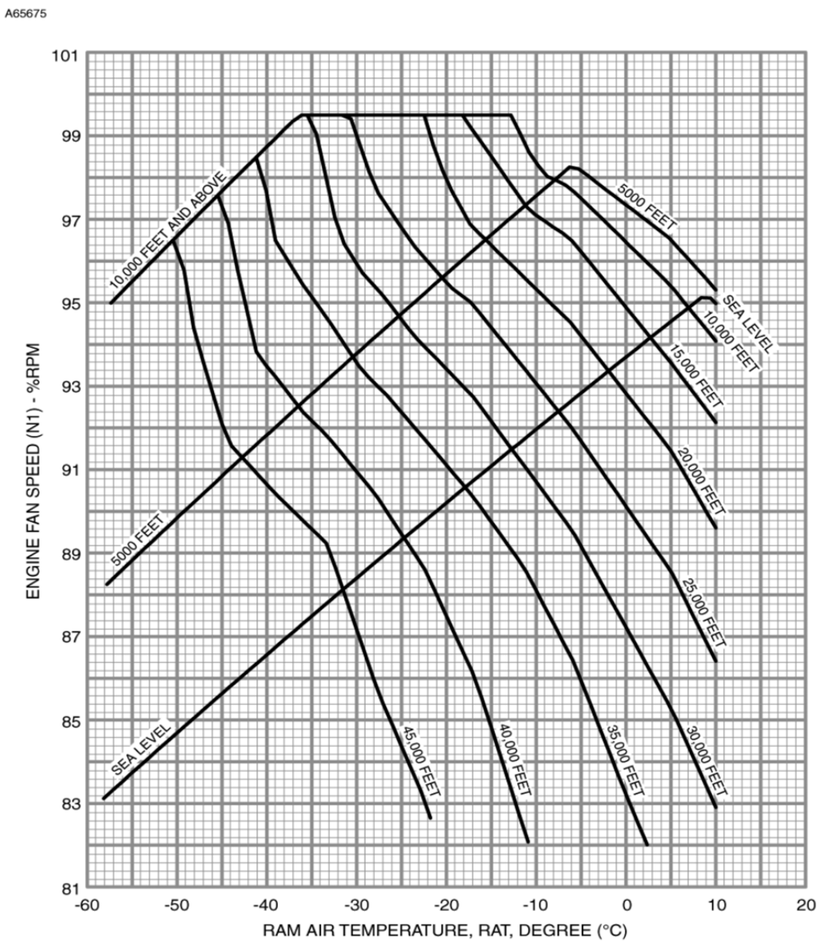


Figure 4-10 (Sheet 2)

MAXIMUM CONTINUOUS THRUST SETTINGS

MULTI-ENGINE (MCT DETENT)

ANTI-ICE OFF

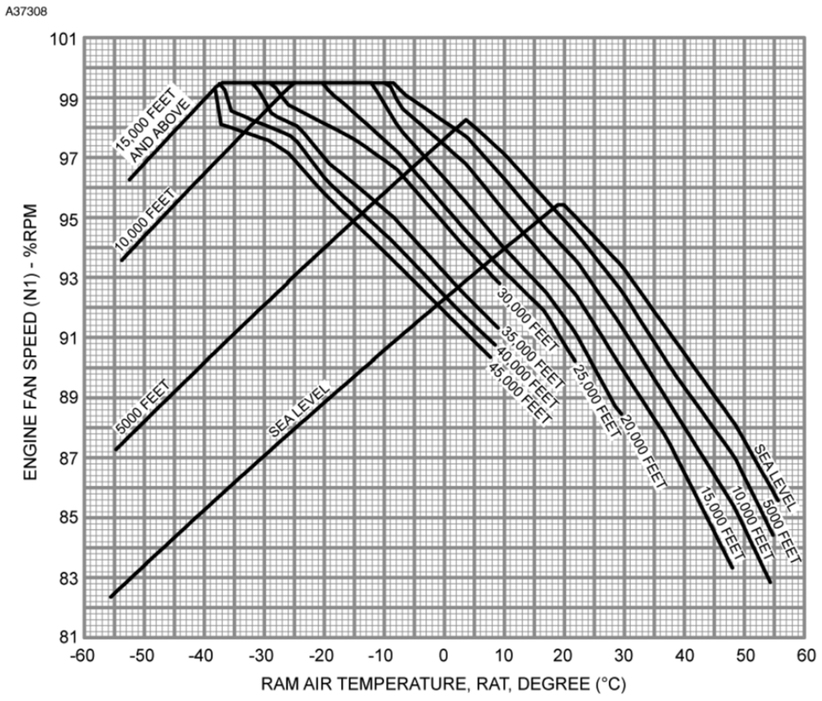


Figure 4-11 (Sheet 1 of 2)

MAXIMUM CONTINUOUS THRUST SETTINGS

MULTI-ENGINE (MCT DETENT)

ANTI-ICE ON

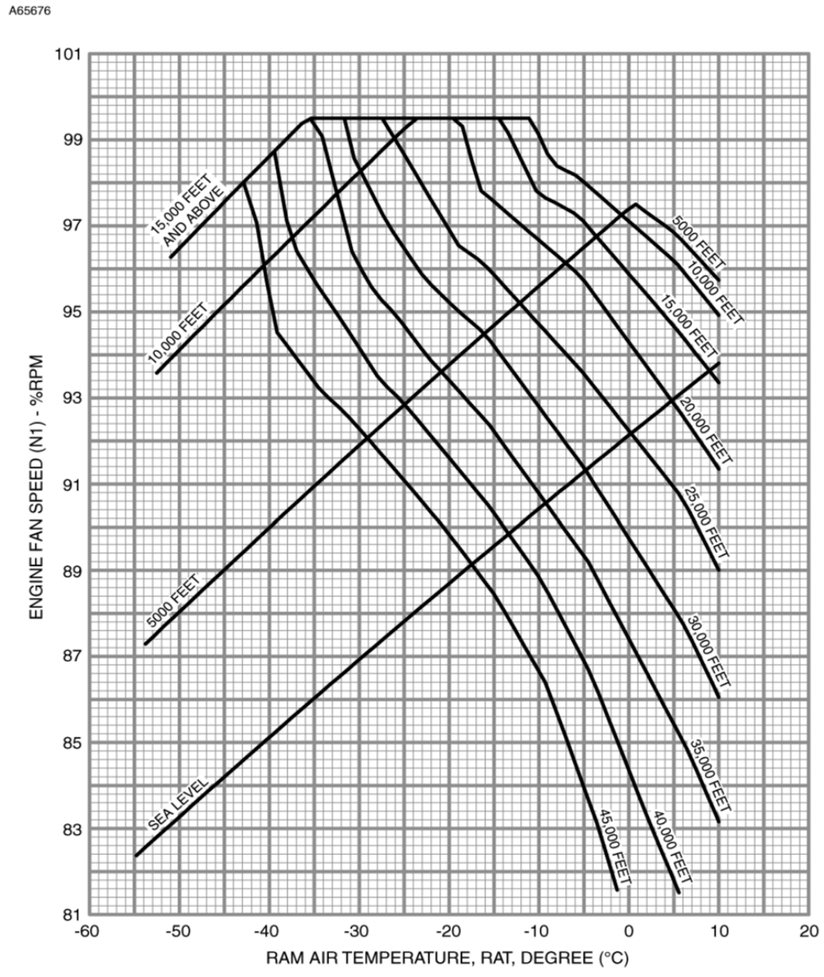


Figure 4-11 (Sheet 2)

BUFFET ONSET

BUFFET AIRSPEED - KIAS

LOW
EXAMPLE:

INDICATED MACH = 0.35

PRESSURE ALTITUDE = 25,000 FEET
WEIGHT = 12,000 POUNDS
BUFFET ONSET
LOAD FACTOR = 1.75 G'S
BANK ANGLE = 55 DEGREES

HIGH
EXAMPLE:

INDICATED MACH = 0.65

PRESSURE ALTITUDE = 35,000 FEET
WEIGHT = 12,000 POUNDS
BUFFET ONSET
LOAD FACTOR = 2.50 G'S
BANK ANGLE = GREATER THAN
65 DEGREES

A11252

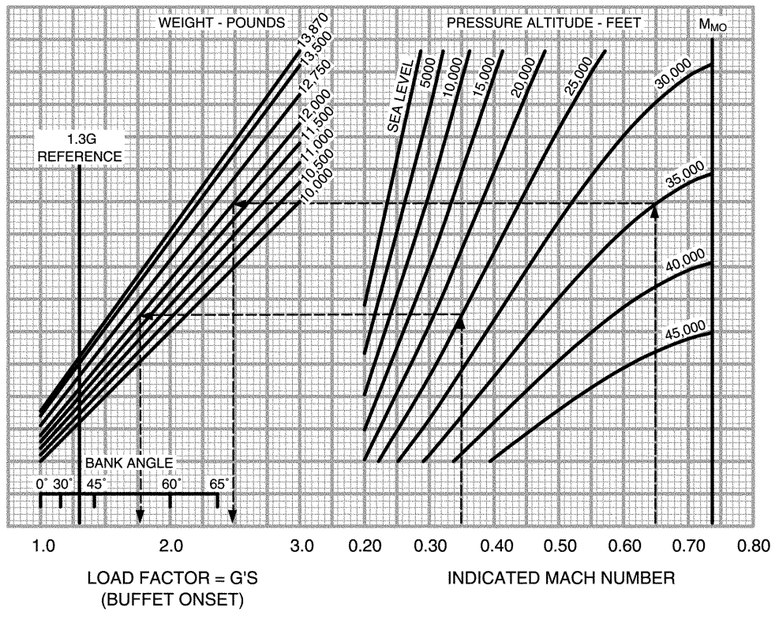
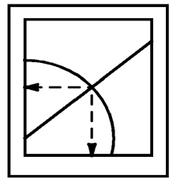


Figure 4-12

CROSSWIND COMPONENT

EXAMPLE:
WIND VELOCITY = 30 KNOTS
ANGLE BETWEEN WIND DIRECTION AND RUNWAY = 30°
CROSSWIND COMPONENT = 15 KNOTS
WIND COMPONENT PARALLEL TO RUNWAY = 26 KNOTS



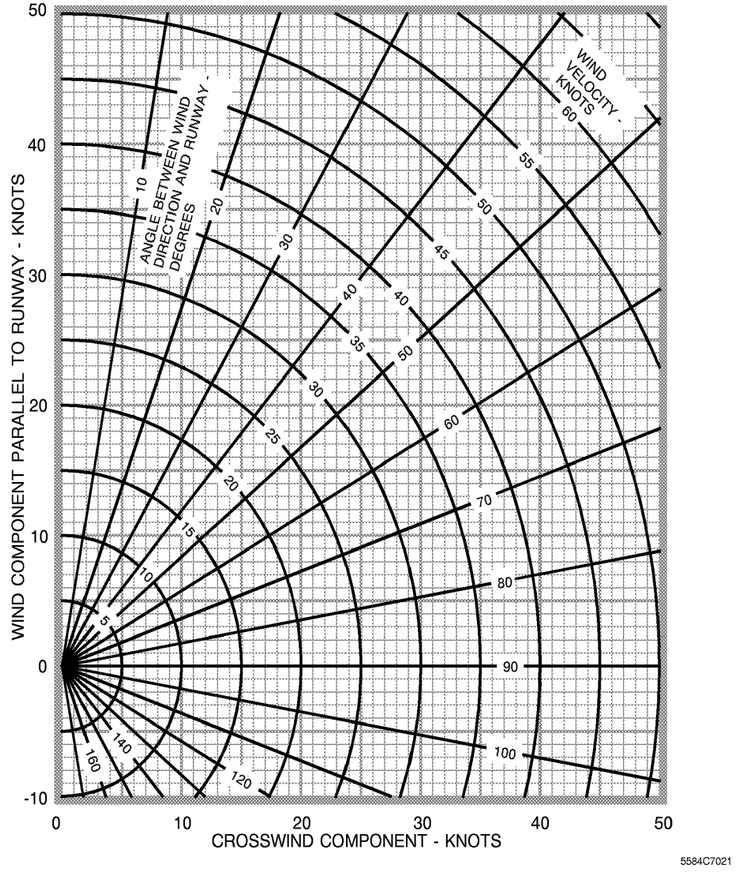


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Figure 4-13

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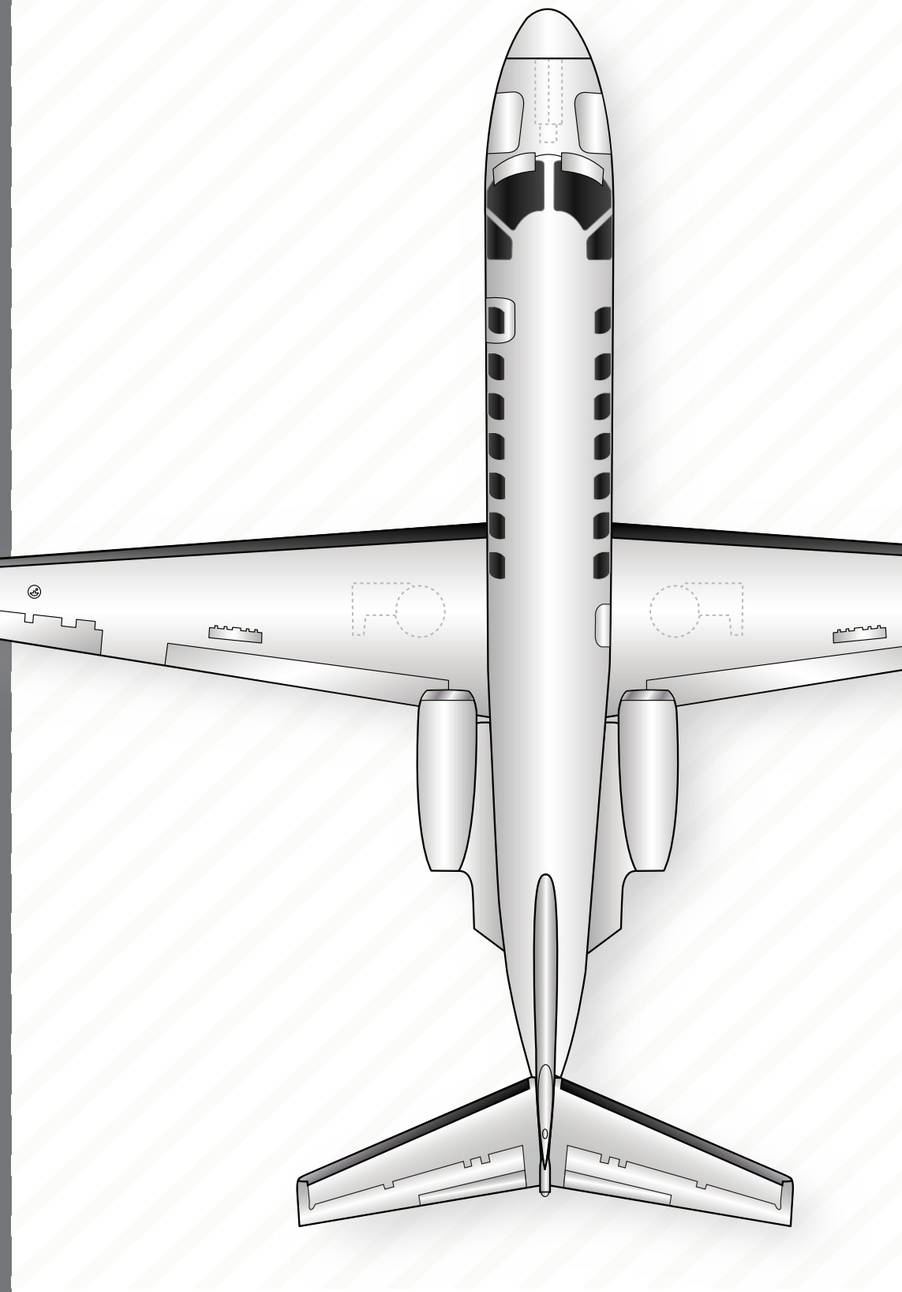
WEIGHT & BALANCE



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WEIGHT AND BALANCE DEFINITIONS

Standard EmptyWeight:	Weight of a standard airplane including unusable fuel, full oil, and full operating fluids.
Basic Empty Weight:	Standard empty weight plus installed optional equipment. This is the weight reflected on the weight and balance data Form 2175 or 2176 supplied with the airplane.
Payload:	Weight of occupants, baggage, cargo, cabinet contents (including charts, maps, manuals, refreshments and miscellaneous equipment).
Zero Fuel Weight:	Basic empty weight plus payload.
Ramp Weight:	Zero fuel weight plus total fuel load.
Takeoff Weight:	Zero fuel weight plus fuel load at takeoff (total fuel minus taxi fuel).
Landing Weight:	Zero fuel weight plus fuel load at landing.

9 OXYGEN SYSTEM

INTRODUCTION

This section provides procedures for establishing the airplane's basic empty weight and moment. It also provides procedures for determining the weight and balance for flight. This section also describes all items on the Weight and Balance Data Sheet which was provided with the airplane as delivered from Cessna Aircraft Company.

WARNING

IT IS THE RESPONSIBILITY OF THE OPERATOR TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE AIRPLANE MUST BE LOADED SO AS TO REMAIN WITHIN THE WEIGHT AND BALANCE LIMITS PRESCRIBED IN THIS AIRPLANE FLIGHT MANUAL THROUGHOUT THE FLIGHT FROM TAKEOFF TO LANDING.

AIRPLANE WEIGHING PROCEDURE

TO ESTABLISH BASIC EMPTY WEIGHT

PREPARATION PRIOR TO WEIGHING

1. Weighing should be accomplished with the airplane in a closed hangar.
2. Calibrate, zero and use the scales in accordance with the scale manufacturer's instructions.
3. Position the scales and jacks under the airplane jack pads or wheels.

AIRPLANE PREPARATION

1. Thoroughly inspect the airplane for loose items, items out of place and systems serviced.
   a. Loose items such as tools, floor mats, spare parts, etc., should be removed.
   b. All items out of place should be placed in their standard location. All seats should be adjusted to their full forward (toward airplane nose) position with their seat backs in the most vertical position and the seat belts crossed on the seat cushions.
   c. The landing gear should be extended and the flaps retracted.
   d. Service the hydraulic system, fire extinguishers, oxygen, and alcohol to the normally full level. Service the engine oil to full. Refer to the Maintenance Manual, Chapter 12, Engine Oil - Servicing.
2. Defuel the airplane. (Refer to the Maintenance Manual, Chapter 12, Fuel - Servicing)
   a. If the airplane is weighed after defueling by the procedure outlined in the Maintenance Manual, the drainable unusable fuel (Refer to Figure 6-1) should be added to the "as weighed" condition.
3. Leveling on landing gear.
   a. Position jacks and jack the airplane, maintaining it approximately level. Refer to the Maintenance Manual, Chapter 7, Lifting - Maintenance Practices.
   b. Position scales, add chocks and remove from jacks.
   c. To level laterally, place 525B Leveling Tool across inboard crew seat rails at approximately FS 148 inches (3759 millimeters). Ensure Leveling Tool is parallel to fuselage station plane and is resting solidly on seat rails. Position inclinometer on Leveling Tool with base parallel to the long axis of the Leveling Tool. Refer to the Maintenance Manual, Chapter 8, Leveling - Maintenance Practices. Adjust the main gear tire or strut pressure to level the aircraft.

(Continued Next Page)

AIRPLANE PREPARATION (Continued)

   d. To level longitudinally, place 525B Leveling Tool across inboard crew seat rails at approximately FS 148 inches (3759 millimeters). Ensure Leveling Tool is parallel to fuselage station plane and is resting solidly on seat rails. Position inclinometer on Leveling Tool with base perpendicular to the long axis of the Leveling Tool at BL 0. Adjust the nose wheel tire or strut pressure to level if sufficient adjustment capability remains. If adjustment is insufficient, adjust both main gear tires and/or struts to level the airplane.
4. Leveling on jack points.
   a. Jack the airplane. Refer to the Maintenance Manual, Chapter 7, Lifting - Maintenance Practices.
   b. Level the airplane. Refer to the Maintenance Manual, Chapter 8, Leveling - Maintenance Practices.
5. Measuring.
   a. When weighing on jack points, no physical measuring is required.
   b. When weighing on landing gear, physically measure the airplane to determine the values. Refer to Figure 6-1.
6. Weighing.
   a. Record each scale reading.
   b. Record tare weight at each weighing point, where tare is used, to determine the "as weighed" condition.

NOTE

- Tare is any weight on the scales not to be included in the airplane weight such as wheel chocks.
- CG is sensitive to proper leveling.
- CG is proportional to proper landing gear measurements.

   c. Locate the longitudinal center-of-gravity and percent MAC. Refer to Figure 6-1 for formulas required.
7. Moment of Wing Fuel.
   a. Figure 6-2 (Sheet 1) presents data for the moment in 100 pound increments and (Sheet 2) presents data for the moment in 50 kilogram increments for the total fuel in both tanks.
8. Balance Limits for Normal Ground Loading.
   a. There is no effect on the balance limits for an operationally ready airplane during normal ground loading operations.

EXAMPLES

GENERAL

1. The contribution that any loading item makes to a shift in the airplane's center-of-gravity depends upon its distance from the airplane's Basic Empty Weight center-of- gravity. Items positioned aft of this point cause the airplane center-of-gravity to shift aft and conversely, items positioned forward of this point cause the center-of-gravity to shift forward.

(Continued Next Page)

EXAMPLES (Continued)

SAMPLE LOADING PROBLEM

The procedure described below illustrates the computations required for a typical mission of a CJ3. Refer to Figure 6-4 to follow the procedure.

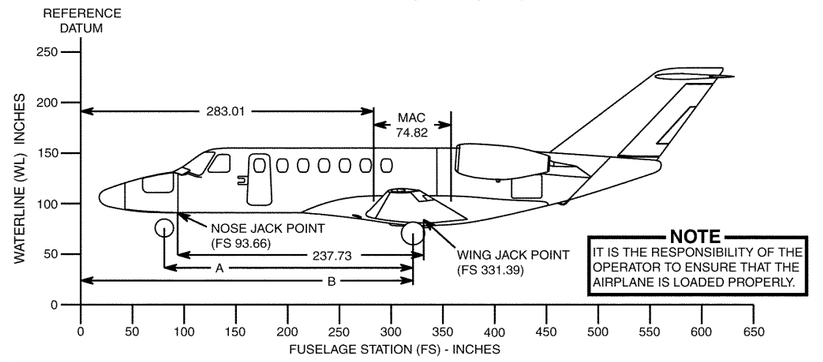
1. Beginning in Column “C” of Figure 6-4 enter the Occupant weights for the Crew and Passengers for your mission, or use the tables from the weight and balance data for steps 1, 2, and 3.
2. Continue in Column “C” and enter the Baggage weights and Cabinet Contents weights. Include all loose equipment, navigation charts, refreshments, baggage, etc.
3. Compute the value for Column “D” as follows: Multiply Column “B” by Column “C” and divide by 100 (1000) or obtain moments from the weight and moments tables.
4. PAYLOAD weight and moment is computed by adding all values for Columns “C” and “D”. Enter these values.
5. Enter the Basic Empty Weight, Moment and center-of-gravity in Columns “F”, “G”, and "E" as shown. These values are obtained from the actual weight sheet furnished with the Airworthiness documents.
6. Enter PAYLOAD weight and moment in Columns “2F” and “2G”.
7. Compute Zero Fuel Weight (ZFW) by adding the values in “1F” and “2F”. Compute ZFW moment by adding the values in “1G” and “2G”. Do not exceed 10,510 pounds (4767 kilograms). Determine ZFW CG and check CG limits.
8. Enter the mission fuel required. Fuel should not exceed 4710 pounds (2136 kilograms). Enter the moment for this fuel weight. (Obtained from the Fuel Moment Table.)
9. Compute Ramp Weight by adding the mission fuel weight and Zero Fuel Weight. Do not exceed 14,070 pounds (6382 kilograms). Compute the moment by adding the moments for these items (Column “G”). Determine ramp weight CG and check limits.
10. Compute the Takeoff Fuel Load by subtracting estimated Taxi Fuel (typically 200 pounds or 91 kilograms) from the Mission Fuel, enter the TAKEOFF FUEL and Takeoff Fuel Moment (obtained from the Fuel Moment Table).
11. Complete the TAKEOFF WEIGHT by adding the takeoff fuel to the zero fuel weight. Do not exceed 13,870 pounds (6291 kilograms). Compute the Takeoff Moment by adding the moments for these items (Column "G"). Determine the Takeoff CG and check limits. Takeoff CG must be within limits.
12. Determine Destination Fuel by subtracting from Takeoff Fuel, expected fuel burn for the intended flight including alternate airports and expected delays. Enter DESTINATION FUEL and moment (obtained from the Fuel Moment Table).
13. Compute LANDING WEIGHT by adding destination fuel to Zero Fuel Weight. Do not exceed 12,750 pounds (5783 kilograms). Compute the Landing Moment by adding the moments for these items (Column "G"). Determine Landing CG and check limits. Landing CG must be within limits.

WARNING

RESULTS COMPUTED FOR STEPS 11 AND 13 MUST BE WITHIN THE LIMITS OF THE APPROVED FLIGHT ENVELOPE AS SHOWN ON FIGURE 6-3 OF THIS MANUAL.

A27783

AIRPLANE WEIGHING FORM



NOTE
IT IS THE RESPONSIBILITY OF THE OPERATOR TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY.

LOCATING CG WITH AIRPLANE ON LANDING GEAR

LEGEND
DIMENSION A = Horizontal distance from center of main landing gear axle to center of nose landing gear axle (determined by measurement after airplane is level on scales).
DIMENSION B = Horizontal distance from reference datum to center of main landing gear axle. Obtain this distance by measuring from nose jack point FS 93.66 to center of nose landing gear axle and subtracting this value from dimension A and adding to FS 93.66. (Must be measured after airplane is level on scales.)

FORMULA for Longitudinal CG

CG Arm of Airplane = (Dimension B) - [(Dimension A) x (Nose Landing Gear Net Weight)( ) / Nose and Main Landing Gear Weight Totaled ( )] = ( ) Inches Aft of Datum

LOCATING CG WITH AIRPLANE ON JACK PADS

FORMULA for Longitudinal CG

CG Arm of Airplane = 331.39 - [237.73 x (Nose Jack Point Net Weight)( ) / Nose and Wing Jack Point Weight Totaled ( )] = ( ) Inches Aft of Datum

LEVELING PROVISIONS

LATERAL AND LONGITUDINAL-USE LEVELING TOOL ACROSS INBOARD SEAT TRACKS AT APPROXIMATELY FS 148.00

LOCATING PERCENT MAC

FORMULA for Percent MAC

CG Percent MAC = [(CG Arm of Airplane) - 283.01] / 0.748

AIRPLANE AS WEIGHED TABLE

POSITION	SCALE READING	SCALE DRIFT	TARE	NET WEIGHT
LEFT WING				
RIGHT WING				
NOSE				
AIRPLANE TOTAL AS WEIGHED				

BASIC EMPTY WEIGHT AND CENTER-OF-GRAVITY TABLE

ITEM	WEIGHT (POUNDS)	CG ARM (INCHES)	MOMENT (INCH-POUNDS/100)
AIRPLANE (CALCULATED OR AS WEIGHED) (INCLUDES ALL UNDRAINABLE FLUIDS AND FULL OIL)			
DRAINABLE UNUSABLE FUEL AT 6.75 POUNDS PER GALLON	**44.24**	**297.22**	**131.49**
BASIC EMPTY WEIGHT			

CESSNA AIRCRAFT COMPANY, AIRCRAFT DIVISION, P.O. BOX 7704, WICHITA, KANSAS 67277

FORM NUMBER 2192, 13 October 2004
REVISED 03 November 2004

Locating CG of Airplane **(U.S. Units)**

Figure 6-1 (Sheet 1 of 5)

A35142

FUEL LOADING WEIGHT AND MOMENT TABLE

WING TANK FUEL

WEIGHT (POUNDS)	MOMENT/100 ARM VARIES (INCH-POUNDS)
100	323.47
200	642.06
300	958.44
400	1273.08
500	1586.45
600	1898.76
700	2210.11
800	2520.64
900	2830.77
1000	3140.40
1100	3449.71
1200	3759.36
1300	4068.74
1400	4378.08
1500	4687.35
1600	4996.32
1700	5305.36
1800	5614.02
1900	5922.87
2000	6231.40
2100	6539.82
2200	6847.94
2300	7155.99
2400	7463.76

WING TANK FUEL (CONTINUED)

WEIGHT (POUNDS)	MOMENT/100 ARM VARIES (INCH-POUNDS)
2500	7771.75
2600	8079.76
2700	8388.09
2800	8696.24
2900	9005.37
3000	9314.40
3100	9624.26
3200	9934.08
3300	10,244.52
3400	10,554.62
3500	10,864.70
3600	11,175.12
3700	11,485.17
3800	11,795.58
3900	12,105.60
4000	12,415.60
4100	12,725.17
4200	13,035.12
4300	13,344.62
4400	13,654.08
4500	13,963.50
4600	14,272.88
4700	14,581.75
4710	14,612.81

FORM NUMBER 2180, 13 October 2004

CAUTION

CERTIFIED MAXIMUM USABLE FUEL QUANTITY IS 4710 POUNDS WITH EACH WING FILLED TO THE "FULL" INDICATING TAB ON THE FILLER STANDPIPE. DO NOT FILL ABOVE THE TAB ON THE STANDPIPE, AS ADEQUATE FUEL EXPANSION VOLUME MAY NOT BE AVAILABLE. CHECK WEIGHT AND BALANCE.

Weight And Moment Table **(U.S. Units)**
Figure 6-2 (Sheet 1 of 10)

A35159

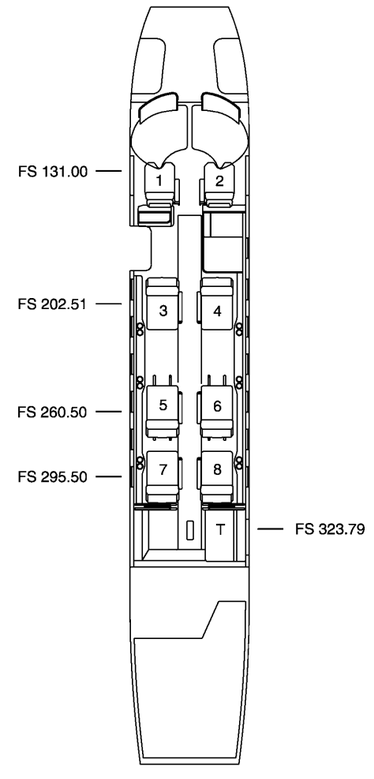
CREW AND PASSENGERS COMPARTMENTS WEIGHT AND MOMENT TABLES STANDARD CENTER CLUB SEAT ARRANGEMENT

CREW AND PASSENGER

WEIGHT (POUNDS)	MOMENT/100 SEAT 1 OR SEAT 2 ARM = FS 131.00 in.	SEAT 3 OR SEAT 4 ARM = FS 202.51 in.	SEAT 5 OR SEAT 6 ARM = FS 260.50 in.	SEAT 7 OR SEAT 8 ARM = FS 295.50 in.	RH NON-BELTED TOILET ARM = FS 323.79 in.
50	65.50	101.26	130.25	147.75	161.90
60	78.60	121.51	156.30	177.30	194.27
70	91.70	141.76	182.35	206.85	226.65
80	104.80	162.01	208.40	236.40	259.03
90	117.90	182.26	234.45	265.95	291.41
100	131.00	202.51	260.50	295.50	323.79
110	144.10	222.76	286.55	325.05	356.17
120	157.20	243.01	312.60	354.60	388.55
130	170.30	263.26	338.65	384.15	420.93
140	183.40	283.51	364.70	413.70	453.31
150	196.50	303.77	390.75	443.25	485.69
160	209.60	324.02	416.80	472.80	518.06
170	222.70	344.27	442.85	502.35	550.44
180	235.80	364.52	468.90	531.90	582.82
190	248.90	384.77	494.95	561.45	615.20
200	262.00	405.02	521.00	591.00	647.58
210	275.10	425.27	547.05	620.55	679.96
220	288.20	445.52	573.10	650.10	712.34
230	301.30	465.77	599.15	679.65	744.72
240	314.40	486.02	625.20	709.20	777.10
250	327.50	506.28	651.25	738.75	809.48
260	340.60	526.53	677.30	768.30	841.85
270	353.70	546.78	703.35	797.85	874.23
280	366.80	567.03	729.40	827.40	906.61
290	379.90	587.28	755.45	856.95	938.99
300	393.00	607.53	781.50	886.50	971.37
310	406.10	627.78	807.55	916.05	1003.75
320	419.20	648.03	833.60	945.60	1036.13
330	432.30	668.28	859.65	975.15	1068.51
340	445.40	688.53	885.70	1004.70	1100.89

NOTE: UNBELTED TOILET MAY BE INSTALLED ON RH SIDE. BELTED TOILET IS ON LH SIDE ONLY.

CREW AND PASSENGER MOMENT ARMS



FORM NUMBER 2188, 13 October 2004

Weight And Moment Table **(U.S. Units)**
Figure 6-2 (Sheet 3)

9 OXYGEN SYSTEM

A35174

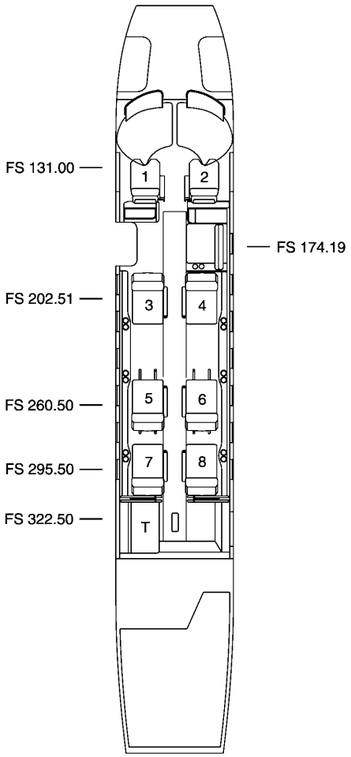
CREW AND PASSENGERS COMPARTMENTS WEIGHT AND MOMENT TABLES OPTION 1 CENTER CLUB SEAT ARRANGEMENT

CREW AND PASSENGER

WEIGHT (POUNDS)	MOMENT/100					
	SEAT 1 OR SEAT 2 ARM = FS 131.00 in.	Optional RH FWD SFS ARM = FS 174.19 in.	SEAT 3 OR SEAT 4 ARM = FS 202.51 in.	SEAT 5 OR SEAT 6 ARM = FS 260.50 in.	SEAT 7 OR SEAT 8 ARM = FS 295.50 in.	Optional LH BELTED TOILET ARM = FS 322.50 in.
50	65.50	87.10	101.26	130.25	147.75	161.25
60	78.60	104.51	121.51	156.30	177.30	193.50
70	91.70	121.93	141.76	182.35	206.85	225.75
80	104.80	139.35	162.01	208.40	236.40	258.00
90	117.90	156.77	182.26	234.45	265.95	290.25
100	131.00	174.19	202.51	260.50	295.50	322.50
110	144.10	191.61	222.76	286.55	325.05	354.75
120	157.20	209.03	243.01	312.60	354.60	387.00
130	170.30	226.45	263.26	338.65	384.15	419.25
140	183.40	243.87	283.51	364.70	413.70	451.50
150	196.50	261.29	303.77	390.75	443.25	483.75
160	209.60	278.70	324.02	416.80	472.80	516.00
170	222.70	296.12	344.27	442.85	502.35	548.25
180	235.80	313.54	364.52	468.90	531.90	580.50
190	248.90	330.96	384.77	494.95	561.45	612.75
200	262.00	348.38	405.02	521.00	591.00	645.00
210	275.10	365.80	425.27	547.05	620.55	677.25
220	288.20	383.22	445.52	573.10	650.10	709.50
230	301.30	400.64	465.77	599.15	679.65	741.75
240	314.40	418.06	486.02	625.20	709.20	774.00
250	327.50	435.48	506.28	651.25	738.75	806.25
260	340.60	452.89	526.53	677.30	768.30	838.50
270	353.70	470.31	546.78	703.35	797.85	870.75
280	366.80	487.73	567.03	729.40	827.40	903.00
290	379.90	505.15	587.28	755.45	856.95	935.25
300	393.00	522.57	607.53	781.50	886.50	967.50
310	406.10	539.99	627.78	807.55	916.05	999.75
320	419.20	557.41	648.03	833.60	945.60	1032.00
330	432.30	574.83	668.28	859.65	975.15	1064.25
340	445.40	592.25	688.53	885.70	1004.70	1096.50

NOTE: UNBELTED TOILET MAY BE INSTALLED ON RH SIDE. BELTED TOILET IS ON LH SIDE ONLY.

CREW AND PASSENGER MOMENT ARMS



FORM NUMBER 2184, 13 October 2004

Weight And Moment Table **(U.S. Units)**

Figure 6-2 (Sheet 5)

A35228

BAGGAGE AND CABINET COMPARTMENTS STANDARD WEIGHT AND MOMENT TABLES

BAGGAGE AND STORAGE COMPARTMENTS CONTENTS

WEIGHT (POUNDS)	MOMENT/100		
	NOSE COMPARTMENT ARM = FS 74.00 in.	*CABIN COMPARTMENT ARM = FS 330.20 in.	TAILCONE COMPARTMENT ARM = FS 414.60 in.
20	14.8	66.0	82.9
40	29.6	132.1	165.8
60	44.4	198.1	248.8
80	59.2	264.2	331.7
100	74.0	330.2	414.6
120	88.8		497.5
140	103.6		580.4
160	118.4		663.4
180	133.2		746.3
200	148.0		829.2
220	162.8		912.1
240	177.6		995.0
260	192.4		1078.0
280	207.2		1160.9
300	222.0		1243.8
320	236.8		1326.7
340	251.6		1409.6
350	259.0		1451.1
380	281.2		1575.5
400	296.0		1658.4
420			1741.3
440			1824.2
460			1907.2
480			1990.1
500			2073.0
520			2155.9
540			2238.8
560			2321.8
580			2404.7
600			2487.6

RH CHART CASE

WEIGHT (POUNDS)	MOMENT/100 NAVIGATION CHART CASE ARM = FS 150.91 in.
5	7.55
10	15.09

LH EVAPORATOR CABINET

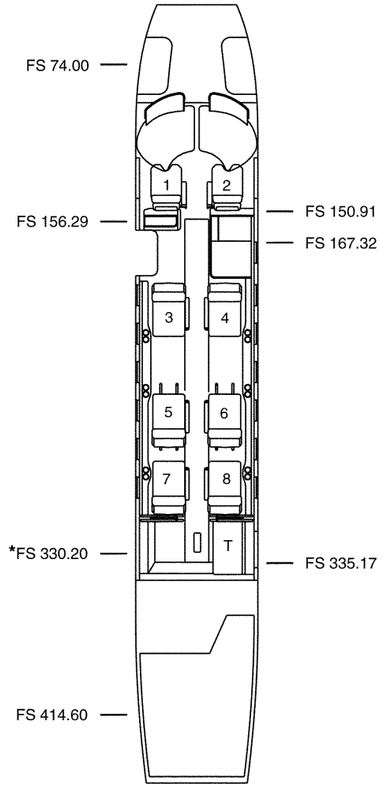
WEIGHT (POUNDS)	MOMENT/100 FORWARD EVAPORATOR ARM = FS 156.29 in.
5	7.81
10	15.63
15	23.44
20	31.26
25	39.07
30	46.89
32	50.01

RH REFRESHMENT CENTER

WEIGHT (POUNDS)	MOMENT/100 REFRESHMENT CENTER ARM = FS 167.32 in.
10	16.73
20	33.46
30	50.20
40	66.93
50	83.66
60	100.39
70	117.12
80	133.86
90	150.59
100	167.32

RH AFT TOILET CABINET

WEIGHT (POUNDS)	MOMENT/100 AFT TOILET CABINET ARM = FS 335.17 in.
1	3.35



***NOTE:** THE CABIN STORAGE IS REMOVED WHEN THE LH TOILET IS INSTALLED.

FORM NUMBER 2186, 13 October 2004
REVISED 03 November 2004

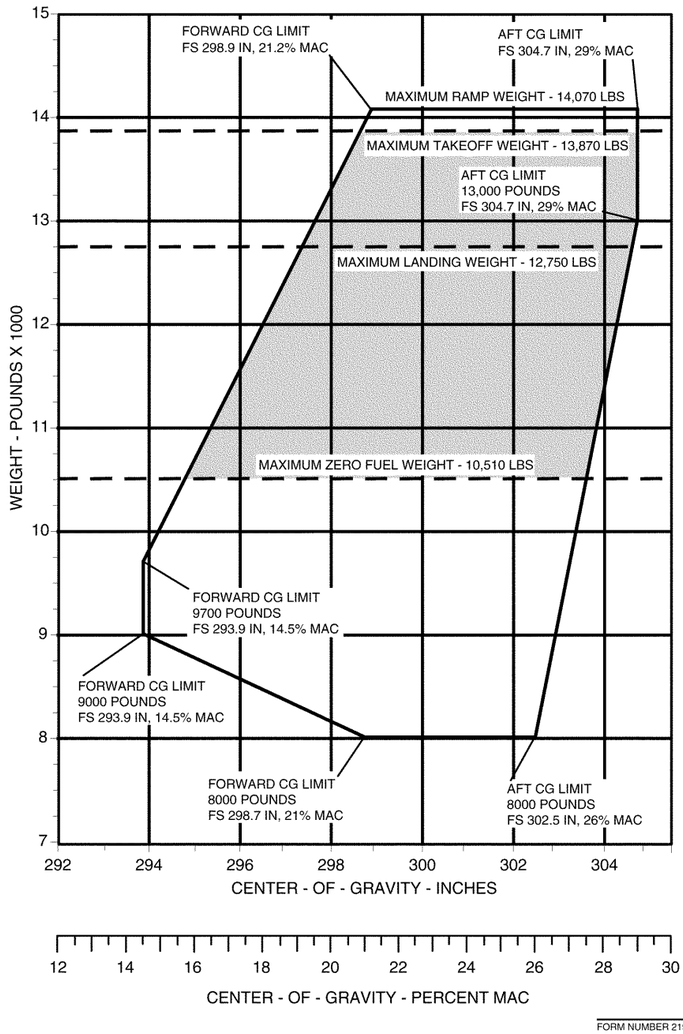
Weight And Moment Table **(U.S. Units)**

Figure 6-2 (Sheet 7)

9 OXYGEN SYSTEM

A35230

CENTER-OF-GRAVITY LIMITS



FORM NUMBER 2190, 13 October 2004

Center-of-Gravity Limits Envelope **(U.S. Units)**

Figure 6-3 (Sheet 1 of 2)

A35232

WEIGHT AND BALANCE COMPUTATION FORM

PAYLOAD COMPUTATIONS				ITEM	WEIGHT (POUNDS)	MOMENT/ 100
'A'	'B'	'C'	'D'	'E'	'F'	'G'
ITEM	ARM (INCHES)	WEIGHT (POUNDS)	MOMENT/ 100	1. BASIC EMPTY WEIGHT *Airplane CG = _____	8160	25,167
OCCUPANTS				2. PAYLOAD	1640	4086
PILOT	131.0	170	223			
COPILOT	131.0	170	223	3. ZERO FUEL WEIGHT (sub-total) Do not exceed maximum zero fuel weight of 10,510 pounds. *Airplane CG = _____	9800	29,253
SEAT 3	202.5	170	344			
SEAT 4	202.5	170	344			
SEAT 5	260.5	170	443	4. FUEL LOADING	4050	12,570
SEAT 6	260.5	170	443	5. RAMP WEIGHT (sub-total) Do not exceed maximum ramp weight of 14,070 pounds. *Airplane CG = _____ * * *	13,850	41,823
SEAT 7	295.5	170	502			
SEAT 8	295.5	170	502			
TOILET	322.5	170		6. LESS FUEL FOR TAXIING	200	620
SIDE FACING SEAT	174.2	170		7. TAKEOFF WEIGHT * * Do not exceed maximum takeoff weight of 13,870 pounds. *Airplane CG = _____	13,650	41,203
CONTENTS						
LH CHART CASE	150.9	0	0	8. LESS FUEL TO DESTINATION	2100	6491
RH REF CENTER	167.3	40	67	9. LANDING WEIGHT * * Do not exceed maximum landing weight of 12,750 pounds. *Airplane CG = _____	11,550	34,712
LH EVAP CABINET	156.3					
VANITY STORAGE	335.2					
NOSE BAGGAGE	74.0			* Airplane CG = MOMENT/100 / WEIGHT X 100		
CAB STORAGE	330.2			* * Totals must be within approved weight and center-of-gravity limits. It is the responsibility of the operator to ensure that the airplane is loaded properly. The Basic Empty Weight CG is noted on the Airplane Weighing Form. If the airplane has been altered, refer to the Weight and Balance Record for information.		
TAILCONE BAGGAGE	414.6	240	995			
PAYLOAD (sub-total)		1640	4086	* * * Enter the Center-of-Gravity Limits Envelope Graph to verify airplane is loaded within approved limits.		

FORM NUMBER 2178, 13 October 2004
REVISED 03 November 2004

Sample Weight and Balance Computation Form **(U.S. Units)**

Figure 6-4 (Sheet 1 of 2)

9 OXYGEN SYSTEM

A35236

WEIGHT AND BALANCE COMPUTATION FORM

PAYLOAD COMPUTATIONS				ITEM	WEIGHT (POUNDS)	MOMENT/ 100
'A'	'B'	'C'	'D'	'E'	'F'	'G'
ITEM	ARM (INCHES)	WEIGHT (POUNDS)	MOMENT/ 100	1. BASIC EMPTY WEIGHT *Airplane CG = _____		
OCCUPANTS PILOT COPILOT				2. PAYLOAD		
				3. ZERO FUEL WEIGHT (sub-total) Do not exceed maximum zero fuel weight of 10,510 pounds. *Airplane CG = _____		
				4. FUEL LOADING		
				5. RAMP WEIGHT (sub-total) Do not exceed maximum ramp weight of 14,070 pounds. *Airplane CG = _____ * * *	* * *	
				6. LESS FUEL FOR TAXIING		
				7. TAKEOFF WEIGHT * * Do not exceed maximum takeoff weight of 13,870 pounds. *Airplane CG = _____	* * *	
CONTENTS LH CHART CASE RH REF CENTER LH EVAP CABINET VANITY STORAGE	 150.9 167.3 156.3 335.2			8. LESS FUEL TO DESTINATION		
				9. LANDING WEIGHT * * Do not exceed maximum landing weight of 12,750 pounds. *Airplane CG = _____		
NOSE BAGGAGE	74.0			* Airplane CG = MOMENT/100 / WEIGHT X 100		
CAB STORAGE	330.2			* * Totals must be within approved weight and center-of-gravity limits. It is the responsibility of the operator to ensure that the airplane is loaded properly. The Basic Empty Weight CG is noted on the Airplane Weighing Form. If the airplane has been altered, refer to the Weight and Balance Record for information.		
TAILCONE BAGGAGE	414.6					
PAYLOAD (sub-total)				* * * Enter the Center-of-Gravity Limits Envelope Graph to verify airplane is loaded within approved limits.		

FORM NUMBER 2178, 13 October 2004
REVISED 03 November 2004

Weight and Balance Computation Form **(U.S. Units)**

Figure 6-6 (Sheet 1 of 2)

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9 OXYGEN SYSTEM

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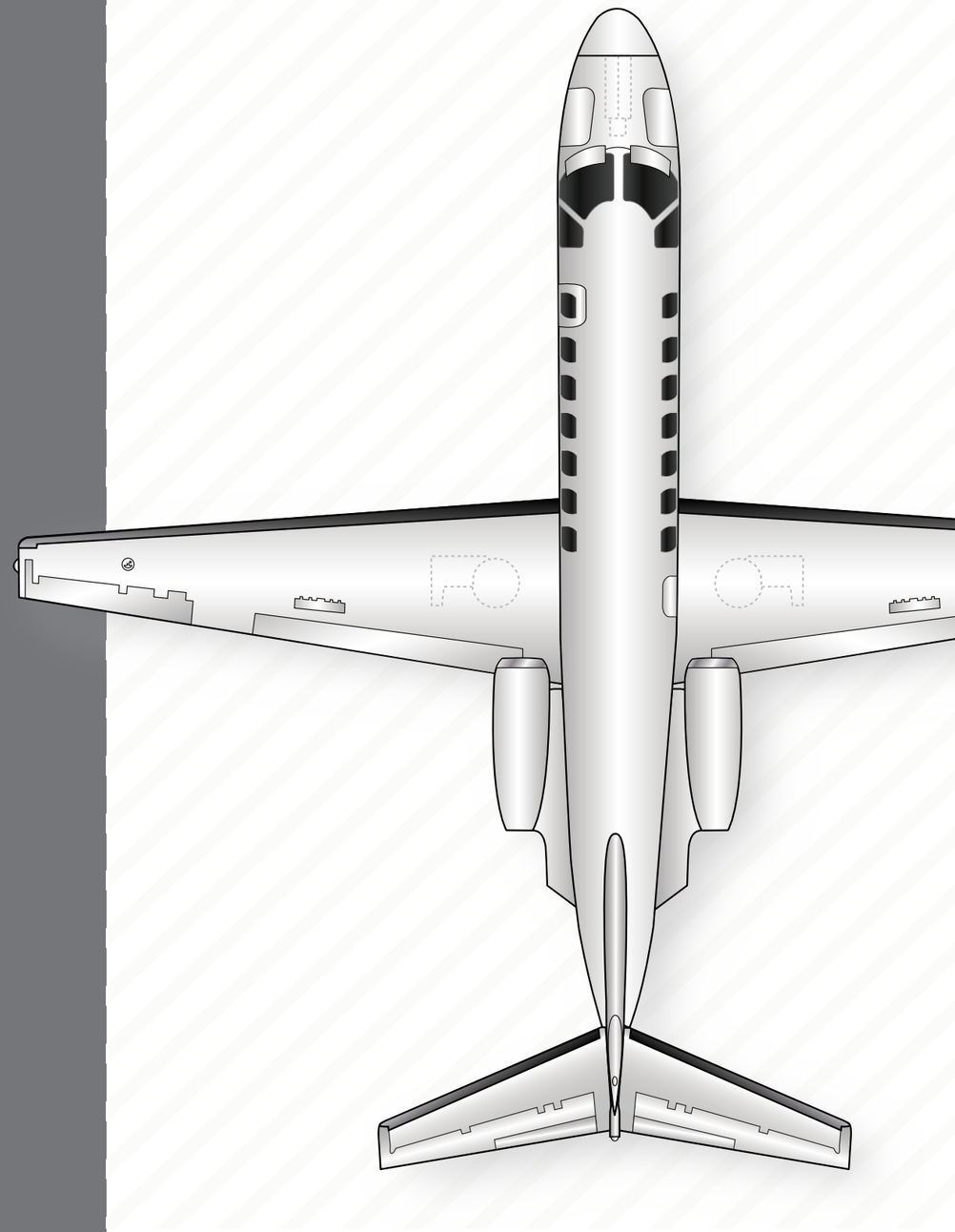
TAKEOFF



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TAKEOFF
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TAKEOFF PERFORMANCE
SIMPLIFIED CRITERIA

Simplified criteria is provided which is intended to cover situations where runway length is appreciably longer than required for this airplane. The other tabulated data gives more exact performance criteria through a range of conditions which include all but the most extreme cases. When conditions are other than those specified in this simplified criteria, the appropriate tabulated data must be referred to.

If the following conditions are met, the simplified performance may be used.

1. No obstacle in flight path.
2. Throttles - TO DETENT.
3. Flaps - Takeoff and Approach = 15°.
4. Anti-Ice - OFF
5. Takeoff field length available = 5000 feet or longer.
6. No tail wind.
7. Runway gradient - Takeoff = Zero to -2% (downhill).
8. Dry paved runway.

The values to be used are as follow:

WEIGHT	13,870 POUNDS OR LESS	13,870 POUNDS OR LESS	13,870 POUNDS OR LESS
ALTITUDE OF AIRPORT	2000 FEET OR BELOW	4000 FEET TO 2001 FEET	6000 FEET TO 4001 FEET
AMBIENT TEMPERATURE	40°C OR LESS	32°C OR LESS	22°C OR LESS
V_1	108 KIAS	108 KIAS	107 KIAS
V_R	108 KIAS	108 KIAS	107 KIAS
V_2	114 KIAS	114 KIAS	114 KIAS
SINGLE-ENGINE CLIMB SPEED	130 KIAS	130 KIAS	130 KIAS

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PROCEDURES FOR USE OF TAKEOFF PERFORMANCE TABLES

1. Determine gross weight of airplane for type of loading desired.
2. Obtain airport information; i.e., active runway, available runway length, ambient temperature (TEMP), altitude, wind, icing conditions, and runway gradient (if applicable) and obstacles in the takeoff flight path. Determine that the temperature is within the ambient temperature limits found in Section II, Limitations.
3. Determine wind component parallel to active runway from the crosswind component chart (Figure 4-13).
4. Check the maximum takeoff weight permitted by climb requirements (Figure 4-14 or Figure 4-16). If takeoff is to be made with anti-ice on, refer to Figure 4-15 or Figure 4-17. If this limitation restricts the gross weight, the pilot must off load weight until the requirement is met.
5. For takeoff from a dry runway; using the calculated takeoff gross weight from step 4, determine takeoff field length, V_1, V_R, V_2, and V_{ENR} from the following figures. If the runway has a gradient, the takeoff field length and V_1 must be adjusted in accordance with the following figures.

	LEVEL RUNWAY	RUNWAY GRADIENT ADJUSTMENT
Flaps UP, anti-ice OFF	Figure 4-19	Figure 4-18
Flaps UP, anti-ice ON	Figure 4-21	Figure 4-20
Flaps 15°, anti-ice OFF	Figure 4-23	Figure 4-22
Flaps 15°, anti-ice ON	Figure 4-25	Figure 4-24

NOTE

For takeoffs with anti-ice fluid applied, refer to Section VII. Takeoff with Type II, III, or IV anti-ice fluid applied is limited to the flaps up configuration.

6. If the available runway length is less than the required field length, the airplane weight must be reduced until this requirement can be met.
7. Determine level off altitude. Level off altitude is airport barometric altitude plus takeoff climb increment (Figure 4-28, 4-29, 4-32, or 4-33) required for obstacle clearance.
8. If the obstacle clearance is a factor, the single-engine takeoff flight path charts (Figures 4-26, 4-28, or 4-29, and 4-30, 4-32, or 4-33) must be used to determine if the net takeoff flight path provides the required obstacle clearance. If the required obstacle clearance is not achieved, the gross weight must be adjusted until the net takeoff flight path assures the required obstacle clearance.

NOTE

If the takeoff flight path has not been completed within ten (10) minutes, reduce power to maximum continuous single engine thrust and continue with the takeoff flight path.

9. For second segment (Figure 4-38, 4-39, 4-40, or 4-41) and enroute (Figure 4-42 or 4-43) turning climb, up to and including a 15° bank angle, if the takeoff weight is 13,400 lbs or less, multiply the takeoff weight by 1.035 to obtain an adjusted weight. Enter the appropriate second segment or enroute climb table at the adjusted weight to find the actual climb performance of the aircraft in the bank. If the takeoff weight is greater than 13,400 lbs, reduce the climb gradient by 1.3.
10. The first segment takeoff net climb gradient tables are presented in Figures 4-34, 4-35, 4-36, and 4-37.

MAXIMUM TAKEOFF WEIGHT - POUNDS PERMITTED BY CLIMB REQUIREMENTS

ANTI-ICE - OFF **FLAPS -UP**

ALTITUDE = 0		ALTITUDE = 1000		ALTITUDE = 2000		ALTITUDE = 3000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 54	13870	-54 TO 51	13870	-54 TO 48	13870	-54 TO 44	13870
		52	13680	50	13490	45	13810
						47	13450

ALTITUDE = 4000		ALTITUDE = 5000		ALTITUDE = 6000		ALTITUDE = 7000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 41	13870	-54 TO 37	13870	-54 TO 34	13870	-54 TO 31	13870
45	13180	40	13450	35	13780	35	13160
		42	13090	40	12830	37	12780

ALTITUDE = 8000		ALTITUDE = 9000		ALTITUDE = 10000		ALTITUDE = 11000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 27	13870	-54 TO 24	13870	-54 TO 20	13870	-54 TO 17	13870
30	13480	25	13770	25	13120	20	13400
35	12540	30	12840	30	12200	25	12500
		32	12470			28	11930

ALTITUDE = 12000		ALTITUDE = 13000		ALTITUDE = 14000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 13	13870	-54 TO 10	13870	-54 TO 6	13870
15	13670	15	13030	10	13250
20	12780	20	12130	15	12380
25	11860	23	11590	20	11500

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Figure 4-14*

WHERE CONDITIONS ALLOW FOR 0° OR 15° FLAP SETTING, IT IS DESIRED TO SELECT THE FLAP SETTING WHICH GIVES THE SHORTER TAKEOFF FIELD LENGTH.

MAXIMUM TAKEOFF WEIGHT - POUNDS PERMITTED BY CLIMB REQUIREMENTS

ANTI-ICE - ON **FLAPS -UP**

ALTITUDE = 0		ALTITUDE = 1000		ALTITUDE = 2000		ALTITUDE = 3000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870

ALTITUDE = 4000		ALTITUDE = 5000		ALTITUDE = 6000		ALTITUDE = 7000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870

ALTITUDE = 8000		ALTITUDE = 9000		ALTITUDE = 10000		ALTITUDE = 11000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870	-54 TO 9	13870
						10	13860

ALTITUDE = 12000		ALTITUDE = 13000		ALTITUDE = 14000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 6	13870	-54 TO 2	13870	-54 TO -2	13870
10	13080	5	13330	0	13550
		10	12340	5	12620
				10	11640

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Figure 4-15*

WHERE CONDITIONS ALLOW FOR 0° OR 15° FLAP SETTING, IT IS DESIRED TO SELECT THE FLAP SETTING WHICH GIVES THE SHORTER TAKEOFF FIELD LENGTH.

MAXIMUM TAKEOFF WEIGHT - POUNDS PERMITTED BY CLIMB REQUIREMENTS

ANTI-ICE - OFF **FLAPS -15°**

ALTITUDE = 0		ALTITUDE = 1000		ALTITUDE = 2000		ALTITUDE = 3000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 54	13870	-54 TO 51	13870	-54 TO 48	13870	-54 TO 44	13870
		52	13680	50	13490	45	13810
						47	13450

ALTITUDE = 4000		ALTITUDE = 5000		ALTITUDE = 6000		ALTITUDE = 7000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 41	13870	-54 TO 37	13870	-54 TO 34	13870	-54 TO 30	13870
45	13180	40	13450	35	13770	35	13150
		42	13090	40	12830	37	12780

ALTITUDE = 8000		ALTITUDE = 9000		ALTITUDE = 10000		ALTITUDE = 11000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 27	13870	-54 TO 23	13870	-54 TO 19	13870	-54 TO 15	13870
30	13350	25	13580	20	13800	20	13160
35	12540	30	12740	25	12950	25	12340
		32	12420	30	12150	28	11870

ALTITUDE = 12000		ALTITUDE = 13000		ALTITUDE = 14000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 11	13870	-54 TO 5	13870	-54 TO -2	13870
15	13330	10	13460	0	13770
20	12520	15	12690	5	13390
25	11750	20	11910	10	12840
		23	11470	15	12080
				20	11340

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Figure 4-16*

WHERE CONDITIONS ALLOW FOR 0° OR 15° FLAP SETTING, IT IS DESIRED TO SELECT THE FLAP SETTING WHICH GIVES THE SHORTER TAKEOFF FIELD LENGTH.

MAXIMUM TAKEOFF WEIGHT - POUNDS PERMITTED BY CLIMB REQUIREMENTS

ANTI-ICE - ON **FLAPS -15°**

ALTITUDE = 0		ALTITUDE = 1000		ALTITUDE = 2000		ALTITUDE = 3000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870

ALTITUDE = 4000		ALTITUDE = 5000		ALTITUDE = 6000		ALTITUDE = 7000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870	-54 TO 10	13870

ALTITUDE = 8000		ALTITUDE = 9000		ALTITUDE = 10000		ALTITUDE = 11000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO 10	13870	-54 TO 10	13870	-54 TO 7	13870	-54 TO 3	13870
				10	13390	5	13640
						10	12720

ALTITUDE = 12000		ALTITUDE = 13000		ALTITUDE = 14000	
TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT	TEMP DEG. C	MAXIMUM TAKEOFF WEIGHT
-54 TO -1	13870	-54 TO -5	13870	-54 TO -9	13870
0	13800	0	13090	-5	13270
5	12920	5	12240	0	12430
10	12010	10	11350	5	11600
				10	10730

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Figure 4-17*

WHERE CONDITIONS ALLOW FOR 0° OR 15° FLAP SETTING, IT IS DESIRED TO SELECT THE FLAP SETTING WHICH GIVES THE SHORTER TAKEOFF FIELD LENGTH.

TAKEOFF FIELD LENGTH - FEET, FLAPS UP
(DRY RUNWAY OVER A 35 FOOT SCREEN HEIGHT) (ANTI-ICE OFF)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 4-19. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 4-18.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS UP, ANTI-ICE OFF

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 4-19	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
1600	1700	1700	1700	1650	1600	1600	1700	1700
1800	1900	1900	1900	1850	1800	1800	1900	1900
2000	2150	2150	2100	2050	2050	2000	2100	2100
2200	2350	2350	2350	2300	2250	2200	2300	2300
2400	2600	2600	2550	2500	2450	2400	2500	2500
2600	2850	2800	2750	2700	2650	2600	2700	2750
2800	3050	3050	3000	2900	2850	2800	2900	2950
3000	3300	3250	3200	3150	3050	3000	3100	3150
3200	3550	3500	3400	3350	3250	3150	3300	3350
3400	3750	3700	3650	3550	3450	3350	3500	3550
3600	4000	3950	3900	3750	3650	3550	3700	3750
3800	4300	4150	4100	3950	3850	3750	3900	3950
4000	4600	4400	4350	4150	4050	3900	4150	4150
4200	5000	4700	4550	4400	4250	4100	4350	4350
4400	5400	5050	4800	4600	4450	4250	4550	4550
4600	5750	5350	5000	4800	4650	4450	4750	4800
4800	6200	5650	5250	5050	4850	4650	4950	5000
5000	6700	6000	5450	5250	5050	4850	5200	5200
5200	7250	6350	5700	5500	5250	5000	5400	5450
5400	7850	6650	6000	5700	5400	5200	5600	5650
5600	8400	7000	6300	5950	5600	5350	5800	5850
5800	8800	7350	6550	6150	5750	5550	6000	6050
6000	9250	7650	6800	6400	5950	5700	6200	6250
6200	9650	8000	7100	6650	6150	5850	6450	6450
6400	10250	8300	7400	6900	6300	6050	6650	6650
6600	10850	8650	7750	7200	6500	6200	6850	6850
6800	11400	9050	8100	7500	6700	6350	7050	7050
7000	12000	9500	8400	7700	6850	6550	7250	7250
7200	12650	9900	8700	7950	7000	6700	7450	7450
7400	13300	10300	9000	8150	7200	6850	7650	7600
7600	14050	10750	9250	8400	7400	7000	7850	7800
7800	14950	11150	9550	8650	7550	7200	8000	8000
8000	15950	11600	9850	8900	7750	7400	8150	8150
8500		12700	10650	9500	8150	7800	8400	8400
9000		13700	11350	10100	8600	8200	8600	8550
9500		14800	12050	10700	9000	8500	8800	8650
10000		15900	12750	11250	9400	8800	9050	8700
10500			13450	11850	9800	9100	9400	8800
11000			14150	12450	10250	9450	9800	9000
11500				13050	10650	9800	10200	9250
12000				13650	11050	10150	10600	9600
12500					11450	10500	11000	9900
13000					11850	10850	11400	10250
13500					12250	11200	11800	10600
14000					12650	11550	12200	10900
14500					13050	11900	12650	11250
15000					13500	12250	13100	11600
V_1 ADJUSTMENT*	V_1 + 3 Knots	V_1 + 2 Knots	V_1 + 1 Knot	V_1	V_1 - 3 Knots	V_1 - 5 Knots	V_1 + 1 Knot	V_1 + 1 Knot

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* If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

Figure 4-18*

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS					VENR = 130 KIAS								WEIGHT = 13600 LBS					VENR = 130 KIAS							
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS				DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS			
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS	C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	118	4250	116	3280	116	3090	117	2890	117	2710	121	129	-35	117	4100	115	3200	115	3000	115	2810	116	2630	120	128
-30	117	4330	116	3340	116	3150	117	2950	117	2760	121	129	-30	116	4180	115	3250	115	3060	115	2870	116	2680	120	128
-25	117	4420	116	3410	116	3210	117	3010	117	2820	121	129	-25	116	4270	115	3310	115	3110	115	2920	116	2740	120	128
-20	117	4510	116	3470	116	3260	117	3060	117	2870	121	129	-20	116	4350	115	3370	115	3170	115	2980	116	2790	120	128
-15	117	4590	116	3530	116	3320	117	3120	117	2930	121	129	-15	116	4430	115	3430	115	3230	115	3030	116	2840	120	128
-10	116	4690	116	3590	116	3380	117	3180	117	2980	121	129	-10	115	4520	115	3490	115	3290	115	3090	116	2900	120	128
-5	116	4770	116	3650	116	3440	117	3230	117	3040	121	129	-5	115	4600	115	3550	115	3340	115	3150	115	2950	120	128
0	116	4870	116	3730	116	3500	117	3290	117	3100	121	129	0	115	4690	115	3610	115	3400	115	3200	116	3010	120	128
5	115	4960	116	3800	116	3560	117	3350	117	3150	121	129	5	115	4780	115	3670	115	3460	115	3260	115	3060	120	128
10	115	5050	116	3870	116	3620	117	3410	117	3210	121	129	10	114	4870	115	3740	115	3520	115	3310	115	3120	120	128
15	115	5150	115	3950	116	3690	117	3470	117	3270	121	129	15	114	4960	114	3810	115	3580	115	3370	115	3170	120	128
20	115	5240	115	4030	116	3760	117	3530	117	3320	121	129	20	114	5050	114	3880	115	3640	115	3430	115	3230	120	128
25	114	5340	115	4100	116	3840	117	3590	117	3380	121	129	25	114	5140	114	3960	115	3700	115	3490	115	3280	120	128
30	114	5640	115	4250	116	3970	117	3730	117	3520	121	128	30	114	5340	114	4100	115	3840	115	3610	116	3400	120	127
35	113	6080	115	4470	116	4220	117	3980	117	3760	120	127	35	114	5650	114	4310	115	4070	116	3850	116	3630	119	126
40	112	6640	115	4790	116	4530	117	4280	117	4030	119	125	40	113	6150	115	4630	115	4380	116	4130	116	3890	118	124
45	111	7420	116	5190	117	4910	117	4640	118	4370	119	124	45	113	6770	115	4980	115	4700	116	4440	116	4180	117	123
50	111	8560	117	5690	118	5390	119	5090	119	4800	119	124	50	112	7790	116	5460	117	5160	117	4870	118	4590	118	122
54	110	9620	118	6110	119	5790	119	5470	120	5160	120	124	54	111	8720	117	5850	118	5530	118	5230	118	4930	118	122

WEIGHT = 13400 LBS					VENR = 130 KIAS								WEIGHT = 13200 LBS					VENR = 130 KIAS							
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS				DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS			
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS	C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	116	4000	114	3130	114	2940	114	2750	115	2570	119	128	-35	115	3900	113	3060	113	2880	113	2700	114	2520	119	127
-30	116	4080	114	3190	114	3000	114	2810	115	2620	119	128	-30	115	3980	113	3120	113	2930	113	2750	114	2570	119	127
-25	115	4160	114	3240	114	3050	114	2860	115	2680	119	128	-25	115	4050	113	3180	113	2990	113	2800	114	2620	119	127
-20	115	4240	114	3300	114	3110	114	2920	115	2730	120	128	-20	114	4130	113	3230	113	3040	113	2850	114	2670	119	127
-15	115	4320	114	3360	114	3160	114	2970	115	2790	120	128	-15	114	4210	113	3290	113	3100	113	2910	114	2730	119	127
-10	115	4400	114	3420	114	3220	114	3020	115	2840	120	128	-10	114	4280	113	3350	113	3150	113	2960	114	2780	119	127
-5	114	4480	114	3480	114	3270	114	3080	115	2890	120	128	-5	114	4360	113	3410	113	3210	113	3020	114	2830	119	127
0	114	4570	114	3530	114	3330	114	3130	115	2940	120	128	0	114	4450	113	3460	113	3260	113	3070	114	2880	119	127
5	114	4650	114	3590	114	3390	114	3190	115	3000	120	128	5	113	4530	113	3520	113	3320	113	3120	114	2930	119	127
10	114	4730	114	3650	114	3440	114	3240	115	3050	120	128	10	113	4610	113	3580	113	3380	113	3180	114	2990	119	127
15	114	4820	114	3720	114	3500	114	3300	115	3100	120	128	15	113	4690	113	3640	113	3430	113	3230	114	3040	119	127
20	113	4910	114	3790	114	3560	114	3360	115	3160	120	128	20	113	4780	113	3690	113	3490	113	3290	114	3090	119	127
25	113	5000	113	3860	114	3620	114	3420	115	3220	120	128	25	112	4870	113	3760	113	3550	113	3340	114	3150	119	127
30	113	5190	113	3990	114	3740	114	3520	115	3320	119	127	30	113	5040	113	3890	113	3660	113	3450	114	3240	118	126
35	114	5470	114	4200	114	3970	115	3750	115	3530	118	125	35	113	5310	113	4090	113	3870	114	3650	114	3440	117	124
40	114	5800	114	4510	114	4260	115	4020	115	3790	117	123	40	113	5620	113	4390	114	4150	114	3910	114	3690	117	123
45	113	6320	114	4840	115	4570	115	4310	115	4060	116	122	45	114	5960	113	4710	114	4450	114	4200	114	3950	116	121
50	113	7230	115	5290	116	5000	116	4720	116	4450	117	121	50	114	6670	114	5120	115	4840	115	4560	115	4300	116	121
54	112	8080	116	5660	117	5350	117	5060	117	4770	117	121	54	113	7450	115	5480	115	5180	116	4890	116	4610	116	120

WEIGHT = 13000 LBS					VENR = 130 KIAS								WEIGHT = 12500 LBS					VENR = 130 KIAS							
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS				DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS			
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS	C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	114	3800	112	3000	112	2820	112	2640	113	2470	118	127	-35	112	3610	109	2850	110	2670	110	2500	110	2340	116	125
-30	114	3870	112	3060	112	2870	112	2690	113	2520	118	127	-30	112	3670	109	2900	110	2730	110	2550	110	2390	116	125
-25	114	3950	112	3110	112	2930	112	2740	113	2570	118	127	-25	112	3730	109	2960	110	2780	110	2600	110	2430	116	125
-20	114	4020	112	3170	112	2980	112	2800	113	2620	118	127	-20	112	3780	109	3010	110	2830	110	2650	110	2480	116	125
-15	114	4100	112	3230	112	3030	112	2850	113	2670	118	127	-15	112	3850	109	3060	110	2880	110	2700	110	2530	116	125
-10	113	4170	112	3280	112	3090	112	2900	113	2720	118	127	-10	112	3920	109	3110	110	2930	110	2750	110	2580	116	125
-5	113	4250	112	3340	112	3140	112	2950	113	2770	118	127	-5	111	3990	109	3170	110	2980	110	2800	110	2620	116	125
0	113	4330	112	3390	112	3200	112	3010	113	2820	118	127	0	111	4060	109	3220	110	3030	110	2850	110	2670	116	125
5	113	4410	112	3450	112	3250	112	3060	113	2870	118	127	5	111	4130	109	3270	110	3080	110	2900	110	2720	116	125
10	112	4490	112	3500	112	3300	112	3110	113	2920	118	127	10	111	4200	109	3330	110	3130	110	2950	110	2770	116	125
15	112	4570	112	3560	112	3360	112	3160	113	2970	118	127	15	111	4270	109	3380	110	3190	110	3000	110	2820	116	125
20	112	4650	112	3620	112	3420	112	3220	113	3020	118	127	20	110	4350	109	3440	110	3240	110	3050	110	2870	116	125
25	112	4730	112	3680	112	3470	112	3270	113	3080	118	126	25	110	4430	109	3490	110	3290	110	3100	110	2920	116	125
30	112	4900	112	3790	112	3580	112	3370	113	3180	118	125	30	110	4580	110	3590	110	3390	110	3200	110	3000	116	124
35	112	5160	112	3990	113	3770	113	3560	113	3350	117	124	35	111	4800	110	3750	110	3540	110	3330	111	3130	115	122
40	113	5460	112	4280	113	4040	113	3810	113	3590	116	122	40	111	5060	110	4000	110	3780	111	3560	111	3350	114	121
45	113	5780	113	4590	113	4330	113	4080	113	3850	115	121	45	111	5350	110	4280	111	4050	111	3810	111	3590	113	119
50	114	6190	113	4960	114	4680	114	4420	114	4160	115	120	50	112	5720	111	4590	111	4330	111	4080	111	3840	112	118
54	114	6800	114	5300	114	5010	115	4730	115	4450	115	119	54	112	6080	111	4880	112	4610	112	4340	112	4080	112	117

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Figure 4-19* (Sheet 1 of 30)

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	109	3430	107	2710	107	2540	107	2380	108	2210	115	124
-30	109	3490	107	2760	107	2590	107	2420	108	2260	115	124
-25	109	3540	107	2810	107	2630	107	2470	108	2300	115	124
-20	109	3600	107	2860	107	2680	107	2510	108	2350	115	124
-15	109	3650	107	2910	107	2730	107	2560	108	2400	115	124
-10	109	3710	107	2960	107	2780	107	2600	108	2440	115	124
-5	109	3770	107	3010	107	2830	107	2650	108	2480	115	124
0	109	3820	107	3060	107	2870	107	2700	108	2530	115	124
5	109	3880	107	3110	107	2920	107	2750	108	2580	115	124
10	109	3940	107	3160	107	2970	107	2800	108	2620	115	124
15	109	4010	107	3210	107	3020	107	2840	108	2670	115	124
20	109	4070	107	3260	107	3070	107	2890	108	2710	115	124
25	109	4140	107	3310	107	3120	107	2940	108	2760	115	124
30	109	4280	107	3410	107	3210	108	3020	108	2840	114	123
35	109	4480	107	3550	108	3340	108	3150	108	2960	113	121
40	109	4710	108	3740	108	3530	108	3320	108	3120	112	119
45	110	4980	108	4000	108	3770	108	3550	109	3340	111	118
50	110	5340	108	4280	108	4040	109	3800	109	3570	111	116
54	110	5630	108	4510	109	4250	109	4000	109	3760	110	115

WEIGHT = 11500 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	106	3260	104	2570	104	2410	105	2250	105	2100	113	122
-30	106	3320	104	2620	104	2460	105	2300	105	2140	113	122
-25	106	3370	104	2670	104	2500	105	2340	105	2190	113	122
-20	106	3420	104	2710	104	2550	105	2390	105	2230	113	122
-15	106	3470	104	2760	104	2590	105	2430	105	2270	113	122
-10	106	3530	104	2810	104	2640	105	2470	105	2310	113	122
-5	106	3580	104	2850	104	2680	105	2520	105	2360	113	122
0	106	3630	104	2900	104	2730	105	2560	105	2400	113	122
5	106	3690	104	2950	104	2780	105	2600	105	2440	113	122
10	106	3740	104	3000	104	2820	105	2650	105	2480	113	122
15	106	3800	104	3040	104	2870	105	2690	105	2530	113	122
20	106	3850	104	3090	104	2910	105	2740	105	2570	113	122
25	106	3900	104	3140	104	2960	105	2790	105	2610	113	122
30	107	4020	104	3230	105	3040	105	2860	105	2690	112	121
35	107	4180	105	3350	105	3160	105	2970	106	2790	111	119
40	108	4390	105	3500	105	3300	106	3100	106	2910	110	118
45	108	4660	106	3730	106	3520	106	3310	106	3110	110	116
50	108	4990	106	3990	106	3760	106	3540	106	3320	109	115
54	108	5250	106	4200	106	3950	106	3720	107	3490	108	114

WEIGHT = 10500 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	100	2950	98	2320	99	2170	99	2030	100	1890	109	120
-30	100	3000	98	2360	99	2210	99	2070	100	1930	109	120
-25	100	3050	98	2400	99	2250	99	2110	100	1960	110	120
-20	100	3090	98	2450	99	2290	99	2150	100	2000	110	120
-15	100	3140	98	2490	99	2340	99	2190	100	2040	110	120
-10	100	3190	98	2530	99	2380	99	2220	100	2080	110	120
-5	100	3230	98	2570	99	2410	99	2260	100	2120	110	120
0	100	3280	98	2610	99	2460	99	2300	100	2150	110	120
5	101	3330	99	2660	99	2500	99	2340	100	2190	110	120
10	101	3380	99	2700	99	2540	99	2380	100	2230	110	120
15	101	3430	99	2740	99	2580	99	2420	100	2270	110	120
20	101	3480	99	2790	99	2620	99	2460	100	2310	110	120
25	101	3520	99	2830	99	2660	99	2500	100	2350	110	120
30	101	3620	99	2900	99	2730	100	2570	100	2410	109	119
35	102	3750	100	3000	100	2820	100	2650	101	2490	108	117
40	102	3910	100	3120	100	2940	101	2760	101	2580	107	115
45	103	4070	101	3250	101	3050	101	2870	101	2690	106	113
50	103	4320	101	3440	101	3240	101	3040	102	2850	105	112
54	104	4540	101	3620	101	3400	102	3200	102	3000	105	111

WEIGHT = 10000 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	97	2810	95	2200	96	2060	96	1920	97	1790	108	119
-30	97	2850	95	2240	96	2100	96	1960	97	1820	108	119
-25	97	2900	95	2280	96	2140	96	2000	97	1860	108	119
-20	97	2940	95	2320	96	2180	96	2030	97	1900	108	119
-15	97	2990	95	2370	96	2210	96	2070	97	1930	108	119
-10	97	3030	95	2400	96	2250	96	2110	97	1970	108	119
-5	97	3070	96	2440	96	2290	96	2150	97	2000	108	119
0	97	3120	96	2480	96	2330	96	2190	97	2040	108	119
5	97	3170	96	2520	96	2370	96	2220	97	2080	108	119
10	97	3210	96	2560	96	2410	97	2260	97	2110	108	119
15	98	3260	96	2600	96	2450	97	2300	97	2150	108	119
20	98	3300	96	2640	96	2490	97	2340	97	2190	108	119
25	98	3350	96	2690	96	2530	97	2380	97	2220	108	119
30	98	3430	96	2750	97	2590	97	2430	97	2280	107	117
35	99	3550	97	2840	97	2670	98	2510	98	2350	106	116
40	100	3690	97	2950	98	2770	98	2600	98	2430	105	114
45	100	3850	98	3060	98	2880	98	2700	99	2530	104	112
50	101	4020	98	3200	99	3010	99	2820	99	2640	104	110
54	101	4220	99	3350	99	3150	99	2960	99	2770	103	109

WEIGHT = 9500 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	94	2680	94	2170	94	2010	94	1860	94	1710	106	118
-30	94	2720	94	2210	94	2050	94	1890	94	1750	106	118
-25	94	2760	94	2240	94	2080	94	1930	94	1780	106	118
-20	94	2800	94	2280	94	2120	94	1960	94	1810	106	118
-15	94	2840	94	2310	94	2150	94	1990	94	1840	106	118
-10	94	2880	94	2350	94	2190	94	2020	94	1870	106	118
-5	94	2920	94	2380	94	2220	94	2060	94	1900	106	118
0	94	2970	94	2410	94	2250	94	2090	94	1940	106	118
5	94	3010	94	2450	94	2280	94	2120	94	1970	106	118
10	94	3050	94	2480	94	2310	94	2150	94	2000	106	118
15	94	3090	94	2510	94	2340	94	2180	94	2040	106	118
20	94	3140	94	2550	94	2380	94	2210	94	2070	106	117
25	95	3180	93	2570	93	2400	94	2250	94	2110	106	117
30	95	3260	93	2610	94	2450	94	2300	95	2160	106	116
35	96	3370	94	2690	94	2530	95	2370	95	2220	105	114
40	97	3490	95	2780	95	2610	95	2450	96	2290	104	112
45	97	3630	95	2880	96	2710	96	2540	96	2370	103	111
50	98	3780	96	3000	96	2810	96	2630	97	2460	102	109
54	98	3910	96	3100	96	2910	97	2730	97	2560	101	108

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Figure 4-19* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	117	4480	116	3450	116	3250	117	3050	117	2860	121	129
-25	117	4580	116	3510	116	3310	117	3110	117	2920	121	129
-20	116	4670	116	3580	116	3370	117	3170	117	2970	121	129
-15	116	4760	116	3640	116	3430	117	3230	117	3030	121	129
-10	116	4850	116	3720	116	3490	117	3290	117	3090	121	129
-5	115	4950	116	3790	116	3550	117	3350	117	3150	121	129
0	115	5040	116	3870	116	3620	117	3410	117	3210	121	129
5	115	5140	115	3940	116	3680	117	3470	117	3260	121	129
10	115	5240	115	4020	116	3760	117	3530	117	3320	121	129
15	114	5340	115	4100	116	3840	117	3590	117	3380	121	129
20	113	5510	115	4190	116	3910	117	3660	117	3440	121	129
25	112	5760	115	4320	116	4040	116	3770	117	3560	121	128
30	112	6180	115	4520	116	4230	116	4000	117	3770	120	127
35	111	6710	115	4790	116	4530	117	4280	117	4040	119	125
40	110	7390	115	5150	116	4880	117	4610	117	4350	119	124
45	109	8530	117	5670	117	5360	118	5070	118	4790	119	124
50	109	9920	118	6220	119	5900	119	5580	120	5270	120	124
51	109	10230	118	6340	119	6010	119	5680	120	5370	120	124
52	108	10560	119	6460	119	6120	120	5790	120	5470	120	124

WEIGHT = 13600 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	116	4240	115	3300	115	3100	115	2910	116	2720	120	128
-30	116	4330	115	3360	115	3160	115	2970	116	2780	120	129
-25	116	4420	115	3420	115	3220	115	3020	116	2830	120	129
-20	115	4500	115	3480	115	3280	115	3080	115	2890	120	129
-15	115	4590	115	3540	115	3340	115	3140	115	2950	120	129
-10	115	4680	115	3600	115	3400	115	3200	115	3000	120	129
-5	115	4770	115	3660	115	3450	115	3250	115	3050	120	129
0	114	4860	115	3740	115	3510	115	3310	115	3110	120	129
5	114	4950	114	3810	115	3580	115	3370	115	3170	120	128
10	114	5040	114	3880	115	3640	115	3430	115	3230	120	128
15	114	5140	114	3960	115	3700	115	3490	115	3280	120	128
20	113	5240	114	4040	115	3780	115	3550	115	3350	120	128
25	113	5410	114	4160	115	3890	115	3650	116	3440	120	128
30	113	5760	114	4350	115	4090	115	3860	116	3640	119	126
35	112	6240	114	4630	115	4380	116	4130	116	3900	118	125
40	111	6820	114	4970	115	4700	116	4440	116	4180	117	123
45	111	7780	115	5430	116	5140	117	4860	117	4580	118	122
50	110	9010	117	5960	117	5640	118	5330	118	5030	118	122
52	110	9570	117	6180	118	5850	118	5530	118	5220	118	122

WEIGHT = 13400 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	115	4130	114	3230	114	3030	114	2850	115	2660	119	128
-30	115	4220	114	3290	114	3090	114	2900	115	2720	120	128
-25	115	4300	114	3350	114	3150	114	2960	115	2770	120	128
-20	115	4380	114	3410	114	3210	114	3020	115	2830	120	128
-15	114	4470	114	3470	114	3270	114	3070	115	2880	120	128
-10	114	4550	114	3530	114	3320	114	3130	115	2940	120	128
-5	114	4640	114	3590	114	3380	114	3190	115	2990	120	128
0	114	4730	114	3650	114	3440	114	3240	115	3050	120	128
5	113	4820	114	3710	114	3500	114	3300	115	3100	120	128
10	113	4900	114	3780	114	3560	114	3360	115	3160	120	128
15	113	5000	113	3860	114	3620	114	3420	114	3220	120	128
20	113	5100	113	3930	114	3680	114	3480	115	3270	120	128
25	113	5260	113	4050	114	3790	114	3570	115	3370	119	127
30	113	5520	113	4240	114	3980	115	3760	115	3550	118	126
35	113	5980	114	4500	114	4260	115	4030	115	3800	118	124
40	112	6430	114	4840	114	4580	115	4320	115	4070	117	122
45	111	7250	115	5260	115	4980	116	4700	116	4430	117	122
50	111	8370	116	5770	116	5460	117	5160	117	4870	117	121
52	110	8880	116	5980	117	5660	117	5350	117	5050	117	121

WEIGHT = 13200 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	115	4030	113	3160	113	2970	113	2790	114	2610	119	127
-30	114	4110	113	3220	113	3030	113	2840	114	2660	119	127
-25	114	4190	113	3280	113	3080	113	2900	114	2710	119	127
-20	114	4270	113	3340	113	3140	113	2950	114	2770	119	127
-15	114	4350	113	3400	113	3200	113	3010	114	2820	119	127
-10	114	4440	113	3450	113	3250	113	3060	114	2870	119	127
-5	113	4520	113	3510	113	3310	113	3120	114	2930	119	127
0	113	4600	113	3570	113	3370	113	3170	114	2980	119	127
5	113	4690	113	3630	113	3430	113	3230	114	3030	119	127
10	112	4770	113	3690	113	3490	113	3290	114	3090	119	127
15	112	4860	113	3760	113	3550	113	3340	114	3150	119	127
20	112	4950	113	3810	113	3610	113	3400	114	3210	119	127
25	112	5110	113	3950	113	3700	113	3490	114	3290	118	126
30	113	5360	113	4120	113	3880	114	3670	114	3460	118	125
35	113	5660	113	4390	114	4150	114	3920	114	3690	117	123
40	113	6040	113	4710	114	4460	114	4210	114	3960	116	122
45	112	6730	114	5100	114	4820	115	4550	115	4290	116	121
50	112	7760	115	5580	115	5280	116	4990	116	4700	116	120
52	111	8220	115	5780	116	5470	116	5170	116	4880	116	120

WEIGHT = 13000 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	114	3930	112	3100	112	2910	112	2730	113	2550	118	127
-30	114	4010	112	3160	112	2970	112	2780	113	2600	118	127
-25	114	4080	112	3210	112	3020	112	2830	113	2660	118	127
-20	113	4160	112	3270	112	3080	112	2890	113	2710	118	127
-15	113	4240	112	3330	112	3130	112	2940	113	2760	118	127
-10	113	4320	112	3390	112	3190	112	3000	113	2810	118	127
-5	113	4400	112	3440	112	3240	112	3050	113	2860	118	127
0	112	4480	112	3500	112	3300	112	3110	113	2920	118	127
5	112	4560	112	3560	112	3360	112	3160	113	2970	118	127
10	112	4650	112	3620	112	3420	112	3220	113	3020	118	127
15	112	4730	112	3680	112	3470	112	3270	113	3080	118	127
20	112	4820	112	3740	112	3530	112	3330	113	3140	118	127
25	112	4970	112	3850	112	3630	112	3420	113	3220	118	126
30	112	5200	112	4010	112	3780	113	3570	113	3370	117	124
35	112	5500	112	4280	113	4050	113	3820	113	3600	116	123
40	113	5820	112	4590	113	4340	113	4090	113	3850	115	121
45	113	6200	113	4940	113	4400	113	4400	113	4150	115	120
50	113	7140	114	5400	114	5110	115	4820	115	4540	115	119
52	112	7570	114	5590	115	5290	115	5000	115	4710	115	119

WEIGHT = 12500 LBS					VENR = 130 KIAS									
TEMP	TAILWIND		ZERO		HEADWINDS									
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS					
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	112	3710	109	2940	110	2760	110	2590	110	2420	116	125
-30	112	3770	109	3000	110	2810	110	2640	110	2470	116	125
-25	112	3830	109	3050	110	2870	110	2690	110	2520	116	125
-20	112	3900	109	3100	110	2920	110	2740	110	2570	116	125
-15	111	3980	109	3160	110	2970	110	2790	110	2610	116	125
-10	111	4050	109	3210	110	3020	110	2840	110	2660	116	125
-5	111	4120	109	3270	110	3080	110	2890	110	2710	116	125
0	111	4200	109	3320	110	3130	110	2950	110	2770	116	125
5	111	4270	109	3380	110	3190	110	3000	110	2810	116	125
10	110	4350	109	3430	110	3240	110	3050	110	2860	116	125
15	110	4420	109	3490	110	3290	110	3100	110	2920	116	125
20	110	4500	109	3550	110	3350	110	3160	110	2970	116	125
25	110	4640	109	3640	110	3440	110	3240	110	3050	116	124
30	110	4850	110	3780	110	3570	110	3360	110	3170	115	123
35	111	5100	110	4000	110	3780	110	3570	111	3360	114	121
40	111	5390	110	4290	110	4050	111	3820	111	3600	113	120
45	111	5720	111	4600	111	4350	111	4100	111	3860	113	118
50	112	6180	111	4970	111	4700	112	4430	112	4170	112	117
52	113	6400	112	5150	112	4870	112	4590	112	4320	113	117

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Figure 4-19* (Sheet 3)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	109	3530	107	2800	107	2620	107	2450	108	2290	115	124
-30	109	3590	107	2840	107	2670	107	2500	108	2340	115	124
-25	109	3640	107	2900	107	2720	107	2550	108	2390	115	124
-20	109	3700	107	2950	107	2770	107	2600	108	2430	115	124
-15	109	3760	107	3000	107	2820	107	2650	108	2480	115	124
-10	109	3820	107	3050	107	2870	107	2700	108	2530	115	124
-5	109	3870	107	3100	107	2920	107	2740	108	2570	115	124
0	109	3930	107	3150	107	2970	107	2790	108	2620	115	124
5	109	4000	107	3210	107	3020	107	2840	108	2670	115	124
10	109	4070	107	3260	107	3070	107	2890	108	2710	115	124
15	108	4140	107	3310	107	3120	107	2940	108	2760	115	124
20	108	4220	107	3370	107	3180	107	2990	108	2810	115	124
25	108	4330	107	3450	107	3260	107	3070	108	2880	114	123
30	109	4520	107	3580	108	3380	108	3180	108	2990	113	121
35	109	4740	108	3740	108	3540	108	3330	108	3140	113	120
40	109	5000	108	4010	108	3780	108	3560	108	3350	112	118
45	110	5340	108	4290	108	4050	109	3820	109	3590	111	116
50	110	5730	108	4600	109	4340	109	4090	109	3840	110	115
52	110	5900	109	4730	109	4470	109	4210	109	3950	110	115

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	106	3360	104	2650	104	2490	105	2330	105	2180	113	122
-30	106	3410	104	2700	104	2540	105	2380	105	2220	113	122
-25	106	3460	104	2750	104	2580	105	2420	105	2260	113	122
-20	106	3520	104	2800	104	2630	105	2460	105	2310	113	122
-15	106	3570	104	2850	104	2680	105	2510	105	2350	113	122
-10	106	3630	104	2900	104	2720	105	2560	105	2400	113	122
-5	106	3680	104	2950	104	2770	105	2600	105	2440	113	122
0	106	3740	104	3000	104	2820	105	2650	105	2480	113	122
5	106	3790	104	3040	104	2870	105	2690	105	2530	113	122
10	106	3850	104	3090	104	2910	105	2740	105	2570	113	122
15	106	3900	104	3140	104	2960	105	2790	105	2620	113	122
20	106	3960	104	3200	104	3010	105	2830	105	2660	113	122
25	107	4060	104	3270	105	3090	105	2900	105	2730	113	122
30	107	4220	105	3390	105	3200	105	3010	106	2820	112	120
35	107	4420	105	3530	105	3330	106	3130	106	2940	111	118
40	108	4650	105	3740	106	3520	106	3320	106	3120	110	117
45	108	4990	106	4000	106	3770	106	3550	106	3340	109	115
50	108	5340	106	4280	106	4040	106	3800	106	3570	108	114
52	108	5490	106	4390	106	4140	106	3900	107	3660	108	113

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	103	3190	101	2520	102	2360	102	2210	102	2060	111	121
-30	103	3240	101	2570	102	2410	102	2250	102	2100	111	121
-25	103	3290	101	2610	102	2450	102	2300	102	2140	111	121
-20	103	3350	101	2660	102	2500	102	2340	102	2190	111	121
-15	103	3400	101	2710	102	2540	102	2380	102	2230	111	121
-10	103	3450	101	2750	102	2590	102	2420	102	2270	111	121
-5	103	3500	101	2800	102	2630	102	2470	102	2310	111	121
0	103	3550	101	2840	102	2670	102	2510	102	2350	111	121
5	103	3600	101	2890	102	2720	102	2550	102	2400	111	121
10	103	3650	101	2940	102	2770	102	2600	102	2440	111	121
15	103	3710	101	2980	102	2810	102	2640	102	2480	111	121
20	104	3760	101	3030	102	2860	102	2690	103	2520	111	121
25	104	3850	102	3100	102	2920	102	2750	103	2580	111	120
30	104	3990	102	3210	102	3020	103	2840	103	2670	110	119
35	105	4160	103	3330	103	3140	103	2950	103	2770	109	117
40	105	4340	103	3480	103	3280	103	3090	104	2900	108	115
45	106	4650	103	3720	103	3510	104	3300	104	3100	107	114
50	106	4970	104	3970	104	3750	104	3520	104	3310	107	112
52	106	5100	104	4080	104	3840	104	3610	104	3390	106	112

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	100	3030	98	2400	99	2240	99	2100	100	1950	110	120
-30	100	3080	98	2440	99	2280	99	2140	100	1990	110	120
-25	100	3130	98	2480	99	2330	99	2180	100	2030	110	120
-20	100	3180	98	2530	99	2370	99	2220	100	2070	110	120
-15	100	3230	98	2570	99	2410	99	2260	100	2110	110	120
-10	100	3280	98	2610	99	2450	99	2300	100	2150	110	120
-5	100	3330	98	2650	99	2500	99	2340	100	2190	110	120
0	100	3380	99	2700	99	2540	99	2380	100	2230	110	120
5	101	3430	99	2740	99	2580	99	2420	100	2270	110	120
10	101	3470	99	2790	99	2620	99	2460	100	2310	110	120
15	101	3520	99	2830	99	2670	99	2510	100	2350	110	120
20	101	3580	99	2880	99	2710	99	2550	100	2390	110	120
25	101	3660	99	2940	99	2770	100	2600	100	2440	109	119
30	102	3780	99	3030	100	2860	100	2690	100	2520	108	117
35	102	3930	100	3150	100	2970	101	2790	101	2610	107	115
40	103	4100	100	3280	101	3090	101	2900	101	2720	106	114
45	103	4320	101	3460	101	3260	101	3060	101	2870	106	112
50	104	4620	101	3690	101	3470	101	3260	102	3060	105	111
52	104	4740	101	3780	101	3560	102	3350	102	3140	104	110

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	97	2880	95	2270	96	2130	96	1990	97	1850	108	119
-30	97	2930	95	2320	96	2170	96	2030	97	1890	108	119
-25	97	2980	95	2360	96	2210	96	2060	97	1930	108	119
-20	97	3020	95	2400	96	2250	96	2100	97	1960	108	119
-15	97	3070	95	2440	96	2290	96	2140	97	2000	108	119
-10	97	3120	96	2480	96	2330	96	2180	97	2040	108	119
-5	97	3160	96	2520	96	2370	96	2220	97	2080	108	119
0	97	3210	96	2560	96	2410	96	2260	97	2110	108	119
5	97	3250	96	2600	96	2450	97	2300	97	2150	108	119
10	98	3300	96	2640	96	2490	97	2340	97	2190	108	119
15	98	3350	96	2690	96	2530	97	2380	97	2230	108	119
20	98	3400	96	2730	96	2570	97	2410	97	2270	108	119
25	98	3470	96	2790	97	2630	97	2470	97	2320	108	118
30	99	3580	97	2880	97	2710	97	2540	98	2380	107	116
35	99	3720	97	2980	98	2800	98	2630	98	2460	106	114
40	100	3870	98	3090	98	2910	98	2730	99	2560	105	112
45	101	4040	98	3220	98	3020	99	2840	99	2660	104	111
50	101	4290	99	3420	99	3220	99	3020	99	2830	103	109
52	101	4400	99	3500	99	3290	99	3090	99	2900	103	109

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2750	94	2230	94	2070	94	1920	94	1770	106	118
-30	94	2790	94	2270	94	2110	94	1960	94	1800	106	118
-25	94	2830	94	2310	94	2150	94	1990	94	1840	106	118
-20	94	2870	94	2350	94	2180	94	2020	94	1870	106	118
-15	94	2920	94	2380	94	2220	94	2060	94	1900	106	118
-10	94	2960	94	2420	94	2250	94	2090	94	1940	106	118
-5	94	3010	94	2450	94	2290	94	2120	94	1970	106	118
0	94	3050	94	2490	94	2320	94	2160	94	2000	106	118
5	94	3090	94	2520	94	2350	94	2190	94	2040	106	118
10	94	3140	94	2560	94	2390	94	2220	94	2070	106	118
15	94	3180	94	2590	94	2410	94	2250	94	2110	106	118
20	95	3230	93	2610	93	2440	94	2290	94	2150	106	117
25	95	3290	93	2640	94	2490	94	2340	95	2190	106	117
30	96	3400	94	2720	94	2560	95	2400	95	2250	105	115
35	97	3520	95	2810	95	2640	95	2480	96	2320	104	113
40	97	3650	95	2910	95	2740	96	2570	96	2400	103	111
45	98	3800	96	3030	96	2840	96	2670	96	2490	102	109
50	98	3980	96	3160	96	2970	97	2790	97	2610	101	108
52	99	4070	96	3240	96	3040	97	2860	97	2670	101	107

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Figure 4-19* (Sheet 4)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
8000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	114	5250	115	4040	116	3770	116	3540	117	3330	121	129
-50	114	5350	115	4110	116	3850	116	3600	117	3390	121	129
-45	113	5540	115	4210	116	3940	116	3680	117	3460	121	129
-40	112	5730	114	4310	115	4040	116	3770	117	3540	121	129
-35	110	5930	114	4410	115	4130	116	3860	117	3610	121	130
-30	109	6130	114	4520	115	4240	116	3960	117	3700	121	129
-25	108	6430	114	4680	115	4380	116	4090	116	3830	121	129
-20	107	6750	114	4840	115	4530	116	4240	116	3960	121	128
-15	106	7080	114	5010	115	4690	115	4380	116	4110	120	128
-10	105	7420	114	5180	115	4850	115	4530	116	4270	120	127
-5	104	7810	113	5360	114	5020	115	4690	116	4440	120	126
0	103	8260	113	5570	114	5210	115	4900	116	4640	119	126
5	103	8740	113	5830	114	5420	115	5110	116	4840	119	125
10	102	9250	112	6180	114	5640	115	5330	116	5050	119	124
15	101	9900	111	6660	115	5920	115	5600	116	5310	119	124
20	100	11000	110	7420	114	6600	116	6020	117	5710	119	124
25	99	12790	110	8620	113	7700	116	6770	118	6310	120	124
27			109	9200	113	8230	116	7260	119	6580	120	124
29			109	9870	112	8850	116	7810	119	6870	120	124

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	114	5060	114	3890	115	3650	115	3440	115	3230	120	129
-50	113	5150	114	3970	115	3710	115	3500	115	3290	120	129
-45	113	5270	114	4060	115	3800	115	3570	115	3370	120	129
-40	113	5380	114	4160	114	3890	115	3650	115	3440	120	129
-35	112	5560	113	4260	114	3990	115	3730	115	3510	120	129
-30	110	5760	113	4360	114	4080	115	3820	115	3590	120	129
-25	109	6040	113	4510	114	4220	115	3950	115	3690	120	128
-20	108	6340	113	4660	114	4360	115	4080	115	3830	120	127
-15	107	6640	113	4820	114	4510	115	4220	115	3970	119	127
-10	106	6970	113	4980	114	4660	114	4360	115	4120	119	126
-5	105	7330	113	5150	114	4820	114	4530	115	4290	119	125
0	105	7740	113	5350	114	5010	114	4730	115	4480	118	125
5	104	8180	113	5560	113	5200	114	4930	115	4670	118	124
10	103	8650	113	5780	113	5420	114	5140	115	4870	118	123
15	102	9160	112	6040	113	5650	114	5360	115	5080	117	123
20	101	10150	111	6730	114	6080	115	5770	116	5470	118	122
25	100	11760	111	7780	114	6890	116	6360	117	6030	118	122
29			110	8890	113	7900	117	6920	118	6560	119	122
30			110	9200	113	8180	116	7140	118	6700	119	122

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	113	4920	113	3800	114	3570	114	3370	114	3170	120	128
-50	113	5010	113	3870	114	3630	114	3430	114	3230	120	128
-45	113	5120	113	3960	114	3710	114	3500	114	3290	120	128
-40	112	5240	113	4050	114	3790	114	3570	114	3360	120	128
-35	112	5350	113	4150	114	3880	114	3640	114	3440	120	128
-30	111	5490	112	4250	113	3980	114	3720	114	3510	120	128
-25	110	5760	112	4390	113	4110	114	3850	114	3620	119	127
-20	109	6040	112	4530	113	4250	114	3970	115	3730	119	127
-15	108	6330	112	4680	113	4390	114	4100	115	3870	119	126
-10	107	6640	112	4840	113	4530	114	4240	114	4020	118	125
-5	106	6980	112	5010	113	4690	114	4410	114	4180	118	125
0	105	7370	112	5190	113	4860	114	4600	114	4360	118	124
5	104	7780	112	5390	113	5070	114	4800	114	4550	117	123
10	104	8230	112	5600	113	5280	114	5010	114	4740	117	123
15	103	8690	112	5810	113	5500	113	5220	114	4940	117	122
20	102	9560	112	6230	113	5880	114	5580	115	5290	117	122
25	101	11030	111	7190	115	6480	115	6150	116	5830	117	121
30	100	13020	111	8470	114	7480	117	6820	117	6470	118	121
31	100	13480	110	8770	114	7750	117	6970	117	6610	118	121

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-50	112	4870	113	3770	113	3560	113	3350	113	3160	119	127
-45	112	4980	112	3860	113	3630	113	3420	113	3230	119	127
-40	112	5090	112	3950	113	3700	113	3490	113	3290	119	127
-35	111	5200	112	4040	113	3780	113	3570	113	3360	119	127
-30	111	5320	112	4130	113	3870	113	3640	113	3440	119	127
-25	111	5500	112	4270	113	4000	113	3750	114	3540	119	127
-20	110	5750	112	4410	113	4130	113	3860	114	3640	118	126
-15	109	6030	112	4550	112	4270	113	3990	114	3770	118	125
-10	108	6320	112	4700	112	4400	113	4130	114	3910	118	125
-5	107	6640	111	4860	112	4550	113	4300	114	4060	117	124
0	106	7000	111	5040	112	4730	113	4480	114	4240	117	123
5	105	7400	111	5230	112	4930	113	4680	114	4430	117	123
10	104	7810	111	5430	112	5140	113	4880	113	4620	116	122
15	104	8250	111	5640	112	5360	113	5080	113	4810	116	121
20	103	8980	112	6000	112	5700	113	5400	114	5110	116	121
25	102	10340	112	6630	114	6270	114	5940	115	5630	116	120
30	101	12160	111	7790	115	6950	116	6590	116	6250	117	120
31	101	12580	111	8050	115	7090	116	6730	116	6380	117	120
32	101	13030	111	8340	114	7300	116	6870	117	6520	117	120

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-50	112	4740	112	3690	112	3480	112	3280	113	3090	118	127
-45	111	4850	112	3760	112	3550	112	3350	113	3160	118	127
-40	111	4950	112	3850	112	3630	112	3420	113	3220	118	127
-35	111	5060	111	3930	112	3690	112	3490	112	3290	118	127
-30	110	5180	111	4030	112	3770	112	3560	113	3360	118	127
-25	110	5350	111	4160	112	3890	112	3670	113	3460	118	126
-20	110	5530	111	4290	112	4020	112	3770	113	3560	118	125
-15	110	5730	111	4430	112	4150	113	3890	113	3670	117	125
-10	109	6000	111	4570	112	4280	112	4030	113	3810	117	124
-5	108	6310	111	4720	112	4430	112	4190	113	3960	117	124
0	107	6650	111	4900	112	4610	112	4370	113	4130	116	123
5	106	7020	111	5080	112	4800	112	4550	113	4310	116	122
10	105	7410	111	5280	111	5010	112	4750	113	4490	115	121
15	104	7820	111	5490	111	5210	112	4940	113	4680	115	121
20	104	8420	111	5810	111	5520	112	5230	113	4950	115	120
25	103	9680	112	6380	113	6060	113	5750	114	5450	115	119
30	102	11340	112	7130	114	6710	115	6370	115	6040	116	119
32	102	12140	112	7620	115	6990	115	6640	116	6290	116	119
35	101	13510	111	8470	115	7440	116	7060	116	6700	116	119

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	110	4360	109	3440	109	3250	110	3060	110	2870	117	125
-50	110	4440	109	3500	109	3300	110	3110	110	2930	117	125
-45	110	4530	109	3570	110	3370	110	3180	110	2990	117	125
-40	110	4630	109	3640	110	3440	110	3240	110	3050	117	125
-35	109	4720	109	3710	110	3500	110	3310	110	3120	117	125
-30	109	4830	109	3780	110	3580	110	3380	110	3190	117	125
-25	109	4980	109	3890	110	3680	110	3470	110	3270	116	125
-20	109	5140	109	4010	110	3780	110	3570	110	3370	116	124
-15	109	5310	109	4140	110	3890	110	3670	110	3470	116	123
-10	109	5480	109	4260	110	4000	110	3780	110	3570	115	123
-5	109	5660	109	4400	110	4140	110	3920	110	3700	115	122
0	109	5870	109	4550	110	4310	110	4080	111	3860	114	121
5	108	6120	109	4730	110	4490	110	4250	111	4020	114	121
10	108	6460	109	4930	110	4680	110	4430	111	4190	114	120
15	107	6800	109	5130	110	4870	110	4610	111	4360	113	119
20	106	7300	109	5420	110	5140	110	4880	111	4610	113	118
25	105	8140	110	5880	110	5570	111	5280	111	5000	112	117
30	104	9450	111	6480	111	6150	112	5830	112	5520	113	117
35	104	11150	112	7170	113	6810	113	6460	114	6120	114	117

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Figure 4-19* (Sheet 17)

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
8000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	109	4080	107	3270	107	3080	107	2900	108	2720	115	124
-50	108	4150	107	3320	107	3130	107	2950	108	2770	115	124
-45	108	4240	107	3390	107	3200	107	3010	108	2830	115	124
-40	108	4330	107	3450	107	3260	107	3070	108	2890	115	124
-35	108	4420	107	3520	107	3320	107	3140	108	2950	115	124
-30	107	4510	107	3590	107	3390	107	3200	108	3020	115	124
-25	107	4650	107	3690	107	3480	107	3290	108	3100	115	123
-20	107	4800	107	3790	107	3580	108	3380	108	3190	114	123
-15	107	4940	107	3890	107	3680	108	3470	108	3280	114	122
-10	107	5100	107	3990	108	3780	108	3570	108	3370	114	121
-5	107	5260	107	4100	108	3880	108	3670	108	3460	113	121
0	107	5440	107	4250	108	4030	108	3810	108	3600	113	120
5	107	5640	107	4430	108	4190	108	3970	108	3750	112	119
10	107	5840	107	4610	108	4370	108	4130	108	3900	112	118
15	107	6040	107	4790	108	4540	108	4300	108	4060	112	118
20	108	6330	107	5060	108	4790	108	4540	108	4290	111	117
25	107	6800	107	5430	108	5150	108	4880	109	4610	110	115
30	107	7780	108	5950	109	5640	109	5340	110	5050	110	115
35	106	9090	110	6560	110	6230	111	5900	111	5580	111	114

WEIGHT = 11500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	106	3860	104	3100	104	2920	105	2750	105	2580	113	123
-50	106	3910	104	3150	104	2970	105	2800	105	2620	113	123
-45	106	3980	104	3220	104	3030	105	2850	105	2680	113	123
-40	106	4060	104	3280	104	3090	105	2910	105	2740	113	123
-35	106	4140	104	3340	104	3150	105	2970	105	2800	113	123
-30	106	4230	104	3410	104	3220	105	3030	105	2860	113	123
-25	106	4350	104	3490	105	3300	105	3120	105	2930	113	122
-20	106	4480	104	3590	105	3390	105	3200	105	3020	112	121
-15	106	4610	105	3680	105	3480	105	3290	105	3100	112	120
-10	106	4740	105	3780	105	3570	105	3370	106	3180	112	120
-5	106	4890	105	3880	105	3670	105	3470	106	3270	111	119
0	106	5050	105	4000	105	3780	106	3570	106	3370	111	118
5	106	5220	105	4130	105	3910	106	3700	106	3490	111	118
10	106	5400	105	4300	106	4070	106	3850	106	3640	110	117
15	106	5580	105	4470	106	4230	106	4000	106	3780	110	116
20	106	5830	106	4710	106	4460	106	4220	106	3990	109	115
25	106	6200	106	5050	106	4790	106	4530	106	4270	108	114
30	107	6700	106	5450	106	5160	106	4890	106	4610	108	112
35	108	7370	107	6000	107	5690	108	5380	108	5080	108	112

WEIGHT = 11000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	103	3670	101	2950	102	2770	102	2610	102	2440	111	121
-50	103	3720	101	2990	102	2820	102	2650	102	2490	111	121
-45	103	3780	101	3050	102	2880	102	2710	102	2540	111	121
-40	103	3850	101	3110	102	2930	102	2760	102	2600	111	121
-35	103	3910	101	3170	102	2990	102	2820	102	2650	112	121
-30	103	3990	101	3230	102	3050	102	2880	102	2710	111	121
-25	104	4080	102	3310	102	3130	102	2950	103	2780	111	121
-20	104	4190	102	3400	102	3210	102	3030	103	2850	111	120
-15	104	4300	102	3490	102	3290	103	3110	103	2930	110	119
-10	104	4430	102	3580	102	3380	103	3190	103	3000	110	118
-5	104	4560	102	3670	103	3470	103	3270	103	3080	110	118
0	104	4700	103	3770	103	3570	103	3370	103	3170	109	117
5	104	4850	103	3880	103	3670	103	3460	103	3270	109	116
10	104	5010	103	4010	103	3790	103	3580	104	3380	108	115
15	104	5170	103	4160	103	3940	103	3720	104	3510	108	115
20	104	5390	103	4380	103	4150	104	3920	104	3700	107	114
25	105	5770	103	4690	104	4440	104	4200	104	3960	107	112
30	105	6220	104	5050	104	4780	104	4520	104	4260	106	111
35	105	6760	104	5480	104	5190	104	4900	105	4630	106	110

WEIGHT = 10500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	100	3480	99	2800	99	2630	99	2470	100	2320	110	120
-50	100	3530	99	2840	99	2680	99	2520	100	2360	110	120
-45	101	3600	99	2900	99	2730	99	2570	100	2410	110	120
-40	101	3660	99	2950	99	2790	99	2620	100	2460	110	120
-35	101	3720	99	3010	99	2840	99	2670	100	2510	110	120
-30	101	3790	99	3070	99	2900	100	2730	100	2570	110	120
-25	101	3880	99	3140	99	2970	100	2800	100	2630	109	119
-20	101	3970	99	3220	100	3040	100	2870	100	2700	109	119
-15	101	4070	99	3300	100	3120	100	2940	100	2770	109	118
-10	102	4170	100	3380	100	3200	100	3020	101	2840	108	117
-5	102	4270	100	3470	100	3280	100	3090	101	2910	108	116
0	102	4390	100	3560	100	3370	101	3180	101	2990	108	116
5	102	4510	100	3660	100	3460	101	3270	101	3080	107	115
10	102	4660	100	3770	101	3560	101	3360	101	3160	107	114
15	102	4800	100	3870	101	3660	101	3460	101	3260	106	113
20	103	5010	101	4070	101	3850	101	3640	101	3430	106	112
25	103	5360	101	4350	101	4120	101	3890	102	3670	105	111
30	103	5770	101	4680	101	4430	102	4180	102	3940	104	109
35	103	6220	101	5030	102	4760	102	4490	102	4230	103	108

WEIGHT = 10000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	97	3310	96	2650	96	2500	97	2350	97	2190	108	119
-50	97	3360	96	2700	96	2540	97	2390	97	2230	108	119
-45	98	3420	96	2750	96	2590	97	2430	97	2280	108	119
-40	98	3470	96	2800	96	2640	97	2480	97	2330	108	119
-35	98	3530	96	2850	96	2690	97	2530	97	2380	108	119
-30	98	3600	96	2910	96	2750	97	2590	97	2430	108	119
-25	98	3680	96	2980	97	2810	97	2650	97	2490	108	118
-20	98	3770	96	3050	97	2880	97	2720	98	2550	107	117
-15	99	3860	97	3130	97	2950	97	2780	98	2610	107	117
-10	99	3950	97	3200	97	3020	98	2850	98	2680	107	116
-5	99	4050	97	3280	97	3100	98	2920	98	2750	106	115
0	99	4150	97	3370	98	3180	98	3000	98	2820	106	114
5	100	4270	98	3450	98	3260	98	3080	98	2900	105	114
10	100	4380	98	3550	98	3350	98	3160	99	2980	105	113
15	100	4490	98	3640	98	3440	98	3250	99	3060	105	112
20	100	4650	98	3780	98	3570	99	3370	99	3180	104	111
25	101	4980	98	4040	99	3820	99	3600	99	3390	103	109
30	101	5350	99	4330	99	4090	99	3860	99	3640	102	108
35	101	5750	99	4650	99	4390	99	4140	99	3900	102	106

WEIGHT = 9500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	94	3150	94	2560	94	2390	94	2220	94	2080	107	118
-50	94	3190	94	2600	94	2420	94	2260	94	2120	107	118
-45	94	3240	94	2640	94	2470	94	2310	94	2170	107	118
-40	94	3300	94	2690	94	2520	94	2360	94	2210	107	118
-35	94	3360	94	2740	94	2560	94	2400	94	2250	107	118
-30	95	3420	93	2780	93	2600	94	2450	94	2300	107	118
-25	95	3490	93	2830	94	2670	94	2510	95	2360	106	117
-20	95	3580	94	2890	94	2730	94	2570	95	2410	106	116
-15	96	3660	94	2960	94	2800	95	2630	95	2470	106	116
-10	96	3740	94	3030	95	2860	95	2690	95	2530	105	115
-5	96	3830	94	3100	95	2930	95	2760	95	2590	105	114
0	97	3930	95	3180	95	3000	95	2830	96	2660	104	113
5	97	4030	95	3260	95	3080	96	2900	96	2730	104	112
10	97	4130	95	3350	95	3160	96	2980	96	2800	103	112
15	97	4240	95	3430	96	3240	96	3050	96	2870	103	111
20	98	4380	96	3540	96	3350	96	3150	96	2970	102	110
25	98	4610	96	3730	96	3530	96	3330	97	3130	101	108
30	99	4950	96	4000	96	3780	97	3560	97	3350	101	106
35	99	5310	97	4280	97	4050	97	3810	97	3590	100	105

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Figure 4-19* (Sheet 18)

TAKEOFF FIELD LENGTH - FEET, FLAPS UP
(DRY RUNWAY OVER A 35 FOOT SCREEN HEIGHT) (ANTI-ICE ON)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 4-21. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 4-20.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS UP, ANTI-ICE ON

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 4-21	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED 2%	1.5%	1%	0.5%	DOWNHILL GRADIENT SHADED -1%	-2%	NON-SHADED -1%	-2%
1600	1700	1700	1700	1650	1600	1600	1700	1700
1800	1900	1900	1900	1850	1800	1800	1900	1900
2000	2150	2100	2100	2050	2000	2000	2100	2100
2200	2350	2350	2300	2300	2200	2200	2300	2300
2400	2600	2550	2550	2500	2400	2400	2500	2500
2600	2850	2800	2750	2700	2600	2600	2700	2700
2800	3050	3000	2950	2950	2800	2800	2900	2950
3000	3300	3250	3200	3150	3000	2950	3100	3150
3200	3550	3450	3400	3350	3200	3150	3300	3350
3400	3750	3700	3600	3550	3400	3350	3500	3550
3600	4000	3900	3850	3750	3600	3550	3700	3750
3800	4200	4100	4050	3950	3800	3750	3900	3950
4000	4450	4400	4250	4200	4000	3900	4150	4150
4200	4700	4600	4500	4400	4200	4100	4350	4350
4400	5000	4850	4700	4600	4400	4250	4550	4550
4600	5250	5100	4950	4800	4600	4450	4750	4800
4800	5500	5350	5200	5050	4750	4650	4950	5000
5000	5800	5550	5400	5250	4950	4850	5200	5200
5200	6150	5900	5650	5500	5150	5000	5400	5450
5400	6500	6100	5850	5750	5350	5150	5600	5650
5600	6950	6400	6150	5950	5550	5350	5800	5850
5800	7400	6700	6400	6200	5750	5550	6000	6050
6000	7850	6950	6600	6450	5900	5700	6200	6250
6200	8400	7350	6950	6650	6100	5850	6400	6450
6400	9000	7800	7300	6900	6250	6000	6600	6650
6600	9600	8200	7650	7150	6450	6200	6800	6850
6800	10300	8550	7950	7450	6650	6350	7000	7050
7000	11100	9050	8250	7700	6800	6500	7200	7250
7200	12050	9550	8550	7950	6950	6650	7400	7450
7400	13400	10050	8800	8200	7200	6850	7650	7650
7600	14800	10750	9100	8450	7350	7000	7850	7800
7800	16200	11500	9450	8700	7500	7150	8050	7950
8000		12200	10000	8950	7700	7300	8200	8050
8500		14400	11000	9750	8100	7750	8600	8300
9000		17700	12150	10450	8600	8150	8900	8550
9500			13300	11150	9000	8550	9150	8700
10000			14450	11800	9400	8850	9350	8800
10500			15700	12450	9750	9150	9550	8900
11000				13100	10150	9450	9800	9050
11500				13750	10600	9750	10150	9250
12000				14400	10950	10100	10500	9550
12500					11400	10450	10950	9900
13000					11800	10800	11350	10200
13500					12200	11100	11700	10500
14000					12600	11450	12150	10850
14500					13000	11800	12600	11200
15000					13400	12200	13050	11550
V_1 ADJUSTMENT*	**V_1 + 3 Knots**	**V_1 + 2 Knots**	**V_1 + 1 Knot**	**V_1**	**V_1 - 3 Knots**	**V_1 - 5 Knots**	**V_1 + 1 Knot**	**V_1 + 1 Knot**

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* **If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.**

Figure 4-20*

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	117	4370	116	3370	116	3170	117	2970	117	2780	121	129
-25	117	4460	116	3430	116	3230	117	3030	117	2830	121	129
-20	117	4540	116	3490	116	3290	117	3090	117	2890	121	129
-15	117	4640	116	3550	116	3340	117	3140	117	2950	121	129
-10	116	4720	116	3620	116	3410	117	3200	117	3010	121	129
-5	116	4820	116	3680	116	3460	117	3260	117	3060	121	129
0	116	4910	116	3760	116	3530	117	3320	117	3120	121	129
5	116	5000	116	3830	116	3590	117	3380	117	3180	121	129
10	115	5100	116	3900	116	3650	117	3440	117	3230	121	129

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	117	4220	115	3270	115	3080	115	2890	116	2700	120	128
-25	116	4300	115	3340	115	3140	115	2940	116	2760	120	128
-20	116	4380	115	3400	115	3190	115	3000	116	2810	120	128
-15	116	4470	115	3450	115	3250	115	3050	116	2860	120	128
-10	116	4550	115	3510	115	3310	115	3110	116	2920	120	128
-5	115	4640	115	3580	115	3370	115	3170	116	2970	120	128
0	115	4730	115	3640	115	3430	115	3230	116	3030	120	128
5	115	4820	115	3700	115	3490	115	3280	116	3080	120	128
10	115	4910	115	3770	115	3550	115	3340	116	3140	120	128

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	116	4110	114	3210	114	3020	114	2820	115	2640	119	127
-25	116	4190	114	3270	114	3070	114	2880	115	2700	119	127
-20	115	4270	114	3330	114	3130	114	2940	115	2750	119	127
-15	115	4350	114	3380	114	3180	114	2990	115	2800	119	127
-10	115	4440	114	3440	114	3240	114	3040	115	2850	119	127
-5	115	4520	114	3500	114	3300	114	3100	115	2910	119	127
0	114	4600	114	3560	114	3360	114	3160	115	2960	119	127
5	114	4690	114	3620	114	3410	114	3210	115	3020	119	127
10	114	4780	114	3680	114	3470	114	3270	115	3070	119	127

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	115	4010	113	3140	113	2950	113	2770	114	2590	119	127
-25	115	4080	113	3200	113	3010	113	2820	114	2640	119	127
-20	115	4160	113	3260	113	3060	113	2870	114	2690	119	127
-15	114	4240	113	3310	113	3120	113	2930	114	2740	119	127
-10	114	4320	113	3370	113	3170	113	2980	114	2800	119	127
-5	114	4400	113	3430	113	3230	113	3030	114	2840	119	127
0	114	4480	113	3490	113	3280	113	3090	114	2900	119	127
5	114	4570	113	3550	113	3340	113	3140	114	2950	119	127
10	113	4650	113	3600	113	3400	113	3200	114	3010	119	127

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	114	3900	112	3080	112	2890	112	2710	113	2530	118	126
-25	114	3980	112	3130	112	2940	112	2760	113	2580	118	126
-20	114	4060	112	3190	112	3000	112	2810	113	2630	118	126
-15	114	4130	112	3240	112	3050	112	2860	113	2680	118	126
-10	113	4210	112	3300	112	3110	112	2920	113	2730	118	126
-5	113	4280	112	3360	112	3160	112	2970	113	2790	118	126
0	113	4360	112	3420	112	3220	112	3020	113	2830	118	126
5	113	4450	112	3470	112	3270	112	3080	113	2890	118	126
10	113	4520	112	3530	112	3330	112	3130	113	2940	118	126

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	112	3690	109	2920	110	2740	110	2570	110	2400	116	125
-25	112	3750	109	2980	110	2790	110	2610	110	2440	116	125
-20	112	3810	109	3030	110	2840	110	2660	110	2490	116	125
-15	112	3870	109	3080	110	2890	110	2720	110	2540	116	125
-10	112	3940	109	3130	110	2950	110	2770	110	2590	116	125
-5	111	4020	109	3190	110	3000	110	2810	110	2640	116	125
0	111	4090	109	3240	110	3050	110	2860	110	2690	116	125
5	111	4160	109	3290	110	3100	110	2920	110	2740	116	125
10	111	4240	109	3350	110	3160	110	2970	110	2790	116	125

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	109	3510	107	2770	107	2600	107	2430	108	2270	114	123
-25	109	3570	107	2820	107	2650	107	2480	108	2320	114	123
-20	109	3620	107	2870	107	2700	107	2530	108	2360	114	123
-15	109	3680	107	2920	107	2750	107	2570	108	2400	114	123
-10	109	3730	107	2970	107	2800	107	2620	108	2450	114	123
-5	109	3790	107	3020	107	2840	107	2670	108	2500	114	123
0	109	3850	107	3070	107	2890	107	2720	108	2540	114	123
5	109	3900	107	3130	107	2940	107	2760	108	2590	114	123
10	109	3970	107	3180	107	2990	107	2810	108	2630	114	123

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	106	3340	104	2630	104	2470	105	2310	105	2150	113	122
-25	106	3390	104	2680	104	2510	105	2350	105	2190	113	122
-20	106	3440	104	2730	104	2560	105	2400	105	2240	113	122
-15	106	3500	104	2780	104	2600	105	2440	105	2280	113	122
-10	106	3550	104	2820	104	2650	105	2480	105	2320	113	122
-5	106	3610	104	2870	104	2700	105	2530	105	2370	113	122
0	106	3660	104	2920	104	2740	105	2570	105	2410	113	122
5	106	3710	104	2970	104	2790	105	2620	105	2450	113	122
10	106	3770	104	3020	105	2830	105	2660	105	2500	113	122

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	3020	98	2380	99	2220	99	2070	100	1930	109	119
-25	101	3060	99	2410	99	2260	99	2110	100	1970	109	119
-20	101	3110	99	2460	99	2300	99	2150	100	2010	109	119
-15	101	3160	99	2500	99	2350	99	2190	100	2050	109	119
-10	101	3210	99	2540	99	2390	99	2230	100	2090	109	119
-5	101	3250	99	2590	99	2430	99	2270	100	2120	109	119
0	101	3300	99	2630	99	2470	99	2310	100	2160	109	119
5	101	3350	99	2670	99	2510	99	2350	100	2200	109	119
10	101	3400	99	2710	99	2550	100	2400	100	2240	109	119

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	94	2720	93	2140	93	2000	93	1870	94	1740	106	117
-25	94	2770	93	2180	93	2040	93	1900	94	1770	106	117
-20	94	2810	93	2210	93	2070	94	1940	94	1800	106	117
-15	94	2850	93	2250	93	2110	94	1970	94	1840	106	117
-10	94	2890	93	2290	93	2150	94	2010	94	1870	106	117
-5	94	2940	93	2330	93	2190	94	2040	94	1910	106	117
0	95	2980	93	2370	93	2220	94	2080	94	1940	106	117
5	95	3020	93	2400	93	2260	94	2110	94	1980	106	117
10	95	3060	93	2440	93	2290	94	2150	94	2010	106	117

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Figure 4-21* (Sheet 1 of 15)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	117	4520	116	3480	116	3270	117	3070	117	2880	121	129
-25	117	4620	116	3540	116	3330	117	3130	117	2940	121	129
-20	116	4710	116	3610	116	3400	117	3190	117	3000	121	129
-15	116	4800	116	3670	116	3460	117	3250	117	3050	121	129
-10	116	4900	116	3750	116	3520	117	3310	117	3110	121	129
-5	116	4990	116	3820	116	3580	117	3370	117	3170	121	129
0	115	5090	116	3900	116	3650	117	3440	117	3230	121	129
5	115	5190	115	3980	116	3720	117	3490	117	3290	121	129
10	115	5290	115	4060	116	3790	117	3560	117	3350	121	129

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	116	4370	115	3380	115	3180	115	2990	116	2800	120	128
-25	116	4450	115	3440	115	3240	115	3040	116	2850	120	128
-20	116	4540	115	3500	115	3300	115	3100	116	2910	120	128
-15	115	4630	115	3570	115	3360	115	3160	116	2970	120	128
-10	115	4720	115	3630	115	3420	115	3220	116	3020	120	128
-5	115	4810	115	3690	115	3480	115	3280	116	3080	120	128
0	115	4900	115	3770	115	3540	115	3340	116	3140	120	128
5	114	5000	115	3840	115	3600	115	3400	116	3190	120	128
10	114	5090	114	3910	115	3660	115	3450	116	3250	120	128

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	115	4250	114	3310	114	3110	114	2920	115	2740	119	127
-25	115	4340	114	3370	114	3170	114	2980	115	2790	119	127
-20	115	4420	114	3430	114	3230	114	3030	115	2850	119	127
-15	115	4510	114	3490	114	3290	114	3090	115	2900	119	127
-10	114	4590	114	3550	114	3350	114	3150	115	2960	119	127
-5	114	4680	114	3620	114	3410	114	3210	115	3010	119	127
0	114	4770	114	3680	114	3470	114	3260	115	3070	119	127
5	114	4860	114	3740	114	3530	114	3320	115	3120	119	127
10	113	4950	114	3820	114	3590	114	3380	115	3180	119	127

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	115	4140	113	3240	113	3050	113	2860	114	2680	119	127
-25	114	4230	113	3300	113	3110	113	2920	114	2730	119	127
-20	114	4310	113	3360	113	3160	113	2970	114	2790	119	127
-15	114	4390	113	3420	113	3220	113	3030	114	2840	119	127
-10	114	4470	113	3480	113	3280	113	3080	114	2890	119	127
-5	114	4560	113	3540	113	3340	113	3140	114	2950	119	127
0	113	4640	113	3600	113	3400	113	3200	114	3000	119	127
5	113	4730	113	3660	113	3450	113	3250	114	3060	119	127
10	113	4820	113	3720	113	3510	113	3310	114	3110	119	127

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	114	4040	112	3180	112	2990	112	2800	113	2620	118	126
-25	114	4120	112	3230	112	3040	112	2850	113	2670	118	126
-20	113	4200	112	3290	112	3100	112	2910	113	2730	118	126
-15	113	4270	112	3350	112	3150	112	2960	113	2780	118	126
-10	113	4350	112	3410	112	3210	112	3020	113	2830	118	126
-5	113	4440	112	3470	112	3270	112	3070	113	2880	118	126
0	113	4520	112	3530	112	3320	112	3130	113	2940	118	126
5	112	4600	112	3590	112	3380	112	3180	113	2990	118	126
10	112	4690	112	3650	112	3440	112	3240	113	3040	118	126

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	112	3800	109	3020	110	2830	110	2650	110	2480	116	125
-25	112	3860	109	3070	110	2880	110	2710	110	2530	116	125
-20	112	3930	109	3130	110	2940	110	2760	110	2580	116	125
-15	111	4010	109	3180	110	2990	110	2810	110	2630	116	125
-10	111	4080	109	3230	110	3040	110	2860	110	2680	116	125
-5	111	4150	109	3290	110	3100	110	2910	110	2730	116	125
0	111	4230	109	3350	110	3150	110	2960	110	2780	116	125
5	111	4300	109	3400	110	3210	110	3020	110	2830	116	125
10	111	4380	109	3460	110	3260	110	3070	110	2880	116	125

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	109	3610	107	2860	107	2690	107	2520	108	2350	114	123
-25	109	3670	107	2910	107	2740	107	2570	108	2400	114	123
-20	109	3730	107	2970	107	2790	107	2610	108	2440	114	123
-15	109	3780	107	3020	107	2840	107	2660	108	2490	114	123
-10	109	3840	107	3070	107	2890	107	2710	108	2540	114	123
-5	109	3900	107	3120	107	2940	107	2760	108	2590	114	123
0	109	3960	107	3170	107	2990	107	2810	108	2630	114	123
5	109	4030	107	3230	107	3040	107	2860	108	2680	114	123
10	109	4100	107	3280	107	3090	107	2910	108	2730	114	123

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	106	3430	104	2720	104	2550	105	2390	105	2230	113	122
-25	106	3490	104	2770	104	2600	105	2430	105	2270	113	122
-20	106	3540	104	2810	104	2640	105	2480	105	2320	113	122
-15	106	3600	104	2860	104	2690	105	2520	105	2360	113	122
-10	106	3650	104	2910	104	2740	105	2570	105	2400	113	122
-5	106	3710	104	2960	104	2790	105	2610	105	2450	113	122
0	106	3760	104	3010	104	2830	105	2660	105	2490	113	122
5	106	3820	104	3060	105	2880	105	2710	105	2540	113	122
10	106	3870	104	3110	105	2930	105	2760	105	2590	113	122

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	3100	99	2450	99	2290	99	2150	100	2000	109	119
-25	101	3150	99	2490	99	2340	99	2190	100	2040	109	119
-20	101	3200	99	2540	99	2380	99	2230	100	2080	109	119
-15	101	3250	99	2580	99	2420	99	2270	100	2120	109	119
-10	101	3300	99	2620	99	2460	99	2310	100	2160	109	119
-5	101	3350	99	2670	99	2510	99	2350	100	2200	109	119
0	101	3400	99	2710	99	2550	99	2390	100	2240	109	119
5	101	3440	99	2760	99	2590	100	2430	100	2280	109	119
10	101	3490	99	2800	99	2640	100	2480	100	2320	109	119

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	94	2800	93	2210	93	2070	94	1930	94	1790	106	117
-25	94	2840	93	2250	93	2100	94	1970	94	1830	106	117
-20	94	2890	93	2290	93	2140	94	2000	94	1870	106	117
-15	94	2930	93	2330	93	2180	94	2040	94	1900	106	117
-10	94	2980	93	2370	93	2220	94	2080	94	1940	106	117
-5	95	3020	93	2400	93	2250	94	2110	94	1970	106	117
0	95	3060	93	2440	93	2290	94	2150	94	2010	106	117
5	95	3110	93	2480	93	2330	94	2190	94	2040	106	117
10	95	3150	93	2520	93	2370	94	2220	94	2080	106	117

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Figure 4-21* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET, FLAPS 15°
(DRY RUNWAY OVER A 35 FOOT SCREEN HEIGHT) (ANTI-ICE OFF)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 4-23. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 4-22.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS 15°, ANTI-ICE OFF

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 4-23	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
1600	1850	1800	1750	1700	1600	1600	1700	1700
1800	2100	2000	1950	1900	1800	1800	1900	1900
2000	2400	2250	2200	2100	2050	2000	2100	2150
2200	2650	2500	2400	2300	2250	2200	2300	2350
2400	2900	2750	2650	2500	2450	2400	2500	2550
2600	3250	3050	2900	2750	2650	2600	2700	2750
2800	3550	3300	3100	2950	2850	2800	2900	2950
3000	3900	3600	3400	3200	3050	3000	3100	3150
3200	4300	3950	3650	3400	3250	3150	3350	3400
3400	4650	4200	3900	3650	3450	3350	3550	3600
3600	5150	4600	4200	3850	3650	3550	3750	3800
3800	5650	4900	4450	4100	3800	3700	3950	3950
4000	6300	5350	4750	4350	4000	3900	4150	4150
4200	6900	5800	5100	4600	4200	4100	4350	4350
4400	7650	6250	5400	4800	4400	4250	4550	4600
4600	8650	6750	5750	5100	4600	4450	4750	4800
4800	10000	7350	6100	5350	4750	4600	4950	5000
5000	11250	7900	6450	5600	4950	4800	5200	5200
5200	12800	8500	6750	5800	5150	4950	5400	5450
5400	14700	9100	7150	6100	5300	5150	5600	5650
5600	16500	9750	7450	6300	5500	5300	5800	5850
5800		10300	7800	6550	5700	5450	6050	6050
6000		11050	8200	6800	5850	5600	6200	6250
6200		12100	8650	7100	6050	5800	6450	6450
6400		13200	9100	7400	6250	5950	6650	6650
6600		14150	9500	7650	6400	6100	6850	6850
6800		15200	9900	7850	6600	6250	7050	7050
7000			10250	8100	6750	6400	7200	7200
7200			10650	8350	6950	6550	7300	7300
7400			11000	8600	7100	6700	7350	7400
7600			11400	8850	7250	6850	7450	7500
7800			11800	9200	7450	7000	7550	7550
8000			12200	9450	7600	7150	7650	7650
8500			13100	10050	8000	7500	7850	7800
9000			13850	10600	8400	7800	8100	7950
9500			14600	11200	8800	8150	8400	8050
10000			15400	11800	9200	8500	8700	8150
10500				12400	9600	8800	9050	8250
11000				13150	9950	9100	9450	8450
11500				13850	10350	9400	9850	8750
12000				14600	10750	9750	10250	9050
12500				15300	11150	10050	10650	9350
13000					11500	10350	11000	9650
13500					11900	10650	11400	9950
14000					12250	10950	11750	10250
14500					12600	11250	12100	10550
15000					13000	11550	12500	10850
V_1 ADJUSTMENT*	V_1	V_1	V_1	V_1	V_1 - 3 Knots	V_1 - 5 Knots	V_1 + 1 Knot	V_1 + 1 Knot

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* If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

Figure 4-22*

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS														WEIGHT = 13600 LBS VENR = 130 KIAS												
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	104	3550	102	2690	103	2510	103	2330	103	2170	104	114	-35	103	3410	101	2600	101	2420	101	2250	102	2090	103	113
-30	104	3600	102	2740	103	2560	103	2380	103	2210	104	114	-30	103	3460	101	2640	101	2470	101	2290	101	2130	103	113
-25	104	3650	102	2790	103	2600	103	2420	103	2250	104	114	-25	103	3510	101	2690	101	2510	101	2340	101	2170	103	113
-20	104	3700	102	2830	103	2650	103	2470	103	2290	104	114	-20	103	3560	101	2740	101	2560	101	2380	101	2210	103	113
-15	105	3760	102	2880	103	2690	103	2510	103	2340	105	114	-15	103	3610	101	2780	101	2600	101	2420	101	2250	103	113
-10	105	3810	102	2930	103	2740	103	2560	103	2380	105	114	-10	103	3650	101	2830	101	2650	101	2470	101	2300	103	113
-5	105	3860	102	2980	103	2790	103	2600	103	2430	105	114	-5	103	3710	101	2880	101	2690	101	2510	101	2340	103	113
0	105	3910	102	3030	103	2830	103	2650	103	2470	105	114	0	103	3760	101	2920	101	2740	101	2560	101	2380	103	113
5	105	3970	102	3080	103	2880	103	2700	103	2520	105	114	5	103	3810	101	2970	101	2780	101	2600	101	2420	103	113
10	104	4040	102	3130	103	2930	103	2750	103	2560	105	114	10	103	3870	101	3020	101	2830	101	2650	101	2470	103	113
15	104	4110	102	3180	103	2990	103	2800	103	2610	105	114	15	103	3940	101	3070	101	2880	101	2690	101	2520	103	113
20	104	4180	102	3230	103	3030	103	2840	103	2660	105	114	20	103	4010	101	3120	101	2930	101	2740	101	2560	103	113
25	104	4260	102	3290	103	3090	103	2890	103	2700	105	114	25	103	4080	101	3170	101	2980	101	2790	101	2600	103	113
30	105	4480	104	3440	104	3230	104	3030	104	2840	105	114	30	104	4290	102	3320	102	3120	102	2920	102	2730	104	113
35	106	4920	105	3690	105	3470	106	3250	106	3050	106	114	35	105	4710	104	3560	104	3340	104	3140	104	2930	105	113
40	107	5510	107	4030	107	3800	107	3590	107	3370	107	114	40	105	5260	105	3850	105	3630	105	3420	105	3220	105	113
45	107	6210	107	4480	107	4240	107	4000	107	3770	107	114	45	106	5900	106	4270	106	4040	106	3810	106	3590	106	113
50	108	7100	108	5050	108	4780	108	4510	108	4260	108	114	50	107	6710	107	4790	107	4530	107	4280	107	4030	107	113
54	109	7950	109	5580	109	5280	109	4990	109	4710	109	114	54	107	7470	107	5270	107	4980	107	4710	107	4440	107	113

WEIGHT = 13400 LBS VENR = 130 KIAS														WEIGHT = 13200 LBS VENR = 130 KIAS												
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	102	3310	100	2530	100	2360	100	2190	100	2030	102	112	-35	101	3220	98	2480	99	2310	99	2140	99	1980	101	111
-30	102	3360	99	2580	100	2400	100	2230	100	2070	102	112	-30	101	3270	98	2520	99	2350	99	2180	99	2020	101	111
-25	102	3410	99	2620	100	2450	100	2280	100	2110	102	112	-25	101	3320	98	2560	99	2390	99	2220	99	2060	101	111
-20	102	3450	99	2670	100	2490	100	2320	100	2150	102	112	-20	101	3370	98	2610	99	2430	99	2270	99	2100	101	111
-15	102	3500	99	2710	100	2530	100	2360	100	2190	102	112	-15	101	3420	98	2650	99	2480	99	2310	99	2140	101	111
-10	102	3550	99	2760	100	2580	100	2400	100	2230	102	112	-10	101	3470	98	2700	99	2520	99	2350	99	2180	101	111
-5	102	3600	99	2800	100	2620	100	2440	100	2280	102	112	-5	101	3520	98	2740	99	2560	99	2390	99	2220	101	111
0	102	3650	99	2850	100	2660	100	2490	100	2320	102	112	0	101	3570	98	2790	99	2600	99	2430	99	2260	101	111
5	102	3700	99	2890	100	2710	100	2530	100	2360	102	112	5	101	3620	98	2830	99	2650	99	2470	99	2300	101	111
10	102	3750	99	2940	100	2760	100	2580	100	2400	102	112	10	101	3670	98	2870	99	2690	99	2520	99	2340	101	111
15	102	3820	100	2990	100	2810	100	2620	100	2450	102	112	15	101	3720	98	2920	99	2740	99	2560	99	2390	101	111
20	102	3880	100	3040	100	2850	100	2670	100	2490	102	112	20	101	3770	98	2970	99	2780	99	2600	99	2420	101	111
25	102	3950	100	3090	100	2900	100	2710	100	2540	102	112	25	101	3830	98	3010	99	2820	99	2640	99	2470	101	111
30	103	4160	101	3230	101	3030	101	2840	101	2660	103	112	30	102	4030	99	3150	100	2960	100	2770	100	2590	102	111
35	104	4560	102	3460	103	3250	103	3050	103	2850	104	112	35	103	4410	101	3370	101	3170	102	2970	102	2770	103	111
40	104	5080	104	3740	104	3510	104	3310	104	3110	104	112	40	103	4910	103	3640	103	3420	103	3200	103	3000	103	111
45	105	5690	105	4130	105	3900	105	3670	105	3450	105	112	45	104	5490	104	3980	104	3760	104	3540	104	3330	104	111
50	106	6440	106	4610	106	4360	106	4110	106	3870	106	112	50	105	6190	105	4440	105	4200	105	3960	105	3720	105	111
54	106	7140	106	5050	106	4780	106	4510	106	4250	106	112	54	105	6830	105	4850	105	4580	105	4320	105	4070	105	111

WEIGHT = 13000 LBS VENR = 130 KIAS														WEIGHT = 12500 LBS VENR = 130 KIAS												
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-35	100	3160	98	2430	98	2260	98	2100	98	1950	101	111	-35	98	3020	95	2320	96	2160	96	2010	96	1860	99	110
-30	100	3210	98	2470	98	2310	98	2140	98	1980	101	111	-30	98	3070	95	2370	96	2200	96	2050	96	1900	99	110
-25	100	3260	98	2520	98	2350	98	2190	98	2020	101	111	-25	98	3120	95	2410	96	2240	96	2090	96	1930	99	110
-20	100	3310	98	2560	98	2390	98	2220	98	2060	101	111	-20	98	3160	95	2450	96	2280	96	2120	96	1970	100	110
-15	100	3360	98	2600	98	2430	98	2260	98	2100	101	111	-15	98	3210	95	2490	96	2320	96	2160	96	2010	100	110
-10	100	3410	97	2650	98	2470	98	2310	98	2140	101	111	-10	98	3260	95	2530	96	2360	96	2200	96	2040	100	110
-5	100	3450	97	2690	98	2520	98	2350	98	2180	101	111	-5	98	3300	95	2570	96	2400	96	2240	96	2080	100	110
0	100	3500	97	2740	98	2560	98	2390	98	2220	101	111	0	98	3350	95	2610	96	2440	96	2280	96	2120	100	110
5	100	3550	97	2780	98	2600	98	2430	98	2260	101	111	5	98	3400	95	2660	96	2480	96	2320	96	2160	100	110
10	100	3610	97	2820	98	2640	98	2470	98	2300	101	111	10	98	3450	95	2700	96	2530	96	2360	96	2190	100	110
15	100	3650	98	2870	98	2690	98	2510	98	2340	101	111	15	98	3500	95	2740	96	2570	96	2400	96	2230	100	110
20	100	3710	98	2910	98	2730	98	2550	98	2380	101	111	20	98	3540	95	2780	96	2600	96	2430	96	2270	100	110
25	100	3760	98	2960	98	2770	98	2600	98	2420	101	111	25	98	3590	95	2820	96	2650	96	2480	96	2310	100	110
30	101	3900	98	3070	98	2880	99	2690	99	2510	101	110	30	98	3690	96	2900	96	2720	96	2540	96	2370	99	109
35	102	4270	100	3280	100	3080	100	2880	101	2690	102	110	35	99	3940	97	3060	97	2870	97	2680	97	2500	99	108
40	102	4740	102	3530	102	3320	102	3110	102	2910	102	110	40	100	4350	99	3290	99	3090	99	2890	99	2700	100	108
45	103	5290	103	3850	103	3630	103	3420	103	3210	103	110	45	101	4830	101	3540	101	3330	101	3120	101	2930	101	108
50	104	5950	104	4280	104	4040	104	3810	104	3580	104	110	50	101	5400	101	3900	101	3670	101	3460	101	3250	101	108
54	104	6540	104	4660	104	4400	104	4150	104	3900	104	110	54	102	5890	102	4220	102	3980	102	3750	102	3520	102	108

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Figure 4-23* (Sheet 1 of 30)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	96	2890	93	2220	93	2070	94	1920	94	1770	98	109
-30	96	2940	93	2260	93	2110	94	1960	94	1810	98	109
-25	96	2980	93	2300	93	2150	94	1990	94	1850	98	109
-20	96	3030	93	2340	93	2180	94	2030	94	1880	98	109
-15	96	3070	93	2380	93	2220	94	2070	94	1920	98	109
-10	96	3120	93	2420	93	2260	94	2100	94	1950	98	109
-5	96	3160	93	2460	93	2300	94	2140	94	1990	98	109
0	96	3210	93	2500	93	2340	94	2180	94	2020	98	109
5	96	3250	93	2540	93	2380	94	2210	94	2060	98	109
10	96	3300	93	2580	93	2410	94	2250	94	2090	98	109
15	96	3340	93	2620	93	2450	94	2290	94	2130	98	109
20	96	3390	93	2660	93	2490	94	2330	94	2170	98	109
25	96	3440	93	2700	93	2530	94	2360	94	2200	98	109
30	96	3520	93	2770	94	2590	94	2420	94	2260	98	108
35	96	3650	94	2860	94	2680	94	2500	94	2330	97	106
40	97	4000	96	3070	96	2870	96	2680	96	2500	97	106
45	98	4420	97	3290	98	3090	98	2890	98	2690	98	106
50	99	4900	99	3550	99	3350	99	3140	99	2950	99	106
54	99	5320	99	3830	99	3610	99	3400	99	3190	99	106

WEIGHT = 11500 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	2770	93	2230	93	2070	93	1910	93	1750	97	108
-30	93	2810	93	2270	93	2100	93	1940	93	1780	97	108
-25	93	2860	93	2310	93	2140	93	1980	93	1820	97	108
-20	93	2900	93	2350	93	2180	93	2010	93	1850	97	108
-15	93	2940	93	2390	93	2210	93	2040	93	1880	97	108
-10	93	2990	93	2420	93	2250	93	2080	93	1920	97	108
-5	93	3030	93	2460	93	2280	93	2110	93	1950	97	108
0	93	3070	93	2490	93	2320	93	2150	93	1980	97	108
5	93	3110	93	2530	93	2350	93	2180	93	2010	97	108
10	93	3160	93	2570	93	2390	93	2210	93	2040	97	108
15	93	3200	93	2600	93	2410	93	2240	93	2070	97	108
20	93	3240	93	2630	93	2450	93	2280	93	2110	97	108
25	93	3290	93	2660	93	2480	93	2300	93	2130	97	108
30	94	3370	91	2640	91	2470	92	2310	92	2150	96	107
35	94	3480	92	2720	92	2550	92	2380	92	2210	95	105
40	95	3670	92	2850	93	2670	93	2490	93	2320	95	104
45	96	4040	94	3060	94	2860	95	2670	95	2490	96	104
50	96	4460	96	3280	96	3070	96	2870	96	2680	96	104
54	97	4820	97	3480	97	3270	97	3070	97	2880	97	104

WEIGHT = 11000 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	2790	93	2250	93	2090	93	1930	93	1770	96	107
-30	93	2830	93	2290	93	2120	93	1960	93	1800	96	107
-25	93	2870	93	2330	93	2160	93	1990	93	1840	96	107
-20	93	2910	93	2370	93	2190	93	2030	93	1870	96	107
-15	93	2950	93	2400	93	2230	93	2060	93	1910	96	107
-10	93	2990	93	2440	93	2270	93	2100	93	1940	96	107
-5	93	3030	93	2480	93	2300	93	2130	93	1970	96	107
0	93	3070	93	2510	93	2340	93	2170	93	2000	96	107
5	93	3110	93	2550	93	2370	93	2200	93	2030	96	107
10	93	3150	93	2580	93	2400	93	2230	93	2060	96	107
15	93	3190	93	2610	93	2430	93	2260	93	2090	96	107
20	93	3230	93	2650	93	2470	93	2290	93	2130	96	107
25	93	3260	93	2680	93	2500	93	2320	93	2150	96	107
30	91	3220	91	2630	91	2450	91	2280	91	2110	95	106
35	92	3320	89	2600	90	2430	90	2270	90	2110	94	104
40	92	3450	90	2680	90	2510	90	2340	90	2180	93	102
45	93	3690	91	2840	91	2650	91	2470	92	2300	93	102
50	94	4060	93	3040	93	2840	93	2650	93	2470	94	102
54	94	4370	94	3200	94	3000	94	2800	94	2600	94	102

WEIGHT = 10500 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2810	94	2280	94	2110	94	1950	94	1800	95	107
-30	94	2850	94	2320	94	2150	94	1990	94	1830	95	107
-25	94	2890	94	2360	94	2190	94	2020	94	1870	95	107
-20	94	2940	94	2390	94	2220	94	2060	94	1900	95	107
-15	94	2980	94	2430	94	2260	94	2090	94	1930	95	107
-10	93	3020	93	2470	93	2290	93	2130	93	1970	95	107
-5	93	3060	93	2500	93	2330	93	2160	93	2000	95	107
0	93	3100	93	2540	93	2360	93	2190	93	2030	95	107
5	93	3130	93	2570	93	2400	93	2230	93	2060	95	107
10	93	3170	93	2600	93	2430	93	2260	93	2090	95	107
15	93	3210	93	2640	93	2460	93	2290	93	2120	95	107
20	93	3240	93	2670	93	2490	93	2320	93	2150	95	107
25	93	3280	93	2700	93	2520	93	2350	93	2180	95	107
30	91	3230	91	2650	91	2470	91	2300	91	2130	94	105
35	89	3170	88	2550	88	2370	88	2190	88	2030	93	103
40	90	3280	88	2560	88	2390	88	2220	88	2070	92	101
45	90	3410	88	2640	88	2470	88	2300	89	2130	91	100
50	91	3690	89	2810	90	2620	90	2450	90	2270	91	99
54	92	3960	91	2960	91	2760	91	2580	91	2400	92	99

WEIGHT = 10000 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2850	94	2320	94	2150	94	1990	94	1830	95	108
-30	94	2890	94	2350	94	2190	94	2020	94	1870	95	108
-25	94	2930	94	2390	94	2220	94	2060	94	1900	95	108
-20	94	2970	94	2430	94	2260	94	2090	94	1940	95	108
-15	94	3010	94	2470	94	2290	94	2130	94	1970	95	108
-10	94	3050	94	2500	94	2330	94	2160	94	2000	95	108
-5	94	3090	94	2540	94	2370	94	2190	94	2030	95	108
0	94	3130	94	2570	94	2400	94	2230	94	2070	95	108
5	94	3170	94	2610	94	2430	94	2260	94	2100	95	108
10	93	3210	93	2640	93	2460	93	2290	93	2130	95	107
15	93	3240	93	2670	93	2490	93	2320	93	2160	95	107
20	93	3280	93	2710	93	2530	93	2360	93	2190	95	107
25	93	3310	93	2740	93	2560	93	2380	93	2210	95	107
30	91	3250	91	2680	91	2500	91	2330	91	2160	93	105
35	89	3130	89	2570	89	2390	89	2220	89	2050	92	103
40	87	3130	86	2450	86	2280	86	2120	86	1970	91	101
45	88	3230	86	2510	86	2340	86	2180	86	2020	90	99
50	89	3360	86	2600	86	2420	87	2250	87	2090	89	97
54	89	3590	87	2730	88	2550	88	2370	88	2200	89	97

WEIGHT = 9500 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2900	94	2370	94	2200	94	2040	94	1880	95	108
-30	94	2940	94	2400	94	2230	94	2070	94	1920	95	108
-25	94	2980	94	2440	94	2270	94	2110	94	1950	95	108
-20	94	3020	94	2480	94	2310	94	2140	94	1980	95	108
-15	94	3060	94	2510	94	2340	94	2180	94	2010	95	108
-10	94	3100	94	2550	94	2380	94	2210	94	2050	95	108
-5	94	3140	94	2590	94	2410	94	2240	94	2080	95	108
0	94	3180	94	2620	94	2440	94	2280	94	2110	95	108
5	94	3220	94	2650	94	2480	94	2310	94	2140	95	108
10	94	3250	94	2690	94	2510	94	2340	94	2170	95	108
15	94	3280	94	2720	94	2540	94	2370	94	2200	95	108
20	94	3320	94	2750	94	2580	94	2400	94	2230	95	108
25	93	3360	93	2780	93	2600	93	2430	93	2260	95	108
30	92	3290	92	2720	92	2540	92	2370	92	2200	93	106
35	89	3160	89	2590	89	2410	89	2240	89	2080	91	102
40	86	3030	86	2470	86	2290	86	2130	86	1960	89	100
45	86	3080	83	2390	84	2220	84	2070	84	1920	88	98
50	86	3180	84	2460	84	2290	84	2130	85	1980	87	96
54	87	3270	84	2520	84	2350	85	2180	85	2020	87	95

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Figure 4-23* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	104	3690	102	2820	103	2630	103	2460	103	2280	104	114
-25	104	3740	102	2870	103	2680	103	2500	103	2330	104	114
-20	104	3790	102	2920	103	2730	103	2550	103	2370	104	114
-15	105	3850	102	2970	103	2780	103	2600	103	2420	105	114
-10	105	3900	102	3020	102	2830	103	2640	103	2460	105	114
-5	105	3950	102	3070	102	2880	103	2690	103	2510	105	114
0	104	4020	102	3120	102	2930	103	2740	103	2560	105	114
5	104	4090	102	3170	102	2980	103	2790	103	2600	105	114
10	104	4170	102	3230	103	3030	103	2840	103	2650	105	114
15	104	4250	102	3280	103	3080	103	2890	103	2700	105	114
20	104	4330	102	3340	103	3140	103	2940	103	2750	105	114
25	104	4520	103	3460	103	3260	104	3060	104	2860	105	114
30	106	4860	105	3690	105	3470	105	3260	105	3050	106	114
35	106	5390	106	3970	106	3750	106	3540	106	3330	106	114
40	107	6070	107	4420	107	4180	107	3940	107	3710	107	114
45	108	6920	108	4970	108	4700	108	4440	108	4190	108	114
50	109	8020	109	5650	109	5350	109	5060	109	4780	109	114
51	109	8310	109	5800	109	5500	109	5200	109	4910	109	114
52	108	8670	109	5960	109	5660	109	5350	109	5060	109	114

WEIGHT = 13600 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	103	3490	101	2680	101	2500	101	2330	101	2160	103	113
-30	103	3540	101	2720	101	2540	101	2370	101	2200	103	113
-25	103	3590	101	2770	101	2590	101	2410	101	2240	103	113
-20	103	3640	101	2820	101	2640	101	2460	101	2290	103	113
-15	103	3690	101	2870	101	2680	101	2500	101	2330	103	113
-10	103	3740	101	2920	101	2730	101	2550	101	2380	103	113
-5	103	3800	101	2960	101	2780	101	2600	101	2420	103	113
0	103	3860	101	3010	101	2820	101	2640	101	2460	103	113
5	103	3930	101	3060	101	2870	101	2690	101	2510	103	113
10	103	4000	101	3110	101	2920	101	2740	101	2560	103	113
15	103	4070	101	3170	101	2970	101	2780	101	2600	103	113
20	103	4150	101	3220	101	3030	101	2840	101	2650	103	113
25	103	4320	102	3340	102	3140	102	2950	102	2760	104	113
30	104	4650	103	3560	103	3350	103	3140	104	2940	104	113
35	105	5150	105	3830	105	3600	105	3380	105	3180	105	113
40	106	5780	106	4210	106	3980	106	3760	106	3540	106	113
45	107	6560	107	4720	107	4470	107	4220	107	3970	107	113
50	107	7540	107	5340	107	5050	107	4780	107	4500	107	113
52	108	8000	108	5620	108	5320	108	5030	108	4750	108	113

WEIGHT = 13400 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	102	3390	99	2610	100	2430	100	2260	100	2100	102	112
-30	102	3440	99	2650	100	2480	100	2310	100	2140	102	112
-25	102	3480	99	2700	100	2520	100	2350	100	2190	102	112
-20	102	3530	99	2750	100	2570	100	2400	100	2220	102	112
-15	102	3580	99	2800	100	2610	100	2440	100	2270	102	112
-10	102	3640	99	2840	100	2660	100	2480	100	2310	102	112
-5	102	3690	99	2890	100	2700	100	2530	100	2350	102	112
0	102	3740	99	2940	100	2750	100	2570	100	2400	102	112
5	102	3810	99	2990	100	2800	100	2610	100	2440	102	112
10	102	3870	99	3030	100	2840	100	2660	100	2480	102	112
15	102	3940	99	3080	100	2890	100	2710	100	2530	102	112
20	102	4020	100	3140	100	2950	100	2760	100	2580	102	112
25	102	4180	100	3260	100	3060	101	2870	101	2680	103	112
30	103	4500	102	3460	102	3260	102	3050	102	2860	103	112
35	104	4980	104	3720	104	3500	104	3290	104	3080	104	112
40	105	5570	105	4070	105	3850	105	3620	105	3410	105	112
45	106	6310	106	4550	106	4300	106	4060	106	3820	106	112
50	106	7210	106	5120	106	4850	106	4580	106	4320	106	112
52	107	7630	107	5380	107	5100	107	4810	107	4540	107	112

WEIGHT = 13200 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	101	3300	98	2550	99	2380	99	2210	99	2050	101	111
-30	101	3360	98	2600	99	2420	99	2260	99	2090	101	111
-25	101	3410	98	2640	99	2470	99	2300	99	2140	101	111
-20	101	3460	98	2690	99	2510	99	2340	99	2180	101	111
-15	101	3510	98	2740	99	2560	99	2390	99	2220	101	111
-10	101	3560	98	2780	99	2600	99	2430	99	2260	101	111
-5	101	3610	98	2830	99	2640	99	2470	99	2300	101	111
0	101	3660	98	2870	99	2690	99	2510	99	2340	101	111
5	101	3720	98	2920	99	2740	99	2560	99	2390	101	111
10	101	3770	98	2970	99	2780	99	2600	99	2420	101	111
15	101	3830	98	3010	99	2820	99	2640	99	2470	101	111
20	101	3900	98	3060	99	2870	99	2690	99	2510	101	111
25	101	4050	99	3170	99	2980	99	2790	100	2600	102	111
30	102	4360	101	3370	101	3170	101	2970	101	2780	102	111
35	103	4820	102	3630	103	3410	103	3200	103	2990	103	111
40	104	5380	104	3930	104	3710	104	3500	104	3290	104	111
45	105	6070	105	4380	105	4140	105	3910	105	3680	105	111
50	105	6900	105	4920	105	4650	105	4390	105	4140	105	111
52	106	7290	106	5160	106	4880	106	4610	106	4340	106	111

WEIGHT = 13000 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	100	3240	98	2510	98	2340	98	2170	98	2010	101	111
-30	100	3290	98	2550	98	2380	98	2210	98	2050	101	111
-25	100	3350	97	2600	98	2420	98	2260	98	2100	101	111
-20	100	3400	97	2640	98	2470	98	2300	98	2140	101	111
-15	100	3450	97	2690	98	2510	98	2340	98	2180	101	111
-10	100	3500	97	2730	98	2550	98	2380	98	2220	101	111
-5	100	3550	97	2780	98	2600	98	2420	98	2260	101	111
0	100	3600	97	2820	98	2640	98	2470	98	2300	101	111
5	100	3650	97	2870	98	2680	98	2510	98	2340	101	111
10	100	3700	97	2910	98	2730	98	2550	98	2380	101	111
15	100	3760	97	2960	98	2770	98	2600	98	2420	101	111
20	100	3810	98	3010	98	2820	98	2640	98	2460	101	111
25	100	3920	98	3090	98	2900	98	2710	98	2530	101	110
30	101	4230	99	3280	100	3080	100	2890	100	2700	101	110
35	102	4660	101	3520	101	3310	102	3100	102	2900	102	110
40	103	5190	103	3800	103	3580	103	3380	103	3170	103	110
45	104	5840	104	4230	104	3990	104	3760	104	3540	104	110
50	104	6610	104	4720	104	4470	104	4210	104	3970	104	110
52	105	6970	105	4950	105	4680	105	4420	105	4160	105	110

WEIGHT = 12500 LBS   VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	98	3100	95	2400	96	2230	96	2080	96	1920	99	110
-30	98	3150	95	2440	96	2270	96	2120	96	1960	100	110
-25	98	3200	95	2480	96	2320	96	2160	96	2000	100	110
-20	98	3250	95	2520	96	2360	96	2190	96	2040	100	110
-15	98	3300	95	2570	96	2400	96	2230	96	2080	100	110
-10	98	3350	95	2610	96	2440	96	2270	96	2120	100	110
-5	98	3400	95	2650	96	2480	96	2320	96	2160	100	110
0	98	3440	95	2700	96	2520	96	2360	96	2190	100	110
5	98	3490	95	2740	96	2570	96	2400	96	2230	100	110
10	98	3540	95	2780	96	2610	96	2440	96	2270	100	110
15	98	3590	95	2830	96	2650	96	2480	96	2310	100	110
20	98	3650	95	2870	96	2690	96	2520	96	2350	100	110
25	98	3730	96	2940	96	2750	96	2580	96	2400	99	109
30	99	3900	96	3060	96	2870	97	2690	97	2510	99	108
35	100	4280	98	3290	98	3080	99	2890	99	2700	100	108
40	101	4750	100	3540	100	3320	100	3110	100	2910	101	108
45	101	5310	101	3850	101	3640	101	3430	101	3220	101	108
50	102	5960	102	4280	102	4040	102	3810	102	3580	102	108
52	102	6250	102	4470	102	4220	102	3980	102	3740	102	108

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Figure 4-23* (Sheet 3)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	96	2970	93	2290	93	2140	94	1980	94	1840	98	109
-30	96	3020	93	2330	93	2180	94	2020	94	1870	98	109
-25	96	3060	93	2370	93	2210	94	2060	94	1910	98	109
-20	96	3110	93	2410	93	2250	94	2100	94	1950	98	109
-15	96	3160	93	2450	93	2290	94	2140	94	1980	98	109
-10	96	3200	93	2500	93	2330	94	2180	94	2020	98	109
-5	96	3250	93	2540	93	2370	94	2210	94	2060	98	109
0	96	3290	93	2580	93	2410	94	2250	94	2090	98	109
5	96	3340	93	2620	93	2450	94	2290	94	2130	98	109
10	96	3390	93	2660	93	2490	94	2330	94	2170	98	109
15	96	3440	93	2700	93	2530	94	2370	94	2200	98	109
20	96	3490	93	2750	93	2570	94	2400	94	2240	98	109
25	96	3560	93	2810	94	2630	94	2460	94	2290	98	108
30	96	3680	94	2890	94	2710	94	2530	94	2360	97	107
35	97	3940	95	3060	95	2870	95	2680	96	2500	97	106
40	98	4350	97	3290	97	3080	97	2880	97	2690	98	106
45	99	4830	99	3540	99	3320	99	3120	99	2930	99	106
50	99	5390	99	3890	99	3670	99	3450	99	3240	99	106
52	100	5630	100	4050	100	3820	100	3590	100	3380	100	106

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	2840	93	2300	93	2130	93	1970	93	1810	97	108
-30	93	2890	93	2340	93	2170	93	2000	93	1840	97	108
-25	93	2930	93	2380	93	2210	93	2040	93	1880	97	108
-20	93	2980	93	2420	93	2240	93	2080	93	1920	97	108
-15	93	3020	93	2460	93	2280	93	2110	93	1950	97	108
-10	93	3060	93	2500	93	2320	93	2150	93	1980	97	108
-5	93	3110	93	2530	93	2360	93	2190	93	2020	97	108
0	93	3150	93	2570	93	2390	93	2220	93	2050	97	108
5	93	3200	93	2610	93	2430	93	2250	93	2080	97	108
10	93	3240	93	2640	93	2460	93	2290	93	2120	97	108
15	93	3290	93	2680	93	2500	93	2320	93	2150	97	108
20	93	3340	93	2710	93	2520	93	2350	93	2180	97	108
25	93	3410	91	2690	91	2510	92	2350	92	2190	97	107
30	94	3510	91	2760	92	2580	92	2410	92	2250	96	106
35	94	3650	92	2850	92	2670	92	2490	92	2320	95	104
40	95	3980	94	3050	94	2860	94	2670	94	2490	95	104
45	96	4400	95	3280	96	3080	96	2880	96	2680	96	104
50	97	4880	97	3530	97	3330	97	3130	97	2930	97	104
52	97	5090	97	3670	97	3460	97	3250	97	3050	97	104

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	2860	93	2320	93	2150	93	1990	93	1830	96	107
-30	93	2900	93	2360	93	2190	93	2020	93	1870	96	107
-25	93	2950	93	2400	93	2230	93	2060	93	1900	96	107
-20	93	2990	93	2440	93	2260	93	2100	93	1940	96	107
-15	93	3030	93	2480	93	2300	93	2130	93	1970	96	107
-10	93	3070	93	2510	93	2340	93	2170	93	2000	96	107
-5	93	3120	93	2550	93	2380	93	2200	93	2040	96	107
0	93	3160	93	2590	93	2410	93	2240	93	2070	96	107
5	93	3200	93	2620	93	2440	93	2270	93	2100	96	107
10	93	3230	93	2660	93	2480	93	2300	93	2140	96	107
15	93	3270	93	2690	93	2510	93	2340	93	2170	96	107
20	93	3310	93	2720	93	2540	93	2370	93	2190	96	107
25	92	3280	92	2700	92	2520	92	2340	92	2170	95	106
30	92	3350	89	2630	90	2460	90	2300	90	2140	94	105
35	92	3470	90	2710	90	2540	90	2370	90	2200	93	103
40	93	3640	90	2830	91	2650	91	2470	91	2300	93	102
45	94	4010	92	3040	92	2850	93	2660	93	2470	94	102
50	94	4420	94	3260	94	3050	94	2850	94	2660	94	102
52	95	4600	94	3350	95	3140	95	2940	95	2750	95	102

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2890	94	2350	94	2180	94	2010	94	1860	95	107
-30	94	2930	94	2390	94	2220	94	2050	94	1890	95	107
-25	94	2970	94	2420	94	2250	94	2090	94	1930	95	107
-20	94	3020	94	2460	94	2290	94	2120	94	1960	95	107
-15	93	3060	93	2500	93	2330	93	2160	93	2000	95	107
-10	93	3100	93	2540	93	2370	93	2190	93	2030	95	107
-5	93	3140	93	2580	93	2400	93	2230	93	2070	95	107
0	93	3180	93	2610	93	2440	93	2260	93	2100	95	107
5	93	3220	93	2650	93	2470	93	2300	93	2130	95	107
10	93	3260	93	2680	93	2500	93	2330	93	2160	95	107
15	93	3290	93	2720	93	2540	93	2360	93	2190	95	107
20	93	3330	93	2750	93	2570	93	2390	93	2220	95	107
25	92	3300	92	2720	92	2540	92	2360	92	2190	94	106
30	89	3210	89	2630	89	2450	89	2270	89	2110	93	104
35	90	3310	87	2590	88	2410	88	2250	88	2100	92	102
40	90	3430	88	2670	88	2490	88	2330	88	2160	91	100
45	91	3650	89	2810	89	2630	89	2450	90	2280	91	99
50	92	4010	91	3010	91	2810	91	2630	91	2440	92	99
52	92	4160	91	3090	91	2890	92	2700	92	2510	92	99

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2920	94	2390	94	2210	94	2050	94	1900	95	108
-30	94	2970	94	2420	94	2250	94	2090	94	1930	95	108
-25	94	3010	94	2460	94	2290	94	2130	94	1970	95	108
-20	94	3050	94	2500	94	2330	94	2160	94	2000	95	108
-15	94	3090	94	2540	94	2370	94	2200	94	2030	95	108
-10	94	3130	94	2580	94	2400	94	2230	94	2070	95	108
-5	94	3170	94	2610	94	2440	94	2270	94	2100	95	108
0	94	3220	94	2650	94	2470	94	2300	94	2140	95	108
5	94	3250	94	2680	94	2510	94	2330	94	2170	95	108
10	93	3290	93	2720	93	2540	93	2370	93	2200	95	108
15	93	3330	93	2750	93	2570	93	2400	93	2230	95	107
20	93	3360	93	2780	93	2600	93	2420	93	2250	95	107
25	92	3330	92	2750	92	2570	92	2400	92	2220	94	106
30	89	3230	89	2650	89	2470	89	2300	89	2130	92	103
35	87	3150	87	2540	87	2360	87	2190	87	2020	91	101
40	88	3260	86	2540	86	2370	86	2210	86	2050	90	99
45	88	3380	86	2620	86	2450	86	2280	87	2120	89	98
50	89	3640	87	2780	88	2600	88	2420	88	2240	89	97
52	90	3770	88	2850	88	2660	88	2480	89	2300	90	97

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	2970	94	2430	94	2260	94	2100	94	1940	95	108
-30	94	3010	94	2470	94	2300	94	2140	94	1980	95	109
-25	94	3050	94	2510	94	2340	94	2170	94	2010	95	109
-20	94	3100	94	2550	94	2380	94	2210	94	2050	95	109
-15	94	3140	94	2590	94	2410	94	2240	94	2080	95	109
-10	94	3180	94	2620	94	2450	94	2280	94	2120	95	109
-5	94	3220	94	2660	94	2480	94	2310	94	2150	95	109
0	94	3260	94	2700	94	2520	94	2350	94	2180	95	109
5	94	3300	94	2730	94	2550	94	2380	94	2210	95	109
10	94	3340	94	2770	94	2590	94	2410	94	2240	95	108
15	94	3370	94	2800	94	2620	94	2440	94	2270	95	108
20	93	3400	93	2830	93	2640	93	2470	93	2300	95	108
25	92	3370	92	2790	92	2610	92	2430	92	2260	94	107
30	90	3250	90	2680	90	2500	90	2330	90	2160	91	103
35	87	3120	87	2560	87	2380	87	2210	87	2040	90	101
40	85	3100	84	2450	84	2270	84	2100	84	1950	89	99
45	86	3210	84	2490	84	2320	84	2160	84	2000	88	97
50	87	3320	84	2570	84	2400	85	2230	85	2070	87	95
52	87	3410	85	2620	85	2450	85	2280	85	2110	87	95

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Figure 4-23* (Sheet 4)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
8000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	104	4180	102	3230	102	3030	103	2840	103	2660	105	114
-50	104	4250	102	3280	102	3080	103	2890	103	2700	105	114
-45	103	4340	102	3350	102	3150	103	2950	103	2760	105	114
-40	103	4430	102	3410	102	3210	103	3010	103	2820	105	114
-35	103	4520	102	3470	102	3270	103	3070	103	2880	105	114
-30	103	4630	102	3550	102	3340	103	3140	103	2940	105	114
-25	103	4840	103	3680	103	3470	103	3260	103	3060	105	114
-20	104	5050	103	3840	104	3610	104	3390	104	3190	105	114
-15	104	5280	104	4000	104	3750	104	3530	105	3310	106	114
-10	104	5520	104	4180	105	3900	105	3670	105	3450	106	114
-5	104	5850	105	4370	105	4080	106	3820	106	3590	106	114
0	103	6360	105	4600	106	4290	106	4000	107	3770	107	114
5	103	6910	106	4840	106	4520	107	4220	107	3990	107	114
10	102	7500	106	5100	107	4750	107	4470	107	4230	107	114
15	101	8120	107	5360	107	5000	107	4730	107	4480	107	114
20	100	9150	108	5760	108	5440	108	5160	108	4890	108	114
25	99	10910	109	6520	109	6200	109	5890	109	5590	109	114
27	99	11810	109	6930	109	6590	109	6270	109	5940	109	114
28	99	12340	109	7160	109	6810	109	6480	109	6150	109	114

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	103	4010	101	3120	101	2930	101	2740	101	2560	103	113
-50	103	4070	101	3170	101	2980	101	2790	101	2600	103	113
-45	102	4160	101	3230	101	3030	101	2840	101	2660	103	113
-40	102	4240	100	3290	101	3090	101	2900	101	2720	103	113
-35	102	4330	100	3350	101	3150	101	2960	101	2770	103	113
-30	102	4430	101	3430	101	3230	101	3030	101	2840	103	113
-25	102	4620	101	3560	101	3350	102	3150	102	2950	104	113
-20	102	4830	102	3690	102	3480	102	3270	102	3070	104	113
-15	103	5040	103	3830	103	3610	103	3400	103	3190	104	113
-10	103	5260	103	3990	103	3750	103	3530	104	3320	105	113
-5	104	5510	103	4180	104	3910	104	3680	104	3460	105	113
0	104	5810	104	4390	105	4100	105	3850	105	3620	105	113
5	104	6300	105	4620	105	4310	106	4030	106	3810	106	113
10	103	6840	105	4860	106	4530	106	4260	106	4030	106	113
15	102	7410	106	5100	106	4760	106	4500	106	4260	106	113
20	101	8340	106	5470	107	5170	107	4900	107	4640	107	113
25	100	9880	107	6160	107	5860	107	5560	107	5270	107	113
28	100	11120	108	6730	108	6400	108	6080	108	5770	108	113
29	100	11610	108	6960	108	6620	108	6290	108	5960	108	113

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	102	3880	99	3040	100	2850	100	2670	100	2490	102	112
-50	102	3950	99	3090	100	2900	100	2710	100	2530	102	112
-45	101	4030	99	3150	100	2960	100	2770	100	2590	102	112
-40	101	4110	99	3210	99	3020	100	2820	100	2640	102	112
-35	101	4190	99	3270	99	3070	100	2880	100	2700	102	112
-30	101	4290	99	3340	100	3140	100	2950	100	2760	102	112
-25	101	4470	100	3460	100	3260	100	3060	101	2870	103	112
-20	102	4670	101	3600	101	3390	101	3180	101	2990	103	112
-15	102	4870	101	3730	101	3520	102	3310	102	3100	103	112
-10	102	5080	102	3870	102	3650	102	3440	102	3230	104	112
-5	103	5320	102	4040	103	3800	103	3580	103	3360	104	112
0	103	5600	103	4240	104	3970	104	3740	104	3520	104	112
5	104	5890	104	4460	104	4160	104	3910	105	3680	105	112
10	104	6350	104	4690	105	4370	105	4110	105	3890	105	112
15	103	6910	105	4910	105	4590	105	4340	105	4110	105	112
20	102	7760	106	5270	106	4980	106	4720	106	4470	106	112
25	101	9160	106	5920	106	5620	106	5330	106	5050	106	112
29	101	10720	107	6640	107	6320	107	6000	107	5690	107	112
30	100	11170	107	6850	107	6520	107	6190	107	5870	107	112

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	101	3790	98	2980	99	2790	99	2610	99	2430	102	111
-50	101	3850	98	3020	99	2840	99	2650	99	2480	102	111
-45	101	3920	98	3080	99	2890	99	2710	99	2530	102	111
-40	100	4000	98	3140	99	2950	99	2770	99	2590	102	111
-35	100	4080	98	3200	99	3010	99	2820	99	2640	102	111
-30	100	4170	98	3260	99	3070	99	2880	99	2690	102	111
-25	100	4330	99	3370	99	3170	99	2980	99	2790	102	111
-20	101	4510	99	3500	100	3290	100	3090	100	2900	102	111
-15	101	4700	100	3630	100	3420	100	3220	101	3020	102	111
-10	102	4900	101	3770	101	3550	101	3340	101	3130	103	111
-5	102	5130	101	3920	102	3690	102	3480	102	3260	103	111
0	103	5390	102	4100	102	3860	103	3640	103	3420	103	111
5	103	5670	103	4300	103	4030	103	3800	103	3570	104	111
10	104	5970	103	4520	104	4220	104	3970	104	3750	104	111
15	104	6390	104	4740	104	4430	104	4190	104	3960	104	111
20	103	7200	105	5070	105	4800	105	4550	105	4300	105	111
25	102	8480	105	5690	105	5400	105	5120	105	4850	105	111
30	101	10280	106	6540	106	6220	106	5910	106	5600	106	111
32	101	11200	106	6970	106	6630	106	6300	106	5970	106	111

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-50	100	3770	97	2970	98	2790	98	2600	98	2430	101	111
-45	100	3840	97	3030	98	2840	98	2660	98	2480	101	111
-40	100	3910	97	3080	98	2900	98	2710	98	2540	101	111
-35	100	3990	97	3140	98	2950	98	2770	98	2590	101	111
-30	99	4070	97	3210	98	3010	98	2820	98	2640	101	111
-25	99	4190	98	3280	98	3090	98	2900	98	2710	101	110
-20	100	4360	98	3410	98	3210	99	3010	99	2820	101	110
-15	100	4550	99	3540	99	3330	99	3130	99	2930	101	110
-10	101	4740	99	3670	100	3450	100	3250	100	3040	102	110
-5	101	4950	100	3810	100	3590	101	3380	101	3170	102	110
0	102	5200	101	3980	101	3750	101	3530	101	3320	102	110
5	102	5470	102	4160	102	3920	102	3690	102	3470	103	110
10	103	5750	102	4360	103	4090	103	3860	103	3630	103	110
15	103	6060	103	4570	103	4270	103	4050	103	3820	103	110
20	104	6610	104	4890	104	4630	104	4380	104	4140	104	110
25	103	7810	104	5470	104	5190	104	4910	104	4650	104	110
30	102	9450	105	6250	105	5940	105	5640	105	5340	105	110
32	102	10260	105	6640	105	6310	105	5990	105	5680	105	110
35	101	11770	106	7350	106	6990	106	6640	106	6300	106	110

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-54	98	3560	95	2800	96	2620	96	2450	96	2280	100	110
-50	98	3610	95	2840	96	2660	96	2490	96	2320	100	110
-45	98	3670	95	2890	96	2710	96	2540	96	2370	100	110
-40	98	3730	95	2950	96	2770	96	2590	96	2420	100	110
-35	98	3790	95	3000	96	2820	96	2640	96	2470	100	110
-30	98	3860	95	3060	96	2880	96	2700	96	2520	100	110
-25	98	3950	95	3140	96	2950	96	2770	96	2590	99	109
-20	98	4060	96	3220	96	3020	96	2830	96	2650	99	109
-15	98	4180	96	3300	96	3100	96	2910	96	2730	99	108
-10	98	4350	96	3420	97	3220	97	3020	97	2830	99	108
-5	99	4540	97	3560	97	3350	97	3140	98	2950	99	108
0	100	4760	98	3710	98	3490	98	3280	98	3080	100	108
5	100	4990	99	3870	99	3650	99	3430	99	3220	100	108
10	100	5260	99	4040	100	3810	100	3580	100	3360	100	108
15	101	5540	100	4200	100	3970	100	3730	101	3510	101	108
20	101	6010	101	4470	101	4220	101	3990	101	3770	101	108
25	102	6760	102	4960	102	4700	102	4450	102	4210	102	108
30	103	7780	103	5610	103	5320	103	5050	103	4770	103	108
35	103	9160	103	6460	103	6140	103	5830	103	5520	103	108

525BFM-06-00

Figure 4-23* (Sheet 17)

TAKEOFF FIELD LENGTH - FEET
(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
8000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS													WEIGHT = 11500 LBS VENR = 130 KIAS											
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2	DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS		C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS	
-54	96	3400	93	2670	93	2500	94	2340	94	2180	98	109	-54	93	3250	93	2650	93	2460	93	2290	93	2120	97	108
-50	95	3450	93	2710	93	2540	94	2380	94	2210	98	109	-50	93	3300	93	2690	93	2500	93	2330	93	2160	97	108
-45	95	3510	93	2770	93	2590	94	2420	94	2260	98	109	-45	93	3360	93	2740	93	2550	93	2380	93	2200	97	108
-40	95	3570	93	2820	93	2640	94	2470	94	2310	98	109	-40	93	3410	93	2790	93	2600	93	2420	93	2250	97	108
-35	95	3630	93	2870	93	2690	94	2520	94	2360	98	109	-35	93	3470	93	2840	93	2650	93	2470	93	2290	97	108
-30	95	3690	93	2920	93	2750	94	2580	94	2410	98	109	-30	93	3530	92	2880	92	2690	92	2510	92	2330	97	108
-25	96	3780	93	3000	94	2810	94	2640	94	2470	98	108	-25	93	3610	91	2870	91	2690	92	2520	92	2360	97	108
-20	96	3860	93	3070	94	2880	94	2700	94	2530	98	108	-20	94	3690	91	2930	92	2750	92	2580	92	2410	96	107
-15	96	3960	94	3140	94	2950	94	2770	94	2590	97	107	-15	94	3780	91	3000	92	2810	92	2640	92	2470	96	106
-10	96	4050	94	3220	94	3020	94	2830	94	2650	97	106	-10	94	3860	92	3060	92	2880	92	2700	92	2530	96	105
-5	96	4170	94	3310	94	3110	94	2920	95	2740	97	106	-5	94	3960	92	3140	92	2950	92	2770	92	2590	95	105
0	97	4360	95	3450	95	3250	95	3050	95	2860	97	106	0	94	4060	92	3220	92	3020	92	2840	92	2650	95	104
5	98	4580	96	3600	96	3390	96	3190	96	2990	98	106	5	95	4220	92	3350	93	3150	93	2950	93	2760	95	104
10	98	4820	96	3750	97	3530	97	3320	97	3120	98	106	10	95	4420	93	3480	93	3280	94	3080	94	2880	95	104
15	98	5070	97	3910	97	3680	97	3460	98	3250	98	106	15	96	4630	94	3630	94	3410	94	3210	95	3010	96	104
20	99	5470	98	4130	98	3900	99	3670	99	3440	99	106	20	96	4990	95	3830	95	3610	95	3390	96	3180	96	104
25	99	6120	99	4510	99	4270	99	4040	99	3810	99	106	25	97	5540	97	4140	97	3910	97	3680	97	3460	97	104
30	100	6950	100	5060	100	4790	100	4530	100	4280	100	106	30	98	6240	98	4570	98	4320	98	4080	98	3850	98	104
35	101	8040	101	5740	101	5450	101	5160	101	4880	101	106	35	98	7120	98	5130	98	4860	98	4600	98	4340	98	104

WEIGHT = 11000 LBS VENR = 130 KIAS													WEIGHT = 10500 LBS VENR = 130 KIAS											
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2	DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS		C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS	
-54	93	3240	93	2660	93	2480	93	2310	93	2140	96	107	-54	93	3260	93	2690	93	2510	93	2330	93	2170	95	107
-50	93	3280	93	2700	93	2520	93	2340	93	2170	96	108	-50	93	3300	93	2730	93	2550	93	2370	93	2200	95	107
-45	93	3340	93	2750	93	2570	93	2390	93	2220	96	108	-45	93	3360	93	2780	93	2600	93	2420	93	2250	95	107
-40	93	3400	93	2810	93	2620	93	2440	93	2260	96	108	-40	93	3420	93	2830	93	2640	93	2460	93	2290	95	107
-35	93	3450	93	2850	93	2670	93	2480	93	2310	96	108	-35	93	3470	93	2880	93	2690	93	2510	93	2340	95	107
-30	93	3490	93	2890	93	2710	93	2520	93	2350	96	107	-30	93	3510	93	2920	93	2730	93	2550	93	2370	95	107
-25	91	3480	91	2880	91	2690	91	2510	91	2330	96	107	-25	92	3500	92	2900	92	2710	92	2530	92	2360	94	106
-20	91	3530	90	2870	90	2690	90	2500	90	2330	95	106	-20	91	3490	91	2890	91	2700	91	2520	91	2340	94	105
-15	91	3610	89	2870	89	2680	90	2520	90	2350	95	105	-15	90	3480	90	2880	90	2690	90	2510	90	2330	94	105
-10	92	3680	89	2920	90	2740	90	2570	90	2400	94	105	-10	89	3520	89	2870	89	2680	89	2500	89	2320	93	104
-5	92	3770	89	2990	90	2810	90	2630	90	2460	94	104	-5	89	3600	87	2850	88	2670	88	2510	88	2340	93	103
0	92	3860	90	3060	90	2880	90	2700	90	2520	94	103	0	90	3680	87	2920	88	2740	88	2570	88	2400	92	102
5	92	3960	90	3140	90	2950	90	2770	90	2590	93	102	5	90	3770	88	2990	88	2810	88	2630	88	2450	92	101
10	92	4080	90	3230	90	3040	90	2850	91	2660	93	102	10	90	3860	88	3060	88	2870	88	2690	88	2520	91	100
15	93	4240	91	3360	91	3160	91	2970	91	2780	93	102	15	90	3960	88	3130	88	2940	88	2760	88	2580	91	100
20	94	4550	92	3550	92	3340	92	3130	93	2940	94	102	20	91	4150	89	3280	89	3080	89	2890	89	2700	91	99
25	95	5030	94	3820	94	3590	94	3370	94	3160	95	102	25	92	4560	90	3520	91	3310	91	3110	91	2910	92	99
30	95	5620	95	4180	95	3940	95	3700	95	3480	95	101	30	93	5070	92	3810	92	3590	92	3380	93	3170	93	99
35	96	6340	96	4610	96	4360	96	4120	96	3880	96	101	35	93	5670	93	4190	93	3940	93	3710	93	3480	93	99

WEIGHT = 10000 LBS VENR = 130 KIAS													WEIGHT = 9500 LBS VENR = 130 KIAS											
TEMP	TAILWIND		ZERO		HEADWINDS								TEMP	TAILWIND		ZERO		HEADWINDS							
DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2	DEG	10 KTS		WIND		10 KTS		20 KTS		30 KTS		VR	V2
C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS		C	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	V1 KIAS	DIST FT	KIAS	
-54	93	3290	93	2720	93	2540	93	2370	93	2200	95	108	-54	94	3340	94	2770	94	2590	94	2410	94	2250	95	109
-50	93	3340	93	2760	93	2580	93	2400	93	2230	95	108	-50	93	3380	93	2810	93	2630	93	2450	93	2280	95	109
-45	93	3400	93	2810	93	2630	93	2450	93	2280	95	108	-45	93	3440	93	2860	93	2680	93	2500	93	2330	95	109
-40	93	3450	93	2860	93	2680	93	2500	93	2330	95	108	-40	93	3490	93	2910	93	2730	93	2550	93	2370	96	109
-35	93	3500	93	2910	93	2730	93	2550	93	2370	95	108	-35	93	3550	93	2960	93	2770	93	2590	93	2420	96	109
-30	93	3550	93	2950	93	2770	93	2580	93	2410	95	108	-30	93	3590	93	3000	93	2810	93	2630	93	2450	95	109
-25	92	3530	92	2930	92	2740	92	2560	92	2390	94	106	-25	92	3560	92	2970	92	2790	92	2600	92	2430	94	107
-20	91	3510	91	2920	91	2730	91	2550	91	2370	93	105	-20	91	3540	91	2950	91	2770	91	2580	91	2410	93	106
-15	90	3500	90	2900	90	2710	90	2530	90	2360	92	104	-15	90	3520	90	2930	90	2740	90	2560	90	2390	92	104
-10	89	3490	89	2890	89	2700	89	2520	89	2340	92	103	-10	89	3510	89	2910	89	2730	89	2550	89	2370	91	103
-5	88	3470	88	2870	88	2680	88	2500	88	2320	92	102	-5	88	3480	88	2890	88	2700	88	2520	88	2350	90	102
0	87	3510	86	2840	86	2650	86	2470	86	2290	91	101	0	86	3450	86	2850	86	2670	86	2490	86	2310	90	101
5	87	3590	85	2840	86	2670	86	2500	86	2330	91	101	5	85	3420	85	2820	85	2640	85	2460	85	2280	89	100
10	88	3670	86	2910	86	2730	86	2560	86	2390	90	100	10	85	3490	84	2800	84	2610	84	2430	84	2270	89	99
15	88	3760	86	2970	86	2790	86	2610	86	2440	90	99	15	86	3570	83	2820	84	2650	84	2480	84	2320	89	98
20	88	3870	86	3060	86	2870	86	2690	87	2510	89	98	20	86	3670	84	2900	84	2720	84	2550	84	2380	88	97
25	89	4140	87	3250	87	3050	88	2860	88	2670	89	97	25	86	3810	84	3000	84	2810	84	2630	85	2460	87	95
30	90	4570	89	3500	89	3280	89	3080	89	2880	90	97	30	88	4130	86	3210	86	3020	86	2820	86	2630	88	95
35	91	5090	91	3810	91	3590	91	3370	91	3160	91	97	35	88	4560	87	3460	87	3250	88	3050	88	2850	88	95

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Figure 4-23* (Sheet 18)

TAKEOFF FIELD LENGTH - FEET, FLAPS 15°
(DRY RUNWAY OVER A 35 FOOT SCREEN HEIGHT) (ANTI-ICE ON)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 4-25. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 4-24.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS 15°, ANTI-ICE ON

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 4-25	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
1600	1750	1700	1700	1700	1600	1600	1700	1700
1800	1950	1900	1900	1900	1800	1800	1900	1900
2000	2250	2150	2100	2100	2050	2000	2100	2150
2200	2550	2450	2350	2300	2250	2200	2300	2350
2400	2800	2650	2550	2500	2450	2400	2500	2550
2600	3000	2850	2750	2750	2650	2600	2700	2750
2800	3250	3100	2950	2950	2850	2800	2900	2950
3000	3550	3400	3250	3150	3050	3000	3100	3150
3200	3950	3700	3500	3400	3250	3150	3350	3400
3400	4350	4050	3800	3600	3450	3350	3550	3600
3600	4650	4300	4050	3850	3650	3550	3750	3750
3800	5050	4650	4300	4050	3800	3700	3950	3950
4000	5450	4950	4550	4300	4000	3900	4150	4150
4200	5900	5300	4850	4500	4200	4100	4350	4350
4400	6350	5650	5100	4750	4400	4250	4550	4600
4600	6950	6000	5400	5000	4600	4450	4750	4800
4800	7700	6450	5750	5250	4750	4600	4950	5000
5000	8450	6850	6050	5450	4950	4800	5200	5200
5200	9150	7350	6350	5700	5150	4950	5400	5400
5400	10050	7800	6700	5950	5300	5150	5600	5650
5600	11300	8400	7050	6200	5500	5300	5800	5850
5800	12850	9050	7450	6450	5700	5450	6050	6050
6000	14700	9850	7750	6700	5850	5600	6200	6250
6200	17150	10600	8250	6950	6050	5800	6450	6450
6400		11750	8650	7200	6250	5950	6650	6600
6600		12850	9150	7450	6400	6100	6850	6750
6800		14050	9600	7650	6600	6250	7050	6900
7000		15600	10200	7900	6750	6400	7200	7050
7200			10850	8150	6950	6550	7300	7150
7400			11450	8350	7100	6700	7350	7250
7600			12050	8600	7250	6850	7450	7350
7800			12600	8850	7450	7000	7550	7450
8000			13050	9100	7600	7150	7650	7550
8500			14250	9750	8000	7500	7850	7700
9000			15350	10350	8400	7800	8100	7850
9500				11000	8800	8150	8400	8000
10000				11600	9200	8500	8700	8200
10500				12150	9600	8800	9050	8350
11000				12750	9950	9100	9450	8550
11500				13300	10350	9400	9850	8750
12000				13850	10750	9750	10250	9000
12500				14400	11150	10050	10650	9250
13000				14950	11500	10350	11000	9550
13500				15500	11900	10650	11400	9850
14000					12250	10950	11750	10150
14500					12600	11250	12100	10450
15000					13000	11550	12500	10800
V_1 ADJUSTMENT*	**V_1 + 3 Knots**	**V_1 + 2 Knots**	**V_1 + 2 Knots**	**V_1**	**V_1 - 3 Knots**	**V_1 - 5 Knots**	**V_1 + 1 Knot**	**V_1 + 1 Knot**

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* **If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.**

Figure 4-24*

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	105	3680	103	2770	103	2590	103	2410	104	2240	105	114
-25	105	3730	103	2820	103	2630	103	2460	104	2280	105	114
-20	105	3780	103	2870	103	2680	103	2500	104	2330	105	114
-15	105	3840	103	2920	103	2730	103	2550	104	2370	105	114
-10	105	3890	103	2970	103	2780	103	2600	103	2410	105	114
-5	105	3940	103	3020	103	2830	103	2640	103	2460	105	114
0	105	4000	103	3070	103	2880	103	2690	103	2510	105	114
5	105	4060	103	3120	103	2930	103	2740	103	2550	105	114
10	105	4110	103	3180	103	2980	103	2790	104	2600	105	114

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	103	3530	101	2680	101	2500	102	2330	102	2160	103	113
-25	103	3580	101	2730	101	2550	102	2370	102	2200	103	113
-20	103	3630	101	2770	101	2590	102	2410	102	2240	103	113
-15	103	3680	101	2820	101	2630	102	2460	102	2280	103	113
-10	103	3730	101	2870	101	2680	102	2500	102	2330	103	113
-5	103	3780	101	2920	101	2730	102	2550	102	2370	103	113
0	103	3840	101	2970	101	2780	102	2590	102	2410	103	113
5	103	3890	101	3020	101	2820	102	2640	102	2460	103	113
10	103	3950	101	3060	101	2870	102	2690	102	2510	103	113

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	102	3420	100	2610	100	2430	100	2260	101	2100	102	112
-25	102	3470	100	2660	100	2480	100	2310	101	2140	102	112
-20	102	3520	100	2700	100	2520	100	2350	101	2180	102	112
-15	102	3570	100	2750	100	2570	100	2390	101	2220	102	112
-10	102	3620	100	2800	100	2610	100	2430	101	2260	102	112
-5	102	3670	100	2840	100	2660	100	2480	101	2310	102	112
0	102	3720	100	2890	100	2700	100	2520	101	2350	102	112
5	102	3780	100	2940	100	2750	100	2570	101	2400	102	112
10	102	3830	100	2990	100	2800	100	2610	101	2440	102	112

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	3320	99	2540	99	2370	99	2200	99	2040	101	111
-25	101	3370	99	2590	99	2410	99	2240	99	2080	101	111
-20	101	3420	99	2630	99	2460	99	2290	99	2120	101	111
-15	101	3460	99	2680	99	2500	99	2330	99	2160	101	111
-10	101	3510	99	2720	99	2540	99	2370	99	2200	101	111
-5	101	3560	99	2770	99	2590	99	2410	99	2240	101	111
0	101	3610	99	2810	99	2630	99	2450	99	2280	101	111
5	101	3660	99	2860	99	2680	99	2500	99	2330	101	111
10	101	3710	99	2910	99	2720	99	2540	99	2370	101	111

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	3230	98	2490	98	2320	98	2150	98	1990	101	110
-25	101	3280	98	2530	98	2360	98	2190	98	2030	101	110
-20	100	3330	98	2570	98	2400	98	2230	98	2070	101	110
-15	100	3380	98	2620	98	2440	98	2270	98	2110	101	110
-10	100	3430	98	2660	98	2490	98	2320	98	2150	101	110
-5	100	3480	98	2700	98	2530	98	2360	98	2190	101	110
0	100	3530	98	2750	98	2570	98	2400	98	2230	101	110
5	100	3580	98	2790	98	2610	98	2440	98	2270	101	110
10	100	3630	98	2840	98	2660	98	2480	98	2310	101	110

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	98	3090	95	2380	96	2210	96	2050	96	1900	99	109
-25	98	3130	95	2420	96	2250	96	2090	96	1940	99	109
-20	98	3180	95	2460	96	2290	96	2130	96	1980	99	109
-15	98	3230	95	2500	96	2330	96	2170	96	2010	99	109
-10	98	3280	95	2540	96	2370	96	2210	96	2050	99	109
-5	98	3320	95	2590	96	2410	96	2250	96	2090	99	109
0	98	3370	95	2620	96	2450	96	2290	96	2130	99	109
5	98	3420	95	2670	96	2500	96	2330	96	2170	99	109
10	98	3470	95	2710	96	2540	96	2370	96	2200	99	109

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	96	2950	93	2270	94	2110	94	1960	94	1810	98	109
-25	96	3000	93	2310	93	2150	94	2000	94	1850	98	109
-20	96	3040	93	2350	93	2190	94	2030	94	1890	98	109
-15	96	3090	93	2390	94	2230	94	2070	94	1920	98	109
-10	96	3130	93	2430	94	2270	94	2110	94	1960	98	109
-5	96	3180	93	2470	94	2310	94	2150	94	1990	98	109
0	96	3230	93	2510	94	2350	94	2190	94	2030	98	109
5	96	3270	93	2550	94	2380	94	2220	94	2060	98	109
10	96	3320	93	2590	94	2420	94	2260	94	2100	98	108

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	93	2830	92	2200	92	2030	92	1870	92	1730	97	108
-25	93	2870	91	2240	91	2070	92	1910	92	1770	97	108
-20	93	2910	91	2270	91	2100	92	1950	92	1800	97	108
-15	93	2960	91	2310	91	2140	92	1980	92	1830	97	108
-10	93	3000	91	2340	91	2170	92	2010	92	1870	97	108
-5	93	3040	91	2380	91	2200	92	2050	92	1900	97	108
0	93	3080	91	2410	91	2240	92	2090	92	1940	97	108
5	93	3130	91	2440	91	2280	92	2120	92	1970	97	108
10	93	3170	91	2480	91	2310	92	2160	92	2010	97	108

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	2770	92	2240	92	2080	92	1920	92	1770	94	106
-25	92	2810	92	2280	92	2110	92	1950	92	1790	94	106
-20	92	2850	92	2310	92	2150	92	1980	92	1830	94	106
-15	92	2890	92	2350	92	2180	92	2020	92	1860	94	106
-10	92	2930	92	2380	92	2210	92	2050	92	1890	94	106
-5	92	2970	92	2420	92	2250	92	2080	92	1920	94	106
0	92	3000	92	2450	92	2280	92	2110	92	1950	94	106
5	92	3040	92	2480	92	2310	92	2140	92	1980	94	106
10	91	3070	91	2520	91	2340	91	2170	91	2010	94	106

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	2850	92	2320	92	2150	92	1990	92	1840	94	107
-25	92	2890	92	2360	92	2190	92	2030	92	1870	94	107
-20	92	2920	92	2390	92	2220	92	2060	92	1900	94	107
-15	92	2960	92	2420	92	2260	92	2090	92	1940	94	107
-10	92	3000	92	2460	92	2290	92	2130	92	1970	94	107
-5	92	3040	92	2490	92	2320	92	2160	92	2000	94	107
0	92	3070	92	2530	92	2360	92	2190	92	2030	94	107
5	92	3110	92	2560	92	2390	92	2220	92	2050	94	107
10	92	3150	92	2590	92	2410	92	2250	92	2080	94	107

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Figure 4-25* (Sheet 1 of 15)

TAKEOFF FIELD LENGTH - FEET

(OVER 35 FOOT SCREEN HEIGHT)

FLAPS - 15°
1000 FEET

CONDITIONS: DRY RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	105	3770	103	2860	103	2670	103	2490	104	2320	105	114
-25	105	3820	103	2910	103	2720	103	2540	103	2360	105	114
-20	105	3880	103	2960	103	2770	103	2590	103	2410	105	114
-15	105	3930	103	3010	103	2820	103	2630	103	2450	105	114
-10	105	3990	103	3060	103	2870	103	2680	103	2500	105	114
-5	105	4040	103	3120	103	2920	103	2730	103	2550	105	114
0	105	4100	103	3170	103	2970	103	2780	103	2600	105	114
5	105	4170	103	3220	103	3020	103	2830	103	2640	105	114
10	105	4240	103	3270	103	3070	103	2880	103	2690	105	114

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	103	3620	101	2760	101	2580	102	2400	102	2230	103	113
-25	103	3670	101	2810	101	2630	102	2450	102	2280	103	113
-20	103	3720	101	2860	101	2670	102	2490	102	2320	103	113
-15	103	3770	101	2910	101	2720	102	2540	102	2370	103	113
-10	103	3830	101	2960	101	2770	102	2590	102	2410	103	113
-5	103	3880	101	3010	101	2820	102	2630	102	2450	103	113
0	103	3940	101	3060	101	2870	102	2680	102	2500	103	113
5	103	3990	101	3110	101	2920	102	2730	102	2550	103	113
10	103	4060	101	3160	101	2970	102	2780	102	2600	104	113

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	102	3510	100	2690	100	2510	100	2340	101	2170	102	112
-25	102	3560	100	2740	100	2560	100	2380	101	2210	102	112
-20	102	3610	100	2790	100	2600	100	2430	101	2260	102	112
-15	102	3660	100	2830	100	2650	100	2470	101	2300	102	112
-10	102	3710	100	2880	100	2700	100	2520	101	2340	102	112
-5	102	3760	100	2930	100	2740	100	2560	101	2390	102	112
0	102	3820	100	2980	100	2790	100	2610	101	2430	102	112
5	102	3870	100	3030	100	2840	100	2650	101	2480	102	112
10	102	3940	100	3080	100	2890	100	2700	101	2520	103	112

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	3400	99	2620	99	2450	99	2280	99	2110	101	111
-25	101	3450	99	2670	99	2490	99	2320	99	2150	101	111
-20	101	3500	99	2710	99	2540	99	2360	99	2190	101	111
-15	101	3550	99	2760	99	2580	99	2400	99	2240	101	111
-10	101	3600	99	2810	99	2620	99	2450	99	2280	101	111
-5	101	3650	99	2850	99	2670	99	2490	99	2320	101	111
0	101	3710	99	2900	99	2720	99	2540	99	2370	101	111
5	101	3760	99	2950	99	2770	99	2590	99	2410	101	111
10	101	3820	99	3000	99	2810	99	2630	99	2450	102	111

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	100	3320	98	2570	98	2390	98	2220	98	2060	101	110
-25	100	3370	98	2610	98	2430	98	2270	98	2100	101	110
-20	100	3420	98	2650	98	2480	98	2310	98	2150	101	110
-15	100	3470	98	2700	98	2520	98	2350	98	2190	101	110
-10	100	3520	98	2750	98	2570	98	2400	98	2230	101	110
-5	100	3570	98	2790	98	2610	98	2440	98	2270	101	110
0	100	3630	98	2830	98	2650	98	2480	98	2310	101	110
5	100	3680	98	2880	98	2700	98	2520	98	2350	101	110
10	100	3730	98	2930	98	2740	98	2570	98	2390	101	110

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	98	3170	95	2450	96	2280	96	2120	96	1970	99	110
-25	98	3220	95	2490	96	2330	96	2170	96	2010	99	110
-20	98	3270	95	2540	96	2370	96	2200	96	2050	99	110
-15	98	3320	95	2580	96	2410	96	2240	96	2080	99	110
-10	98	3370	95	2620	96	2450	96	2280	96	2120	99	110
-5	98	3420	95	2660	96	2490	96	2330	96	2160	99	110
0	98	3460	95	2710	96	2540	96	2370	96	2200	99	109
5	98	3510	95	2750	96	2580	96	2400	96	2240	99	109
10	98	3570	95	2800	96	2620	96	2450	96	2280	99	109

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	96	3030	93	2340	93	2180	94	2030	94	1880	98	109
-25	96	3080	93	2380	93	2220	94	2070	94	1920	98	109
-20	96	3130	93	2420	93	2260	94	2100	94	1950	98	109
-15	96	3170	93	2460	94	2300	94	2140	94	1990	98	109
-10	96	3220	93	2510	94	2340	94	2180	94	2030	98	109
-5	96	3270	93	2550	94	2380	94	2220	94	2060	98	109
0	96	3310	93	2590	94	2420	94	2260	94	2100	98	109
5	96	3360	93	2630	94	2460	94	2300	94	2140	98	109
10	96	3410	93	2670	94	2500	94	2340	94	2180	98	109

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	93	2900	91	2260	91	2100	92	1940	92	1790	97	108
-25	93	2950	91	2300	91	2130	92	1980	92	1830	97	108
-20	93	2990	91	2340	91	2170	92	2010	92	1860	97	108
-15	93	3030	91	2380	91	2200	92	2050	92	1900	97	108
-10	93	3080	91	2410	91	2240	92	2080	92	1940	97	108
-5	93	3120	91	2450	91	2280	92	2120	92	1970	97	108
0	93	3170	91	2480	91	2310	92	2160	92	2000	97	108
5	93	3220	91	2520	91	2350	92	2190	92	2040	97	108
10	93	3260	91	2560	91	2390	92	2230	92	2080	97	108

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	2840	92	2310	92	2140	92	1980	92	1820	94	106
-25	92	2880	92	2340	92	2180	92	2010	92	1850	94	106
-20	92	2920	92	2380	92	2210	92	2040	92	1890	94	106
-15	92	2960	92	2410	92	2240	92	2080	92	1920	94	106
-10	92	3000	92	2450	92	2280	92	2110	92	1950	94	106
-5	92	3040	92	2490	92	2310	92	2150	92	1980	94	106
0	92	3080	92	2520	92	2350	92	2180	92	2010	94	106
5	91	3120	91	2560	91	2380	91	2210	91	2040	94	106
10	91	3150	91	2590	91	2410	91	2240	91	2070	94	106

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	2920	92	2380	92	2210	92	2050	92	1900	94	107
-25	92	2960	92	2420	92	2250	92	2090	92	1930	94	107
-20	92	3000	92	2460	92	2290	92	2120	92	1960	94	107
-15	92	3040	92	2490	92	2320	92	2160	92	1990	95	108
-10	92	3080	92	2530	92	2360	92	2190	92	2030	95	108
-5	92	3110	92	2560	92	2390	92	2220	92	2060	95	107
0	92	3150	92	2600	92	2420	92	2250	92	2090	95	107
5	92	3190	92	2630	92	2450	92	2280	92	2120	94	107
10	92	3230	92	2660	92	2490	92	2320	92	2150	94	107

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Figure 4-25* (Sheet 2)

10 TAKEOFF

SINGLE-ENGINE TAKEOFF FLIGHT PATH - FLAPS UP
FIRST AND SECOND SEGMENTS

Knowing weight, altitude, temperature, wind, obstacle height above runway surface and the obstacle distance from "reference zero", at the airport pressure altitude plus the takeoff climb increment (TCI) from Figure 4-28 or 4-29, determine the available climb gradient from Figure 4-38 or 4-39. Using this climb gradient, the required horizontal distance can be determined from Figure 4-26. If this required horizontal distance is less than the horizontal distance to the obstacle, the takeoff weight determined by other limitations is satisfactory; otherwise, the weight must be reduced to correspond with the required horizontal distance.

EXAMPLE:

Flaps = UP
Anti-Ice = OFF
Ambient Temperature at Airport = 45°C
Pressure Altitude at Airport = SEA LEVEL
Gross Weight at Brake Release = 10,500 POUNDS
Wind = 30 KNOTS HEADWIND
A. Obstacle Height = 200 feet above runway surface
B. Obstacle Horizontal Distance from Reference Zero = 4000 FEET

From Figure 4-28, the takeoff climb increment (TCI) above the runway surface is 1460 feet. The pressure altitude at the airport plus the takeoff climb increment (TCI) is 1460 feet.

From Figure 4-38, the available climb gradient at a pressure altitude of 1460 feet under the specific conditions is 9.0 percent.

From Figure 4-26, for 9.0 percent gradient, the required horizontal distance to clear the obstacle is 2290 feet.

The obstacle can be cleared since the horizontal distance to the obstacle (4000 feet) is greater than the required horizontal distance to clear the obstacle (2290 feet).

SINGLE-ENGINE TAKEOFF FLIGHT PATH TO 1500 FEET
FIRST AND SECOND SEGMENT FLAPS - UP

CONDITIONS: Landing Gear - DOWN/UP
Speedbrakes - RETRACT
Airspeed - V_2
Inoperative Engine - WINDMILLING
Operative Engine - TAKEOFF THRUST

SECOND SEGMENT GRADIENT AT PRESSURE ALTITUDE AT AIRPORT PLUS TAKEOFF CLIMB INCREMENT - PERCENT													
HEIGHT ABOVE RUNWAY FT	16	14	12	11	10	9	8	7	6	5	4	3	2
	REQUIRED HORIZONTAL DISTANCE FROM REFERENCE ZERO - FEET												
50	110	130	160	170	200	220	260	320	400	540	840	1770	2630
100	480	560	680	750	850	970	1140	1380	1740	2080	2590	3440	5130
150	850	1000	1200	1330	1510	1720	1940	2210	2570	3080	3840	5100	7630
200	1220	1430	1720	1880	2060	2290	2570	2930	3410	4080	5090	6770	10130
250	1590	1840	2140	2330	2560	2840	3190	3640	4240	5080	6340	8440	12630
300	1930	2200	2560	2790	3060	3400	3820	4350	5070	6080	7590	10100	15130
350	2240	2560	2970	3240	3560	3950	4440	5070	5910	7080	8840	11770	17630
400	2550	2910	3390	3700	4060	4510	5070	5780	6740	8080	10090	13440	20130
450	2870	3270	3810	4150	4560	5060	5690	6500	7570	9080	11340	15100	22630
500	3180	3630	4220	4600	5060	5620	6320	7210	8410	10080	12590	16770	25130
550	3490	3980	4640	5060	5560	6170	6940	7930	9240	11080	13840	18440	27630
600	3800	4340	5060	5510	6060	6730	7570	8640	10070	12080	15090	20100	30130
650	4120	4700	5470	5970	6560	7290	8190	9350	10910	13080	16340	21770	32630
700	4430	5060	5890	6420	7060	7840	8820	10070	11740	14080	17590	23440	35130
750	4740	5410	6310	6880	7560	8400	9440	10780	12570	15080	18840	25100	37630
800	5050	5770	6720	7330	8060	8950	10070	11500	13410	16080	20090	26770	40130
850	5370	6130	7140	7790	8560	9510	10690	12210	14240	17080	21340	28440	42630
900	5680	6480	7560	8240	9060	10060	11320	12930	15070	18080	22590	30100	45130
950	5990	6840	7970	8700	9560	10620	11940	13640	15910	19080	23840	31770	47630
1000	6300	7200	8390	9150	10060	11170	12570	14350	16740	20080	25090	33440	50130
1050	6620	7560	8810	9600	10560	11730	13190	15070	17570	21080	26340	35100	52630
1100	6930	7910	9220	10060	11060	12290	13820	15780	18410	22080	27590	36770	55130
1150	7240	8270	9640	10510	11560	12840	14440	16500	19240	23080	28840	38440	57630
1200	7550	8630	10060	10970	12060	13400	15070	17210	20070	24080	30090	40100	60130
1250	7870	8980	10470	11420	12560	13950	15690	17930	20910	25080	31340	41770	62630
1300	8180	9340	10890	11880	13060	14510	16320	18640	21740	26080	32590	43440	65130
1350	8490	9700	11310	12330	13560	15060	16940	19350	22570	27080	33840	45100	67630
1400	8800	10060	11720	12790	14060	15620	17570	20070	23410	28080	35090	46770	70130
1450	9120	10410	12140	13240	14560	16170	18190	20780	24240	29080	36340	48440	72630
1500	9430	10770	12560	13700	15060	16730	18820	21500	25070	30080	37590	50100	75130

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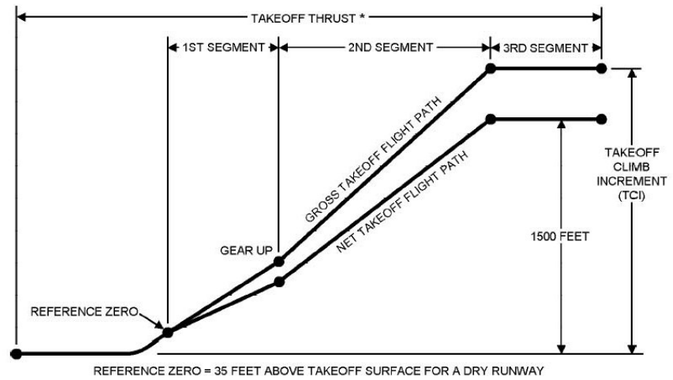
Figure 4-26*

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES - FLAPS UP

The data presented in Figure 4-28 (Anti-ice off) and Figure 4-29 (Anti-ice on) is for the purpose of determining the takeoff climb increment (TCI) and the horizontal distances along the net takeoff flight path. The net takeoff flight path is used to plan obstacle clearance.



REFERENCE ZERO = 35 FEET ABOVE TAKEOFF SURFACE FOR A DRY RUNWAY

*** TAKEOFF THRUST IS LIMITED TO TEN MINUTES MAXIMUM AND THEREAFTER TO MAXIMUM CONTINUOUS THRUST.**

SINGLE-ENGINE FLIGHT PATH CONDITIONS:			
	FIRST SEGMENT	SECOND SEGMENT	THIRD SEGMENT
LANDING GEAR	DOWN TRANSITION TO UP	UP	UP
WING FLAP DEGREES	0	0	0
SPEED BRAKES	RETRACT	RETRACT	RETRACT
INOPERATIVE ENGINE	WINDMILLING	WINDMILLING	WINDMILLING
OPERATIVE ENGINE	T.O. THRUST	T.O. THRUST	T.O. THRUST
AIRSPEED	V_2	V_2	V_2 TRANSITIONING TO V_{ENR}

EXAMPLE:

Flaps = UP
Anti-Ice = OFF
Pressure Altitude at Airport = 4000 FEET
Gross Weight at Brake Release = 10,500 POUNDS
Ambient Temperature at Airport = 10°C
Wind = 10 KNOTS (HEADWIND)
Airport Barometric Altitude = 3925 FEET MSL

Horizontal Distance and Takeoff Climb Increment from Figure 4-28
Reference Zero to End of First Segment = 1322 FEET
Reference Zero to End of Second Segment = 11,506 FEET
Reference Zero to End of Third Segment = 12,719 FEET
Takeoff Climb Increment (TCI) = 1580 FEET

Calculate the level off altitude by adding the takeoff climb increment to the airport barometric altitude.
3925 + 1580 = 5505 FEET.

Figure 4-27

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP
SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1392	21409	21742	2200	1227	18654	18850	2170	1172	17751	17939	2160	1063	15970	16141	2150
	10	1559	21109	21480	1700	1395	18680	19013	1680	1340	17883	18203	1670	1230	16306	16503	1660
	15	1571	21159	21533	1670	1406	18741	19077	1650	1352	17948	18271	1640	1242	16379	16577	1630
	20	1583	21199	21575	1640	1418	18794	19132	1620	1363	18004	18330	1620	1254	16443	16744	1600
	25	1594	21414	21792	1610	1430	18994	19335	1600	1375	18201	18529	1590	1265	16632	16935	1580
	30	1596	23931	24564	1610	1431	21196	21767	1590	1376	20301	20851	1580	1266	18534	18940	1570
	35	1590	27897	29167	1610	1425	24642	25672	1590	1370	23580	24460	1580	1261	21488	22302	1560
	40	1583	33791	35826	1630	1418	29733	31335	1600	1363	28414	29959	1590	1254	25832	27157	1570
	45	1584	41449	44386	1660	1419	36309	38608	1620	1364	34649	36752	1610	1255	31405	33247	1590
	50	1593	52017	55876	1710	1429	45313	48326	1660	1374	43167	45958	1640	1264	38997	41371	1610
	54	1602	63255	68044	1770	1438	54775	58509	1710	1383	52084	55571	1690	1273	46890	49802	1650
13600	-54	1384	20486	20929	2190	1220	17845	18139	2170	1165	16980	17261	2160	1055	15271	15526	2140
	10	1551	20200	20693	1690	1386	17871	18314	1670	1331	17106	17425	1670	1221	15594	15887	1650
	15	1562	20246	20742	1660	1398	17928	18375	1640	1343	17167	17489	1640	1233	15662	15958	1630
	20	1574	20282	20783	1630	1409	17977	18427	1620	1355	17220	17654	1610	1245	15723	16022	1600
	25	1585	20483	20986	1610	1421	18165	18619	1590	1366	17404	17841	1580	1256	15900	16201	1570
	30	1587	22821	23707	1600	1422	20212	20894	1580	1367	19357	20015	1570	1257	17668	18173	1560
	35	1581	26475	27869	1600	1416	23388	24528	1580	1361	22387	23374	1570	1251	20391	21304	1550
	40	1573	31840	33995	1610	1409	28025	29736	1590	1354	26784	28434	1580	1244	24345	25663	1560
	45	1571	38767	41944	1640	1406	33970	36487	1600	1351	32418	34731	1590	1242	29382	31313	1570
	50	1579	46078	52173	1680	1414	41927	45154	1640	1360	39952	42950	1620	1250	36107	38673	1590
	54	1587	57745	62898	1730	1423	50102	54166	1670	1368	47667	51357	1660	1258	42952	46053	1620
13400	-54	1379	19832	20272	2190	1214	17272	17663	2160	1159	16433	16807	2150	1050	14774	15029	2130
	10	1544	19554	20170	1690	1380	17297	17738	1670	1325	16555	16980	1660	1215	15088	15479	1650
	15	1556	19598	20218	1660	1391	17351	17796	1640	1336	16613	17041	1630	1227	15153	15548	1620
	20	1567	19632	20257	1630	1403	17398	17846	1610	1348	16664	17096	1610	1238	15212	15610	1590
	25	1579	19823	20452	1600	1414	17577	18143	1590	1360	16840	17275	1580	1250	15381	15782	1570
	30	1580	22038	22921	1590	1415	19517	20312	1570	1361	18690	19345	1570	1251	17057	17662	1560
	35	1574	25481	26998	1590	1409	22503	23639	1570	1354	21538	22633	1560	1245	19623	20532	1550
	40	1567	30491	32770	1600	1402	26843	28666	1580	1347	25655	27299	1570	1237	23319	24736	1550
	45	1561	36909	40205	1630	1396	32353	34977	1590	1342	30877	33294	1580	1232	27986	30014	1560
	50	1568	45442	49780	1660	1404	39653	43100	1620	1349	37790	40886	1610	1239	34159	36816	1580
	54	1576	54135	59395	1700	1412	47025	51186	1650	1357	44753	48537	1640	1247	40346	43535	1600
13200	-54	1373	19200	19751	2180	1209	16718	17108	2150	1154	15904	16277	2140	1044	14296	14635	2130
	10	1538	18931	19545	1680	1373	16743	17294	1660	1319	16024	16446	1660	1209	14600	14990	1650
	15	1550	18972	19590	1650	1385	16795	17350	1630	1330	16079	16614	1630	1220	14663	15056	1620
	20	1561	19005	19628	1620	1396	16839	17399	1610	1341	16128	16667	1600	1232	14718	15115	1590
	25	1573	19187	19940	1600	1408	17010	17574	1580	1353	16295	16838	1580	1243	14880	15382	1560
	30	1573	21287	22294	1590	1409	18849	19642	1570	1354	18050	18813	1560	1244	16470	17072	1550
	35	1567	24533	26045	1590	1403	21672	22920	1560	1348	20736	21938	1560	1238	18889	19898	1540
	40	1560	29218	31619	1590	1395	25726	27542	1570	1340	24588	26339	1560	1231	22349	23760	1540
	45	1554	35156	38573	1610	1389	30829	33445	1580	1335	29426	31834	1570	1225	26674	28694	1550
	50	1558	43012	47462	1640	1393	37551	41099	1600	1338	35791	38984	1590	1229	32356	35104	1570
	54	1565	50858	56226	1680	1401	44221	48480	1630	1346	42095	45975	1620	1236	37965	41242	1590
13000	-54	1368	18590	19139	2170	1203	16184	16671	2150	1148	15394	15765	2140	1039	13833	14171	2120
	10	1532	18330	19066	1680	1367	16208	16757	1660	1312	15510	16039	1650	1203	14129	14616	1640
	15	1543	18369	19110	1650	1379	16258	16811	1630	1324	15563	16096	1620	1214	14189	14680	1610
	20	1555	18400	19146	1620	1390	16300	16858	1600	1335	15610	16147	1600	1226	14242	14738	1590
	25	1566	18573	19324	1590	1402	16463	17140	1580	1347	15770	16311	1570	1237	14397	14897	1560
	30	1567	20565	21697	1580	1402	18208	19113	1560	1348	17434	18195	1560	1238	15905	16608	1550
	35	1560	23627	25264	1580	1396	20871	22115	1560	1341	19969	21167	1550	1231	18188	19193	1540
	40	1553	28013	30407	1590	1388	24668	26595	1560	1334	23577	25322	1550	1224	21429	22939	1540
	45	1547	33517	36925	1600	1382	29402	32128	1570	1328	28066	30581	1560	1218	25444	27563	1540
	50	1547	40767	45327	1630	1382	35604	39253	1590	1328	33938	37229	1580	1218	30682	33520	1560
	54	1554	47867	53343	1660	1390	41654	46013	1610	1335	39660	43635	1600	1225	35780	39146	1570
12500	-54	1354	17155	17810	2160	1190	14926	15507	2130	1135	14194	14655	2130	1025	12745	13165	2110
	10	1516	16915	17769	1660	1352	14949	15604	1650	1297	14302	14932	1640	1187	13020	13601	1630
	15	1528	16949	17809	1640	1363	14993	15654	1620	1308	14349	14985	1610	1199	13074	13660	1600
	20	1539	16976	17842	1610	1375	15031	15696	1590	1320	14391	15031	1590	1210	13122	13713	1580
	25	1550	17129	18128	1580	1386	15176	15961	1570	1331	14534	15179	1560	1221	13261	13857	1550
	30	1551	18878	20130	1570	1386	16709	17721	1550	1332	15996	16860	1550	1222	14585	15384	1540
	35	1544	21534	23286	1560	1380	19019	20484	1540	1325	18194	19494	1540	1215	16565	17664	1530
	40	1536	25269	27776	1570	1372	22255	24284	1540	1317	21269	23113	1540	1207	19327	20929	1520
	45	1530	29851	33238	1570	1365	26203	28910	1550	1310	25015	27513	1540	1201	22680	24783	1520
	50	1524	35781	40433	1590	1360	31279	35012	1560	1305	29820	33192	1550	1195	26962	29770	1530
	54	1528	41438	47122	1610	1363	36111	40539	1570	1308	34393	38551	1560	1199	31038	34468	1540

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Figure 4-28* (Sheet 1 of 30)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1341	15835	16596	2140	1177	13769	14345	2120	1122	13089	13641	2110	1012	11744	12160	2100
	10	1502	15614	16585	1650	1337	13791	14552	1640	1282	13190	13923	1630	1172	12000	12576	1620
	15	1513	15643	16621	1630	1348	13830	14596	1610	1293	13232	13971	1610	1184	12048	12629	1600
	20	1524	15667	16652	1600	1359	13864	14637	1580	1305	13270	14014	1580	1195	12092	12678	1570
	25	1535	15803	16794	1570	1371	13994	14886	1560	1316	13398	14147	1550	1206	12217	12909	1540
	30	1535	17343	18713	1560	1371	15343	16463	1540	1316	14685	15653	1540	1206	13383	14277	1530
	35	1528	19654	21523	1550	1364	17354	18808	1530	1309	16599	18000	1530	1199	15105	16298	1520
	40	1520	22851	25473	1550	1355	20125	22141	1530	1300	19233	21063	1520	1191	17471	19061	1510
	45	1513	26698	30067	1550	1349	23445	26135	1530	1294	22384	24865	1520	1184	20291	22380	1500
	50	1507	31550	36050	1560	1343	27607	31203	1530	1288	26326	29681	1520	1178	23810	26602	1510
	54	1504	36138	41779	1570	1339	31523	35913	1540	1285	30029	34151	1530	1175	27104	30501	1510
11500	-54	1330	14617	15485	2130	1165	12701	13372	2110	1110	12071	12713	2100	1001	10822	11320	2090
	10	1487	14412	15502	1640	1322	12722	13589	1630	1268	12165	12891	1630	1158	11060	11729	1620
	15	1498	14438	15535	1620	1334	12757	13630	1600	1279	12202	13043	1600	1169	11103	11779	1590
	20	1509	14459	15563	1590	1345	12787	13667	1570	1290	12232	13080	1570	1180	11143	11824	1560
	25	1520	14580	15691	1560	1356	12904	13790	1550	1301	12351	13204	1540	1191	11255	11942	1540
	30	1520	15939	17429	1550	1356	14095	15206	1530	1301	13488	14559	1530	1191	12284	13171	1520
	35	1513	17957	19815	1540	1348	15850	17410	1520	1293	15157	16549	1520	1184	13786	14970	1510
	40	1504	20707	23314	1530	1339	18234	20237	1510	1285	17423	19355	1510	1175	15821	17400	1500
	45	1497	23960	27312	1530	1332	21043	23719	1510	1277	20089	22557	1500	1168	18208	20284	1490
	50	1490	27971	32322	1540	1326	24491	27952	1510	1271	23356	26582	1500	1161	21125	23798	1490
	54	1487	31671	37031	1540	1322	27658	31914	1520	1267	26354	30231	1510	1158	23795	27072	1490
11000	-54	1316	13490	14352	2120	1152	11714	12379	2100	1097	11128	11766	2090	987	9968	10463	2080
	10	1473	13301	14384	1630	1308	11734	12595	1620	1254	11216	12045	1620	1144	10190	10855	1610
	15	1484	13323	14413	1610	1319	11764	12632	1590	1265	11250	12085	1590	1155	10229	10900	1580
	20	1495	13342	14439	1580	1330	11792	12666	1570	1276	11280	12122	1560	1166	10265	10942	1550
	25	1506	13450	14681	1550	1341	11896	12891	1540	1286	11384	12231	1540	1177	10367	11150	1530
	30	1506	14652	16133	1540	1341	12950	14169	1520	1286	12392	13456	1520	1176	11276	12157	1510
	35	1497	16417	18394	1520	1333	14485	16036	1510	1278	13849	15232	1510	1168	12589	13765	1500
	40	1488	18793	21387	1520	1324	16544	18653	1500	1269	15805	17726	1500	1159	14345	15915	1490
	45	1481	21558	24897	1510	1316	18933	21598	1490	1261	18073	20530	1490	1152	16376	18441	1480
	50	1474	24904	29110	1510	1310	21813	25143	1490	1255	20803	23902	1490	1145	18813	21475	1470
	54	1470	27925	33007	1520	1306	24404	28409	1490	1251	23256	27007	1480	1141	21000	24161	1470
10500	-54	1304	12444	13413	2110	1140	10798	11558	2090	1085	10255	10889	2090	975	9178	9756	2070
	10	1460	12269	13347	1630	1295	10817	11673	1610	1240	10337	11161	1610	1130	9385	10045	1600
	15	1470	12289	13499	1600	1306	10844	11819	1590	1251	10367	11197	1580	1141	9420	10186	1580
	20	1481	12305	13523	1570	1317	10869	11851	1560	1262	10394	11231	1560	1152	9453	10225	1550
	25	1492	12402	13627	1550	1327	10962	11952	1530	1272	10487	11440	1530	1163	9544	10322	1520
	30	1491	13467	14940	1530	1327	11895	13109	1520	1272	11377	12435	1510	1162	10349	11327	1500
	35	1481	15015	16983	1510	1317	13241	14784	1500	1262	12657	14145	1500	1152	11499	12668	1490
	40	1473	17073	19658	1510	1309	15025	17008	1490	1254	14351	16264	1490	1144	13018	14580	1480
	45	1465	19436	22634	1500	1301	17067	19604	1480	1246	16290	18623	1480	1136	14753	16705	1460
	50	1458	22247	26311	1500	1294	19488	22690	1480	1239	18585	21561	1470	1129	16802	19350	1460
	54	1454	24738	29547	1490	1290	21628	25506	1470	1235	20612	24124	1470	1125	18610	21550	1450
10000	-54	1293	11470	12436	2100	1128	9946	10703	2080	1073	9443	10073	2080	964	8444	9019	2070
	10	1447	11310	12507	1620	1282	9964	10928	1610	1227	9520	10339	1600	1118	8636	9392	1600
	15	1457	11327	12532	1590	1293	9989	10960	1580	1238	9546	10373	1580	1128	8668	9431	1570
	20	1468	11341	12554	1560	1304	10011	10989	1550	1249	9571	10404	1550	1139	8698	9467	1540
	25	1479	11428	12647	1540	1314	10095	11080	1530	1259	9655	10603	1520	1150	8781	9555	1520
	30	1478	12372	13840	1520	1313	10922	12131	1510	1259	10444	11608	1500	1149	9494	10468	1500
	35	1469	13733	15694	1500	1305	12104	13642	1490	1250	11567	12937	1490	1140	10502	11667	1480
	40	1459	15520	17967	1490	1295	13653	15629	1480	1240	13038	14831	1480	1130	11820	13377	1470
	45	1449	17548	20607	1480	1285	15405	17935	1470	1230	14701	17028	1460	1120	13308	15254	1450
	50	1442	19924	23849	1480	1278	17452	20529	1460	1223	16641	19497	1460	1113	15040	17477	1440
	54	1440	21995	26535	1480	1275	19233	22867	1460	1221	18328	21722	1450	1111	16544	19374	1440
9500	-54	1282	10563	11525	2090	1118	9152	9907	2070	1063	8686	9315	2070	953	7762	8334	2060
	10	1434	10415	11608	1610	1270	9170	10130	1600	1215	8758	9575	1600	1105	7940	8693	1590
	15	1445	10430	11631	1580	1280	9192	10159	1570	1226	8781	9604	1570	1116	7969	8729	1560
	20	1454	10442	11651	1560	1290	9211	10186	1550	1235	8804	9634	1540	1125	7996	8762	1540
	25	1466	10520	11736	1530	1302	9287	10269	1520	1247	8880	9825	1520	1137	8070	8842	1510
	30	1465	11358	12822	1510	1301	10022	11226	1500	1246	9580	10630	1500	1136	8704	9674	1490
	35	1456	12555	14382	1500	1291	11061	12594	1480	1236	10568	11933	1480	1127	9589	10749	1470
	40	1445	14112	16554	1480	1281	12408	14263	1470	1226	11847	13636	1470	1116	10734	12182	1460
	45	1436	15858	18912	1470	1272	13917	16325	1460	1217	13278	15487	1450	1107	12013	13850	1440
	50	1428	17875	21535	1460	1264	15655	18611	1450	1209	14926	17664	1440	1099	13483	15812	1430
	54	1424	19608	23883	1460	1259	17146	20541	1440	1204	16338	19501	1440	1094	14743	17358	1420

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Figure 4-28* (Sheet 2)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP 1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1414	21426	21764	2190	1250	18712	18912	2160	1195	17823	18014	2150	1085	16067	16242	2130
	15	1597	21199	21578	1660	1432	18813	19155	1640	1378	18030	18360	1630	1268	16482	16684	1620
	20	1606	21600	21982	1630	1442	19179	19523	1610	1387	18384	18716	1610	1278	16814	17120	1600
	25	1613	23185	23826	1620	1449	20573	21034	1600	1394	19717	20162	1590	1284	18027	18438	1580
	30	1609	26534	27560	1620	1445	23493	24419	1590	1390	22499	23279	1590	1280	20540	21262	1570
	35	1605	31524	33325	1630	1440	27820	29210	1600	1385	26614	27954	1590	1275	24243	25379	1570
	40	1599	38650	41488	1650	1434	33957	36165	1620	1379	32437	34452	1610	1270	29462	31223	1590
	45	1608	48479	52114	1700	1444	42381	45310	1650	1389	40422	43133	1640	1279	36608	38799	1610
	50	1619	62546	67388	1770	1455	54279	58058	1710	1400	51650	55180	1690	1290	46572	49523	1660
	51	1622	66044	71154	1790	1457	57195	61217	1730	1402	54392	58158	1710	1293	48989	52049	1670
	52	1624	69960	75474	1810	1459	60450	64716	1740	1405	57448	61449	1720	1295	51674	54952	1680
13600	-54	1407	20502	20951	2180	1242	17901	18199	2150	1187	17048	17334	2140	1078	15364	15624	2120
	10	1576	20204	20705	1680	1412	17912	18363	1660	1357	17159	17484	1650	1247	15670	15970	1640
	15	1588	20282	20787	1650	1424	17996	18451	1630	1369	17245	17683	1630	1259	15760	16063	1610
	20	1599	20657	21165	1630	1435	18338	18796	1610	1380	17577	18018	1600	1270	16071	16376	1590
	25	1604	22130	22897	1610	1439	19634	20209	1590	1385	18816	19370	1580	1275	17200	17712	1570
	30	1600	25223	26504	1610	1435	22332	23371	1580	1381	21387	22275	1580	1271	19522	20344	1560
	35	1594	29785	31708	1610	1429	26291	27791	1590	1374	25152	26599	1580	1265	22911	24146	1560
	40	1588	36221	39177	1630	1423	31837	34152	1600	1368	30416	32534	1590	1259	27629	29486	1570
	45	1594	44983	48858	1670	1429	39355	42503	1630	1375	37543	40465	1620	1265	34008	36395	1590
	50	1604	57146	62355	1730	1440	49679	53792	1680	1385	47298	51034	1660	1275	42684	45826	1630
	52	1609	63376	69121	1770	1444	54905	59504	1710	1389	52217	56422	1690	1280	47029	50498	1650
13400	-54	1401	19846	20294	2170	1237	17325	17723	2140	1182	16498	16879	2140	1072	14864	15124	2120
	10	1570	19558	20184	1670	1405	17337	17786	1660	1350	16607	17039	1650	1241	15162	15561	1640
	15	1582	19632	20262	1650	1417	17417	17869	1630	1362	16689	17125	1620	1253	15248	15651	1610
	20	1593	19986	20621	1620	1428	17742	18313	1600	1374	17004	17443	1600	1264	15544	15950	1590
	25	1597	21385	22278	1600	1433	18971	19660	1590	1378	18179	18843	1580	1268	16614	17125	1570
	30	1593	24303	25580	1600	1429	21518	22553	1580	1374	20606	21604	1570	1264	18807	19626	1560
	35	1587	28578	30626	1600	1422	25228	26842	1580	1367	24135	25577	1570	1258	21984	23214	1560
	40	1581	34547	37493	1620	1416	30376	32803	1590	1361	29023	31248	1580	1251	26367	28216	1560
	45	1583	42626	46748	1650	1418	37311	40561	1620	1363	35595	38616	1600	1254	32247	34726	1580
	50	1593	53598	58915	1710	1428	46647	50858	1660	1373	44423	48255	1640	1264	40109	43341	1610
	52	1597	59120	65106	1740	1433	51298	55994	1680	1378	48808	53107	1660	1268	43991	47547	1630
13200	-54	1395	19213	19773	2160	1231	16769	17165	2140	1176	15967	16347	2130	1066	14382	14728	2110
	10	1563	18935	19559	1670	1399	16781	17342	1650	1344	16073	16613	1650	1234	14672	15069	1630
	15	1575	19005	19633	1640	1411	16857	17423	1620	1356	16151	16696	1620	1246	14754	15155	1610
	20	1586	19343	20104	1620	1422	17167	17736	1600	1367	16451	17000	1590	1257	15036	15543	1580
	25	1591	20668	21558	1600	1426	18333	19136	1580	1371	17567	18228	1570	1262	16052	16663	1560
	30	1586	23424	24827	1590	1422	20739	21887	1570	1367	19859	20853	1570	1257	18122	19043	1550
	35	1580	27433	29475	1600	1415	24220	25946	1570	1360	23171	24722	1560	1251	21104	22435	1550
	40	1573	32977	36047	1610	1409	29006	31424	1580	1354	27715	29933	1570	1244	25180	27130	1550
	45	1572	40444	44679	1640	1408	35412	38765	1600	1353	33787	36906	1590	1243	30609	33180	1570
	50	1582	50371	55798	1680	1417	43880	48191	1640	1363	41799	45727	1620	1253	37753	41074	1590
	52	1586	55300	61393	1710	1421	48045	52838	1660	1367	45729	50122	1640	1257	41239	44883	1610
13000	-54	1390	18603	19160	2160	1225	16233	16728	2130	1170	15455	15833	2130	1061	13917	14262	2110
	10	1557	18333	19081	1660	1392	16245	16804	1650	1338	15558	16096	1640	1228	14198	14695	1630
	15	1569	18400	19152	1640	1404	16317	16881	1620	1349	15633	16175	1610	1240	14277	14778	1600
	20	1580	18721	19479	1610	1415	16612	17295	1590	1361	15918	16465	1590	1251	14546	15051	1580
	25	1584	19979	20995	1590	1420	17720	18519	1580	1365	16981	17752	1570	1255	15510	16119	1560
	30	1580	22584	24112	1590	1415	19993	21138	1570	1360	19144	20247	1560	1251	17467	18384	1550
	35	1573	26347	28513	1590	1409	23262	24983	1570	1354	22254	23800	1560	1244	20268	21594	1540
	40	1567	31504	34565	1600	1402	27717	30248	1570	1347	26485	28811	1560	1237	24064	26007	1550
	45	1562	38417	42764	1620	1397	33646	37101	1590	1342	32102	35321	1580	1233	29081	31745	1560
	50	1571	47427	52963	1660	1406	41342	45753	1620	1352	39394	43418	1610	1242	35591	39002	1580
	52	1576	51850	58050	1680	1412	45096	49986	1640	1357	42934	47421	1620	1247	38735	42467	1590
12500	-54	1376	17165	17831	2140	1212	14970	15561	2120	1157	14249	14719	2110	1047	12821	13250	2100
	10	1541	16917	17785	1650	1377	14982	15649	1640	1322	14345	14988	1630	1212	13084	13676	1620
	15	1551	16975	17848	1620	1386	15046	15718	1610	1332	14411	15059	1600	1222	13154	13752	1590
	20	1564	17259	18267	1600	1400	15307	16100	1580	1345	14665	15429	1580	1235	13393	13996	1570
	25	1569	18366	19502	1580	1405	16283	17191	1560	1350	15598	16474	1560	1240	14242	14949	1550
	30	1562	20632	22279	1570	1398	18261	19513	1550	1343	17483	18690	1550	1233	15945	16957	1540
	35	1556	23865	26146	1570	1392	21066	22891	1550	1337	20151	21797	1540	1227	18348	19767	1530
	40	1549	28187	31360	1580	1385	24810	27322	1550	1330	23708	26017	1540	1220	21540	23468	1530
	45	1543	33839	38160	1590	1379	29668	33100	1560	1324	28314	31510	1550	1214	25658	28301	1530
	50	1544	41090	46835	1620	1379	35870	40351	1580	1325	34197	38407	1570	1215	30895	34371	1550
	52	1548	44504	50775	1630	1383	38782	43739	1590	1328	36940	41493	1580	1219	33350	37144	1550

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Figure 4-28* (Sheet 3)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP 1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1362	15843	16616	2130	1197	13808	14395	2110	1142	13139	13701	2100	1033	11814	12327	2090
	10	1526	15615	16602	1640	1362	13821	14596	1630	1307	13230	13976	1620	1197	12059	12646	1610
	15	1538	15665	16659	1610	1373	13878	14658	1600	1318	13289	14041	1600	1209	12122	12714	1590
	20	1549	15917	17045	1590	1384	14110	15011	1570	1329	13518	14275	1570	1220	12335	13035	1560
	25	1552	16893	18149	1570	1388	14970	15987	1550	1333	14337	15318	1550	1223	13084	13887	1540
	30	1547	18872	20637	1560	1383	16698	18057	1540	1328	15984	17294	1540	1218	14571	15679	1530
	35	1540	21651	24048	1550	1375	19114	21044	1530	1320	18283	20030	1530	1211	16640	18153	1520
	40	1533	25310	28464	1560	1368	22282	24779	1530	1313	21293	23702	1530	1203	19343	21363	1510
	45	1526	29974	34274	1560	1361	26299	29713	1540	1306	25103	28282	1530	1197	22752	25379	1510
	50	1521	35849	41553	1580	1356	31327	35771	1550	1301	29862	34036	1540	1192	26993	30436	1520
	52	1521	38588	44936	1590	1356	33663	38691	1560	1301	32071	36692	1540	1191	28958	32816	1520
11500	-54	1350	14623	15504	2120	1185	12737	13419	2100	1130	12116	12770	2090	1021	10885	11394	2080
	10	1512	14413	15520	1630	1347	12750	13632	1620	1292	12201	13051	1610	1182	11114	11797	1610
	15	1524	14458	15572	1600	1359	12801	13689	1590	1304	12254	13111	1590	1195	11170	11859	1580
	20	1534	14681	15802	1580	1369	13007	13901	1570	1314	12455	13317	1560	1205	11361	12054	1550
	25	1537	15543	16920	1560	1373	13767	14893	1550	1318	13182	14156	1540	1208	12023	12923	1530
	30	1532	17277	19031	1550	1367	15280	16747	1530	1312	14624	15925	1530	1203	13324	14423	1520
	35	1524	19679	22063	1540	1359	17370	19288	1520	1304	16612	18348	1520	1195	15112	16615	1500
	40	1518	22792	25930	1540	1353	20066	22549	1520	1298	19174	21569	1510	1188	17413	19421	1500
	45	1509	26676	30826	1540	1344	23417	26694	1520	1290	22353	25400	1510	1180	20258	22871	1490
	50	1503	31438	36857	1550	1339	27502	31810	1520	1284	26223	30149	1510	1174	23710	27032	1500
	52	1502	33627	39551	1560	1337	29372	34138	1530	1282	27992	32360	1520	1173	25284	28909	1500
11000	-54	1337	13495	14371	2100	1173	11746	12424	2090	1118	11170	11819	2080	1008	10027	10532	2070
	10	1497	13301	14401	1620	1333	11759	12635	1610	1278	11250	12094	1610	1168	10240	10918	1600
	15	1509	13340	14448	1600	1344	11804	12687	1580	1289	11297	12148	1580	1179	10291	10975	1570
	20	1519	13541	14783	1570	1355	11988	12992	1560	1300	11477	12333	1550	1190	10461	11253	1550
	25	1522	14302	15672	1550	1358	12661	13781	1540	1303	12120	13199	1530	1193	11048	11942	1520
	30	1517	15824	17698	1540	1352	13989	15447	1520	1297	13385	14791	1520	1188	12188	13385	1510
	35	1508	17909	20281	1530	1344	15802	17710	1510	1289	15109	16835	1500	1179	13739	15232	1490
	40	1500	20563	23689	1520	1336	18107	20578	1500	1281	17300	19569	1500	1171	15705	17703	1480
	45	1493	23832	27835	1520	1328	20922	24187	1500	1273	19971	22891	1490	1164	18096	20591	1480
	50	1487	27734	32872	1520	1322	24278	28332	1500	1267	23151	26950	1490	1158	20935	24139	1480
	52	1485	29496	35140	1530	1320	25787	30300	1500	1265	24580	28705	1490	1156	22208	25715	1480
10500	-54	1325	12448	13432	2090	1161	10827	11601	2080	1106	10293	10938	2070	996	9232	9822	2060
	10	1484	12269	13490	1620	1319	10840	11825	1600	1264	10368	11207	1600	1154	9431	10205	1590
	15	1495	12304	13532	1590	1330	10880	11872	1580	1275	10410	11256	1570	1166	9477	10258	1560
	20	1506	12481	13716	1560	1341	11045	12043	1550	1286	10571	11533	1550	1177	9629	10416	1540
	25	1508	13158	14649	1540	1344	11642	12755	1530	1289	11142	12215	1520	1179	10149	11038	1520
	30	1502	14496	16362	1520	1337	12809	14259	1510	1283	12253	13652	1510	1173	11150	12341	1500
	35	1493	16310	18672	1510	1329	14386	16285	1500	1274	13752	15470	1490	1164	12498	13984	1490
	40	1485	18594	21709	1510	1320	16365	18826	1490	1265	15633	17893	1480	1156	14185	16068	1470
	45	1477	21348	25207	1500	1312	18744	21879	1480	1257	17891	20802	1480	1148	16206	18585	1470
	50	1470	24579	29442	1500	1306	21525	25450	1480	1251	20527	24084	1470	1141	18560	21540	1460
	52	1468	26015	31384	1500	1304	22757	27021	1480	1249	21694	25578	1470	1139	19600	22884	1460
10000	-54	1314	11473	12454	2080	1149	9973	10743	2070	1094	9477	10120	2060	985	8494	9081	2050
	10	1470	11310	12525	1610	1306	9985	10966	1600	1251	9548	10383	1590	1141	8679	9450	1590
	15	1481	11340	12563	1580	1317	10021	11009	1570	1262	9586	10538	1570	1152	8720	9498	1560
	20	1492	11498	12728	1550	1327	10169	11162	1540	1272	9730	10687	1540	1163	8857	9640	1530
	25	1495	12099	13585	1530	1330	10699	11923	1520	1275	10237	11305	1520	1166	9319	10203	1510
	30	1488	13277	15136	1520	1324	11726	13170	1500	1269	11214	12607	1500	1159	10199	11384	1490
	35	1477	14860	17214	1500	1312	13100	14993	1490	1258	12521	14232	1490	1148	11372	12853	1480
	40	1470	16828	19802	1490	1305	14806	17141	1480	1250	14142	16279	1470	1141	12825	14702	1460
	45	1461	19167	22885	1490	1297	16833	19841	1470	1242	16059	18847	1460	1132	14540	16807	1450
	50	1455	21862	26452	1480	1290	19148	22827	1460	1235	18260	21696	1460	1125	16506	19373	1440
	52	1452	23043	28141	1480	1288	20163	24181	1460	1233	19221	22868	1450	1123	17363	20427	1440
9500	-54	1303	10565	11543	2070	1138	9177	9945	2060	1083	8718	9358	2050	974	7807	8392	2040
	10	1458	10414	11626	1600	1293	9189	10167	1590	1239	8784	9616	1590	1129	7979	8748	1580
	15	1471	10441	11661	1570	1306	9222	10206	1560	1251	8818	9767	1560	1141	8017	8791	1550
	20	1479	10583	11809	1550	1315	9353	10344	1540	1260	8947	9901	1530	1150	8140	8919	1530
	25	1482	11117	12598	1520	1317	9825	10929	1510	1262	9398	10462	1510	1153	8549	9430	1510
	30	1475	12156	14010	1510	1310	10730	12170	1500	1255	10259	11535	1490	1146	9324	10401	1490
	35	1465	13539	15757	1490	1301	11930	13700	1480	1246	11400	13107	1480	1136	10348	11719	1470
	40	1456	15240	18077	1480	1291	13404	15734	1470	1236	12799	14933	1460	1127	11602	13368	1450
	45	1447	17234	20816	1470	1282	15127	18012	1460	1227	14434	17104	1450	1118	13063	15220	1440
	50	1439	19497	23818	1470	1275	17076	20512	1450	1220	16282	19484	1440	1110	14714	17364	1430
	52	1437	20476	25173	1460	1272	17919	21695	1450	1218	17081	20494	1440	1108	15426	18382	1430

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Figure 4-28* (Sheet 4)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP 8,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1588	21550	21929	2080	1424	19109	19451	2060	1369	18308	18527	2050	1259	16726	16928	2030
	-10	1696	26742	27963	1770	1531	23824	24807	1750	1476	22870	23820	1740	1366	20989	21761	1730
	-5	1702	28496	30134	1750	1537	25375	26612	1730	1483	24356	25551	1720	1373	22348	23347	1700
	0	1707	30866	32925	1740	1543	27461	29080	1710	1488	26350	27916	1710	1378	24166	25509	1690
	5	1713	33573	36057	1730	1548	29836	31840	1700	1493	28620	30434	1690	1384	26230	27806	1670
	10	1718	36695	39748	1720	1554	32566	35089	1690	1499	31226	33541	1680	1389	28597	30523	1660
	15	1730	40121	43616	1720	1565	35574	38369	1690	1510	34099	36678	1670	1401	31212	33501	1650
	20	1742	48194	52564	1750	1577	42588	46048	1710	1523	40782	44004	1700	1413	37272	40043	1670
	25	1755	63283	69109	1830	1590	55503	60159	1770	1535	53025	57404	1760	1426	48230	51962	1720
	27					1596	62873	68195	1820	1541	59980	65006	1800	1431	54410	58625	1750
	29					1601	72562	78953	1870	1546	69088	74889	1850	1436	62441	67382	1800
13600	-54	1580	20617	21121	2070	1415	18278	18618	2050	1360	17511	17838	2040	1250	15993	16295	2030
	-10	1686	25425	26914	1760	1521	22652	23754	1740	1466	21744	22809	1730	1357	19954	20832	1720
	-5	1692	27032	28801	1740	1527	24074	25430	1720	1473	23107	24417	1710	1363	21200	22306	1700
	0	1697	29195	31385	1730	1533	25979	27717	1700	1478	24930	26610	1690	1368	22863	24313	1680
	5	1703	31651	34264	1720	1538	28137	30259	1690	1483	26992	28921	1680	1373	24740	26423	1660
	10	1708	34463	37644	1710	1543	30600	33240	1680	1488	29345	31773	1670	1379	26878	28910	1650
	15	1714	37601	41356	1700	1550	33344	36377	1670	1495	31962	34771	1660	1385	29254	31641	1640
	20	1726	44728	49355	1720	1562	39554	43250	1690	1507	37883	41334	1670	1397	34619	37604	1650
	25	1738	57743	63963	1790	1574	50739	55756	1740	1519	48499	53101	1720	1409	44152	48093	1690
	29					1584	64940	71553	1820	1530	61904	67921	1800	1420	56067	61210	1750
	30					1587	69556	76702	1850	1532	66242	72775	1820	1422	59889	65393	1780
13400	-54	1573	19955	20584	2070	1409	17689	18141	2040	1354	16945	17380	2040	1244	15473	15875	2020
	-10	1679	24501	25985	1760	1514	21828	23051	1730	1459	20953	22134	1730	1349	19226	20212	1710
	-5	1685	26008	27910	1730	1520	23163	24640	1710	1465	22232	23659	1700	1356	20397	21611	1690
	0	1690	28033	30356	1720	1525	24948	26806	1690	1470	23940	25614	1690	1361	21949	23394	1670
	5	1695	30322	33067	1710	1530	26961	29204	1680	1476	25865	27910	1670	1366	23707	25498	1650
	10	1700	32929	36243	1700	1536	29248	31878	1670	1481	28049	30469	1660	1371	25693	27834	1640
	15	1706	35827	39713	1690	1541	31783	34935	1660	1486	30469	33394	1650	1377	27892	30386	1630
	20	1715	42390	47283	1710	1550	37503	41441	1670	1495	35922	39607	1660	1385	32830	35916	1640
	25	1726	54116	60596	1760	1561	47605	52727	1720	1507	45517	50349	1700	1397	41459	45495	1670
	30	1739	79607	82703	1870	1575	64095	71340	1810	1520	61091	67720	1790	1410	55514	60909	1740
	31	1742	79034	88859	1910	1577	68610	76387	1830	1522	65334	72478	1810	1413	59052	65128	1760
13200	-54	1567	19316	18943	2060	1402	17120	17685	2040	1347	16398	16943	2030	1238	14971	15372	2020
	-5	1677	25033	26929	1730	1513	22295	23892	1700	1458	21399	22820	1700	1348	19630	20840	1680
	0	1682	26930	29245	1710	1518	23968	25819	1690	1463	23000	24790	1680	1353	21091	22644	1660
	5	1687	29065	31943	1700	1523	25848	28083	1670	1468	24797	26959	1660	1358	22729	24513	1650
	10	1693	31487	34791	1680	1528	27973	30725	1660	1473	26829	29366	1650	1363	24577	26710	1630
	15	1698	34162	38180	1680	1534	30317	33459	1650	1479	29067	31982	1640	1369	26611	29097	1620
	20	1703	40225	45237	1690	1538	35598	39647	1660	1483	34100	37892	1650	1374	31166	34352	1620
	25	1714	50822	57417	1740	1550	44749	49977	1700	1495	42797	47733	1680	1385	38997	43131	1650
	30	1727	67947	77005	1830	1562	59304	66515	1770	1507	56563	63289	1750	1398	51275	56962	1710
	31	1730	72598	82382	1860	1565	63201	70942	1790	1510	60233	67473	1770	1400	54521	60566	1730
	32	1732	77959	88616	1890	1567	67655	76059	1820	1513	64425	72177	1800	1403	58213	64738	1750
13000	-54	1560	18700	19452	2050	1396	16571	17134	2030	1341	15871	16413	2030	1231	14487	14987	2010
	-5	1670	24103	26131	1720	1506	21466	23057	1700	1451	20602	22140	1690	1341	18897	20216	1680
	0	1675	25881	28328	1700	1511	23036	25008	1680	1456	22105	23889	1670	1346	20269	21816	1660
	5	1680	27876	30746	1690	1516	24793	27149	1660	1461	23786	25941	1650	1351	21801	23694	1640
	10	1685	30129	33565	1670	1520	26772	29515	1650	1466	25677	28206	1640	1356	23523	25766	1620
	15	1691	32602	36610	1660	1526	28942	32205	1640	1471	27750	30782	1630	1361	25408	28003	1610
	20	1691	38213	43346	1680	1527	33826	37985	1640	1472	32403	36302	1630	1362	29615	32901	1610
	25	1702	47821	54533	1720	1538	42139	47475	1680	1483	40309	45349	1660	1373	36742	40972	1640
	30	1715	62971	72137	1800	1550	55065	62376	1740	1495	52549	59243	1720	1385	47681	53339	1690
	32	1720	71588	82204	1850	1555	62306	70675	1780	1500	59373	67091	1760	1391	53726	60220	1720
	35	1727	89659	103325	1960	1563	77226	87845	1870	1508	73347	83116	1840	1398	65975	74144	1790
12500	-54	1545	17250	18123	2040	1380	15284	15955	2020	1325	14631	15277	2010	1216	13346	13943	2000
	-10	1647	20809	22681	1720	1482	18534	20110	1710	1427	17788	19189	1700	1318	16311	17503	1690
	-5	1653	21952	24103	1700	1488	19549	21378	1680	1433	18761	20407	1680	1323	17203	18622	1660
	0	1657	23473	26042	1680	1493	20893	22976	1660	1438	20047	21938	1660	1328	18378	20025	1640
	5	1662	25164	28154	1670	1497	22384	24850	1640	1442	21475	23736	1640	1333	19680	21673	1620
	10	1667	27054	30609	1650	1502	24048	26900	1630	1447	23072	25706	1620	1337	21130	23354	1600
	15	1672	29102	33084	1640	1507	25850	29090	1610	1452	24788	27798	1600	1343	22698	25273	1590
	20	1672	33657	38760	1640	1507	29825	33958	1610	1452	28578	32452	1600	1343	26129	29392	1590
	25	1673	41374	48307	1670	1508	36507	42046	1640	1453	34934	40041	1620	1344	31854	36270	1600
	30	1683	52796	61874	1730	1519	46324	53557	1680	1464	44249	50998	1660	1354	40214	45924	1640
	35	1696	71064	83744	1830	1532	61743	71733	1760	1477	58797	68089	1740	1367	53130	60977	1700

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Figure 4-28* (Sheet 17)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - UP 8,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1530	15917	16910	2030	1365	14091	14870	2010	1310	13490	14240	2000	1200	12298	12890	1990
	-10	1630	19037	21033	1710	1465	16952	18515	1690	1410	16266	17777	1690	1301	14910	16203	1680
	-5	1635	20023	22298	1690	1471	17827	19643	1670	1416	17106	18861	1660	1306	15679	17200	1650
	0	1640	21330	24021	1670	1475	18983	21178	1650	1420	18213	20212	1640	1310	16691	18439	1630
	5	1644	22771	25883	1650	1479	20256	22705	1630	1424	19427	21796	1620	1315	17803	19781	1610
	10	1648	24369	27903	1630	1484	21665	24498	1610	1429	20779	23395	1600	1319	19032	21356	1590
	15	1653	26080	30182	1610	1489	23172	26392	1590	1434	22221	25212	1580	1324	20346	22904	1570
	20	1653	29818	34896	1610	1488	26441	30552	1590	1434	25340	29066	1580	1324	23173	26416	1560
	25	1648	36052	42790	1630	1483	31844	37339	1600	1428	30478	35544	1590	1318	27800	32178	1570
	30	1654	44924	53780	1670	1489	39500	46667	1630	1434	37752	44307	1620	1325	34338	39990	1590
	35	1665	58132	69988	1740	1500	50765	60274	1680	1445	48414	57109	1670	1336	43859	51271	1630
11500	-54	1515	14688	15801	2010	1350	12996	13883	2000	1295	12438	13293	1990	1186	11332	12020	1980
	-10	1613	17430	19551	1700	1449	15515	17192	1680	1394	14885	16505	1680	1284	13637	15033	1670
	-5	1618	18284	20683	1670	1454	16274	18203	1660	1399	15613	17356	1650	1289	14304	15814	1640
	0	1622	19411	22087	1650	1458	17271	19452	1630	1403	16568	18555	1630	1293	15178	16914	1620
	5	1627	20646	23741	1630	1462	18364	20926	1610	1407	17614	19969	1610	1297	16132	18097	1590
	10	1631	22004	25519	1610	1466	19562	22379	1590	1411	18761	21487	1590	1302	17179	19489	1570
	15	1635	23444	27383	1590	1471	20833	24035	1570	1416	19977	22951	1570	1306	18288	20829	1560
	20	1637	26541	31454	1590	1472	23546	27506	1570	1417	22567	26274	1560	1307	20636	23744	1550
	25	1629	31585	38012	1600	1464	27928	33140	1570	1409	26737	31529	1560	1300	24396	28518	1550
	30	1624	38662	47305	1620	1459	34034	41007	1590	1405	32536	38905	1580	1295	29602	35080	1560
	35	1634	48550	59745	1670	1470	42527	51433	1620	1415	40592	48834	1610	1305	36823	43812	1580
11000	-54	1500	13551	14784	2000	1336	11983	12979	1990	1281	11466	12315	1980	1171	10439	11224	1970
	-10	1597	15966	18075	1680	1433	14205	15872	1670	1378	13627	15237	1670	1268	12478	13864	1660
	-5	1602	16707	19094	1660	1438	14865	16783	1640	1383	14259	15991	1640	1273	13057	14557	1630
	0	1606	17683	20345	1640	1441	15729	17898	1620	1386	15087	17184	1620	1277	13814	15540	1610
	5	1610	18746	21826	1620	1445	16670	19219	1600	1390	15987	18329	1590	1281	14636	16589	1580
	10	1613	19906	23406	1600	1449	17695	20497	1580	1394	16969	19556	1570	1284	15532	17830	1560
	15	1618	21125	25048	1580	1453	18771	21959	1560	1398	17999	20959	1550	1289	16472	19001	1540
	20	1617	23711	28463	1570	1452	21039	24853	1550	1397	20164	23730	1540	1288	18437	21531	1530
	25	1610	27840	33961	1570	1446	24633	29566	1550	1391	23586	28236	1540	1281	21524	25514	1530
	30	1604	33460	41505	1590	1439	29495	35922	1560	1385	28206	34176	1550	1275	25677	30781	1530
	35	1604	41147	51695	1620	1440	36108	44558	1580	1385	34481	42281	1570	1275	31299	37998	1550
10500	-54	1487	12497	13723	1990	1322	11044	12034	1980	1267	10564	11408	1970	1158	9612	10392	1960
	-10	1582	14628	16727	1670	1417	13009	14792	1660	1362	12476	14078	1660	1253	11418	12796	1650
	-5	1586	15272	17648	1650	1422	13583	15491	1630	1367	13026	14872	1630	1257	11921	13412	1620
	0	1590	16119	18771	1620	1425	14333	16492	1610	1370	13745	15833	1600	1261	12579	14296	1600
	5	1593	17037	20105	1600	1429	15146	17556	1590	1374	14523	16855	1580	1264	13290	15233	1570
	10	1597	18033	21520	1580	1432	16026	18817	1570	1377	15366	17942	1560	1268	14059	16230	1550
	15	1601	19070	22836	1560	1436	16943	19989	1550	1381	16244	19066	1540	1272	14861	17379	1530
	20	1599	21243	25838	1550	1435	18850	22520	1530	1380	18065	21492	1530	1270	16513	19479	1520
	25	1593	24654	30475	1550	1428	21823	26482	1530	1373	20897	25281	1520	1264	19069	22811	1510
	30	1586	29174	36632	1560	1421	25742	31766	1530	1366	24623	30202	1520	1257	22422	27161	1510
	35	1580	35203	44996	1570	1415	30936	38831	1540	1360	29551	36814	1530	1251	26837	33033	1510
10000	-54	1473	11516	12738	1980	1309	10171	11157	1970	1254	9727	10677	1960	1144	8845	9620	1960
	-10	1567	13399	15490	1660	1402	11911	13561	1650	1347	11420	13015	1650	1238	10446	11818	1640
	-5	1571	13961	16329	1640	1407	12411	14312	1620	1352	11900	13616	1620	1242	10886	12371	1610
	0	1576	14699	17341	1610	1412	13065	15215	1600	1357	12526	14483	1600	1247	11458	13168	1590
	5	1578	15493	18411	1590	1413	13768	16170	1580	1358	13200	15399	1570	1248	12073	14009	1560
	10	1582	16350	19686	1570	1417	14526	17180	1550	1362	13926	16368	1550	1252	12736	14899	1540
	15	1585	17236	20993	1550	1420	15310	18347	1530	1365	14676	17490	1530	1255	13421	15814	1520
	20	1583	19072	23514	1530	1418	16922	20453	1520	1363	16215	19508	1510	1254	14817	17657	1500
	25	1575	21914	27439	1530	1411	19400	23922	1510	1356	18576	22700	1500	1246	16949	20446	1490
	30	1568	25592	32614	1530	1404	22595	28220	1510	1349	21616	26808	1500	1239	19684	24183	1490
	35	1562	30349	39278	1540	1397	26705	33943	1510	1342	25518	32145	1500	1233	23186	28908	1490
9500	-54	1461	10603	11820	1970	1297	9359	10341	1960	1242	8948	9894	1960	1132	8130	8903	1950
	-10	1553	12267	14353	1650	1388	10900	12545	1640	1333	10448	12038	1640	1224	9551	10919	1630
	-5	1557	12758	14981	1630	1392	11336	13232	1620	1338	10867	12578	1610	1228	9935	11416	1600
	0	1560	13401	15897	1600	1395	11906	13924	1590	1340	11413	13365	1590	1231	10434	12139	1580
	5	1563	14091	17002	1580	1398	12517	14785	1570	1343	11998	14192	1560	1234	10968	12784	1550
	10	1566	14830	18017	1560	1401	13171	15819	1540	1346	12624	15062	1540	1236	11539	13582	1530
	15	1569	15590	19198	1530	1404	13843	16745	1520	1350	13268	15951	1520	1240	12128	14399	1510
	20	1567	17147	21296	1520	1402	15212	18608	1510	1347	14575	17737	1500	1238	13313	16031	1490
	25	1559	19532	24765	1510	1394	17292	21547	1500	1340	16556	20422	1490	1230	15101	18479	1480
	30	1551	22555	28998	1510	1386	19920	25150	1490	1332	19057	23996	1480	1222	17353	21494	1470
	35	1544	26363	34577	1510	1380	23217	29801	1490	1325	22190	28313	1480	1215	20166	25417	1470

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Figure 4-28* (Sheet 18)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - UP SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1388	22177	22509	2210	1223	19306	19600	2180	1169	18366	18648	2170	1059	16512	16769	2150
	-35	1440	22033	22376	2030	1275	19282	19588	2000	1221	18381	18675	2000	1111	16603	16871	1980
	-30	1453	22002	22349	1990	1289	19280	19589	1960	1234	18389	18685	1950	1124	16628	16899	1940
	-25	1466	21972	22321	1950	1302	19278	19590	1920	1247	18395	18694	1910	1137	16652	16926	1900
	-20	1480	21948	22301	1910	1315	19281	19595	1880	1260	18406	18708	1880	1150	16680	16957	1860
	-15	1492	21924	22279	1870	1328	19282	19600	1850	1273	18416	18721	1840	1163	16705	16986	1820
	-10	1505	21907	22386	1840	1341	19289	19610	1810	1286	18431	18739	1810	1176	16735	17018	1790
	-5	1518	21894	22376	1800	1353	19298	19622	1780	1298	18447	18758	1770	1189	16766	17052	1760
	0	1530	21914	22401	1770	1366	19337	19663	1750	1311	18492	18805	1740	1201	16822	17110	1720
	5	1542	21940	22430	1740	1378	19379	19708	1710	1323	18539	18855	1710	1213	16879	17171	1690
	10	1554	21965	22459	1710	1390	19420	19752	1680	1335	18585	18905	1680	1225	16936	17230	1660
13600	-54	1380	21202	21642	2200	1216	18453	18844	2170	1161	17553	17927	2160	1051	15776	16030	2140
	-35	1432	21065	21521	2020	1268	18431	18838	2000	1213	17568	17958	1990	1103	15863	16130	1970
	-30	1445	21036	21496	1980	1281	18429	18840	1950	1226	17575	17969	1950	1116	15888	16157	1930
	-25	1458	21007	21472	1940	1294	18427	18842	1920	1239	17582	17980	1910	1129	15911	16183	1890
	-20	1471	20984	21453	1900	1307	18430	18848	1880	1252	17592	17994	1870	1142	15937	16212	1850
	-15	1484	20961	21434	1860	1320	18431	18854	1840	1265	17601	18007	1830	1155	15962	16334	1820
	-10	1497	20945	21421	1830	1332	18438	18864	1810	1277	17616	18025	1800	1168	15990	16367	1780
	-5	1509	20932	21533	1790	1345	18447	18877	1770	1290	17631	18045	1760	1180	16020	16400	1750
	0	1522	20950	21557	1760	1357	18482	18916	1740	1302	17673	18090	1730	1193	16072	16456	1720
	5	1534	20974	21585	1730	1369	18522	18959	1710	1314	17717	18138	1700	1204	16127	16514	1690
	10	1545	20997	21612	1700	1381	18560	19001	1680	1326	17761	18185	1670	1216	16180	16571	1660
13400	-54	1375	20510	21061	2190	1210	17848	18238	2170	1155	16976	17349	2160	1045	15253	15593	2140
	-35	1426	20379	20949	2020	1262	17828	18233	1990	1207	16992	17380	1980	1097	15339	15694	1970
	-30	1439	20351	20926	1970	1275	17826	18235	1950	1220	16999	17391	1940	1110	15363	15722	1930
	-25	1452	20323	20903	1930	1288	17825	18238	1910	1233	17005	17401	1900	1123	15385	15748	1890
	-20	1465	20301	20886	1890	1301	17827	18350	1870	1246	17015	17415	1860	1136	15411	15778	1850
	-15	1478	20279	20869	1860	1314	17828	18356	1830	1259	17024	17428	1830	1149	15435	15806	1810
	-10	1491	20263	20858	1820	1326	17835	18367	1800	1271	17038	17446	1790	1162	15462	15837	1780
	-5	1503	20250	20850	1790	1339	17843	18380	1770	1284	17053	17465	1760	1174	15491	15869	1750
	0	1515	20267	20872	1750	1351	17877	18419	1730	1296	17092	17614	1730	1186	15541	15923	1710
	5	1527	20289	20898	1720	1363	17914	18461	1700	1308	17135	17660	1700	1198	15593	15979	1680
	10	1539	20311	20924	1690	1375	17951	18502	1670	1320	17176	17706	1670	1210	15644	16033	1650
13200	-54	1369	19845	20394	2190	1205	17266	17752	2160	1150	16420	16886	2150	1040	14750	15088	2130
	-35	1420	19718	20402	2010	1256	17247	17753	1980	1201	16436	16921	1980	1091	14834	15187	1960
	-30	1434	19691	20381	1970	1269	17245	17756	1940	1214	16443	16933	1940	1104	14857	15214	1920
	-25	1447	19664	20360	1930	1282	17244	17759	1900	1227	16449	16944	1900	1117	14879	15240	1880
	-20	1459	19643	20345	1890	1295	17246	17767	1870	1240	16459	16959	1860	1130	14903	15269	1840
	-15	1472	19621	20329	1850	1308	17247	17773	1830	1253	16468	16973	1820	1143	14927	15296	1810
	-10	1485	19606	20319	1820	1320	17253	17784	1790	1265	16481	16990	1790	1156	14953	15422	1770
	-5	1497	19593	20312	1780	1332	17261	17796	1760	1278	16496	17010	1750	1168	14981	15454	1740
	0	1509	19609	20334	1750	1345	17294	17833	1730	1290	16533	17052	1720	1180	15029	15507	1710
	5	1521	19630	20360	1720	1356	17329	17873	1700	1302	16574	17097	1690	1192	15079	15561	1680
	10	1533	19650	20385	1690	1368	17364	17913	1670	1313	16613	17141	1660	1204	15128	15614	1650
13000	-54	1364	19203	19861	2180	1199	16704	17189	2150	1144	15884	16348	2140	1035	14265	14687	2130
	-35	1415	19081	19763	2000	1250	16686	17190	1980	1195	15900	16384	1970	1086	14346	14788	1960
	-30	1428	19055	19742	1960	1263	16685	17194	1940	1208	15907	16395	1930	1099	14369	14816	1920
	-25	1440	19029	19722	1920	1276	16683	17197	1900	1221	15913	16406	1890	1111	14390	14842	1880
	-20	1454	19008	19708	1880	1289	16686	17310	1860	1234	15923	16421	1850	1124	14414	14871	1840
	-15	1466	18988	19693	1850	1302	16687	17317	1820	1247	15931	16434	1820	1137	14437	14898	1800
	-10	1479	18972	19683	1810	1314	16693	17329	1790	1259	15944	16451	1780	1150	14460	14927	1770
	-5	1491	18960	19677	1780	1326	16700	17342	1760	1272	15958	16470	1750	1162	14489	14960	1740
	0	1503	18975	19697	1740	1339	16731	17379	1720	1284	15994	16617	1720	1174	14535	15011	1710
	5	1515	18994	19845	1710	1350	16765	17418	1690	1295	16033	16660	1690	1186	14583	15063	1680
	10	1527	19013	19870	1680	1362	16798	17456	1660	1307	16070	16703	1660	1197	14630	15114	1650
12500	-54	1350	17695	18459	2160	1186	15384	15963	2140	1131	14625	15179	2130	1021	13124	13543	2120
	-35	1401	17584	18375	1990	1236	15369	15971	1970	1181	14641	15218	1960	1072	13201	13729	1950
	-30	1414	17560	18358	1950	1249	15368	15975	1930	1194	14648	15230	1920	1084	13222	13756	1910
	-25	1426	17537	18341	1910	1262	15367	15980	1890	1207	14654	15242	1880	1097	13242	13782	1870
	-20	1439	17517	18329	1870	1274	15369	16094	1850	1220	14662	15257	1840	1110	13264	13810	1830
	-15	1452	17498	18316	1830	1287	15370	16102	1810	1232	14670	15271	1810	1122	13285	13836	1790
	-10	1464	17484	18309	1800	1299	15375	16113	1780	1244	14682	15288	1770	1135	13309	13866	1760
	-5	1476	17473	18426	1760	1311	15382	16127	1740	1257	14695	15306	1740	1147	13334	13896	1730
	0	1488	17485	18445	1730	1323	15410	16161	1710	1269	14727	15449	1710	1159	13376	13943	1700
	5	1500	17501	18468	1700	1335	15439	16197	1680	1280	14761	15490	1680	1171	13418	13991	1670
	10	1509	17517	18491	1670	1345	15468	16232	1650	1290	14795	15529	1650	1181	13460	14038	1640

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Figure 4-29* (Sheet 1 of 30)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - UP SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
12000	-54	1337	16312	17182	2150	1173	14173	14845	2130	1118	13470	14114	2120	1008	12079	12579	2100
	-35	1387	16211	17111	1970	1222	14161	14859	1950	1168	13486	14157	1950	1058	12151	12674	1940
	-30	1400	16189	17097	1930	1235	14160	14865	1910	1180	13492	14169	1910	1071	12170	12699	1900
	-25	1412	16167	17083	1890	1248	14159	14871	1880	1193	13498	14182	1870	1083	12189	12724	1860
	-20	1425	16150	17073	1860	1260	14160	14880	1840	1205	13506	14197	1830	1096	12208	12749	1820
	-15	1437	16134	17065	1820	1273	14162	14888	1800	1218	13514	14211	1800	1108	12229	12775	1780
	-10	1449	16118	17057	1780	1285	14166	14899	1770	1230	13524	14228	1760	1120	12251	12898	1750
	-5	1461	16108	17054	1750	1297	14173	15020	1730	1242	13536	14246	1730	1132	12274	12927	1720
	0	1473	16118	17194	1720	1309	14197	15052	1700	1254	13565	14281	1700	1144	12312	12971	1690
	5	1485	16132	17215	1690	1320	14223	15085	1670	1265	13595	14318	1670	1156	12350	13016	1660
	10	1496	16145	17236	1660	1332	14249	15118	1640	1277	13625	14461	1640	1167	12388	13060	1630
11500	-54	1324	15039	15903	2140	1160	13059	13726	2110	1105	12407	13046	2110	995	11117	11612	2090
	-35	1374	14947	15956	1960	1209	13048	13845	1940	1154	12423	13088	1940	1045	11185	11793	1930
	-30	1386	14926	15945	1920	1222	13047	13851	1900	1167	12429	13101	1900	1057	11203	11818	1890
	-25	1397	14906	15934	1880	1233	13046	13858	1860	1178	12434	13113	1860	1068	11220	11842	1850
	-20	1411	14890	15926	1840	1247	13048	13868	1830	1192	12442	13229	1820	1082	11239	11868	1810
	-15	1423	14874	15918	1810	1259	13050	13876	1790	1204	12449	13243	1790	1094	11258	11893	1780
	-10	1435	14862	15914	1770	1271	13054	13888	1760	1216	12458	13260	1750	1106	11278	11919	1740
	-5	1447	14852	15912	1740	1283	13060	13901	1720	1228	12470	13279	1720	1118	11299	11947	1710
	0	1459	14860	15929	1710	1294	13081	13930	1690	1240	12495	13311	1690	1130	11333	11987	1680
	5	1470	14872	15948	1680	1306	13105	13960	1660	1251	12522	13345	1660	1141	11368	12028	1650
	10	1482	14883	15967	1650	1317	13128	13990	1630	1262	12549	13379	1630	1153	11406	12072	1620
11000	-54	1312	13864	14834	2120	1147	12030	12792	2100	1093	11426	12061	2100	983	10229	10807	2080
	-35	1360	13780	14783	1950	1196	12021	12813	1930	1141	11442	12201	1930	1031	10293	10897	1920
	-30	1373	13761	14773	1910	1209	12021	12820	1890	1154	11447	12214	1890	1044	10310	10921	1880
	-25	1386	13743	14764	1870	1221	12020	12827	1860	1166	11453	12227	1850	1056	10327	10944	1840
	-20	1397	13728	14757	1830	1232	12022	12836	1820	1178	11459	12241	1810	1068	10344	10968	1800
	-15	1410	13713	14750	1800	1245	12023	12844	1780	1191	11466	12255	1780	1081	10361	10992	1770
	-10	1422	13701	14868	1760	1257	12027	12855	1750	1202	11475	12271	1740	1093	10380	11017	1730
	-5	1434	13692	14867	1730	1269	12032	12977	1720	1214	11485	12288	1710	1105	10399	11042	1700
	0	1445	13699	14883	1700	1281	12051	13004	1680	1226	11508	12319	1680	1116	10430	11177	1670
	5	1456	13708	14901	1670	1292	12072	13032	1650	1237	11532	12350	1650	1127	10462	11215	1640
	10	1468	13718	14919	1640	1303	12092	13060	1630	1248	11556	12488	1620	1139	10493	11253	1610
10500	-54	1299	12776	13741	2110	1134	11078	11835	2090	1080	10519	11244	2090	970	9409	9983	2080
	-35	1348	12699	13697	1940	1184	11071	11858	1920	1129	10536	11291	1920	1019	9469	10069	1910
	-30	1361	12681	13689	1900	1196	11070	11865	1880	1141	10539	11301	1880	1032	9486	10092	1870
	-25	1373	12665	13798	1860	1208	11070	11872	1850	1154	10544	11314	1840	1044	9500	10114	1830
	-20	1385	12651	13794	1820	1220	11071	11987	1810	1166	10550	11328	1810	1056	9517	10136	1800
	-15	1397	12637	13789	1790	1232	11073	11996	1770	1178	10557	11342	1770	1068	9532	10253	1760
	-10	1409	12626	13787	1750	1244	11076	12008	1740	1189	10565	11356	1740	1080	9550	10277	1730
	-5	1420	12618	13788	1720	1256	11081	12021	1710	1201	10574	11373	1700	1091	9568	10302	1690
	0	1432	12623	13802	1690	1267	11098	12046	1680	1213	10595	11506	1670	1103	9596	10337	1660
	5	1443	12631	13818	1660	1278	11116	12072	1650	1224	10617	11536	1640	1114	9624	10373	1630
	10	1454	12639	13835	1630	1290	11135	12097	1620	1235	10638	11565	1610	1125	9652	10407	1610
10000	-54	1289	11766	12727	2100	1124	10195	10949	2080	1069	9677	10399	2080	960	8649	9220	2070
	-35	1336	11695	12805	1930	1172	10189	10972	1920	1117	9692	10443	1910	1007	8705	9302	1900
	-30	1349	11679	12799	1890	1184	10188	10979	1880	1129	9696	10455	1870	1020	8720	9323	1860
	-25	1361	11664	12793	1850	1196	10188	11091	1840	1141	9701	10467	1830	1032	8734	9344	1820
	-20	1373	11651	12789	1820	1208	10190	11101	1800	1153	9707	10481	1800	1044	8749	9459	1790
	-15	1385	11638	12786	1780	1220	10191	11110	1770	1165	9713	10494	1760	1056	8764	9481	1750
	-10	1396	11628	12785	1750	1232	10194	11121	1730	1177	9720	10508	1730	1067	8778	9502	1720
	-5	1408	11620	12785	1710	1243	10198	11134	1700	1188	9729	10628	1700	1079	8797	9528	1690
	0	1419	11625	12799	1680	1255	10214	11157	1670	1200	9748	10655	1670	1090	8822	9560	1660
	5	1430	11632	12814	1650	1266	10230	11181	1640	1211	9767	10682	1640	1101	8848	9592	1630
	10	1441	11638	12829	1620	1277	10246	11204	1610	1222	9787	10709	1610	1112	8874	9625	1600
9500	-54	1278	10825	11783	2090	1113	9373	10124	2080	1058	8891	9611	2070	949	7943	8512	2060
	-35	1325	10761	11752	1920	1161	9368	10149	1910	1106	8908	9657	1900	996	7995	8590	1900
	-30	1339	10746	11862	1880	1175	9368	10156	1870	1120	8913	9669	1860	1010	8009	8610	1860
	-25	1349	10732	11858	1840	1185	9368	10268	1830	1130	8918	9681	1830	1020	8022	8630	1820
	-20	1361	10720	11855	1810	1197	9369	10278	1790	1142	8923	9694	1790	1032	8037	8744	1780
	-15	1373	10709	11852	1770	1208	9370	10287	1760	1154	8928	9706	1760	1044	8050	8765	1750
	-10	1385	10699	11852	1740	1220	9373	10298	1730	1165	8935	9720	1720	1055	8065	8786	1710
	-5	1398	10692	11854	1700	1233	9378	10310	1690	1178	8943	9735	1690	1068	8080	8809	1680
	0	1407	10696	11866	1670	1243	9391	10331	1660	1188	8960	9864	1660	1078	8103	8839	1650
	5	1418	10701	11880	1640	1253	9406	10353	1630	1199	8978	9889	1630	1089	8127	8869	1620
	10	1429	10707	11893	1610	1264	9420	10375	1600	1209	8995	9914	1600	1100	8150	8898	1590

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Figure 4-29* (Sheet 2)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - UP 1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
13870	-54	1410	22205	22542	2200	1246	19375	19674	2170	1191	18448	18735	2160	1081	16620	16881	2140
	-35	1463	22056	22405	2020	1299	19346	19657	1990	1244	18458	18756	1980	1134	16704	16978	1970
	-30	1477	22023	22375	1980	1312	19341	19655	1950	1257	18462	18764	1940	1148	16727	17003	1930
	-25	1490	21993	22348	1930	1326	19339	19656	1910	1271	18469	18774	1900	1161	16751	17030	1890
	-20	1504	21967	22325	1900	1339	19339	19659	1870	1284	18477	18785	1860	1174	16776	17058	1850
	-15	1517	21942	22424	1860	1352	19339	19662	1840	1297	18486	18796	1830	1188	16800	17086	1810
	-10	1530	21922	22409	1820	1365	19343	19670	1800	1310	18498	18812	1790	1201	16827	17116	1780
	-5	1542	21922	22412	1790	1378	19364	19693	1770	1323	18525	18842	1760	1213	16868	17159	1750
	0	1555	21937	22432	1760	1390	19398	19730	1730	1336	18565	18884	1730	1226	16919	17213	1710
	5	1567	21953	22451	1720	1403	19431	19766	1700	1348	18604	18926	1700	1238	16969	17266	1680
	10	1580	22197	22699	1700	1415	19661	19999	1680	1360	18830	19155	1670	1250	17186	17486	1660
13600	-54	1403	21227	21675	2190	1238	18518	18915	2160	1183	17630	18011	2150	1073	15878	16137	2130
	-35	1455	21086	21550	2010	1291	18491	18905	1980	1236	17640	18037	1970	1126	15960	16231	1960
	-30	1469	21054	21522	1970	1304	18487	18905	1940	1249	17645	18046	1930	1140	15981	16256	1920
	-25	1482	21026	21498	1930	1318	18485	18907	1900	1263	17651	18057	1890	1153	16004	16377	1880
	-20	1495	21001	21477	1890	1331	18485	18911	1860	1276	17659	18069	1860	1166	16028	16404	1840
	-15	1508	20977	21457	1850	1344	18485	18915	1830	1289	17667	18081	1820	1179	16052	16432	1810
	-10	1521	20958	21565	1810	1357	18489	18923	1790	1302	17679	18096	1790	1192	16078	16462	1770
	-5	1534	20957	21569	1780	1369	18508	18946	1760	1315	17705	18126	1750	1205	16116	16504	1740
	0	1546	20971	21588	1750	1382	18540	18982	1730	1327	17742	18167	1720	1217	16164	16556	1710
	5	1559	20986	21606	1720	1394	18571	19016	1700	1339	17778	18207	1690	1230	16212	16607	1680
	10	1571	21213	21838	1690	1406	18786	19235	1670	1351	17989	18422	1660	1242	16415	16814	1650
13400	-54	1397	20534	21094	2180	1232	17910	18307	2150	1177	17050	17430	2140	1068	15352	15698	2120
	-35	1449	20399	20978	2000	1285	17885	18297	1980	1230	17061	17456	1970	1120	15432	15794	1950
	-30	1463	20368	20953	1960	1298	17881	18403	1940	1243	17065	17465	1930	1134	15453	15819	1910
	-25	1476	20346	20936	1920	1311	17879	18407	1900	1257	17072	17476	1890	1147	15475	15846	1870
	-20	1489	20317	20912	1880	1325	17880	18412	1860	1270	17080	17487	1850	1160	15499	15873	1840
	-15	1502	20293	20893	1840	1338	17880	18417	1820	1283	17088	17499	1820	1173	15521	15900	1800
	-10	1515	20275	20880	1810	1350	17884	18426	1790	1296	17099	17515	1780	1186	15547	15929	1770
	-5	1528	20274	20884	1770	1363	17902	18449	1750	1308	17123	17649	1750	1199	15583	15970	1730
	0	1540	20287	20901	1740	1375	17932	18484	1720	1321	17159	17690	1720	1211	15630	16020	1700
	5	1552	20300	20919	1710	1388	17962	18518	1690	1333	17194	17729	1690	1223	15675	16069	1670
	10	1564	20515	21265	1680	1400	18166	18726	1660	1345	17394	17934	1660	1235	15869	16266	1640
13200	-54	1390	19866	20424	2170	1225	17325	17820	2140	1171	16491	16966	2140	1061	14844	15189	2120
	-35	1443	19736	20431	2000	1279	17301	17816	1970	1224	16502	16997	1960	1114	14923	15284	1950
	-30	1457	19707	20408	1950	1292	17298	17818	1930	1237	16507	17006	1920	1128	14944	15308	1910
	-25	1470	19681	20388	1910	1305	17296	17821	1890	1251	16513	17018	1880	1141	14967	15336	1870
	-20	1483	19658	20370	1880	1319	17296	17826	1850	1264	16521	17030	1850	1154	14988	15456	1830
	-15	1496	19635	20354	1840	1331	17297	17832	1820	1277	16529	17043	1810	1167	15010	15483	1800
	-10	1509	19617	20342	1800	1344	17301	17840	1780	1289	16540	17059	1780	1180	15035	15513	1760
	-5	1521	19616	20346	1770	1357	17318	17863	1750	1302	16563	17087	1740	1192	15070	15553	1730
	0	1534	19628	20364	1740	1369	17346	17896	1720	1314	16597	17126	1710	1205	15115	15602	1700
	5	1546	19640	20382	1710	1381	17375	17929	1690	1326	16630	17164	1680	1217	15158	15650	1670
	10	1558	19844	20591	1680	1393	17568	18240	1660	1339	16821	17359	1650	1229	15342	15839	1640
13000	-54	1386	19224	19892	2160	1221	16761	17254	2140	1166	15953	16425	2130	1057	14356	14787	2110
	-35	1438	19098	19790	1990	1273	16739	17252	1970	1218	15964	16456	1960	1109	14432	14883	1940
	-30	1451	19070	19768	1950	1286	16735	17359	1930	1232	15968	16466	1920	1122	14453	14909	1900
	-25	1464	19044	19749	1910	1300	16734	17364	1890	1245	15975	16477	1880	1135	14474	14935	1870
	-20	1477	19022	19732	1870	1313	16734	17370	1850	1258	15982	16490	1840	1148	14496	14962	1830
	-15	1490	19000	19716	1830	1325	16734	17376	1810	1271	15990	16502	1810	1161	14517	14988	1790
	-10	1503	18983	19705	1800	1338	16738	17386	1780	1283	16000	16518	1770	1174	14541	15017	1760
	-5	1515	18981	19709	1760	1351	16755	17408	1740	1296	16023	16651	1740	1186	14575	15056	1730
	0	1528	18992	19850	1730	1363	16782	17441	1710	1308	16055	16689	1710	1198	14618	15103	1690
	5	1540	19003	19868	1700	1375	16808	17473	1680	1320	16087	16727	1680	1210	14659	15149	1660
	10	1552	19197	20067	1670	1387	16993	17662	1650	1332	16268	16913	1650	1222	14835	15329	1640
12500	-54	1372	17712	18488	2150	1207	15435	16024	2120	1153	14687	15251	2120	1043	13207	13634	2100
	-35	1423	17598	18401	1970	1259	15416	16028	1950	1204	14699	15286	1950	1094	13280	13818	1930
	-30	1436	17572	18383	1930	1272	15413	16137	1910	1217	14703	15297	1910	1107	13299	13843	1890
	-25	1449	17549	18367	1890	1285	15412	16143	1870	1230	14709	15309	1870	1120	13319	13869	1850
	-20	1462	17528	18353	1860	1298	15412	16150	1840	1243	14716	15322	1830	1133	13339	13895	1820
	-15	1475	17508	18461	1820	1311	15412	16157	1800	1256	14723	15335	1790	1146	13359	13921	1780
	-10	1488	17493	18453	1780	1323	15416	16167	1770	1268	14733	15350	1760	1159	13381	13949	1750
	-5	1500	17490	18458	1750	1335	15431	16189	1730	1281	14753	15483	1730	1171	13412	13985	1720
	0	1512	17499	18475	1720	1348	15455	16219	1700	1293	14782	15518	1700	1183	13451	14030	1680
	5	1524	17508	18491	1690	1360	15479	16249	1670	1305	14811	15553	1670	1195	13488	14072	1650
	10	1536	17678	18668	1660	1371	15641	16418	1640	1317	14971	15719	1640	1207	13644	14234	1630

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Figure 4-29* (Sheet 3)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - UP 1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1360	16326	17210	2130	1195	14219	14903	2110	1140	13526	14181	2100	1030	12154	12665	2090
	-35	1409	16222	17136	1960	1245	14202	14914	1940	1190	13538	14221	1940	1080	12222	12756	1920
	-30	1422	16196	17119	1920	1258	14200	14918	1900	1203	13542	14232	1900	1093	12240	12780	1880
	-25	1435	16177	17108	1880	1271	14199	14924	1860	1216	13548	14245	1860	1106	12259	12804	1840
	-20	1448	16158	17096	1840	1283	14200	14931	1830	1229	13557	14260	1820	1119	12278	12924	1810
	-15	1461	16140	17086	1810	1296	14200	15047	1790	1241	13561	14271	1780	1131	12297	12949	1770
	-10	1473	16125	17201	1770	1308	14203	15058	1760	1254	13571	14287	1750	1144	12317	12976	1740
	-5	1485	16123	17207	1740	1321	14216	15079	1720	1266	13589	14312	1720	1156	12345	13011	1710
	0	1497	16130	17223	1710	1333	14238	15108	1690	1278	13615	14344	1690	1168	12380	13053	1680
	5	1509	16137	17238	1680	1344	14259	15136	1660	1290	13640	14485	1660	1180	12414	13093	1650
	10	1521	16287	17395	1650	1356	14403	15287	1630	1301	13783	14634	1630	1192	12553	13238	1620
11500	-54	1346	15051	16042	2120	1181	13100	13879	2100	1126	12458	13108	2090	1016	11186	11779	2080
	-35	1396	14956	15981	1950	1231	13086	13896	1930	1176	12470	13147	1930	1067	11250	11870	1910
	-30	1409	14934	15968	1910	1244	13084	13902	1890	1189	12474	13260	1890	1080	11267	11894	1870
	-25	1421	14915	15958	1870	1257	13083	13909	1850	1202	12480	13273	1850	1092	11284	11918	1840
	-20	1434	14897	15949	1830	1269	13084	13917	1820	1215	12486	13287	1810	1105	11302	11943	1800
	-15	1446	14880	15941	1800	1282	13084	13925	1780	1227	12492	13301	1770	1117	11319	11967	1760
	-10	1459	14867	15936	1760	1294	13087	13936	1750	1239	12501	13317	1740	1130	11338	11992	1730
	-5	1471	14864	15941	1730	1306	13099	13955	1710	1251	12517	13341	1710	1142	11364	12025	1700
	0	1483	14870	15955	1700	1318	13118	13981	1680	1263	12541	13372	1680	1154	11396	12063	1670
	5	1494	14876	15969	1670	1330	13137	14007	1650	1275	12563	13401	1650	1165	11427	12100	1640
	10	1506	15008	16235	1640	1341	13265	14255	1620	1286	12690	13535	1620	1177	11551	12331	1610
11000	-54	1333	13874	14859	2110	1168	12067	12842	2090	1114	11472	12214	2080	1004	10292	10882	2070
	-35	1383	13787	14806	1940	1218	12055	12860	1920	1163	11484	12257	1920	1054	10353	10969	1900
	-30	1393	13767	14795	1900	1229	12053	12866	1880	1174	11488	12269	1880	1065	10368	10991	1870
	-25	1408	13749	14786	1860	1243	12053	12874	1840	1189	11494	12282	1840	1079	10385	11015	1830
	-20	1420	13733	14899	1820	1256	12054	12882	1810	1201	11500	12296	1800	1091	10402	11038	1790
	-15	1433	13718	14893	1790	1268	12054	12999	1770	1213	11506	12309	1770	1104	10418	11061	1760
	-10	1445	13705	14890	1750	1280	12057	13010	1740	1226	11513	12324	1730	1116	10435	11182	1720
	-5	1457	13702	14896	1720	1292	12067	13029	1700	1237	11528	12347	1700	1128	10459	11213	1690
	0	1469	13707	14910	1690	1304	12085	13054	1670	1249	11549	12375	1670	1139	10488	11249	1660
	5	1480	13712	14924	1660	1316	12101	13078	1640	1261	11570	12511	1640	1151	10516	11284	1630
	10	1492	13829	15049	1630	1327	12215	13199	1610	1272	11683	12631	1610	1162	10627	11401	1600
10500	-54	1321	12784	13764	2100	1156	11111	11882	2080	1101	10560	11298	2070	992	9467	10053	2060
	-35	1372	12705	13836	1930	1207	11102	11902	1910	1152	10573	11341	1910	1042	9524	10136	1900
	-30	1383	12686	13828	1890	1218	11100	12014	1870	1163	10577	11353	1870	1054	9538	10157	1860
	-25	1395	12670	13821	1850	1231	11100	12022	1830	1176	10582	11365	1830	1066	9555	10275	1820
	-20	1407	12655	13816	1810	1243	11100	12032	1800	1188	10587	11379	1790	1078	9569	10296	1780
	-15	1420	12641	13811	1780	1255	11101	12040	1760	1200	10593	11391	1760	1090	9584	10319	1750
	-10	1432	12630	13809	1740	1267	11103	12051	1730	1212	10600	11406	1720	1103	9600	10342	1720
	-5	1443	12626	13815	1710	1279	11113	12069	1700	1224	10614	11533	1690	1114	9622	10371	1680
	0	1455	12630	13827	1680	1291	11128	12092	1670	1236	10632	11560	1660	1126	9648	10405	1650
	5	1466	12634	13840	1650	1302	11143	12115	1640	1247	10651	11586	1630	1137	9674	10437	1620
	10	1478	12738	14078	1620	1313	11245	12223	1610	1258	10752	11694	1600	1149	9773	10543	1600
10000	-54	1309	11772	12748	2090	1145	10224	10990	2070	1090	9715	10449	2060	980	8702	9284	2050
	-35	1358	11700	12827	1920	1193	10216	11118	1900	1139	9727	10492	1900	1029	8755	9364	1890
	-30	1370	11683	12820	1880	1206	10215	11125	1860	1151	9731	10503	1860	1041	8769	9478	1850
	-25	1383	11668	12815	1840	1219	10215	11134	1830	1164	9736	10516	1820	1054	8783	9499	1810
	-20	1395	11655	12810	1800	1230	10216	11143	1790	1176	9741	10528	1790	1066	8798	9521	1780
	-15	1407	11642	12807	1770	1242	10216	11152	1750	1188	9746	10645	1750	1078	8812	9543	1740
	-10	1419	11631	12805	1730	1254	10219	11162	1720	1200	9753	10660	1720	1090	8827	9565	1710
	-5	1431	11628	12811	1700	1266	10227	11179	1690	1211	9765	10681	1680	1102	8847	9592	1680
	0	1442	11635	12827	1670	1278	10241	11200	1660	1223	9782	10706	1650	1113	8870	9623	1650
	5	1453	11634	12834	1640	1289	10254	11221	1630	1234	9799	10730	1620	1124	8893	9653	1620
	10	1465	11726	13061	1610	1300	10345	11433	1600	1245	9889	10827	1600	1135	8983	9748	1590
9500	-54	1298	10830	11803	2080	1134	9401	10165	2060	1079	8929	9661	2060	969	7991	8572	2050
	-35	1347	10764	11888	1910	1182	9393	10292	1900	1127	8941	9702	1890	1017	8041	8648	1880
	-30	1359	10749	11882	1870	1194	9392	10300	1860	1139	8944	9714	1850	1030	8054	8760	1840
	-25	1372	10736	11878	1830	1207	9393	10308	1820	1152	8949	9726	1810	1042	8067	8781	1810
	-20	1383	10723	11875	1790	1219	9393	10317	1780	1164	8954	9738	1780	1054	8080	8801	1770
	-15	1395	10711	11873	1760	1231	9394	10326	1750	1176	8959	9750	1740	1066	8094	8822	1740
	-10	1407	10701	11872	1730	1242	9396	10336	1710	1188	8965	9869	1710	1078	8108	8843	1700
	-5	1419	10698	11878	1690	1254	9404	10352	1680	1199	8976	9889	1680	1089	8126	8869	1670
	0	1431	10701	11889	1660	1267	9416	10372	1650	1212	8992	9912	1650	1102	8148	8897	1640
	5	1441	10703	11899	1630	1276	9428	10391	1620	1222	9006	9934	1620	1112	8169	8925	1610
	10	1452	10785	12116	1600	1288	9509	10480	1590	1233	9087	10022	1590	1123	8249	9011	1580

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Figure 4-29* (Sheet 4)

SINGLE-ENGINE TAKEOFF FLIGHT PATH - FLAPS 15° FIRST AND SECOND SEGMENTS

Knowing weight, altitude, temperature, wind, obstacle height above runway surface and the obstacle distance from "reference zero", at the airport pressure altitude plus the takeoff climb increment (TCI) from Figure 4-32 or 4-33, determine the available climb gradient from Figure 4-40 or 4-41. Using this climb gradient, the required horizontal distance can be determined from Figure 4-30. If this required horizontal distance is less than the horizontal distance to the obstacle, the takeoff weight determined by other limitations is satisfactory; otherwise, the weight must be reduced to correspond with the required horizontal distance.

EXAMPLE:

Flaps = 15°
Anti-Ice Systems = OFF
Ambient Temperature at Airport = 45°C
Pressure Altitude at Airport = SEA LEVEL
Gross Weight at Brake Release = 10,500 POUNDS
Wind = 30 KNOTS HEADWIND
A. Obstacle Height = 200 feet above runway surface
B. Obstacle Horizontal Distance from Reference Zero = 4000 FEET

From Figure 4-32, the takeoff climb increment (TCI) above the runway surface is 1470 feet. The pressure altitude at the airport plus the takeoff climb increment (TCI) is 1470 feet.

From Figure 4-40, the available climb gradient at a pressure altitude of 1470 feet under the specific conditions is 8.0 percent.

From Figure 4-30, for 8.0 percent gradient, the required horizontal distance to clear the obstacle is 2460 feet.

The obstacle can be cleared since the horizontal distance to the obstacle (4000 feet) is greater than the required horizontal distance to clear the obstacle (2460 feet).

SINGLE-ENGINE TAKEOFF FLIGHT PATH TO 1500 FEET
FIRST AND SECOND SEGMENT FLAPS - 15°

CONDITIONS: Landing Gear - DOWN/UP
Speedbrakes - RETRACT
Airspeed - V_2
Inoperative Engine - WINDMILLING
Operative Engine - TAKEOFF THRUST

SECOND SEGMENT GRADIENT AT PRESSURE ALTITUDE AT AIRPORT PLUS TAKEOFF CLIMB INCREMENT - PERCENT													
HEIGHT ABOVE RUNWAY FT	16	14	12	11	10	9	8	7	6	5	4	3	2
	REQUIRED HORIZONTAL DISTANCE FROM REFERENCE ZERO - FEET												
50	110	130	150	170	190	220	250	300	370	490	720	1360	2240
100	470	550	660	730	820	940	1090	1300	1610	1920	2390	3170	4740
150	840	970	1170	1290	1450	1640	1840	2100	2440	2920	3640	4840	7240
200	1200	1400	1660	1800	1980	2200	2460	2810	3270	3920	4890	6510	9740
250	1560	1780	2070	2260	2480	2750	3090	3530	4110	4920	6140	8170	12240
300	1880	2140	2490	2710	2980	3310	3710	4240	4940	5920	7390	9840	14740
350	2190	2500	2910	3170	3480	3860	4340	4950	5770	6920	8640	11510	17240
400	2500	2850	3320	3620	3980	4420	4960	5670	6610	7920	9890	13170	19740
450	2810	3210	3740	4080	4480	4970	5590	6380	7440	8920	11140	14840	22240
500	3130	3570	4160	4530	4980	5530	6210	7100	8270	9920	12390	16510	24740
550	3440	3920	4570	4980	5480	6080	6840	7810	9110	10920	13640	18170	27240
600	3750	4280	4990	5440	5980	6640	7460	8530	9940	11920	14890	19840	29740
650	4060	4640	5410	5890	6480	7200	8090	9240	10770	12920	16140	21510	32240
700	4380	5000	5820	6350	6980	7750	8710	9950	11610	13920	17390	23170	34740
750	4690	5350	6240	6800	7480	8310	9340	10670	12440	14920	18640	24840	37240
800	5000	5710	6660	7260	7980	8860	9960	11380	13270	15920	19890	26510	39740
850	5310	6070	7070	7710	8480	9420	10590	12100	14110	16920	21140	28170	42240
900	5630	6420	7490	8170	8980	9970	11210	12810	14940	17920	22390	29840	44740
950	5940	6780	7910	8620	9480	10530	11840	13530	15770	18920	23640	31510	47240
1000	6250	7140	8320	9080	9980	11080	12460	14240	16610	19920	24890	33170	49740
1050	6560	7500	8740	9530	10480	11640	13090	14950	17440	20920	26140	34840	52240
1100	6880	7850	9160	9980	10980	12200	13710	15670	18270	21920	27390	36510	54740
1150	7190	8210	9570	10440	11480	12750	14340	16380	19110	22920	28640	38170	57240
1200	7500	8570	9990	10890	11980	13310	14960	17100	19940	23920	29890	39840	59740
1250	7810	8920	10410	11350	12480	13860	15590	17810	20770	24920	31140	41510	62240
1300	8130	9280	10820	11800	12980	14420	16210	18530	21610	25920	32390	43170	64740
1350	8440	9640	11240	12260	13480	14970	16840	19240	22440	26920	33640	44840	67240
1400	8750	10000	11660	12710	13980	15530	17460	19950	23270	27920	34890	46510	69740
1450	9060	10350	12070	13170	14480	16080	18090	20670	24110	28920	36140	48170	72240
1500	9380	10710	12490	13620	14980	16640	18710	21380	24940	29920	37390	49840	74740

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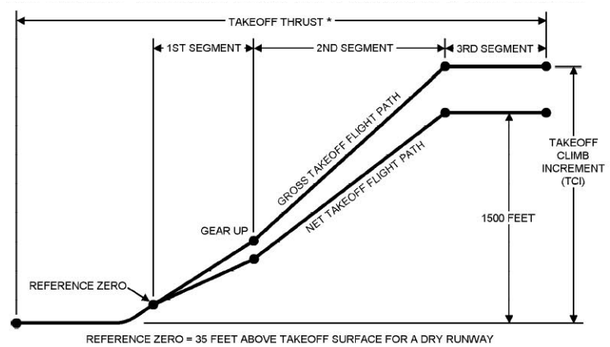
Figure 4-30*

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES - FLAPS 15°

The data presented in Figure 4-32 (Anti-ice off) and 4-33 (Anti-ice on) is included for the purpose of determining the takeoff climb increment (TCI) and the horizontal distances along the net takeoff flight path. The net takeoff flight path is used to plan obstacle clearance.



*** TAKEOFF THRUST IS LIMITED TO TEN MINUTES MAXIMUM AND THEREAFTER TO MAXIMUM CONTINUOUS THRUST.**

CONDITIONS

SINGLE-ENGINE FLIGHT PATH CONDITIONS:			
	FIRST SEGMENT	SECOND SEGMENT	THIRD SEGMENT
LANDING GEAR WING FLAP DEGREES SPEED BRAKES INOPERATIVE ENGINE OPERATIVE ENGINE AIRSPEED	DOWN TRANSITION TO UP 15 RETRACT WINDMILLING T.O. THRUST V_2	UP 15 RETRACT WINDMILLING T.O. THRUST V_2	UP 15 TRANSITIONING TO 0 RETRACT WINDMILLING T.O. THRUST V_2 TRANSITIONING TO V_{ENR}

EXAMPLE:

Flaps = 15°
Anti-Ice = OFF
Pressure Altitude at Airport = 4000 FEET
Gross Weight at Brake Release = 10,500 POUNDS
Ambient Temperature at Airport = 10°C
Wind = 10 KNOTS (HEADWIND)
Airport Barometric Altitude = 3925 FEET MSL

Horizontal Distance and Takeoff Climb Increment from Figure 4-32
Reference Zero to End of First Segment = 1174 FEET
Reference Zero to End of Second Segment = 12,209 FEET
Reference Zero to End of Third Segment = 14,711 FEET
Takeoff Climb Increment (TCI) = 1580 FEET

Calculate the level off altitude by adding the takeoff climb increment to the airport barometric altitude.
3925 + 1580 = 5505 FEET.

Figure 4-31

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1253	24707	27447	2240	1088	21132	23169	2200	1034	19967	21823	2190	924	17676	19196	2160
	10	1402	24298	27583	1720	1237	21150	23769	1700	1182	20122	22643	1690	1073	18094	20222	1670
	15	1412	24364	27671	1690	1248	21232	23984	1670	1193	20206	22748	1660	1083	18188	20233	1650
	20	1423	24424	27880	1670	1259	21305	24077	1640	1204	20286	22847	1630	1094	18276	20339	1620
	25	1434	24782	28380	1640	1269	21627	24413	1620	1214	20596	23281	1610	1105	18566	20845	1590
	30	1444	28222	32451	1640	1280	24596	27950	1610	1225	23415	26426	1600	1115	21095	23674	1590
	35	1454	33841	38819	1660	1290	29418	33448	1620	1235	27984	31646	1610	1125	25175	28255	1590
	40	1464	42699	49058	1690	1299	36949	41994	1650	1244	35099	39739	1640	1135	31493	35374	1610
	45	1473	55714	64085	1760	1309	47846	54358	1700	1254	45343	51286	1690	1144	40505	45490	1650
	50	1483	77257	88907	1890	1318	65440	74452	1800	1264	61757	69884	1780	1154	54735	61535	1730
	54	1491	106149	122105	2070	1327	88126	100215	1940	1272	82674	93544	1900	1162	72479	81407	1830
13600	-54	1242	23494	26221	2220	1078	20082	22206	2190	1023	18970	20909	2180	913	16779	18289	2150
	10	1389	23105	26373	1710	1225	20100	22704	1690	1170	19117	21517	1680	1060	17180	19294	1670
	15	1401	23165	26581	1690	1236	20174	22798	1660	1181	19196	21614	1650	1072	17267	19400	1640
	20	1411	23221	26659	1660	1246	20244	23000	1630	1191	19270	21816	1630	1082	17349	19500	1610
	25	1421	23550	27130	1630	1257	20541	23426	1610	1202	19557	22227	1600	1092	17619	19883	1590
	30	1431	26702	30911	1630	1267	23264	26600	1600	1212	22143	25137	1590	1102	19939	22503	1580
	35	1441	31794	36750	1640	1277	27638	31649	1610	1222	26289	29933	1600	1112	23644	26707	1580
	40	1451	39671	45876	1670	1286	34349	39256	1630	1231	32639	37146	1620	1122	29282	33041	1600
	45	1460	50926	59014	1730	1296	43811	50186	1680	1241	41539	47349	1660	1131	37135	41996	1630
	50	1470	68743	79590	1830	1305	58484	66887	1750	1250	55262	63031	1730	1141	49085	55448	1690
	54	1478	90969	105355	1960	1313	76257	87158	1860	1258	71736	81690	1830	1149	63196	71377	1770
13400	-54	1234	22642	25358	2220	1070	19344	21459	2180	1015	18270	20202	2170	905	16148	17651	2150
	10	1380	22266	25522	1710	1216	19361	21954	1680	1161	18411	20800	1680	1051	16536	18542	1660
	15	1391	22322	25725	1680	1226	19431	22044	1660	1171	18485	20893	1650	1062	16619	18642	1630
	20	1401	22374	25800	1650	1237	19497	22243	1630	1182	18553	21089	1620	1072	16697	18838	1610
	25	1412	22685	26252	1620	1247	19778	22651	1600	1193	18827	21486	1590	1083	16953	19106	1580
	30	1422	25638	29832	1620	1258	22334	25658	1600	1203	21255	24348	1590	1093	19131	21685	1570
	35	1432	30384	35325	1630	1267	26411	30292	1600	1212	25119	28750	1590	1103	22586	25637	1570
	40	1441	37625	43814	1660	1277	32588	37480	1620	1222	30961	35455	1610	1112	27781	31527	1580
	45	1451	47781	55591	1700	1286	41148	47272	1660	1231	39024	44708	1640	1122	34901	39645	1610
	50	1460	63392	73835	1790	1295	54071	62227	1720	1241	51129	58546	1700	1131	45472	51614	1660
	54	1468	82072	95540	1900	1303	69160	79465	1810	1249	65157	74536	1780	1139	57553	65307	1730
13200	-54	1228	21810	24521	2210	1063	18628	20639	2170	1008	17588	19515	2160	899	15541	17126	2140
	10	1373	21450	24697	1700	1208	18646	21232	1680	1153	17728	20110	1670	1044	15916	17916	1660
	15	1383	21506	24900	1670	1218	18714	21431	1650	1163	17800	20200	1640	1054	15996	18012	1630
	20	1393	21558	24973	1640	1228	18778	21515	1620	1174	17868	20395	1610	1064	16072	18204	1600
	25	1403	21855	25410	1620	1238	19046	21909	1600	1183	18127	20776	1590	1074	16315	18560	1580
	30	1413	24635	28816	1610	1248	21450	24761	1590	1193	20410	23492	1580	1084	18363	20906	1560
	35	1422	29056	33982	1620	1258	25253	29121	1590	1203	24016	27635	1580	1093	21587	24627	1560
	40	1432	35726	41770	1640	1267	30950	35712	1610	1212	29405	33773	1600	1103	26383	30117	1570
	45	1441	44925	52591	1680	1277	38721	44714	1640	1222	36730	42267	1620	1112	32858	37485	1600
	50	1450	58696	68737	1760	1286	50171	57963	1690	1231	47470	54650	1680	1121	42261	48182	1640
	54	1458	74605	87281	1850	1293	63127	72836	1760	1238	59544	68459	1740	1129	52704	60028	1690
13000	-54	1224	20992	23591	2200	1060	17931	19941	2170	1005	16930	18761	2160	895	14957	16543	2130
	10	1369	20647	23894	1690	1204	17948	20534	1670	1149	17064	19446	1670	1039	15319	17319	1650
	15	1379	20699	23967	1670	1214	18013	20617	1640	1159	17132	19532	1640	1049	15394	17410	1620
	20	1389	20747	24162	1640	1224	18073	20695	1620	1169	17197	19614	1610	1060	15466	17498	1600
	25	1399	21025	24580	1610	1234	18325	21073	1590	1179	17441	19979	1580	1069	15695	17839	1570
	30	1403	23676	27843	1610	1239	20607	23907	1580	1184	19605	22564	1570	1074	17630	20163	1560
	35	1413	27804	32715	1610	1248	24160	28016	1580	1193	22974	26580	1570	1084	20643	23568	1560
	40	1422	33960	39989	1630	1258	29424	34172	1600	1203	27954	32309	1590	1093	25077	28695	1560
	45	1432	42320	49840	1660	1267	36500	42363	1620	1212	34628	40060	1610	1102	30983	35493	1580
	50	1441	54541	64178	1730	1276	46713	54259	1670	1221	44207	51148	1650	1112	39387	45088	1620
	54	1448	68237	80255	1800	1283	57929	67158	1730	1229	54692	63146	1710	1119	48490	55490	1660
12500	-54	1215	19109	21596	2180	1051	16323	18235	2150	996	15411	17148	2140	886	13608	15107	2120
	10	1358	18795	21918	1680	1194	16340	18814	1660	1139	15534	17809	1650	1029	13942	15843	1640
	15	1368	18839	21982	1650	1204	16395	18886	1630	1149	15593	17884	1620	1039	14008	15923	1610
	20	1378	18880	22042	1620	1214	16447	18956	1600	1159	15649	17957	1600	1049	14071	16002	1580
	25	1389	19116	22545	1600	1224	16663	19297	1580	1169	15859	18287	1570	1059	14269	16311	1560
	30	1388	21415	25441	1590	1223	18634	21807	1570	1168	17724	20672	1560	1058	15928	18348	1550
	35	1389	24961	29710	1590	1225	21676	25502	1560	1170	20604	24070	1560	1060	18494	21393	1540
	40	1398	30038	35773	1600	1234	26026	30627	1570	1179	24722	28935	1560	1069	22163	25651	1540
	45	1408	36702	43799	1620	1243	31689	37288	1590	1188	30070	35246	1580	1079	26906	31180	1550
	50	1417	45971	54799	1660	1252	39484	46415	1620	1197	37405	43755	1600	1088	33368	38627	1570
	54	1424	55711	66409	1710	1259	47572	55844	1660	1204	44987	52632	1640	1095	39997	46352	1600

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Figure 4-32* (Sheet 1 of 30)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1207	17424	19802	2160	1042	14884	16698	2130	987	14051	15694	2130	878	12405	13819	2110
	10	1349	17140	20140	1670	1184	14900	17264	1650	1129	14164	16333	1640	1020	12709	14512	1630
	15	1359	17177	20196	1640	1194	14951	17332	1620	1139	14215	16400	1610	1029	12766	14584	1600
	20	1368	17211	20249	1610	1204	14993	17390	1590	1149	14264	16464	1590	1039	12822	14654	1580
	25	1378	17413	20590	1580	1214	15179	17701	1570	1159	14446	16766	1560	1049	12994	14937	1550
	30	1376	19376	23152	1570	1212	16863	19811	1550	1157	16040	18770	1550	1047	14413	16735	1530
	35	1366	22463	27184	1570	1201	19490	23176	1550	1147	18518	21960	1540	1037	16602	19481	1530
	40	1375	26697	32271	1580	1210	23120	27460	1550	1155	21956	26030	1540	1045	19666	23025	1520
	45	1384	32090	38766	1590	1219	27717	33055	1560	1164	26300	31111	1550	1055	23523	27567	1530
	50	1393	39297	47582	1620	1228	33811	40251	1580	1173	32044	38033	1570	1063	28598	33523	1540
	54	1400	46507	56279	1650	1235	39851	47402	1600	1180	37721	44670	1590	1070	33586	39403	1560
11500	-54	1197	15910	18178	2140	1033	13587	15305	2120	978	12827	14473	2110	868	11320	12564	2100
	10	1340	15651	18406	1650	1175	13605	15860	1640	1120	12932	14996	1630	1010	11599	13306	1620
	15	1349	15682	18580	1630	1185	13646	15917	1610	1130	12976	15055	1600	1020	11650	13370	1590
	20	1357	15711	18627	1600	1193	13685	15972	1580	1138	13019	15113	1580	1029	11699	13433	1570
	25	1369	15886	18940	1570	1204	13847	16258	1560	1149	13177	15390	1550	1039	11850	13694	1540
	30	1366	17570	21097	1560	1202	15293	18132	1540	1147	14546	17172	1540	1037	13069	15191	1520
	35	1356	20175	24523	1550	1191	17511	20976	1530	1136	16638	19757	1530	1027	14916	17599	1510
	40	1351	23816	29233	1550	1186	20609	24808	1530	1131	19563	23390	1520	1022	17502	20737	1510
	45	1360	28233	34625	1560	1195	24383	29464	1530	1140	23131	27695	1530	1030	20673	24487	1510
	50	1368	33947	41690	1580	1204	29232	35302	1550	1149	27707	33225	1530	1039	24724	29318	1510
	54	1375	39443	48420	1600	1211	33866	40815	1560	1156	32070	38552	1550	1046	28570	33955	1520
11000	-54	1191	14541	16702	2130	1026	12419	14042	2110	972	11721	13276	2100	862	10340	11674	2090
	10	1331	14306	16941	1640	1166	12433	14470	1630	1111	11817	13778	1620	1002	10596	12208	1610
	15	1341	14332	16984	1610	1176	12469	14633	1600	1121	11856	13831	1590	1011	10641	12265	1590
	20	1350	14357	17152	1590	1186	12504	14682	1570	1131	11894	13883	1570	1021	10685	12322	1560
	25	1360	14508	17314	1560	1195	12645	14947	1550	1140	12032	14140	1540	1031	10817	12563	1530
	30	1357	15960	19368	1550	1193	13893	16509	1530	1138	13214	15624	1530	1028	11869	13895	1520
	35	1346	18171	22277	1540	1182	15774	19020	1520	1127	14990	18009	1510	1017	13437	15923	1500
	40	1334	21249	26280	1540	1170	18385	22353	1510	1115	17449	21165	1510	1005	15601	18630	1490
	45	1335	24960	31070	1540	1171	21544	26372	1510	1116	20430	24864	1510	1006	18240	21934	1490
	50	1344	29559	36765	1550	1180	25459	31161	1520	1125	24127	29290	1510	1015	21516	25889	1490
	54	1351	33845	42157	1560	1186	29087	35556	1530	1132	27548	33452	1510	1022	24539	29493	1490
10500	-54	1185	13298	15355	2120	1020	11357	12986	2100	965	10718	12184	2090	856	9452	10618	2080
	10	1324	13084	15603	1630	1159	11371	13303	1620	1104	10806	12667	1610	994	9687	11206	1610
	15	1333	13106	15640	1600	1168	11401	13459	1590	1113	10840	12713	1590	1004	9726	11357	1580
	20	1342	13127	15677	1580	1177	11431	13502	1560	1123	10873	12759	1560	1013	9764	11407	1550
	25	1350	13258	15945	1550	1185	11555	13749	1540	1130	10993	12998	1530	1021	9880	11531	1530
	30	1349	14516	17680	1540	1184	12636	15146	1520	1129	12017	14327	1520	1020	10792	12724	1510
	35	1337	16402	20267	1520	1173	14242	17271	1510	1118	13533	16342	1500	1008	12129	14421	1490
	40	1325	18980	23649	1520	1160	16429	20069	1500	1106	15593	18994	1490	996	13942	16784	1480
	45	1314	22125	27837	1520	1149	19085	23555	1500	1095	18092	22293	1490	985	16135	19616	1470
	50	1320	25896	32696	1520	1155	22295	27631	1500	1100	21122	26048	1490	991	18818	22866	1470
	54	1327	29295	36947	1530	1162	25182	31172	1500	1107	23847	29404	1490	998	21232	25865	1470
10000	-54	1191	12171	14029	2110	1026	10411	11765	2090	972	9832	11128	2080	862	8682	9693	2070
	10	1331	11978	14279	1620	1166	10425	12272	1610	1111	9913	11692	1610	1001	8896	10240	1600
	15	1340	11996	14311	1600	1175	10451	12311	1580	1120	9942	11733	1580	1011	8930	10284	1570
	20	1349	12014	14343	1570	1184	10477	12349	1560	1130	9970	11774	1550	1020	8964	10531	1540
	25	1358	12126	14591	1540	1193	10583	12463	1530	1138	10074	11886	1530	1029	9064	10638	1520
	30	1343	13213	16140	1530	1179	11506	13803	1510	1124	10944	13047	1510	1015	9829	11571	1500
	35	1329	14830	18326	1510	1165	12879	15691	1500	1110	12237	14838	1490	1000	10966	13169	1480
	40	1316	17002	21312	1500	1152	14722	18153	1490	1097	13974	17059	1480	987	12494	15148	1470
	45	1305	19600	24832	1500	1140	16918	21069	1480	1085	16040	19821	1470	976	14306	17502	1460
	50	1296	22786	29187	1500	1131	19602	24576	1480	1076	18562	23140	1470	966	16516	20346	1450
	54	1301	25519	32644	1500	1137	21929	27560	1470	1082	20760	25971	1470	972	18462	22776	1450
9500	-54	1198	11159	12817	2090	1034	9562	10836	2080	979	9035	10162	2070	869	7990	8932	2060
	10	1339	10985	13066	1620	1174	9575	11113	1600	1120	9110	10590	1600	1010	8186	9354	1590
	15	1348	11000	13094	1590	1184	9598	11372	1580	1129	9135	10625	1570	1019	8216	9492	1570
	20	1358	11015	13121	1560	1193	9620	11291	1550	1138	9160	10660	1550	1028	8245	9531	1540
	25	1367	11111	13354	1540	1202	9712	11391	1520	1147	9250	10980	1520	1037	8333	9625	1510
	30	1353	12047	14630	1520	1188	10508	12609	1510	1133	10000	11915	1500	1024	8993	10560	1490
	35	1323	13423	16685	1500	1158	11660	14260	1490	1104	11079	13475	1490	994	9928	11941	1480
	40	1308	15265	19213	1490	1144	13221	16443	1480	1089	12549	15433	1470	979	11219	13686	1460
	45	1297	17427	22310	1480	1132	15049	18884	1470	1077	14269	17744	1460	967	12728	15640	1450
	50	1286	20025	25825	1480	1121	17239	21787	1460	1066	16327	20493	1450	957	14529	18083	1440
	54	1279	22323	29061	1480	1114	19169	24450	1460	1059	18139	23013	1450	950	16112	20114	1430

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Figure 4-32* (Sheet 2)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1272	24728	27509	2220	1107	21205	23275	2190	1053	20056	21944	2170	943	17797	19346	2150
	15	1435	24436	27918	1680	1271	21337	24132	1660	1216	20325	22908	1650	1106	18329	20616	1640
	20	1446	25025	28778	1660	1282	21860	24784	1630	1227	20827	23534	1630	1117	18791	21194	1610
	25	1457	27209	31353	1650	1292	23757	27034	1620	1237	22632	25680	1610	1128	20420	22929	1600
	30	1467	31888	36796	1660	1302	27789	31638	1630	1248	26458	30058	1620	1138	23847	26868	1600
	35	1477	39238	45289	1680	1312	34072	38836	1650	1258	32404	36773	1630	1148	29147	32776	1610
	40	1487	50705	58536	1740	1322	43752	49890	1690	1267	41529	47109	1670	1158	37217	41862	1640
	45	1497	69482	80111	1850	1332	59272	67590	1770	1277	56063	63631	1750	1167	49910	56188	1710
	50	1507	104006	120013	2060	1342	86677	98798	1940	1287	81415	92427	1900	1178	71553	80496	1830
	51	1509	114715	152416	2130	1345	94831	108105	1990	1290	88866	100877	1950	1180	77774	87541	1870
	52					1347	104825	134649	2060	1292	97936	111285	2010	1182	85252	95941	1920
13600	-54	1262	23512	26279	2210	1097	20150	22309	2170	1042	19053	21123	2160	933	16893	18608	2140
	10	1412	23112	26555	1700	1247	20152	22913	1680	1192	19184	21625	1670	1082	17275	19429	1660
	15	1423	23229	26694	1670	1258	20273	23052	1650	1203	19306	21874	1640	1093	17399	19570	1630
	20	1433	23771	27506	1650	1269	20755	23663	1630	1214	19769	22461	1620	1104	17826	20111	1600
	25	1444	25776	29900	1640	1279	22498	25757	1610	1225	21428	24459	1600	1115	19323	21818	1590
	30	1454	30031	34917	1640	1290	26168	29998	1610	1235	24912	28493	1600	1125	22445	25450	1580
	35	1464	36614	42510	1660	1299	31804	36430	1630	1245	30249	34598	1620	1135	27206	30817	1590
	40	1474	46636	54180	1710	1309	40292	46290	1660	1254	38257	43701	1650	1145	34301	38928	1620
	45	1483	62414	72495	1800	1319	53418	61238	1730	1264	50573	57778	1710	1154	45096	51144	1670
	50	1493	89383	103798	1960	1329	75167	86203	1860	1274	70786	80868	1830	1164	62505	70798	1770
	52	1498	106586	123809	2070	1333	88513	101503	1940	1278	83048	94902	1900	1169	72832	82453	1830
13400	-54	1254	22658	25414	2200	1089	19408	21558	2170	1034	18347	20311	2160	925	16257	17965	2130
	10	1401	22271	25702	1700	1237	19411	22160	1670	1182	18474	21014	1670	1072	16627	18771	1650
	15	1413	22382	25960	1670	1249	19524	22292	1640	1194	18589	21147	1640	1084	16745	18905	1620
	20	1424	22892	26612	1640	1259	19978	22989	1620	1205	19026	21707	1610	1095	17148	19423	1600
	25	1434	24775	28885	1630	1270	21617	24864	1610	1215	20586	23605	1600	1105	18556	21039	1580
	30	1445	28747	33618	1630	1280	25045	28862	1600	1225	23841	27409	1600	1115	21474	24466	1580
	35	1454	34827	40708	1650	1290	30258	34868	1620	1235	28778	32998	1610	1125	25880	29477	1580
	40	1464	43935	51329	1690	1299	37985	43849	1650	1245	36074	41389	1630	1135	32351	36858	1610
	45	1474	57908	67711	1760	1309	49658	57226	1710	1254	47039	54001	1690	1144	41983	47806	1650
	50	1483	80767	94251	1900	1319	68257	78691	1810	1264	64370	73868	1780	1154	56976	64835	1730
	52	1487	94609	110383	1980	1323	79179	91213	1880	1268	74454	85383	1840	1158	65550	74528	1780
13200	-54	1248	21820	24572	2190	1083	18686	20832	2160	1028	17662	19622	2150	918	15644	17348	2130
	10	1395	21451	24874	1690	1231	18691	21434	1670	1176	17787	20321	1660	1066	16003	18041	1650
	15	1406	21557	25127	1660	1241	18799	21560	1640	1186	17897	20447	1630	1076	16115	18269	1620
	20	1415	22044	25754	1640	1251	19233	22234	1610	1196	18312	20983	1610	1086	16497	18763	1590
	25	1425	23821	27917	1620	1260	20778	24012	1600	1205	19784	22790	1590	1096	17824	20297	1580
	30	1435	27534	32390	1620	1270	23984	27787	1600	1216	22827	26270	1590	1106	20554	23430	1570
	35	1445	33161	38894	1640	1280	28812	33408	1610	1225	27401	31609	1600	1116	24638	28224	1580
	40	1454	41461	48709	1670	1290	35868	41598	1630	1235	34067	39254	1620	1125	30555	34943	1590
	45	1464	53906	63299	1740	1299	46299	53617	1680	1244	43877	50596	1660	1135	39189	44787	1630
	50	1473	73511	86196	1850	1309	62368	72196	1770	1254	58882	67910	1740	1144	52221	59644	1700
	52	1478	84890	99611	1920	1313	71464	82781	1820	1258	67312	77549	1790	1148	59439	67879	1740
13000	-54	1245	21002	23752	2180	1080	17986	20131	2150	1026	17000	18864	2140	916	15057	16672	2120
	10	1391	20647	23943	1680	1226	17991	20620	1660	1172	17121	19544	1650	1062	15403	17440	1640
	15	1401	20745	24187	1650	1237	18093	20853	1630	1182	17224	19774	1630	1072	15508	17662	1610
	20	1411	21202	24784	1630	1246	18499	21385	1610	1191	17614	20285	1600	1082	15868	18134	1590
	25	1415	22912	26994	1620	1251	19977	23199	1590	1196	19017	22013	1590	1086	17126	19588	1570
	30	1425	26386	31097	1610	1261	22978	26769	1590	1206	21867	25298	1580	1096	19682	22547	1560
	35	1435	31601	37319	1630	1271	27457	32040	1600	1216	26112	30306	1590	1106	23473	26941	1570
	40	1445	39188	46288	1660	1280	33916	39514	1620	1225	32216	37390	1610	1116	28896	33167	1580
	45	1454	50326	59443	1710	1290	43281	50468	1660	1235	41030	47624	1640	1125	36667	42149	1610
	50	1463	67303	79455	1800	1299	57280	66621	1730	1244	54127	62688	1710	1134	48080	55174	1670
	52	1467	76819	90614	1860	1303	64965	75562	1780	1248	61271	70928	1750	1138	54231	62241	1700
12500	-54	1236	19115	21752	2160	1071	16371	18416	2130	1016	15473	17240	2130	907	13700	15227	2110
	10	1381	18794	21964	1670	1216	16378	18893	1650	1161	15585	17899	1640	1051	14017	15954	1630
	15	1391	18877	22192	1640	1226	16460	19106	1620	1171	15673	18113	1610	1062	14109	16161	1600
	20	1400	19266	22720	1610	1236	16813	19584	1600	1181	16008	18568	1590	1071	14418	16582	1580
	25	1402	20737	24687	1600	1238	18082	21185	1580	1183	17212	20092	1570	1073	15495	17852	1560
	30	1401	23767	28444	1590	1237	20681	24325	1570	1182	19673	23075	1560	1072	17687	20527	1550
	35	1411	28111	33662	1600	1246	24418	28852	1570	1192	23216	27266	1560	1082	20854	24295	1550
	40	1421	34229	41031	1620	1257	29648	34976	1590	1202	28163	33077	1580	1092	25256	29394	1550
	45	1430	42828	51255	1660	1265	36918	43600	1610	1210	35018	41126	1600	1101	31320	36458	1570
	50	1439	55059	65873	1720	1274	47119	55612	1660	1219	44595	52335	1640	1110	39719	46158	1610
	52	1442	61492	73568	1750	1278	52410	61806	1690	1223	49541	58153	1670	1113	44019	51166	1630

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Figure 4-32* (Sheet 3)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1226	17428	19954	2150	1061	14930	16875	2120	1007	14106	15875	2110	897	12485	14015	2090
	10	1371	17138	20183	1650	1206	14934	17337	1640	1151	14210	16416	1630	1042	12777	14614	1620
	15	1381	17208	20270	1630	1216	15008	17542	1610	1161	14286	16617	1600	1052	12856	14809	1590
	20	1390	17542	20870	1600	1226	15309	17967	1580	1171	14575	17026	1580	1061	13125	15188	1570
	25	1392	18799	22496	1580	1227	16395	19269	1570	1173	15606	18266	1560	1063	14048	16304	1550
	30	1384	21407	25944	1580	1220	18622	22138	1560	1165	17710	20990	1550	1055	15913	18639	1540
	35	1387	25105	30493	1580	1222	21793	26081	1550	1167	20712	24622	1550	1058	18586	21898	1530
	40	1396	30109	36618	1590	1232	26078	31142	1560	1177	24768	29428	1550	1067	22199	26100	1530
	45	1405	36884	44756	1610	1241	31834	38135	1580	1186	30203	35943	1570	1076	27017	31814	1540
	50	1414	46028	55905	1650	1250	39522	47283	1610	1195	37438	44586	1590	1085	33389	39283	1560
	52	1417	50611	61359	1680	1253	43337	51770	1620	1198	41016	48814	1610	1088	36523	43020	1580
11500	-54	1218	15912	18214	2130	1053	13627	15474	2110	998	12877	14552	2100	889	11393	12837	2080
	10	1361	15649	18571	1640	1197	13635	15928	1630	1142	12972	15072	1620	1032	11661	13400	1610
	15	1371	15708	18647	1610	1207	13699	16007	1600	1152	13039	15152	1590	1042	11731	13584	1580
	20	1381	15996	19073	1590	1216	13959	16390	1570	1161	13290	15522	1570	1052	11964	13928	1560
	25	1382	17071	20516	1570	1218	14894	17657	1550	1163	14177	16730	1550	1053	12759	14916	1540
	30	1374	19287	23446	1560	1209	16783	20075	1540	1155	15962	19025	1540	1045	14341	16867	1520
	35	1363	22485	27716	1560	1199	19502	23647	1540	1144	18527	22301	1530	1034	16605	19792	1520
	40	1372	26622	32842	1560	1207	23049	27972	1540	1152	21886	26408	1530	1043	19598	23373	1510
	45	1381	32052	39507	1580	1216	27677	33481	1550	1162	26259	31634	1540	1052	23481	27940	1520
	50	1390	39078	48148	1600	1225	33618	40770	1570	1170	31859	38420	1550	1061	28428	33883	1530
	52	1393	42475	52292	1620	1229	36468	44175	1580	1174	34539	41639	1560	1064	30785	36633	1540
11000	-54	1210	14542	16735	2120	1046	12453	14203	2090	991	11766	13348	2090	881	10406	11765	2070
	10	1353	14303	17104	1630	1188	12461	14644	1620	1133	11854	13849	1610	1023	10652	12294	1600
	15	1363	14353	17171	1600	1198	12517	14714	1590	1143	11912	13920	1580	1033	10714	12469	1570
	20	1372	14603	17558	1580	1207	12743	15064	1560	1152	12131	14257	1560	1043	10918	12784	1550
	25	1373	15536	18860	1560	1209	13550	16205	1540	1154	12897	15346	1540	1044	11605	13665	1530
	30	1364	17420	21332	1550	1200	15161	18231	1530	1145	14420	17268	1520	1035	12953	15385	1510
	35	1353	20097	24959	1540	1189	17439	21250	1520	1134	16569	20020	1520	1024	14850	17737	1500
	40	1348	23635	29568	1540	1183	20454	25120	1520	1128	19407	23682	1510	1018	17358	20904	1500
	45	1356	28045	35087	1550	1192	24215	29764	1520	1137	22970	28099	1510	1027	20524	24756	1500
	50	1365	33559	41959	1570	1201	28896	35558	1530	1146	27387	33478	1520	1036	24434	29452	1500
	52	1369	36148	45166	1570	1204	31081	38187	1540	1149	29446	35963	1530	1040	26251	31665	1500
10500	-54	1204	13298	15385	2100	1040	11388	13044	2080	985	10759	12251	2080	875	9513	10701	2060
	10	1346	13080	15638	1620	1181	11396	13474	1610	1126	10841	12734	1600	1016	9739	11389	1590
	15	1355	13124	15823	1590	1191	11444	13535	1580	1136	10891	12795	1580	1026	9793	11453	1570
	20	1363	13341	16176	1570	1199	11641	13853	1550	1144	11081	13103	1550	1034	9970	11636	1540
	25	1365	14150	17226	1550	1200	12341	14772	1530	1145	11746	13978	1530	1035	10566	12426	1520
	30	1356	15764	19431	1530	1191	13721	16687	1520	1136	13050	15685	1510	1026	11721	13955	1500
	35	1344	18021	22513	1530	1179	15642	19237	1510	1124	14862	18105	1500	1015	13320	16013	1490
	40	1332	20983	26537	1520	1168	18153	22474	1500	1113	17228	21172	1500	1003	15402	18747	1480
	45	1332	24668	31299	1530	1167	21287	26466	1500	1113	20185	24958	1490	1003	18016	22025	1480
	50	1341	29066	36929	1530	1176	25032	31211	1500	1121	23722	29344	1500	1011	21151	25844	1480
	52	1344	31084	39438	1540	1179	26743	33365	1510	1125	25335	31386	1500	1015	22578	27669	1480
10000	-54	1210	12172	14057	2090	1046	10440	12018	2070	991	9869	11189	2070	881	8738	9768	2050
	10	1353	11976	14312	1610	1188	10448	12327	1600	1133	9944	11755	1600	1024	8944	10314	1590
	15	1362	12012	14361	1590	1198	10490	12380	1570	1143	9988	11810	1570	1033	8991	10575	1560
	20	1370	12200	14684	1560	1206	10661	12672	1550	1151	10153	11981	1540	1041	9146	10735	1540
	25	1364	12897	15740	1540	1199	11257	13476	1530	1144	10716	12745	1520	1035	9644	11420	1510
	30	1347	14285	17709	1520	1183	12435	15180	1510	1128	11826	14362	1500	1018	10619	12762	1500
	35	1335	16198	20322	1510	1171	14063	17326	1500	1116	13362	16397	1490	1006	11974	14475	1480
	40	1323	18662	23726	1510	1159	16154	20151	1490	1104	15331	18961	1480	994	13705	16759	1470
	45	1312	21748	27990	1500	1147	18760	23588	1480	1092	17783	22216	1480	983	15859	19554	1460
	50	1316	25337	32667	1510	1151	21812	27507	1480	1096	20664	25936	1470	987	18406	22775	1460
	52	1319	26937	34761	1510	1155	23173	29316	1480	1100	21948	27537	1470	990	19543	24206	1460
9500	-54	1218	11160	12843	2080	1053	9588	10884	2060	999	9070	10216	2060	889	8041	9001	2050
	10	1361	10983	13097	1600	1197	9597	11274	1590	1142	9139	10646	1590	1032	8230	9522	1580
	15	1371	11014	13268	1580	1206	9633	11321	1570	1152	9177	10693	1560	1042	8271	9572	1560
	20	1379	11178	13437	1550	1215	9783	11708	1540	1160	9322	10954	1540	1050	8407	9815	1530
	25	1372	11776	14270	1530	1208	10295	12315	1520	1153	9806	11643	1510	1043	8836	10434	1510
	30	1347	12957	16153	1510	1182	11288	13826	1500	1127	10738	13074	1500	1017	9647	11604	1490
	35	1327	14586	18474	1500	1163	12666	15715	1490	1108	12034	14864	1480	998	10783	13093	1470
	40	1315	16650	21358	1490	1150	14418	18090	1480	1095	13683	17116	1470	986	12235	15105	1460
	45	1303	19181	24815	1490	1138	16557	21072	1470	1084	15698	19830	1460	974	14001	17415	1450
	50	1294	22174	28983	1480	1129	19077	24420	1460	1074	18066	22999	1460	964	16074	20128	1440
	52	1294	23473	30637	1480	1130	20180	25845	1460	1075	19106	24351	1450	965	16992	21336	1440

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Figure 4-32* (Sheet 4)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
8,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
13870	-54	1426	25082	28674	2120	1262	21866	24761	2090	1207	20817	23497	2070	1097	18752	20924	2050
	-10	1546	32597	38300	1820	1381	28593	33154	1790	1327	27293	31461	1780	1217	24743	28287	1760
	-5	1559	35094	41230	1810	1394	30772	35726	1770	1339	29371	33918	1760	1230	26627	30524	1740
	0	1571	38650	45493	1800	1407	33855	39325	1770	1352	32305	37351	1750	1242	29275	33636	1730
	5	1584	42893	50585	1800	1419	37514	43756	1760	1364	35781	41450	1750	1254	32401	37228	1720
	10	1596	48010	56693	1810	1431	41899	48917	1760	1376	39938	46356	1750	1267	36125	41535	1720
	15	1608	54024	63989	1830	1443	47017	54943	1770	1389	44780	52077	1760	1279	40446	46677	1720
	20	1620	69240	82000	1910	1455	59792	69878	1840	1400	56812	66074	1810	1291	51083	58914	1770
	25	1632	106986	126835	2150	1468	90134	105398	2030	1413	85012	98910	1990	1303	75419	86878	1920
	27					1473	112969	147720	2180	1418	105870	123313	2130	1308	92840	107030	2030
	28																
13600	-54	1414	23834	27535	2100	1249	20768	23647	2070	1194	19767	22431	2060	1084	17795	20055	2040
	-10	1532	30688	36367	1810	1368	26918	31457	1780	1313	25693	29839	1770	1203	23286	26810	1750
	-5	1545	32930	39041	1790	1380	28879	33810	1760	1325	27564	32089	1750	1216	24984	28861	1730
	0	1557	36104	42921	1780	1393	31637	37083	1750	1338	30190	35212	1740	1228	27357	31583	1710
	5	1570	39853	47376	1780	1405	34878	40968	1740	1350	33272	38917	1730	1240	30133	34824	1700
	10	1582	44317	52831	1780	1417	38718	45453	1740	1362	36917	43186	1730	1253	33406	38794	1700
	15	1594	49482	59134	1790	1429	43135	50777	1740	1374	41102	48249	1730	1265	37150	43124	1700
	20	1605	62174	74194	1850	1441	53861	63403	1790	1386	51223	59958	1770	1276	46132	53590	1740
	25	1617	91417	109112	2040	1453	77759	91445	1940	1398	73542	86167	1910	1288	65550	76057	1850
	28					1460	105566	124294	2120	1406	99105	116113	2070	1296	87164	101064	1990
	29													1298	98170	113884	2060
13400	-54	1404	22957	26644	2100	1240	19997	22864	2070	1185	19029	21682	2060	1075	17122	19372	2040
	-10	1522	29368	34891	1800	1358	25758	30281	1770	1303	24583	28715	1760	1193	22275	25786	1740
	-5	1535	31443	37536	1780	1370	27575	32490	1750	1315	26318	30827	1740	1206	23851	27713	1720
	0	1547	34367	41024	1770	1382	30119	35421	1740	1328	28742	33749	1720	1218	26043	30254	1700
	5	1559	37798	45302	1760	1395	33092	39036	1730	1340	31570	37074	1720	1230	28593	33267	1690
	10	1571	41849	50202	1760	1407	36585	43302	1720	1352	34888	41015	1710	1242	31576	36832	1690
	15	1583	46490	55837	1770	1419	40565	48059	1720	1364	38662	45541	1710	1254	34959	40800	1680
	20	1595	57674	69247	1820	1430	50055	59189	1760	1376	47628	56096	1750	1266	42934	50142	1710
	25	1607	82332	98729	1970	1442	70404	83302	1880	1387	66685	78544	1860	1277	59596	69503	1800
	29					1452	103686	122478	2100	1397	97363	114561	2050	1287	85659	99740	1970
	30													1289	95791	111563	2030
13200	-54	1398	22093	25775	2090	1233	19242	22104	2060	1179	18309	20957	2050	1069	16471	18716	2030
	-10	1512	28120	33626	1790	1347	24660	29168	1760	1293	23533	27650	1750	1183	21318	24815	1730
	-5	1524	30044	35980	1770	1360	26347	31119	1740	1305	25144	29638	1730	1195	22782	26517	1710
	0	1537	32742	39382	1760	1372	28698	33984	1720	1317	27385	32253	1710	1208	24810	29006	1690
	5	1549	35890	43234	1750	1384	31430	37357	1710	1329	29985	35473	1700	1220	27156	31816	1680
	10	1561	39577	47769	1750	1396	34616	41187	1710	1341	33013	39125	1700	1232	29883	35008	1670
	15	1573	43763	52949	1750	1408	38215	45563	1710	1353	36430	43168	1690	1244	32950	38659	1670
	20	1584	53677	64803	1790	1420	46657	55516	1740	1365	44415	52614	1720	1255	40066	47023	1690
	25	1596	74763	90151	1920	1431	64175	76279	1840	1376	60855	72075	1810	1266	54500	63927	1770
	30					1443	101180	120172	2070	1388	95042	112305	2030	1279	83657	97924	1950
	32																
13000	-54	1394	21251	24806	2080	1229	18511	21373	2050	1174	17614	20262	2040	1065	15845	17988	2030
	-5	1514	28724	34643	1760	1350	25187	29945	1730	1295	24036	28393	1720	1185	21771	25493	1700
	0	1526	31220	37701	1740	1362	27364	32634	1710	1307	26111	30963	1700	1197	23651	27719	1680
	5	1538	34113	41298	1740	1374	29879	35662	1700	1319	28506	33854	1690	1209	25808	30338	1670
	10	1550	37479	45511	1730	1386	32793	39218	1690	1331	31277	37247	1680	1221	28312	33306	1660
	15	1562	41268	50152	1730	1398	36060	43262	1690	1343	34380	40976	1680	1233	31102	36679	1650
	20	1574	50102	60929	1760	1409	43605	52188	1720	1354	41523	49457	1700	1245	37479	44189	1670
	25	1585	68305	82971	1870	1420	58818	70393	1800	1365	55827	66533	1780	1256	50079	59028	1730
	30	1597	105728	128095	2110	1432	88839	106029	1980	1377	83707	99477	1950	1267	74078	87061	1880
	32					1437	111026	166412	2130	1382	103941	130327	2080	1272	90938	106833	1990
	35																
12500	-54	1383	19316	22744	2060	1219	16828	19462	2030	1164	16013	18441	2030	1054	14402	16444	2010
	-10	1477	24246	29696	1750	1312	21245	25579	1730	1257	20261	24211	1720	1147	18334	21676	1700
	-5	1489	25739	31479	1730	1324	22558	27155	1710	1269	21521	25844	1700	1160	19477	23169	1680
	0	1501	27805	34106	1720	1336	24366	29472	1690	1281	23245	27940	1680	1172	21041	25079	1660
	5	1513	30170	37174	1700	1348	26428	32047	1680	1293	25211	30401	1670	1183	22821	27204	1650
	10	1524	32878	40586	1700	1360	28782	34914	1660	1305	27453	33139	1650	1195	24846	29691	1630
	15	1536	35874	44289	1690	1371	31378	38154	1650	1316	29922	36232	1640	1207	27073	32384	1620
	20	1547	42622	52554	1710	1383	37176	45206	1670	1328	35421	42820	1660	1218	31998	38325	1630
	25	1558	55659	68735	1780	1393	48198	58582	1720	1339	45820	55372	1700	1229	41213	49320	1670
	30	1569	79029	97152	1910	1404	67472	81693	1830	1350	63866	77011	1810	1240	56984	67984	1760
	35					1416	109101	173039	2090	1361	102092	135112	2050	1251	89221	106121	1950

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Figure 4-32* (Sheet 17)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE OFF

FLAPS - 15°
8,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS				ZERO WIND				HEADWIND 10 KTS				HEADWIND 30 KTS			
		1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT	1ST FT	2ND FT	3RD FT	TCI FT
12000	-54	1373	17590	20767	2040	1209	15327	17849	2020	1154	14583	16903	2010	1044	13113	15056	2000
	-10	1456	21832	26989	1730	1292	19123	23316	1710	1237	18236	22049	1700	1127	16487	19704	1690
	-5	1463	23132	28836	1710	1298	20258	24823	1690	1244	19319	23490	1680	1134	17466	21017	1670
	0	1475	24857	30983	1690	1310	21771	26718	1670	1255	20763	25304	1660	1146	18778	22673	1650
	5	1487	26812	33498	1680	1322	23479	28809	1650	1267	22393	27303	1640	1157	20255	24494	1630
	10	1498	29020	36267	1670	1334	25405	31246	1640	1279	24228	29634	1630	1169	21916	26501	1610
	15	1509	31427	39522	1650	1345	27499	33985	1620	1290	26223	32126	1620	1180	23718	28767	1600
	20	1521	36695	46024	1670	1356	32045	39525	1630	1301	30549	37542	1620	1191	27594	33544	1600
	25	1531	46402	58173	1710	1367	40316	49769	1660	1312	38362	47013	1650	1202	34560	41943	1620
	30	1542	62281	77854	1790	1377	53621	66030	1730	1322	50879	62268	1710	1213	45592	55182	1670
	35	1553	92022	114666	1970	1388	77698	95284	1870	1333	73290	89448	1840	1224	64959	78431	1780
11500	-54	1364	16043	19097	2030	1200	13978	16389	2010	1145	13300	15513	2000	1035	11957	13800	1990
	-10	1446	19643	24541	1720	1281	17212	21044	1700	1226	16415	20000	1690	1116	14841	17845	1680
	-5	1449	20753	26048	1690	1284	18178	22496	1670	1229	17334	21268	1660	1120	15668	18997	1650
	0	1450	22276	28235	1670	1286	19496	24165	1650	1231	18587	22983	1640	1121	16793	20552	1630
	5	1460	23917	30288	1660	1296	20931	26104	1630	1241	19955	24716	1620	1131	18032	22132	1610
	10	1472	25736	32669	1640	1307	22521	28206	1620	1252	21472	26727	1610	1143	19407	23852	1590
	15	1483	27696	35334	1630	1318	24231	30300	1600	1264	23102	28727	1590	1154	20883	25673	1570
	20	1494	31879	40608	1630	1329	27853	34917	1600	1274	26545	33136	1590	1165	23979	29555	1570
	25	1504	39314	50212	1660	1340	34229	42877	1620	1285	32579	40585	1610	1175	29369	36149	1580
	30	1515	50685	64557	1710	1350	43849	54829	1660	1295	41662	51794	1650	1186	37421	45956	1620
	35	1525	69562	88302	1820	1360	59486	74277	1740	1306	56320	69892	1720	1196	50248	61648	1680
11000	-54	1355	14648	17581	2010	1191	12762	15064	1990	1136	12142	14250	1990	1026	10913	12659	1980
	-10	1435	17721	22223	1700	1271	15532	19129	1680	1216	14813	18171	1680	1106	13391	16296	1660
	-5	1438	18652	23552	1670	1274	16343	20302	1660	1219	15585	19293	1650	1109	14087	17206	1640
	0	1442	19920	25346	1650	1277	17442	21881	1630	1222	16630	20679	1630	1112	15026	18463	1620
	5	1441	21342	27432	1640	1277	18673	23590	1610	1222	17800	22311	1610	1112	16075	19944	1590
	10	1445	22908	29530	1620	1281	20031	25433	1600	1226	19090	24073	1590	1116	17236	21428	1570
	15	1456	24519	31703	1600	1292	21441	27227	1580	1237	20436	25789	1570	1127	18455	22992	1560
	20	1467	27886	36164	1600	1303	24363	31017	1570	1248	23215	29409	1570	1138	20958	26162	1550
	25	1478	33706	43732	1620	1313	29369	37359	1580	1258	27963	35324	1570	1149	25207	31504	1550
	30	1488	42159	54604	1650	1323	36574	46517	1610	1268	34776	43903	1600	1159	31271	39106	1570
	35	1498	55062	71142	1710	1333	47412	60161	1660	1278	44977	56696	1640	1169	40267	50172	1610
10500	-54	1349	13384	16073	2000	1184	11662	13859	1980	1129	11095	13102	1980	1020	9971	11624	1970
	-10	1426	16019	20265	1690	1261	14043	17407	1670	1206	13393	16525	1660	1097	12106	14800	1650
	-5	1429	16805	21451	1660	1264	14728	18455	1640	1209	14045	17408	1640	1099	12695	15604	1630
	0	1430	17868	22903	1640	1265	15650	19731	1620	1210	14923	18750	1610	1101	13483	16712	1600
	5	1431	19050	24611	1620	1266	16675	21237	1600	1211	15897	20065	1590	1102	14357	17905	1580
	10	1432	20358	26585	1600	1268	17807	22849	1580	1213	16972	21605	1570	1103	15321	19186	1560
	15	1434	21751	28505	1580	1269	19012	24535	1560	1214	18115	23215	1550	1105	16347	20647	1540
	20	1441	24522	32354	1570	1277	21413	27661	1550	1222	20398	26199	1540	1112	18398	23354	1530
	25	1451	29154	38454	1580	1286	25409	32868	1550	1231	24190	31037	1550	1122	21796	27614	1530
	30	1461	35614	46919	1600	1296	30942	39974	1570	1241	29430	37802	1560	1132	26472	33600	1540
	35	1471	44884	59146	1640	1306	38799	50147	1600	1251	36846	47334	1580	1142	33045	41919	1560
10000	-54	1356	12240	14709	1990	1191	10682	12679	1970	1137	10168	11983	1970	1027	9149	10726	1960
	-10	1417	14503	18494	1670	1253	12715	15847	1660	1198	12126	15034	1650	1088	10959	13445	1640
	-5	1420	15169	19423	1650	1255	13297	16792	1630	1200	12680	15819	1630	1090	11460	14161	1620
	0	1420	16067	20710	1620	1256	14076	17802	1610	1201	13422	16904	1600	1091	12126	15148	1590
	5	1421	17056	22229	1600	1257	14935	19143	1590	1202	14238	18063	1580	1092	12859	16086	1570
	10	1422	18140	23842	1580	1258	15874	20437	1560	1203	15131	19425	1560	1093	13660	17208	1550
	15	1424	19283	25516	1560	1259	16865	21912	1540	1204	16072	20710	1540	1095	14505	18491	1530
	20	1419	21610	28882	1550	1255	18865	24732	1530	1200	17966	23400	1530	1090	16194	20806	1510
	25	1425	25385	34107	1550	1260	22117	29049	1530	1205	21051	27516	1520	1095	18952	24414	1510
	30	1434	30426	40882	1570	1269	26449	34837	1540	1214	25158	32905	1530	1105	22623	29165	1510
	35	1443	37325	50043	1590	1279	32333	42534	1550	1224	30721	40097	1540	1114	27571	35522	1520
9500	-54	1365	11216	13462	1980	1200	9804	11486	1960	1145	9337	10958	1960	1036	8412	9707	1950
	-10	1414	13141	16753	1660	1250	11528	14439	1650	1195	10996	13691	1640	1085	9941	12228	1630
	-5	1411	13711	17712	1630	1247	12020	15160	1620	1192	11463	14379	1620	1082	10358	12852	1610
	0	1412	14472	18866	1610	1247	12681	16180	1600	1193	12092	15354	1590	1083	10924	13626	1580
	5	1413	15305	20092	1590	1248	13405	17260	1570	1193	12780	16389	1570	1083	11542	14567	1560
	10	1413	16210	21529	1570	1249	14191	18402	1550	1194	13527	17481	1550	1084	12212	15559	1540
	15	1415	17157	22868	1550	1250	15012	19582	1530	1195	14307	18609	1530	1085	12913	16585	1510
	20	1410	19058	25675	1530	1245	16648	21917	1520	1190	15857	20838	1510	1080	14296	18484	1500
	25	1399	22198	30211	1530	1234	19330	25748	1510	1179	18392	24357	1500	1070	16542	21657	1490
	30	1407	26210	35817	1530	1242	22783	30525	1510	1187	21665	28788	1500	1077	19468	25548	1490
	35	1416	31481	43087	1550	1252	27297	36607	1520	1197	25939	34452	1510	1087	23277	30543	1490

525BFM-06-00

Figure 4-32* (Sheet 18)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - 15°
SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
13870	-54	1252	25720	28453	2250	1088	21983	24211	2210	1033	20766	22711	2200	923	18375	19976	2170
	-35	1299	25525	28467	2070	1135	21947	24364	2030	1080	20781	23001	2020	970	18488	20159	2000
	-30	1311	25482	28447	2020	1146	21942	24381	1990	1092	20788	23029	1980	982	18517	20298	1960
	-25	1323	25442	28550	1980	1158	21939	24400	1950	1103	20796	23059	1940	994	18548	20347	1920
	-20	1334	25409	28541	1940	1170	21939	24423	1910	1115	20808	23092	1900	1005	18582	20399	1880
	-15	1346	25375	28533	1900	1181	21940	24445	1870	1126	20819	23228	1860	1017	18614	20449	1840
	-10	1357	25350	28532	1870	1193	21946	24473	1840	1138	20836	23266	1830	1028	18650	20503	1810
	-5	1368	25334	28539	1830	1204	21959	24617	1800	1149	20858	23310	1790	1039	18691	20754	1770
	0	1380	25360	28711	1800	1215	22008	24687	1770	1160	20914	23386	1760	1050	18761	20746	1740
	5	1391	25394	28769	1760	1226	22063	24764	1740	1171	20976	23468	1730	1061	18835	20838	1710
	10	1402	25427	28826	1730	1237	22117	24839	1710	1182	21036	23549	1700	1072	18908	21128	1680
13600	-54	1242	24427	27258	2230	1078	20866	23082	2200	1023	19705	21734	2180	913	17423	19014	2160
	-35	1288	24243	27170	2050	1123	20837	23138	2020	1068	19721	21830	2010	959	17531	19373	1990
	-30	1300	24202	27269	2010	1135	20828	23150	1980	1080	19727	21856	1970	970	17560	19421	1950
	-25	1311	24165	27257	1970	1147	20825	23169	1940	1092	19736	21986	1930	982	17590	19470	1910
	-20	1323	24133	27249	1930	1158	20826	23296	1900	1103	19747	22018	1890	993	17626	19524	1870
	-15	1334	24101	27242	1890	1169	20827	23318	1860	1115	19758	22049	1850	1005	17652	19665	1830
	-10	1345	24077	27363	1850	1181	20833	23345	1830	1126	19773	22085	1820	1016	17686	19718	1800
	-5	1356	24066	27377	1820	1192	20845	23379	1790	1137	19794	22127	1780	1027	17725	19776	1770
	0	1367	24084	27419	1790	1203	20890	23554	1760	1148	19846	22199	1750	1038	17791	19860	1730
	5	1378	24114	27473	1750	1214	20940	23626	1730	1159	19903	22382	1720	1049	17860	19949	1700
	10	1389	24144	27526	1720	1225	20990	23697	1700	1170	19959	22458	1690	1060	17929	20035	1670
13400	-54	1234	23520	26341	2230	1070	20081	22190	2190	1015	18960	20886	2180	905	16754	18424	2150
	-35	1279	23344	26375	2040	1115	20051	22342	2010	1060	18976	21076	2000	950	16860	18693	1980
	-30	1291	23304	26360	2000	1127	20044	22356	1970	1072	18982	21103	1960	962	16887	18740	1940
	-25	1303	23268	26349	1960	1138	20044	22482	1930	1083	18988	21229	1920	973	16917	18788	1900
	-20	1314	23237	26343	1920	1149	20044	22504	1890	1095	19002	21263	1880	985	16947	18837	1860
	-15	1325	23207	26337	1880	1161	20045	22527	1850	1106	19012	21294	1850	996	16977	18886	1830
	-10	1336	23183	26457	1850	1172	20050	22553	1820	1117	19027	21329	1810	1007	17010	18937	1790
	-5	1348	23168	26466	1810	1183	20062	22586	1790	1128	19047	21370	1780	1018	17047	18993	1760
	0	1358	23189	26511	1780	1194	20104	22758	1750	1139	19096	21544	1740	1029	17109	19073	1730
	5	1369	23217	26563	1750	1205	20152	22827	1720	1150	19150	21618	1710	1040	17176	19255	1700
	10	1380	23244	26738	1720	1215	20199	22895	1690	1161	19203	21691	1680	1051	17241	19338	1670
13200	-54	1226	22652	25463	2220	1061	19331	21530	2180	1007	18252	20169	2170	897	16113	17777	2150
	-35	1271	22484	25504	2040	1107	19303	21585	2000	1052	18264	20355	1990	942	16217	17952	1970
	-30	1283	22445	25491	1990	1118	19298	21601	1960	1063	18270	20381	1950	953	16244	17997	1930
	-25	1294	22411	25481	1950	1129	19296	21725	1920	1075	18278	20510	1910	965	16272	18043	1900
	-20	1305	22381	25476	1910	1141	19297	21747	1880	1086	18289	20541	1880	976	16302	18184	1860
	-15	1317	22352	25590	1880	1152	19297	21769	1850	1097	18299	20572	1840	987	16330	18231	1820
	-10	1328	22329	25591	1840	1163	19302	21795	1810	1108	18313	20606	1800	999	16362	18281	1790
	-5	1339	22314	25601	1800	1174	19314	21936	1780	1119	18329	20642	1770	1010	16398	18335	1750
	0	1350	22333	25644	1770	1185	19353	21997	1750	1130	18379	20817	1740	1020	16458	18509	1720
	5	1360	22359	25816	1740	1196	19398	22063	1720	1141	18430	20888	1710	1031	16521	18591	1690
	10	1371	22384	25866	1710	1206	19443	22128	1680	1152	18480	20958	1680	1042	16583	18671	1660
13000	-54	1220	21805	24611	2210	1055	18603	20699	2170	1001	17558	19471	2160	891	15498	17071	2140
	-35	1265	21643	24657	2030	1100	18576	20853	2000	1046	17574	19661	1990	936	15599	17329	1970
	-30	1276	21605	24645	1990	1112	18572	20870	1960	1057	17580	19687	1950	947	15625	17373	1930
	-25	1288	21572	24637	1940	1123	18570	20994	1920	1068	17588	19715	1910	959	15652	17419	1890
	-20	1299	21544	24632	1910	1134	18570	21016	1880	1080	17598	19846	1870	970	15680	17465	1850
	-15	1310	21516	24628	1870	1146	18571	21038	1840	1091	17608	19876	1830	981	15708	17605	1820
	-10	1320	21493	24750	1830	1155	18576	21063	1810	1101	17621	19909	1800	991	15739	17653	1780
	-5	1332	21480	24760	1800	1167	18587	21095	1770	1112	17641	19948	1760	1003	15774	17706	1750
	0	1343	21498	24802	1760	1178	18625	21263	1740	1123	17685	20117	1730	1013	15830	17780	1720
	5	1353	21525	24852	1730	1188	18670	21327	1710	1133	17735	20186	1700	1024	15891	17955	1690
	10	1363	21551	25024	1700	1199	18713	21390	1680	1144	17784	20254	1670	1034	15951	18032	1660
12500	-54	1211	19803	22498	2190	1046	16897	18895	2160	992	15947	17766	2150	882	14072	15560	2130
	-35	1255	19658	22443	2010	1091	16875	19050	1980	1036	15964	17953	1970	926	14166	15807	1950
	-30	1267	19625	22433	1970	1102	16871	19066	1940	1047	15969	17977	1930	938	14190	15848	1910
	-25	1278	19595	22543	1930	1114	16870	19190	1900	1059	15977	18004	1890	949	14215	15890	1880
	-20	1289	19569	22540	1890	1125	16870	19211	1860	1070	15986	18133	1850	960	14241	16026	1840
	-15	1300	19544	22538	1850	1136	16871	19231	1830	1081	15995	18162	1820	971	14266	16069	1800
	-10	1311	19524	22540	1810	1147	16875	19256	1790	1092	16008	18193	1780	982	14294	16114	1770
	-5	1322	19511	22671	1780	1157	16885	19285	1760	1103	16025	18228	1750	993	14325	16162	1740
	0	1333	19525	22708	1750	1168	16918	19447	1730	1113	16063	18391	1720	1003	14375	16228	1700
	5	1343	19547	22751	1720	1178	16956	19503	1690	1123	16107	18452	1690	1014	14429	16395	1670
	10	1353	19568	22793	1690	1188	16993	19559	1670	1133	16149	18512	1660	1024	14481	16464	1640

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Figure 4-33* (Sheet 1 of 30)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - 15°
SEA LEVEL

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
12000	-54	1202	18021	20495	2170	1038	15377	17278	2140	983	14511	16237	2130	873	12801	14290	2110
	-35	1247	17891	20563	1990	1082	15359	17433	1970	1027	14528	16420	1960	917	12888	14441	1940
	-30	1258	17861	20555	1950	1093	15355	17449	1930	1038	14534	16444	1920	929	12910	14479	1900
	-25	1269	17835	20550	1910	1105	15354	17466	1890	1050	14541	16469	1880	940	12933	14518	1860
	-20	1280	17811	20666	1870	1116	15355	17591	1850	1061	14549	16597	1840	951	12957	14651	1830
	-15	1291	17788	20665	1830	1126	15356	17611	1810	1072	14558	16623	1810	962	12980	14691	1790
	-10	1302	17770	20668	1800	1137	15360	17634	1780	1082	14569	16652	1770	973	13005	14732	1760
	-5	1312	17757	20677	1770	1148	15368	17661	1740	1093	14584	16685	1740	983	13034	14776	1720
	0	1323	17769	20831	1730	1158	15396	17708	1710	1104	14618	16736	1710	994	13078	14836	1690
	5	1333	17787	20870	1700	1168	15429	17868	1680	1114	14655	16896	1680	1004	13125	14996	1660
	10	1343	17803	20907	1670	1179	15461	17918	1650	1124	14692	16950	1650	1014	13171	15057	1630
11500	-54	1194	16425	18790	2150	1030	14015	15820	2120	975	13224	14859	2120	865	11661	13067	2100
	-35	1238	16308	18868	1980	1073	13999	15974	1950	1019	13241	15038	1950	909	11742	13207	1930
	-30	1249	16281	18862	1930	1085	13997	15989	1910	1030	13246	15060	1910	920	11762	13243	1890
	-25	1260	16258	18859	1890	1096	13996	16006	1870	1041	13253	15084	1870	931	11784	13280	1850
	-20	1271	16236	18858	1860	1107	13996	16130	1840	1052	13261	15108	1830	942	11806	13409	1820
	-15	1283	16211	18972	1820	1119	13997	16150	1800	1064	13269	15235	1790	954	11827	13446	1780
	-10	1293	16198	18980	1790	1128	14001	16171	1770	1073	13278	15262	1760	964	11850	13484	1750
	-5	1303	16187	18989	1750	1139	14008	16196	1730	1084	13292	15292	1730	974	11875	13525	1710
	0	1314	16199	19021	1720	1149	14033	16238	1700	1094	13322	15338	1700	985	11915	13579	1680
	5	1324	16210	19174	1690	1159	14061	16393	1670	1104	13354	15493	1660	995	11956	13732	1650
	10	1334	16224	19207	1660	1169	14088	16437	1640	1114	13386	15541	1640	1005	11997	13788	1620
11000	-54	1187	14987	17246	2140	1022	12787	14497	2110	967	12064	13608	2100	857	10635	11958	2090
	-35	1230	14883	17332	1960	1066	12774	14650	1940	1011	12081	13783	1930	901	10709	12179	1920
	-30	1240	14858	17327	1920	1076	12772	14665	1900	1021	12086	13804	1890	911	10728	12213	1880
	-25	1252	14837	17326	1880	1088	12772	14682	1860	1033	12092	13827	1860	923	10748	12248	1840
	-20	1263	14817	17325	1840	1099	12772	14699	1830	1044	12100	13951	1820	934	10768	12283	1810
	-15	1274	14798	17326	1810	1109	12773	14823	1790	1054	12107	13975	1780	945	10788	12317	1770
	-10	1285	14783	17449	1770	1120	12776	14843	1760	1065	12116	14000	1750	955	10808	12352	1740
	-5	1295	14772	17458	1740	1130	12782	14867	1720	1076	12128	14028	1720	966	10832	12389	1710
	0	1305	14779	17484	1710	1141	12804	14904	1690	1086	12154	14069	1690	976	10867	12438	1670
	5	1315	14790	17513	1680	1151	12828	14944	1660	1096	12182	14113	1660	986	10904	12586	1640
	10	1325	14801	17542	1650	1161	12852	15095	1630	1106	12210	14263	1630	996	10940	12636	1620
10500	-54	1179	13686	15840	2120	1015	11676	13292	2100	960	11015	12469	2090	850	9705	11034	2080
	-35	1223	13592	15817	1950	1058	11665	13444	1930	1003	11031	12640	1920	894	9775	11159	1910
	-30	1234	13570	15929	1910	1069	11663	13458	1890	1014	11036	12660	1880	905	9792	11191	1870
	-25	1245	13553	15931	1870	1080	11663	13474	1850	1025	11042	12681	1850	916	9811	11223	1830
	-20	1255	13533	15929	1830	1091	11663	13491	1820	1036	11048	12702	1810	926	9829	11255	1800
	-15	1266	13515	15930	1800	1102	11664	13507	1780	1047	11055	12826	1770	937	9847	11287	1760
	-10	1277	13501	15934	1760	1112	11667	13633	1750	1057	11063	12850	1740	948	9866	11320	1730
	-5	1287	13491	15941	1730	1123	11673	13654	1710	1068	11074	12876	1710	958	9887	11354	1700
	0	1297	13496	16086	1700	1133	11691	13688	1680	1078	11097	12913	1680	968	9918	11496	1670
	5	1307	13506	16113	1670	1143	11712	13724	1650	1088	11122	12952	1650	978	9951	11541	1640
	10	1315	13514	16138	1640	1151	11733	13759	1620	1096	11146	13098	1620	987	9983	11586	1610
10000	-54	1183	12505	14458	2110	1018	10682	12219	2090	963	10082	11555	2080	853	8889	9974	2070
	-35	1226	12421	14438	1940	1061	10673	12371	1920	1007	10098	11628	1920	897	8956	10268	1900
	-30	1237	12401	14552	1900	1073	10672	12385	1880	1018	10102	11647	1880	908	8972	10206	1860
	-25	1246	12384	14551	1860	1082	10672	12400	1840	1027	10108	11667	1840	918	8989	10235	1830
	-20	1259	12368	14552	1820	1094	10672	12415	1810	1040	10114	11687	1800	930	9006	10264	1790
	-15	1270	12352	14553	1790	1105	10673	12431	1770	1050	10120	11707	1770	941	9022	10293	1760
	-10	1280	12339	14557	1750	1116	10676	12448	1740	1061	10127	11832	1730	951	9039	10322	1720
	-5	1291	12330	14563	1720	1126	10681	12467	1700	1071	10137	11856	1700	961	9058	10546	1690
	0	1301	12334	14706	1690	1136	10697	12497	1670	1081	10157	11890	1670	972	9086	10586	1660
	5	1309	12341	14727	1660	1144	10714	12527	1640	1090	10178	11923	1640	980	9113	10626	1630
	10	1320	12348	14750	1630	1155	10732	12670	1610	1100	10199	11957	1610	991	9141	10666	1600
9500	-54	1190	11446	13313	2100	1025	9795	11155	2080	971	9250	10459	2070	861	8170	9101	2060
	-35	1235	11371	13300	1930	1071	9788	11199	1910	1016	9266	10522	1910	906	8229	9290	1900
	-30	1245	11354	13298	1890	1080	9787	11211	1870	1025	9270	10638	1870	916	8244	9316	1860
	-25	1256	11338	13298	1850	1091	9787	11224	1830	1037	9275	10656	1830	927	8258	9340	1820
	-20	1267	11324	13299	1810	1102	9788	11450	1800	1047	9281	10674	1790	938	8275	9368	1780
	-15	1278	11310	13300	1780	1113	9788	11465	1760	1058	9286	10692	1760	949	8290	9488	1750
	-10	1288	11298	13304	1740	1124	9791	11482	1730	1069	9293	10711	1720	959	8306	9515	1720
	-5	1299	11290	13310	1710	1134	9795	11499	1700	1079	9302	10731	1690	970	8323	9543	1680
	0	1309	11293	13327	1680	1144	9809	11527	1670	1089	9319	10761	1660	980	8347	9578	1650
	5	1318	11298	13345	1650	1153	9824	11554	1640	1098	9338	11003	1630	989	8372	9613	1620
	10	1328	11303	13488	1620	1163	9839	11694	1610	1109	9356	11034	1600	999	8396	9647	1600

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Figure 4-33* (Sheet 2)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - 15°
1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
13870	-54	1273	25757	28644	2230	1108	22071	24236	2190	1053	20871	22850	2180	944	18511	20143	2160
	-35	1320	25556	28658	2050	1155	22028	24484	2020	1100	20878	23136	2010	991	18615	20410	1980
	-30	1332	25510	28638	2010	1167	22020	24499	1980	1112	20882	23061	1960	1003	18642	20456	1940
	-25	1344	25470	28624	1970	1179	22016	24519	1930	1124	20889	23295	1920	1015	18672	20505	1900
	-20	1357	25434	28614	1930	1192	22015	24648	1900	1137	20899	23327	1890	1028	18704	20746	1870
	-15	1367	25399	28725	1890	1203	22013	24669	1860	1148	20908	23358	1850	1038	18733	20796	1830
	-10	1379	25373	28725	1850	1214	22018	24698	1820	1159	20924	23396	1810	1050	18768	20753	1800
	-5	1390	25373	28750	1820	1226	22045	24746	1790	1171	20959	23452	1780	1061	18820	20823	1760
	0	1402	25393	28794	1780	1237	22088	24812	1760	1182	21009	23524	1750	1072	18885	21106	1730
	5	1413	25413	28839	1750	1248	22131	24877	1730	1193	21060	23704	1720	1084	18949	21191	1700
	10	1424	25768	29340	1720	1259	22457	25333	1700	1205	21376	24037	1690	1095	19248	21606	1670
13600	-54	1262	24463	27336	2220	1097	20947	23200	2180	1042	19802	21866	2170	933	17550	19172	2150
	-35	1308	24269	27356	2040	1144	20908	23351	2010	1089	19811	22056	2000	979	17651	19527	1970
	-30	1320	24226	27338	2000	1156	20900	23366	1960	1101	19815	22082	1950	991	17677	19573	1930
	-25	1332	24189	27326	1960	1167	20897	23385	1920	1113	19822	22111	1910	1003	17706	19716	1900
	-20	1344	24155	27438	1920	1179	20896	23407	1890	1124	19832	22142	1880	1015	17736	19766	1860
	-15	1355	24121	27431	1880	1191	20895	23427	1850	1136	19841	22172	1840	1026	17765	19815	1820
	-10	1367	24097	27431	1840	1202	20899	23564	1810	1147	19855	22313	1800	1038	17798	19867	1790
	-5	1378	24095	27455	1810	1213	20924	23611	1780	1159	19888	22367	1770	1049	17846	19936	1750
	0	1389	24113	27622	1770	1225	20964	23673	1750	1170	19935	22435	1740	1060	17908	20016	1720
	5	1400	24131	27665	1740	1236	21004	23734	1720	1181	19982	22503	1710	1071	17968	20095	1690
	10	1411	24456	28136	1710	1247	21303	24163	1690	1192	20273	22919	1680	1082	18243	20486	1660
13400	-54	1254	23549	26411	2210	1089	20158	22403	2170	1034	19052	21107	2160	924	16876	18577	2140
	-35	1300	23367	26443	2030	1135	20121	22555	2000	1080	19061	21298	1990	971	16974	18841	1970
	-30	1312	23326	26427	1990	1147	20114	22570	1960	1092	19066	21324	1950	982	17000	18887	1930
	-25	1323	23290	26535	1950	1159	20111	22590	1920	1104	19073	21353	1910	994	17028	18934	1890
	-20	1335	23257	26529	1910	1170	20110	22611	1880	1115	19084	21384	1870	1006	17057	18982	1850
	-15	1346	23223	26521	1870	1182	20109	22741	1840	1127	19091	21412	1830	1017	17084	19029	1820
	-10	1358	23201	26523	1830	1193	20114	22768	1810	1138	19105	21552	1800	1028	17116	19080	1780
	-5	1369	23199	26670	1800	1204	20137	22813	1770	1150	19136	21605	1760	1040	17163	19243	1750
	0	1380	23215	26711	1770	1216	20175	22872	1740	1161	19181	21671	1730	1051	17221	19320	1720
	5	1391	23231	26753	1730	1227	20212	23044	1710	1172	19225	21735	1700	1062	17279	19396	1690
	10	1402	23536	27203	1710	1238	20493	23342	1680	1183	19499	22134	1670	1073	17538	19771	1660
13200	-54	1245	22679	25531	2200	1081	19404	21639	2170	1026	18335	20382	2160	916	16230	17924	2130
	-35	1291	22505	25569	2020	1127	19369	21793	1990	1072	18345	20572	1980	962	16326	18093	1960
	-30	1303	22465	25555	1980	1138	19363	21809	1950	1084	18349	20598	1940	974	16351	18230	1920
	-25	1315	22430	25664	1940	1150	19360	21829	1910	1095	18356	20626	1900	985	16378	18276	1880
	-20	1326	22399	25659	1900	1162	19359	21957	1870	1107	18365	20656	1860	997	16406	18323	1850
	-15	1338	22368	25654	1860	1173	19358	21979	1840	1118	18374	20790	1830	1008	16433	18369	1810
	-10	1349	22345	25655	1830	1184	19363	22006	1800	1129	18387	20825	1790	1020	16464	18516	1780
	-5	1360	22342	25801	1790	1195	19384	22050	1770	1141	18417	20876	1760	1031	16509	18580	1740
	0	1371	22357	25841	1760	1206	19420	22107	1730	1152	18459	20939	1730	1042	16565	18654	1710
	5	1383	22372	25881	1730	1219	19456	22277	1700	1164	18501	21110	1700	1054	16620	18728	1680
	10	1393	22658	26312	1700	1228	19720	22671	1680	1173	18759	21384	1670	1064	16864	19088	1650
13000	-54	1239	21828	24674	2190	1075	18671	20902	2160	1020	17640	19683	2150	910	15609	17300	2130
	-35	1285	21660	24719	2010	1120	18638	21057	1980	1066	17650	19773	1970	956	15703	17466	1960
	-30	1295	21621	24705	1970	1131	18632	21073	1940	1076	17654	19899	1930	966	15727	17508	1920
	-25	1308	21588	24698	1930	1144	18629	21093	1900	1089	17662	19927	1890	979	15753	17647	1880
	-20	1320	21558	24812	1890	1155	18628	21114	1870	1100	17670	19957	1860	991	15780	17693	1840
	-15	1331	21528	24808	1860	1167	18628	21135	1830	1112	17678	19986	1820	1002	15806	17738	1800
	-10	1342	21506	24811	1820	1178	18632	21271	1790	1123	17692	20125	1790	1013	15836	17787	1770
	-5	1353	21504	24834	1790	1189	18653	21313	1760	1134	17720	20174	1750	1024	15879	17945	1740
	0	1364	21520	24997	1750	1199	18688	21369	1730	1145	17761	20235	1720	1035	15933	18017	1710
	5	1375	21535	25036	1720	1210	18723	21537	1700	1155	17802	20296	1690	1046	15985	18088	1680
	10	1385	21806	25451	1690	1221	18979	21809	1670	1166	18046	20663	1660	1056	16217	18434	1650
12500	-54	1229	19820	22554	2170	1065	16957	19087	2140	1010	16020	17966	2130	900	14171	15774	2110
	-35	1276	19671	22613	1990	1111	16929	19244	1970	1056	16031	18054	1960	946	14259	15930	1940
	-30	1287	19637	22603	1950	1123	16924	19261	1930	1068	16035	18179	1920	958	14281	16064	1900
	-25	1299	19607	22598	1910	1134	16922	19280	1890	1079	16042	18206	1880	969	14305	16106	1860
	-20	1310	19580	22594	1870	1145	16921	19300	1850	1091	16050	18234	1840	981	14330	16149	1830
	-15	1321	19553	22713	1840	1157	16921	19320	1810	1102	16058	18261	1810	992	14354	16190	1790
	-10	1332	19533	22716	1800	1168	16924	19454	1780	1113	16070	18398	1770	1003	14381	16235	1760
	-5	1343	19530	22737	1770	1179	16943	19493	1750	1124	16095	18442	1740	1014	14419	16388	1720
	0	1354	19542	22771	1740	1189	16973	19542	1710	1134	16130	18497	1710	1025	14467	16453	1690
	5	1364	19554	22931	1700	1200	17002	19592	1680	1145	16166	18551	1680	1035	14513	16516	1660
	10	1375	19784	23304	1680	1210	17216	19934	1660	1155	16375	18884	1650	1046	14712	16829	1640

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Figure 4-33* (Sheet 3)

SINGLE-ENGINE TAKEOFF FLIGHT PATH DISTANCES AND TAKEOFF CLIMB INCREMENT (TCI) ANTI-ICE ON

FLAPS - 15°
1,000 FEET

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

WT LBS	TEMP DEG C	TAILWIND 10 KTS 1ST FT	TAILWIND 10 KTS 2ND FT	TAILWIND 10 KTS 3RD FT	TAILWIND 10 KTS TCI FT	ZERO WIND 1ST FT	ZERO WIND 2ND FT	ZERO WIND 3RD FT	ZERO WIND TCI FT	HEADWIND 10 KTS 1ST FT	HEADWIND 10 KTS 2ND FT	HEADWIND 10 KTS 3RD FT	HEADWIND 10 KTS TCI FT	HEADWIND 30 KTS 1ST FT	HEADWIND 30 KTS 2ND FT	HEADWIND 30 KTS 3RD FT	HEADWIND 30 KTS TCI FT
12000	-54	1221	18034	20657	2150	1057	15429	17461	2120	1002	14576	16428	2120	892	12890	14407	2100
	-35	1266	17901	20611	1980	1102	15406	17514	1950	1047	14588	16512	1950	937	12971	14552	1930
	-30	1278	17870	20721	1940	1113	15402	17635	1910	1059	14592	16636	1910	949	12992	14683	1890
	-25	1289	17843	20717	1900	1125	15400	17653	1870	1070	14598	16662	1870	960	13014	14723	1850
	-20	1301	17819	20715	1860	1136	15400	17673	1840	1081	14606	16688	1830	971	13037	14762	1820
	-15	1312	17795	20714	1820	1147	15399	17692	1800	1092	14613	16714	1790	983	13059	14801	1780
	-10	1323	17776	20840	1790	1158	15403	17715	1770	1103	14624	16743	1760	994	13084	14842	1750
	-5	1334	17773	20858	1750	1169	15418	17860	1730	1114	14646	16889	1730	1004	13118	14990	1710
	0	1344	17782	20889	1720	1179	15444	17905	1700	1125	14677	16939	1690	1015	13160	15049	1680
	5	1354	17791	20920	1690	1190	15470	17949	1670	1135	14708	16987	1660	1025	13201	15106	1650
	10	1365	17987	21257	1660	1200	15654	18260	1640	1145	14888	17290	1640	1036	13373	15392	1620
11500	-54	1213	16435	18948	2140	1049	14060	15995	2110	994	13281	15040	2100	884	11741	13173	2090
	-35	1258	16315	18912	1960	1093	14041	16047	1940	1038	13294	15121	1930	929	11817	13309	1920
	-30	1268	16287	18905	1920	1103	14037	16168	1900	1048	13298	15244	1890	939	11836	13437	1880
	-25	1280	16263	19022	1880	1116	14036	16186	1860	1061	13304	15268	1850	951	11857	13474	1840
	-20	1292	16241	19021	1840	1127	14036	16205	1820	1072	13311	15293	1820	963	11878	13511	1800
	-15	1303	16220	19021	1810	1138	14036	16223	1790	1083	13318	15317	1780	974	11901	13550	1770
	-10	1313	16203	19025	1770	1148	14039	16244	1750	1093	13327	15344	1750	984	11920	13585	1740
	-5	1324	16199	19042	1740	1160	14052	16276	1720	1105	13347	15487	1720	995	11951	13729	1700
	0	1335	16206	19193	1710	1170	14075	16427	1690	1115	13374	15532	1680	1006	11988	13781	1670
	5	1345	16213	19221	1680	1181	14097	16467	1660	1126	13401	15576	1650	1016	12024	13833	1640
	10	1355	16381	19530	1650	1191	14256	16753	1630	1136	13557	15854	1630	1026	12175	14096	1610
11000	-54	1205	14993	17284	2120	1041	12828	14666	2100	986	12115	13782	2090	876	10706	12054	2080
	-35	1250	14887	17372	1950	1085	12811	14718	1930	1030	12128	13859	1920	921	10777	12273	1910
	-30	1261	14862	17368	1910	1096	12808	14732	1890	1042	12132	13981	1880	932	10795	12307	1870
	-25	1272	14841	17366	1870	1108	12807	14855	1850	1053	12138	14004	1840	943	10814	12341	1830
	-20	1283	14821	17486	1830	1119	12807	14873	1810	1064	12145	14028	1810	954	10833	12375	1800
	-15	1294	14801	17487	1800	1130	12807	14891	1780	1075	12151	14051	1770	965	10852	12409	1760
	-10	1305	14786	17491	1760	1141	12810	14911	1740	1086	12160	14076	1740	976	10872	12444	1730
	-5	1316	14781	17507	1730	1151	12822	14939	1710	1096	12177	14109	1710	987	10900	12584	1690
	0	1326	14787	17531	1700	1161	12841	15087	1680	1107	12201	14256	1670	997	10933	12632	1660
	5	1336	14792	17680	1670	1172	12860	15123	1650	1117	12225	14296	1640	1007	10965	12679	1630
	10	1345	14937	17840	1640	1180	12998	15274	1620	1126	12360	14553	1620	1016	11097	12922	1610
10500	-54	1198	13692	15877	2110	1034	11712	13455	2090	979	11060	12635	2080	869	9770	11123	2070
	-35	1242	13595	15969	1940	1078	11698	13506	1920	1023	11073	12709	1910	913	9836	11245	1900
	-30	1253	13573	15966	1900	1089	11695	13520	1880	1034	11077	12729	1870	924	9852	11277	1860
	-25	1264	13553	15965	1860	1100	11694	13642	1840	1045	11083	12852	1830	935	9870	11309	1820
	-20	1276	13538	15969	1820	1111	11695	13659	1800	1056	11089	12874	1800	946	9888	11341	1790
	-15	1286	13517	15967	1780	1122	11695	13676	1770	1067	11094	12896	1760	957	9905	11372	1750
	-10	1297	13503	16094	1750	1133	11697	13695	1730	1078	11102	12919	1730	968	9923	11501	1720
	-5	1308	13499	16108	1720	1143	11708	13721	1700	1088	11118	12950	1700	979	9948	11540	1690
	0	1318	13503	16130	1690	1153	11723	13752	1670	1099	11139	13093	1670	989	9978	11584	1660
	5	1328	13506	16152	1650	1164	11741	13899	1640	1109	11160	13129	1640	999	10007	11626	1630
	10	1338	13632	16417	1630	1174	11862	14031	1610	1119	11279	13260	1610	1009	10123	11854	1600
10000	-54	1201	12510	14491	2090	1037	10714	12276	2080	982	10123	11621	2070	872	8950	10056	2060
	-35	1246	12424	14587	1920	1081	10703	12428	1910	1026	10136	11692	1900	917	9011	10255	1890
	-30	1257	12404	14585	1880	1092	10701	12442	1870	1038	10140	11711	1860	928	9027	10284	1850
	-25	1268	12386	14585	1850	1104	10700	12457	1830	1049	10145	11730	1830	939	9043	10313	1820
	-20	1279	12370	14586	1810	1115	10701	12472	1790	1060	10151	11855	1790	950	9059	10341	1780
	-15	1290	12354	14587	1770	1126	10701	12487	1760	1071	10156	11875	1750	961	9075	10563	1740
	-10	1301	12341	14591	1740	1136	10703	12504	1730	1082	10160	11894	1720	972	9092	10594	1710
	-5	1311	12336	14726	1710	1147	10712	12528	1690	1092	10176	11924	1690	982	9114	10629	1680
	0	1321	12339	14745	1680	1157	10726	12668	1660	1102	10195	11956	1660	992	9140	10667	1650
	5	1331	12342	14763	1650	1167	10741	12696	1630	1112	10213	11988	1630	1002	9165	10705	1620
	10	1341	12451	15010	1620	1176	10845	12812	1600	1121	10316	12101	1600	1012	9266	10815	1590
9500	-54	1209	11450	13344	2080	1044	9824	11207	2070	989	9287	10517	2060	880	8224	9260	2050
	-35	1253	11373	13331	1910	1089	9815	11249	1900	1034	9300	10678	1890	924	8280	9360	1880
	-30	1265	11356	13329	1870	1101	9813	11474	1860	1046	9304	10695	1860	936	8294	9386	1850
	-25	1276	11340	13329	1840	1112	9813	11488	1820	1057	9309	10713	1820	947	8309	9506	1810
	-20	1287	11325	13330	1800	1123	9813	11503	1790	1068	9314	10731	1780	958	8324	9533	1770
	-15	1298	11311	13331	1760	1134	9813	11518	1750	1079	9319	10749	1750	969	8338	9559	1740
	-10	1309	11299	13335	1730	1145	9815	11534	1720	1090	9326	10768	1710	980	8354	9585	1700
	-5	1320	11295	13345	1700	1155	9823	11556	1690	1100	9338	11006	1680	990	8373	9616	1670
	0	1330	11297	13485	1670	1165	9836	11694	1650	1110	9354	11035	1650	1001	8396	9650	1640
	5	1340	11299	13501	1640	1175	9848	11720	1620	1120	9369	11063	1620	1011	8418	9783	1610
	10	1350	11393	13607	1610	1185	9940	11822	1600	1130	9460	11164	1590	1021	8508	9881	1580

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Figure 4-33* (Sheet 4)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - UP

CONDITIONS: ANTI-ICE - OFF
LANDING GEAR - UP
AIRSPEED - V2
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	13870 lb, wind -10 kt	13870, 0	13870, 10	13870, 20	13870, 30	13500, -10	13500, 0	13500, 10	13500, 20	13500, 30	13000, -10	13000, 0	13000, 10	13000, 20	13000, 30	12500, -10	12500, 0	12500, 10	12500, 20	12500, 30	12000, -10	12000, 0	12000, 10	12000, 20	12000, 30
0	-25	7.0	8.0	8.4	8.8	9.3	7.5	8.5	8.9	9.4	9.9	8.1	9.2	9.7	10.2	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.9	11.4	12.0	12.6
	-20	7.0	8.0	8.4	8.8	9.3	7.5	8.5	8.9	9.4	9.9	8.1	9.2	9.7	10.2	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.9	11.4	12.0	12.6
	-15	7.1	8.0	8.4	8.8	9.3	7.5	8.5	8.9	9.4	9.8	8.1	9.2	9.7	10.2	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.9	11.4	12.0	12.6
	-10	7.1	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.4	9.8	8.1	9.2	9.7	10.1	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.9	11.4	11.9	12.6
	-5	7.1	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.7	10.1	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.9	11.4	11.9	12.5
	0	7.1	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.7	10.1	10.6	8.8	10.0	10.5	11.0	11.5	9.5	10.8	11.4	11.9	12.5
	5	7.1	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.5	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	10	7.1	8.0	8.3	8.7	9.2	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.4
	15	7.0	8.0	8.3	8.7	9.1	7.5	8.4	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	20	7.0	7.9	8.3	8.7	9.1	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.6	10.0	10.5	8.8	9.9	10.4	10.8	11.4	9.5	10.8	11.2	11.8	12.4
	25	7.0	7.9	8.2	8.6	9.0	7.4	8.4	8.8	9.2	9.6	8.1	9.1	9.5	10.0	10.4	8.7	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	30	6.4	7.2	7.6	7.9	8.3	6.8	7.7	8.1	8.4	8.8	7.4	8.4	8.8	9.2	9.6	8.1	9.2	9.6	10.0	10.5	8.8	10.0	10.4	10.9	11.4
	35	5.5	6.3	6.6	6.9	7.2	5.9	6.7	7.0	7.4	7.7	6.5	7.4	7.7	8.1	8.5	7.1	8.1	8.4	8.8	9.3	7.8	8.8	9.2	9.7	10.2
	40	4.6	5.2	5.4	5.7	6.0	5.0	5.6	5.9	6.2	6.5	5.5	6.2	6.5	6.8	7.2	6.1	6.9	7.2	7.6	7.9	6.7	7.6	8.0	8.3	8.8
	45	3.8	4.3	4.5	4.7	5.0	4.1	4.7	4.9	5.2	5.4	4.6	5.3	5.5	5.8	6.1	5.2	5.9	6.2	6.5	6.8	5.8	6.6	6.9	7.2	7.6
	50	3.1	3.5	3.7	3.9	4.1	3.4	3.9	4.1	4.3	4.5	3.8	4.4	4.6	4.8	5.1	4.4	5.0	5.2	5.5	5.8	4.9	5.6	5.9	6.2	6.5
	54	2.5	2.9	3.1	3.2	3.4	2.9	3.3	3.4	3.6	3.8	3.3	3.8	4.0	4.2	4.4	3.8	4.3	4.5	4.8	5.0	4.3	4.9	5.2	5.4	5.7
1000	-25	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.7	10.1	10.7	8.8	10.0	10.5	11.0	11.6	9.5	10.8	11.4	11.9	12.6
	-20	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.7	10.1	10.6	8.8	10.0	10.5	11.0	11.6	9.5	10.8	11.4	11.9	12.5
	-15	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.5	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	-10	7.1	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.5	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	-5	7.1	8.0	8.4	8.7	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	0	7.1	8.0	8.3	8.7	9.2	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5
	5	7.1	8.0	8.3	8.7	9.1	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.1	10.5	8.8	10.0	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	10	7.0	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	15	7.0	7.9	8.3	8.7	9.1	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.6	10.0	10.5	8.8	9.9	10.4	10.8	11.4	9.5	10.8	11.2	11.8	12.3
	20	7.0	7.9	8.2	8.6	9.0	7.4	8.4	8.8	9.1	9.6	8.1	9.1	9.5	9.9	10.4	8.7	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	25	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.1	7.7	8.7	9.1	9.5	9.9	8.4	9.4	9.8	10.3	10.8	9.1	10.2	10.7	11.2	11.7
	30	5.8	6.6	6.9	7.2	7.5	6.2	7.0	7.3	7.7	8.0	6.8	7.7	8.0	8.4	8.8	7.4	8.4	8.8	9.2	9.6	8.1	9.2	9.6	10.0	10.5
	35	4.9	5.6	5.8	6.1	6.4	5.3	6.0	6.3	6.6	6.9	5.9	6.6	6.9	7.3	7.6	6.5	7.3	7.6	8.0	8.4	7.1	8.0	8.4	8.8	9.2
	40	4.0	4.6	4.8	5.0	5.3	4.4	5.0	5.2	5.5	5.7	4.9	5.6	5.8	6.1	6.4	5.5	6.2	6.5	6.8	7.2	6.1	6.9	7.2	7.6	7.9
	45	3.3	3.7	3.9	4.1	4.3	3.6	4.1	4.3	4.5	4.7	4.1	4.6	4.9	5.1	5.4	4.6	5.2	5.5	5.8	6.0	5.2	5.9	6.2	6.5	6.8
	50	2.6	3.0	3.1	3.3	3.4	2.9	3.3	3.5	3.6	3.8	3.3	3.8	4.0	4.2	4.4	3.8	4.4	4.6	4.8	5.1	4.3	5.0	5.2	5.5	5.8
	52	2.3	2.7	2.8	3.0	3.1	2.6	3.0	3.2	3.3	3.5	3.1	3.5	3.7	3.9	4.1	3.5	4.1	4.3	4.5	4.7	4.1	4.6	4.9	5.1	5.4
2000	-30	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	-25	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	-20	7.0	8.0	8.4	8.8	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	11.0	11.5	9.5	10.8	11.3	11.9	12.5
	-15	7.1	8.0	8.4	8.7	9.2	7.5	8.5	8.9	9.3	9.8	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5
	-10	7.1	8.0	8.3	8.7	9.2	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5
	-5	7.1	8.0	8.3	8.7	9.1	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.1	10.6	8.8	10.0	10.4	10.9	11.5	9.6	10.8	11.3	11.8	12.4
	0	7.1	8.0	8.3	8.7	9.1	7.5	8.5	8.9	9.3	9.7	8.1	9.2	9.6	10.0	10.5	8.8	10.0	10.4	10.9	11.4	9.6	10.8	11.3	11.8	12.4
	5	7.1	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	10.0	10.4	10.9	11.4	9.6	10.8	11.3	11.8	12.4
	10	7.1	7.9	8.3	8.7	9.1	7.5	8.4	8.8	9.2	9.6	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.8	11.4	9.5	10.8	11.3	11.8	12.3
	15	7.0	7.9	8.2	8.6	9.0	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	20	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.8	8.8	9.2	9.6	10.0	8.5	9.5	10.0	10.4	10.9	9.2	10.4	10.8	11.3	11.9
	25	6.0	6.8	7.1	7.4	7.8	6.5	7.3	7.6	7.9	8.3	7.0	7.9	8.3	8.7	9.1	7.7	8.7	9.1	9.5	9.9	8.4	9.5	9.9	10.3	10.8
	30	5.2	5.9	6.1	6.4	6.7	5.6	6.3	6.6	6.9	7.2	6.2	7.0	7.3	7.6	8.0	6.8	7.6	8.0	8.3	8.8	7.4	8.4	8.8	9.2	9.6
	35	4.3	4.9	5.1	5.4	5.6	4.7	5.3	5.5	5.8	6.1	5.2	5.9	6.2	6.5	6.8	5.8	6.5	6.8	7.2	7.5	6.4	7.2	7.6	7.9	8.3
	40	3.5	4.0	4.2	4.4	4.6	3.8	4.3	4.6	4.8	5.0	4.3	4.9	5.1	5.4	5.7	4.8	5.5	5.8	6.0	6.4	5.4	6.2	6.5	6.8	7.1
	45	2.7	3.1	3.3	3.5	3.6	3.1	3.5	3.7	3.8	4.0	3.5	4.0	4.2	4.4	4.6	4.0	4.6	4.8	5.0	5.3	4.5	5.2	5.4	5.7	6.0
	50	2.1	2.4	2.6	2.7	2.8	2.4	2.8	2.9	3.1	3.2	2.8	3.2	3.4	3.6	3.8	3.3	3.8	4.0	4.2	4.4	3.8	4.3	4.6	4.8	5.0
3000	-30	7.0	7.9	8.3	8.7	9.1	7.4	8.4	8.8	9.3	9.7	8.1	9.2	9.6	10.0	10.6	8.7	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.8	12.4
	-25	7.0	8.0	8.3	8.7	9.1	7.5	8.4	8.8	9.3	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	-20	7.0	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	-15	7.0	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	-10	7.0	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	-5	7.1	8.0	8.3	8.7	9.1	7.5	8.5	8.8	9.2	9.7	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4
	0	7.1	7.9	8.3	8.7	9.1	7.5	8.4	8.8	9.2	9.6	8.1	9.2	9.6	10.0	10.5	8.8	9.9	10.4	10.8	11.4	9.5	10.8	11.2	11.8	12.3
	5	7.0	7.9	8.3	8.6	9.0	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.5	10.0	10.4	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.7	12.3
	10	7.0	7.8	8.2	8.5	8.9	7.4	8.3	8.7	9.1	9.5	8.0	9.0	9.4	9.9	10.3	8.7	9.8	10.2	10.7	11.2	9.4	10.6	11.1	11.6	12.2
	15	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.1	7.7	8.7	9.1	9.5	9.9	8.4	9.4	9.8	10.3	10.8	9.1	10.2	10.7	11.2	11.7
	20	6.2	7.0	7.3	7.6	8.0	6.6	7.5	7.8	8.1	8.5	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.2	9.7	10.1	8.6	9.7	10.1	10.5	11.0
	25	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.5	6.4	7.2	7.5	7.9	8.2	7.0	7.9	8.3	8.6	9.0	7.7	8.7	9.0	9.5	9.9
	30	4.6	5.2	5.4	5.7	6.0	5.0	5.6	5.9	6.1	6.4	5.5	6.2	6.5	6.8	7.1	6.1	6.9	7.2	7.5	7.9	6.7	7.6	7.9	8.3	8.7
	35	3.7	4.3	4.4	4.7	4.9	4.1	4.6	4.9	5.1	5.3	4.6	5.2	5.5	5.7	6.0	5.1	5.8	6.1	6.4	6.7	5.7	6.5	6.8	7.1	7.5
	40	3.0	3.4	3.5	3.7	3.9	3.3	3.7	3.9	4.1	4.3	3.7	4.3	4.5	4.7	4.9	4.2	4.8	5.1	5.3	5.6	4.8	5.5	5.7	6.0	6.3
	45	2.3	2.6	2.7	2.9	3.0	2.6	2.9	3.1	3.2	3.4	3.0	3.4	3.6	3.8	4.0	3.5	4.0	4.2	4.4	4.6	4.0	4.5	4.8	5.0	5.3
	47	2.0	2.3	2.4	2.6	2.7	2.3	2.7	2.8	2.9	3.1	2.7	3.1	3.3	3.5	3.6	3.2	3.7	3.8	4.0	4.2	3.7	4.2	4.4	4.6	4.9

525BFM-06-00

Figure 4-38* (Sheet 1 of 8)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - UP

CONDITIONS: ANTI-ICE - OFF
LANDING GEAR - UP
AIRSPEED - V2
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	11500 lb, wind -10 kt	11500, 0	11500, 10	11500, 20	11500, 30	11000, -10	11000, 0	11000, 10	11000, 20	11000, 30	10500, -10	10500, 0	10500, 10	10500, 20	10500, 30	10000, -10	10000, 0	10000, 10	10000, 20	10000, 30	9500, -10	9500, 0	9500, 10	9500, 20	9500, 30
0	-25	10.3	11.8	12.4	13.0	13.7	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.3	16.2	13.1	15.1	15.8	16.7	17.6	14.3	16.4	17.2	18.1	19.2
	-20	10.3	11.8	12.4	13.0	13.7	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.3	16.2	13.2	15.1	15.8	16.6	17.6	14.3	16.4	17.2	18.1	19.1
	-15	10.3	11.8	12.3	13.0	13.7	11.2	12.8	13.4	14.1	14.8	12.1	13.9	14.5	15.3	16.1	13.2	15.1	15.8	16.6	17.5	14.3	16.4	17.2	18.1	19.1
	-10	10.3	11.8	12.3	13.0	13.6	11.2	12.8	13.4	14.1	14.8	12.1	13.9	14.5	15.3	16.1	13.2	15.1	15.8	16.6	17.5	14.3	16.4	17.2	18.1	19.1
	-5	10.3	11.8	12.3	12.9	13.6	11.2	12.8	13.4	14.1	14.8	12.2	13.9	14.5	15.3	16.1	13.2	15.1	15.8	16.6	17.5	14.3	16.4	17.2	18.1	19.0
	0	10.3	11.8	12.3	12.9	13.6	11.2	12.8	13.4	14.0	14.8	12.2	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.4	14.3	16.4	17.2	18.0	19.0
	5	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	18.9
	10	10.3	11.7	12.3	12.9	13.5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	15.9	13.2	15.0	15.7	16.5	17.3	14.3	16.3	17.1	17.9	18.9
	15	10.3	11.7	12.2	12.8	13.5	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.3	14.3	16.3	17.0	17.9	18.8
	20	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.2	13.9	14.6	12.1	13.7	14.4	15.1	15.8	13.2	14.9	15.6	16.4	17.2	14.3	16.2	17.0	17.8	18.8
	25	10.3	11.6	12.2	12.7	13.3	11.1	12.6	13.2	13.8	14.5	12.1	13.7	14.3	15.0	15.8	13.1	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.8	18.7
	30	9.6	10.8	11.3	11.9	12.5	10.4	11.8	12.3	12.9	13.6	11.3	12.8	13.4	14.1	14.8	12.3	14.0	14.6	15.3	16.1	13.4	15.2	16.0	16.7	17.6
	35	8.5	9.7	10.1	10.6	11.1	9.3	10.6	11.1	11.6	12.2	10.2	11.5	12.1	12.7	13.3	11.1	12.6	13.2	13.9	14.6	12.2	13.8	14.5	15.2	16.0
	40	7.4	8.4	8.8	9.2	9.7	8.1	9.2	9.7	10.1	10.7	8.9	10.1	10.6	11.2	11.7	9.8	11.2	11.7	12.3	12.9	10.8	12.3	12.9	13.5	14.2
	45	6.4	7.3	7.6	8.0	8.4	7.1	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5	9.6	11.0	11.5	12.1	12.7
	50	5.5	6.3	6.6	6.9	7.3	6.2	7.1	7.4	7.8	8.2	6.9	7.9	8.3	8.7	9.2	7.7	8.8	9.2	9.7	10.2	8.6	9.8	10.3	10.8	11.4
	54	4.9	5.6	5.9	6.2	6.5	5.5	6.3	6.6	7.0	7.3	6.2	7.1	7.5	7.8	8.3	7.0	8.0	8.4	8.8	9.3	7.8	8.9	9.4	9.9	10.4
1000	-25	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.4	14.1	14.8	12.1	13.8	14.5	15.3	16.1	13.1	15.0	15.8	16.6	17.5	14.3	16.3	17.2	18.1	19.1
	-20	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.4	14.0	14.8	12.1	13.8	14.5	15.3	16.1	13.2	15.0	15.8	16.6	17.5	14.3	16.3	17.2	18.1	19.0
	-15	10.3	11.8	12.3	12.9	13.6	11.2	12.7	13.4	14.0	14.8	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.3	16.3	17.2	18.0	19.0
	-10	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.4	14.0	14.7	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.4	14.3	16.3	17.1	18.0	19.0
	-5	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	18.9
	0	10.3	11.7	12.3	12.9	13.5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.4	16.3	17.1	18.0	18.9
	5	10.3	11.7	12.3	12.8	13.5	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.3	14.4	16.3	17.1	17.9	18.9
	10	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.3	14.3	16.3	17.0	17.9	18.8
	15	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.2	13.9	14.5	12.1	13.7	14.4	15.1	15.8	13.2	14.9	15.6	16.4	17.2	14.3	16.2	17.0	17.8	18.7
	20	10.3	11.6	12.1	12.7	13.3	11.1	12.6	13.2	13.8	14.5	12.1	13.7	14.3	15.0	15.7	13.1	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.7	18.6
	25	9.9	11.1	11.6	12.2	12.8	10.7	12.1	12.6	13.2	13.9	11.6	13.2	13.7	14.4	15.1	12.6	14.3	15.0	15.7	16.5	13.8	15.6	16.3	17.1	17.9
	30	8.9	10.0	10.5	11.0	11.5	9.7	10.9	11.4	12.0	12.6	10.5	11.9	12.5	13.1	13.7	11.5	13.0	13.6	14.3	15.0	12.6	14.2	14.9	15.6	16.4
	35	7.8	8.8	9.2	9.7	10.2	8.5	9.7	10.1	10.6	11.2	9.4	10.6	11.1	11.7	12.3	10.3	11.7	12.2	12.8	13.5	11.3	12.8	13.4	14.1	14.8
	40	6.7	7.6	8.0	8.4	8.8	7.4	8.5	8.9	9.3	9.8	8.2	9.3	9.8	10.3	10.8	9.1	10.3	10.8	11.3	11.9	10.0	11.4	11.9	12.5	13.2
	45	5.8	6.6	6.9	7.2	7.6	6.5	7.3	7.7	8.1	8.5	7.2	8.2	8.6	9.0	9.5	8.0	9.1	9.5	10.0	10.5	8.9	10.1	10.6	11.1	11.7
	50	4.9	5.6	5.9	6.2	6.5	5.6	6.4	6.7	7.0	7.4	6.3	7.2	7.5	7.9	8.3	7.0	8.0	8.4	8.8	9.3	7.9	9.0	9.4	9.9	10.4
	52	4.6	5.3	5.5	5.8	6.1	5.2	6.0	6.3	6.6	7.0	5.9	6.8	7.1	7.5	7.9	6.7	7.6	8.0	8.4	8.9	7.5	8.6	9.0	9.5	10.0
2000	-30	10.3	11.7	12.3	12.9	13.6	11.1	12.7	13.3	14.0	14.8	12.1	13.8	14.5	15.2	16.0	13.1	15.0	15.7	16.6	17.5	14.3	16.3	17.1	18.0	19.0
	-25	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.0	13.1	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	19.0
	-20	10.3	11.7	12.3	12.9	13.6	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	19.0
	-15	10.3	11.7	12.3	12.9	13.5	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	18.9
	-10	10.3	11.7	12.3	12.9	13.5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.0	15.7	16.5	17.4	14.3	16.3	17.1	18.0	18.9
	-5	10.4	11.7	12.3	12.9	13.5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	15.9	13.2	15.0	15.7	16.5	17.3	14.4	16.3	17.1	17.9	18.9
	0	10.4	11.7	12.3	12.8	13.5	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.3	14.4	16.3	17.1	17.9	18.8
	5	10.4	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.2	14.4	16.3	17.0	17.9	18.8
	10	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.2	13.9	14.5	12.2	13.8	14.4	15.1	15.8	13.2	15.0	15.6	16.4	17.2	14.4	16.3	17.0	17.8	18.7
	15	10.3	11.6	12.2	12.7	13.3	11.2	12.6	13.2	13.8	14.5	12.1	13.7	14.3	15.0	15.7	13.2	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.7	18.6
	20	10.0	11.3	11.8	12.3	12.9	10.8	12.2	12.8	13.4	14.0	11.8	13.3	13.9	14.5	15.2	12.8	14.5	15.1	15.8	16.6	13.9	15.7	16.5	17.2	18.1
	25	9.1	10.3	10.8	11.3	11.8	9.9	11.2	11.7	12.3	12.9	10.8	12.3	12.8	13.4	14.1	11.8	13.4	14.0	14.6	15.4	12.9	14.6	15.3	16.0	16.8
	30	8.1	9.2	9.6	10.1	10.5	8.9	10.1	10.5	11.0	11.6	9.7	11.0	11.5	12.1	12.7	10.7	12.1	12.6	13.2	13.9	11.7	13.2	13.9	14.5	15.3
	35	7.1	8.0	8.4	8.8	9.2	7.8	8.8	9.2	9.7	10.2	8.6	9.7	10.2	10.7	11.2	9.5	10.7	11.2	11.8	12.4	10.4	11.8	12.4	13.0	13.7
	40	6.1	6.9	7.2	7.6	7.9	6.7	7.7	8.0	8.4	8.8	7.5	8.5	8.9	9.4	9.8	8.3	9.5	9.9	10.4	10.9	9.2	10.5	11.0	11.5	12.1
	45	5.1	5.9	6.1	6.4	6.8	5.8	6.6	6.9	7.3	7.6	6.5	7.4	7.8	8.1	8.6	7.3	8.3	8.7	9.1	9.6	8.1	9.3	9.7	10.2	10.7
	50	4.3	5.0	5.2	5.5	5.8	5.0	5.7	5.9	6.3	6.6	5.6	6.4	6.7	7.1	7.5	6.4	7.3	7.6	8.0	8.4	7.2	8.2	8.6	9.0	9.5
3000	-30	10.3	11.7	12.2	12.8	13.5	11.1	12.7	13.3	13.9	14.7	12.1	13.8	14.4	15.1	15.9	13.1	15.0	15.7	16.5	17.3	14.3	16.3	17.1	17.9	18.9
	-25	10.3	11.7	12.2	12.8	13.5	11.2	12.7	13.3	13.9	14.7	12.1	13.8	14.4	15.1	15.9	13.1	15.0	15.7	16.5	17.3	14.3	16.3	17.1	17.9	18.9
	-20	10.3	11.7	12.2	12.8	13.5	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.3	14.3	16.3	17.1	17.9	18.8
	-15	10.3	11.7	12.2	12.8	13.5	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.3	14.3	16.3	17.0	17.9	18.8
	-10	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.4	17.3	14.3	16.3	17.0	17.9	18.8
	-5	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.4	15.1	15.8	13.2	15.0	15.6	16.4	17.2	14.3	16.3	17.0	17.9	18.8
	0	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.2	13.9	14.5	12.2	13.8	14.4	15.1	15.8	13.2	14.9	15.6	16.4	17.2	14.4	16.3	17.0	17.8	18.7
	5	10.3	11.7	12.2	12.7	13.3	11.2	12.7	13.2	13.8	14.5	12.2	13.7	14.4	15.0	15.8	13.2	14.9	15.6	16.3	17.1	14.3	16.2	17.0	17.8	18.7
	10	10.2	11.5	12.1	12.6	13.2	11.1	12.5	13.1	13.7	14.3	12.0	13.6	14.2	14.9	15.6	13.1	14.8	15.5	16.2	17.0	14.2	16.1	16.8	17.6	18.5
	15	9.9	11.1	11.6	12.2	12.7	10.7	12.1	12.6	13.2	13.8	11.6	13.1	13.7	14.4	15.1	12.7	14.3	14.9	15.6	16.4	13.8	15.6	16.3	17.0	17.9
	20	9.3	10.5	11.0	11.5	12.0	10.1	11.4	12.0	12.5	13.1	11.0	12.5	13.0	13.6	14.3	12.0	13.6	14.2	14.9	15.6	13.1	14.8	15.5	16.2	17.0
	25	8.4	9.5	9.9	10.4	10.9	9.2	10.4	10.8	11.3	11.9	10.0	11.4	11.9	12.4	13.0	11.0	12.4	13.0	13.6	14.3	12.0	13.6	14.2	14.9	15.6
	30	7.4	8.4	8.8	9.2	9.6	8.2	9.2	9.6	10.1	10.6	9.0	10.1	10.6	11.1	11.7	9.9	11.2	11.7	12.2	12.8	10.8	12.3	12.8	13.5	14.1
	35	6.4	7.2	7.6	7.9	8.3	7.1	8.0	8.4	8.8	9.2	7.8	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.4	9.6	10.9	11.4	12.0	12.6
	40	5.4	6.1	6.4	6.7	7.1	6.1	6.9	7.2	7.6	8.0	6.8	7.7	8.1	8.5	8.9	7.6	8.6	9.0	9.5	9.9	8.4	9.6	10.1	10.5	11.1
	45	4.6	5.2	5.4	5.7	6.0	5.2	5.9	6.2	6.5	6.8	5.9	6.7	7.0	7.3	7.7	6.6	7.5	7.9	8.3	8.7	7.4	8.4	8.9	9.3	9.8
	47	4.2	4.8	5.1	5.3	5.6	4.8	5.5	5.8	6.1	6.4	5.5	6.3	6.6	6.9	7.3	6.2	7.1	7.5	7.8	8.2	7.0	8.0	8.4	8.8	9.3

525BFM-06-00

Figure 4-38* (Sheet 2)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT FLAPS - UP

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS / WIND KNOTS

ALT FT	TEMP DEG C	13870					13500					13000					12500					12000				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-45	7.0	7.9	8.3	8.6	9.0	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	-40	7.0	7.9	8.3	8.6	9.0	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	-35	7.1	7.9	8.3	8.6	9.0	7.5	8.4	8.8	9.2	9.6	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.2
	-30	7.1	7.9	8.2	8.6	9.0	7.5	8.4	8.8	9.1	9.5	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.2	9.5	10.7	11.2	11.7	12.2
	-25	6.9	7.8	8.1	8.5	8.8	7.4	8.3	8.6	9.0	9.4	8.0	9.0	9.3	9.8	10.2	8.7	9.7	10.1	10.6	11.1	9.4	10.5	11.0	11.5	12.0
	-20	6.6	7.4	7.7	8.1	8.4	7.0	7.9	8.2	8.6	9.0	7.6	8.6	8.9	9.3	9.7	8.3	9.3	9.7	10.1	10.6	9.0	10.1	10.5	11.0	11.5
	-15	6.3	7.0	7.3	7.6	8.0	6.7	7.5	7.8	8.1	8.5	7.3	8.2	8.5	8.9	9.3	7.9	8.9	9.3	9.7	10.1	8.6	9.7	10.1	10.5	11.0
	-10	5.9	6.7	6.9	7.2	7.6	6.3	7.1	7.4	7.7	8.1	6.9	7.8	8.1	8.5	8.8	7.6	8.5	8.8	9.2	9.6	8.2	9.3	9.6	10.1	10.5
	-5	5.6	6.2	6.5	6.8	7.1	6.0	6.7	7.0	7.3	7.6	6.5	7.3	7.6	8.0	8.3	7.1	8.0	8.4	8.7	9.1	7.8	8.8	9.1	9.5	10.0
	0	5.1	5.8	6.0	6.3	6.6	5.5	6.2	6.5	6.7	7.1	6.1	6.8	7.1	7.4	7.8	6.7	7.5	7.8	8.2	8.5	7.3	8.2	8.6	9.0	9.4
	5	4.7	5.3	5.6	5.8	6.1	5.1	5.8	6.0	6.3	6.5	5.7	6.4	6.6	6.9	7.2	6.2	7.0	7.3	7.6	8.0	6.9	7.7	8.1	8.4	8.8
	10	4.4	4.9	5.1	5.3	5.6	4.7	5.3	5.5	5.8	6.0	5.3	5.9	6.2	6.4	6.7	5.8	6.5	6.8	7.1	7.4	6.4	7.2	7.5	7.9	8.2
	15	4.0	4.5	4.7	4.9	5.1	4.3	4.9	5.1	5.3	5.6	4.9	5.5	5.7	6.0	6.2	5.4	6.1	6.4	6.6	6.9	6.0	6.8	7.1	7.4	7.7
	20	3.3	3.7	3.9	4.1	4.3	3.6	4.1	4.3	4.5	4.7	4.1	4.6	4.9	5.1	5.3	4.7	5.2	5.5	5.7	6.0	5.2	5.9	6.1	6.4	6.7
	25	2.6	2.9	3.0	3.2	3.3	2.9	3.3	3.4	3.6	3.7	3.3	3.8	3.9	4.1	4.3	3.8	4.3	4.5	4.7	4.9	4.3	4.9	5.1	5.4	5.6
	30	1.9	2.1	2.3	2.4	2.5	2.2	2.5	2.6	2.7	2.8	2.6	2.9	3.1	3.2	3.4	3.0	3.4	3.6	3.8	4.0	3.5	4.0	4.2	4.4	4.6
	35	1.2	1.4	1.5	1.6	1.7	1.5	1.7	1.8	1.9	2.0	1.9	2.2	2.3	2.4	2.5	2.3	2.7	2.8	2.9	3.1	2.8	3.2	3.3	3.5	3.7
9000	-45	7.0	7.9	8.2	8.6	8.9	7.4	8.4	8.7	9.1	9.5	8.1	9.1	9.5	9.9	10.3	8.7	9.8	10.3	10.7	11.2	9.5	10.7	11.1	11.6	12.2
	-40	7.0	7.9	8.2	8.6	8.9	7.4	8.4	8.7	9.1	9.5	8.1	9.1	9.5	9.9	10.3	8.8	9.8	10.3	10.7	11.2	9.5	10.7	11.1	11.6	12.2
	-35	7.0	7.8	8.1	8.5	8.9	7.4	8.3	8.6	9.0	9.4	8.0	9.0	9.4	9.8	10.2	8.7	9.8	10.2	10.6	11.1	9.4	10.6	11.0	11.5	12.0
	-30	6.7	7.5	7.8	8.2	8.5	7.1	8.0	8.3	8.7	9.1	7.7	8.7	9.0	9.4	9.9	8.4	9.4	9.8	10.3	10.7	9.1	10.2	10.7	11.1	11.6
	-25	6.4	7.1	7.4	7.7	8.1	6.8	7.6	7.9	8.3	8.6	7.4	8.3	8.6	9.0	9.4	8.0	9.0	9.4	9.8	10.2	8.7	9.8	10.2	10.6	11.1
	-20	6.0	6.8	7.0	7.3	7.7	6.4	7.2	7.5	7.8	8.2	7.0	7.9	8.2	8.6	8.9	7.6	8.6	8.9	9.3	9.8	8.3	9.4	9.8	10.2	10.6
	-15	5.7	6.4	6.7	6.9	7.3	6.1	6.8	7.1	7.4	7.8	6.7	7.5	7.8	8.1	8.5	7.3	8.2	8.5	8.9	9.3	8.0	8.9	9.3	9.7	10.2
	-10	5.4	6.0	6.3	6.6	6.9	5.8	6.5	6.7	7.0	7.4	6.3	7.1	7.4	7.7	8.1	6.9	7.8	8.1	8.5	8.9	7.6	8.5	8.9	9.3	9.7
	-5	5.0	5.6	5.9	6.1	6.4	5.4	6.1	6.3	6.6	6.9	5.9	6.7	7.0	7.3	7.6	6.5	7.3	7.6	8.0	8.3	7.2	8.1	8.4	8.8	9.2
	0	4.6	5.2	5.4	5.6	5.9	5.0	5.6	5.8	6.1	6.4	5.5	6.2	6.5	6.7	7.0	6.1	6.9	7.1	7.5	7.8	6.7	7.6	7.9	8.2	8.6
	5	4.2	4.8	5.0	5.2	5.4	4.6	5.2	5.4	5.6	5.9	5.1	5.7	6.0	6.3	6.5	5.7	6.4	6.6	6.9	7.3	6.3	7.1	7.4	7.7	8.0
	10	3.9	4.4	4.5	4.7	5.0	4.2	4.7	4.9	5.2	5.4	4.7	5.3	5.5	5.8	6.0	5.3	5.9	6.2	6.4	6.7	5.9	6.6	6.9	7.2	7.5
	15	3.5	3.9	4.1	4.2	4.4	3.8	4.3	4.5	4.7	4.9	4.3	4.8	5.0	5.2	5.5	4.8	5.4	5.6	5.9	6.2	5.4	6.1	6.3	6.6	6.9
	20	2.8	3.1	3.3	3.4	3.6	3.1	3.5	3.6	3.8	4.0	3.5	4.0	4.2	4.4	4.6	4.0	4.6	4.8	5.0	5.2	4.6	5.2	5.4	5.6	5.9
	25	2.1	2.3	2.5	2.6	2.7	2.4	2.7	2.8	2.9	3.1	2.8	3.2	3.3	3.5	3.6	3.2	3.7	3.8	4.0	4.2	3.7	4.2	4.4	4.6	4.9
	30	1.4	1.6	1.7	1.8	1.9	1.7	1.9	2.0	2.1	2.2	2.1	2.4	2.5	2.6	2.7	2.5	2.8	3.0	3.1	3.3	3.0	3.4	3.5	3.7	3.9
	32	1.1	1.3	1.4	1.5	1.6	1.4	1.6	1.7	1.8	1.9	1.8	2.1	2.2	2.3	2.4	2.2	2.5	2.6	2.8	2.9	2.7	3.0	3.2	3.3	3.5
10000	-50	6.7	7.6	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.8	8.7	9.1	9.5	9.9	8.4	9.5	9.9	10.3	10.8	9.1	10.3	10.7	11.2	11.7
	-45	6.7	7.6	7.9	8.2	8.6	7.2	8.1	8.4	8.8	9.2	7.8	8.7	9.1	9.5	9.9	8.4	9.5	9.9	10.3	10.8	9.1	10.3	10.7	11.2	11.7
	-40	6.8	7.6	7.9	8.2	8.6	7.2	8.1	8.4	8.8	9.2	7.8	8.7	9.1	9.5	9.9	8.4	9.5	9.9	10.3	10.8	9.2	10.3	10.7	11.2	11.7
	-35	6.5	7.2	7.5	7.9	8.2	6.9	7.7	8.0	8.4	8.8	7.5	8.4	8.7	9.1	9.5	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3
	-30	6.1	6.9	7.1	7.4	7.8	6.5	7.3	7.6	8.0	8.3	7.1	8.0	8.3	8.7	9.1	7.7	8.7	9.1	9.5	9.9	8.4	9.5	9.9	10.3	10.8
	-25	5.8	6.5	6.7	7.0	7.3	6.2	6.9	7.2	7.5	7.9	6.8	7.6	7.9	8.2	8.6	7.4	8.3	8.6	9.0	9.4	8.0	9.0	9.4	9.8	10.3
	-20	5.5	6.1	6.4	6.6	6.9	5.9	6.6	6.8	7.1	7.4	6.4	7.2	7.5	7.8	8.2	7.0	7.9	8.2	8.6	9.0	7.7	8.6	9.0	9.4	9.8
	-15	5.2	5.8	6.0	6.3	6.6	5.5	6.2	6.5	6.7	7.0	6.1	6.8	7.1	7.4	7.8	6.7	7.5	7.8	8.2	8.5	7.3	8.2	8.6	8.9	9.4
	-10	4.9	5.5	5.7	5.9	6.2	5.2	5.9	6.1	6.4	6.7	5.8	6.5	6.8	7.0	7.4	6.4	7.1	7.4	7.8	8.1	7.0	7.9	8.2	8.5	8.9
	-5	4.5	5.0	5.2	5.5	5.7	4.9	5.4	5.7	5.9	6.2	5.4	6.0	6.3	6.6	6.9	6.0	6.7	7.0	7.3	7.6	6.6	7.4	7.7	8.0	8.4
	0	4.1	4.6	4.8	5.0	5.2	4.5	5.0	5.2	5.4	5.7	5.0	5.6	5.8	6.1	6.3	5.5	6.2	6.5	6.8	7.1	6.1	6.9	7.2	7.5	7.8
	5	3.7	4.2	4.4	4.6	4.8	4.1	4.6	4.8	5.0	5.2	4.6	5.1	5.4	5.6	5.9	5.1	5.8	6.0	6.3	6.5	5.7	6.4	6.7	7.0	7.3
	10	3.4	3.8	4.0	4.2	4.4	3.7	4.2	4.4	4.6	4.8	4.2	4.7	4.9	5.1	5.4	4.7	5.3	5.5	5.8	6.1	5.3	6.0	6.2	6.5	6.8
	15	2.9	3.3	3.5	3.6	3.8	3.3	3.7	3.8	4.0	4.2	3.7	4.2	4.4	4.6	4.8	4.2	4.8	5.0	5.2	5.4	4.8	5.4	5.6	5.9	6.1
	20	2.2	2.5	2.7	2.8	2.9	2.5	2.9	3.0	3.1	3.3	3.0	3.4	3.5	3.7	3.8	3.4	3.9	4.1	4.2	4.4	3.9	4.5	4.7	4.9	5.1
	25	1.6	1.8	1.9	2.0	2.1	1.8	2.1	2.2	2.3	2.4	2.2	2.6	2.7	2.8	2.9	2.7	3.1	3.2	3.3	3.5	3.2	3.6	3.7	3.9	4.1
	30	0.9	1.1	1.1	1.2	1.3	1.2	1.4	1.4	1.5	1.6	1.6	1.8	1.9	2.0	2.1	2.0	2.3	2.4	2.5	2.6	2.4	2.8	2.9	3.0	3.2
11000	-50	6.1	6.9	7.2	7.5	7.9	6.5	7.4	7.7	8.0	8.4	7.1	8.0	8.4	8.7	9.1	7.8	8.7	9.1	9.5	10.0	8.4	9.5	9.9	10.4	10.8
	-45	6.2	6.9	7.2	7.5	7.9	6.6	7.4	7.7	8.0	8.4	7.1	8.0	8.4	8.7	9.1	7.8	8.7	9.1	9.5	9.9	8.5	9.5	9.9	10.4	10.8
	-40	6.1	6.9	7.1	7.4	7.8	6.5	7.3	7.6	7.9	8.3	7.1	8.0	8.3	8.7	9.0	7.7	8.7	9.0	9.4	9.9	8.4	9.4	9.8	10.3	10.7
	-35	5.9	6.6	6.9	7.2	7.5	6.3	7.0	7.3	7.7	8.0	6.9	7.7	8.0	8.4	8.7	7.5	8.4	8.8	9.1	9.5	8.2	9.2	9.5	10.0	10.4
	-30	5.5	6.2	6.5	6.7	7.0	5.9	6.7	6.9	7.2	7.5	6.5	7.3	7.6	7.9	8.3	7.1	8.0	8.3	8.7	9.1	7.8	8.7	9.1	9.5	9.9
	-25	5.2	5.9	6.1	6.4	6.6	5.6	6.3	6.5	6.8	7.1	6.2	6.9	7.2	7.5	7.8	6.8	7.6	7.9	8.2	8.6	7.4	8.3	8.7	9.0	9.4
	-20	4.9	5.5	5.7	6.0	6.2	5.3	5.9	6.2	6.4	6.7	5.8	6.5	6.8	7.1	7.4	6.4	7.2	7.5	7.8	8.2	7.1	7.9	8.2	8.6	9.0
	-15	4.6	5.2	5.4	5.6	5.9	5.0	5.6	5.8	6.1	6.3	5.5	6.2	6.4	6.7	7.0	6.1	6.8	7.1	7.4	7.8	6.7	7.5	7.9	8.2	8.6
	-10	4.3	4.8	5.0	5.3	5.5	4.7	5.2	5.5	5.7	6.0	5.2	5.8	6.1	6.3	6.6	5.8	6.5	6.7	7.0	7.3	6.4	7.2	7.5	7.8	8.1
	-5	4.0	4.5	4.7	4.9	5.1	4.3	4.9	5.1	5.3	5.5	4.8	5.4	5.7	5.9	6.2	5.4	6.0	6.3	6.6	6.9	6.0	6.7	7.0	7.3	7.6
	0	3.6	4.1	4.2	4.4	4.6	4.0	4.4	4.6	4.8	5.0	4.4	5.0	5.2	5.4	5.7	5.0	5.6	5.8	6.1	6.4	5.6	6.2	6.5	6.8	7.1
	5	3.3	3.7	3.8	4.0	4.2	3.6	4.0	4.2	4.4	4.6	4.1	4.6	4.8	5.0	5.2	4.6	5.2	5.4	5.6	5.9	5.2	5.8	6.0	6.3	6.6
	10	2.9	3.3	3.5	3.6	3.8	3.3	3.7	3.8	4.0	4.2	3.7	4.2	4.4	4.5	4.8	4.2	4.7	4.9	5.2	5.4	4.8	5.3	5.6	5.8	6.1
	15	2.4	2.7	2.9	3.0	3.1	2.7	3.1	3.2	3.4	3.5	3.2	3.6	3.7	3.9	4.1	3.6	4.1	4.3	4.5	4.7	4.2	4.7	4.9	5.1	5.3
	20	1.7	2.0	2.1	2.2	2.3	2.0	2.3	2.4	2.5	2.6	2.4	2.8	2.9	3.0	3.2	2.9	3.3	3.4	3.6	3.7	3.4	3.8	4.0	4.2	4.3
	25	1.1	1.3	1.3	1.4	1.5	1.3	1.6	1.6	1.7	1.8	1.7	2.0	2.1	2.2	2.3	2.1	2.5	2.6	2.7	2.8	2.6	3.0	3.1	3.2	3.4
	28	0.7	0.8	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.5	1.6	1.7	1.8	1.7	2.0	2.1	2.2	2.3	2.2	2.5	2.6	2.7	2.9

525BFM-06-00

Figure 4-38* (Sheet 5)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT FLAPS - UP

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS / WIND KNOTS

ALT FT	TEMP DEG C	11500					11000					10500					10000					9500				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-45	10.3	11.6	12.1	12.7	13.3	11.2	12.6	13.2	13.8	14.5	12.1	13.7	14.3	15.0	15.7	13.1	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.7	18.6
	-40	10.3	11.6	12.1	12.7	13.3	11.2	12.6	13.2	13.8	14.5	12.1	13.7	14.3	15.0	15.7	13.2	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.7	18.6
	-35	10.3	11.6	12.1	12.7	13.3	11.2	12.6	13.2	13.8	14.4	12.2	13.7	14.3	15.0	15.7	13.2	14.9	15.6	16.3	17.1	14.3	16.2	16.9	17.7	18.6
	-30	10.3	11.6	12.1	12.7	13.2	11.2	12.6	13.1	13.7	14.4	12.1	13.7	14.3	14.9	15.6	13.2	14.9	15.5	16.2	17.0	14.3	16.2	16.9	17.7	18.5
	-25	10.2	11.4	11.9	12.5	13.0	11.0	12.4	12.9	13.5	14.2	12.0	13.5	14.1	14.7	15.4	13.0	14.6	15.3	16.0	16.7	14.1	15.9	16.6	17.4	18.2
	-20	9.8	11.0	11.5	12.0	12.5	10.6	11.9	12.4	13.0	13.6	11.5	13.0	13.5	14.1	14.8	12.5	14.1	14.7	15.4	16.1	13.6	15.4	16.0	16.8	17.6
	-15	9.4	10.5	11.0	11.5	12.0	10.2	11.5	12.0	12.5	13.1	11.1	12.5	13.0	13.6	14.2	12.1	13.6	14.2	14.8	15.5	13.2	14.8	15.5	16.2	17.0
	-10	9.0	10.1	10.5	11.0	11.5	9.8	11.0	11.5	12.0	12.5	10.7	12.0	12.5	13.1	13.7	11.6	13.1	13.7	14.3	14.9	12.7	14.3	14.9	15.6	16.3
	-5	8.5	9.6	10.0	10.4	10.9	9.3	10.5	10.9	11.4	11.9	10.2	11.4	11.9	12.5	13.1	11.1	12.5	13.1	13.6	14.3	12.2	13.7	14.3	14.9	15.7
	0	8.0	9.0	9.4	9.8	10.3	8.8	9.9	10.3	10.8	11.3	9.6	10.8	11.3	11.8	12.4	10.6	11.9	12.4	13.0	13.6	11.6	13.0	13.6	14.2	14.9
	5	7.6	8.5	8.9	9.3	9.7	8.3	9.3	9.7	10.2	10.6	9.1	10.3	10.7	11.2	11.7	10.0	11.3	11.8	12.3	12.9	11.0	12.4	12.9	13.5	14.2
	10	7.1	8.0	8.3	8.7	9.1	7.8	8.8	9.2	9.6	10.0	8.6	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.7	12.2	10.5	11.8	12.3	12.9	13.5
	15	6.7	7.5	7.8	8.2	8.6	7.4	8.3	8.7	9.1	9.5	8.2	9.2	9.6	10.0	10.5	9.0	10.1	10.6	11.1	11.6	9.9	11.2	11.7	12.2	12.8
	20	5.8	6.6	6.9	7.2	7.5	6.5	7.4	7.7	8.0	8.4	7.3	8.2	8.5	8.9	9.4	8.1	9.1	9.5	9.9	10.4	9.0	10.1	10.6	11.0	11.6
	25	4.9	5.6	5.8	6.1	6.4	5.6	6.3	6.6	6.9	7.2	6.3	7.1	7.4	7.7	8.1	7.0	8.0	8.3	8.7	9.1	7.9	8.9	9.3	9.7	10.2
	30	4.1	4.6	4.8	5.0	5.3	4.7	5.3	5.5	5.8	6.1	5.3	6.0	6.3	6.6	6.9	6.0	6.8	7.2	7.5	7.9	6.8	7.7	8.1	8.5	8.9
	35	3.3	3.7	3.9	4.1	4.3	3.8	4.4	4.6	4.8	5.0	4.4	5.1	5.3	5.5	5.8	5.1	5.8	6.1	6.4	6.7	5.9	6.7	7.0	7.3	7.7
9000	-45	10.3	11.6	12.1	12.6	13.2	11.1	12.6	13.1	13.7	14.4	12.1	13.6	14.2	14.9	15.6	13.1	14.8	15.5	16.2	17.0	14.3	16.1	16.8	17.6	18.5
	-40	10.3	11.6	12.1	12.6	13.2	11.2	12.6	13.1	13.7	14.3	12.1	13.6	14.2	14.9	15.6	13.1	14.8	15.5	16.2	17.0	14.3	16.1	16.8	17.6	18.5
	-35	10.2	11.5	12.0	12.5	13.1	11.1	12.4	13.0	13.6	14.2	12.0	13.5	14.1	14.7	15.4	13.0	14.7	15.3	16.0	16.8	14.2	16.0	16.7	17.4	18.3
	-30	9.9	11.1	11.6	12.1	12.7	10.7	12.1	12.6	13.1	13.8	11.6	13.1	13.7	14.3	15.0	12.7	14.3	14.9	15.6	16.3	13.8	15.5	16.2	16.9	17.8
	-25	9.5	10.6	11.1	11.6	12.1	10.3	11.6	12.1	12.6	13.2	11.2	12.6	13.1	13.7	14.4	12.2	13.7	14.3	15.0	15.7	13.3	15.0	15.6	16.3	17.1
	-20	9.1	10.2	10.6	11.1	11.6	9.9	11.1	11.6	12.1	12.7	10.8	12.1	12.6	13.2	13.8	11.7	13.2	13.8	14.4	15.1	12.8	14.4	15.0	15.7	16.5
	-15	8.7	9.8	10.2	10.6	11.1	9.5	10.7	11.1	11.6	12.1	10.3	11.6	12.1	12.7	13.3	11.3	12.7	13.3	13.9	14.5	12.3	13.9	14.5	15.2	15.9
	-10	8.3	9.3	9.7	10.2	10.6	9.1	10.2	10.7	11.1	11.6	9.9	11.2	11.7	12.2	12.7	10.9	12.2	12.8	13.3	14.0	11.9	13.4	14.0	14.6	15.3
	-5	7.9	8.9	9.2	9.6	10.1	8.6	9.7	10.1	10.6	11.1	9.5	10.6	11.1	11.6	12.1	10.4	11.7	12.2	12.7	13.3	11.4	12.8	13.4	14.0	14.6
	0	7.4	8.3	8.7	9.1	9.5	8.1	9.2	9.5	10.0	10.4	9.0	10.1	10.5	11.0	11.5	9.8	11.1	11.5	12.1	12.6	10.8	12.2	12.7	13.3	13.9
	5	6.9	7.8	8.1	8.5	8.9	7.7	8.6	9.0	9.4	9.8	8.5	9.5	9.9	10.4	10.8	9.3	10.5	10.9	11.4	12.0	10.3	11.6	12.1	12.6	13.2
	10	6.5	7.3	7.6	8.0	8.3	7.2	8.1	8.5	8.8	9.2	8.0	9.0	9.4	9.8	10.2	8.8	9.9	10.3	10.8	11.3	9.7	11.0	11.4	12.0	12.5
	15	6.0	6.8	7.1	7.4	7.7	6.7	7.5	7.9	8.2	8.6	7.4	8.4	8.7	9.1	9.6	8.3	9.3	9.7	10.1	10.6	9.2	10.3	10.8	11.3	11.8
	20	5.2	5.8	6.1	6.4	6.7	5.8	6.6	6.9	7.2	7.5	6.5	7.4	7.7	8.0	8.4	7.3	8.2	8.6	9.0	9.4	8.2	9.2	9.6	10.1	10.5
	25	4.3	4.9	5.1	5.3	5.6	4.9	5.6	5.8	6.1	6.4	5.6	6.3	6.6	6.9	7.2	6.3	7.1	7.5	7.8	8.2	7.1	8.0	8.4	8.8	9.2
	30	3.5	3.9	4.1	4.3	4.5	4.0	4.6	4.8	5.0	5.3	4.7	5.3	5.5	5.8	6.1	5.4	6.1	6.4	6.7	7.0	6.1	6.9	7.2	7.6	8.0
	32	3.2	3.6	3.8	3.9	4.1	3.7	4.2	4.4	4.6	4.9	4.3	4.9	5.1	5.4	5.6	5.0	5.7	5.9	6.2	6.5	5.7	6.5	6.8	7.1	7.5
10000	-50	9.9	11.1	11.6	12.2	12.7	10.7	12.1	12.6	13.2	13.8	11.6	13.1	13.7	14.4	15.0	12.6	14.3	14.9	15.6	16.4	13.7	15.5	16.2	17.0	17.8
	-45	9.9	11.2	11.6	12.2	12.7	10.7	12.1	12.6	13.2	13.8	11.7	13.1	13.7	14.4	15.0	12.7	14.3	14.9	15.6	16.4	13.8	15.6	16.2	17.0	17.8
	-40	9.9	11.2	11.6	12.2	12.7	10.8	12.1	12.6	13.2	13.8	11.7	13.2	13.7	14.4	15.0	12.7	14.3	14.9	15.6	16.4	13.8	15.6	16.3	17.0	17.8
	-35	9.6	10.8	11.2	11.7	12.3	10.4	11.7	12.2	12.8	13.4	11.3	12.7	13.3	13.9	14.5	12.3	13.9	14.5	15.1	15.8	13.4	15.1	15.8	16.5	17.3
	-30	9.2	10.3	10.8	11.2	11.7	10.0	11.2	11.7	12.2	12.8	10.9	12.2	12.8	13.3	14.0	11.9	13.3	13.9	14.6	15.2	12.9	14.6	15.2	15.9	16.6
	-25	8.8	9.9	10.3	10.7	11.2	9.6	10.8	11.2	11.7	12.3	10.4	11.7	12.2	12.8	13.4	11.4	12.8	13.4	14.0	14.6	12.4	14.0	14.6	15.3	16.0
	-20	8.4	9.4	9.8	10.3	10.7	9.2	10.3	10.8	11.2	11.7	10.0	11.3	11.8	12.3	12.9	11.0	12.3	12.9	13.4	14.1	12.0	13.5	14.1	14.7	15.4
	-15	8.0	9.0	9.4	9.8	10.3	8.8	9.9	10.3	10.8	11.3	9.6	10.8	11.3	11.8	12.3	10.5	11.9	12.4	12.9	13.5	11.6	13.0	13.6	14.2	14.8
	-10	7.7	8.6	9.0	9.4	9.8	8.4	9.5	9.9	10.3	10.8	9.2	10.4	10.8	11.3	11.8	10.1	11.4	11.9	12.4	13.0	11.1	12.5	13.1	13.7	14.3
	-5	7.2	8.1	8.5	8.9	9.3	8.0	9.0	9.3	9.8	10.2	8.8	9.9	10.3	10.7	11.2	9.7	10.9	11.3	11.8	12.4	10.6	12.0	12.5	13.0	13.6
	0	6.8	7.6	8.0	8.3	8.7	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.7	10.1	10.6	9.1	10.3	10.7	11.2	11.7	10.1	11.3	11.8	12.4	12.9
	5	6.3	7.1	7.4	7.8	8.1	7.0	7.9	8.3	8.6	9.0	7.8	8.8	9.1	9.6	10.0	8.6	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.7	12.3
	10	5.9	6.7	6.9	7.3	7.6	6.6	7.4	7.7	8.1	8.5	7.3	8.3	8.6	9.0	9.4	8.2	9.2	9.6	10.0	10.5	9.0	10.2	10.6	11.1	11.6
	15	5.4	6.1	6.3	6.6	6.9	6.0	6.8	7.1	7.4	7.8	6.8	7.6	7.9	8.3	8.7	7.6	8.5	8.9	9.3	9.7	8.4	9.5	9.9	10.3	10.8
	20	4.5	5.1	5.3	5.6	5.8	5.1	5.8	6.1	6.3	6.6	5.8	6.6	6.8	7.2	7.5	6.6	7.4	7.7	8.1	8.5	7.4	8.3	8.7	9.1	9.5
	25	3.7	4.2	4.4	4.6	4.8	4.3	4.8	5.0	5.3	5.5	4.9	5.5	5.8	6.1	6.4	5.6	6.3	6.6	6.9	7.3	6.4	7.2	7.5	7.9	8.3
	30	2.9	3.3	3.5	3.6	3.8	3.4	3.9	4.1	4.3	4.5	4.0	4.6	4.8	5.0	5.2	4.7	5.3	5.6	5.8	6.1	5.4	6.1	6.4	6.7	7.0
11000	-50	9.2	10.3	10.8	11.3	11.8	10.0	11.3	11.7	12.3	12.9	10.9	12.3	12.8	13.4	14.0	11.8	13.4	13.9	14.6	15.3	12.9	14.6	15.2	15.9	16.7
	-45	9.2	10.4	10.8	11.3	11.8	10.0	11.3	11.8	12.3	12.9	10.9	12.3	12.8	13.4	14.0	11.9	13.4	14.0	14.6	15.3	12.9	14.6	15.2	15.9	16.7
	-40	9.2	10.3	10.7	11.2	11.7	10.0	11.2	11.7	12.2	12.8	10.8	12.2	12.7	13.3	13.9	11.8	13.3	13.9	14.5	15.2	12.9	14.5	15.1	15.8	16.6
	-35	8.9	10.0	10.4	10.9	11.4	9.7	10.9	11.4	11.9	12.4	10.6	11.9	12.4	12.9	13.5	11.5	13.0	13.5	14.1	14.8	12.6	14.2	14.8	15.5	16.2
	-30	8.5	9.5	9.9	10.4	10.8	9.3	10.4	10.9	11.3	11.9	10.1	11.4	11.9	12.4	13.0	11.1	12.4	13.0	13.6	14.2	12.1	13.6	14.2	14.8	15.5
	-25	8.1	9.1	9.5	9.9	10.4	8.9	10.0	10.4	10.9	11.3	9.7	10.9	11.4	11.9	12.4	10.6	12.0	12.5	13.0	13.6	11.6	13.1	13.7	14.3	15.0
	-20	7.7	8.7	9.1	9.5	9.9	8.5	9.5	9.9	10.4	10.9	9.3	10.5	10.9	11.4	11.9	10.2	11.5	12.0	12.5	13.1	11.2	12.6	13.2	13.7	14.4
	-15	7.4	8.3	8.6	9.0	9.4	8.1	9.1	9.5	9.9	10.4	8.9	10.0	10.5	10.9	11.4	9.8	11.0	11.5	12.0	12.6	10.8	12.1	12.7	13.2	13.8
	-10	7.0	7.9	8.2	8.6	9.0	7.8	8.7	9.1	9.5	9.9	8.5	9.6	10.0	10.4	10.9	9.4	10.6	11.0	11.5	12.0	10.4	11.7	12.2	12.7	13.3
	-5	6.6	7.5	7.8	8.1	8.5	7.3	8.2	8.6	9.0	9.4	8.1	9.1	9.5	9.9	10.4	9.0	10.1	10.5	11.0	11.5	9.9	11.1	11.6	12.1	12.7
	0	6.2	7.0	7.3	7.6	7.9	6.9	7.7	8.1	8.4	8.8	7.6	8.6	8.9	9.3	9.8	8.5	9.5	9.9	10.4	10.8	9.4	10.5	11.0	11.5	12.0
	5	5.8	6.5	6.8	7.1	7.4	6.4	7.2	7.5	7.9	8.2	7.2	8.1	8.4	8.8	9.2	8.0	9.0	9.3	9.8	10.2	8.9	10.0	10.4	10.9	11.4
	10	5.4	6.0	6.3	6.6	6.9	6.0	6.8	7.0	7.4	7.7	6.7	7.6	7.9	8.2	8.6	7.5	8.4	8.8	9.2	9.6	8.4	9.4	9.8	10.3	10.7
	15	4.7	5.3	5.6	5.8	6.1	5.4	6.0	6.3	6.6	6.9	6.1	6.8	7.1	7.4	7.8	6.8	7.7	8.0	8.4	8.7	7.6	8.6	9.0	9.4	9.8
	20	3.9	4.4	4.6	4.8	5.0	4.5	5.1	5.3	5.5	5.8	5.1	5.8	6.0	6.3	6.6	5.8	6.6	6.9	7.2	7.5	6.6	7.5	7.8	8.2	8.5
	25	3.1	3.5	3.7	3.8	4.0	3.6	4.1	4.3	4.5	4.7	4.2	4.8	5.0	5.3	5.5	4.9	5.6	5.8	6.1	6.4	5.7	6.4	6.7	7.0	7.3
	28	2.6	3.0	3.1	3.3	3.5	3.2	3.6	3.8	3.9	4.1	3.7	4.2	4.4	4.6	4.9	4.4	5.0	5.2	5.4	5.7	5.1	5.8	6.0	6.3	6.6

525BFM-06-00

Figure 4-38* (Sheet 6)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - UP

CONDITIONS: ANTI-ICE - ON; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	13870					13500					13000					12500					12000				
	WIND KNOTS	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	6.8	7.7	8.1	8.5	9.0	7.2	8.2	8.6	9.1	9.6	7.8	8.9	9.4	9.9	10.4	8.5	9.7	10.2	10.7	11.3	9.2	10.5	11.1	11.7	12.3
	-30	6.8	7.7	8.1	8.5	9.0	7.2	8.2	8.6	9.1	9.6	7.8	8.9	9.4	9.9	10.4	8.5	9.7	10.2	10.7	11.3	9.2	10.5	11.1	11.6	12.3
	-25	6.8	7.7	8.1	8.5	9.0	7.2	8.2	8.6	9.1	9.5	7.8	8.9	9.4	9.9	10.4	8.5	9.7	10.2	10.7	11.3	9.2	10.5	11.1	11.6	12.3
	-20	6.8	7.7	8.1	8.5	9.0	7.2	8.2	8.6	9.1	9.5	7.8	8.9	9.4	9.8	10.4	8.5	9.7	10.2	10.7	11.3	9.2	10.5	11.1	11.6	12.2
	-15	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.1	9.5	7.8	8.9	9.4	9.8	10.3	8.5	9.7	10.2	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	-10	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.9	8.9	9.4	9.8	10.3	8.5	9.7	10.2	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	-5	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.9	8.9	9.4	9.8	10.3	8.5	9.7	10.2	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	0	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.9	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.6	12.1
	5	6.8	7.7	8.1	8.4	8.8	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.2	8.5	9.7	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	10	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
1000	-35	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	-30	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	-25	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.7	11.2	9.2	10.5	11.0	11.6	12.2
	-20	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.6	12.2
	-15	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.6	12.2
	-10	6.8	7.7	8.1	8.4	8.9	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.5	12.1
	-5	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.2	8.5	9.7	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	0	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	5	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.5	11.1	9.2	10.5	10.9	11.5	12.0
	10	6.8	7.6	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
2000	-35	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.6	12.2
	-30	6.8	7.7	8.1	8.5	8.9	7.2	8.2	8.6	9.0	9.5	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.5	12.2
	-25	6.8	7.7	8.1	8.4	8.9	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.2	9.2	10.5	11.0	11.5	12.1
	-20	6.8	7.7	8.0	8.4	8.9	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.3	8.5	9.7	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	-15	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.8	10.2	8.5	9.7	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	-10	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.6	9.0	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.7	10.1	10.6	11.1	9.2	10.5	11.0	11.5	12.1
	-5	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.6	11.1	9.2	10.5	10.9	11.5	12.0
	0	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.3	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.5	11.1	9.2	10.5	10.9	11.4	12.0
	5	6.8	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.8	8.9	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	10	6.6	7.5	7.8	8.2	8.5	7.0	8.0	8.3	8.7	9.1	7.7	8.7	9.0	9.4	9.9	8.3	9.4	9.8	10.3	10.8	9.0	10.2	10.7	11.2	11.7
3000	-35	6.7	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.4	9.6	10.1	10.6	11.1	9.2	10.4	10.9	11.5	12.1
	-30	6.7	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.6	11.1	9.2	10.4	10.9	11.5	12.1
	-25	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.6	11.1	9.2	10.4	10.9	11.5	12.1
	-20	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.5	11.1	9.2	10.4	10.9	11.5	12.0
	-15	6.8	7.7	8.0	8.4	8.8	7.2	8.2	8.5	8.9	9.4	7.8	8.9	9.3	9.7	10.2	8.5	9.6	10.1	10.5	11.1	9.2	10.4	10.9	11.4	12.0
	-10	6.8	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	-5	6.8	7.6	8.0	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	0	6.8	7.6	8.0	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.6	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	11.9
	5	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.7	9.1	7.7	8.7	9.1	9.5	10.0	8.4	9.5	9.9	10.3	10.8	9.1	10.3	10.7	11.2	11.8
	10	6.1	6.9	7.2	7.5	7.9	6.5	7.4	7.7	8.0	8.4	7.1	8.1	8.4	8.8	9.2	7.8	8.8	9.2	9.6	10.0	8.5	9.6	10.0	10.5	11.0
4000	-35	6.7	7.6	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.4	7.8	8.8	9.2	9.7	10.2	8.5	9.6	10.0	10.5	11.1	9.2	10.4	10.9	11.5	12.0
	-30	6.8	7.6	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.4	7.8	8.8	9.2	9.7	10.2	8.5	9.6	10.0	10.5	11.1	9.2	10.4	10.9	11.4	12.0
	-25	6.8	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.2	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	-20	6.8	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	-15	6.8	7.6	8.0	8.4	8.7	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.7	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	12.0
	-10	6.8	7.6	8.0	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.6	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	11.9
	-5	6.8	7.6	8.0	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.8	8.8	9.2	9.6	10.1	8.5	9.6	10.0	10.5	11.0	9.2	10.4	10.9	11.4	11.9
	0	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.5	8.8	9.2	7.8	8.8	9.2	9.6	10.1	8.5	9.6	10.0	10.4	10.9	9.2	10.4	10.9	11.3	11.9
	5	6.3	7.1	7.4	7.7	8.1	6.7	7.6	7.9	8.3	8.6	7.3	8.3	8.6	9.0	9.4	8.0	9.0	9.4	9.8	10.3	8.7	9.8	10.2	10.7	11.2
	10	5.5	6.2	6.5	6.7	7.1	5.9	6.6	6.9	7.2	7.6	6.4	7.3	7.6	7.9	8.3	7.1	8.0	8.3	8.7	9.1	7.7	8.7	9.1	9.5	10.0

WEIGHT - POUNDS

525BFM-06-00

Figure 4-39* (Sheet 1 of 8)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - UP

CONDITIONS: ANTI-ICE - ON; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	11500					11000					10500					10000					9500				
	WIND KNOTS	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	10.0	11.4	12.0	12.7	13.4	10.8	12.4	13.1	13.8	14.5	11.7	13.5	14.2	15.0	15.8	12.8	14.7	15.4	16.3	17.2	13.9	16.0	16.8	17.7	18.8
	-30	10.0	11.4	12.0	12.7	13.4	10.8	12.4	13.1	13.7	14.5	11.8	13.5	14.2	14.9	15.8	12.8	14.7	15.4	16.3	17.2	13.9	16.0	16.8	17.7	18.7
	-25	10.0	11.4	12.0	12.6	13.3	10.8	12.4	13.0	13.7	14.5	11.8	13.5	14.2	14.9	15.8	12.8	14.7	15.4	16.2	17.2	13.9	16.0	16.8	17.7	18.7
	-20	10.0	11.4	12.0	12.6	13.3	10.9	12.4	13.0	13.7	14.5	11.8	13.5	14.2	14.9	15.7	12.8	14.7	15.4	16.2	17.1	13.9	16.0	16.8	17.7	18.7
	-15	10.0	11.4	12.0	12.6	13.3	10.9	12.4	13.0	13.7	14.4	11.8	13.5	14.2	14.9	15.7	12.8	14.7	15.4	16.2	17.1	13.9	16.0	16.8	17.7	18.6
	-10	10.0	11.4	12.0	12.6	13.3	10.9	12.4	13.0	13.7	14.4	11.8	13.5	14.2	14.9	15.7	12.8	14.7	15.4	16.2	17.1	14.0	16.0	16.8	17.6	18.6
	-5	10.0	11.4	12.0	12.6	13.2	10.9	12.4	13.0	13.7	14.4	11.8	13.5	14.1	14.9	15.7	12.8	14.7	15.4	16.2	17.0	14.0	16.0	16.7	17.6	18.6
	0	10.0	11.4	12.0	12.6	13.2	10.9	12.4	13.0	13.6	14.4	11.8	13.5	14.1	14.8	15.6	12.8	14.6	15.4	16.1	17.0	14.0	15.9	16.7	17.6	18.5
	5	10.0	11.4	11.9	12.5	13.2	10.9	12.4	13.0	13.6	14.3	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	16.9	14.0	15.9	16.7	17.5	18.5
	10	10.0	11.4	11.9	12.5	13.1	10.9	12.3	12.9	13.6	14.3	11.8	13.4	14.1	14.7	15.5	12.8	14.6	15.3	16.0	16.9	13.9	15.9	16.6	17.5	18.4
1000	-35	10.0	11.4	12.0	12.6	13.3	10.8	12.4	13.0	13.7	14.5	11.7	13.5	14.1	14.9	15.7	12.7	14.6	15.4	16.2	17.1	13.9	15.9	16.8	17.7	18.7
	-30	10.0	11.4	12.0	12.6	13.3	10.8	12.4	13.0	13.7	14.4	11.8	13.5	14.1	14.9	15.7	12.8	14.6	15.4	16.2	17.1	13.9	15.9	16.7	17.6	18.6
	-25	10.0	11.4	12.0	12.6	13.2	10.8	12.4	13.0	13.7	14.4	11.8	13.5	14.1	14.9	15.7	12.8	14.6	15.4	16.2	17.1	13.9	15.9	16.7	17.6	18.6
	-20	10.0	11.4	12.0	12.6	13.2	10.9	12.4	13.0	13.7	14.4	11.8	13.5	14.1	14.8	15.6	12.8	14.6	15.4	16.2	17.0	13.9	15.9	16.7	17.6	18.6
	-15	10.0	11.4	12.0	12.5	13.2	10.9	12.4	13.0	13.6	14.4	11.8	13.5	14.1	14.8	15.6	12.8	14.6	15.4	16.1	17.0	13.9	15.9	16.7	17.6	18.5
	-10	10.0	11.4	11.9	12.5	13.2	10.9	12.4	13.0	13.6	14.3	11.8	13.5	14.1	14.8	15.6	12.8	14.6	15.3	16.1	17.0	14.0	15.9	16.7	17.6	18.5
	-5	10.0	11.4	11.9	12.5	13.2	10.9	12.4	13.0	13.6	14.3	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	16.9	14.0	15.9	16.7	17.5	18.5
	0	10.0	11.4	11.9	12.5	13.1	10.9	12.4	12.9	13.6	14.3	11.8	13.4	14.1	14.7	15.5	12.8	14.6	15.3	16.1	16.9	14.0	15.9	16.7	17.5	18.4
	5	10.0	11.4	11.9	12.4	13.1	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.6	15.3	16.0	16.8	14.0	15.9	16.6	17.5	18.4
	10	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.3
2000	-35	10.0	11.4	11.9	12.6	13.2	10.8	12.4	13.0	13.6	14.4	11.7	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	17.0	13.9	15.9	16.7	17.6	18.6
	-30	10.0	11.4	11.9	12.5	13.2	10.8	12.4	13.0	13.6	14.4	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	17.0	13.9	15.9	16.7	17.6	18.5
	-25	10.0	11.4	11.9	12.5	13.2	10.8	12.4	13.0	13.6	14.3	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	17.0	13.9	15.9	16.7	17.6	18.5
	-20	10.0	11.4	11.9	12.5	13.2	10.9	12.4	13.0	13.6	14.3	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	17.0	13.9	15.9	16.7	17.5	18.5
	-15	10.0	11.4	11.9	12.5	13.1	10.9	12.4	13.0	13.6	14.3	11.8	13.4	14.1	14.8	15.6	12.8	14.6	15.3	16.1	16.9	13.9	15.9	16.7	17.5	18.5
	-10	10.0	11.4	11.9	12.5	13.1	10.9	12.4	12.9	13.6	14.3	11.8	13.4	14.1	14.8	15.5	12.8	14.6	15.3	16.1	16.9	14.0	15.9	16.7	17.5	18.4
	-5	10.0	11.4	11.9	12.5	13.1	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.6	15.3	16.0	16.9	14.0	15.9	16.6	17.5	18.4
	0	10.0	11.4	11.9	12.4	13.1	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.6	15.3	16.0	16.8	14.0	15.9	16.6	17.4	18.3
	5	10.0	11.3	11.9	12.4	13.0	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.6	15.2	16.0	16.8	14.0	15.8	16.6	17.4	18.3
	10	9.8	11.1	11.6	12.2	12.7	10.7	12.1	12.6	13.2	13.9	11.6	13.1	13.7	14.4	15.1	12.6	14.3	14.9	15.7	16.4	13.7	15.6	16.3	17.1	17.9
3000	-35	9.9	11.3	11.9	12.5	13.1	10.8	12.3	12.9	13.6	14.3	11.7	13.4	14.0	14.8	15.5	12.7	14.6	15.3	16.1	16.9	13.9	15.8	16.6	17.5	18.5
	-30	10.0	11.3	11.9	12.5	13.1	10.8	12.3	12.9	13.6	14.3	11.7	13.4	14.0	14.7	15.5	12.8	14.6	15.3	16.0	16.9	13.9	15.9	16.6	17.5	18.4
	-25	10.0	11.3	11.9	12.5	13.1	10.8	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.6	15.3	16.0	16.9	13.9	15.9	16.6	17.5	18.4
	-20	10.0	11.3	11.9	12.5	13.1	10.8	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.6	15.3	16.0	16.9	13.9	15.9	16.6	17.5	18.4
	-15	10.0	11.3	11.9	12.4	13.1	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.6	15.2	16.0	16.8	13.9	15.9	16.6	17.4	18.3
	-10	10.0	11.3	11.9	12.4	13.0	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.3
	-5	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.9	13.5	14.1	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	14.0	15.8	16.6	17.4	18.3
	0	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.8	13.5	14.1	11.8	13.4	14.0	14.6	15.4	12.8	14.5	15.2	15.9	16.7	14.0	15.8	16.6	17.3	18.2
	5	9.9	11.2	11.7	12.2	12.8	10.7	12.1	12.7	13.3	13.9	11.7	13.2	13.8	14.5	15.2	12.7	14.4	15.0	15.7	16.5	13.8	15.7	16.4	17.2	18.0
	10	9.2	10.4	10.9	11.4	12.0	10.0	11.4	11.9	12.4	13.0	10.9	12.4	12.9	13.6	14.2	11.9	13.5	14.1	14.8	15.5	13.0	14.7	15.4	16.2	17.0
4000	-35	10.0	11.3	11.9	12.4	13.1	10.8	12.3	12.9	13.5	14.2	11.7	13.4	14.0	14.7	15.5	12.8	14.5	15.2	16.0	16.9	13.9	15.8	16.6	17.4	18.4
	-30	10.0	11.3	11.9	12.4	13.1	10.8	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.5	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.4
	-25	10.0	11.3	11.9	12.4	13.1	10.8	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.3
	-20	10.0	11.3	11.9	12.4	13.0	10.9	12.3	12.9	13.5	14.2	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.3
	-15	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.9	13.5	14.1	11.8	13.4	14.0	14.7	15.4	12.8	14.5	15.2	16.0	16.8	13.9	15.8	16.6	17.4	18.3
	-10	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.9	13.5	14.1	11.8	13.4	14.0	14.6	15.4	12.8	14.5	15.2	15.9	16.7	14.0	15.8	16.6	17.4	18.2
	-5	10.0	11.3	11.8	12.4	13.0	10.9	12.3	12.8	13.4	14.1	11.8	13.4	14.0	14.6	15.3	12.8	14.5	15.2	15.9	16.7	14.0	15.8	16.5	17.3	18.2
	0	10.0	11.3	11.8	12.3	12.9	10.9	12.3	12.8	13.4	14.0	11.8	13.3	13.9	14.6	15.3	12.8	14.5	15.2	15.9	16.6	14.0	15.8	16.5	17.3	18.1
	5	9.4	10.7	11.1	11.6	12.2	10.3	11.6	12.1	12.7	13.3	11.2	12.6	13.2	13.8	14.5	12.2	13.8	14.4	15.1	15.8	13.3	15.0	15.7	16.4	17.3
	10	8.5	9.6	10.0	10.4	10.9	9.2	10.4	10.9	11.4	12.0	10.1	11.4	11.9	12.5	13.1	11.0	12.5	13.1	13.7	14.4	12.1	13.7	14.3	15.0	15.7

WEIGHT - POUNDS

525BFM-06-00

Figure 4-39* (Sheet 2)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	13870					13500					13000					12500					12000				
		WIND KNOTS -10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-25	6.1	7.0	7.4	7.9	8.3	6.5	7.6	8.0	8.4	9.0	7.1	8.3	8.8	9.3	9.9	7.8	9.1	9.6	10.2	10.8	8.6	10.0	10.6	11.2	11.9
	-20	6.1	7.1	7.4	7.9	8.3	6.5	7.6	8.0	8.4	8.9	7.1	8.3	8.8	9.3	9.8	7.9	9.1	9.6	10.2	10.8	8.6	10.0	10.6	11.2	11.9
	-15	6.1	7.1	7.4	7.9	8.3	6.5	7.6	8.0	8.4	8.9	7.2	8.3	8.8	9.3	9.8	7.9	9.1	9.6	10.2	10.8	8.6	10.0	10.6	11.2	11.8
	-10	6.1	7.0	7.4	7.8	8.3	6.5	7.6	8.0	8.4	8.9	7.2	8.3	8.8	9.3	9.8	7.9	9.1	9.6	10.2	10.8	8.6	10.0	10.5	11.2	11.8
	-5	6.1	7.0	7.4	7.8	8.3	6.5	7.6	8.0	8.4	8.9	7.2	8.3	8.7	9.2	9.8	7.9	9.1	9.6	10.1	10.8	8.6	10.0	10.5	11.1	11.8
	0	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.8	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.8
	5	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.4	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.7
	10	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.5	10.1	10.7	8.6	9.9	10.5	11.1	11.7
	15	6.1	7.0	7.3	7.7	8.2	6.5	7.5	7.9	8.3	8.8	7.1	8.2	8.7	9.1	9.6	7.8	9.0	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	20	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.8	8.3	8.7	7.1	8.2	8.6	9.1	9.6	7.8	9.0	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	25	6.0	6.9	7.3	7.7	8.1	6.5	7.4	7.8	8.2	8.7	7.1	8.2	8.6	9.0	9.5	7.8	9.0	9.4	9.9	10.5	8.6	9.8	10.4	10.9	11.5
	30	5.5	6.3	6.6	6.9	7.3	5.9	6.7	7.1	7.5	7.9	6.5	7.4	7.8	8.2	8.7	7.1	8.2	8.6	9.1	9.6	7.9	9.1	9.5	10.0	10.6
	35	4.6	5.3	5.5	5.8	6.2	5.0	5.7	6.0	6.3	6.7	5.5	6.4	6.7	7.1	7.5	6.1	7.1	7.5	7.9	8.3	6.8	7.9	8.3	8.7	9.2
	40	3.7	4.2	4.4	4.7	4.9	4.0	4.6	4.9	5.1	5.4	4.5	5.2	5.5	5.8	6.1	5.1	5.9	6.2	6.6	6.9	5.7	6.6	7.0	7.4	7.8
	45	2.9	3.3	3.5	3.7	3.9	3.2	3.7	3.9	4.1	4.4	3.7	4.3	4.5	4.8	5.0	4.2	4.9	5.2	5.4	5.8	4.8	5.6	5.9	6.2	6.6
	50	2.1	2.5	2.6	2.8	3.0	2.5	2.9	3.0	3.2	3.4	2.9	3.4	3.6	3.8	4.0	3.4	4.0	4.2	4.4	4.7	4.0	4.6	4.9	5.2	5.5
	54	1.6	1.9	2.0	2.2	2.3	1.9	2.3	2.4	2.6	2.7	2.4	2.8	2.9	3.1	3.3	2.9	3.3	3.5	3.7	4.0	3.4	3.9	4.2	4.4	4.7
1000	-25	6.1	7.0	7.4	7.8	8.3	6.5	7.5	8.0	8.4	8.9	7.1	8.3	8.7	9.2	9.8	7.8	9.1	9.6	10.2	10.8	8.6	10.0	10.5	11.1	11.8
	-20	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.8	7.9	9.1	9.6	10.2	10.8	8.6	10.0	10.5	11.1	11.8
	-15	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.8	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.8
	-10	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.8	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.8
	-5	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.7
	0	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.4	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.7	10.0	10.5	11.1	11.7
	5	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.5	10.1	10.6	8.6	10.0	10.5	11.0	11.7
	10	6.1	7.0	7.3	7.7	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.2	8.7	9.1	9.6	7.9	9.1	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	15	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.8	8.3	8.7	7.2	8.2	8.6	9.1	9.6	7.9	9.0	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	20	6.0	6.9	7.3	7.6	8.1	6.5	7.4	7.8	8.2	8.6	7.1	8.2	8.6	9.0	9.5	7.8	9.0	9.4	9.9	10.5	8.6	9.8	10.3	10.9	11.5
	25	5.7	6.5	6.8	7.2	7.6	6.1	7.0	7.3	7.7	8.1	6.7	7.7	8.1	8.5	9.0	7.4	8.5	8.9	9.4	9.9	8.1	9.3	9.8	10.3	10.9
	30	4.9	5.6	5.9	6.2	6.5	5.3	6.0	6.3	6.7	7.0	5.8	6.7	7.0	7.4	7.8	6.5	7.4	7.8	8.2	8.7	7.1	8.2	8.6	9.1	9.6
	35	4.0	4.6	4.8	5.1	5.4	4.4	5.0	5.3	5.6	5.9	4.9	5.6	5.9	6.2	6.6	5.5	6.3	6.6	7.0	7.4	6.1	7.0	7.4	7.8	8.3
	40	3.1	3.6	3.8	4.0	4.2	3.5	4.0	4.2	4.4	4.7	4.0	4.6	4.8	5.1	5.4	4.5	5.2	5.5	5.8	6.1	5.1	5.9	6.2	6.6	6.9
	45	2.3	2.7	2.9	3.0	3.2	2.7	3.1	3.3	3.5	3.7	3.1	3.7	3.8	4.1	4.3	3.7	4.2	4.5	4.7	5.0	4.2	4.9	5.1	5.4	5.8
	50	1.7	2.0	2.1	2.2	2.3	2.0	2.3	2.4	2.6	2.8	2.4	2.8	3.0	3.2	3.3	2.9	3.4	3.6	3.8	4.0	3.4	4.0	4.2	4.4	4.7
	52	1.4	1.7	1.8	1.9	2.0	1.7	2.0	2.1	2.3	2.4	2.1	2.5	2.7	2.8	3.0	2.6	3.1	3.2	3.4	3.6	3.1	3.7	3.9	4.1	4.3
2000	-30	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.1	8.3	8.7	9.2	9.8	7.8	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.8
	-25	6.1	7.0	7.4	7.8	8.3	6.5	7.5	7.9	8.4	8.9	7.1	8.3	8.7	9.2	9.8	7.8	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.8
	-20	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.4	8.9	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.7
	-15	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.4	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.7
	-10	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.7	8.6	10.0	10.5	11.1	11.7
	-5	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.3	8.7	9.2	9.7	7.9	9.1	9.6	10.1	10.6	8.7	10.0	10.5	11.1	11.7
	0	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.3	8.7	9.1	9.7	7.9	9.1	9.5	10.1	10.6	8.7	10.0	10.5	11.0	11.7
	5	6.1	7.0	7.4	7.7	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.2	8.7	9.1	9.6	7.9	9.1	9.5	10.0	10.6	8.7	9.9	10.4	11.0	11.6
	10	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.9	8.3	8.7	7.2	8.2	8.6	9.1	9.6	7.9	9.0	9.5	10.0	10.5	8.6	9.9	10.4	11.0	11.6
	15	6.1	6.9	7.3	7.7	8.1	6.5	7.4	7.8	8.2	8.7	7.1	8.2	8.6	9.0	9.5	7.8	9.0	9.4	9.9	10.5	8.6	9.9	10.4	10.9	11.5
	20	5.8	6.6	6.9	7.3	7.7	6.2	7.1	7.5	7.8	8.3	6.8	7.8	8.2	8.6	9.1	7.5	8.6	9.0	9.5	10.0	8.3	9.5	9.9	10.5	11.0
	25	5.1	5.8	6.1	6.4	6.8	5.5	6.3	6.6	6.9	7.3	6.1	7.0	7.3	7.7	8.1	6.7	7.7	8.1	8.5	9.0	7.4	8.5	8.9	9.4	9.9
	30	4.3	4.9	5.1	5.4	5.7	4.6	5.3	5.6	5.9	6.2	5.2	6.0	6.3	6.6	7.0	5.8	6.6	7.0	7.4	7.8	6.4	7.4	7.8	8.2	8.7
	35	3.4	3.9	4.1	4.3	4.6	3.8	4.3	4.5	4.8	5.0	4.3	4.9	5.2	5.4	5.7	4.8	5.6	5.8	6.2	6.5	5.4	6.3	6.6	6.9	7.3
	40	2.6	3.0	3.1	3.3	3.5	2.9	3.4	3.5	3.7	4.0	3.4	3.9	4.1	4.4	4.6	3.9	4.5	4.8	5.0	5.3	4.5	5.2	5.5	5.8	6.1
	45	1.8	2.1	2.3	2.4	2.6	2.1	2.5	2.6	2.8	3.0	2.6	3.0	3.2	3.4	3.6	3.1	3.6	3.8	4.0	4.2	3.6	4.2	4.4	4.7	4.9
	50	1.2	1.4	1.5	1.6	1.7	1.5	1.8	1.9	2.0	2.1	1.9	2.3	2.4	2.5	2.7	2.4	2.8	2.9	3.1	3.3	2.9	3.4	3.5	3.7	4.0
3000	-30	6.0	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.1	8.2	8.7	9.2	9.7	7.8	9.0	9.5	10.1	10.7	8.6	9.9	10.5	11.0	11.7
	-25	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.1	8.2	8.7	9.2	9.7	7.8	9.0	9.5	10.1	10.6	8.6	9.9	10.5	11.0	11.7
	-20	6.1	7.0	7.4	7.8	8.2	6.5	7.5	7.9	8.3	8.8	7.1	8.2	8.7	9.1	9.7	7.9	9.0	9.5	10.1	10.6	8.6	9.9	10.5	11.0	11.7
	-15	6.1	7.0	7.4	7.7	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.2	8.7	9.1	9.7	7.9	9.1	9.5	10.0	10.6	8.6	9.9	10.5	11.0	11.7
	-10	6.1	7.0	7.3	7.7	8.2	6.5	7.5	7.9	8.3	8.8	7.2	8.2	8.7	9.1	9.6	7.9	9.1	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	-5	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.9	8.3	8.7	7.2	8.2	8.7	9.1	9.6	7.9	9.0	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	0	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.9	8.3	8.7	7.2	8.2	8.6	9.1	9.6	7.9	9.0	9.5	10.0	10.6	8.6	9.9	10.4	11.0	11.6
	5	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.8	8.2	8.7	7.2	8.2	8.6	9.1	9.6	7.9	9.0	9.5	10.0	10.5	8.6	9.9	10.4	10.9	11.5
	10	6.0	6.9	7.2	7.6	8.0	6.4	7.4	7.7	8.1	8.5	7.1	8.1	8.5	8.9	9.4	7.8	8.9	9.3	9.8	10.4	8.5	9.8	10.2	10.8	11.4
	15	5.7	6.5	6.8	7.1	7.5	6.1	7.0	7.3	7.7	8.1	6.7	7.7	8.0	8.5	8.9	7.4	8.4	8.9	9.3	9.8	8.1	9.3	9.8	10.3	10.8
	20	5.2	6.0	6.3	6.6	6.9	5.6	6.4	6.8	7.1	7.5	6.2	7.1	7.5	7.9	8.3	6.8	7.9	8.2	8.7	9.2	7.6	8.7	9.1	9.6	10.1
	25	4.5	5.1	5.4	5.7	6.0	4.9	5.6	5.8	6.2	6.5	5.4	6.2	6.5	6.9	7.2	6.0	6.9	7.3	7.6	8.1	6.7	7.7	8.1	8.5	9.0
	30	3.7	4.2	4.4	4.7	4.9	4.0	4.6	4.9	5.1	5.4	4.6	5.2	5.5	5.8	6.1	5.1	5.9	6.2	6.5	6.9	5.8	6.6	7.0	7.3	7.7
	35	2.8	3.3	3.4	3.6	3.8	3.2	3.7	3.9	4.1	4.3	3.7	4.2	4.4	4.7	4.9	4.2	4.8	5.1	5.4	5.7	4.8	5.5	5.8	6.1	6.5
	40	2.0	2.4	2.5	2.7	2.8	2.4	2.7	2.9	3.1	3.2	2.8	3.3	3.4	3.6	3.8	3.3	3.8	4.1	4.3	4.5	3.9	4.5	4.7	5.0	5.3
	45	1.3	1.6	1.7	1.8	1.9	1.6	1.9	2.1	2.2	2.3	2.1	2.4	2.6	2.7	2.9	2.6	3.0	3.1	3.3	3.5	3.1	3.6	3.8	4.0	4.2
	47	1.1	1.3	1.4	1.5	1.6	1.4	1.7	1.8	1.9	2.0	1.8	2.1	2.3	2.4	2.5	2.3	2.7	2.8	3.0	3.2	2.8	3.2	3.4	3.6	3.8

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Figure 4-40* (Sheet 1 of 10)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	11500					11000					10500					10000					9500				
		WIND KNOTS -10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-25	9.4	10.9	11.6	12.3	13.0	10.3	12.0	12.7	13.4	14.3	11.3	13.1	13.9	14.7	15.6	12.3	14.3	15.1	16.0	17.0	13.5	15.6	16.5	17.5	18.5
	-20	9.4	11.0	11.6	12.2	13.0	10.3	12.0	12.7	13.4	14.3	11.3	13.1	13.9	14.7	15.6	12.3	14.3	15.1	16.0	17.0	13.5	15.6	16.5	17.4	18.5
	-15	9.4	11.0	11.6	12.2	13.0	10.3	12.0	12.7	13.4	14.2	11.3	13.1	13.8	14.7	15.6	12.4	14.3	15.1	16.0	17.0	13.5	15.6	16.5	17.4	18.5
	-10	9.5	11.0	11.6	12.2	13.0	10.3	12.0	12.6	13.4	14.2	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	16.0	16.9	13.5	15.6	16.5	17.4	18.4
	-5	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.6	13.4	14.2	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	16.0	16.9	13.5	15.6	16.5	17.4	18.4
	0	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	15.9	16.9	13.5	15.6	16.4	17.4	18.4
	5	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.4	12.4	14.3	15.1	15.9	16.8	13.5	15.6	16.4	17.3	18.3
	10	9.5	10.9	11.5	12.1	12.8	10.3	11.9	12.6	13.3	14.0	11.3	13.1	13.8	14.5	15.4	12.4	14.3	15.0	15.8	16.8	13.5	15.6	16.4	17.3	18.3
	15	9.4	10.9	11.4	12.1	12.8	10.3	11.9	12.5	13.2	14.0	11.3	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.5	15.5	16.3	17.2	18.2
	20	9.4	10.8	11.4	12.0	12.7	10.3	11.9	12.5	13.2	13.9	11.3	13.0	13.7	14.4	15.3	12.4	14.2	14.9	15.7	16.6	13.5	15.5	16.3	17.2	18.1
	25	9.4	10.8	11.4	12.0	12.6	10.3	11.8	12.4	13.1	13.9	11.3	12.9	13.6	14.4	15.2	12.3	14.2	14.9	15.7	16.6	13.5	15.4	16.2	17.1	18.0
	30	8.7	10.0	10.5	11.1	11.7	9.5	11.0	11.5	12.2	12.9	10.5	12.0	12.7	13.4	14.1	11.5	13.2	13.9	14.7	15.5	12.6	14.5	15.2	16.1	17.0
	35	7.6	8.7	9.2	9.7	10.3	8.4	9.7	10.2	10.7	11.4	9.3	10.7	11.3	11.9	12.6	10.3	11.8	12.5	13.2	13.9	11.3	13.1	13.8	14.5	15.4
	40	6.4	7.4	7.8	8.2	8.7	7.2	8.3	8.7	9.2	9.8	8.0	9.3	9.8	10.3	10.9	8.9	10.3	10.9	11.5	12.2	9.9	11.5	12.1	12.8	13.6
	45	5.4	6.3	6.6	7.0	7.4	6.1	7.1	7.5	7.9	8.4	6.9	8.0	8.4	8.9	9.5	7.8	9.0	9.5	10.1	10.7	8.7	10.1	10.7	11.3	12.0
	50	4.6	5.3	5.6	5.9	6.3	5.2	6.1	6.4	6.8	7.2	5.9	6.9	7.3	7.7	8.2	6.7	7.8	8.3	8.8	9.3	7.6	8.9	9.4	9.9	10.5
	54	4.0	4.6	4.9	5.1	5.5	4.6	5.3	5.6	6.0	6.3	5.3	6.1	6.5	6.8	7.3	6.0	7.0	7.4	7.8	8.3	6.8	8.0	8.4	8.9	9.5
1000	-25	9.4	10.9	11.5	12.2	13.0	10.3	12.0	12.6	13.4	14.2	11.3	13.1	13.8	14.6	15.5	12.3	14.3	15.1	16.0	17.0	13.5	15.6	16.4	17.4	18.5
	-20	9.4	10.9	11.5	12.2	12.9	10.3	12.0	12.6	13.4	14.2	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	16.0	16.9	13.5	15.6	16.4	17.4	18.4
	-15	9.5	10.9	11.5	12.2	12.9	10.3	12.0	12.6	13.4	14.2	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	15.9	16.9	13.5	15.6	16.4	17.4	18.4
	-10	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.5	12.4	14.3	15.1	15.9	16.9	13.5	15.6	16.4	17.3	18.4
	-5	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.4	12.4	14.3	15.1	15.9	16.8	13.5	15.6	16.4	17.3	18.3
	0	9.5	10.9	11.5	12.1	12.8	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.5	15.4	12.4	14.3	15.0	15.9	16.8	13.6	15.6	16.4	17.3	18.3
	5	9.5	10.9	11.5	12.1	12.8	10.4	11.9	12.6	13.3	14.0	11.3	13.1	13.8	14.5	15.4	12.4	14.3	15.0	15.8	16.7	13.6	15.6	16.4	17.3	18.2
	10	9.5	10.9	11.4	12.1	12.8	10.4	11.9	12.5	13.2	14.0	11.3	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.5	15.5	16.3	17.2	18.2
	15	9.4	10.9	11.4	12.0	12.7	10.3	11.9	12.5	13.2	13.9	11.3	13.0	13.7	14.4	15.2	12.4	14.2	14.9	15.7	16.6	13.5	15.5	16.3	17.2	18.1
	20	9.4	10.8	11.3	11.9	12.6	10.3	11.8	12.4	13.1	13.8	11.3	12.9	13.6	14.3	15.1	12.3	14.1	14.9	15.6	16.5	13.5	15.4	16.2	17.1	18.0
	25	8.9	10.3	10.8	11.4	12.0	9.8	11.3	11.8	12.5	13.2	10.8	12.4	13.0	13.7	14.5	11.8	13.5	14.2	15.0	15.9	12.9	14.8	15.6	16.4	17.3
	30	7.9	9.1	9.6	10.1	10.7	8.7	10.1	10.6	11.2	11.8	9.7	11.1	11.7	12.3	13.0	10.6	12.3	12.9	13.6	14.4	11.7	13.5	14.2	15.0	15.8
	35	6.8	7.9	8.3	8.7	9.2	7.6	8.8	9.2	9.7	10.3	8.5	9.8	10.3	10.8	11.5	9.4	10.8	11.4	12.1	12.8	10.4	12.0	12.7	13.4	14.2
	40	5.8	6.7	7.0	7.4	7.8	6.5	7.5	7.9	8.3	8.8	7.3	8.4	8.9	9.4	9.9	8.2	9.4	9.9	10.5	11.1	9.1	10.6	11.1	11.8	12.5
	45	4.8	5.6	5.9	6.2	6.6	5.5	6.4	6.7	7.1	7.5	6.2	7.2	7.6	8.0	8.5	7.0	8.1	8.6	9.1	9.7	7.9	9.2	9.7	10.3	10.9
	50	4.0	4.6	4.9	5.2	5.5	4.6	5.4	5.7	6.0	6.3	5.3	6.2	6.5	6.9	7.3	6.1	7.0	7.4	7.9	8.4	6.9	8.0	8.5	9.0	9.5
	52	3.7	4.3	4.5	4.8	5.1	4.3	5.0	5.3	5.6	5.9	5.0	5.8	6.1	6.5	6.9	5.7	6.6	7.0	7.4	7.9	6.5	7.6	8.0	8.5	9.0
2000	-30	9.4	10.9	11.5	12.2	12.9	10.3	11.9	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.5	12.3	14.3	15.1	15.9	16.9	13.5	15.6	16.4	17.3	18.4
	-25	9.4	10.9	11.5	12.2	12.9	10.3	11.9	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.5	12.3	14.3	15.0	15.9	16.9	13.5	15.6	16.4	17.3	18.4
	-20	9.4	10.9	11.5	12.2	12.9	10.3	11.9	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.4	12.4	14.3	15.0	15.9	16.8	13.5	15.6	16.4	17.3	18.3
	-15	9.5	10.9	11.5	12.1	12.9	10.4	12.0	12.6	13.3	14.1	11.3	13.1	13.8	14.6	15.4	12.4	14.3	15.0	15.9	16.8	13.5	15.6	16.4	17.3	18.3
	-10	9.5	10.9	11.5	12.1	12.8	10.4	11.9	12.6	13.3	14.1	11.3	13.1	13.8	14.5	15.4	12.4	14.3	15.0	15.9	16.8	13.5	15.6	16.4	17.3	18.3
	-5	9.5	10.9	11.5	12.1	12.8	10.4	11.9	12.6	13.3	14.0	11.3	13.1	13.8	14.5	15.4	12.4	14.3	15.0	15.8	16.8	13.6	15.6	16.4	17.3	18.2
	0	9.5	10.9	11.5	12.1	12.8	10.4	11.9	12.6	13.2	14.0	11.4	13.1	13.7	14.5	15.3	12.4	14.3	15.0	15.8	16.7	13.6	15.6	16.4	17.2	18.2
	5	9.5	10.9	11.4	12.1	12.7	10.4	11.9	12.5	13.2	14.0	11.4	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.6	15.5	16.3	17.2	18.2
	10	9.5	10.9	11.4	12.0	12.7	10.4	11.9	12.5	13.2	13.9	11.3	13.0	13.7	14.4	15.2	12.4	14.2	14.9	15.7	16.6	13.6	15.5	16.3	17.1	18.1
	15	9.4	10.8	11.4	12.0	12.6	10.3	11.8	12.4	13.1	13.8	11.3	13.0	13.6	14.3	15.1	12.4	14.2	14.9	15.7	16.5	13.5	15.5	16.2	17.1	18.0
	20	9.1	10.4	10.9	11.5	12.1	9.9	11.4	12.0	12.6	13.3	10.9	12.5	13.1	13.8	14.6	12.0	13.7	14.4	15.2	16.0	13.1	15.0	15.7	16.6	17.5
	25	8.2	9.4	9.9	10.4	11.0	9.0	10.4	10.9	11.5	12.1	10.0	11.4	12.0	12.7	13.4	11.0	12.6	13.2	13.9	14.7	12.1	13.8	14.5	15.3	16.2
	30	7.2	8.2	8.7	9.1	9.7	8.0	9.2	9.6	10.2	10.7	8.8	10.2	10.7	11.3	11.9	9.8	11.3	11.9	12.5	13.2	10.8	12.5	13.1	13.8	14.6
	35	6.1	7.0	7.4	7.8	8.2	6.8	7.9	8.3	8.7	9.3	7.6	8.8	9.3	9.8	10.4	8.6	9.9	10.4	11.0	11.6	9.5	11.0	11.6	12.2	13.0
	40	5.1	5.9	6.2	6.5	6.9	5.8	6.7	7.0	7.4	7.9	6.5	7.5	7.9	8.4	8.9	7.4	8.5	9.0	9.5	10.1	8.3	9.6	10.1	10.7	11.3
	45	4.2	4.9	5.1	5.4	5.7	4.8	5.6	5.9	6.2	6.6	5.5	6.4	6.8	7.2	7.6	6.3	7.3	7.7	8.2	8.7	7.2	8.3	8.8	9.3	9.9
	50	3.4	4.0	4.2	4.5	4.7	4.0	4.7	4.9	5.2	5.5	4.7	5.4	5.7	6.1	6.4	5.4	6.3	6.6	7.0	7.4	6.2	7.2	7.6	8.1	8.6
3000	-30	9.4	10.9	11.5	12.1	12.8	10.3	11.9	12.5	13.3	14.1	11.3	13.0	13.7	14.5	15.4	12.3	14.2	15.0	15.8	16.8	13.5	15.5	16.3	17.3	18.3
	-25	9.4	10.9	11.5	12.1	12.8	10.3	11.9	12.5	13.3	14.0	11.3	13.0	13.7	14.5	15.4	12.3	14.2	15.0	15.8	16.8	13.5	15.5	16.3	17.2	18.2
	-20	9.4	10.9	11.5	12.1	12.8	10.3	11.9	12.5	13.2	14.0	11.3	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.5	15.5	16.3	17.2	18.2
	-15	9.5	10.9	11.5	12.1	12.8	10.3	11.9	12.5	13.2	14.0	11.3	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.5	15.5	16.3	17.2	18.2
	-10	9.5	10.9	11.4	12.1	12.8	10.4	11.9	12.5	13.2	14.0	11.3	13.0	13.7	14.5	15.3	12.4	14.2	15.0	15.8	16.7	13.5	15.5	16.3	17.2	18.2
	-5	9.5	10.9	11.4	12.1	12.7	10.4	11.9	12.5	13.2	13.9	11.3	13.0	13.7	14.4	15.3	12.4	14.2	15.0	15.8	16.7	13.6	15.5	16.3	17.2	18.1
	0	9.5	10.9	11.4	12.0	12.7	10.4	11.9	12.5	13.2	13.9	11.3	13.0	13.7	14.4	15.2	12.4	14.2	14.9	15.7	16.6	13.6	15.5	16.3	17.1	18.1
	5	9.5	10.8	11.4	12.0	12.7	10.4	11.9	12.5	13.1	13.9	11.3	13.0	13.7	14.4	15.2	12.4	14.2	14.9	15.7	16.6	13.5	15.5	16.3	17.1	18.0
	10	9.3	10.7	11.2	11.8	12.5	10.2	11.7	12.3	13.0	13.7	11.2	12.8	13.5	14.2	15.0	12.3	14.0	14.7	15.5	16.4	13.4	15.3	16.1	16.9	17.8
	15	8.9	10.2	10.7	11.3	11.9	9.8	11.2	11.8	12.4	13.1	10.7	12.3	12.9	13.6	14.4	11.8	13.5	14.2	14.9	15.8	12.9	14.8	15.5	16.3	17.2
	20	8.4	9.6	10.1	10.6	11.2	9.2	10.6	11.1	11.7	12.3	10.1	11.6	12.2	12.9	13.6	11.2	12.8	13.4	14.2	14.9	12.3	14.1	14.8	15.5	16.4
	25	7.4	8.5	9.0	9.4	10.0	8.2	9.5	10.0	10.5	11.1	9.1	10.5	11.0	11.6	12.3	10.1	11.6	12.2	12.9	13.6	11.2	12.8	13.5	14.2	15.0
	30	6.4	7.4	7.8	8.2	8.7	7.2	8.3	8.7	9.2	9.7	8.0	9.2	9.7	10.3	10.8	9.0	10.3	10.8	11.4	12.1	10.0	11.5	12.1	12.7	13.5
	35	5.4	6.2	6.6	6.9	7.3	6.1	7.0	7.4	7.8	8.3	6.9	7.9	8.4	8.8	9.3	7.7	8.9	9.4	9.9	10.5	8.7	10.0	10.6	11.2	11.8
	40	4.5	5.2	5.4	5.7	6.1	5.1	5.9	6.2	6.6	6.9	5.8	6.7	7.1	7.5	7.9	6.6	7.6	8.1	8.5	9.0	7.5	8.7	9.2	9.7	10.3
	45	3.6	4.2	4.4	4.7	5.0	4.2	4.9	5.2	5.5	5.8	4.9	5.7	6.0	6.3	6.7	5.6	6.5	6.9	7.3	7.7	6.5	7.5	7.9	8.4	8.9
	47	3.3	3.9	4.1	4.3	4.6	3.9	4.5	4.8	5.1	5.4	4.6	5.3	5.6	5.9	6.3	5.3	6.1	6.5	6.8	7.2	6.1	7.1	7.4	7.9	8.4

525BFM-06-00

Figure 4-40* (Sheet 2)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	13870					13500					13000					12500					12000				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-45	6.1	6.9	7.3	7.7	8.1	6.5	7.4	7.8	8.2	8.7	7.1	8.2	8.6	9.0	9.5	7.8	9.0	9.4	9.9	10.5	8.6	9.9	10.4	10.9	11.5
	-40	6.1	6.9	7.3	7.7	8.1	6.5	7.4	7.8	8.2	8.7	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.4	9.9	10.5	8.6	9.9	10.4	10.9	11.5
	-35	6.1	7.0	7.3	7.7	8.1	6.5	7.5	7.8	8.2	8.7	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.4	9.9	10.5	8.6	9.9	10.4	10.9	11.5
	-30	6.1	6.9	7.3	7.6	8.0	6.5	7.4	7.8	8.2	8.6	7.1	8.2	8.5	9.0	9.5	7.8	9.0	9.4	9.9	10.4	8.6	9.8	10.3	10.8	11.4
	-25	5.9	6.7	7.1	7.4	7.8	6.3	7.2	7.6	7.9	8.4	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.1	8.4	9.6	10.0	10.6	11.1
	-20	5.6	6.4	6.7	7.0	7.3	6.0	6.8	7.2	7.5	7.9	6.6	7.5	7.9	8.3	8.7	7.2	8.3	8.7	9.1	9.6	8.0	9.1	9.6	10.0	10.6
	-15	5.2	6.0	6.3	6.6	6.9	5.7	6.4	6.7	7.1	7.4	6.2	7.1	7.5	7.8	8.2	6.9	7.8	8.2	8.6	9.1	7.6	8.7	9.1	9.5	10.1
	-10	4.9	5.6	5.9	6.2	6.5	5.3	6.1	6.4	6.7	7.0	5.9	6.7	7.0	7.4	7.8	6.5	7.4	7.8	8.2	8.6	7.2	8.2	8.6	9.1	9.5
	-5	4.6	5.2	5.4	5.7	6.0	5.0	5.6	5.9	6.2	6.5	5.5	6.3	6.6	6.9	7.3	6.1	7.0	7.3	7.7	8.1	6.8	7.7	8.1	8.5	9.0
	0	4.2	4.7	5.0	5.2	5.5	4.5	5.2	5.4	5.7	6.0	5.1	5.8	6.1	6.4	6.7	5.7	6.5	6.8	7.1	7.5	6.3	7.2	7.6	7.9	8.4
	5	3.8	4.3	4.5	4.7	5.0	4.1	4.7	4.9	5.2	5.5	4.7	5.3	5.6	5.9	6.2	5.2	6.0	6.3	6.6	6.9	5.9	6.7	7.0	7.4	7.8
	10	3.4	3.9	4.1	4.3	4.5	3.8	4.3	4.5	4.7	5.0	4.3	4.9	5.1	5.4	5.6	4.8	5.5	5.8	6.1	6.4	5.4	6.2	6.5	6.8	7.2
	15	3.1	3.5	3.7	3.8	4.0	3.4	3.9	4.1	4.3	4.5	3.9	4.5	4.7	4.9	5.2	4.4	5.1	5.3	5.6	5.9	5.0	5.7	6.0	6.3	6.7
	20	2.4	2.7	2.9	3.0	3.2	2.7	3.1	3.3	3.4	3.6	3.2	3.7	3.8	4.0	4.3	3.7	4.3	4.5	4.7	4.9	4.3	4.9	5.1	5.4	5.7
	25	1.6	1.9	2.0	2.1	2.3	2.0	2.3	2.4	2.5	2.7	2.4	2.8	2.9	3.1	3.2	2.9	3.3	3.5	3.7	3.9	3.4	3.9	4.1	4.3	4.6
	30	0.9	1.1	1.2	1.3	1.4	1.2	1.5	1.6	1.7	1.8	1.7	1.9	2.0	2.2	2.3	2.1	2.5	2.6	2.7	2.9	2.6	3.0	3.2	3.3	3.5
	35	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.2	1.2	1.3	1.4	1.4	1.7	1.8	1.9	2.0	1.9	2.2	2.3	2.4	2.6
9000	-45	6.0	6.9	7.2	7.6	8.0	6.5	7.4	7.7	8.1	8.6	7.1	8.1	8.5	9.0	9.4	7.8	8.9	9.4	9.8	10.4	8.6	9.8	10.3	10.8	11.4
	-40	6.0	6.9	7.2	7.6	8.0	6.5	7.4	7.8	8.1	8.6	7.1	8.1	8.5	9.0	9.4	7.8	8.9	9.4	9.9	10.4	8.6	9.8	10.3	10.8	11.4
	-35	5.9	6.8	7.1	7.4	7.8	6.4	7.3	7.6	8.0	8.4	7.0	8.0	8.4	8.8	9.2	7.7	8.8	9.2	9.7	10.2	8.4	9.6	10.1	10.6	11.2
	-30	5.7	6.5	6.8	7.1	7.5	6.1	6.9	7.3	7.6	8.0	6.7	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.2	9.7	8.1	9.2	9.7	10.2	10.7
	-25	5.3	6.1	6.4	6.7	7.0	5.7	6.5	6.8	7.2	7.6	6.3	7.2	7.6	7.9	8.3	7.0	7.9	8.3	8.7	9.2	7.7	8.8	9.2	9.7	10.2
	-20	5.0	5.7	6.0	6.3	6.6	5.4	6.1	6.4	6.8	7.1	6.0	6.8	7.1	7.5	7.9	6.6	7.5	7.9	8.3	8.7	7.3	8.3	8.7	9.2	9.7
	-15	4.7	5.3	5.6	5.9	6.2	5.1	5.8	6.1	6.4	6.7	5.6	6.4	6.7	7.1	7.4	6.2	7.1	7.5	7.8	8.3	6.9	7.9	8.3	8.7	9.2
	-10	4.4	5.0	5.2	5.5	5.8	4.8	5.4	5.7	6.0	6.3	5.3	6.1	6.3	6.7	7.0	5.9	6.7	7.1	7.4	7.8	6.6	7.5	7.9	8.2	8.7
	-5	4.0	4.6	4.8	5.0	5.3	4.4	5.0	5.3	5.5	5.8	4.9	5.6	5.9	6.2	6.5	5.5	6.3	6.6	6.9	7.3	6.2	7.0	7.4	7.7	8.1
	0	3.7	4.2	4.4	4.6	4.8	4.0	4.6	4.8	5.0	5.3	4.5	5.2	5.4	5.7	6.0	5.1	5.8	6.1	6.4	6.7	5.7	6.5	6.8	7.2	7.6
	5	3.3	3.7	3.9	4.1	4.3	3.6	4.1	4.3	4.6	4.8	4.1	4.7	4.9	5.2	5.5	4.7	5.3	5.6	5.9	6.2	5.3	6.0	6.3	6.6	7.0
	10	2.9	3.3	3.5	3.7	3.9	3.3	3.7	3.9	4.1	4.3	3.8	4.3	4.5	4.7	5.0	4.3	4.9	5.1	5.4	5.7	4.9	5.6	5.8	6.1	6.4
	15	2.5	2.9	3.0	3.2	3.4	2.9	3.3	3.4	3.6	3.8	3.3	3.8	4.0	4.2	4.4	3.9	4.4	4.6	4.9	5.1	4.4	5.1	5.3	5.6	5.8
	20	1.8	2.1	2.2	2.4	2.5	2.2	2.5	2.6	2.8	2.9	2.6	3.0	3.2	3.3	3.5	3.1	3.6	3.7	3.9	4.1	3.6	4.2	4.4	4.6	4.9
	25	1.1	1.3	1.4	1.5	1.6	1.4	1.7	1.8	1.9	2.0	1.9	2.2	2.3	2.4	2.5	2.3	2.7	2.8	3.0	3.1	2.8	3.3	3.4	3.6	3.8
	30	0.5	0.6	0.7	0.7	0.8	0.7	0.9	1.0	1.0	1.1	1.1	1.4	1.4	1.5	1.6	1.6	1.8	2.0	2.1	2.2	2.0	2.4	2.5	2.7	2.8
	32	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.3	1.5	1.6	1.7	1.8	1.7	2.0	2.2	2.3	2.4
10000	-50	5.7	6.5	6.8	7.1	7.5	6.1	6.9	7.3	7.6	8.0	6.6	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.2	9.7	8.0	9.2	9.7	10.2	10.7
	-45	5.7	6.5	6.8	7.1	7.5	6.1	6.9	7.3	7.6	8.0	6.7	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.2	9.7	8.1	9.2	9.7	10.2	10.7
	-40	5.7	6.5	6.8	7.1	7.5	6.1	6.9	7.3	7.6	8.0	6.7	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.2	9.7	8.1	9.2	9.7	10.2	10.7
	-35	5.4	6.2	6.5	6.8	7.1	5.8	6.6	7.0	7.3	7.7	6.4	7.3	7.7	8.1	8.5	7.1	8.1	8.4	8.9	9.3	7.8	8.9	9.3	9.8	10.3
	-30	5.1	5.8	6.1	6.4	6.7	5.5	6.3	6.6	6.9	7.2	6.1	6.9	7.2	7.6	8.0	6.7	7.6	8.0	8.4	8.8	7.4	8.4	8.8	9.3	9.8
	-25	4.8	5.4	5.7	6.0	6.3	5.2	5.9	6.1	6.4	6.8	5.7	6.5	6.8	7.2	7.5	6.3	7.2	7.6	7.9	8.4	7.0	8.0	8.4	8.8	9.3
	-20	4.5	5.1	5.3	5.6	5.8	4.8	5.5	5.8	6.0	6.4	5.4	6.1	6.4	6.7	7.1	6.0	6.8	7.1	7.5	7.9	6.6	7.6	7.9	8.3	8.8
	-15	4.2	4.7	5.0	5.2	5.5	4.5	5.2	5.4	5.7	6.0	5.1	5.8	6.0	6.3	6.7	5.7	6.4	6.7	7.1	7.4	6.3	7.2	7.5	7.9	8.3
	-10	3.9	4.4	4.6	4.8	5.1	4.2	4.8	5.1	5.3	5.6	4.8	5.4	5.7	6.0	6.3	5.3	6.1	6.4	6.7	7.0	6.0	6.8	7.1	7.5	7.9
	-5	3.5	4.0	4.2	4.4	4.6	3.9	4.4	4.6	4.9	5.1	4.4	5.0	5.2	5.5	5.8	5.0	5.6	5.9	6.2	6.5	5.6	6.3	6.6	7.0	7.3
	0	3.2	3.6	3.8	4.0	4.2	3.5	4.0	4.2	4.4	4.6	4.0	4.6	4.8	5.0	5.3	4.5	5.2	5.4	5.7	6.0	5.1	5.9	6.1	6.4	6.8
	5	2.8	3.2	3.3	3.5	3.7	3.1	3.6	3.7	3.9	4.1	3.6	4.1	4.3	4.5	4.8	4.1	4.7	5.0	5.2	5.5	4.7	5.4	5.6	5.9	6.2
	10	2.4	2.8	2.9	3.1	3.3	2.8	3.2	3.3	3.5	3.7	3.3	3.7	3.9	4.1	4.3	3.8	4.3	4.5	4.7	5.0	4.3	4.9	5.2	5.4	5.7
	15	2.0	2.3	2.4	2.6	2.7	2.3	2.7	2.8	3.0	3.1	2.8	3.2	3.4	3.5	3.7	3.3	3.8	4.0	4.2	4.4	3.8	4.4	4.6	4.8	5.1
	20	1.3	1.5	1.6	1.7	1.8	1.6	1.9	2.0	2.1	2.2	2.0	2.4	2.5	2.6	2.8	2.5	2.9	3.0	3.2	3.4	3.0	3.5	3.7	3.8	4.0
	25	0.6	0.8	0.8	0.9	1.0	0.9	1.1	1.2	1.3	1.3	1.3	1.6	1.7	1.7	1.9	1.8	2.1	2.2	2.3	2.4	2.2	2.6	2.7	2.9	3.0
	30	0.0	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.5	0.6	0.8	0.8	0.9	1.0	1.0	1.3	1.3	1.4	1.5	1.5	1.8	1.9	2.0	2.1
11000	-50	5.1	5.8	6.1	6.4	6.7	5.5	6.2	6.6	6.9	7.2	6.0	6.9	7.2	7.6	8.0	6.6	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.3	9.8
	-45	5.1	5.8	6.1	6.4	6.7	5.5	6.3	6.6	6.9	7.2	6.0	6.9	7.2	7.6	8.0	6.7	7.6	8.0	8.4	8.8	7.3	8.4	8.8	9.3	9.8
	-40	5.1	5.8	6.0	6.3	6.7	5.5	6.2	6.5	6.8	7.2	6.0	6.9	7.2	7.5	7.9	6.6	7.6	7.9	8.3	8.8	7.3	8.4	8.8	9.2	9.7
	-35	4.9	5.5	5.8	6.1	6.4	5.3	6.0	6.3	6.6	6.9	5.8	6.6	6.9	7.3	7.7	6.4	7.3	7.7	8.1	8.5	7.1	8.1	8.5	8.9	9.4
	-30	4.5	5.2	5.4	5.7	5.9	4.9	5.6	5.9	6.1	6.5	5.5	6.2	6.5	6.8	7.2	6.1	6.9	7.2	7.6	8.0	6.7	7.7	8.0	8.4	8.9
	-25	4.2	4.8	5.0	5.3	5.5	4.6	5.2	5.5	5.7	6.0	5.1	5.8	6.1	6.4	6.8	5.7	6.5	6.8	7.2	7.5	6.4	7.2	7.6	8.0	8.4
	-20	3.9	4.5	4.7	4.9	5.2	4.3	4.9	5.1	5.4	5.6	4.8	5.5	5.7	6.0	6.3	5.4	6.1	6.4	6.7	7.1	6.0	6.9	7.2	7.5	7.9
	-15	3.6	4.1	4.3	4.5	4.8	4.0	4.6	4.8	5.0	5.2	4.5	5.1	5.4	5.6	5.9	5.1	5.8	6.1	6.3	6.7	5.7	6.5	6.8	7.1	7.5
	-10	3.3	3.8	4.0	4.2	4.4	3.7	4.2	4.4	4.6	4.9	4.2	4.8	5.0	5.3	5.5	4.8	5.4	5.7	5.9	6.3	5.4	6.1	6.4	6.7	7.1
	-5	3.0	3.5	3.6	3.8	4.0	3.4	3.8	4.0	4.2	4.4	3.9	4.4	4.6	4.8	5.1	4.4	5.0	5.3	5.5	5.8	5.0	5.7	6.0	6.2	6.6
	0	2.7	3.1	3.2	3.4	3.5	3.0	3.4	3.6	3.8	4.0	3.5	4.0	4.2	4.4	4.6	4.0	4.6	4.8	5.0	5.3	4.6	5.2	5.5	5.7	6.0
	5	2.3	2.7	2.8	2.9	3.1	2.6	3.0	3.2	3.3	3.5	3.1	3.6	3.7	3.9	4.1	3.6	4.1	4.3	4.5	4.8	4.2	4.8	5.0	5.2	5.5
	10	2.0	2.3	2.4	2.5	2.7	2.3	2.6	2.8	2.9	3.1	2.8	3.2	3.3	3.5	3.7	3.3	3.7	3.9	4.1	4.3	3.8	4.3	4.5	4.8	5.0
	15	1.5	1.7	1.8	1.9	2.0	1.8	2.1	2.2	2.3	2.4	2.2	2.6	2.7	2.8	3.0	2.7	3.1	3.3	3.4	3.6	3.2	3.7	3.9	4.1	4.3
	20	0.8	1.0	1.0	1.1	1.2	1.1	1.3	1.4	1.5	1.5	1.5	1.8	1.9	2.0	2.1	2.0	2.3	2.4	2.5	2.6	2.4	2.8	3.0	3.1	3.3
	25	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.0	1.1	1.2	1.2	1.4	1.5	1.6	1.7	1.7	2.0	2.1	2.2	2.3
	28	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.1	0.1	0.2	0.2	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.0	1.1	1.2	1.2	1.5	1.6	1.7	1.8

(Column headings: WEIGHT - POUNDS; WIND KNOTS under each weight.)

525BFM-06-00

Figure 4-40* (Sheet 5)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - V2; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	11500					11000					10500					10000					9500				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-45	9.4	10.8	11.4	12.0	12.6	10.3	11.8	12.4	13.1	13.8	11.3	12.9	13.6	14.3	15.1	12.3	14.1	14.9	15.6	16.5	13.5	15.4	16.2	17.0	18.0
	-40	9.4	10.8	11.4	12.0	12.6	10.3	11.8	12.4	13.1	13.8	11.3	13.0	13.6	14.3	15.1	12.4	14.2	14.9	15.6	16.5	13.5	15.4	16.2	17.0	18.0
	-35	9.5	10.8	11.4	11.9	12.6	10.4	11.8	12.4	13.1	13.8	11.3	13.0	13.6	14.3	15.1	12.4	14.2	14.9	15.6	16.5	13.5	15.4	16.2	17.0	17.9
	-30	9.4	10.8	11.3	11.9	12.5	10.3	11.8	12.4	13.0	13.7	11.3	12.9	13.5	14.2	15.0	12.4	14.1	14.8	15.6	16.4	13.5	15.4	16.1	17.0	17.8
	-25	9.2	10.5	11.0	11.6	12.2	10.1	11.5	12.1	12.7	13.4	11.1	12.6	13.2	13.9	14.7	12.1	13.8	14.5	15.2	16.1	13.3	15.1	15.9	16.7	17.5
	-20	8.8	10.0	10.5	11.1	11.6	9.7	11.0	11.6	12.2	12.8	10.6	12.1	12.7	13.4	14.1	11.6	13.3	13.9	14.7	15.4	12.8	14.6	15.3	16.0	16.9
	-15	8.4	9.6	10.0	10.5	11.1	9.2	10.5	11.0	11.6	12.2	10.1	11.6	12.2	12.8	13.5	11.2	12.8	13.4	14.1	14.8	12.3	14.0	14.7	15.5	16.3
	-10	8.0	9.1	9.5	10.0	10.6	8.8	10.1	10.5	11.1	11.7	9.7	11.1	11.6	12.2	12.9	10.7	12.2	12.8	13.5	14.2	11.8	13.5	14.1	14.9	15.7
	-5	7.5	8.6	9.0	9.5	10.0	8.3	9.5	10.0	10.5	11.1	9.2	10.5	11.1	11.6	12.3	10.2	11.7	12.2	12.9	13.6	11.3	12.9	13.5	14.2	15.0
	0	7.0	8.0	8.4	8.8	9.3	7.8	8.9	9.4	9.8	10.4	8.7	9.9	10.4	10.9	11.5	9.6	11.0	11.5	12.1	12.8	10.7	12.2	12.8	13.5	14.2
	5	6.5	7.5	7.8	8.2	8.7	7.3	8.3	8.8	9.2	9.7	8.1	9.3	9.8	10.3	10.8	9.1	10.4	10.9	11.5	12.1	10.1	11.5	12.1	12.7	13.4
	10	6.1	7.0	7.3	7.7	8.1	6.8	7.8	8.2	8.6	9.1	7.6	8.7	9.2	9.6	10.2	8.5	9.8	10.3	10.8	11.4	9.5	10.9	11.4	12.0	12.7
	15	5.7	6.5	6.8	7.1	7.5	6.4	7.3	7.6	8.0	8.5	7.2	8.2	8.6	9.0	9.5	8.0	9.2	9.7	10.2	10.7	9.0	10.3	10.8	11.4	12.0
	20	4.9	5.6	5.9	6.2	6.5	5.6	6.4	6.7	7.0	7.4	6.3	7.2	7.6	8.0	8.4	7.1	8.2	8.6	9.0	9.5	8.0	9.2	9.7	10.2	10.8
	25	4.0	4.6	4.8	5.1	5.3	4.6	5.3	5.6	5.9	6.2	5.3	6.1	6.4	6.7	7.1	6.1	7.0	7.3	7.7	8.2	6.9	8.0	8.4	8.8	9.3
	30	3.1	3.6	3.8	4.0	4.2	3.7	4.3	4.5	4.8	5.0	4.4	5.0	5.3	5.6	5.9	5.1	5.9	6.2	6.5	6.9	5.9	6.8	7.1	7.5	7.9
	35	2.4	2.8	2.9	3.1	3.2	2.9	3.4	3.6	3.8	4.0	3.5	4.1	4.3	4.5	4.8	4.2	4.8	5.1	5.4	5.7	4.9	5.7	6.0	6.3	6.7
9000	-45	9.4	10.7	11.3	11.9	12.5	10.3	11.8	12.4	13.0	13.7	11.2	12.9	13.5	14.2	15.0	12.3	14.1	14.8	15.6	16.4	13.5	15.4	16.1	17.0	17.9
	-40	9.4	10.7	11.3	11.9	12.5	10.3	11.8	12.4	13.0	13.7	11.3	12.9	13.5	14.2	15.0	12.3	14.1	14.8	15.5	16.4	13.5	15.4	16.1	16.9	17.9
	-35	9.3	10.6	11.1	11.7	12.3	10.1	11.6	12.2	12.8	13.5	11.1	12.7	13.3	14.0	14.8	12.2	13.9	14.6	15.3	16.1	13.3	15.2	15.9	16.7	17.6
	-30	8.9	10.2	10.7	11.2	11.8	9.8	11.2	11.7	12.3	13.0	10.7	12.2	12.8	13.5	14.2	11.8	13.4	14.1	14.8	15.6	12.9	14.7	15.4	16.2	17.1
	-25	8.5	9.7	10.1	10.7	11.2	9.3	10.6	11.2	11.7	12.4	10.3	11.7	12.3	12.9	13.6	11.3	12.9	13.5	14.2	15.0	12.4	14.1	14.8	15.6	16.4
	-20	8.1	9.2	9.6	10.1	10.7	8.9	10.2	10.7	11.2	11.8	9.8	11.2	11.8	12.4	13.0	10.8	12.3	13.0	13.6	14.4	11.9	13.6	14.3	15.0	15.8
	-15	7.7	8.8	9.2	9.6	10.2	8.5	9.7	10.2	10.7	11.3	9.4	10.7	11.2	11.8	12.5	10.4	11.8	12.4	13.1	13.8	11.4	13.1	13.7	14.4	15.2
	-10	7.3	8.3	8.7	9.2	9.7	8.1	9.2	9.7	10.2	10.7	9.0	10.2	10.8	11.3	11.9	9.9	11.4	11.9	12.5	13.2	11.0	12.6	13.2	13.9	14.6
	-5	6.8	7.8	8.2	8.6	9.1	7.6	8.7	9.1	9.6	10.1	8.5	9.7	10.2	10.7	11.3	9.4	10.8	11.3	11.9	12.5	10.5	12.0	12.6	13.2	13.9
	0	6.4	7.3	7.6	8.0	8.5	7.1	8.1	8.5	9.0	9.5	8.0	9.1	9.6	10.0	10.6	8.9	10.2	10.7	11.2	11.8	9.9	11.3	11.9	12.5	13.2
	5	5.9	6.8	7.1	7.5	7.9	6.6	7.6	8.0	8.4	8.8	7.5	8.5	8.9	9.4	9.9	8.4	9.5	10.0	10.5	11.1	9.3	10.7	11.2	11.8	12.4
	10	5.5	6.3	6.6	6.9	7.3	6.2	7.1	7.4	7.8	8.2	7.0	8.0	8.4	8.8	9.3	7.8	9.0	9.4	9.9	10.4	8.8	10.1	10.6	11.1	11.7
	15	5.0	5.8	6.0	6.3	6.7	5.7	6.5	6.8	7.2	7.6	6.4	7.4	7.7	8.1	8.6	7.3	8.3	8.7	9.2	9.7	8.2	9.4	9.9	10.4	10.9
	20	4.2	4.8	5.1	5.3	5.6	4.9	5.6	5.9	6.2	6.5	5.6	6.4	6.7	7.0	7.4	6.3	7.3	7.6	8.0	8.5	7.2	8.3	8.7	9.2	9.7
	25	3.4	3.9	4.1	4.3	4.5	4.0	4.6	4.8	5.0	5.3	4.6	5.3	5.6	5.9	6.2	5.4	6.2	6.5	6.8	7.2	6.2	7.1	7.4	7.8	8.3
	30	2.6	3.0	3.1	3.3	3.5	3.1	3.6	3.8	4.0	4.2	3.7	4.3	4.5	4.8	5.0	4.4	5.1	5.4	5.6	6.0	5.2	6.0	6.3	6.6	7.0
	32	2.2	2.6	2.8	2.9	3.1	2.8	3.2	3.4	3.6	3.8	3.4	3.9	4.1	4.3	4.6	4.1	4.7	4.9	5.2	5.5	4.8	5.5	5.8	6.1	6.5
10000	-50	8.8	10.1	10.6	11.2	11.8	9.7	11.1	11.7	12.3	13.0	10.6	12.2	12.8	13.5	14.2	11.7	13.4	14.1	14.8	15.6	12.8	14.7	15.4	16.2	17.1
	-45	8.9	10.1	10.6	11.2	11.8	9.7	11.1	11.7	12.3	13.0	10.7	12.2	12.8	13.5	14.2	11.7	13.4	14.1	14.8	15.6	12.8	14.7	15.4	16.2	17.1
	-40	8.9	10.1	10.6	11.2	11.8	9.7	11.1	11.7	12.3	12.9	10.7	12.2	12.8	13.5	14.2	11.7	13.4	14.1	14.8	15.6	12.9	14.7	15.4	16.2	17.1
	-35	8.6	9.8	10.3	10.8	11.4	9.4	10.8	11.3	11.9	12.5	10.4	11.8	12.4	13.1	13.8	11.4	13.0	13.7	14.4	15.1	12.5	14.3	15.0	15.7	16.6
	-30	8.2	9.3	9.8	10.3	10.8	9.0	10.3	10.8	11.3	11.9	9.9	11.3	11.9	12.5	13.2	10.9	12.5	13.1	13.8	14.5	12.0	13.7	14.4	15.1	16.0
	-25	7.8	8.8	9.3	9.8	10.3	8.6	9.8	10.3	10.8	11.4	9.5	10.8	11.4	11.9	12.6	10.5	11.9	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.3
	-20	7.4	8.4	8.8	9.3	9.7	8.2	9.3	9.8	10.3	10.8	9.1	10.3	10.8	11.4	12.0	10.0	11.4	12.0	12.6	13.3	11.1	12.7	13.3	14.0	14.7
	-15	7.0	8.0	8.4	8.8	9.2	7.8	8.9	9.3	9.8	10.3	8.6	9.9	10.4	10.9	11.5	9.6	11.0	11.5	12.1	12.7	10.6	12.1	12.7	13.4	14.1
	-10	6.6	7.6	7.9	8.3	8.8	7.4	8.4	8.9	9.3	9.8	8.3	9.4	9.9	10.4	10.9	9.2	10.5	11.0	11.6	12.2	10.2	11.7	12.2	12.9	13.5
	-5	6.2	7.1	7.4	7.8	8.2	6.9	7.9	8.3	8.7	9.2	7.8	8.9	9.3	9.8	10.3	8.7	9.9	10.4	11.0	11.5	9.7	11.1	11.6	12.2	12.9
	0	5.8	6.6	6.9	7.3	7.6	6.5	7.4	7.8	8.2	8.6	7.3	8.3	8.7	9.2	9.7	8.2	9.3	9.8	10.3	10.8	9.1	10.4	11.0	11.5	12.1
	5	5.4	6.1	6.4	6.7	7.1	6.0	6.9	7.2	7.6	8.0	6.8	7.8	8.1	8.6	9.0	7.6	8.7	9.2	9.6	10.2	8.6	9.8	10.3	10.8	11.4
	10	4.9	5.6	5.9	6.2	6.5	5.6	6.4	6.7	7.0	7.4	6.3	7.2	7.6	8.0	8.4	7.1	8.2	8.6	9.0	9.5	8.1	9.2	9.7	10.2	10.7
	15	4.4	5.1	5.3	5.6	5.9	5.1	5.8	6.1	6.4	6.7	5.8	6.6	6.9	7.3	7.7	6.6	7.5	7.9	8.3	8.7	7.5	8.5	9.0	9.4	9.9
	20	3.6	4.1	4.3	4.5	4.8	4.2	4.8	5.0	5.3	5.6	4.9	5.6	5.9	6.2	6.5	5.6	6.4	6.7	7.1	7.5	6.4	7.4	7.7	8.1	8.6
	25	2.8	3.2	3.4	3.5	3.7	3.3	3.8	4.0	4.3	4.5	4.0	4.6	4.8	5.0	5.3	4.7	5.4	5.6	5.9	6.2	5.4	6.2	6.6	6.9	7.3
	30	2.0	2.3	2.4	2.6	2.7	2.5	2.9	3.1	3.2	3.4	3.1	3.6	3.8	4.0	4.2	3.8	4.3	4.6	4.8	5.1	4.5	5.2	5.4	5.7	6.0
11000	-50	8.1	9.3	9.7	10.2	10.8	8.9	10.2	10.7	11.3	11.9	9.8	11.3	11.8	12.5	13.2	10.8	12.4	13.1	13.7	14.5	11.9	13.7	14.4	15.1	16.0
	-45	8.1	9.3	9.7	10.3	10.8	9.0	10.2	10.8	11.3	11.9	9.9	11.3	11.9	12.5	13.2	10.9	12.4	13.1	13.7	14.5	12.0	13.7	14.4	15.1	16.0
	-40	8.1	9.2	9.7	10.2	10.7	8.9	10.2	10.7	11.2	11.9	9.8	11.2	11.8	12.4	13.1	10.8	12.4	13.0	13.7	14.4	11.9	13.6	14.3	15.0	15.9
	-35	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5	9.6	11.0	11.5	12.1	12.7	10.6	12.1	12.7	13.3	14.0	11.7	13.3	14.0	14.7	15.5
	-30	7.4	8.5	8.9	9.4	9.9	8.3	9.4	9.9	10.4	10.9	9.1	10.4	11.0	11.5	12.1	10.1	11.6	12.1	12.7	13.4	11.2	12.8	13.4	14.1	14.8
	-25	7.1	8.1	8.4	8.9	9.3	7.9	9.0	9.4	9.9	10.4	8.7	10.0	10.4	11.0	11.6	9.7	11.1	11.6	12.2	12.8	10.7	12.2	12.8	13.5	14.2
	-20	6.7	7.6	8.0	8.4	8.9	7.5	8.5	8.9	9.4	9.9	8.3	9.5	10.0	10.5	11.0	9.3	10.6	11.1	11.6	12.3	10.3	11.7	12.3	12.9	13.6
	-15	6.3	7.2	7.6	8.0	8.4	7.1	8.1	8.5	8.9	9.4	7.9	9.0	9.5	10.0	10.5	8.8	10.1	10.6	11.1	11.7	9.9	11.2	11.8	12.4	13.1
	-10	6.0	6.8	7.2	7.5	7.9	6.7	7.7	8.0	8.4	8.9	7.5	8.6	9.0	9.5	10.0	8.4	9.6	10.1	10.6	11.2	9.4	10.8	11.3	11.9	12.5
	-5	5.6	6.4	6.7	7.1	7.4	6.3	7.2	7.6	7.9	8.4	7.1	8.1	8.5	8.9	9.4	8.0	9.1	9.6	10.0	10.6	8.9	10.2	10.7	11.3	11.9
	0	5.2	5.9	6.2	6.5	6.9	5.9	6.7	7.0	7.4	7.8	6.6	7.6	7.9	8.3	8.8	7.5	8.5	8.9	9.4	9.9	8.4	9.6	10.1	10.6	11.2
	5	4.8	5.5	5.7	6.0	6.3	5.4	6.2	6.5	6.8	7.2	6.2	7.0	7.4	7.8	8.2	7.0	8.0	8.3	8.8	9.2	7.9	9.0	9.5	9.9	10.5
	10	4.4	5.0	5.2	5.5	5.8	5.0	5.7	6.0	6.3	6.6	5.7	6.5	6.9	7.2	7.6	6.5	7.4	7.8	8.2	8.6	7.4	8.4	8.9	9.3	9.8
	15	3.8	4.3	4.5	4.8	5.0	4.4	5.0	5.3	5.6	5.8	5.1	5.8	6.1	6.4	6.7	5.8	6.7	7.0	7.4	7.8	6.7	7.6	8.0	8.4	8.9
	20	3.0	3.4	3.6	3.8	4.0	3.6	4.1	4.3	4.5	4.7	4.2	4.8	5.0	5.3	5.6	4.9	5.6	5.9	6.2	6.5	5.7	6.5	6.8	7.2	7.6
	25	2.2	2.5	2.7	2.8	3.0	2.7	3.1	3.3	3.5	3.7	3.3	3.8	4.0	4.2	4.5	4.0	4.6	4.8	5.1	5.3	4.7	5.4	5.7	6.0	6.3
	28	1.7	2.0	2.1	2.3	2.4	2.2	2.6	2.7	2.9	3.1	2.8	3.3	3.4	3.6	3.8	3.5	4.0	4.2	4.4	4.7	4.2	4.8	5.0	5.3	5.6

(Column headings: WEIGHT - POUNDS; WIND KNOTS under each weight.)

525BFM-06-00

Figure 4-40* (Sheet 6)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - ON
LANDING GEAR - UP
AIRSPEED - V2
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS 13870 WIND KNOTS -10	0	10	20	30	13500 -10	0	10	20	30	13000 -10	0	10	20	30	12500 -10	0	10	20	30	12000 -10	0	10	20	30
0	-35	5.8	6.8	7.2	7.6	8.1	6.2	7.3	7.7	8.1	8.7	6.8	8.0	8.4	9.0	9.5	7.5	8.8	9.3	9.9	10.5	8.3	9.7	10.2	10.8	11.6
	-30	5.8	6.8	7.2	7.6	8.0	6.2	7.3	7.7	8.1	8.6	6.9	8.0	8.4	9.0	9.5	7.5	8.8	9.3	9.9	10.5	8.3	9.7	10.2	10.8	11.5
	-25	5.8	6.8	7.1	7.6	8.0	6.2	7.3	7.7	8.1	8.6	6.9	8.0	8.4	8.9	9.5	7.6	8.8	9.3	9.8	10.5	8.3	9.7	10.2	10.8	11.5
	-20	5.8	6.8	7.1	7.6	8.0	6.3	7.3	7.7	8.1	8.6	6.9	8.0	8.4	8.9	9.5	7.6	8.8	9.3	9.8	10.4	8.3	9.7	10.2	10.8	11.5
	-15	5.8	6.8	7.1	7.5	8.0	6.3	7.3	7.7	8.1	8.6	6.9	8.0	8.4	8.9	9.5	7.6	8.8	9.3	9.8	10.4	8.3	9.7	10.2	10.8	11.5
	-10	5.8	6.8	7.1	7.5	8.0	6.3	7.3	7.7	8.1	8.6	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.3	9.8	10.4	8.3	9.7	10.2	10.8	11.4
	-5	5.9	6.8	7.1	7.5	8.0	6.3	7.3	7.6	8.1	8.6	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.3	9.8	10.4	8.3	9.7	10.2	10.8	11.4
	0	5.8	6.8	7.1	7.5	7.9	6.3	7.2	7.6	8.1	8.5	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.2	9.8	10.4	8.3	9.6	10.2	10.7	11.4
	5	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.8	9.4	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	10	5.8	6.7	7.1	7.4	7.9	6.3	7.2	7.6	8.0	8.5	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
1000	-35	5.8	6.7	7.1	7.5	8.0	6.2	7.2	7.6	8.1	8.6	6.8	8.0	8.4	8.9	9.5	7.5	8.8	9.3	9.8	10.4	8.3	9.6	10.2	10.8	11.5
	-30	5.8	6.7	7.1	7.5	8.0	6.2	7.2	7.6	8.1	8.6	6.8	8.0	8.4	8.9	9.5	7.5	8.8	9.3	9.8	10.4	8.3	9.6	10.2	10.8	11.5
	-25	5.8	6.7	7.1	7.5	8.0	6.2	7.2	7.6	8.1	8.6	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.3	9.8	10.4	8.3	9.6	10.2	10.8	11.4
	-20	5.8	6.7	7.1	7.5	8.0	6.3	7.2	7.6	8.1	8.6	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.3	9.8	10.4	8.3	9.6	10.2	10.8	11.4
	-15	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.1	8.5	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.2	9.8	10.4	8.3	9.6	10.2	10.7	11.4
	-10	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.1	8.5	6.9	8.0	8.4	8.9	9.4	7.6	8.8	9.2	9.8	10.3	8.3	9.6	10.2	10.7	11.4
	-5	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.0	8.5	6.9	8.0	8.4	8.8	9.4	7.6	8.8	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	0	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.8	9.3	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	5	5.8	6.7	7.0	7.4	7.8	6.3	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.3
	10	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.1	9.6	10.2	8.3	9.6	10.1	10.6	11.2
2000	-35	5.8	6.7	7.1	7.5	7.9	6.2	7.2	7.6	8.1	8.5	6.8	7.9	8.4	8.9	9.4	7.5	8.7	9.2	9.8	10.4	8.3	9.6	10.1	10.7	11.4
	-30	5.8	6.7	7.1	7.5	7.9	6.2	7.2	7.6	8.1	8.5	6.8	7.9	8.4	8.9	9.4	7.5	8.7	9.2	9.8	10.4	8.3	9.6	10.1	10.7	11.4
	-25	5.8	6.7	7.1	7.5	7.9	6.2	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.9	9.4	7.5	8.7	9.2	9.8	10.3	8.3	9.6	10.1	10.7	11.4
	-20	5.8	6.7	7.1	7.5	7.9	6.2	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.8	9.4	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.4
	-15	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.8	9.4	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-10	5.8	6.7	7.1	7.5	7.9	6.3	7.2	7.6	8.0	8.5	6.9	7.9	8.4	8.8	9.3	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-5	5.8	6.7	7.1	7.4	7.9	6.3	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	0	5.8	6.7	7.0	7.4	7.8	6.3	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.2
	5	5.8	6.7	7.0	7.4	7.8	6.3	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.8	9.2	7.6	8.7	9.2	9.6	10.2	8.3	9.6	10.1	10.6	11.2
	10	5.7	6.5	6.8	7.2	7.6	6.1	7.0	7.3	7.7	8.1	6.7	7.7	8.1	8.5	9.0	7.4	8.5	8.9	9.4	9.9	8.1	9.3	9.8	10.3	10.9
3000	-35	5.8	6.7	7.1	7.4	7.9	6.2	7.2	7.6	8.0	8.5	6.8	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-30	5.8	6.7	7.1	7.4	7.9	6.2	7.2	7.6	8.0	8.5	6.8	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-25	5.8	6.7	7.0	7.4	7.9	6.2	7.2	7.6	8.0	8.5	6.8	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-20	5.8	6.7	7.0	7.4	7.9	6.2	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.3	8.3	9.6	10.1	10.7	11.3
	-15	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.3
	-10	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.2
	-5	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.2	8.3	9.6	10.1	10.6	11.2
	0	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.2	8.3	9.6	10.0	10.6	11.2
	5	5.7	6.6	6.9	7.2	7.6	6.1	7.0	7.4	7.8	8.2	6.8	7.8	8.1	8.6	9.1	7.5	8.6	9.0	9.5	10.0	8.2	9.4	9.9	10.4	11.0
	10	5.2	5.9	6.2	6.5	6.9	5.6	6.4	6.7	7.1	7.4	6.2	7.1	7.4	7.8	8.2	6.8	7.8	8.2	8.6	9.1	7.5	8.6	9.1	9.6	10.1
4000	-35	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.8	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.3
	-30	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.8	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.3
	-25	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.5	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.2
	-20	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.6	8.0	8.4	6.9	7.9	8.3	8.8	9.3	7.6	8.7	9.2	9.7	10.2	8.3	9.6	10.1	10.6	11.2
	-15	5.8	6.7	7.0	7.4	7.8	6.2	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.2	8.3	9.6	10.1	10.6	11.2
	-10	5.8	6.7	7.0	7.4	7.8	6.3	7.2	7.5	7.9	8.4	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.2	8.3	9.6	10.0	10.6	11.2
	-5	5.8	6.7	7.0	7.4	7.8	6.3	7.2	7.5	7.9	8.3	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.1	8.3	9.6	10.0	10.6	11.2
	0	5.8	6.7	7.0	7.3	7.7	6.2	7.1	7.5	7.9	8.3	6.9	7.9	8.3	8.7	9.2	7.6	8.7	9.1	9.6	10.1	8.3	9.5	10.0	10.5	11.1
	5	5.3	6.1	6.4	6.7	7.1	5.8	6.6	6.9	7.3	7.7	6.4	7.3	7.6	8.0	8.5	7.0	8.0	8.4	8.9	9.4	7.7	8.9	9.3	9.8	10.4
	10	4.5	5.2	5.4	5.7	6.0	4.9	5.6	5.9	6.2	6.6	5.5	6.3	6.6	6.9	7.3	6.1	7.0	7.3	7.7	8.2	6.7	7.7	8.1	8.6	9.1

525BFM-06-00

Figure 4-41* (Sheet 1 of 8)

SECOND SEGMENT TAKEOFF NET CLIMB GRADIENT - PERCENT
FLAPS - 15°

CONDITIONS: ANTI-ICE - ON
LANDING GEAR - UP
AIRSPEED - V2
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS 11500 WIND KNOTS -10	0	10	20	30	11000 -10	0	10	20	30	10500 -10	0	10	20	30	10000 -10	0	10	20	30	9500 -10	0	10	20	30
0	-35	9.1	10.6	11.2	11.9	12.7	10.0	11.6	12.3	13.1	13.9	10.9	12.7	13.5	14.3	15.3	11.9	13.9	14.8	15.7	16.7	13.1	15.2	16.1	17.1	18.2
	-30	9.1	10.6	11.2	11.9	12.7	10.0	11.6	12.3	13.1	13.9	10.9	12.7	13.5	14.3	15.2	12.0	13.9	14.7	15.6	16.6	13.1	15.2	16.1	17.1	18.2
	-25	9.1	10.6	11.2	11.9	12.6	10.0	11.6	12.3	13.0	13.9	10.9	12.7	13.5	14.3	15.2	12.0	13.9	14.7	15.6	16.6	13.1	15.2	16.1	17.0	18.1
	-20	9.1	10.6	11.2	11.9	12.6	10.0	11.6	12.3	13.0	13.8	11.0	12.7	13.5	14.3	15.2	12.0	13.9	14.7	15.6	16.6	13.1	15.2	16.1	17.0	18.1
	-15	9.1	10.6	11.2	11.9	12.6	10.0	11.6	12.3	13.0	13.8	11.0	12.7	13.5	14.3	15.1	12.0	13.9	14.7	15.6	16.6	13.1	15.2	16.1	17.0	18.0
	-10	9.1	10.6	11.2	11.8	12.6	10.0	11.6	12.3	13.0	13.8	11.0	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.6	16.5	13.2	15.2	16.1	17.0	18.0
	-5	9.1	10.6	11.2	11.8	12.5	10.0	11.6	12.3	13.0	13.8	11.0	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.5	16.5	13.2	15.2	16.0	17.0	18.0
	0	9.1	10.6	11.2	11.8	12.5	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.2	15.0	12.0	13.9	14.7	15.5	16.4	13.2	15.2	16.0	16.9	17.9
	5	9.1	10.6	11.1	11.8	12.4	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.1	15.0	12.0	13.9	14.6	15.5	16.4	13.2	15.2	16.0	16.9	17.9
	10	9.1	10.5	11.1	11.7	12.4	10.0	11.6	12.2	12.9	13.6	11.0	12.7	13.3	14.1	14.9	12.0	13.9	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.8
1000	-35	9.1	10.6	11.2	11.9	12.6	10.0	11.6	12.3	13.0	13.8	10.9	12.7	13.4	14.3	15.2	11.9	13.9	14.7	15.6	16.6	13.1	15.2	16.1	17.0	18.1
	-30	9.1	10.6	11.2	11.8	12.6	10.0	11.6	12.3	13.0	13.8	10.9	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.6	16.6	13.1	15.2	16.0	17.0	18.0
	-25	9.1	10.6	11.2	11.8	12.6	10.0	11.6	12.3	13.0	13.8	10.9	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.6	16.5	13.1	15.2	16.0	17.0	18.0
	-20	9.1	10.6	11.2	11.8	12.5	10.0	11.6	12.2	13.0	13.8	11.0	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.5	16.5	13.1	15.2	16.0	17.0	18.0
	-15	9.1	10.6	11.2	11.8	12.5	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.5	16.5	13.1	15.2	16.0	16.9	17.9
	-10	9.1	10.6	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.2	15.0	12.0	13.9	14.7	15.5	16.4	13.2	15.2	16.0	16.9	17.9
	-5	9.1	10.6	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.1	15.0	12.0	13.9	14.6	15.5	16.4	13.2	15.2	16.0	16.9	17.9
	0	9.1	10.5	11.1	11.7	12.4	10.0	11.6	12.2	12.9	13.6	11.0	12.7	13.4	14.1	14.9	12.0	13.9	14.6	15.4	16.3	13.2	15.2	16.0	16.8	17.8
	5	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.2	12.8	13.6	11.0	12.7	13.3	14.1	14.9	12.0	13.9	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.8
	10	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.1	15.1	15.9	16.7	17.7
2000	-35	9.1	10.5	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.8	10.9	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.5	16.5	13.1	15.2	16.0	16.9	18.0
	-30	9.1	10.6	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.7	10.9	12.7	13.4	14.2	15.1	12.0	13.9	14.7	15.5	16.5	13.1	15.2	16.0	16.9	18.0
	-25	9.1	10.6	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.7	10.9	12.7	13.4	14.2	15.0	12.0	13.9	14.6	15.5	16.4	13.1	15.2	16.0	16.9	17.9
	-20	9.1	10.6	11.1	11.8	12.5	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.1	15.0	12.0	13.9	14.6	15.5	16.4	13.1	15.2	16.0	16.9	17.9
	-15	9.1	10.6	11.1	11.7	12.4	10.0	11.6	12.2	12.9	13.7	11.0	12.7	13.4	14.1	15.0	12.0	13.9	14.6	15.5	16.4	13.2	15.2	16.0	16.9	17.9
	-10	9.1	10.6	11.1	11.7	12.4	10.0	11.6	12.2	12.9	13.6	11.0	12.7	13.4	14.1	14.9	12.0	13.9	14.6	15.4	16.3	13.2	15.2	16.0	16.8	17.8
	-5	9.1	10.5	11.1	11.7	12.4	10.0	11.6	12.2	12.8	13.6	11.0	12.7	13.3	14.1	14.9	12.0	13.9	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.8
	0	9.1	10.5	11.1	11.7	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.9	12.0	13.8	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.7
	5	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.7
	10	8.9	10.2	10.8	11.4	12.0	9.8	11.3	11.8	12.5	13.2	10.7	12.3	13.0	13.7	14.5	11.8	13.5	14.2	15.0	15.9	12.9	14.8	15.6	16.4	17.3
3000	-35	9.1	10.5	11.1	11.7	12.4	9.9	11.5	12.2	12.9	13.7	10.9	12.6	13.3	14.1	15.0	11.9	13.8	14.6	15.4	16.4	13.1	15.1	15.9	16.9	17.9
	-30	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.2	12.9	13.6	10.9	12.6	13.3	14.1	15.0	12.0	13.8	14.6	15.4	16.4	13.1	15.1	15.9	16.8	17.8
	-25	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.2	12.8	13.6	10.9	12.6	13.3	14.1	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.8
	-20	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.2	12.8	13.6	11.0	12.6	13.3	14.1	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.8
	-15	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.1	12.8	13.6	11.0	12.6	13.3	14.1	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.7
	-10	9.1	10.5	11.1	11.7	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.7
	-5	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.7
	0	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.7	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.6
	5	9.0	10.3	10.9	11.4	12.1	9.9	11.4	11.9	12.6	13.3	10.8	12.5	13.1	13.8	14.6	11.9	13.6	14.3	15.1	16.0	13.0	14.9	15.7	16.5	17.4
	10	8.3	9.5	10.0	10.6	11.1	9.1	10.5	11.0	11.6	12.3	10.1	11.6	12.2	12.8	13.5	11.1	12.7	13.4	14.1	14.9	12.2	14.0	14.7	15.5	16.4
4000	-35	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.1	12.8	13.6	10.9	12.6	13.3	14.1	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.8
	-30	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.1	12.8	13.6	10.9	12.6	13.3	14.1	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.8
	-25	9.1	10.5	11.1	11.7	12.4	10.0	11.5	12.1	12.8	13.6	10.9	12.6	13.3	14.0	14.9	12.0	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.7
	-20	9.1	10.5	11.1	11.7	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.1	15.1	15.9	16.7	17.7
	-15	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.7
	-10	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.8	13.5	11.0	12.6	13.3	14.0	14.8	12.0	13.8	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.6
	-5	9.1	10.5	11.0	11.6	12.3	10.0	11.5	12.1	12.7	13.4	11.0	12.6	13.3	14.0	14.7	12.0	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6
	0	9.1	10.5	11.0	11.6	12.2	10.0	11.5	12.1	12.7	13.4	11.0	12.6	13.2	13.9	14.7	12.0	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.6	17.5
	5	8.5	9.8	10.3	10.8	11.4	9.4	10.8	11.3	11.9	12.6	10.3	11.8	12.4	13.1	13.8	11.3	13.0	13.7	14.4	15.2	12.5	14.3	15.0	15.8	16.7
	10	7.5	8.6	9.1	9.5	10.1	8.3	9.5	10.0	10.6	11.2	9.2	10.6	11.1	11.7	12.4	10.2	11.7	12.3	13.0	13.7	11.2	12.9	13.6	14.3	15.1

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Figure 4-41* (Sheet 2)

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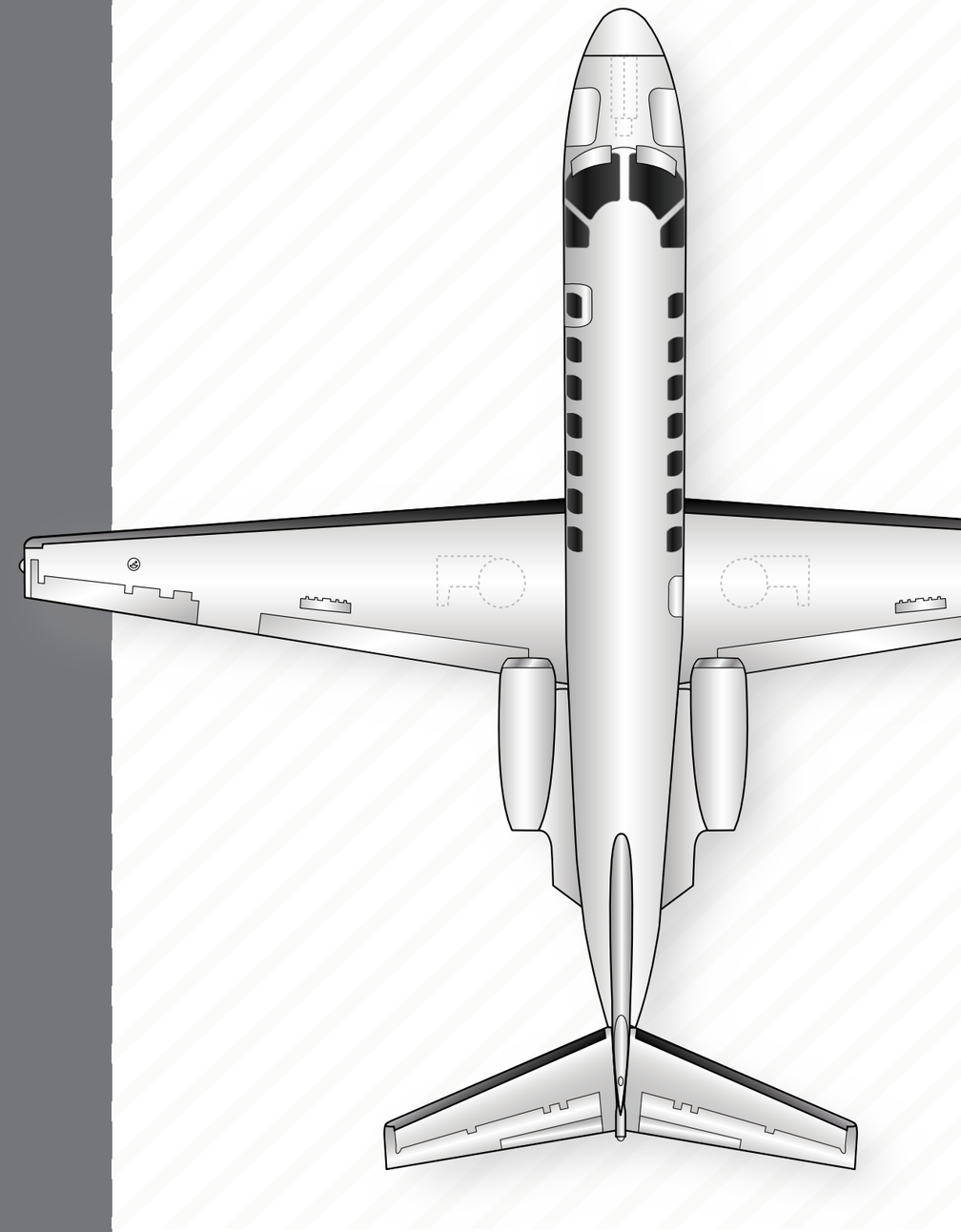
ENROUTE



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CRUISE CLIMB

222 KIAS/0.56 INDICATED MACH

TIME, DISTANCE, FUEL, AND RATE OF CLIMB

ANTI-ICE SYSTEMS OFF

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F						10000 FEET ISA = -5°C = 23°F						15000 FEET ISA = -15°C = 6°F					
	MIN	2	2	2	2	1	1	4	4	4	3	3	3	7	7	6	5	5	4
ISA	NM	8	7	7	6	5	5	18	16	15	13	12	11	30	28	25	23	20	18
+20°C	LB	71	65	60	54	48	43	143	133	121	109	98	87	221	204	185	167	150	133
	FPM	2315	2504	2752	3042	3386	3803	2013	2184	2408	2669	2978	3351	1676	1826	2023	2251	2521	2847
	MIN	2	1	1	1	1	1	3	3	3	3	2	2	5	5	4	4	4	3
ISA	NM	6	6	5	5	4	4	13	12	11	10	9	8	22	20	18	17	15	13
+10°C	LB	61	57	52	47	42	38	122	113	103	94	85	75	185	171	156	142	127	114
	FPM	3060	3299	3613	3980	4418	4949	2744	2964	3252	3589	3990	4476	2387	2585	2844	3147	3507	3941
	MIN	1	1	1	1	1	1	3	2	2	2	2	2	4	4	4	3	3	3
ISA	NM	5	4	4	4	3	3	10	9	9	8	7	6	17	16	14	13	12	10
	LB	54	51	46	42	38	34	108	101	92	84	76	68	163	151	138	126	113	101
	FPM	3858	4149	4534	4985	5522	6175	3509	3779	4135	4553	5049	5652	3065	3308	3627	4001	4445	4983
	MIN	1	1	1	1	1	1	2	2	2	2	2	1	4	3	3	3	3	2
ISA	NM	4	4	4	3	3	3	9	8	7	7	6	5	14	13	12	11	10	9
-10°C	LB	52	48	44	40	37	33	102	95	87	79	72	64	152	142	130	118	107	95
	FPM	4474	4806	5245	5760	6375	7122	4186	4501	4916	5404	5985	6691	3557	3832	4194	4619	5124	5737
PRESSURE ALTITUDE		17000 FEET ISA = -19°C = -2°F						19000 FEET ISA = -23°C = -9°F						21000 FEET ISA = -27°C = -16°F					
	MIN	8	8	7	6	6	5	10	9	8	7	7	6	11	10	9	8	8	7
ISA	NM	36	33	30	27	24	22	43	40	36	32	29	25	51	47	42	38	34	30
+20°C	LB	254	234	212	191	172	152	289	266	241	217	194	173	326	300	271	244	218	194
	FPM	1527	1668	1853	2067	2320	2624	1369	1500	1672	1871	2105	2387	1216	1338	1497	1682	1898	2157
	MIN	6	6	5	5	4	4	7	7	6	5	5	4	8	7	7	6	6	5
ISA	NM	26	24	22	20	18	16	31	28	26	23	21	18	36	33	30	27	24	22
+10°C	LB	211	195	178	161	145	129	237	220	200	181	163	145	265	245	223	202	182	162
	FPM	2212	2399	2645	2931	3269	3678	2030	2206	2436	2704	3021	3404	1877	2044	2261	2515	2814	3175
	MIN	5	4	4	4	3	3	5	5	5	4	4	3	6	6	5	5	4	4
ISA	NM	20	18	17	15	14	12	23	22	20	18	16	14	27	25	23	21	18	16
	LB	185	172	157	143	129	115	208	193	176	160	144	129	231	214	196	178	160	143
	FPM	2976	3214	3527	3892	4327	4853	2784	3010	3307	3654	4065	4564	2527	2737	3012	3333	3714	4174
	MIN	4	4	4	3	3	3	5	4	4	4	3	3	5	5	5	4	4	3
ISA	NM	17	16	14	13	12	10	20	18	17	15	14	12	23	22	20	18	16	14
-10°C	LB	173	161	147	134	121	108	194	181	165	150	136	121	216	201	184	167	151	135
	FPM	3284	3542	3882	4279	4752	5324	3019	3260	3577	3947	4388	4921	2754	2979	3273	3618	4026	4521
PRESSURE ALTITUDE		23000 FEET ISA = -31°C = -23°F						25000 FEET ISA = -35°C = -30°F						27000 FEET ISA = -38°C = -37°F					
	MIN	13	12	11	10	9	8	15	14	12	11	10	9	17	16	14	13	11	10
ISA	NM	60	55	50	45	40	35	71	65	59	53	47	41	84	77	69	61	54	48
+20°C	LB	366	336	304	273	244	216	411	377	340	305	272	241	459	419	377	338	301	266
	FPM	1062	1176	1323	1493	1692	1931	908	1013	1148	1303	1485	1702	958	1073	1221	1391	1590	1826
	MIN	9	8	8	7	6	6	10	10	9	8	7	6	12	11	10	9	8	7
ISA	NM	41	38	35	31	28	25	48	44	40	36	32	29	55	51	46	42	37	33
+10°C	LB	294	272	247	224	201	179	325	300	273	246	221	197	357	329	299	270	242	215
	FPM	1727	1885	2092	2331	2614	2955	1535	1681	1872	2093	2354	2667	1580	1736	1939	2175	2452	2784
	MIN	7	7	6	5	5	4	8	7	7	6	6	5	9	8	8	7	6	6
ISA	NM	31	29	26	24	21	19	36	33	30	28	25	22	42	39	35	32	28	25
	LB	255	237	216	196	176	157	281	260	237	215	194	173	307	285	259	235	211	188
	FPM	2260	2453	2706	3002	3351	3773	1990	2166	2397	2666	2983	3366	1976	2159	2397	2673	2999	3392
	MIN	6	6	5	5	4	4	7	7	6	5	5	4	8	7	7	6	6	5
ISA	NM	27	25	23	21	19	16	31	29	26	24	21	19	36	34	31	28	25	22
-10°C	LB	239	222	203	184	166	148	262	244	222	202	182	163	287	266	243	220	198	177
	FPM	2487	2695	2968	3287	3664	4120	2222	2414	2665	2957	3303	3720	2244	2443	2704	3008	3366	3799
PRESSURE ALTITUDE		29000 FEET ISA = -42°C = -44°F						31000 FEET ISA = -46°C = -52°F						33000 FEET ISA = -50°C = -59°F					
	MIN	19	17	16	14	12	11	21	19	17	15	13	12	23	21	18	16	14	13
ISA	NM	95	86	77	69	61	53	104	95	85	75	67	59	115	104	93	82	73	64
+20°C	LB	497	453	407	364	324	286	530	483	433	387	344	303	564	513	459	410	364	321
	FPM	1156	1294	1471	1674	1912	2195	1127	1267	1448	1655	1896	2184	1010	1147	1323	1526	1761	2040
	MIN	13	12	11	10	9	8	14	13	12	11	9	8	16	14	13	12	10	9
ISA	NM	62	57	52	46	41	37	69	63	57	51	46	41	76	70	63	56	50	44
+10°C	LB	384	354	321	289	259	230	411	378	342	308	276	245	437	402	363	327	292	259
	FPM	1656	1827	2048	2304	2604	2964	1546	1714	1932	2183	2477	2828	1426	1591	1805	2051	2338	2681
	MIN	10	9	8	8	7	6	11	10	9	8	7	7	12	11	10	9	8	7
ISA	NM	47	43	39	36	32	28	52	48	44	39	35	31	58	54	49	44	39	35
	LB	331	306	278	252	227	202	353	326	297	268	241	215	376	347	315	285	255	227
	FPM	2059	2256	2512	2810	3159	3580	1921	2114	2364	2653	2993	3401	1750	1936	2178	2457	2784	3175
	MIN	9	8	8	7	6	5	10	9	8	7	7	6	11	10	9	8	7	7
ISA	NM	41	38	34	31	28	25	46	42	38	35	31	28	52	48	43	39	35	31
-10°C	LB	308	285	260	236	212	190	329	305	278	252	226	202	352	325	296	268	240	214
	FPM	2233	2440	2711	3025	3395	3840	1968	2162	2415	2708	3052	3465	1692	1873	2108	2379	2697	3076

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Figure 4-10 (Sheet 1 of 4)

CRUISE CLIMB
222 KIAS/0.56 INDICATED MACH
TIME, DISTANCE, FUEL, AND RATE OF CLIMB — ANTI-ICE SYSTEMS OFF

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F						37000 FEET ISA = -57°C = -70°F						39000 FEET ISA = -57°C = -70°F					
	MIN	25	22	20	18	16	14	27	24	22	19	17	15	30	27	24	21	18	16
ISA	NM	126	114	101	90	79	69	138	124	110	97	86	75	154	137	121	106	93	81
+20°C	LB	599	543	485	432	383	337	633	573	511	454	402	353	674	608	540	479	423	371
	FPM	982	1124	1305	1512	1754	2039	822	958	1130	1326	1553	1822	595	725	889	1072	1282	1529
	MIN	17	16	14	13	11	10	19	17	15	14	12	11	21	19	17	15	13	12
ISA	NM	84	77	69	62	55	49	93	85	76	68	60	53	105	95	85	75	66	58
+10°C	LB	464	425	384	345	308	273	492	450	406	364	325	287	525	478	430	385	342	302
	FPM	1297	1460	1670	1910	2191	2525	1061	1214	1408	1629	1886	2191	824	971	1156	1363	1602	1884
	MIN	13	12	11	10	9	8	15	14	12	11	10	9	17	15	14	12	11	10
ISA	NM	65	60	54	48	43	38	73	67	60	54	48	42	83	75	67	60	53	47
	LB	399	368	334	301	270	240	425	391	354	319	285	253	454	416	375	337	301	267
	FPM	1482	1657	1882	2141	2443	2804	1188	1348	1552	1785	2057	2379	964	1120	1316	1537	1792	2093
	MIN	12	11	10	9	8	7	14	13	11	10	9	8	16	14	13	11	10	9
ISA	NM	58	54	48	43	39	34	66	61	55	49	43	38	76	69	62	55	49	43
-10°C	LB	375	346	314	284	255	227	401	369	334	301	270	240	430	394	356	320	286	254
	FPM	1431	1601	1820	2071	2365	2715	1145	1301	1499	1726	1989	2302	927	1079	1269	1484	1732	2024
PRESSURE ALTITUDE		41000 FEET ISA = -57°C = -70°F						43000 FEET ISA = -57°C = -70°F						45000 FEET ISA = -57°C = -70°F					
	MIN	34	30	26	23	20	17	42	35	30	26	22	19	* 194	* 118	38	31	26	22
ISA	NM	177	156	135	118	103	89	223	186	156	134	115	99	1114	676	202	161	134	113
+20°C	LB	730	652	575	507	446	390	830	717	620	541	473	412	2488	1621	708	593	509	438
	FPM	365	490	648	821	1017	1244	136	257	407	574	758	969	100	100	115	265	435	623
	MIN	24	21	19	17	15	13	28	25	21	19	16	14	* 44	31	25	22	19	16
ISA	NM	120	108	95	84	74	65	144	126	109	95	83	72	237	159	131	111	95	82
+10°C	LB	565	512	457	407	361	319	621	555	490	434	383	336	811	624	535	467	408	356
	FPM	576	717	895	1091	1314	1573	334	476	646	836	1047	1289	100	209	375	553	754	978
	MIN	19	17	15	14	12	11	22	20	17	15	14	12	27	24	20	17	15	13
ISA	NM	95	86	76	67	60	52	112	99	87	76	67	58	139	119	101	88	76	66
	LB	488	445	399	358	319	282	530	478	427	380	337	297	591	523	460	406	358	314
	FPM	741	892	1084	1295	1537	1820	508	662	847	1054	1285	1551	292	431	615	815	1040	1294
	MIN	18	16	15	13	11	10	21	19	17	15	13	11	27	23	20	17	15	13
ISA	NM	89	80	71	63	55	49	106	94	82	72	63	55	133	113	96	83	72	62
-10°C	LB	464	423	380	341	304	269	506	457	407	363	322	284	566	501	440	388	343	301
	FPM	718	865	1053	1259	1495	1771	492	642	823	1025	1251	1511	285	420	600	796	1016	1265

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* INDICATES STEP CLIMB REQUIRED
NOTE: STEP CLIMB DATA INCLUDES TIME, DISTANCE, AND FUEL USED IN CRUISE PORTION. BASED ON MAXIMUM CRUISE THRUST.

CRUISE CLIMB SPEED - KIAS

PRESSURE ALTITUDE - FEET									
0	5000	10000	15000	20000	25000	30000	35000	40000	45000
222	222	222	222	222	222	205	183	162	144

WIND EFFECT ON CLIMB DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME	WIND		
(MIN)	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

NOTE: FOR CLIMB CONDITIONS REQUIRING A STEP CLIMB. THE FOLLOWING TABLE GIVES THE WEIGHT AT THE END OF THE STEP CRUISE AT THE STEP ALTITUDE, REQUIRED TO CONTINUE CLIMB.

	TEMPERATURE	
STEP CLIMB ALT IN FEET	ISA +10°C	ISA +20°C
43000	13170	11473

Figure 4-10 (Sheet 2)

CRUISE CLIMB
222 KIAS/0.56 INDICATED MACH
TIME, DISTANCE, FUEL, AND RATE OF CLIMB — ANTI-ICE SYSTEMS ON

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		5000 FEET ISA = 5°C = 41°F						10000 FEET ISA = -5°C = 23°F						15000 FEET ISA = -15°C = 6°F					
	MIN	2	2	2	1	1	1	4	4	3	3	3	2	6	6	5	5	4	4
ISA	NM	7	7	6	6	5	5	16	15	13	12	11	10	26	24	22	20	18	16
+10°C	LB	72	67	61	55	49	44	142	132	120	109	98	87	215	199	181	164	147	131
	FPM	2576	2782	3053	3370	3746	4202	2357	2550	2804	3101	3452	3878	1960	2129	2350	2608	2913	3282
	MIN	1	1	1	1	1	1	3	3	3	2	2	2	5	4	4	4	3	3
ISA	NM	6	5	5	4	4	3	12	11	10	9	8	7	19	18	16	15	13	12
	LB	61	57	52	47	43	38	120	112	102	93	84	75	181	168	153	139	125	112
	FPM	3450	3715	4063	4471	4957	5547	3167	3415	3740	4121	4575	5125	2710	2929	3216	3552	3952	4435
	MIN	1	1	1	1	1	1	2	2	2	2	2	2	4	3	3	3	3	2
ISA	NM	4	4	4	3	3	3	9	9	8	7	6	6	15	14	13	11	10	9
-10°C	LB	55	51	47	43	38	34	108	101	92	84	76	68	162	151	138	125	113	101
	FPM	4257	4575	4994	5487	6074	6787	3907	4203	4594	5052	5598	6262	3514	3786	4145	4565	5064	5671
PRESSURE ALTITUDE		17000 FEET ISA = -19°C = -2°F						19000 FEET ISA = -23°C = -9°F						21000 FEET ISA = -27°C = -16°F					
	MIN	7	7	6	6	5	4	9	8	7	6	6	5	10	9	8	7	7	6
ISA	NM	31	29	26	24	21	19	37	34	31	28	25	22	44	40	37	33	29	26
+10°C	LB	246	228	207	187	168	150	279	258	234	211	190	169	314	289	262	237	212	189
	FPM	1775	1932	2139	2378	2661	3003	1611	1758	1951	2175	2439	2756	1433	1570	1748	1954	2197	2489
	MIN	5	5	5	4	4	3	6	6	5	5	4	4	7	7	6	5	5	4
ISA	NM	23	21	19	17	16	14	27	25	22	20	18	16	31	29	26	24	21	19
	LB	206	191	174	158	142	127	232	215	196	178	160	143	258	239	218	198	178	159
	FPM	2515	2722	2993	3310	3686	4141	2325	2520	2776	3074	3427	3855	2111	2293	2531	2808	3136	3533
	MIN	4	4	4	3	3	3	5	5	4	4	3	3	6	5	5	4	4	4
ISA	NM	18	16	15	14	12	11	21	19	17	16	14	13	24	22	20	18	16	15
-10°C	LB	184	171	156	142	128	115	206	191	175	159	144	128	229	212	194	177	159	142
	FPM	3265	3522	3860	4255	4725	5295	3005	3245	3560	3929	4368	4899	2744	2968	3262	3605	4012	4505
PRESSURE ALTITUDE		23000 FEET ISA = -31°C = -23°F						25000 FEET ISA = -35°C = -30°F						27000 FEET ISA = -38°C = -37°F					
	MIN	11	10	9	9	8	7	13	12	11	10	9	8	15	14	13	11	10	9
ISA	NM	52	47	43	39	35	31	61	56	51	46	41	36	74	67	60	54	48	42
+10°C	LB	351	324	293	264	237	210	394	362	328	295	264	234	443	406	366	329	294	260
	FPM	1211	1334	1494	1679	1897	2157	985	1094	1236	1399	1589	1817	909	1020	1163	1327	1519	1747
	MIN	8	8	7	6	6	5	9	9	8	7	6	6	11	10	9	8	7	6
ISA	NM	36	33	30	27	25	22	42	39	35	32	29	25	49	45	41	37	33	29
	LB	287	265	242	219	197	176	317	293	267	241	217	193	349	322	293	265	238	212
	FPM	1893	2062	2282	2539	2842	3207	1647	1801	2001	2233	2507	2836	1619	1777	1983	2221	2502	2838
	MIN	6	6	5	5	4	4	7	7	6	6	5	5	8	8	7	6	6	5
ISA	NM	28	26	23	21	19	17	32	30	27	25	22	20	37	34	31	28	25	22
-10°C	LB	252	234	214	195	175	157	277	257	235	213	192	172	303	281	256	233	209	187
	FPM	2479	2687	2959	3276	3653	4108	2213	2404	2654	2945	3290	3706	2189	2384	2640	2938	3289	3713
PRESSURE ALTITUDE		29000 FEET ISA = -42°C = -44°F						31000 FEET ISA = -46°C = -52°F						33000 FEET ISA = -50°C = -59°F					
	MIN	17	16	14	13	11	10	20	18	16	14	13	11	22	20	18	16	14	12
ISA	NM	85	78	69	62	55	48	97	88	78	70	62	54	109	98	87	78	69	60
+10°C	LB	487	445	400	359	319	282	528	481	432	386	343	303	569	518	463	413	367	323
	FPM	995	1121	1282	1468	1683	1940	924	1049	1211	1395	1609	1864	874	1001	1163	1350	1566	1822
	MIN	12	11	10	9	8	7	13	12	11	10	9	8	14	13	12	11	10	8
ISA	NM	55	51	46	42	37	33	62	57	52	46	41	37	69	63	57	51	46	40
	LB	377	348	316	286	256	228	405	373	339	305	274	243	431	397	359	324	290	258
	FPM	1659	1828	2049	2303	2602	2960	1553	1720	1937	2187	2480	2831	1639	1817	2047	2314	2626	2999
	MIN	9	8	8	7	6	6	10	9	9	8	7	6	11	10	9	9	8	7
ISA	NM	42	39	35	32	28	25	47	44	40	36	32	28	53	49	44	40	36	32
-10°C	LB	326	302	276	250	225	200	350	324	295	267	240	214	375	346	315	285	256	228
	FPM	2127	2328	2589	2891	3248	3677	1845	2031	2273	2553	2881	3275	1579	1752	1976	2235	2538	2900

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Figure 4-10 (Sheet 3)

CRUISE CLIMB

222 KIAS/0.56 INDICATED MACH

TIME, DISTANCE, FUEL, AND RATE OF CLIMB — **ANTI-ICE SYSTEMS ON**

T.O. WEIGHT		13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000	13870	13000	12000	11000	10000	9000
PRESSURE ALTITUDE		35000 FEET ISA = -54°C = -66°F						37000 FEET ISA = -57°C = -70°F						39000 FEET ISA = -57°C = -70°F					
	MIN	24	22	19	17	15	13	27	24	21	19	17	14	31	28	24	21	18	16
ISA	NM	122	109	97	86	76	66	136	122	107	95	83	73	161	142	123	107	94	81
+10°C	LB	610	553	494	440	389	343	655	591	526	467	412	362	721	644	568	501	440	385
	FPM	813	941	1105	1293	1510	1767	602	721	872	1042	1239	1470	297	405	539	688	857	1054
	MIN	16	14	13	12	10	9	17	16	14	13	11	10	19	17	16	14	12	11
ISA	NM	76	69	62	56	50	44	84	77	69	62	55	48	95	86	77	68	61	53
	LB	458	421	380	342	306	272	487	446	403	362	323	287	521	476	428	384	342	302
	FPM	1379	1545	1760	2007	2296	2640	1094	1247	1442	1665	1923	2230	874	1022	1209	1419	1662	1948
	MIN	13	12	11	10	9	8	14	13	12	11	9	8	17	15	13	12	11	9
ISA	NM	61	56	50	45	40	35	69	63	57	51	45	40	80	73	65	58	51	45
-10°C	LB	401	370	336	303	272	242	430	396	358	323	289	257	465	425	383	344	308	272
	FPM	1326	1488	1697	1937	2218	2551	1050	1199	1388	1604	1855	2153	837	981	1163	1368	1604	1882
PRESSURE ALTITUDE		41000 FEET ISA = -57°C = -70°F																	
	MIN	——	36	30	25	21	18												
ISA	NM	——	188	153	129	110	94												
+10°C	LB	——	753	637	551	479	415												
	FPM	——	101	220	350	495	661												
	MIN	22	20	18	16	14	12												
ISA	NM	112	100	88	78	68	60												
	LB	567	514	459	409	364	321												
	FPM	457	588	753	934	1138	1376												
	MIN	19	17	15	14	12	11												
ISA	NM	94	84	75	66	58	51												
-10°C	LB	505	459	411	368	327	289												
	FPM	632	773	951	1148	1372	1634												

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CRUISE CLIMB SPEED - KIAS

PRESSURE ALTITUDE - FEET									
0	5000	10000	15000	20000	25000	30000	35000	40000	41000
222	222	222	222	222	222	205	183	162	158

WIND EFFECT ON CLIMB DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

CLIMB TIME (MIN)	WIND		
	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 4-10 (Sheet 4)

FLIGHT PLANNING

NORMAL CRUISE

CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 37000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
100	13870	586	0.51	607	0.53	621	0.54	637	0.56	657	0.59	682	0.61	761	0.70
	11000	533	0.49	554	0.52	568	0.54	585	0.56	606	0.59	633	0.62	723	0.75
	9000	500	0.49	521	0.52	535	0.54	552	0.56	573	0.59	602	0.64	702	0.80
200	13870	805	0.70	850	0.75	877	0.77	909	0.81	946	0.84	992	0.89	1121	1.03
	11000	744	0.69	789	0.74	816	0.77	847	0.80	885	0.85	932	0.90	1071	1.08
	9000	707	0.68	751	0.73	778	0.77	809	0.81	848	0.85	895	0.92	1045	1.13
300	13870	1023	0.90	1091	0.96	1132	1.00	1180	1.05	1234	1.10	1300	1.17	1479	1.36
	11000	955	0.88	1022	0.95	1063	1.00	1109	1.05	1164	1.11	1230	1.18	1418	1.40
	9000	914	0.88	980	0.95	1020	1.00	1066	1.05	1121	1.11	1188	1.20	1387	1.46
400	13870	1240	1.09	1332	1.18	1387	1.23	1449	1.29	1521	1.36	1606	1.45	1835	1.68
	11000	1166	1.08	1256	1.17	1309	1.23	1371	1.29	1442	1.37	1527	1.46	1764	1.73
	9000	1121	1.07	1209	1.17	1262	1.23	1323	1.29	1394	1.38	1479	1.48	1728	1.80
500	13870	1457	1.29	1572	1.40	1640	1.46	1718	1.54	1807	1.62	1912	1.73	2190	2.01
	11000	1376	1.28	1488	1.39	1555	1.46	1631	1.53	1719	1.63	1823	1.74	2109	2.06
	9000	1328	1.27	1438	1.39	1504	1.46	1579	1.54	1666	1.64	1771	1.76	2069	2.13
600	13870	1674	1.48	1812	1.61	1893	1.69	1986	1.78	2092	1.88	2216	2.00	2543	2.34
	11000	1586	1.47	1721	1.60	1800	1.69	1891	1.78	1996	1.89	2119	2.02	2453	2.39
	9000	1534	1.46	1666	1.60	1744	1.69	1834	1.78	1938	1.90	2061	2.04	2409	2.48
700	13870	1889	1.68	2050	1.83	2145	1.92	2253	2.02	2376	2.14	2519	2.28	2895	2.66
	11000	1796	1.67	1952	1.82	2045	1.92	2150	2.02	2272	2.15	2413	2.30	2796	2.73
	9000	1739	1.66	1893	1.82	1985	1.92	2089	2.03	2209	2.16	2351	2.32	2749	2.82
800	13870	2105	1.87	2288	2.05	2397	2.15	2519	2.27	2659	2.40	2821	2.56	3245	2.99
	11000	2005	1.86	2183	2.04	2289	2.14	2409	2.27	2547	2.41	2707	2.58	3138	3.06
	9000	1945	1.86	2121	2.04	2225	2.15	2344	2.27	2480	2.42	2640	2.60		
900	13870	2319	2.07	2526	2.26	2647	2.38	2784	2.51	2941	2.66	3122	2.84	3594	3.32
	11000	2213	2.06	2414	2.26	2533	2.37	2667	2.51	2821	2.67	3000	2.86	3480	3.39
	9000	2150	2.05	2348	2.25	2465	2.38	2597	2.52	2750	2.68				
1000	13870	2534	2.26	2762	2.48	2897	2.61	3049	2.75	3222	2.92	3422	3.12	3942	3.65
	11000	2421	2.25	2644	2.47	2775	2.60	2924	2.75	3095	2.93	3292	3.14	3820	3.73
	9000	2355	2.25	2574	2.47	2704	2.61	2851	2.76						
1100	13870	2747	2.46	2998	2.70	3146	2.84	3313	3.00	3502	3.18	3721	3.40	4289	3.97
	11000	2629	2.45	2873	2.69	3018	2.83	3181	3.00	3367	3.19	3584	3.42		
	9000	2559	2.44	2800	2.69										
1200	13870	2960	2.66	3233	2.91	3394	3.07	3576	3.24	3782	3.44	4019	3.68	4634	4.31
	11000	2836	2.64	3103	2.91	3260	3.06	3437	3.24	3640	3.45	3874	3.70		
	9000	2763	2.64												
1300	13870	3173	2.85	3468	3.13	3642	3.30	3838	3.49	4060	3.70	4317	3.95		
	11000	3043	2.84	3331	3.12	3501	3.29	3693	3.49	3911	3.71				
	9000														
1400	13870	3385	3.05	3702	3.35	3889	3.53	4099	3.73	4338	3.96				
	11000	3250	3.03	3559	3.34	3742	3.52	3947	3.73						
	9000														
1500	13870	3596	3.24	3936	3.56	4135	3.76	4360	3.97						
	11000	3456	3.23	3787	3.56	3982	3.75								
	9000														
1600	13870	3807	3.44	4168	3.78	4381	3.99								
	11000	3661	3.43	4014	3.78										
	9000														
1700	13870	4018	3.63	4401	4.00										
	11000	3866	3.62												
	9000														
1800	13870	4228	3.83												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 9)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 39000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
100	13870	599	0.52	619	0.54	631	0.55	647	0.57	666	0.59	690	0.62	765	0.71
	11000	539	0.50	559	0.53	572	0.54	588	0.57	608	0.59	634	0.63	721	0.75
	9000	504	0.49	524	0.52	537	0.54	553	0.57	574	0.60	601	0.64	699	0.80
200	13870	799	0.71	840	0.76	866	0.78	895	0.81	930	0.85	972	0.90	1094	1.03
	11000	735	0.70	776	0.74	801	0.77	831	0.81	867	0.85	910	0.91	1043	1.08
	9000	695	0.69	736	0.74	761	0.77	791	0.81	827	0.86	871	0.92	1015	1.13
300	13870	999	0.91	1062	0.97	1100	1.01	1143	1.06	1194	1.11	1255	1.18	1423	1.36
	11000	930	0.89	992	0.96	1030	1.00	1073	1.05	1125	1.11	1186	1.18	1364	1.40
	9000	886	0.88	948	0.96	985	1.00	1028	1.05	1079	1.12	1141	1.20	1330	1.46
400	13870	1199	1.10	1283	1.19	1334	1.24	1392	1.30	1459	1.37	1538	1.45	1752	1.68
	11000	1125	1.09	1208	1.18	1258	1.23	1315	1.30	1382	1.37	1461	1.46	1684	1.73
	9000	1077	1.08	1159	1.17	1208	1.23	1264	1.30	1330	1.38	1410	1.48	1645	1.80
500	13870	1398	1.30	1505	1.41	1568	1.47	1640	1.54	1723	1.63	1820	1.73	2081	2.01
	11000	1319	1.28	1423	1.39	1485	1.46	1556	1.54	1638	1.63	1735	1.74	2003	2.06
	9000	1267	1.27	1369	1.39	1430	1.46	1500	1.54	1581	1.64	1678	1.76	1958	2.13
600	13870	1598	1.49	1726	1.62	1802	1.70	1888	1.79	1987	1.89	2103	2.01	2410	2.34
	11000	1513	1.48	1638	1.61	1712	1.69	1796	1.78	1893	1.89	2008	2.02	2320	2.39
	9000	1457	1.47	1579	1.61	1652	1.69	1735	1.79	1831	1.90	1946	2.04	2271	2.47
700	13870	1798	1.69	1948	1.84	2036	1.93	2137	2.03	2252	2.15	2386	2.29	2739	2.66
	11000	1707	1.67	1852	1.83	1938	1.92	2036	2.03	2148	2.15	2280	2.30	2637	2.72
	9000	1646	1.67	1789	1.82	1873	1.92	1970	2.03	2081	2.16	2213	2.32	2584	2.81
800	13870	1998	1.88	2169	2.06	2271	2.16	2385	2.27	2516	2.41	2669	2.57	3069	2.99
	11000	1900	1.87	2065	2.04	2163	2.15	2274	2.27	2402	2.41	2551	2.58	2953	3.05
	9000	1836	1.86	1998	2.04	2094	2.15	2204	2.27	2330	2.42	2479	2.60		
900	13870	2198	2.08	2391	2.27	2505	2.39	2634	2.52	2781	2.67	2952	2.84	3396	3.32
	11000	2093	2.06	2278	2.26	2388	2.38	2513	2.51	2655	2.67	2822	2.86	3268	3.39
	9000	2024	2.06	2207	2.26	2315	2.38	2437	2.52	2579	2.68	2744	2.88		
1000	13870	2399	2.27	2613	2.49	2739	2.62	2882	2.76	3046	2.93	3234	3.12	3719	3.65
	11000	2285	2.26	2491	2.48	2612	2.61	2750	2.76	2908	2.93	3091	3.14	3582	3.72
	9000	2213	2.25	2415	2.48	2535	2.61	2671	2.76	2827	2.94				
1100	13870	2599	2.47	2834	2.71	2973	2.85	3131	3.00	3308	3.19	3512	3.40	4040	3.97
	11000	2477	2.45	2703	2.70	2836	2.84	2987	3.00	3160	3.19	3360	3.42	3895	4.05
	9000	2401	2.45	2623	2.69	2754	2.84								
1200	13870	2799	2.66	3056	2.92	3207	3.08	3375	3.25	3567	3.45	3788	3.68	4360	4.30
	11000	2668	2.65	2914	2.91	3059	3.07	3224	3.25	3411	3.45	3629	3.70		
	9000	2589	2.64	2830	2.91										
1300	13870	2999	2.86	3275	3.14	3437	3.30	3618	3.49	3825	3.71	4063	3.96	4679	4.63
	11000	2859	2.85	3125	3.13	3282	3.30	3459	3.49	3662	3.71	3896	3.98		
	9000	2776	2.84												
1400	13870	3198	3.06	3492	3.36	3666	3.53	3861	3.74	4083	3.97	4338	4.24		
	11000	3049	3.04	3336	3.35	3504	3.53	3694	3.73	3911	3.97				
	9000														
1500	13870	3394	3.25	3709	3.57	3894	3.76	4102	3.98	4339	4.23				
	11000	3240	3.24	3546	3.56	3726	3.76	3929	3.98						
	9000														
1600	13870	3590	3.45	3925	3.79	4122	3.99	4343	4.22						
	11000	3429	3.43	3755	3.78	3947	3.99								
	9000														
1700	13870	3785	3.64	4140	4.01	4349	4.22								
	11000	3619	3.63	3964	4.00										
	9000														
1800	13870	3980	3.84	4355	4.22										
	11000	3808	3.82												
	9000														
1900	13870	4174	4.03												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 10)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 41000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	798	0.72	835	0.77	859	0.79	886	0.82	918	0.86	957	0.91	1071	1.04
	11000	728	0.70	766	0.75	790	0.78	818	0.81	851	0.86	893	0.91	1020	1.08
	9000	686	0.69	724	0.74	748	0.78	776	0.81	809	0.86	852	0.92	990	1.13
300	13870	978	0.92	1036	0.98	1070	1.02	1110	1.07	1157	1.12	1213	1.18	1369	1.36
	11000	909	0.90	967	0.97	1002	1.01	1043	1.06	1091	1.12	1149	1.19	1318	1.41
	9000	863	0.89	920	0.96	954	1.01	994	1.06	1042	1.12	1101	1.20	1281	1.46
400	13870	1159	1.11	1236	1.20	1282	1.25	1335	1.31	1396	1.38	1469	1.46	1666	1.69
	11000	1090	1.09	1167	1.18	1214	1.24	1267	1.30	1329	1.38	1404	1.47	1614	1.73
	9000	1039	1.09	1114	1.18	1160	1.24	1213	1.30	1275	1.38	1349	1.48	1571	1.79
500	13870	1340	1.31	1436	1.42	1494	1.48	1560	1.55	1635	1.64	1724	1.74	1964	2.01
	11000	1270	1.29	1367	1.40	1424	1.47	1490	1.55	1567	1.64	1658	1.75	1910	2.06
	9000	1215	1.28	1309	1.40	1365	1.46	1430	1.55	1506	1.64	1597	1.76	1860	2.13
600	13870	1521	1.50	1637	1.63	1706	1.71	1784	1.80	1875	1.90	1980	2.02	2262	2.34
	11000	1450	1.49	1566	1.62	1635	1.70	1713	1.79	1804	1.90	1911	2.02	2204	2.39
	9000	1390	1.48	1503	1.61	1570	1.69	1648	1.79	1737	1.90	1844	2.04	2149	2.46
700	13870	1702	1.70	1837	1.85	1918	1.94	2009	2.04	2114	2.16	2236	2.29	2560	2.67
	11000	1630	1.68	1764	1.83	1844	1.93	1935	2.03	2040	2.16	2163	2.30	2497	2.72
	9000	1565	1.67	1696	1.83	1775	1.92	1864	2.03	1968	2.16	2090	2.32	2437	2.80
800	13870	1883	1.90	2038	2.07	2130	2.17	2234	2.28	2353	2.42	2492	2.57	2858	2.99
	11000	1808	1.88	1962	2.05	2053	2.16	2156	2.28	2275	2.42	2414	2.58	2789	3.05
	9000	1739	1.87	1889	2.05	1979	2.15	2080	2.28	2198	2.42	2336	2.60	2725	3.14
900	13870	2064	2.09	2238	2.28	2342	2.40	2459	2.53	2593	2.68	2748	2.85	3156	3.32
	11000	1987	2.07	2159	2.27	2261	2.39	2377	2.52	2509	2.68	2664	2.86	3081	3.38
	9000	1913	2.06	2082	2.26	2182	2.38	2296	2.52	2427	2.68	2581	2.88		
1000	13870	2245	2.29	2439	2.50	2554	2.63	2683	2.77	2832	2.94	3004	3.13	3454	3.64
	11000	2165	2.27	2356	2.48	2469	2.61	2597	2.76	2743	2.94	2914	3.14	3371	3.71
	9000	2087	2.26	2274	2.48	2385	2.61	2511	2.77	2655	2.95	2825	3.16		
1100	13870	2426	2.48	2639	2.72	2766	2.86	2908	3.01	3071	3.19	3260	3.41	3753	3.97
	11000	2343	2.46	2552	2.70	2676	2.84	2816	3.01	2976	3.20	3163	3.42	3661	4.05
	9000	2261	2.45	2466	2.70	2587	2.84	2725	3.01						
1200	13870	2607	2.68	2840	2.93	2978	3.08	3133	3.26	3311	3.45	3516	3.68	4051	4.30
	11000	2520	2.66	2748	2.92	2882	3.07	3035	3.25	3209	3.46	3411	3.70	3949	4.38
	9000	2434	2.65	2657	2.91	2789	3.07								
1300	13870	2788	2.87	3041	3.15	3190	3.31	3358	3.50	3550	3.71	3772	3.96	4349	4.63
	11000	2696	2.85	2943	3.14	3088	3.30	3253	3.49	3440	3.72	3658	3.98		
	9000	2607	2.85												
1400	13870	2969	3.07	3241	3.37	3402	3.54	3583	3.74	3790	3.97	4028	4.24	4648	4.95
	11000	2873	3.05	3138	3.35	3294	3.53	3470	3.74	3671	3.98	3904	4.26		
	9000	2779	3.04												
1500	13870	3150	3.26	3442	3.58	3614	3.77	3808	3.99	4029	4.23	4285	4.52		
	11000	3049	3.24	3332	3.57	3499	3.76	3687	3.98	3902	4.24				
	9000														
1600	13870	3331	3.46	3642	3.80	3826	4.00	4033	4.23	4269	4.49				
	11000	3224	3.44	3526	3.79	3703	3.99	3903	4.23						
	9000														
1700	13870	3512	3.65	3843	4.02	4038	4.23	4258	4.47						
	11000	3399	3.64	3719	4.00	3907	4.22								
	9000														
1800	13870	3693	3.85	4044	4.23	4250	4.46								
	11000	3574	3.83	3912	4.22										
	9000														
1900	13870	3875	4.04	4245	4.45										
	11000	3748	4.03												
	9000														
2000	13870	4056	4.24	4445	4.67										
	11000	3922	4.22												
	9000														
2100	13870	4237	4.44												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 11)

FLIGHT PLANNING
NORMAL CRUISE
CRUISE (MACH 0.72)

STANDARD DAY — **CRUISE ALTITUDE 43000 FEET**

STAGE LENGTH NM	T.O. WEIGHT LBS	TAILWIND 100 KT FUEL LBS	TAILWIND 100 KT TIME HRS	TAILWIND 50 KT FUEL LBS	TAILWIND 50 KT TIME HRS	TAILWIND 25 KT FUEL LBS	TAILWIND 25 KT TIME HRS	ZERO WIND FUEL LBS	ZERO WIND TIME HRS	HEADWIND 25 KT FUEL LBS	HEADWIND 25 KT TIME HRS	HEADWIND 50 KT FUEL LBS	HEADWIND 50 KT TIME HRS	HEADWIND 100 KT FUEL LBS	HEADWIND 100 KT TIME HRS
200	13870	802	0.74	837	0.78	858	0.81	883	0.84	913	0.87	949	0.92	1056	1.05
	11000	723	0.71	759	0.76	781	0.79	806	0.82	838	0.86	876	0.92	997	1.08
	9000	680	0.70	715	0.75	737	0.78	763	0.82	795	0.87	836	0.93	968	1.13
400	13870	1129	1.13	1199	1.21	1241	1.27	1289	1.32	1345	1.39	1411	1.47	1594	1.70
	11000	1051	1.10	1122	1.19	1164	1.25	1213	1.31	1271	1.38	1340	1.47	1537	1.74
	9000	1006	1.09	1077	1.18	1119	1.24	1168	1.31	1226	1.39	1297	1.48	1507	1.79
500	13870	1293	1.33	1380	1.43	1432	1.49	1492	1.57	1561	1.65	1643	1.75	1863	2.02
	11000	1215	1.30	1303	1.41	1356	1.48	1417	1.55	1488	1.64	1572	1.75	1807	2.06
	9000	1169	1.29	1257	1.40	1309	1.47	1370	1.55	1441	1.65	1526	1.76	1774	2.13
600	13870	1456	1.52	1561	1.65	1624	1.72	1695	1.81	1778	1.91	1874	2.03	2133	2.35
	11000	1379	1.49	1485	1.63	1548	1.70	1620	1.80	1704	1.90	1803	2.03	2077	2.39
	9000	1331	1.48	1436	1.62	1499	1.70	1571	1.79	1655	1.91	1754	2.04	2041	2.46
700	13870	1620	1.72	1743	1.86	1816	1.95	1899	2.05	1994	2.17	2105	2.30	2402	2.67
	11000	1543	1.69	1666	1.84	1740	1.93	1824	2.04	1921	2.16	2035	2.31	2348	2.72
	9000	1493	1.68	1615	1.83	1688	1.93	1771	2.04	1868	2.17	1982	2.32	2308	2.79
800	13870	1784	1.91	1924	2.08	2007	2.18	2102	2.30	2210	2.43	2337	2.58	2671	3.00
	11000	1707	1.89	1848	2.06	1932	2.16	2028	2.28	2138	2.42	2267	2.59	2618	3.05
	9000	1655	1.87	1794	2.05	1877	2.16	1971	2.28	2081	2.43	2210	2.60	2574	3.13
900	13870	1947	2.11	2105	2.30	2199	2.41	2305	2.54	2427	2.69	2568	2.86	2941	3.32
	11000	1871	2.08	2030	2.28	2124	2.39	2231	2.53	2354	2.68	2499	2.86	2889	3.38
	9000	1816	2.07	1972	2.27	2065	2.39	2171	2.53	2293	2.69	2436	2.88	2839	3.47
1000	13870	2111	2.30	2287	2.51	2391	2.64	2509	2.78	2643	2.95	2800	3.14	3211	3.65
	11000	2035	2.28	2211	2.49	2316	2.62	2435	2.77	2571	2.94	2731	3.14	3160	3.71
	9000	1977	2.27	2150	2.49	2253	2.62	2370	2.77	2504	2.95	2662	3.16		
1100	13870	2275	2.50	2468	2.73	2582	2.87	2712	3.03	2860	3.21	3032	3.42	3481	3.97
	11000	2198	2.47	2393	2.71	2508	2.85	2638	3.01	2788	3.20	2962	3.42	3431	4.04
	9000	2137	2.46	2327	2.70	2440	2.85	2568	3.01	2715	3.21				
1200	13870	2438	2.69	2649	2.95	2774	3.10	2915	3.27	3076	3.46	3263	3.69	3751	4.30
	11000	2362	2.67	2574	2.93	2700	3.08	2842	3.26	3005	3.46	3194	3.70	3703	4.37
	9000	2297	2.66	2504	2.92	2627	3.08	2766	3.26						
1300	13870	2602	2.89	2831	3.16	2966	3.33	3119	3.51	3293	3.72	3495	3.97	4020	4.63
	11000	2526	2.86	2756	3.14	2892	3.31	3046	3.50	3222	3.72	3426	3.98	3974	4.70
	9000	2457	2.85	2681	3.14	2813	3.31								
1400	13870	2766	3.08	3012	3.38	3158	3.56	3322	3.76	3510	3.98	3726	4.25	4290	4.95
	11000	2690	3.06	2938	3.36	3084	3.54	3249	3.74	3439	3.98	3658	4.26		
	9000	2617	3.05												
1500	13870	2930	3.28	3194	3.60	3350	3.79	3526	4.00	3726	4.24	3958	4.53	4561	5.28
	11000	2854	3.25	3119	3.58	3276	3.77	3453	3.99	3655	4.24	3890	4.54		
	9000	2776	3.24												
1600	13870	3093	3.47	3375	3.81	3541	4.01	3729	4.24	3943	4.50	4190	4.81		
	11000	3018	3.45	3301	3.79	3468	4.00	3657	4.23	3872	4.50				
	9000														
1700	13870	3257	3.67	3557	4.03	3733	4.24	3933	4.49	4160	4.76	4422	5.08		
	11000	3182	3.64	3483	4.01	3660	4.23	3860	4.48	4089	4.76				
	9000														
1800	13870	3421	3.86	3738	4.25	3925	4.47	4136	4.73	4376	5.02				
	11000	3346	3.84	3664	4.23	3852	4.46	4064	4.72						
	9000														
1900	13870	3585	4.06	3920	4.46	4117	4.70	4340	4.97						
	11000	3510	4.03	3846	4.44	4044	4.69								
	9000														
2000	13870	3749	4.26	4101	4.68	4309	4.93								
	11000	3674	4.23	4028	4.66										
	9000														
2100	13870	3913	4.45	4283	4.90										
	11000	3838	4.43												
	9000														
2200	13870	4076	4.65	4464	5.11										
	11000	4003	4.62												
	9000														
2300	13870	4240	4.84												
	11000														
	9000														

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NOTE: FUEL VALUES LARGER THAN THE MAXIMUM USABLE FUEL ARE PRESENTED FOR INTERPOLATION PURPOSES.

Figure 4-8 (Sheet 12)

DESCENT

Performance for two types of descent is presented on the following pages. Time, distance and fuel information are provided for a normal descent of 2000 feet per minute; and a high speed descent of 3000 feet per minute for maximum speed.

This performance is based on controlling the fan speed to obtain the fuel flows, airspeed and rates of descent presented with gear and flaps up, speed brakes retracted and anti-ice systems OFF or ON.

The time, distance and fuel used from a given altitude is based on descending to sea level. If the descent is to another altitude, the difference in time, distance and fuel used between the initial and the final altitude must be determined.

Begin descent at MMO -10 KIAS, and maintain desired rate of descent when obtained.

The data is based on three weights at standard day temperature.

NORMAL DESCENT

2000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS OFF

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
45,000	183	22.6	132	184	22.5	131	202	22.5	131	226
43,000	192	21.6	125	180	21.5	125	198	21.5	125	221
41,000	202	20.6	119	175	20.5	118	193	20.5	118	215
39,000	212	19.6	112	170	19.5	112	187	19.5	112	208
37,000	223	18.6	105	163	18.5	105	180	18.5	105	201
35,000	234	17.6	99	156	17.5	99	172	17.5	99	192
33,000	246	16.6	92	146	16.5	92	162	16.5	92	182
31,000	258	15.6	85	136	15.5	85	151	15.5	85	170
29,000	268	14.6	79	124	14.5	78	138	14.5	78	157
27,000	268	13.6	72	114	13.5	72	127	13.5	72	144
25,000	268	12.6	65	103	12.5	65	116	12.5	65	132
23,000	268	11.6	59	94	11.5	59	105	11.5	59	121
21,000	268	10.6	53	84	10.5	53	95	10.5	53	109
19,000	268	9.6	47	74	9.5	47	84	9.5	47	97
17,000	268	8.6	41	65	8.5	41	74	8.5	41	86
15,000	268	7.6	36	56	7.5	36	64	7.5	35	74
10,000	253	5.0	22	34	5.0	22	41	5.0	22	48
5,000	253	2.5	11	17	2.5	11	20	2.5	11	24

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NORMAL DESCENT

2000 FEET PER MINUTE RATE OF DESCENT
ANTI-ICE SYSTEMS ON

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

PRESSURE ALTITUDE FEET	KIAS	WEIGHT AT START OF DESCENT - LBS								
		12750			11000			9000		
		TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS	TIME MIN	DIST NM	FUEL LBS
41,000	202	20.8	119	207	20.6	119	222	20.5	118	243
39,000	212	19.8	113	200	19.6	112	214	19.5	112	235
37,000	223	18.8	106	193	18.6	105	206	18.5	105	226
35,000	234	17.8	100	184	17.6	99	197	17.5	99	216
33,000	246	16.8	93	173	16.6	92	186	16.5	92	205
31,000	258	15.8	86	162	15.6	85	174	15.5	85	191
29,000	268	14.8	79	149	14.6	79	160	14.5	78	177
27,000	268	13.8	73	137	13.6	72	147	13.5	72	163
25,000	268	12.8	66	126	12.6	65	135	12.5	65	150
23,000	268	11.8	60	115	11.6	59	123	11.5	59	137
21,000	268	10.8	54	104	10.6	53	112	10.5	53	124
19,000	268	9.8	48	93	9.6	47	100	9.5	47	111
17,000	268	8.8	42	83	8.6	41	88	8.5	41	99
15,000	268	7.8	37	72	7.6	36	77	7.5	35	86
10,000	253	5.2	23	46	5.0	22	49	5.0	22	56
5,000	253	2.7	11	25	2.5	11	25	2.5	11	28

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WIND EFFECT ON DESCENT DISTANCE - NM
(SUBTRACT FOR HEADWIND, ADD FOR TAILWIND)

TIME (MIN)	WIND		
	25KTS	50KTS	100KTS
5	2	4	8
10	4	8	16
15	6	12	25
20	8	16	33
25	10	20	41
30	12	25	50

Figure 4-13

HOLDING

Holding fuel in total pounds per hour is presented for various weights at several altitudes.

This data is based on a nominal holding speed with gear and flaps up and speed brakes retracted.

HOLDING FUEL

ANTI-ICE SYSTEMS OFF

SPEED BRAKES RETRACTED **GEAR AND FLAPS UP**

WEIGHT LBS	KIAS	TOTAL POUNDS PER HOUR PRESSURE ALTITUDE - FEET SEA LEVEL	1,500	5,000	10,000	15,000	20,000	25,000	30,000
13,000	185	911	896	861	820	793	768	750	720
12,000	180	862	848	814	775	750	725	707	676
11,000	175	815	801	769	732	707	683	665	635
10,000	170	769	755	724	689	665	642	625	595
9,000	165	724	711	682	648	625	602	586	557

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WHEN ANTI-ICE SYSTEMS ARE ON, INCREASE FUEL FLOWS BY 14%.

Figure 4-15

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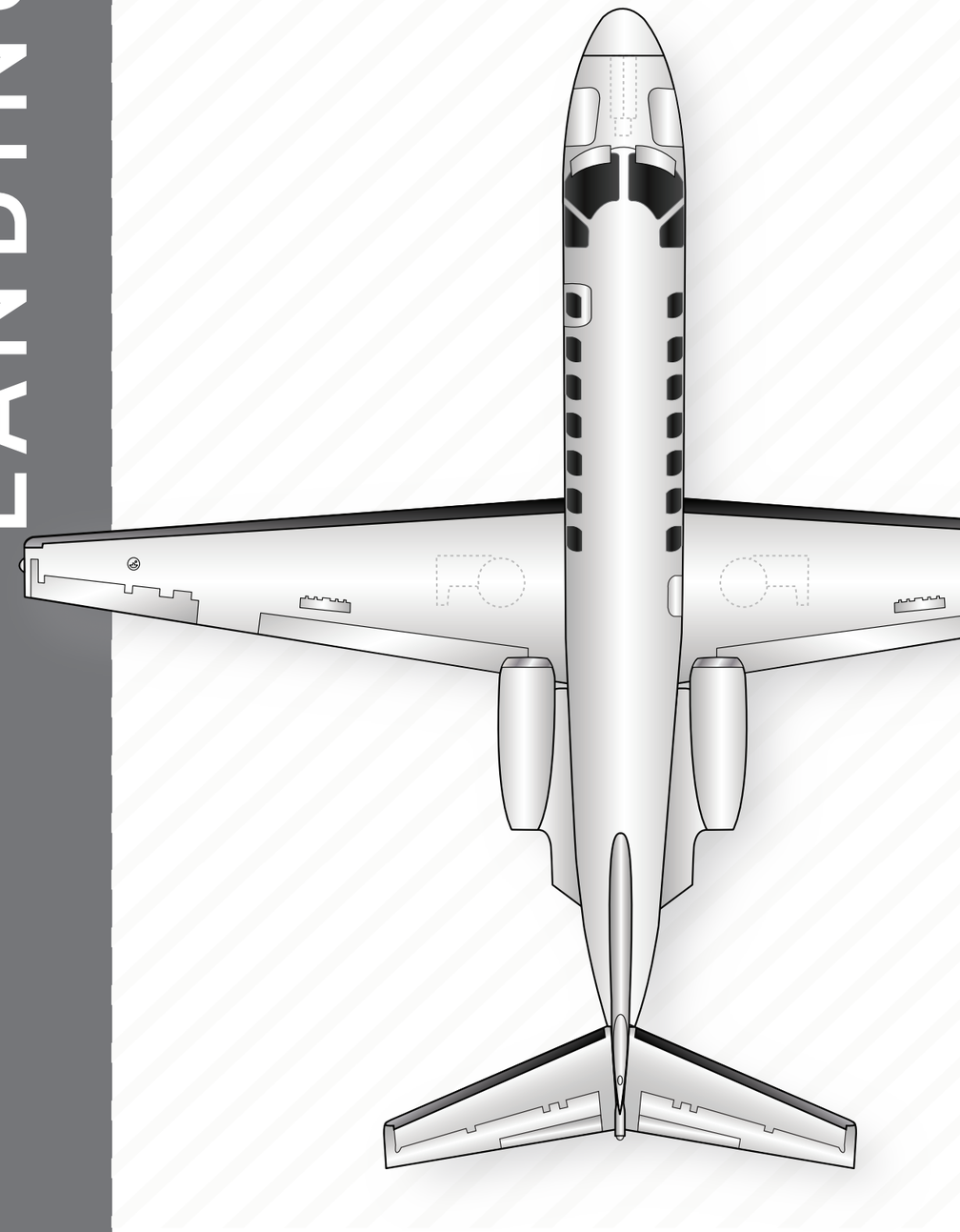
APPROACH & LANDING



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FAA APPROVED
525BFM-06 Configuration AA U.S. 4-353/4-354

PROCEDURES FOR USE OF APPROACH AND LANDING PERFORMANCE TABLES

1. Determine gross weight of airplane at the time of arrival at the destination airport.
2. Obtain airport information; i.e., active runway, available runway length, temperature, altitude, wind, icing conditions and runway gradient if applicable. Determine that the temperature is within the ambient temperature limits found in Section II, Limitations.
3. Determine wind component parallel to active runway from the crosswind component chart (Figure 4-13).
4. Check the maximum landing weight permitted by climb requirements and the brake energy limits (Figures 4-49, if anti-ice systems are OFF; Figures 4-48 and 4-49, if anti-ice systems are ON). If these limitations restrict the landing weight, the pilot must burn off fuel prior to landing.
5. Determine the landing distance, V_{APP} and V_{REF} from Figure 4-50 (flaps land), then apply the appropriate factors from the note below. If the available runway length is less than the landing distance required, the airplane landing weight must be reduced.

NOTE

- Multiply the FLAPS LAND landing distance by 1.20 for a -1 percent (downhill) runway gradient or by 1.73 for a -2 percent (downhill) runway gradient. For positive (uphill) runway gradients, use the landing distance obtained from Figure 4-50.
- For inoperative antiskid system, multiply the landng distance obtained from Figure 4-50 by 1.5.

6. The approach climb and landing climb gradient tables are presented in Figures 4-51, 4-52, 4-53, and 4-54.

NOTE

These procedures apply for normal landings at or below 12,750 pounds. Performance above 12,750 pounds is provided as additional information, for use in an emergency which requires a landing at a weight in excess of the maximum design landing weight of 12,750 pounds.

MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS

APPROACH FLAPS - 15° LANDING FLAPS - LAND

The maximum allowable landing weight with anti-ice OFF and for brake energy limits is determined from Figure 4-49 for a given set of conditions. Figure 4-48 does not include data for brake energy limits, therefore, when determining maximum landing weight with anti-ice ON, determine the maximum weight from both Figure 4-48 and Figure 4-49, and use the lesser of the two weights.

EXAMPLE: Anti-Ice - ON

Ambient Temperature = 5°C
Pressure Altitude = 8000 FEET
Wind = -10 KNOTS (TAILWIND)
Runway Gradient = –2% (DOWNHILL)

From Figure 4-48, Maximum Weight = 12,750 POUNDS
From Figure 4-49, Maximum Weight = 11,600 POUNDS
Therefore, Maximum Weight = 11,600 POUNDS

CONDITIONS

MAXIMUM LANDING WEIGHT CONDITIONS:			
	APPROACH CLIMB	LANDING CLIMB	LANDING
LANDING GEAR	UP	DOWN	DOWN
WING FLAP DEGREES	15	35	35 TO 55 AFTER TOUCHDOWN
SPEED BRAKES	RETRACT	RETRACT	EXTEND AFTER TOUCHDOWN
ENGINE(S)	T.O. THRUST / WINDMILLING	T.O. THRUST	IDLE AT 50 FEET
AIRSPEED	V_{APP}	V_{REF}	V_{REF} AT 50 FEET

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MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS - POUNDS
APPROACH FLAPS - 15° / LANDING FLAPS - LAND

CONDITIONS: REFER TO TABLE ABOVE

ANTI-ICE - ON

ALTITUDE - FEET S.L. to 9,000		ALTITUDE - FEET 10,000		ALTITUDE - FEET 11,000	
TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT
-54 TO 10	12750	-54 TO 7	12750	-54 TO 3	12750
		10	12340	5	12550
				10	11710
ALTITUDE - FEET 12,000		**ALTITUDE - FEET 13,000**		**ALTITUDE - FEET 14,000**	
TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT
-54 TO -1	12750	-54 TO -5	12750	-54 TO -9	12750
0	12700	0	12050	-5	12240
5	11900	5	11270	0	11450
10	11050	10	10440	5	10680
				10	9850

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Figure 4-48*

MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS

ANTI-ICE - OFF

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

APPROACH FLAPS - 15°
LANDING FLAPS - LAND

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	12670	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	45	12570	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	50	12480	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	54	12400	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
1	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	12550	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	12450	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	45	12350	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	50	12260	12740	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	52	12220	12700	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
2	-30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	12640	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	12430	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	12330	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	12230	12710	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	45	12130	12610	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	50	12040	12520	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

525BFM-06-00

Figure 4-49* (Sheet 1 of 5)

MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS

ANTI-ICE - OFF

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

APPROACH FLAPS - 15°
LANDING FLAPS - LAND

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
3	-30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12740	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12630	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12520	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12410	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12310	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	12200	12690	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	12100	12590	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	12010	12490	12720	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11910	12390	12620	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	37	11870	12350	12590	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
4	-35	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12740	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12620	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12510	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12400	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12290	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	12180	12670	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	12080	12560	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	11980	12460	12700	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11880	12360	12590	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	11790	12260	12490	12730	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	45	11690	12160	12400	12630	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
5	-35	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-20	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12620	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12510	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12390	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12280	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	12170	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	12060	12540	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	11960	12440	12670	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	11860	12330	12570	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	11760	12230	12460	12700	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11660	12130	12360	12600	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	11570	12030	12260	12500	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	42	11530	11990	12230	12460	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

525BFM-06-00

Figure 4-49* (Sheet 2)

MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS

ANTI-ICE - OFF

CONDITIONS: REFER TO PAGE PRECEDING THIS TABLE

APPROACH FLAPS - 15°
LANDING FLAPS - LAND

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
6	-40	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-35	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-30	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-20	12630	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12510	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12390	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12280	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	12160	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	12050	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	11940	12420	12660	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	11840	12310	12550	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	11740	12210	12440	12680	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	11640	12100	12340	12570	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	11540	12000	12230	12470	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11440	11900	12130	12360	12700	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	40	11350	11810	12040	12270	12590	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
7	-40	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-35	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-30	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-25	12520	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-20	12400	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12280	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	12160	12640	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	12050	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	11930	12410	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	11830	12300	12540	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	11720	12190	12420	12660	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	11620	12080	12320	12550	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	11510	11980	12210	12440	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	11420	11880	12110	12340	12670	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	11320	11780	12010	12230	12560	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11220	11680	11910	12130	12450	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	37	11190	11640	11870	12090	12410	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750

ALT FT	TEMP DEG C	WIND - KNOTS -10 RNWY GRADIENT PERCENT -2	0	1	2	0 -2	0	1	2	10 -2	0	1	2	20 -2	0	1	2	30 -2	0	1	2
8	-45	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-40	12670	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-35	12540	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
0	-30	12420	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-25	12290	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-20	12170	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-15	12050	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-10	11930	12410	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	-5	11820	12290	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	0	11710	12180	12410	12650	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	5	11600	12070	12300	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	10	11500	11960	12190	12420	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	15	11390	11850	12080	12310	12640	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	20	11290	11750	11980	12210	12530	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	25	11200	11650	11880	12100	12420	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	30	11100	11550	11780	12000	12310	12750	12750	12750	12740	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750	12750
	35	11010	11460	11680	11900	12200	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540	12540

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Figure 4-49* (Sheet 3)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND
SEA LEVEL

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET

ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

	*WEIGHT = 13870 POUNDS VREF = 112 KIAS VAPP = 122 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3210	2640	2490	2340	2190
-20	3250	2680	2520	2370	2220
-15	3290	2720	2560	2400	2260
-10	3330	2760	2600	2440	2290
-5	3380	2790	2630	2470	2330
0	3420	2830	2670	2510	2360
5	3470	2870	2710	2550	2400
10	3520	2920	2750	2590	2430
15	3570	2960	2790	2630	2470
20	3620	3000	2830	2670	2510
25	3670	3040	2870	2710	2550
30	3720	3090	2910	2750	2590
35	3770	3130	2950	2790	2620
40	3820	3180	3000	2820	2660
45	3870	3220	3040	2860	2700
50	3920	3260	3080	2900	2740
54	3960	3300	3110	2930	2770

	WEIGHT = 12750 POUNDS VREF = 108 KIAS VAPP = 117 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3020	2490	2340	2190	2050
-20	3050	2520	2370	2220	2080
-15	3090	2550	2400	2250	2120
-10	3130	2590	2430	2290	2150
-5	3170	2620	2460	2320	2180
0	3210	2650	2500	2350	2210
5	3250	2690	2540	2390	2240
10	3290	2730	2570	2420	2270
15	3340	2770	2610	2460	2310
20	3380	2810	2650	2490	2340
25	3430	2850	2680	2530	2380
30	3470	2880	2720	2560	2410
35	3520	2920	2760	2600	2440
40	3560	2960	2800	2630	2480
45	3610	3000	2830	2670	2510
50	3650	3040	2870	2700	2550
54	3680	3070	2900	2730	2580

	WEIGHT = 12600 POUNDS VREF = 107 KIAS VAPP = 117 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3000	2460	2320	2180	2040
-20	3030	2500	2350	2200	2070
-15	3070	2530	2380	2230	2100
-10	3100	2560	2410	2270	2130
-5	3140	2600	2440	2300	2160
0	3180	2630	2480	2330	2190
5	3220	2670	2510	2370	2220
10	3270	2710	2550	2400	2250
15	3310	2750	2590	2430	2290
20	3350	2780	2620	2470	2320
25	3400	2820	2660	2500	2360
30	3440	2860	2700	2540	2390
35	3480	2900	2730	2580	2420
40	3530	2940	2770	2610	2460
45	3570	2980	2810	2640	2490
50	3620	3010	2840	2680	2520
54	3650	3040	2870	2710	2550

	WEIGHT = 12400 POUNDS VREF = 106 KIAS VAPP = 116 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2960	2440	2290	2150	2010
-20	3000	2470	2320	2180	2040
-15	3030	2500	2350	2210	2070
-10	3070	2540	2390	2240	2100
-5	3110	2570	2410	2270	2130
0	3140	2600	2450	2300	2160
5	3190	2640	2480	2340	2190
10	3230	2680	2520	2370	2230
15	3270	2710	2560	2400	2260
20	3310	2750	2590	2440	2290
25	3360	2790	2630	2470	2330
30	3400	2820	2660	2510	2360
35	3440	2860	2700	2540	2390
40	3490	2900	2740	2580	2430
45	3530	2940	2770	2610	2460
50	3570	2980	2810	2650	2490
54	3610	3010	2830	2670	2520

	WEIGHT = 12200 POUNDS VREF = 106 KIAS VAPP = 115 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2930	2410	2270	2130	1990
-20	2970	2440	2300	2160	2020
-15	3000	2470	2330	2190	2050
-10	3040	2510	2360	2210	2080
-5	3070	2540	2390	2240	2110
0	3110	2570	2420	2270	2140
5	3150	2610	2450	2310	2170
10	3190	2640	2490	2340	2200
15	3230	2680	2530	2380	2230
20	3280	2720	2560	2410	2270
25	3320	2760	2600	2440	2300
30	3360	2790	2630	2480	2330
35	3400	2830	2670	2510	2360
40	3440	2860	2700	2550	2400
45	3490	2900	2740	2580	2430
50	3530	2940	2770	2610	2460
54	3560	2970	2800	2640	2490

	WEIGHT = 12000 POUNDS VREF = 105 KIAS VAPP = 114 KIAS				
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2900	2390	2240	2100	1970
-20	2940	2420	2270	2130	1990
-15	2970	2450	2300	2160	2020
-10	3010	2480	2330	2190	2050
-5	3040	2510	2360	2220	2080
0	3070	2540	2390	2250	2110
5	3120	2580	2430	2280	2140
10	3160	2610	2460	2320	2180
15	3200	2650	2500	2350	2200
20	3240	2690	2530	2380	2240
25	3280	2720	2570	2410	2270
30	3320	2760	2600	2450	2300
35	3360	2800	2630	2480	2340
40	3410	2830	2670	2520	2370
45	3440	2870	2700	2550	2400
50	3490	2900	2740	2580	2430
54	3520	2930	2770	2610	2460

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TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES
* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-50* (Sheet 1 of 30)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND SEA LEVEL

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET

ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 11500 POUNDS — VREF = 103 KIAS — VAPP = 111 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2830	2320	2180	2040	1910
-20	2860	2350	2210	2070	1940
-15	2890	2380	2240	2100	1970
-10	2930	2410	2270	2130	1990
-5	2960	2440	2290	2160	2020
0	2990	2470	2330	2190	2050
5	3030	2510	2360	2210	2080
10	3070	2540	2390	2250	2110
15	3110	2580	2420	2280	2140
20	3150	2610	2460	2310	2170
25	3190	2640	2490	2340	2200
30	3230	2680	2530	2380	2230
35	3270	2710	2560	2410	2260
40	3310	2750	2590	2440	2290
45	3350	2780	2620	2470	2330
50	3380	2820	2660	2500	2360
54	3420	2840	2680	2530	2380

WEIGHT = 11000 POUNDS — VREF = 101 KIAS — VAPP = 109 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2760	2260	2120	1990	1860
-20	2790	2290	2150	2010	1880
-15	2820	2320	2180	2040	1910
-10	2850	2350	2200	2070	1940
-5	2880	2370	2230	2090	1960
0	2910	2400	2260	2120	1990
5	2950	2430	2290	2150	2020
10	2990	2470	2320	2180	2050
15	3020	2500	2360	2210	2080
20	3060	2540	2390	2240	2110
25	3100	2570	2420	2270	2140
30	3140	2600	2450	2310	2170
35	3180	2630	2480	2340	2190
40	3210	2670	2520	2370	2220
45	3250	2700	2550	2400	2250
50	3290	2730	2580	2430	2280
54	3310	2760	2600	2450	2310

WEIGHT = 10500 POUNDS — VREF = 99 KIAS — VAPP = 107 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2690	2200	2060	1930	1810
-20	2720	2230	2090	1960	1830
-15	2750	2250	2120	1980	1860
-10	2780	2280	2140	2010	1880
-5	2810	2310	2170	2030	1910
0	2830	2340	2190	2060	1930
5	2870	2370	2230	2090	1960
10	2910	2400	2260	2120	1980
15	2940	2430	2290	2150	2010
20	2980	2460	2320	2180	2040
25	3020	2500	2350	2210	2070
30	3050	2530	2380	2240	2100
35	3090	2560	2410	2270	2130
40	3120	2590	2440	2300	2160
45	3160	2620	2470	2330	2190
50	3190	2650	2500	2360	2210
54	3220	2680	2530	2380	2240

WEIGHT = 10000 POUNDS — VREF = 97 KIAS — VAPP = 105 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2620	2140	2010	1890	1760
-20	2650	2170	2030	1910	1780
-15	2680	2190	2060	1930	1810
-10	2710	2220	2080	1960	1830
-5	2730	2240	2110	1980	1850
0	2760	2270	2140	2000	1880
5	2800	2300	2170	2030	1910
10	2830	2330	2190	2060	1930
15	2870	2370	2220	2090	1960
20	2900	2400	2250	2120	1980
25	2930	2420	2280	2140	2010
30	2970	2460	2310	2170	2040
35	3000	2490	2340	2200	2060
40	3040	2520	2370	2230	2090
45	3070	2550	2400	2260	2120
50	3100	2580	2430	2290	2150
54	3130	2600	2450	2310	2170

WEIGHT = 9500 POUNDS — VREF = 95 KIAS — VAPP = 102 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2560	2090	1960	1840	1720
-20	2590	2110	1980	1860	1740
-15	2610	2140	2000	1880	1760
-10	2640	2160	2030	1900	1780
-5	2660	2190	2050	1930	1800
0	2690	2210	2080	1950	1830
5	2730	2240	2100	1980	1850
10	2760	2270	2130	2000	1880
15	2790	2300	2160	2030	1900
20	2820	2330	2190	2060	1930
25	2860	2360	2220	2080	1960
30	2890	2390	2240	2110	1980
35	2920	2410	2270	2140	2010
40	2960	2440	2300	2160	2030
45	2990	2470	2330	2190	2060
50	3020	2500	2360	2220	2080
54	3040	2530	2380	2240	2100

WEIGHT = 9000 POUNDS — VREF = 93 KIAS — VAPP = 100 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2500	2040	1910	1790	1670
-20	2520	2060	1930	1810	1690
-15	2550	2080	1960	1830	1710
-10	2570	2110	1980	1850	1730
-5	2600	2130	2000	1870	1750
0	2620	2150	2020	1900	1770
5	2650	2180	2050	1920	1800
10	2690	2200	2070	1950	1820
15	2720	2230	2100	1980	1850
20	2750	2260	2130	2000	1880
25	2780	2290	2160	2020	1900
30	2810	2320	2180	2050	1930
35	2840	2350	2210	2080	1950
40	2870	2380	2230	2100	1980
45	2900	2400	2260	2130	2000
50	2940	2430	2290	2150	2020
54	2960	2450	2310	2170	2040

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TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES

Figure 4-50* (Sheet 2)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND 1000 FEET

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET

ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

*WEIGHT = 13870 POUNDS — VREF = 112 KIAS — VAPP = 122 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3290	2720	2560	2400	2260
-20	3330	2760	2590	2440	2290
-15	3380	2800	2630	2470	2330
-10	3420	2830	2670	2510	2360
-5	3470	2870	2710	2550	2400
0	3520	2920	2750	2590	2430
5	3570	2960	2790	2630	2470
10	3620	3010	2830	2670	2510
15	3670	3050	2870	2710	2550
20	3730	3090	2920	2750	2590
25	3780	3140	2960	2790	2630
30	3830	3180	3000	2830	2670
35	3880	3230	3040	2870	2710
40	3940	3270	3090	2910	2750
45	3990	3320	3130	2950	2790
50	4040	3360	3180	3000	2820
51	4060	3370	3180	3000	2830

WEIGHT = 12750 POUNDS — VREF = 108 KIAS — VAPP = 117 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3090	2550	2400	2250	2110
-20	3130	2590	2430	2290	2150
-15	3170	2620	2470	2320	2180
-10	3210	2650	2500	2350	2210
-5	3250	2690	2530	2390	2240
0	3290	2730	2570	2420	2270
5	3340	2770	2610	2460	2310
10	3380	2810	2650	2490	2340
15	3430	2850	2690	2530	2380
20	3480	2890	2720	2570	2410
25	3520	2930	2760	2600	2450
30	3570	2970	2800	2640	2490
35	3620	3010	2840	2680	2520
40	3660	3050	2880	2710	2560
45	3710	3090	2920	2750	2590
50	3750	3130	2960	2790	2630
52	3770	3150	2970	2800	2640

WEIGHT = 12600 POUNDS — VREF = 107 KIAS — VAPP = 117 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3070	2530	2380	2230	2100
-20	3100	2560	2410	2270	2130
-15	3140	2600	2440	2300	2160
-10	3180	2630	2480	2330	2190
-5	3220	2670	2510	2360	2220
0	3260	2700	2550	2400	2250
5	3310	2740	2590	2430	2290
10	3350	2790	2620	2470	2320
15	3400	2820	2660	2510	2360
20	3440	2860	2700	2540	2390
25	3490	2900	2740	2580	2430
30	3540	2940	2780	2610	2460
35	3580	2980	2810	2650	2500
40	3630	3020	2850	2690	2530
45	3670	3060	2890	2730	2570
50	3720	3100	2930	2760	2600
52	3740	3120	2940	2780	2610

WEIGHT = 12400 POUNDS — VREF = 106 KIAS — VAPP = 116 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3030	2500	2350	2210	2070
-20	3070	2540	2390	2240	2100
-15	3110	2570	2420	2270	2130
-10	3150	2600	2450	2300	2160
-5	3190	2640	2480	2340	2190
0	3230	2670	2520	2370	2220
5	3270	2710	2560	2400	2260
10	3310	2750	2590	2440	2290
15	3360	2790	2630	2480	2330
20	3410	2830	2670	2510	2360
25	3450	2870	2700	2550	2400
30	3490	2910	2740	2590	2430
35	3540	2950	2780	2620	2470
40	3580	2990	2820	2650	2500
45	3630	3020	2850	2690	2540
50	3670	3060	2890	2730	2570
52	3690	3080	2910	2740	2580

WEIGHT = 12200 POUNDS — VREF = 106 KIAS — VAPP = 115 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	3000	2470	2330	2190	2050
-20	3040	2510	2360	2210	2080
-15	3070	2540	2390	2240	2110
-10	3110	2570	2420	2280	2140
-5	3150	2600	2450	2310	2170
0	3190	2640	2490	2340	2200
5	3230	2680	2530	2380	2230
10	3280	2720	2560	2410	2270
15	3320	2760	2600	2450	2300
20	3360	2800	2630	2480	2340
25	3410	2830	2670	2520	2370
30	3450	2870	2710	2550	2400
35	3490	2910	2750	2590	2430
40	3540	2950	2780	2620	2470
45	3580	2990	2820	2660	2500
50	3630	3020	2850	2690	2540
52	3650	3040	2870	2710	2550

WEIGHT = 12000 POUNDS — VREF = 105 KIAS — VAPP = 114 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2970	2450	2300	2160	2020
-20	3010	2480	2330	2190	2050
-15	3040	2510	2360	2220	2080
-10	3080	2540	2400	2250	2110
-5	3110	2580	2420	2280	2140
0	3150	2610	2460	2310	2170
5	3200	2650	2500	2350	2200
10	3240	2690	2530	2380	2240
15	3280	2730	2570	2420	2270
20	3320	2760	2600	2450	2310
25	3370	2800	2640	2490	2340
30	3410	2840	2680	2520	2370
35	3450	2870	2710	2560	2400
40	3500	2910	2750	2590	2440
45	3540	2950	2790	2620	2470
50	3580	2990	2820	2660	2510
52	3600	3000	2830	2670	2520

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TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES
* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-50* (Sheet 3)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND 1000 FEET

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET

ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 11500 POUNDS
VREF = 103 KIAS VAPP = 111 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2890	2380	2240	2100	1970
-20	2930	2410	2270	2130	1990
-15	2960	2440	2300	2160	2020
-10	3000	2470	2330	2190	2050
-5	3030	2500	2360	2210	2080
0	3070	2540	2390	2250	2110
5	3110	2580	2420	2280	2140
10	3150	2610	2460	2310	2170
15	3190	2650	2490	2350	2200
20	3230	2680	2530	2380	2240
25	3270	2720	2560	2410	2270
30	3310	2750	2600	2440	2300
35	3350	2790	2630	2480	2330
40	3390	2820	2670	2510	2370
45	3440	2860	2700	2550	2400
50	3470	2900	2730	2580	2430
52	3490	2910	2750	2590	2440

WEIGHT = 11000 POUNDS
VREF = 101 KIAS VAPP = 109 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2820	2320	2180	2040	1910
-20	2850	2350	2200	2070	1940
-15	2880	2380	2230	2090	1960
-10	2910	2400	2260	2120	1990
-5	2950	2430	2290	2150	2010
0	2990	2470	2320	2180	2040
5	3020	2500	2360	2210	2080
10	3060	2540	2390	2240	2110
15	3100	2570	2420	2280	2140
20	3140	2600	2450	2310	2170
25	3180	2640	2490	2340	2200
30	3220	2670	2520	2370	2230
35	3260	2710	2550	2400	2260
40	3290	2740	2590	2440	2290
45	3330	2780	2620	2470	2320
50	3370	2810	2650	2500	2350
52	3390	2820	2660	2510	2370

WEIGHT = 10500 POUNDS
VREF = 99 KIAS VAPP = 107 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2750	2250	2120	1980	1860
-20	2780	2280	2140	2010	1880
-15	2810	2310	2170	2030	1910
-10	2840	2340	2200	2060	1930
-5	2870	2370	2220	2090	1960
0	2910	2400	2260	2120	1980
5	2940	2430	2290	2150	2010
10	2980	2460	2320	2180	2040
15	3020	2500	2350	2210	2070
20	3050	2530	2380	2240	2100
25	3090	2560	2410	2270	2130
30	3130	2600	2450	2300	2160
35	3170	2630	2480	2330	2190
40	3200	2660	2510	2360	2220
45	3240	2690	2540	2390	2250
50	3270	2730	2570	2420	2280
52	3290	2740	2590	2430	2290

WEIGHT = 10000 POUNDS
VREF = 97 KIAS VAPP = 105 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2680	2190	2060	1930	1810
-20	2710	2220	2080	1960	1830
-15	2740	2250	2110	1980	1860
-10	2770	2270	2140	2000	1880
-5	2800	2300	2160	2030	1900
0	2830	2330	2190	2060	1930
5	2860	2370	2220	2090	1960
10	2900	2400	2250	2120	1980
15	2940	2430	2280	2150	2010
20	2970	2460	2310	2180	2040
25	3010	2490	2350	2200	2070
30	3040	2520	2380	2230	2100
35	3080	2550	2400	2260	2130
40	3110	2590	2440	2290	2150
45	3150	2620	2470	2320	2180
50	3180	2650	2500	2350	2210
52	3200	2660	2510	2360	2220

WEIGHT = 9500 POUNDS
VREF = 95 KIAS VAPP = 102 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2610	2140	2010	1880	1760
-20	2640	2160	2030	1910	1780
-15	2670	2190	2050	1930	1800
-10	2690	2210	2080	1950	1830
-5	2720	2240	2100	1980	1850
0	2760	2270	2130	2000	1880
5	2790	2300	2160	2030	1900
10	2820	2330	2190	2060	1930
15	2860	2360	2220	2080	1960
20	2890	2390	2250	2110	1980
25	2930	2420	2280	2140	2010
30	2960	2450	2310	2170	2040
35	2990	2480	2340	2190	2060
40	3030	2510	2370	2220	2090
45	3060	2540	2400	2250	2110
50	3090	2570	2420	2280	2140
52	3110	2580	2430	2290	2150

WEIGHT = 9000 POUNDS
VREF = 93 KIAS VAPP = 100 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-25	2550	2080	1960	1830	1710
-20	2580	2110	1980	1850	1730
-15	2600	2130	2000	1880	1760
-10	2620	2150	2020	1900	1770
-5	2650	2180	2050	1920	1800
0	2680	2200	2070	1950	1820
5	2720	2230	2100	1980	1850
10	2750	2260	2130	2000	1880
15	2780	2290	2160	2030	1900
20	2810	2320	2180	2050	1930
25	2840	2350	2210	2080	1950
30	2880	2380	2240	2110	1980
35	2910	2410	2270	2130	2000
40	2940	2440	2290	2160	2030
45	2980	2470	2320	2180	2050
50	3010	2490	2350	2210	2080
52	3020	2510	2360	2220	2090

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TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES

Figure 4-50* (Sheet 4)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND 8000 FEET

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET

ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

*WEIGHT = 13870 POUNDS
VREF = 112 KIAS VAPP = 122 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-50	3710	3080	2900	2740	2580
-45	3770	3130	2950	2780	2620
-40	3830	3180	3000	2830	2660
-35	3880	3230	3050	2870	2710
-30	3950	3280	3100	2920	2760
-25	4020	3340	3160	2980	2810
-20	4090	3400	3210	3030	2860
-15	4160	3460	3270	3080	2910
-10	4230	3520	3330	3140	2960
-5	4300	3580	3380	3190	3010
0	4380	3650	3440	3250	3060
5	4450	3710	3500	3300	3120
10	4520	3770	3560	3360	3170
15	4600	3830	3620	3420	3220
20	4670	3890	3670	3470	3270
25	4750	3950	3730	3530	3330
27	4780	3980	3760	3550	3350

WEIGHT = 12750 POUNDS
VREF = 108 KIAS VAPP = 117 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3520	2920	2760	2600	2440
-40	3570	2970	2800	2640	2480
-35	3620	3010	2840	2680	2520
-30	3670	3060	2890	2720	2570
-25	3730	3110	2940	2770	2610
-20	3800	3170	2990	2820	2660
-15	3850	3220	3040	2870	2700
-10	3920	3270	3090	2920	2750
-5	3980	3320	3140	2970	2800
0	4040	3380	3190	3020	2840
5	4100	3430	3240	3060	2890
10	4170	3480	3290	3110	2940
15	4230	3540	3350	3160	2990
20	4290	3600	3400	3210	3030
25	4360	3650	3450	3260	3080
30	4430	3700	3500	3310	3130
33	4470	3740	3530	3340	3160

WEIGHT = 12600 POUNDS
VREF = 107 KIAS VAPP = 117 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3480	2900	2730	2570	2420
-40	3530	2940	2770	2610	2460
-35	3580	2990	2810	2650	2500
-30	3640	3030	2860	2700	2540
-25	3700	3080	2910	2750	2590
-20	3760	3140	2960	2790	2630
-15	3820	3190	3010	2840	2680
-10	3880	3240	3060	2890	2720
-5	3940	3290	3110	2940	2770
0	4000	3350	3160	2990	2810
5	4060	3400	3210	3030	2860
10	4120	3450	3260	3080	2910
15	4190	3500	3310	3130	2960
20	4250	3560	3360	3180	3000
25	4310	3610	3420	3230	3050
30	4380	3660	3460	3270	3090
34	4430	3710	3510	3310	3130

WEIGHT = 12400 POUNDS
VREF = 106 KIAS VAPP = 116 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3440	2860	2700	2540	2390
-40	3490	2900	2740	2580	2430
-35	3540	2950	2780	2620	2470
-30	3590	3000	2820	2660	2510
-25	3650	3040	2870	2710	2560
-20	3710	3100	2920	2760	2600
-15	3770	3150	2970	2810	2640
-10	3830	3200	3020	2850	2690
-5	3890	3250	3070	2900	2730
0	3950	3300	3120	2950	2780
5	4010	3350	3170	2990	2820
10	4070	3410	3220	3040	2870
15	4130	3460	3270	3090	2920
20	4190	3510	3320	3140	2960
25	4250	3560	3370	3180	3010
30	4310	3620	3420	3230	3050
35	4370	3670	3470	3280	3100

WEIGHT = 12200 POUNDS
VREF = 106 KIAS VAPP = 115 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3400	2830	2670	2510	2360
-40	3450	2870	2710	2550	2400
-35	3500	2910	2750	2590	2440
-30	3550	2960	2790	2630	2480
-25	3610	3010	2840	2680	2520
-20	3660	3060	2890	2720	2570
-15	3720	3110	2940	2770	2610
-10	3780	3160	2980	2810	2650
-5	3840	3210	3030	2860	2700
0	3890	3260	3080	2910	2740
5	3950	3310	3130	2950	2790
10	4010	3360	3180	3000	2830
15	4070	3410	3230	3050	2880
20	4130	3460	3270	3090	2920
25	4190	3510	3320	3140	2970
30	4250	3570	3370	3190	3010
35	4310	3620	3420	3230	3050

WEIGHT = 12000 POUNDS
VREF = 105 KIAS VAPP = 114 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3360	2800	2630	2480	2330
-40	3410	2830	2670	2520	2370
-35	3450	2880	2710	2560	2410
-30	3510	2920	2760	2600	2450
-25	3560	2970	2810	2640	2490
-20	3620	3020	2850	2690	2530
-15	3670	3070	2900	2730	2580
-10	3730	3120	2950	2780	2620
-5	3790	3170	2990	2820	2660
0	3850	3220	3040	2870	2710
5	3900	3270	3090	2920	2750
10	3960	3320	3130	2960	2800
15	4020	3370	3180	3010	2840
20	4070	3420	3230	3050	2880
25	4130	3460	3280	3100	2930
30	4190	3520	3330	3140	2970
35	4250	3570	3370	3190	3020

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TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES
* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-50* (Sheet 17)

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND 8000 FEET

CONDITIONS: LANDING GEAR - DOWN
THRUST - IDLE AT 50 FEET
AIRSPEED - VREF AT 50 FEET
ANTI-ICE - ON OR OFF
GROUND FLAPS - AFTER TOUCHDOWN

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 11500 POUNDS — VREF = 103 KIAS — VAPP = 111 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3270	2710	2560	2410	2260
-40	3310	2750	2600	2440	2300
-35	3350	2790	2630	2480	2330
-30	3400	2830	2670	2520	2370
-25	3450	2880	2720	2560	2410
-20	3510	2930	2760	2600	2450
-15	3560	2980	2810	2650	2500
-10	3620	3020	2850	2690	2540
-5	3670	3070	2900	2740	2580
0	3720	3120	2940	2780	2620
5	3780	3160	2990	2820	2660
10	3830	3210	3030	2870	2700
15	3880	3260	3080	2910	2750
20	3940	3300	3120	2950	2790
25	4000	3350	3170	3000	2830
30	4050	3400	3220	3040	2870
35	4100	3450	3260	3080	2910

WEIGHT = 11000 POUNDS — VREF = 101 KIAS — VAPP = 109 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3180	2640	2480	2340	2190
-40	3220	2670	2520	2370	2230
-35	3260	2710	2560	2400	2260
-30	3300	2750	2600	2440	2300
-25	3350	2800	2640	2490	2340
-20	3410	2840	2680	2530	2380
-15	3450	2880	2720	2570	2420
-10	3510	2930	2770	2610	2460
-5	3560	2970	2810	2650	2500
0	3610	3020	2850	2690	2540
5	3660	3060	2890	2730	2580
10	3710	3110	2940	2780	2620
15	3760	3150	2980	2810	2660
20	3810	3200	3020	2860	2700
25	3860	3240	3070	2900	2740
30	3920	3290	3110	2940	2780
35	3970	3330	3150	2980	2820

WEIGHT = 10500 POUNDS — VREF = 99 KIAS — VAPP = 107 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3090	2560	2410	2270	2130
-40	3130	2600	2440	2300	2160
-35	3170	2630	2480	2340	2190
-30	3210	2670	2520	2370	2230
-25	3260	2710	2560	2410	2270
-20	3310	2760	2600	2450	2310
-15	3350	2800	2640	2490	2340
-10	3400	2840	2680	2530	2380
-5	3450	2880	2720	2570	2420
0	3500	2930	2770	2610	2460
5	3550	2970	2810	2650	2500
10	3600	3010	2850	2690	2530
15	3650	3050	2890	2730	2570
20	3690	3100	2930	2770	2610
25	3740	3140	2970	2810	2650
30	3790	3180	3010	2840	2690
35	3840	3230	3050	2880	2730

WEIGHT = 10000 POUNDS — VREF = 97 KIAS — VAPP = 105 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	3010	2490	2340	2200	2070
-40	3040	2520	2380	2230	2100
-35	3080	2560	2410	2260	2130
-30	3120	2590	2440	2300	2160
-25	3170	2630	2480	2340	2200
-20	3210	2670	2520	2380	2230
-15	3260	2720	2560	2410	2270
-10	3300	2760	2600	2450	2310
-5	3350	2800	2640	2490	2340
0	3400	2840	2680	2530	2380
5	3440	2880	2720	2570	2420
10	3490	2920	2760	2600	2450
15	3530	2960	2800	2640	2490
20	3580	3000	2840	2680	2530
25	3630	3040	2880	2720	2560
30	3670	3080	2920	2760	2600
35	3720	3120	2960	2790	2640

WEIGHT = 9500 POUNDS — VREF = 95 KIAS — VAPP = 102 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	2930	2420	2280	2140	2010
-40	2960	2450	2310	2170	2030
-35	3000	2480	2340	2200	2060
-30	3030	2520	2370	2230	2090
-25	3080	2560	2410	2270	2130
-20	3120	2600	2450	2300	2170
-15	3170	2630	2480	2340	2200
-10	3210	2670	2520	2380	2230
-5	3250	2710	2560	2410	2270
0	3300	2750	2600	2450	2310
5	3340	2790	2630	2490	2340
10	3380	2830	2670	2520	2380
15	3430	2870	2710	2560	2410
20	3470	2910	2750	2600	2440
25	3510	2950	2790	2630	2480
30	3560	2990	2820	2670	2520
35	3600	3020	2860	2700	2550

WEIGHT = 9000 POUNDS — VREF = 93 KIAS — VAPP = 100 KIAS

TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-45	2850	2350	2210	2080	1950
-40	2880	2380	2240	2110	1980
-35	2910	2410	2270	2130	2000
-30	2950	2440	2300	2160	2030
-25	2990	2480	2340	2200	2070
-20	3030	2520	2370	2230	2100
-15	3070	2560	2410	2270	2130
-10	3120	2600	2440	2300	2170
-5	3160	2630	2480	2340	2200
0	3200	2670	2520	2370	2230
5	3240	2710	2550	2410	2260
10	3280	2740	2590	2440	2300
15	3320	2780	2620	2480	2330
20	3370	2820	2660	2510	2370
25	3410	2850	2700	2550	2400
30	3450	2890	2730	2580	2430
35	3490	2930	2770	2610	2470

525BFM-06-00

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES

Figure 4-50* (Sheet 18)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF
LANDING GEAR - UP
AIRSPEED - VAPP
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	*13870 WIND KNOTS -10	0	10	20	30	12750 WIND KNOTS -10	0	10	20	30	12500 WIND KNOTS -10	0	10	20	30	12000 WIND KNOTS -10	0	10	20	30	11500 WIND KNOTS -10	0	10	20	30
0	-25	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.1	8.7	10.0	10.4	11.0	11.6	9.5	10.8	11.3	11.9	12.6	10.3	11.7	12.3	13.0	13.7
	-20	7.0	7.9	8.3	8.7	9.1	8.4	9.6	10.0	10.5	11.1	8.7	10.0	10.4	11.0	11.6	9.5	10.8	11.3	11.9	12.6	10.3	11.8	12.3	13.0	13.7
	-15	7.0	7.9	8.3	8.7	9.1	8.4	9.6	10.0	10.5	11.1	8.8	10.0	10.4	11.0	11.5	9.5	10.8	11.3	11.9	12.6	10.3	11.8	12.3	13.0	13.7
	-10	7.0	7.9	8.3	8.7	9.1	8.4	9.6	10.0	10.5	11.0	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.8	12.3	13.0	13.7
	-5	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.0	8.8	10.0	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	13.0	13.7
	0	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.0	8.8	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	5	7.0	7.9	8.3	8.6	9.0	8.4	9.5	10.0	10.4	11.0	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	10	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.5
	15	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	20	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.9	10.3	10.8	8.7	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.6	12.2	12.8	13.4
	25	7.0	7.8	8.1	8.5	8.9	8.4	9.4	9.8	10.3	10.8	8.7	9.8	10.2	10.7	11.2	9.4	10.7	11.1	11.7	12.2	10.2	11.6	12.1	12.7	13.4
	30	6.3	7.1	7.4	7.7	8.0	7.6	8.6	9.0	9.4	9.8	8.0	9.0	9.4	9.8	10.3	8.7	9.8	10.2	10.7	11.2	9.4	10.7	11.2	11.7	12.3
	35	5.4	6.1	6.3	6.6	6.9	6.7	7.5	7.8	8.2	8.6	7.0	7.9	8.2	8.6	9.0	7.7	8.6	9.0	9.4	9.9	8.4	9.5	9.9	10.4	10.9
	40	4.5	5.0	5.3	5.5	5.7	5.7	6.4	6.7	7.0	7.3	6.0	6.7	7.0	7.3	7.7	6.6	7.4	7.8	8.1	8.5	7.3	8.2	8.6	9.0	9.4
	45	3.7	4.2	4.3	4.5	4.7	4.8	5.4	5.6	5.9	6.2	5.1	5.7	6.0	6.2	6.5	5.7	6.4	6.7	7.0	7.3	6.3	7.1	7.4	7.8	8.1
	50	3.0	3.4	3.5	3.6	3.8	4.0	4.5	4.7	4.9	5.1	4.3	4.8	5.0	5.2	5.5	4.8	5.4	5.7	5.9	6.2	5.4	6.1	6.4	6.7	7.0
	54	2.5	2.8	2.9	3.0	3.2	3.5	3.9	4.1	4.2	4.4	3.7	4.2	4.4	4.6	4.8	4.3	4.8	5.0	5.2	5.5	4.8	5.4	5.7	5.9	6.2
1000	-25	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.0	8.7	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	13.0	13.7
	-20	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.0	8.8	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	13.0	13.7
	-15	7.0	7.9	8.3	8.7	9.1	8.4	9.5	10.0	10.5	11.0	8.8	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	-10	7.0	7.9	8.3	8.6	9.1	8.4	9.5	10.0	10.5	11.0	8.8	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	-5	7.0	7.9	8.3	8.6	9.0	8.4	9.5	10.0	10.4	11.0	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	0	7.0	7.9	8.3	8.6	9.0	8.4	9.5	10.0	10.4	10.9	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.6
	5	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.5
	10	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	15	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	20	6.9	7.8	8.1	8.4	8.8	8.3	9.4	9.8	10.2	10.7	8.7	9.8	10.2	10.7	11.2	9.4	10.6	11.1	11.6	12.2	10.2	11.5	12.1	12.6	13.3
	25	6.5	7.3	7.6	7.9	8.3	7.9	8.8	9.2	9.6	10.1	8.2	9.2	9.6	10.1	10.5	8.9	10.1	10.5	11.0	11.5	9.7	10.9	11.4	12.0	12.6
	30	5.7	6.4	6.6	6.9	7.2	7.0	7.8	8.2	8.5	8.9	7.3	8.2	8.6	8.9	9.4	8.0	9.0	9.4	9.8	10.3	8.7	9.8	10.3	10.8	11.3
	35	4.8	5.4	5.6	5.9	6.1	6.0	6.8	7.1	7.4	7.7	6.3	7.1	7.4	7.7	8.1	7.0	7.8	8.2	8.6	9.0	7.7	8.6	9.0	9.4	9.9
	40	4.0	4.4	4.6	4.8	5.0	5.1	5.7	6.0	6.2	6.5	5.4	6.0	6.3	6.6	6.9	6.0	6.7	7.0	7.3	7.7	6.6	7.5	7.8	8.1	8.5
	45	3.2	3.6	3.7	3.9	4.0	4.3	4.8	5.0	5.2	5.4	4.5	5.1	5.3	5.5	5.8	5.1	5.7	5.9	6.2	6.5	5.7	6.4	6.7	7.0	7.3
	50	2.5	2.8	2.9	3.1	3.2	3.5	3.9	4.1	4.3	4.5	3.8	4.2	4.4	4.6	4.8	4.3	4.8	5.0	5.2	5.5	4.9	5.5	5.7	6.0	6.2
	52	2.3	2.5	2.6	2.8	2.9	3.3	3.6	3.8	3.9	4.1	3.5	3.9	4.1	4.2	4.4	4.0	4.5	4.7	4.9	5.1	4.6	5.1	5.3	5.6	5.8
2000	-30	7.0	7.9	8.2	8.6	9.1	8.4	9.5	10.0	10.4	11.0	8.7	9.9	10.4	10.9	11.5	9.5	10.8	11.3	11.9	12.5	10.2	11.7	12.3	12.9	13.6
	-25	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	11.0	8.7	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.9	12.5	10.3	11.7	12.3	12.9	13.6
	-20	7.0	7.9	8.2	8.6	9.0	8.4	9.5	10.0	10.4	11.0	8.7	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.5	10.3	11.7	12.3	12.9	13.6
	-15	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.6
	-10	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.4	10.9	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.6
	-5	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.4	10.8	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.3	12.9	13.5
	0	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.4	9.5	10.8	11.3	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	5	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.5
	10	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	15	6.9	7.7	8.1	8.4	8.8	8.3	9.3	9.7	10.2	10.6	8.7	9.7	10.2	10.6	11.1	9.4	10.6	11.0	11.6	12.1	10.2	11.5	12.0	12.6	13.2
	20	6.6	7.4	7.7	8.0	8.4	8.0	8.9	9.3	9.7	10.2	8.3	9.3	9.7	10.2	10.6	9.0	10.1	10.6	11.1	11.6	9.8	11.0	11.5	12.1	12.7
	25	5.9	6.6	6.9	7.2	7.5	7.2	8.1	8.4	8.8	9.2	7.5	8.5	8.8	9.2	9.6	8.2	9.3	9.7	10.1	10.6	9.0	10.1	10.6	11.1	11.6
	30	5.1	5.7	5.9	6.2	6.4	6.3	7.1	7.4	7.7	8.1	6.6	7.4	7.8	8.1	8.5	7.3	8.2	8.5	8.9	9.3	8.0	9.0	9.4	9.8	10.3
	35	4.3	4.7	4.9	5.1	5.4	5.4	6.0	6.3	6.6	6.9	5.7	6.4	6.6	6.9	7.2	6.3	7.1	7.4	7.7	8.1	6.9	7.8	8.2	8.5	8.9
	40	3.4	3.8	4.0	4.1	4.3	4.5	5.0	5.3	5.5	5.7	4.8	5.3	5.6	5.8	6.1	5.3	6.0	6.2	6.5	6.8	6.0	6.7	7.0	7.3	7.6
	45	2.7	3.0	3.1	3.2	3.4	3.7	4.1	4.3	4.5	4.7	4.0	4.4	4.6	4.8	5.0	4.5	5.0	5.2	5.5	5.7	5.1	5.7	5.9	6.2	6.5
	50	2.1	2.3	2.4	2.5	2.6	3.0	3.4	3.5	3.6	3.8	3.2	3.6	3.8	3.9	4.1	3.7	4.2	4.4	4.6	4.8	4.3	4.8	5.0	5.2	5.5
3000	-30	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.4	10.7	11.2	11.8	12.4	10.2	11.7	12.2	12.9	13.6
	-25	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.9	13.5
	-20	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-15	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.4	9.5	10.8	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-10	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.4	9.5	10.8	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-5	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.5
	0	7.0	7.9	8.2	8.6	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	5	7.0	7.8	8.2	8.5	8.9	8.4	9.4	9.8	10.3	10.8	8.8	9.8	10.3	10.7	11.2	9.5	10.7	11.2	11.7	12.3	10.3	11.6	12.2	12.7	13.4
	10	6.8	7.6	8.0	8.3	8.7	8.2	9.2	9.6	10.0	10.5	8.6	9.6	10.0	10.5	11.0	9.3	10.5	10.9	11.4	12.0	10.1	11.4	11.9	12.4	13.0
	15	6.5	7.3	7.6	7.9	8.2	7.8	8.8	9.2	9.6	10.0	8.2	9.2	9.6	10.0	10.4	8.9	10.0	10.4	10.9	11.4	9.6	10.9	11.3	11.9	12.5
	20	6.1	6.8	7.0	7.3	7.6	7.4	8.2	8.6	9.0	9.4	7.7	8.6	9.0	9.4	9.8	8.4	9.4	9.8	10.3	10.7	9.1	10.3	10.7	11.2	11.8
	25	5.3	5.9	6.2	6.4	6.7	6.6	7.4	7.7	8.0	8.3	6.9	7.7	8.0	8.4	8.8	7.5	8.5	8.8	9.2	9.6	8.2	9.3	9.7	10.1	10.6
	30	4.5	5.0	5.2	5.4	5.7	5.7	6.4	6.6	6.9	7.2	6.0	6.7	7.0	7.3	7.6	6.6	7.4	7.7	8.1	8.4	7.3	8.2	8.5	8.9	9.3
	35	3.7	4.1	4.3	4.4	4.6	4.8	5.4	5.6	5.8	6.1	5.1	5.7	5.9	6.2	6.4	5.6	6.3	6.6	6.9	7.2	6.3	7.0	7.3	7.7	8.0
	40	2.9	3.2	3.4	3.5	3.6	3.9	4.4	4.6	4.8	5.0	4.2	4.7	4.9	5.1	5.3	4.7	5.3	5.5	5.8	6.0	5.3	6.0	6.2	6.5	6.8
	45	2.2	2.5	2.6	2.7	2.8	3.2	3.6	3.7	3.9	4.0	3.4	3.8	4.0	4.2	4.3	3.9	4.4	4.6	4.8	5.0	4.5	5.0	5.2	5.5	5.7
	47	2.0	2.2	2.3	2.4	2.5	2.9	3.2	3.4	3.5	3.7	3.1	3.5	3.7	3.8	4.0	3.6	4.1	4.2	4.4	4.6	4.2	4.7	4.9	5.1	5.3

(WEIGHT - POUNDS)

525BFM-06-00

* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-51* (Sheet 1 of 8)

12 APPROACH & LANDING

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS 11000					10500					10000					9500					9000				
		WIND KNOTS -10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-25	11.1	12.8	13.4	14.2	15.0	12.1	13.9	14.6	15.5	16.4	13.1	15.2	16.0	16.9	18.0	14.3	16.6	17.5	18.5	19.7	15.6	18.1	19.2	20.3	21.7
	-20	11.1	12.8	13.4	14.2	15.0	12.1	13.9	14.6	15.5	16.4	13.1	15.2	16.0	16.9	17.9	14.3	16.6	17.5	18.5	19.7	15.6	18.1	19.2	20.3	21.6
	-15	11.2	12.8	13.4	14.2	15.0	12.1	13.9	14.6	15.4	16.3	13.2	15.2	16.0	16.9	17.9	14.3	16.6	17.5	18.5	19.6	15.6	18.1	19.1	20.3	21.6
	-10	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.2	15.2	16.0	16.9	17.9	14.3	16.6	17.5	18.5	19.6	15.6	18.1	19.1	20.3	21.5
	-5	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.2	15.2	16.0	16.8	17.8	14.4	16.6	17.4	18.4	19.6	15.7	18.1	19.1	20.2	21.5
	0	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.2	15.2	15.9	16.8	17.8	14.4	16.5	17.4	18.4	19.5	15.7	18.1	19.1	20.2	21.4
	5	11.2	12.8	13.4	14.1	14.8	12.1	13.9	14.6	15.4	16.2	13.2	15.1	15.9	16.8	17.7	14.4	16.5	17.4	18.4	19.5	15.7	18.1	19.1	20.2	21.4
	10	11.2	12.7	13.3	14.0	14.8	12.1	13.9	14.5	15.3	16.2	13.2	15.1	15.9	16.7	17.7	14.4	16.5	17.4	18.3	19.4	15.7	18.1	19.0	20.1	21.3
	15	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.3	16.5	17.3	18.3	19.3	15.6	18.0	19.0	20.0	21.2
	20	11.1	12.7	13.3	13.9	14.7	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.3	16.4	17.3	18.2	19.2	15.6	18.0	18.9	20.0	21.1
	25	11.1	12.6	13.2	13.8	14.6	12.0	13.7	14.4	15.1	15.9	13.1	15.0	15.7	16.5	17.4	14.3	16.3	17.2	18.1	19.1	15.6	17.9	18.8	19.8	21.0
	30	10.3	11.6	12.2	12.8	13.4	11.2	12.7	13.3	14.0	14.7	12.2	13.9	14.6	15.3	16.2	13.3	15.2	16.0	16.8	17.8	14.5	16.7	17.5	18.5	19.6
	35	9.2	10.4	10.9	11.4	12.0	10.0	11.4	11.9	12.5	13.2	11.0	12.5	13.1	13.8	14.5	12.0	13.7	14.4	15.1	16.0	13.2	15.1	15.9	16.7	17.7
	40	8.0	9.0	9.5	9.9	10.4	8.8	10.0	10.4	11.0	11.5	9.7	11.0	11.5	12.1	12.8	10.6	12.1	12.7	13.4	14.1	11.7	13.4	14.1	14.9	15.7
	45	7.0	7.9	8.3	8.6	9.1	7.7	8.8	9.2	9.6	10.1	8.6	9.7	10.2	10.7	11.3	9.5	10.8	11.3	11.9	12.5	10.5	12.0	12.6	13.3	14.0
	50	6.1	6.9	7.2	7.5	7.9	6.8	7.7	8.0	8.4	8.8	7.6	8.6	9.0	9.4	9.9	8.4	9.6	10.0	10.5	11.1	9.4	10.7	11.2	11.8	12.5
	54	5.4	6.1	6.4	6.7	7.0	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.1	8.5	9.0	7.7	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4
1000	-25	11.1	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.1	15.1	16.0	16.9	17.9	14.3	16.5	17.4	18.5	19.6	15.6	18.1	19.1	20.3	21.6
	-20	11.1	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.8	14.3	16.5	17.4	18.4	19.6	15.6	18.1	19.1	20.2	21.5
	-15	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.3	13.2	15.1	15.9	16.8	17.8	14.3	16.5	17.4	18.4	19.5	15.6	18.1	19.1	20.2	21.5
	-10	11.2	12.8	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.2	13.2	15.1	15.9	16.8	17.8	14.4	16.5	17.4	18.4	19.5	15.7	18.1	19.1	20.2	21.4
	-5	11.2	12.8	13.4	14.1	14.8	12.1	13.9	14.6	15.4	16.2	13.2	15.1	15.9	16.8	17.7	14.4	16.5	17.4	18.4	19.5	15.7	18.1	19.1	20.2	21.4
	0	11.2	12.7	13.4	14.1	14.8	12.1	13.9	14.6	15.3	16.2	13.2	15.1	15.9	16.8	17.7	14.4	16.5	17.4	18.3	19.4	15.7	18.1	19.1	20.1	21.3
	5	11.2	12.7	13.3	14.0	14.8	12.1	13.9	14.5	15.3	16.1	13.2	15.1	15.9	16.7	17.7	14.4	16.5	17.4	18.3	19.4	15.7	18.1	19.0	20.1	21.3
	10	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.3	19.3	15.7	18.0	19.0	20.0	21.2
	15	11.2	12.7	13.3	13.9	14.7	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.4	16.4	17.3	18.2	19.2	15.7	18.0	18.9	20.0	21.1
	20	11.1	12.6	13.1	13.8	14.5	12.0	13.7	14.3	15.0	15.8	13.1	14.9	15.6	16.4	17.3	14.2	16.3	17.1	18.0	19.0	15.5	17.8	18.7	19.8	20.9
	25	10.5	11.9	12.5	13.1	13.8	11.5	13.0	13.6	14.3	15.1	12.5	14.2	14.9	15.7	16.5	13.6	15.5	16.3	17.2	18.1	14.9	17.0	17.9	18.9	19.9
	30	9.5	10.8	11.3	11.8	12.4	10.4	11.8	12.3	12.9	13.6	11.3	12.9	13.5	14.2	15.0	12.4	14.2	14.9	15.6	16.5	13.6	15.6	16.3	17.2	18.2
	35	8.4	9.5	9.9	10.4	10.9	9.2	10.5	10.9	11.5	12.1	10.1	11.5	12.1	12.7	13.3	11.1	12.7	13.3	14.0	14.7	12.2	14.0	14.7	15.5	16.3
	40	7.3	8.3	8.6	9.0	9.5	8.1	9.2	9.6	10.0	10.5	8.9	10.1	10.6	11.1	11.7	9.9	11.2	11.8	12.4	13.0	10.9	12.4	13.1	13.7	14.5
	45	6.3	7.2	7.5	7.8	8.2	7.1	8.0	8.3	8.7	9.2	7.8	8.9	9.3	9.8	10.3	8.7	9.9	10.4	10.9	11.5	9.7	11.1	11.6	12.2	12.9
	50	5.5	6.2	6.4	6.7	7.1	6.1	6.9	7.3	7.6	8.0	6.9	7.8	8.2	8.6	9.0	7.7	8.8	9.2	9.6	10.1	8.6	9.8	10.3	10.8	11.4
	52	5.2	5.8	6.1	6.4	6.7	5.8	6.6	6.9	7.2	7.6	6.5	7.4	7.8	8.1	8.5	7.4	8.3	8.7	9.2	9.7	8.2	9.4	9.8	10.3	10.9
2000	-30	11.1	12.7	13.4	14.1	14.9	12.1	13.8	14.6	15.4	16.3	13.1	15.1	15.9	16.8	17.8	14.3	16.5	17.4	18.4	19.5	15.6	18.0	19.1	20.2	21.5
	-25	11.1	12.7	13.4	14.1	14.9	12.1	13.9	14.6	15.4	16.2	13.1	15.1	15.9	16.8	17.8	14.3	16.5	17.4	18.4	19.5	15.6	18.0	19.1	20.2	21.4
	-20	11.1	12.7	13.4	14.1	14.8	12.1	13.9	14.6	15.3	16.2	13.2	15.1	15.9	16.8	17.7	14.3	16.5	17.4	18.4	19.5	15.6	18.1	19.0	20.2	21.4
	-15	11.2	12.7	13.4	14.1	14.8	12.1	13.9	14.6	15.3	16.2	13.2	15.1	15.9	16.8	17.7	14.3	16.5	17.4	18.3	19.4	15.6	18.1	19.0	20.1	21.4
	-10	11.2	12.7	13.4	14.0	14.8	12.1	13.9	14.6	15.3	16.2	13.2	15.1	15.9	16.7	17.7	14.4	16.5	17.4	18.3	19.4	15.7	18.1	19.0	20.1	21.3
	-5	11.2	12.7	13.3	14.0	14.8	12.1	13.9	14.5	15.3	16.1	13.2	15.1	15.9	16.7	17.7	14.4	16.5	17.4	18.3	19.4	15.7	18.1	19.0	20.1	21.3
	0	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.3	16.1	13.2	15.1	15.9	16.7	17.6	14.4	16.5	17.3	18.3	19.3	15.7	18.0	19.0	20.1	21.2
	5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	10	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.4	16.4	17.3	18.2	19.2	15.7	18.0	18.9	20.0	21.1
	15	11.0	12.5	13.1	13.7	14.4	12.0	13.6	14.3	15.0	15.8	13.0	14.8	15.6	16.4	17.3	14.2	16.2	17.0	17.9	18.9	15.5	17.8	18.7	19.7	20.8
	20	10.6	12.0	12.6	13.2	13.9	11.6	13.1	13.7	14.4	15.2	12.6	14.3	15.0	15.8	16.6	13.7	15.7	16.4	17.3	18.2	15.0	17.1	18.0	19.0	20.0
	25	9.8	11.0	11.6	12.1	12.7	10.7	12.1	12.6	13.3	13.9	11.6	13.2	13.9	14.6	15.3	12.7	14.5	15.2	16.0	16.9	13.9	15.9	16.7	17.6	18.6
	30	8.7	9.9	10.3	10.8	11.3	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.2	12.7	14.5	15.2	16.0	16.8
	35	7.7	8.6	9.0	9.5	9.9	8.4	9.6	10.0	10.5	11.0	9.3	10.6	11.1	11.6	12.2	10.3	11.7	12.2	12.8	13.5	11.3	12.9	13.6	14.3	15.0
	40	6.6	7.5	7.8	8.2	8.6	7.4	8.3	8.7	9.1	9.6	8.2	9.3	9.7	10.1	10.7	9.1	10.3	10.8	11.3	11.9	10.1	11.4	12.0	12.6	13.3
	45	5.7	6.4	6.7	7.0	7.3	6.4	7.2	7.5	7.9	8.3	7.1	8.1	8.5	8.9	9.3	8.0	9.1	9.5	9.9	10.5	8.9	10.1	10.6	11.2	11.8
	50	4.9	5.5	5.7	6.0	6.3	5.5	6.2	6.5	6.8	7.1	6.2	7.1	7.4	7.7	8.1	7.0	8.0	8.3	8.7	9.2	7.9	9.0	9.4	9.9	10.4
3000	-30	11.1	12.7	13.3	14.0	14.8	12.1	13.8	14.5	15.3	16.2	13.1	15.1	15.9	16.7	17.7	14.3	16.5	17.3	18.3	19.4	15.6	18.0	19.0	20.1	21.3
	-25	11.1	12.7	13.3	14.0	14.8	12.1	13.8	14.5	15.3	16.2	13.1	15.1	15.9	16.7	17.7	14.3	16.5	17.3	18.3	19.4	15.6	18.0	19.0	20.1	21.3
	-20	11.2	12.7	13.3	14.0	14.8	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.9	16.7	17.7	14.3	16.5	17.3	18.3	19.4	15.6	18.0	19.0	20.1	21.3
	-15	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.3	19.3	15.7	18.0	19.0	20.1	21.3
	-10	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.3	19.3	15.7	18.0	19.0	20.0	21.2
	-5	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	0	11.2	12.7	13.3	13.9	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	18.9	20.0	21.1
	5	11.2	12.6	13.2	13.9	14.6	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.4	14.3	16.4	17.2	18.1	19.1	15.7	17.9	18.9	19.9	21.0
	10	10.9	12.4	12.9	13.6	14.2	11.9	13.5	14.1	14.8	15.6	12.9	14.7	15.4	16.2	17.0	14.1	16.0	16.8	17.7	18.7	15.3	17.6	18.5	19.4	20.5
	15	10.5	11.8	12.4	13.0	13.6	11.4	12.9	13.5	14.2	14.9	12.4	14.1	14.8	15.5	16.3	13.5	15.4	16.2	17.0	17.9	14.8	16.9	17.7	18.7	19.7
	20	9.9	11.2	11.7	12.3	12.9	10.8	12.2	12.8	13.4	14.1	11.8	13.4	14.0	14.7	15.5	12.9	14.7	15.4	16.2	17.0	14.1	16.1	16.9	17.8	18.8
	25	9.0	10.2	10.6	11.1	11.7	9.9	11.2	11.7	12.2	12.8	10.8	12.3	12.8	13.5	14.1	11.8	13.5	14.1	14.8	15.6	13.0	14.8	15.5	16.4	17.2
	30	8.0	9.0	9.4	9.9	10.3	8.8	9.9	10.4	10.9	11.4	9.7	11.0	11.5	12.0	12.6	10.7	12.1	12.7	13.3	14.0	11.7	13.4	14.0	14.7	15.5
	35	7.0	7.8	8.2	8.6	9.0	7.7	8.7	9.1	9.5	10.0	8.5	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.8	12.4	10.5	11.9	12.5	13.1	13.8
	40	6.0	6.7	7.0	7.3	7.7	6.7	7.5	7.9	8.2	8.6	7.4	8.4	8.8	9.2	9.7	8.3	9.4	9.8	10.3	10.8	9.2	10.5	11.0	11.6	12.2
	45	5.1	5.7	6.0	6.2	6.5	5.8	6.5	6.8	7.1	7.4	6.5	7.3	7.6	8.0	8.4	7.3	8.2	8.6	9.0	9.5	8.2	9.3	9.7	10.2	10.7
	47	4.8	5.4	5.6	5.8	6.1	5.4	6.1	6.4	6.7	7.0	6.1	6.9	7.2	7.6	7.9	6.9	7.8	8.2	8.6	9.0	7.8	8.8	9.2	9.7	10.2

525BFM-06-00

Figure 4-51* (Sheet 2)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS *13870					12750					12500					12000					11500				
		WIND KNOTS -10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
4000	-35	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.4	10.7	11.2	11.8	12.4	10.2	11.7	12.2	12.8	13.5
	-30	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-25	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-20	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-15	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.5
	-10	7.0	7.9	8.2	8.6	8.9	8.4	9.5	9.9	10.4	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.4
	-5	7.0	7.9	8.2	8.6	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	0	7.0	7.8	8.1	8.5	8.8	8.4	9.4	9.8	10.2	10.7	8.7	9.8	10.2	10.7	11.2	9.5	10.6	11.1	11.6	12.2	10.3	11.6	12.1	12.7	13.3
	5	6.7	7.5	7.8	8.2	8.5	8.1	9.1	9.5	9.9	10.3	8.4	9.5	9.9	10.3	10.8	9.2	10.3	10.7	11.2	11.8	9.9	11.2	11.7	12.2	12.8
	10	6.4	7.1	7.4	7.7	8.0	7.7	8.6	8.9	9.3	9.8	8.0	9.0	9.3	9.8	10.2	8.7	9.8	10.2	10.6	11.1	9.4	10.6	11.1	11.6	12.2
	15	6.0	6.6	6.9	7.2	7.5	7.2	8.1	8.4	8.8	9.2	7.6	8.5	8.8	9.2	9.6	8.2	9.2	9.6	10.1	10.5	9.0	10.1	10.5	11.0	11.5
	20	5.5	6.1	6.4	6.6	6.9	6.8	7.6	7.9	8.2	8.6	7.1	7.9	8.3	8.6	9.0	7.7	8.7	9.1	9.5	9.9	8.5	9.5	9.9	10.4	10.9
	25	4.7	5.3	5.5	5.7	5.9	5.9	6.6	6.9	7.2	7.5	6.2	7.0	7.2	7.5	7.9	6.8	7.7	8.0	8.3	8.7	7.5	8.5	8.8	9.2	9.6
	30	3.9	4.4	4.6	4.7	4.9	5.1	5.7	5.9	6.1	6.4	5.3	6.0	6.2	6.5	6.8	5.9	6.6	6.9	7.2	7.5	6.6	7.4	7.7	8.0	8.4
	35	3.2	3.5	3.6	3.8	3.9	4.2	4.7	4.9	5.1	5.3	4.5	5.0	5.2	5.4	5.6	5.0	5.6	5.8	6.1	6.4	5.6	6.3	6.6	6.9	7.2
	40	2.4	2.7	2.8	2.9	3.0	3.4	3.8	4.0	4.1	4.3	3.7	4.1	4.2	4.4	4.6	4.2	4.7	4.9	5.1	5.3	4.7	5.3	5.5	5.8	6.0
	45	1.8	2.0	2.0	2.1	2.2	2.7	3.0	3.1	3.2	3.4	2.9	3.3	3.4	3.5	3.7	3.4	3.8	4.0	4.1	4.3	3.9	4.4	4.6	4.8	5.0
5000	-35	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.7	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-30	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-25	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.5
	-20	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.5
	-15	7.1	7.9	8.2	8.6	8.9	8.5	9.5	9.9	10.4	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.8	12.3	10.3	11.7	12.2	12.8	13.4
	-10	7.1	7.9	8.2	8.6	8.9	8.5	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.7	12.3	10.4	11.7	12.2	12.8	13.4
	-5	7.0	7.8	8.1	8.4	8.8	8.4	9.4	9.8	10.2	10.7	8.7	9.8	10.2	10.6	11.1	9.4	10.6	11.1	11.6	12.1	10.2	11.5	12.0	12.6	13.2
	0	6.6	7.4	7.7	8.0	8.4	8.0	9.0	9.3	9.7	10.2	8.3	9.3	9.7	10.2	10.6	9.0	10.2	10.6	11.1	11.6	9.8	11.0	11.5	12.1	12.6
	5	6.2	6.9	7.2	7.5	7.8	7.5	8.4	8.8	9.1	9.5	7.8	8.8	9.2	9.5	10.0	8.5	9.6	10.0	10.4	10.9	9.3	10.4	10.9	11.4	11.9
	10	5.8	6.5	6.7	7.0	7.3	7.1	7.9	8.2	8.6	9.0	7.4	8.3	8.6	9.0	9.4	8.1	9.0	9.4	9.8	10.3	8.8	9.9	10.3	10.8	11.3
	15	5.4	6.0	6.3	6.5	6.8	6.7	7.4	7.7	8.1	8.4	7.0	7.8	8.1	8.4	8.8	7.6	8.5	8.9	9.3	9.7	8.3	9.3	9.7	10.2	10.6
	20	4.9	5.5	5.7	5.9	6.2	6.2	6.9	7.1	7.4	7.8	6.5	7.2	7.5	7.8	8.2	7.1	7.9	8.3	8.6	9.0	7.8	8.7	9.1	9.5	9.9
	25	4.2	4.6	4.8	5.0	5.2	5.3	5.9	6.1	6.4	6.7	5.6	6.2	6.5	6.7	7.0	6.2	6.9	7.2	7.5	7.8	6.8	7.6	8.0	8.3	8.7
	30	3.4	3.8	3.9	4.0	4.2	4.5	5.0	5.2	5.4	5.6	4.7	5.3	5.5	5.7	5.9	5.3	5.9	6.1	6.4	6.7	5.9	6.6	6.9	7.2	7.5
	35	2.6	2.9	3.0	3.2	3.3	3.6	4.1	4.2	4.4	4.6	3.9	4.3	4.5	4.7	4.9	4.4	4.9	5.1	5.4	5.6	5.0	5.6	5.8	6.1	6.3
	40	1.9	2.2	2.2	2.3	2.4	2.9	3.2	3.3	3.5	3.6	3.1	3.5	3.6	3.8	3.9	3.6	4.0	4.2	4.4	4.6	4.2	4.6	4.8	5.0	5.3
	42	1.7	1.9	1.9	2.0	2.1	2.6	2.9	3.0	3.1	3.3	2.8	3.2	3.3	3.4	3.6	3.3	3.7	3.9	4.0	4.2	3.9	4.3	4.5	4.7	4.9
6000	-40	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.4	9.5	10.7	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-35	7.0	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-30	7.1	7.9	8.2	8.6	9.0	8.4	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.8	12.4	10.3	11.7	12.2	12.8	13.5
	-25	7.1	7.9	8.2	8.6	9.0	8.5	9.5	9.9	10.4	10.9	8.8	9.9	10.3	10.8	11.3	9.5	10.8	11.2	11.8	12.3	10.4	11.7	12.2	12.8	13.5
	-20	7.1	7.9	8.2	8.6	8.9	8.5	9.5	9.9	10.4	10.8	8.8	9.9	10.3	10.8	11.3	9.6	10.8	11.2	11.8	12.3	10.4	11.7	12.2	12.8	13.4
	-15	7.0	7.8	8.2	8.5	8.9	8.4	9.4	9.8	10.3	10.7	8.8	9.8	10.3	10.7	11.2	9.5	10.7	11.2	11.7	12.2	10.3	11.6	12.1	12.7	13.3
	-10	6.9	7.6	7.9	8.3	8.6	8.2	9.2	9.6	10.0	10.5	8.6	9.6	10.0	10.4	10.9	9.3	10.4	10.9	11.4	11.9	10.1	11.3	11.8	12.4	13.0
	-5	6.5	7.3	7.5	7.9	8.2	7.8	8.8	9.1	9.5	10.0	8.2	9.2	9.5	10.0	10.4	8.9	10.0	10.4	10.9	11.4	9.6	10.9	11.3	11.8	12.4
	0	6.1	6.8	7.0	7.3	7.6	7.4	8.2	8.6	9.0	9.3	7.7	8.6	9.0	9.4	9.8	8.4	9.4	9.8	10.2	10.7	9.1	10.3	10.7	11.2	11.7
	5	5.7	6.3	6.5	6.8	7.1	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.4	8.8	9.2	7.9	8.9	9.2	9.6	10.1	8.6	9.7	10.1	10.5	11.0
	10	5.3	5.9	6.1	6.3	6.6	6.5	7.2	7.5	7.8	8.2	6.8	7.6	7.9	8.2	8.6	7.4	8.3	8.7	9.0	9.5	8.1	9.1	9.5	9.9	10.4
	15	4.9	5.4	5.6	5.9	6.1	6.1	6.8	7.1	7.3	7.7	6.4	7.1	7.4	7.7	8.1	7.0	7.8	8.2	8.5	8.9	7.7	8.6	9.0	9.4	9.8
	20	4.4	4.9	5.0	5.2	5.4	5.5	6.2	6.4	6.7	6.9	5.8	6.5	6.7	7.0	7.3	6.4	7.2	7.5	7.8	8.1	7.1	7.9	8.3	8.6	9.0
	25	3.6	4.0	4.1	4.3	4.5	4.7	5.2	5.4	5.6	5.9	4.9	5.5	5.7	6.0	6.2	5.5	6.2	6.4	6.7	7.0	6.1	6.9	7.2	7.5	7.8
	30	2.8	3.2	3.3	3.4	3.5	3.9	4.3	4.5	4.6	4.8	4.1	4.6	4.8	5.0	5.2	4.7	5.2	5.4	5.6	5.9	5.2	5.9	6.1	6.4	6.6
	35	2.1	2.4	2.5	2.6	2.7	3.1	3.5	3.6	3.7	3.9	3.3	3.7	3.9	4.0	4.2	3.9	4.3	4.5	4.6	4.8	4.4	4.9	5.1	5.3	5.6
	40	1.5	1.6	1.7	1.8	1.8	2.4	2.7	2.8	2.9	3.0	2.6	2.9	3.0	3.1	3.3	3.1	3.4	3.6	3.7	3.9	3.6	4.0	4.2	4.4	4.5
7000	-40	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.6	12.2	12.8	13.4
	-35	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	-30	7.1	7.9	8.2	8.6	8.9	8.4	9.5	9.9	10.3	10.8	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3	10.3	11.7	12.2	12.8	13.4
	-25	7.0	7.9	8.2	8.5	8.9	8.4	9.5	9.8	10.3	10.8	8.8	9.8	10.3	10.7	11.2	9.5	10.7	11.2	11.7	12.2	10.3	11.6	12.1	12.7	13.3
	-20	6.9	7.7	8.0	8.4	8.7	8.3	9.3	9.7	10.1	10.6	8.6	9.7	10.1	10.5	11.0	9.4	10.5	11.0	11.5	12.0	10.2	11.4	11.9	12.5	13.1
	-15	6.7	7.4	7.7	8.0	8.4	8.0	8.9	9.3	9.7	10.1	8.3	9.3	9.7	10.1	10.6	9.0	10.1	10.6	11.0	11.6	9.8	11.0	11.5	12.0	12.6
	-10	6.3	7.1	7.3	7.6	7.9	7.6	8.5	8.9	9.3	9.7	8.0	8.9	9.3	9.7	10.1	8.7	9.7	10.1	10.6	11.0	9.4	10.6	11.0	11.5	12.1
	-5	6.0	6.6	6.9	7.2	7.5	7.2	8.1	8.4	8.8	9.1	7.5	8.4	8.8	9.2	9.6	8.2	9.2	9.6	10.0	10.5	9.0	10.1	10.5	11.0	11.5
	0	5.5	6.2	6.4	6.6	6.9	6.8	7.6	7.9	8.2	8.6	7.1	7.9	8.2	8.6	9.0	7.8	8.7	9.0	9.4	9.8	8.5	9.5	9.9	10.3	10.8
	5	5.1	5.7	5.9	6.2	6.4	6.4	7.1	7.4	7.7	8.0	6.6	7.4	7.7	8.0	8.4	7.3	8.1	8.5	8.8	9.2	8.0	8.9	9.3	9.7	10.2
	10	4.8	5.3	5.5	5.7	5.9	5.9	6.6	6.9	7.1	7.5	6.2	6.9	7.2	7.5	7.8	6.8	7.6	8.0	8.3	8.7	7.5	8.4	8.8	9.1	9.6
	15	4.4	4.9	5.1	5.3	5.5	5.5	6.2	6.4	6.7	7.0	5.8	6.5	6.7	7.0	7.3	6.4	7.2	7.5	7.8	8.1	7.1	7.9	8.3	8.6	9.0
	20	3.8	4.2	4.4	4.5	4.7	4.9	5.5	5.7	5.9	6.1	5.2	5.8	6.0	6.2	6.5	5.8	6.4	6.7	7.0	7.3	6.4	7.2	7.4	7.8	8.1
	25	3.0	3.4	3.5	3.6	3.8	4.1	4.5	4.7	4.9	5.1	4.3	4.8	5.0	5.2	5.4	4.9	5.4	5.7	5.9	6.1	5.5	6.1	6.4	6.6	6.9
	30	2.3	2.6	2.7	2.8	2.9	3.3	3.7	3.8	4.0	4.1	3.5	3.9	4.1	4.2	4.4	4.1	4.5	4.7	4.9	5.1	4.6	5.1	5.4	5.6	5.8
	35	1.7	1.8	1.9	2.0	2.0	2.6	2.9	3.0	3.1	3.2	2.8	3.1	3.2	3.4	3.5	3.3	3.6	3.8	3.9	4.1	3.8	4.2	4.4	4.6	4.8
	37	1.4	1.6	1.6	1.7	1.7	2.3	2.5	2.6	2.7	2.9	2.5	2.8	2.9	3.0	3.1	3.0	3.3	3.4	3.6	3.7	3.5	3.9	4.1	4.2	4.4

525BFM-06-00

* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-51* (Sheet 3)

MODEL 525B

SECTION IV - PERFORMANCE
APPROACH AND LANDING

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS / WIND KNOTS

ALT FT	TEMP DEG C	11000					10500					10000					9500					9000				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
4000	-35	11.1	12.7	13.3	14.0	14.8	12.1	13.8	14.5	15.3	16.1	13.1	15.0	15.8	16.7	17.7	14.3	16.4	17.3	18.3	19.4	15.6	18.0	19.0	20.1	21.3
	-30	11.1	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.1	15.1	15.8	16.7	17.6	14.3	16.4	17.3	18.3	19.3	15.6	18.0	19.0	20.1	21.3
	-25	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.3	16.5	17.3	18.3	19.3	15.6	18.0	19.0	20.0	21.2
	-20	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	-15	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	-10	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	19.0	20.0	21.1
	-5	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	18.9	20.0	21.1
	0	11.1	12.6	13.2	13.8	14.5	12.1	13.7	14.4	15.1	15.8	13.1	14.9	15.7	16.5	17.3	14.3	16.3	17.1	18.0	19.0	15.6	17.9	18.8	19.8	20.9
	5	10.8	12.2	12.7	13.3	14.0	11.7	13.3	13.9	14.6	15.3	12.7	14.5	15.2	15.9	16.8	13.9	15.8	16.6	17.5	18.4	15.2	17.3	18.2	19.2	20.2
	10	10.3	11.6	12.1	12.7	13.3	11.2	12.7	13.2	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.3	15.1	15.9	16.7	17.6	14.5	16.6	17.4	18.3	19.3
	15	9.8	11.0	11.5	12.0	12.6	10.7	12.0	12.6	13.2	13.9	11.6	13.2	13.8	14.5	15.2	12.7	14.4	15.1	15.9	16.7	13.9	15.8	16.6	17.5	18.4
	20	9.2	10.4	10.9	11.4	11.9	10.1	11.4	11.9	12.5	13.1	11.1	12.5	13.1	13.7	14.4	12.1	13.7	14.4	15.1	15.9	13.3	15.1	15.9	16.7	17.6
	25	8.3	9.3	9.7	10.2	10.6	9.1	10.3	10.7	11.2	11.8	10.0	11.3	11.8	12.4	13.0	11.0	12.5	13.0	13.7	14.4	12.1	13.7	14.4	15.1	15.9
	30	7.3	8.2	8.5	8.9	9.3	8.0	9.1	9.5	9.9	10.4	8.9	10.0	10.5	11.0	11.5	9.8	11.1	11.6	12.2	12.8	10.8	12.3	12.9	13.6	14.3
	35	6.3	7.1	7.4	7.7	8.0	7.0	7.9	8.2	8.6	9.0	7.8	8.8	9.2	9.6	10.1	8.7	9.8	10.3	10.8	11.3	9.6	10.9	11.5	12.0	12.6
	40	5.4	6.0	6.3	6.5	6.8	6.0	6.8	7.1	7.4	7.7	6.8	7.6	8.0	8.3	8.8	7.6	8.6	9.0	9.4	9.9	8.5	9.6	10.1	10.6	11.1
	45	4.5	5.1	5.3	5.5	5.8	5.1	5.8	6.0	6.3	6.6	5.8	6.6	6.9	7.2	7.5	6.6	7.5	7.8	8.2	8.6	7.5	8.5	8.8	9.3	9.7
5000	-35	11.1	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.3	16.4	17.3	18.3	19.3	15.6	18.0	19.0	20.0	21.2
	-30	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.3	16.5	17.3	18.2	19.3	15.6	18.0	19.0	20.0	21.2
	-25	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	-20	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	19.0	20.0	21.1
	-15	11.2	12.7	13.3	13.9	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	19.0	20.0	21.1
	-10	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.3	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	18.9	19.9	21.1
	-5	11.1	12.5	13.1	13.7	14.4	12.0	13.7	14.3	15.0	15.8	13.1	14.9	15.6	16.4	17.2	14.3	16.3	17.0	17.9	18.9	15.6	17.8	18.7	19.7	20.8
	0	10.6	12.0	12.6	13.2	13.8	11.6	13.1	13.7	14.4	15.1	12.6	14.3	15.0	15.7	16.5	13.7	15.6	16.4	17.2	18.1	15.0	17.1	18.0	18.9	19.9
	5	10.1	11.4	11.9	12.5	13.1	11.0	12.4	13.0	13.6	14.3	12.0	13.6	14.2	14.9	15.7	13.1	14.9	15.6	16.4	17.2	14.3	16.3	17.1	18.0	19.0
	10	9.6	10.8	11.3	11.8	12.4	10.4	11.8	12.3	12.9	13.6	11.4	12.9	13.5	14.2	14.9	12.5	14.2	14.8	15.6	16.4	13.7	15.6	16.3	17.1	18.1
	15	9.1	10.2	10.7	11.2	11.7	9.9	11.2	11.7	12.3	12.9	10.9	12.3	12.9	13.5	14.2	11.9	13.5	14.1	14.8	15.6	13.1	14.9	15.6	16.4	17.2
	20	8.5	9.6	10.0	10.5	11.0	9.4	10.5	11.0	11.5	12.1	10.3	11.6	12.1	12.7	13.3	11.3	12.8	13.4	14.0	14.7	12.4	14.1	14.8	15.5	16.3
	25	7.5	8.5	8.8	9.2	9.7	8.3	9.4	9.8	10.2	10.7	9.2	10.4	10.8	11.3	11.9	10.1	11.5	12.0	12.6	13.2	11.2	12.7	13.3	13.9	14.7
	30	6.6	7.4	7.7	8.0	8.4	7.3	8.2	8.6	8.9	9.4	8.1	9.1	9.5	10.0	10.5	9.0	10.2	10.6	11.1	11.7	10.0	11.3	11.8	12.4	13.0
	35	5.6	6.3	6.6	6.9	7.2	6.3	7.1	7.4	7.7	8.1	7.1	8.0	8.3	8.7	9.1	7.9	8.9	9.3	9.8	10.3	8.8	10.0	10.5	11.0	11.5
	40	4.7	5.3	5.5	5.8	6.0	5.4	6.0	6.3	6.6	6.9	6.1	6.9	7.2	7.5	7.8	6.9	7.8	8.1	8.5	8.9	7.8	8.8	9.2	9.6	10.1
	42	4.4	5.0	5.2	5.4	5.6	5.1	5.7	5.9	6.2	6.5	5.7	6.5	6.7	7.0	7.4	6.5	7.3	7.7	8.0	8.4	7.4	8.3	8.7	9.1	9.6
6000	-40	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.3	16.1	13.2	15.1	15.8	16.7	17.6	14.3	16.5	17.3	18.2	19.3	15.6	18.0	19.0	20.0	21.2
	-35	11.2	12.7	13.3	14.0	14.7	12.1	13.8	14.5	15.2	16.1	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	-30	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.7	17.6	14.4	16.5	17.3	18.2	19.3	15.7	18.0	19.0	20.0	21.2
	-25	11.2	12.7	13.3	14.0	14.7	12.2	13.8	14.5	15.2	16.0	13.3	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	19.0	20.0	21.1
	-20	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.3	15.1	15.8	16.6	17.5	14.4	16.5	17.3	18.2	19.2	15.7	18.0	18.9	19.9	21.1
	-15	11.2	12.6	13.2	13.8	14.5	12.1	13.7	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.3	14.3	16.3	17.1	18.0	19.0	15.6	17.9	18.8	19.8	20.9
	-10	10.9	12.3	12.9	13.5	14.2	11.9	13.4	14.0	14.7	15.5	12.9	14.6	15.3	16.1	16.9	14.0	16.0	16.8	17.6	18.6	15.3	17.5	18.4	19.3	20.4
	-5	10.5	11.8	12.3	12.9	13.6	11.4	12.9	13.5	14.1	14.8	12.4	14.1	14.7	15.4	16.2	13.5	15.4	16.1	16.9	17.8	14.8	16.8	17.7	18.6	19.6
	0	9.9	11.2	11.7	12.2	12.8	10.8	12.2	12.8	13.4	14.0	11.8	13.4	14.0	14.7	15.4	12.9	14.6	15.3	16.1	16.9	14.1	16.1	16.8	17.7	18.7
	5	9.4	10.6	11.1	11.6	12.1	10.3	11.6	12.1	12.7	13.3	11.2	12.7	13.3	13.9	14.6	12.3	13.9	14.6	15.3	16.1	13.5	15.3	16.0	16.9	17.8
	10	8.9	10.0	10.5	10.9	11.4	9.8	11.0	11.5	12.0	12.6	10.7	12.1	12.6	13.2	13.9	11.7	13.3	13.9	14.5	15.3	12.8	14.6	15.3	16.0	16.9
	15	8.4	9.5	9.9	10.3	10.8	9.3	10.4	10.9	11.4	11.9	10.2	11.5	12.0	12.5	13.2	11.2	12.6	13.2	13.8	14.5	12.3	13.9	14.6	15.3	16.1
	20	7.8	8.8	9.1	9.5	10.0	8.6	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.7	12.2	10.4	11.8	12.3	12.9	13.6	11.5	13.1	13.7	14.3	15.1
	25	6.8	7.7	8.0	8.3	8.7	7.6	8.5	8.9	9.3	9.7	8.4	9.5	9.9	10.3	10.8	9.3	10.5	11.0	11.5	12.1	10.3	11.7	12.2	12.8	13.5
	30	5.9	6.6	6.9	7.2	7.5	6.6	7.4	7.7	8.0	8.4	7.4	8.3	8.6	9.0	9.5	8.2	9.3	9.7	10.1	10.6	9.1	10.3	10.8	11.3	11.9
	35	5.0	5.6	5.8	6.1	6.3	5.7	6.3	6.6	6.9	7.2	6.4	7.2	7.5	7.8	8.2	7.2	8.1	8.4	8.8	9.3	8.1	9.1	9.5	10.0	10.5
	40	4.2	4.7	4.9	5.1	5.3	4.8	5.4	5.6	5.8	6.1	5.5	6.1	6.4	6.7	7.0	6.2	7.0	7.3	7.6	8.0	7.0	8.0	8.3	8.7	9.1
7000	-40	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.3	16.4	17.3	18.2	19.2	15.6	18.0	18.9	19.9	21.1
	-35	11.2	12.7	13.3	13.9	14.6	12.1	13.8	14.5	15.2	16.0	13.2	15.0	15.8	16.6	17.5	14.4	16.4	17.3	18.2	19.2	15.7	18.0	18.9	19.9	21.1
	-30	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.2	15.1	15.8	16.6	17.5	14.4	16.4	17.3	18.2	19.2	15.7	18.0	18.9	19.9	21.0
	-25	11.2	12.6	13.2	13.8	14.5	12.1	13.8	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.4	14.4	16.4	17.2	18.0	19.0	15.7	17.9	18.8	19.8	20.9
	-20	11.0	12.4	13.0	13.6	14.3	11.9	13.5	14.2	14.8	15.6	13.0	14.7	15.4	16.2	17.1	14.1	16.1	16.9	17.7	18.7	15.4	17.6	18.5	19.5	20.5
	-15	10.6	12.0	12.5	13.1	13.8	11.6	13.1	13.7	14.3	15.0	12.6	14.3	14.9	15.7	16.5	13.7	15.6	16.3	17.1	18.1	15.0	17.1	17.9	18.8	19.8
	-10	10.2	11.5	12.0	12.6	13.2	11.1	12.6	13.1	13.8	14.4	12.1	13.7	14.4	15.1	15.8	13.2	15.0	15.7	16.5	17.4	14.5	16.5	17.3	18.1	19.1
	-5	9.8	11.0	11.5	12.0	12.6	10.6	12.0	12.5	13.1	13.8	11.6	13.1	13.7	14.4	15.1	12.7	14.4	15.1	15.8	16.6	13.9	15.8	16.6	17.4	18.3
	0	9.2	10.4	10.8	11.3	11.9	10.1	11.4	11.9	12.4	13.0	11.0	12.5	13.0	13.7	14.3	12.1	13.7	14.3	15.0	15.8	13.3	15.1	15.8	16.6	17.4
	5	8.7	9.8	10.2	10.7	11.2	9.6	10.8	11.2	11.8	12.3	10.5	11.8	12.4	12.9	13.6	11.5	13.0	13.6	14.3	15.0	12.6	14.3	15.0	15.8	16.6
	10	8.3	9.3	9.7	10.1	10.6	9.1	10.2	10.6	11.1	11.6	10.0	11.2	11.7	12.3	12.9	10.9	12.4	12.9	13.5	14.2	12.0	13.6	14.3	15.0	15.8
	15	7.8	8.8	9.1	9.5	10.0	8.6	9.7	10.1	10.5	11.0	9.5	10.7	11.1	11.6	12.2	10.4	11.8	12.3	12.9	13.5	11.5	13.0	13.6	14.3	15.0
	20	7.1	7.9	8.3	8.6	9.0	7.9	8.8	9.2	9.6	10.0	8.7	9.8	10.2	10.7	11.2	9.6	10.8	11.3	11.8	12.4	10.6	12.0	12.6	13.2	13.8
	25	6.1	6.9	7.1	7.5	7.8	6.9	7.7	8.0	8.4	8.7	7.6	8.6	8.9	9.4	9.8	8.5	9.6	10.0	10.5	11.0	9.5	10.7	11.2	11.7	12.3
	30	5.2	5.8	6.1	6.3	6.6	5.9	6.6	6.9	7.2	7.5	6.6	7.4	7.8	8.1	8.5	7.4	8.4	8.7	9.1	9.6	8.3	9.4	9.8	10.3	10.8
	35	4.4	4.9	5.1	5.3	5.5	5.0	5.6	5.8	6.1	6.4	5.7	6.4	6.7	7.0	7.3	6.5	7.3	7.6	7.9	8.3	7.3	8.2	8.6	9.0	9.4
	37	4.1	4.5	4.7	4.9	5.1	4.7	5.2	5.4	5.7	5.9	5.3	6.0	6.2	6.5	6.8	6.1	6.8	7.1	7.5	7.8	6.9	7.8	8.1	8.5	8.9

525BFM-06-00

Figure 4-51* (Sheet 4)

SECTION IV - PERFORMANCE
APPROACH AND LANDING

MODEL 525B

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS / WIND KNOTS

ALT FT	TEMP DEG C	*13870					12750					12500					12000					11500				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-45	7.0	7.8	8.1	8.5	8.9	8.4	9.4	9.8	10.3	10.8	8.7	9.8	10.3	10.7	11.2	9.5	10.7	11.1	11.7	12.2	10.3	11.6	12.1	12.7	13.3
	-40	7.0	7.8	8.2	8.5	8.9	8.4	9.4	9.8	10.3	10.8	8.7	9.8	10.3	10.7	11.2	9.5	10.7	11.2	11.7	12.2	10.3	11.6	12.1	12.7	13.3
	-35	7.0	7.8	8.1	8.5	8.9	8.4	9.4	9.8	10.3	10.7	8.8	9.8	10.2	10.7	11.2	9.5	10.7	11.1	11.6	12.2	10.3	11.6	12.1	12.7	13.3
	-30	6.9	7.7	8.1	8.4	8.8	8.3	9.3	9.7	10.1	10.6	8.7	9.7	10.1	10.6	11.1	9.4	10.5	11.0	11.5	12.0	10.2	11.5	12.0	12.5	13.1
	-25	6.7	7.5	7.8	8.1	8.5	8.1	9.0	9.4	9.8	10.3	8.4	9.4	9.8	10.3	10.7	9.1	10.2	10.7	11.2	11.7	9.9	11.1	11.6	12.2	12.7
	-20	6.4	7.1	7.4	7.7	8.0	7.7	8.6	9.0	9.4	9.8	8.0	9.0	9.4	9.8	10.2	8.7	9.8	10.2	10.7	11.2	9.5	10.7	11.1	11.6	12.2
	-15	6.1	6.8	7.0	7.3	7.6	7.4	8.2	8.6	8.9	9.3	7.7	8.6	8.9	9.3	9.7	8.4	9.4	9.8	10.2	10.7	9.1	10.2	10.7	11.1	11.7
	-10	5.8	6.4	6.7	6.9	7.2	7.0	7.8	8.2	8.5	8.9	7.3	8.2	8.5	8.9	9.3	8.0	9.0	9.3	9.7	10.2	8.7	9.8	10.2	10.6	11.1
	-5	5.4	6.0	6.2	6.5	6.7	6.6	7.4	7.7	8.0	8.4	7.0	7.8	8.1	8.4	8.8	7.6	8.5	8.8	9.2	9.6	8.3	9.3	9.7	10.1	10.6
	0	5.0	5.6	5.8	6.0	6.2	6.2	6.9	7.2	7.5	7.8	6.5	7.3	7.5	7.9	8.2	7.1	8.0	8.3	8.6	9.0	7.8	8.8	9.1	9.5	9.9
	5	4.6	5.1	5.3	5.5	5.7	5.8	6.4	6.7	7.0	7.3	6.1	6.8	7.0	7.3	7.6	6.7	7.5	7.8	8.1	8.4	7.4	8.2	8.6	8.9	9.3
	10	4.3	4.7	4.9	5.1	5.3	5.4	6.0	6.2	6.5	6.7	5.7	6.3	6.6	6.8	7.1	6.3	7.0	7.3	7.6	7.9	6.9	7.7	8.0	8.4	8.8
	15	3.9	4.3	4.5	4.7	4.8	5.0	5.6	5.8	6.0	6.3	5.3	5.9	6.1	6.3	6.6	5.9	6.5	6.8	7.1	7.4	6.5	7.3	7.5	7.9	8.2
	20	3.3	3.6	3.7	3.9	4.0	4.3	4.8	5.0	5.2	5.4	4.6	5.1	5.3	5.5	5.7	5.1	5.7	5.9	6.2	6.4	5.7	6.4	6.6	6.9	7.2
	25	2.5	2.8	2.9	3.0	3.1	3.5	3.9	4.0	4.2	4.4	3.8	4.2	4.3	4.5	4.7	4.3	4.8	4.9	5.1	5.4	4.9	5.4	5.6	5.8	6.1
	30	1.8	2.0	2.1	2.2	2.2	2.8	3.1	3.2	3.3	3.4	3.0	3.3	3.4	3.6	3.7	3.5	3.9	4.0	4.2	4.3	4.0	4.5	4.6	4.8	5.0
	35	1.2	1.3	1.4	1.4	1.5	2.1	2.3	2.4	2.4	2.5	2.3	2.5	2.6	2.7	2.8	2.7	3.0	3.1	3.3	3.4	3.2	3.6	3.7	3.9	4.0
9000	-45	6.9	7.7	8.0	8.3	8.7	8.2	9.2	9.6	10.1	10.5	8.6	9.6	10.0	10.5	11.0	9.3	10.5	10.9	11.4	12.0	10.1	11.4	11.9	12.4	13.0
	-40	6.9	7.7	8.0	8.3	8.7	8.3	9.2	9.6	10.1	10.5	8.6	9.6	10.0	10.5	11.0	9.3	10.5	10.9	11.4	12.0	10.1	11.4	11.9	12.4	13.0
	-35	6.8	7.6	7.9	8.2	8.5	8.1	9.1	9.5	9.9	10.3	8.5	9.5	9.9	10.3	10.8	9.2	10.3	10.7	11.2	11.7	9.9	11.2	11.7	12.2	12.8
	-30	6.5	7.2	7.5	7.8	8.2	7.8	8.7	9.1	9.5	9.9	8.2	9.1	9.5	9.9	10.4	8.8	9.9	10.3	10.8	11.3	9.6	10.8	11.3	11.8	12.3
	-25	6.2	6.9	7.1	7.4	7.7	7.5	8.3	8.7	9.0	9.4	7.8	8.7	9.1	9.4	9.9	8.5	9.5	9.9	10.3	10.8	9.2	10.3	10.8	11.3	11.8
	-20	5.8	6.5	6.7	7.0	7.3	7.1	7.9	8.2	8.6	9.0	7.4	8.3	8.6	9.0	9.4	8.1	9.0	9.4	9.8	10.3	8.8	9.9	10.3	10.8	11.2
	-15	5.5	6.1	6.4	6.6	6.9	6.8	7.5	7.8	8.2	8.5	7.1	7.9	8.2	8.6	8.9	7.7	8.6	9.0	9.4	9.8	8.4	9.5	9.9	10.3	10.7
	-10	5.2	5.8	6.0	6.3	6.5	6.4	7.2	7.5	7.8	8.1	6.7	7.5	7.8	8.1	8.5	7.4	8.2	8.6	8.9	9.3	8.1	9.0	9.4	9.8	10.3
	-5	4.9	5.4	5.6	5.8	6.1	6.1	6.8	7.0	7.3	7.6	6.4	7.1	7.4	7.7	8.0	7.0	7.8	8.1	8.4	8.8	7.7	8.6	8.9	9.3	9.7
	0	4.5	5.0	5.2	5.4	5.6	5.7	6.3	6.5	6.8	7.1	5.9	6.6	6.9	7.1	7.4	6.6	7.3	7.6	7.9	8.2	7.2	8.1	8.4	8.7	9.1
	5	4.1	4.6	4.7	4.9	5.1	5.3	5.8	6.1	6.3	6.6	5.5	6.2	6.4	6.6	6.9	6.1	6.8	7.1	7.4	7.7	6.8	7.6	7.9	8.2	8.5
	10	3.8	4.2	4.3	4.5	4.7	4.9	5.4	5.6	5.8	6.1	5.1	5.7	5.9	6.2	6.4	5.7	6.4	6.6	6.9	7.2	6.3	7.1	7.3	7.6	8.0
	15	3.4	3.7	3.9	4.0	4.2	4.4	4.9	5.1	5.3	5.5	4.7	5.2	5.4	5.6	5.9	5.3	5.9	6.1	6.3	6.6	5.9	6.5	6.8	7.1	7.4
	20	2.7	3.0	3.1	3.2	3.3	3.7	4.1	4.3	4.4	4.6	4.0	4.4	4.6	4.7	4.9	4.5	5.0	5.2	5.4	5.6	5.1	5.7	5.9	6.1	6.4
	25	2.0	2.2	2.3	2.4	2.5	3.0	3.3	3.4	3.5	3.7	3.2	3.5	3.7	3.8	4.0	3.7	4.1	4.2	4.4	4.6	4.2	4.7	4.9	5.1	5.3
	30	1.3	1.5	1.5	1.6	1.6	2.2	2.5	2.6	2.7	2.8	2.5	2.7	2.8	2.9	3.0	2.9	3.2	3.4	3.5	3.6	3.4	3.8	4.0	4.1	4.3
	32	1.1	1.2	1.2	1.3	1.3	1.9	2.2	2.2	2.3	2.4	2.2	2.4	2.5	2.6	2.7	2.6	2.9	3.0	3.1	3.3	3.1	3.5	3.6	3.7	3.9
10000	-50	6.5	7.2	7.5	7.8	8.2	7.8	8.7	9.1	9.5	9.9	8.1	9.1	9.5	9.9	10.3	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	-45	6.5	7.2	7.5	7.8	8.2	7.8	8.7	9.1	9.5	9.9	8.1	9.1	9.5	9.9	10.3	8.8	9.9	10.3	10.8	11.3	9.5	10.7	11.2	11.7	12.3
	-40	6.5	7.2	7.5	7.8	8.2	7.8	8.7	9.1	9.5	9.9	8.1	9.1	9.5	9.9	10.3	8.8	9.9	10.3	10.8	11.3	9.6	10.7	11.2	11.7	12.3
	-35	6.3	7.0	7.2	7.5	7.9	7.6	8.4	8.8	9.2	9.6	7.9	8.8	9.2	9.6	10.0	8.6	9.6	10.0	10.4	10.9	9.3	10.5	10.9	11.4	11.9
	-30	5.9	6.6	6.8	7.1	7.4	7.2	8.0	8.4	8.7	9.1	7.5	8.4	8.7	9.1	9.5	8.2	9.2	9.5	10.0	10.4	8.9	10.0	10.4	10.9	11.4
	-25	5.6	6.2	6.5	6.7	7.0	6.8	7.6	7.9	8.3	8.6	7.2	8.0	8.3	8.7	9.0	7.8	8.7	9.1	9.5	9.9	8.5	9.5	9.9	10.4	10.9
	-20	5.3	5.9	6.1	6.3	6.6	6.5	7.3	7.5	7.8	8.2	6.8	7.6	7.9	8.2	8.6	7.5	8.3	8.7	9.0	9.4	8.2	9.1	9.5	9.9	10.4
	-15	5.0	5.5	5.8	6.0	6.2	6.2	6.9	7.2	7.4	7.8	6.5	7.2	7.5	7.8	8.1	7.1	7.9	8.3	8.6	9.0	7.8	8.7	9.1	9.5	9.9
	-10	4.7	5.2	5.4	5.6	5.8	5.9	6.5	6.8	7.1	7.4	6.2	6.9	7.1	7.4	7.7	6.8	7.6	7.9	8.2	8.5	7.5	8.3	8.7	9.0	9.4
	-5	4.4	4.8	5.0	5.2	5.4	5.5	6.1	6.4	6.6	6.9	5.8	6.4	6.7	7.0	7.3	6.4	7.1	7.4	7.7	8.0	7.1	7.9	8.2	8.5	8.9
	0	4.0	4.4	4.6	4.8	4.9	5.1	5.7	5.9	6.1	6.4	5.4	6.0	6.2	6.5	6.7	6.0	6.7	6.9	7.2	7.5	6.6	7.4	7.7	8.0	8.3
	5	3.7	4.0	4.2	4.3	4.5	4.7	5.2	5.4	5.7	5.9	5.0	5.5	5.8	6.0	6.2	5.6	6.2	6.4	6.7	7.0	6.2	6.9	7.2	7.5	7.8
	10	3.3	3.7	3.8	3.9	4.1	4.4	4.8	5.0	5.2	5.4	4.6	5.1	5.3	5.5	5.7	5.2	5.7	6.0	6.2	6.5	5.8	6.4	6.7	6.9	7.2
	15	2.9	3.2	3.3	3.4	3.5	3.9	4.3	4.5	4.6	4.8	4.2	4.6	4.8	4.9	5.1	4.7	5.2	5.4	5.6	5.8	5.3	5.9	6.1	6.3	6.6
	20	2.2	2.4	2.5	2.6	2.7	3.1	3.5	3.6	3.7	3.9	3.4	3.7	3.9	4.0	4.2	3.9	4.3	4.5	4.6	4.8	4.4	4.9	5.1	5.3	5.5
	25	1.5	1.7	1.7	1.8	1.8	2.4	2.7	2.8	2.9	3.0	2.6	2.9	3.0	3.1	3.3	3.1	3.4	3.6	3.7	3.9	3.6	4.0	4.2	4.3	4.5
	30	0.9	1.0	1.0	1.0	1.1	1.7	1.9	2.0	2.0	2.1	1.9	2.1	2.2	2.3	2.4	2.4	2.6	2.7	2.8	2.9	2.9	3.2	3.3	3.4	3.5
11000	-50	5.9	6.6	6.8	7.1	7.4	7.2	8.0	8.3	8.7	9.1	7.5	8.4	8.7	9.1	9.5	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.4	10.8	11.3
	-45	5.9	6.6	6.8	7.1	7.4	7.2	8.0	8.3	8.7	9.1	7.5	8.4	8.7	9.1	9.5	8.1	9.1	9.5	9.9	10.4	8.8	9.9	10.4	10.8	11.3
	-40	5.9	6.5	6.8	7.1	7.4	7.1	8.0	8.3	8.6	9.0	7.5	8.3	8.7	9.0	9.4	8.1	9.1	9.5	9.9	10.3	8.8	9.9	10.3	10.8	11.3
	-35	5.7	6.3	6.6	6.8	7.1	7.0	7.7	8.1	8.4	8.8	7.3	8.1	8.4	8.8	9.2	7.9	8.9	9.2	9.6	10.0	8.6	9.7	10.1	10.5	11.0
	-30	5.4	6.0	6.2	6.4	6.7	6.6	7.3	7.6	7.9	8.3	6.9	7.7	8.0	8.3	8.7	7.5	8.4	8.8	9.1	9.5	8.2	9.2	9.6	10.0	10.5
	-25	5.1	5.6	5.8	6.0	6.3	6.3	7.0	7.2	7.5	7.8	6.6	7.3	7.6	7.9	8.2	7.2	8.0	8.3	8.7	9.1	7.9	8.8	9.2	9.6	10.0
	-20	4.8	5.3	5.5	5.7	5.9	5.9	6.6	6.9	7.1	7.4	6.2	6.9	7.2	7.5	7.8	6.8	7.6	7.9	8.3	8.6	7.5	8.4	8.7	9.1	9.5
	-15	4.5	5.0	5.1	5.3	5.6	5.6	6.3	6.5	6.7	7.0	5.9	6.6	6.8	7.1	7.4	6.5	7.3	7.5	7.9	8.2	7.2	8.0	8.3	8.7	9.1
	-10	4.2	4.6	4.8	5.0	5.2	5.3	5.9	6.1	6.4	6.6	5.6	6.2	6.5	6.7	7.0	6.2	6.9	7.2	7.4	7.8	6.8	7.6	7.9	8.2	8.6
	-5	3.9	4.3	4.4	4.6	4.8	5.0	5.5	5.7	5.9	6.2	5.3	5.8	6.0	6.3	6.5	5.8	6.5	6.7	7.0	7.3	6.5	7.2	7.5	7.8	8.1
	0	3.5	3.9	4.0	4.2	4.3	4.6	5.1	5.3	5.5	5.7	4.9	5.4	5.6	5.8	6.0	5.4	6.0	6.3	6.5	6.8	6.0	6.7	7.0	7.3	7.6
	5	3.2	3.5	3.6	3.8	3.9	4.2	4.7	4.8	5.0	5.2	4.5	5.0	5.1	5.3	5.6	5.0	5.6	5.8	6.0	6.3	5.6	6.2	6.5	6.8	7.0
	10	2.9	3.1	3.3	3.4	3.5	3.9	4.3	4.4	4.6	4.8	4.1	4.6	4.7	4.9	5.1	4.6	5.1	5.3	5.5	5.8	5.2	5.8	6.0	6.3	6.5
	15	2.4	2.6	2.7	2.8	2.9	3.3	3.7	3.8	3.9	4.1	3.6	3.9	4.1	4.2	4.4	4.1	4.5	4.7	4.9	5.1	4.6	5.1	5.3	5.5	5.8
	20	1.7	1.8	1.9	2.0	2.0	2.6	2.9	3.0	3.1	3.2	2.8	3.1	3.2	3.3	3.5	3.3	3.7	3.8	3.9	4.1	3.8	4.2	4.4	4.6	4.8
	25	1.0	1.1	1.2	1.2	1.2	1.9	2.1	2.1	2.2	2.3	2.1	2.3	2.4	2.5	2.6	2.5	2.8	2.9	3.0	3.1	3.0	3.4	3.5	3.6	3.8
	28	0.7	0.7	0.7	0.8	0.8	1.5	1.6	1.7	1.7	1.8	1.7	1.9	1.9	2.0	2.1	2.1	2.3	2.4	2.5	2.6	2.6	2.9	3.0	3.1	3.2

525BFM-06-00

* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-51* (Sheet 5)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - OFF; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS 11000 WIND KNOTS -10	0	10	20	30	10500 WIND KNOTS -10	0	10	20	30	10000 WIND KNOTS -10	0	10	20	30	9500 WIND KNOTS -10	0	10	20	30	9000 WIND KNOTS -10	0	10	20	30
8000	-45	11.1	12.6	13.2	13.9	14.6	12.1	13.7	14.4	15.1	15.9	13.1	15.0	15.7	16.5	17.4	14.3	16.4	17.2	18.1	19.1	15.6	17.9	18.8	19.8	21.0
	-40	11.2	12.6	13.2	13.9	14.6	12.1	13.7	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.4	14.3	16.4	17.2	18.1	19.1	15.6	17.9	18.8	19.8	21.0
	-35	11.2	12.6	13.2	13.8	14.5	12.1	13.7	14.4	15.1	15.9	13.2	15.0	15.7	16.5	17.4	14.3	16.4	17.2	18.0	19.0	15.6	17.9	18.8	19.8	20.9
	-30	11.0	12.5	13.0	13.6	14.3	12.0	13.6	14.2	14.9	15.6	13.0	14.8	15.5	16.3	17.1	14.2	16.1	16.9	17.8	18.7	15.5	17.7	18.5	19.5	20.6
	-25	10.7	12.1	12.7	13.3	13.9	11.7	13.2	13.8	14.5	15.2	12.7	14.4	15.1	15.8	16.6	13.8	15.7	16.5	17.3	18.2	15.1	17.2	18.1	19.0	20.0
	-20	10.3	11.6	12.1	12.7	13.3	11.2	12.7	13.3	13.9	14.6	12.2	13.8	14.5	15.2	16.0	13.3	15.1	15.9	16.6	17.5	14.6	16.6	17.4	18.3	19.3
	-15	9.9	11.2	11.6	12.2	12.8	10.8	12.2	12.7	13.3	14.0	11.8	13.3	13.9	14.6	15.3	12.9	14.6	15.3	16.0	16.8	14.1	16.0	16.8	17.6	18.5
	-10	9.5	10.7	11.2	11.7	12.2	10.4	11.7	12.2	12.8	13.4	11.3	12.8	13.4	14.0	14.7	12.4	14.0	14.7	15.4	16.2	13.6	15.4	16.2	17.0	17.9
	-5	9.1	10.2	10.6	11.1	11.6	9.9	11.2	11.7	12.2	12.8	10.9	12.3	12.8	13.4	14.1	11.9	13.5	14.1	14.8	15.5	13.1	14.8	15.5	16.3	17.1
	0	8.6	9.6	10.0	10.5	11.0	9.4	10.6	11.0	11.5	12.1	10.3	11.6	12.1	12.7	13.3	11.3	12.8	13.4	14.0	14.7	12.4	14.1	14.8	15.5	16.3
	5	8.1	9.1	9.5	9.9	10.3	8.9	10.0	10.4	10.9	11.4	9.8	11.0	11.5	12.0	12.6	10.8	12.1	12.7	13.3	13.9	11.8	13.4	14.0	14.7	15.4
	10	7.6	8.5	8.9	9.3	9.7	8.4	9.4	9.8	10.3	10.7	9.3	10.4	10.9	11.4	11.9	10.2	11.5	12.0	12.6	13.2	11.3	12.7	13.3	14.0	14.7
	15	7.2	8.0	8.4	8.7	9.1	8.0	8.9	9.3	9.7	10.1	8.8	9.9	10.3	10.8	11.3	9.7	10.9	11.4	12.0	12.5	10.7	12.1	12.7	13.3	13.9
	20	6.4	7.1	7.4	7.8	8.1	7.1	8.0	8.3	8.7	9.1	7.9	8.9	9.3	9.7	10.1	8.8	9.9	10.3	10.8	11.3	9.8	11.0	11.5	12.1	12.7
	25	5.5	6.1	6.4	6.6	6.9	6.2	6.9	7.2	7.5	7.8	6.9	7.7	8.1	8.4	8.8	7.7	8.7	9.1	9.5	9.9	8.7	9.8	10.2	10.7	11.2
	30	4.6	5.1	5.3	5.5	5.8	5.2	5.8	6.1	6.3	6.6	5.9	6.6	6.9	7.2	7.6	6.7	7.5	7.9	8.2	8.6	7.6	8.5	8.9	9.3	9.7
	35	3.8	4.2	4.4	4.6	4.8	4.4	4.9	5.1	5.3	5.5	5.0	5.6	5.9	6.1	6.4	5.8	6.5	6.7	7.0	7.4	6.6	7.4	7.7	8.1	8.4
9000	-45	10.9	12.4	12.9	13.5	14.2	11.9	13.5	14.1	14.8	15.5	12.9	14.7	15.4	16.2	17.0	14.0	16.0	16.8	17.7	18.6	15.3	17.5	18.4	19.4	20.5
	-40	11.0	12.4	12.9	13.5	14.2	11.9	13.5	14.1	14.8	15.5	12.9	14.7	15.4	16.1	17.0	14.1	16.0	16.8	17.7	18.6	15.4	17.6	18.4	19.4	20.5
	-35	10.8	12.2	12.7	13.3	14.0	11.7	13.3	13.9	14.5	15.3	12.8	14.5	15.1	15.9	16.7	13.9	15.8	16.6	17.4	18.3	15.2	17.3	18.1	19.1	20.1
	-30	10.4	11.8	12.3	12.8	13.5	11.3	12.8	13.4	14.0	14.7	12.3	14.0	14.6	15.3	16.1	13.5	15.3	16.0	16.8	17.7	14.7	16.7	17.6	18.5	19.5
	-25	10.0	11.3	11.8	12.3	12.9	10.9	12.3	12.8	13.5	14.1	11.9	13.4	14.1	14.7	15.5	13.0	14.7	15.4	16.2	17.0	14.2	16.1	16.9	17.8	18.7
	-20	9.6	10.8	11.3	11.8	12.3	10.5	11.8	12.3	12.9	13.5	11.4	12.9	13.5	14.1	14.8	12.5	14.2	14.8	15.5	16.3	13.7	15.5	16.3	17.1	18.0
	-15	9.2	10.3	10.8	11.3	11.8	10.1	11.3	11.8	12.4	13.0	11.0	12.4	13.0	13.6	14.3	12.0	13.6	14.3	14.9	15.7	13.2	15.0	15.7	16.5	17.3
	-10	8.8	9.9	10.3	10.8	11.3	9.7	10.9	11.4	11.9	12.4	10.6	11.9	12.5	13.1	13.7	11.6	13.1	13.7	14.4	15.1	12.7	14.4	15.1	15.9	16.7
	-5	8.4	9.4	9.8	10.2	10.7	9.2	10.4	10.8	11.3	11.8	10.1	11.4	11.9	12.4	13.0	11.1	12.6	13.1	13.7	14.4	12.2	13.8	14.5	15.2	15.9
	0	7.9	8.9	9.3	9.7	10.1	8.7	9.8	10.2	10.7	11.2	9.6	10.8	11.3	11.8	12.3	10.6	11.9	12.4	13.0	13.7	11.6	13.2	13.8	14.4	15.1
	5	7.5	8.4	8.7	9.1	9.5	8.2	9.2	9.6	10.0	10.5	9.1	10.2	10.7	11.1	11.7	10.0	11.3	11.8	12.3	12.9	11.1	12.5	13.1	13.7	14.4
	10	7.0	7.8	8.2	8.5	8.9	7.8	8.7	9.1	9.5	9.9	8.6	9.6	10.1	10.5	11.0	9.5	10.7	11.2	11.7	12.2	10.5	11.9	12.4	13.0	13.6
	15	6.5	7.3	7.6	7.9	8.3	7.3	8.1	8.5	8.8	9.2	8.1	9.0	9.4	9.8	10.3	9.0	10.1	10.5	11.0	11.5	9.9	11.2	11.7	12.2	12.8
	20	5.7	6.4	6.6	6.9	7.2	6.4	7.2	7.5	7.8	8.1	7.2	8.0	8.4	8.7	9.1	8.0	9.0	9.4	9.8	10.3	9.0	10.1	10.5	11.0	11.5
	25	4.8	5.4	5.6	5.8	6.1	5.5	6.1	6.4	6.6	6.9	6.2	6.9	7.2	7.5	7.9	7.0	7.8	8.2	8.5	8.9	7.9	8.8	9.2	9.6	10.1
	30	4.0	4.4	4.6	4.8	5.0	4.6	5.1	5.3	5.5	5.8	5.3	5.9	6.1	6.4	6.7	6.0	6.7	7.0	7.3	7.6	6.8	7.7	8.0	8.4	8.7
	32	3.7	4.1	4.2	4.4	4.6	4.2	4.7	4.9	5.1	5.4	4.9	5.5	5.7	5.9	6.2	5.6	6.3	6.6	6.8	7.2	6.4	7.2	7.5	7.9	8.2
10000	-50	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.7	12.2	13.9	14.5	15.2	16.0	13.3	15.1	15.9	16.7	17.6	14.5	16.6	17.4	18.3	19.3
	-45	10.3	11.7	12.2	12.8	13.4	11.2	12.7	13.3	13.9	14.6	12.2	13.9	14.5	15.2	16.0	13.3	15.2	15.9	16.7	17.6	14.5	16.6	17.4	18.3	19.3
	-40	10.4	11.7	12.2	12.8	13.4	11.3	12.7	13.3	13.9	14.6	12.3	13.9	14.5	15.2	16.0	13.4	15.2	15.9	16.7	17.6	14.6	16.6	17.4	18.3	19.3
	-35	10.1	11.4	11.9	12.4	13.0	11.0	12.4	13.0	13.6	14.3	12.0	13.6	14.2	14.9	15.6	13.1	14.9	15.6	16.3	17.2	14.3	16.3	17.1	17.9	18.9
	-30	9.7	10.9	11.4	11.9	12.5	10.6	11.9	12.5	13.0	13.7	11.5	13.0	13.6	14.3	15.0	12.6	14.3	15.0	15.7	16.5	13.8	15.7	16.4	17.3	18.2
	-25	9.3	10.4	10.9	11.4	11.9	10.2	11.4	11.9	12.5	13.1	11.1	12.5	13.1	13.7	14.4	12.1	13.7	14.4	15.1	15.8	13.3	15.1	15.8	16.6	17.5
	-20	8.9	10.0	10.4	10.9	11.4	9.7	11.0	11.4	12.0	12.5	10.7	12.0	12.6	13.1	13.8	11.7	13.2	13.8	14.5	15.2	12.8	14.5	15.2	16.0	16.8
	-15	8.5	9.6	10.0	10.4	10.9	9.4	10.5	11.0	11.5	12.0	10.3	11.6	12.1	12.6	13.2	11.3	12.7	13.3	13.9	14.6	12.4	14.0	14.7	15.4	16.1
	-10	8.2	9.2	9.5	10.0	10.4	9.0	10.1	10.5	11.0	11.5	9.9	11.1	11.6	12.1	12.7	10.8	12.2	12.8	13.4	14.0	11.9	13.5	14.1	14.8	15.5
	-5	7.8	8.7	9.0	9.4	9.9	8.6	9.6	10.0	10.4	10.9	9.4	10.6	11.0	11.5	12.1	10.4	11.7	12.2	12.8	13.4	11.4	12.9	13.5	14.1	14.8
	0	7.3	8.2	8.5	8.9	9.2	8.1	9.0	9.4	9.8	10.3	8.9	10.0	10.4	10.9	11.4	9.8	11.1	11.6	12.1	12.7	10.9	12.3	12.8	13.4	14.1
	5	6.9	7.7	8.0	8.3	8.7	7.6	8.5	8.9	9.2	9.6	8.4	9.4	9.8	10.3	10.7	9.3	10.5	10.9	11.4	12.0	10.3	11.6	12.2	12.7	13.3
	10	6.4	7.2	7.5	7.8	8.1	7.2	8.0	8.3	8.7	9.1	7.9	8.9	9.3	9.7	10.1	8.8	9.9	10.3	10.8	11.3	9.8	11.0	11.5	12.0	12.6
	15	5.9	6.6	6.8	7.1	7.4	6.6	7.4	7.7	8.0	8.4	7.4	8.3	8.6	9.0	9.4	8.2	9.2	9.6	10.1	10.5	9.2	10.3	10.8	11.3	11.8
	20	5.0	5.6	5.8	6.1	6.3	5.7	6.4	6.6	6.9	7.2	6.4	7.2	7.5	7.8	8.1	7.2	8.1	8.4	8.8	9.2	8.1	9.1	9.5	9.9	10.4
	25	4.2	4.7	4.8	5.0	5.2	4.8	5.4	5.6	5.8	6.1	5.5	6.1	6.4	6.7	6.9	6.2	7.0	7.3	7.6	7.9	7.1	7.9	8.3	8.7	9.1
	30	3.4	3.8	3.9	4.1	4.2	4.0	4.4	4.6	4.8	5.0	4.6	5.1	5.3	5.6	5.8	5.3	5.9	6.2	6.4	6.7	6.1	6.8	7.1	7.4	7.8
11000	-50	9.6	10.8	11.3	11.8	12.4	10.5	11.8	12.4	13.0	13.6	11.4	12.9	13.5	14.2	14.9	12.5	14.2	14.8	15.6	16.4	13.6	15.5	16.3	17.1	18.1
	-45	9.6	10.8	11.3	11.8	12.4	10.5	11.8	12.4	13.0	13.6	11.4	12.9	13.5	14.2	14.9	12.5	14.2	14.8	15.6	16.4	13.7	15.6	16.3	17.1	18.0
	-40	9.6	10.8	11.3	11.8	12.4	10.5	11.8	12.3	12.9	13.5	11.4	12.9	13.5	14.1	14.9	12.5	14.1	14.8	15.5	16.3	13.7	15.5	16.3	17.1	18.0
	-35	9.4	10.6	11.0	11.5	12.1	10.3	11.6	12.1	12.6	13.2	11.2	12.7	13.2	13.8	14.5	12.3	13.9	14.5	15.2	16.0	13.4	15.2	16.0	16.7	17.6
	-30	9.0	10.1	10.5	11.0	11.5	9.8	11.1	11.5	12.1	12.6	10.8	12.1	12.7	13.3	13.9	11.8	13.3	13.9	14.6	15.3	12.9	14.7	15.3	16.1	16.9
	-25	8.6	9.7	10.1	10.5	11.0	9.4	10.6	11.1	11.5	12.1	10.3	11.6	12.2	12.7	13.3	11.3	12.8	13.4	14.0	14.7	12.5	14.1	14.8	15.5	16.3
	-20	8.2	9.2	9.6	10.0	10.5	9.0	10.2	10.6	11.1	11.6	9.9	11.2	11.7	12.2	12.8	10.9	12.3	12.9	13.5	14.1	12.0	13.6	14.2	14.9	15.6
	-15	7.9	8.8	9.2	9.6	10.0	8.7	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.7	12.2	10.5	11.8	12.4	12.9	13.5	11.6	13.1	13.7	14.3	15.0
	-10	7.5	8.4	8.8	9.1	9.5	8.3	9.3	9.7	10.1	10.6	9.2	10.3	10.7	11.2	11.7	10.1	11.4	11.9	12.4	13.0	11.1	12.6	13.1	13.7	14.4
	-5	7.1	8.0	8.3	8.6	9.0	7.9	8.8	9.2	9.6	10.0	8.7	9.8	10.2	10.6	11.1	9.6	10.8	11.3	11.8	12.4	10.7	12.0	12.6	13.1	13.8
	0	6.7	7.5	7.8	8.1	8.4	7.4	8.3	8.6	9.0	9.4	8.2	9.2	9.6	10.0	10.5	9.1	10.3	10.7	11.2	11.7	10.1	11.4	11.9	12.4	13.0
	5	6.3	7.0	7.3	7.6	7.9	7.0	7.8	8.1	8.4	8.8	7.8	8.7	9.0	9.4	9.9	8.6	9.7	10.1	10.5	11.0	9.6	10.8	11.3	11.8	12.3
	10	5.9	6.5	6.8	7.0	7.3	6.5	7.3	7.6	7.9	8.2	7.3	8.2	8.5	8.9	9.3	8.2	9.1	9.5	9.9	10.4	9.1	10.2	10.7	11.1	11.6
	15	5.2	5.8	6.1	6.3	6.6	5.9	6.6	6.8	7.1	7.4	6.6	7.4	7.7	8.0	8.4	7.5	8.3	8.7	9.1	9.5	8.4	9.4	9.8	10.2	10.7
	20	4.4	4.9	5.1	5.3	5.5	5.0	5.6	5.8	6.1	6.3	5.7	6.4	6.6	6.9	7.2	6.5	7.3	7.6	7.9	8.2	7.3	8.2	8.6	8.9	9.4
	25	3.6	4.0	4.1	4.3	4.5	4.2	4.6	4.8	5.0	5.2	4.8	5.4	5.6	5.8	6.1	5.5	6.2	6.4	6.7	7.0	6.3	7.1	7.4	7.7	8.0
	28	3.1	3.4	3.6	3.7	3.9	3.7	4.1	4.2	4.4	4.6	4.3	4.8	5.0	5.2	5.4	5.0	5.6	5.8	6.0	6.3	5.8	6.4	6.7	7.0	7.3

525BFM-06-00

Figure 4-51* (Sheet 6)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - ON; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS *13870 WIND KNOTS -10	0	10	20	30	12750 WIND KNOTS -10	0	10	20	30	12500 WIND KNOTS -10	0	10	20	30	12000 WIND KNOTS -10	0	10	20	30	11500 WIND KNOTS -10	0	10	20	30
0	-35	5.5	6.2	6.5	6.8	7.2	6.8	7.8	8.2	8.6	9.1	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	10.0	10.6	8.7	9.9	10.5	11.0	11.7
	-30	5.5	6.2	6.5	6.8	7.2	6.8	7.8	8.2	8.6	9.1	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	10.0	10.5	8.7	9.9	10.5	11.0	11.7
	-25	5.5	6.2	6.5	6.8	7.2	6.9	7.8	8.2	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	10.0	10.5	8.7	9.9	10.5	11.0	11.6
	-20	5.5	6.2	6.5	6.8	7.2	6.9	7.8	8.2	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	10.0	10.5	8.7	9.9	10.4	11.0	11.6
	-15	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.2	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	10.0	10.5	8.7	9.9	10.4	11.0	11.6
	-10	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.2	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	9.9	10.5	8.7	9.9	10.4	11.0	11.6
	-5	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.2	8.5	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	9.9	10.5	8.7	9.9	10.4	11.0	11.5
	0	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.1	8.5	9.0	7.2	8.2	8.5	9.0	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	5	5.5	6.2	6.4	6.7	7.1	6.9	7.8	8.1	8.5	8.9	7.2	8.2	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	10	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.9	11.4
1000	-35	5.5	6.2	6.5	6.8	7.1	6.8	7.8	8.1	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.5	9.9	10.5	8.7	9.9	10.4	11.0	11.6
	-30	5.5	6.2	6.5	6.8	7.1	6.8	7.8	8.1	8.6	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.4	9.9	10.5	8.7	9.9	10.4	11.0	11.6
	-25	5.5	6.2	6.5	6.8	7.1	6.8	7.8	8.1	8.5	9.0	7.2	8.2	8.6	9.0	9.5	7.9	9.0	9.4	9.9	10.5	8.7	9.9	10.4	11.0	11.6
	-20	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.1	8.5	9.0	7.2	8.2	8.6	9.0	9.4	7.9	9.0	9.4	9.9	10.5	8.7	9.9	10.4	10.9	11.5
	-15	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.1	8.5	9.0	7.2	8.2	8.6	9.0	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-10	5.5	6.2	6.5	6.8	7.1	6.9	7.8	8.1	8.5	9.0	7.2	8.2	8.5	9.0	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-5	5.5	6.2	6.5	6.7	7.1	6.9	7.8	8.1	8.5	8.9	7.2	8.2	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	0	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.4
	5	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	10	5.4	6.1	6.4	6.6	6.9	6.8	7.7	8.0	8.4	8.8	7.2	8.1	8.4	8.8	9.3	7.9	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.3
2000	-35	5.5	6.2	6.5	6.8	7.1	6.8	7.7	8.1	8.5	9.0	7.2	8.1	8.5	9.0	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-30	5.5	6.2	6.4	6.8	7.1	6.8	7.8	8.1	8.5	9.0	7.2	8.1	8.5	9.0	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-25	5.5	6.2	6.4	6.7	7.1	6.8	7.8	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-20	5.5	6.2	6.4	6.7	7.1	6.9	7.8	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-15	5.5	6.2	6.4	6.7	7.1	6.9	7.8	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.5
	-10	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.9	10.4	8.7	9.9	10.4	10.9	11.4
	-5	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.9	11.4
	0	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	5	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.3	9.8	10.3	8.7	9.8	10.3	10.8	11.3
	10	5.2	5.9	6.1	6.4	6.7	6.6	7.4	7.7	8.1	8.5	6.9	7.8	8.1	8.5	8.9	7.6	8.6	9.0	9.4	9.9	8.4	9.5	9.9	10.4	10.9
3000	-35	5.5	6.1	6.4	6.7	7.0	6.8	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	8.9	9.4	9.9	10.4	8.6	9.9	10.3	10.9	11.5
	-30	5.5	6.1	6.4	6.7	7.0	6.8	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.8	10.4	8.7	9.9	10.3	10.9	11.5
	-25	5.5	6.2	6.4	6.7	7.0	6.8	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.4	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.9	11.4
	-20	5.5	6.2	6.4	6.7	7.0	6.8	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-15	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-10	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-5	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.3	9.8	10.3	8.7	9.8	10.3	10.8	11.3
	0	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.8	9.3	7.9	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.3
	5	5.4	6.0	6.2	6.5	6.8	6.7	7.6	7.9	8.2	8.6	7.1	7.9	8.3	8.7	9.1	7.8	8.8	9.2	9.6	10.0	8.6	9.7	10.1	10.6	11.1
	10	4.7	5.3	5.5	5.7	6.0	6.0	6.8	7.0	7.4	7.7	6.3	7.1	7.4	7.8	8.1	7.0	7.9	8.3	8.6	9.1	7.8	8.8	9.2	9.6	10.1
4000	-35	5.5	6.1	6.4	6.7	7.0	6.8	7.7	8.1	8.4	8.9	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.4	9.8	10.3	8.7	9.8	10.3	10.8	11.4
	-30	5.5	6.1	6.4	6.7	7.0	6.8	7.7	8.1	8.4	8.9	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.4	9.8	10.3	8.7	9.8	10.3	10.8	11.4
	-25	5.5	6.1	6.4	6.7	7.0	6.8	7.7	8.1	8.4	8.9	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-20	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-15	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	8.9	9.3	9.8	10.3	8.7	9.8	10.3	10.8	11.4
	-10	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.8	9.3	7.9	8.9	9.3	9.8	10.3	8.7	9.8	10.3	10.8	11.3
	-5	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.8	9.3	7.9	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.3
	0	5.4	6.1	6.3	6.6	6.9	6.8	7.6	7.9	8.3	8.7	7.1	8.0	8.4	8.7	9.1	7.9	8.8	9.2	9.6	10.1	8.6	9.7	10.2	10.7	11.2
	5	4.9	5.5	5.7	5.9	6.2	6.2	7.0	7.3	7.6	8.0	6.6	7.4	7.7	8.0	8.4	7.3	8.2	8.5	8.9	9.3	8.0	9.0	9.4	9.9	10.3
	10	4.1	4.6	4.8	4.9	5.2	5.3	6.0	6.2	6.5	6.8	5.7	6.3	6.6	6.9	7.2	6.3	7.1	7.4	7.7	8.1	7.0	7.9	8.2	8.6	9.0

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* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-52* (Sheet 1 of 6)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - ON; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS

ALT FT	TEMP DEG C	11000					10500					10000					9500					9000				
	WIND KNOTS	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.7	13.4	14.2	11.4	13.3	14.0	14.8	15.8	12.6	14.6	15.4	16.4	17.4	13.8	16.1	17.1	18.1	19.3
	-30	9.5	10.9	11.5	12.2	12.9	10.4	12.0	12.7	13.4	14.2	11.5	13.3	14.0	14.8	15.7	12.6	14.6	15.4	16.4	17.4	13.8	16.1	17.1	18.1	19.3
	-25	9.5	10.9	11.5	12.1	12.9	10.5	12.0	12.7	13.4	14.2	11.5	13.3	14.0	14.8	15.7	12.6	14.6	15.4	16.3	17.4	13.9	16.1	17.0	18.1	19.3
	-20	9.5	10.9	11.5	12.1	12.8	10.5	12.0	12.7	13.4	14.2	11.5	13.3	14.0	14.8	15.7	12.6	14.6	15.4	16.3	17.3	13.9	16.1	17.0	18.1	19.2
	-15	9.6	10.9	11.5	12.1	12.8	10.5	12.0	12.7	13.4	14.1	11.5	13.3	14.0	14.8	15.6	12.6	14.6	15.4	16.3	17.3	13.9	16.1	17.0	18.0	19.2
	-10	9.6	10.9	11.5	12.1	12.8	10.5	12.0	12.7	13.4	14.1	11.5	13.3	14.0	14.7	15.6	12.7	14.6	15.4	16.3	17.3	13.9	16.1	17.0	18.0	19.1
	-5	9.6	10.9	11.5	12.1	12.8	10.5	12.0	12.7	13.3	14.1	11.5	13.2	13.9	14.7	15.6	12.7	14.6	15.4	16.3	17.2	13.9	16.1	17.0	18.0	19.1
	0	9.6	10.9	11.5	12.1	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.7	15.5	12.7	14.6	15.4	16.2	17.2	13.9	16.1	17.0	17.9	19.0
	5	9.6	10.9	11.4	12.0	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.6	15.5	12.7	14.6	15.3	16.2	17.1	13.9	16.1	16.9	17.9	19.0
	10	9.5	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.3	16.1	17.1	13.9	16.0	16.9	17.8	18.9
1000	-35	9.5	10.9	11.5	12.1	12.8	10.4	12.0	12.7	13.4	14.2	11.4	13.2	13.9	14.8	15.7	12.6	14.6	15.4	16.3	17.3	13.8	16.1	17.0	18.0	19.2
	-30	9.5	10.9	11.5	12.1	12.8	10.4	12.0	12.6	13.4	14.1	11.5	13.2	13.9	14.7	15.6	12.6	14.6	15.4	16.3	17.3	13.8	16.1	17.0	18.0	19.2
	-25	9.5	10.9	11.5	12.1	12.8	10.5	12.0	12.6	13.3	14.1	11.5	13.2	13.9	14.7	15.6	12.6	14.6	15.4	16.3	17.3	13.9	16.1	17.0	18.0	19.1
	-20	9.5	10.9	11.5	12.1	12.8	10.5	12.0	12.6	13.3	14.1	11.5	13.2	13.9	14.7	15.6	12.6	14.6	15.4	16.3	17.2	13.9	16.1	17.0	18.0	19.1
	-15	9.6	10.9	11.5	12.1	12.7	10.5	12.0	12.6	13.3	14.1	11.5	13.2	13.9	14.7	15.6	12.6	14.6	15.4	16.2	17.2	13.9	16.1	17.0	18.0	19.1
	-10	9.6	10.9	11.5	12.1	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.7	15.5	12.7	14.6	15.4	16.2	17.2	13.9	16.1	17.0	17.9	19.0
	-5	9.6	10.9	11.4	12.0	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.6	15.5	12.7	14.6	15.3	16.2	17.1	13.9	16.1	16.9	17.9	19.0
	0	9.6	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	14.0	11.5	13.2	13.9	14.6	15.4	12.7	14.5	15.3	16.1	17.1	13.9	16.0	16.9	17.9	18.9
	5	9.6	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.7	14.5	15.3	16.1	17.0	13.9	16.0	16.9	17.8	18.9
	10	9.5	10.8	11.3	11.9	12.5	10.4	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.6	14.4	15.2	16.0	16.9	13.9	15.9	16.8	17.7	18.7
2000	-35	9.5	10.9	11.4	12.1	12.7	10.4	12.0	12.6	13.3	14.1	11.4	13.2	13.9	14.7	15.6	12.6	14.5	15.3	16.2	17.2	13.8	16.0	16.9	18.0	19.1
	-30	9.5	10.9	11.4	12.0	12.7	10.4	12.0	12.6	13.3	14.1	11.5	13.2	13.9	14.7	15.5	12.6	14.5	15.3	16.2	17.2	13.8	16.0	16.9	17.9	19.1
	-25	9.5	10.9	11.4	12.0	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.7	15.5	12.6	14.5	15.3	16.2	17.2	13.9	16.0	16.9	17.9	19.0
	-20	9.5	10.9	11.4	12.0	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.6	15.5	12.6	14.5	15.3	16.2	17.1	13.9	16.0	16.9	17.9	19.0
	-15	9.6	10.9	11.4	12.0	12.7	10.5	12.0	12.6	13.3	14.0	11.5	13.2	13.9	14.6	15.5	12.6	14.5	15.3	16.2	17.1	13.9	16.0	16.9	17.9	19.0
	-10	9.6	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	14.0	11.5	13.2	13.9	14.6	15.4	12.7	14.5	15.3	16.1	17.1	13.9	16.0	16.9	17.9	18.9
	-5	9.6	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.7	14.5	15.3	16.1	17.0	13.9	16.0	16.9	17.8	18.9
	0	9.6	10.9	11.4	11.9	12.6	10.5	12.0	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.4	12.7	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
	5	9.6	10.8	11.4	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.8
	10	9.2	10.5	11.0	11.5	12.1	10.2	11.5	12.1	12.7	13.4	11.2	12.7	13.4	14.0	14.8	12.3	14.0	14.7	15.5	16.4	13.5	15.5	16.3	17.2	18.2
3000	-35	9.5	10.9	11.4	12.0	12.7	10.4	11.9	12.6	13.2	14.0	11.4	13.2	13.8	14.6	15.5	12.6	14.5	15.3	16.2	17.1	13.8	16.0	16.9	17.9	19.0
	-30	9.5	10.9	11.4	12.0	12.7	10.4	12.0	12.6	13.2	14.0	11.5	13.2	13.8	14.6	15.5	12.6	14.5	15.3	16.1	17.1	13.8	16.0	16.9	17.9	19.0
	-25	9.5	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	14.0	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.3	16.1	17.1	13.9	16.0	16.9	17.8	18.9
	-20	9.5	10.9	11.4	12.0	12.6	10.5	12.0	12.6	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.3	16.1	17.0	13.9	16.0	16.9	17.8	18.9
	-15	9.5	10.9	11.4	12.0	12.6	10.5	12.0	12.5	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.3	16.1	17.0	13.9	16.0	16.9	17.8	18.9
	-10	9.5	10.8	11.4	11.9	12.6	10.5	11.9	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.3	12.6	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
	-5	9.6	10.8	11.4	11.9	12.5	10.5	11.9	12.5	13.1	13.9	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.8
	0	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.7
	5	9.4	10.7	11.1	11.7	12.3	10.3	11.7	12.3	12.9	13.6	11.4	12.9	13.6	14.3	15.0	12.5	14.3	15.0	15.8	16.6	13.7	15.7	16.5	17.4	18.4
	10	8.6	9.7	10.2	10.6	11.2	9.5	10.7	11.2	11.8	12.4	10.4	11.9	12.4	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.3	16.1	17.0
4000	-35	9.5	10.8	11.4	12.0	12.6	10.4	11.9	12.5	13.2	13.9	11.5	13.1	13.8	14.6	15.4	12.6	14.5	15.2	16.1	17.1	13.8	16.0	16.8	17.8	18.9
	-30	9.5	10.8	11.4	12.0	12.6	10.4	11.9	12.5	13.2	13.9	11.5	13.1	13.8	14.6	15.4	12.6	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.9
	-25	9.5	10.8	11.4	11.9	12.6	10.5	11.9	12.5	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
	-20	9.5	10.8	11.4	11.9	12.6	10.5	11.9	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.3	12.6	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
	-15	9.6	10.8	11.4	11.9	12.5	10.5	11.9	12.5	13.1	13.9	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.8
	-10	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.7
	-5	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.7
	0	9.5	10.7	11.2	11.8	12.3	10.4	11.8	12.4	13.0	13.6	11.4	13.0	13.6	14.3	15.1	12.6	14.3	15.0	15.8	16.7	13.8	15.8	16.6	17.5	18.5
	5	8.8	10.0	10.4	10.9	11.5	9.7	11.0	11.5	12.1	12.7	10.7	12.2	12.7	13.4	14.1	11.8	13.4	14.1	14.8	15.6	13.0	14.9	15.6	16.4	17.3
	10	7.8	8.8	9.2	9.6	10.1	8.6	9.8	10.2	10.7	11.3	9.6	10.9	11.4	11.9	12.5	10.6	12.1	12.6	13.3	14.0	11.7	13.4	14.1	14.8	15.6

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Figure 4-52* (Sheet 2)

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - ON; LANDING GEAR - UP; AIRSPEED - VAPP; SPEEDBRAKES - RETRACT; INOPERATIVE ENGINE - WINDMILLING; OPERATIVE ENGINE - TAKEOFF THRUST

WEIGHT - POUNDS

ALT FT	TEMP DEG C	*13870					12750					12500					12000					11500				
	WIND KNOTS	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
5000	-35	5.5	6.2	6.4	6.7	7.0	6.8	7.7	8.1	8.4	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-30	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-25	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-20	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.3
	-15	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.3
	-10	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.8	9.3	8.0	9.0	9.3	9.8	10.2	8.7	9.9	10.3	10.8	11.3
	-5	5.4	6.0	6.3	6.6	6.8	6.8	7.6	7.9	8.3	8.6	7.1	8.0	8.3	8.7	9.1	7.8	8.8	9.2	9.6	10.1	8.6	9.7	10.1	10.6	11.1
	0	5.1	5.7	5.9	6.2	6.4	6.4	7.2	7.5	7.8	8.2	6.7	7.6	7.9	8.2	8.6	7.4	8.4	8.7	9.1	9.5	8.2	9.2	9.6	10.1	10.6
	5	4.3	4.8	5.0	5.2	5.4	5.6	6.2	6.5	6.8	7.1	5.9	6.6	6.9	7.2	7.5	6.6	7.4	7.7	8.0	8.4	7.3	8.2	8.6	8.9	9.4
	10	3.5	3.9	4.0	4.2	4.4	4.7	5.2	5.5	5.7	5.9	5.0	5.6	5.8	6.1	6.3	5.6	6.3	6.6	6.9	7.2	6.3	7.1	7.4	7.7	8.1
6000	-35	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-30	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.5	8.9	7.2	8.1	8.5	8.9	9.3	7.9	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-25	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	8.0	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.4
	-20	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.5	8.9	9.3	8.0	9.0	9.4	9.8	10.3	8.7	9.9	10.3	10.8	11.3
	-15	5.5	6.1	6.4	6.6	6.9	6.8	7.7	8.0	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.9	8.9	9.3	9.7	10.2	8.7	9.8	10.2	10.7	11.2
	-10	5.3	5.9	6.1	6.4	6.7	6.6	7.4	7.8	8.1	8.5	7.0	7.8	8.2	8.5	8.9	7.7	8.6	9.0	9.4	9.9	8.5	9.5	9.9	10.4	10.9
	-5	5.0	5.5	5.8	6.0	6.3	6.3	7.0	7.3	7.6	8.0	6.6	7.4	7.7	8.0	8.4	7.3	8.2	8.5	8.9	9.3	8.0	9.0	9.4	9.9	10.3
	0	4.5	5.0	5.2	5.4	5.6	5.7	6.4	6.7	6.9	7.2	6.0	6.8	7.0	7.3	7.7	6.7	7.5	7.8	8.2	8.6	7.4	8.3	8.7	9.1	9.5
	5	3.7	4.1	4.3	4.5	4.7	4.9	5.5	5.7	6.0	6.2	5.2	5.9	6.1	6.4	6.6	5.9	6.6	6.9	7.2	7.5	6.6	7.4	7.7	8.0	8.4
	10	2.9	3.2	3.4	3.5	3.6	4.1	4.5	4.7	4.9	5.1	4.3	4.8	5.0	5.2	5.5	4.9	5.5	5.7	6.0	6.3	5.6	6.3	6.5	6.8	7.1
7000	-35	5.5	6.1	6.4	6.7	7.0	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.8	9.3	7.9	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.3
	-30	5.5	6.2	6.4	6.7	7.0	6.9	7.7	8.0	8.4	8.8	7.2	8.1	8.5	8.8	9.3	7.9	8.9	9.3	9.8	10.2	8.7	9.8	10.3	10.8	11.3
	-25	5.5	6.1	6.4	6.6	6.9	6.8	7.7	8.0	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.9	8.9	9.3	9.7	10.2	8.7	9.8	10.2	10.7	11.2
	-20	5.4	6.0	6.2	6.5	6.8	6.7	7.5	7.8	8.2	8.5	7.1	7.9	8.2	8.6	9.0	7.8	8.7	9.1	9.5	9.9	8.5	9.6	10.0	10.5	11.0
	-15	5.1	5.7	5.9	6.2	6.4	6.4	7.2	7.5	7.8	8.1	6.7	7.5	7.9	8.2	8.6	7.4	8.3	8.7	9.1	9.5	8.2	9.2	9.6	10.0	10.5
	-10	4.8	5.3	5.5	5.8	6.0	6.1	6.8	7.1	7.4	7.7	6.4	7.2	7.5	7.8	8.1	7.1	7.9	8.3	8.6	9.0	7.8	8.8	9.2	9.6	10.0
	-5	4.4	4.9	5.1	5.3	5.5	5.7	6.3	6.6	6.9	7.2	6.0	6.7	7.0	7.3	7.6	6.6	7.4	7.8	8.1	8.5	7.4	8.3	8.6	9.0	9.4
	0	3.9	4.3	4.5	4.7	4.9	5.1	5.7	5.9	6.2	6.4	5.4	6.0	6.3	6.6	6.8	6.1	6.8	7.1	7.4	7.7	6.8	7.6	7.9	8.2	8.6
	5	3.1	3.4	3.6	3.7	3.9	4.2	4.7	4.9	5.1	5.3	4.5	5.1	5.3	5.5	5.7	5.1	5.7	6.0	6.2	6.5	5.8	6.5	6.8	7.1	7.4
	10	2.3	2.5	2.6	2.7	2.9	3.4	3.8	3.9	4.1	4.2	3.6	4.1	4.2	4.4	4.6	4.2	4.7	4.9	5.1	5.3	4.8	5.4	5.6	5.9	6.1
8000	-35	5.5	6.1	6.3	6.6	6.9	6.8	7.7	8.0	8.3	8.7	7.2	8.0	8.4	8.8	9.2	7.9	8.9	9.3	9.7	10.1	8.7	9.8	10.2	10.7	11.2
	-30	5.4	6.0	6.2	6.5	6.8	6.7	7.5	7.9	8.2	8.6	7.1	7.9	8.3	8.6	9.0	7.8	8.7	9.1	9.5	10.0	8.5	9.6	10.1	10.5	11.0
	-25	5.2	5.8	6.0	6.2	6.5	6.5	7.3	7.6	7.9	8.3	6.8	7.6	8.0	8.3	8.7	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.7	10.2	10.6
	-20	4.9	5.4	5.6	5.8	6.1	6.1	6.9	7.2	7.5	7.8	6.5	7.2	7.5	7.9	8.2	7.1	8.0	8.3	8.7	9.1	7.9	8.9	9.2	9.7	10.1
	-15	4.5	5.1	5.3	5.5	5.7	5.8	6.5	6.7	7.0	7.3	6.1	6.8	7.1	7.4	7.7	6.8	7.6	7.9	8.3	8.6	7.5	8.4	8.8	9.2	9.6
	-10	4.2	4.7	4.9	5.1	5.3	5.5	6.1	6.4	6.6	6.9	5.8	6.5	6.7	7.0	7.3	6.4	7.2	7.5	7.8	8.2	7.1	8.0	8.3	8.7	9.1
	-5	3.9	4.3	4.5	4.6	4.8	5.1	5.7	5.9	6.1	6.4	5.4	6.0	6.2	6.5	6.8	6.0	6.7	7.0	7.3	7.6	6.7	7.5	7.8	8.2	8.5
	0	3.3	3.6	3.8	3.9	4.1	4.5	5.0	5.1	5.4	5.6	4.7	5.3	5.5	5.7	6.0	5.4	6.0	6.2	6.5	6.8	6.0	6.7	7.0	7.3	7.6
	5	2.4	2.7	2.8	2.9	3.0	3.5	3.9	4.1	4.2	4.4	3.8	4.2	4.4	4.6	4.8	4.4	4.9	5.1	5.3	5.5	5.0	5.6	5.8	6.1	6.3
	10	1.7	1.8	1.9	2.0	2.1	2.7	3.0	3.1	3.2	3.4	2.9	3.3	3.4	3.5	3.7	3.5	3.9	4.0	4.2	4.4	4.1	4.5	4.7	4.9	5.1
9000	-35	5.2	5.8	6.0	6.3	6.6	6.5	7.3	7.6	8.0	8.3	6.9	7.7	8.0	8.4	8.7	7.6	8.5	8.9	9.2	9.7	8.3	9.4	9.8	10.2	10.7
	-30	5.0	5.5	5.7	6.0	6.2	6.2	7.0	7.3	7.6	7.9	6.6	7.3	7.6	8.0	8.3	7.2	8.1	8.5	8.8	9.2	8.0	9.0	9.4	9.8	10.2
	-25	4.6	5.1	5.3	5.6	5.8	5.9	6.6	6.8	7.1	7.4	6.2	6.9	7.2	7.5	7.9	6.9	7.7	8.0	8.4	8.7	7.6	8.5	8.9	9.3	9.7
	-20	4.3	4.8	5.0	5.2	5.4	5.5	6.2	6.4	6.7	7.0	5.9	6.5	6.8	7.1	7.4	6.5	7.3	7.6	7.9	8.3	7.2	8.1	8.4	8.8	9.2
	-15	4.0	4.4	4.6	4.8	5.0	5.2	5.8	6.0	6.3	6.6	5.5	6.2	6.4	6.7	7.0	6.2	6.9	7.2	7.5	7.8	6.8	7.7	8.0	8.3	8.7
	-10	3.7	4.1	4.3	4.4	4.6	4.9	5.5	5.7	5.9	6.1	5.2	5.8	6.0	6.3	6.5	5.8	6.5	6.8	7.0	7.4	6.5	7.3	7.6	7.9	8.3
	-5	3.3	3.7	3.8	4.0	4.1	4.5	5.0	5.2	5.4	5.6	4.8	5.3	5.5	5.7	6.0	5.4	6.0	6.2	6.5	6.8	6.0	6.8	7.0	7.3	7.7
	0	2.6	2.9	3.0	3.1	3.3	3.8	4.2	4.3	4.5	4.7	4.0	4.5	4.7	4.8	5.0	4.6	5.1	5.3	5.6	5.8	5.3	5.9	6.1	6.4	6.6
	5	1.9	2.0	2.1	2.2	2.3	2.9	3.2	3.3	3.5	3.6	3.2	3.5	3.6	3.8	3.9	3.7	4.1	4.3	4.5	4.7	4.3	4.8	5.0	5.2	5.4
	10	1.1	1.2	1.3	1.3	1.3	2.1	2.3	2.4	2.5	2.6	2.3	2.6	2.7	2.8	2.9	2.8	3.2	3.3	3.4	3.6	3.4	3.8	3.9	4.1	4.3

525BFM-06-00

* FOR USE IN AN EMERGENCY WHICH REQUIRES LANDING IN EXCESS OF THE MAXIMUM DESIGN LANDING WEIGHT OF 12750 POUNDS

Figure 4-52* (Sheet 3)

MODEL 525B

SECTION IV - PERFORMANCE
APPROACH AND LANDING

APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE - ON
LANDING GEAR - UP
AIRSPEED - VAPP
SPEEDBRAKES - RETRACT
INOPERATIVE ENGINE - WINDMILLING
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		11000					10500					10000					9500					9000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
5	-35	9.5	10.9	11.4	12.0	12.6	10.5	11.9	12.5	13.2	13.9	11.5	13.2	13.8	14.6	15.4	12.6	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.9
0	-30	9.6	10.9	11.4	11.9	12.6	10.5	12.0	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.4	12.7	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
0	-25	9.6	10.9	11.4	11.9	12.6	10.5	12.0	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
0	-20	9.6	10.9	11.4	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.8
	-15	9.6	10.9	11.4	11.9	12.5	10.5	12.0	12.5	13.1	13.8	11.6	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	14.0	16.0	16.8	17.7	18.7
	-10	9.6	10.9	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.6	13.2	13.8	14.5	15.2	12.7	14.5	15.2	16.0	16.9	14.0	16.0	16.8	17.7	18.7
	-5	9.5	10.7	11.2	11.7	12.3	10.4	11.8	12.3	12.9	13.6	11.4	13.0	13.6	14.3	15.0	12.5	14.3	15.0	15.7	16.6	13.8	15.8	16.6	17.4	18.4
	0	9.0	10.2	10.6	11.1	11.7	9.9	11.2	11.7	12.3	12.9	10.9	12.4	13.0	13.6	14.3	12.0	13.7	14.3	15.0	15.9	13.2	15.1	15.8	16.7	17.6
	5	8.1	9.1	9.5	10.0	10.4	8.9	10.1	10.6	11.1	11.6	9.9	11.2	11.7	12.3	12.9	10.9	12.4	13.0	13.7	14.4	12.1	13.8	14.5	15.2	16.0
	10	7.0	7.9	8.3	8.7	9.1	7.8	8.9	9.3	9.7	10.2	8.7	9.9	10.4	10.9	11.4	9.7	11.0	11.6	12.1	12.8	10.8	12.3	12.9	13.6	14.3
6	-35	9.6	10.9	11.4	11.9	12.6	10.5	12.0	12.5	13.2	13.9	11.5	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.1	17.0	13.9	16.0	16.8	17.8	18.8
0	-30	9.6	10.9	11.4	11.9	12.6	10.5	12.0	12.5	13.2	13.9	11.6	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.1	17.0	14.0	16.0	16.8	17.8	18.8
0	-25	9.6	10.9	11.4	11.9	12.5	10.5	12.0	12.5	13.2	13.8	11.6	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	14.0	16.0	16.8	17.7	18.8
0	-20	9.6	10.9	11.4	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.6	13.2	13.8	14.5	15.3	12.7	14.5	15.2	16.0	16.9	14.0	16.0	16.8	17.7	18.7
	-15	9.5	10.8	11.3	11.8	12.4	10.5	11.8	12.4	13.0	13.7	11.5	13.0	13.7	14.3	15.1	12.6	14.4	15.1	15.8	16.7	13.9	15.8	16.6	17.5	18.5
	-10	9.3	10.5	11.0	11.5	12.0	10.2	11.5	12.1	12.7	13.3	11.2	12.7	13.3	14.0	14.7	12.3	14.0	14.7	15.4	16.3	13.6	15.5	16.2	17.1	18.0
	-5	8.9	10.0	10.4	10.9	11.5	9.7	11.0	11.5	12.1	12.7	10.7	12.2	12.7	13.4	14.0	11.8	13.4	14.1	14.8	15.6	13.0	14.8	15.6	16.4	17.3
	0	8.2	9.3	9.7	10.1	10.6	9.1	10.3	10.7	11.2	11.8	10.0	11.4	11.9	12.5	13.1	11.1	12.6	13.2	13.8	14.6	12.3	14.0	14.6	15.4	16.2
	5	7.3	8.2	8.6	9.0	9.4	8.2	9.2	9.6	10.1	10.5	9.1	10.2	10.7	11.2	11.8	10.1	11.4	11.9	12.5	13.2	11.2	12.7	13.3	14.0	14.7
	10	6.3	7.1	7.4	7.7	8.1	7.1	8.0	8.3	8.7	9.1	7.9	8.9	9.3	9.8	10.3	8.8	10.0	10.5	11.0	11.6	9.9	11.2	11.8	12.4	13.0
7	-35	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.2	12.7	14.5	15.2	16.0	16.9	13.9	16.0	16.8	17.7	18.7
0	-30	9.6	10.8	11.3	11.9	12.5	10.5	11.9	12.5	13.1	13.8	11.5	13.1	13.8	14.5	15.2	12.7	14.5	15.2	16.0	16.8	13.9	16.0	16.8	17.7	18.7
0	-25	9.5	10.8	11.3	11.8	12.4	10.5	11.9	12.4	13.0	13.7	11.5	13.0	13.7	14.4	15.1	12.6	14.4	15.1	15.9	16.7	13.9	15.9	16.7	17.5	18.5
0	-20	9.4	10.6	11.0	11.6	12.1	10.3	11.6	12.2	12.8	13.4	11.3	12.8	13.4	14.1	14.8	12.4	14.1	14.8	15.5	16.4	13.6	15.6	16.3	17.2	18.1
	-15	9.0	10.2	10.6	11.1	11.6	9.9	11.2	11.7	12.3	12.9	10.9	12.3	12.9	13.5	14.2	12.0	13.6	14.3	15.0	15.8	13.2	15.0	15.8	16.6	17.5
	-10	8.6	9.7	10.1	10.6	11.1	9.5	10.7	11.2	11.7	12.3	10.5	11.8	12.4	13.0	13.6	11.5	13.1	13.7	14.4	15.1	12.7	14.5	15.2	16.0	16.8
	-5	8.1	9.2	9.6	10.0	10.5	9.0	10.2	10.6	11.1	11.6	9.9	11.3	11.8	12.3	12.9	11.0	12.5	13.0	13.7	14.4	12.2	13.8	14.5	15.2	16.0
	0	7.5	8.4	8.8	9.2	9.6	8.3	9.4	9.8	10.3	10.8	9.3	10.5	10.9	11.4	12.0	10.3	11.6	12.2	12.8	13.4	11.4	12.9	13.6	14.2	15.0
	5	6.5	7.3	7.6	8.0	8.3	7.3	8.2	8.6	9.0	9.4	8.2	9.2	9.6	10.1	10.6	9.1	10.3	10.8	11.3	11.9	10.2	11.5	12.1	12.7	13.3
	10	5.5	6.2	6.4	6.7	7.0	6.2	7.0	7.3	7.6	8.0	7.0	7.9	8.3	8.7	9.1	7.9	9.0	9.4	9.8	10.3	8.9	10.1	10.6	11.1	11.6
8	-35	9.5	10.8	11.2	11.8	12.4	10.4	11.8	12.4	13.0	13.7	11.5	13.0	13.7	14.3	15.1	12.6	14.4	15.1	15.8	16.7	13.9	15.9	16.7	17.5	18.5
0	-30	9.4	10.6	11.1	11.6	12.2	10.3	11.7	12.2	12.8	13.4	11.3	12.9	13.5	14.1	14.9	12.4	14.2	14.8	15.6	16.4	13.7	15.6	16.4	17.3	18.2
0	-25	9.1	10.3	10.7	11.2	11.8	10.0	11.3	11.8	12.4	13.0	11.0	12.5	13.0	13.7	14.4	12.1	13.7	14.4	15.1	15.9	13.3	15.2	15.9	16.7	17.6
0	-20	8.7	9.8	10.2	10.7	11.2	9.6	10.8	11.3	11.8	12.4	10.5	11.9	12.5	13.1	13.7	11.6	13.2	13.8	14.5	15.2	12.8	14.6	15.3	16.1	16.9
	-15	8.3	9.3	9.7	10.2	10.7	9.2	10.3	10.8	11.3	11.8	10.1	11.4	11.9	12.5	13.1	11.1	12.6	13.2	13.9	14.6	12.3	14.0	14.7	15.4	16.2
	-10	7.9	8.9	9.3	9.7	10.1	8.8	9.9	10.3	10.8	11.3	9.7	10.9	11.4	12.0	12.6	10.7	12.1	12.7	13.3	14.0	11.8	13.5	14.1	14.8	15.6
	-5	7.5	8.4	8.7	9.1	9.5	8.3	9.3	9.7	10.2	10.7	9.2	10.4	10.8	11.3	11.9	10.2	11.5	12.1	12.6	13.3	11.3	12.8	13.4	14.1	14.8
	0	6.7	7.6	7.9	8.2	8.6	7.5	8.5	8.8	9.2	9.7	8.4	9.5	9.9	10.4	10.9	9.4	10.6	11.1	11.6	12.2	10.5	11.9	12.4	13.0	13.7
	5	5.7	6.4	6.6	6.9	7.2	6.4	7.2	7.5	7.9	8.2	7.2	8.2	8.5	8.9	9.3	8.2	9.2	9.6	10.1	10.6	9.2	10.4	10.8	11.4	11.9
	10	4.7	5.3	5.5	5.7	6.0	5.4	6.1	6.3	6.6	6.9	6.2	6.9	7.2	7.6	7.9	7.0	7.9	8.3	8.6	9.1	8.0	9.0	9.4	9.8	10.3
9	-35	9.1	10.3	10.8	11.3	11.8	10.0	11.4	11.9	12.4	13.1	11.0	12.5	13.1	13.7	14.5	12.1	13.8	14.5	15.2	16.0	13.4	15.2	16.0	16.8	17.7
0	-30	8.8	9.9	10.3	10.8	11.3	9.7	10.9	11.4	12.0	12.6	10.6	12.1	12.6	13.2	13.9	11.7	13.3	13.9	14.6	15.4	12.9	14.7	15.4	16.2	17.1
0	-25	8.4	9.4	9.8	10.3	10.8	9.2	10.4	10.9	11.4	12.0	10.2	11.5	12.1	12.6	13.3	11.3	12.8	13.4	14.0	14.7	12.4	14.1	14.8	15.6	16.4
0	-20	8.0	9.0	9.4	9.8	10.2	8.8	9.9	10.4	10.9	11.4	9.8	11.0	11.5	12.1	12.7	10.8	12.2	12.8	13.4	14.1	11.9	13.6	14.2	14.9	15.7
	-15	7.6	8.5	8.9	9.3	9.7	8.4	9.5	9.9	10.4	10.9	9.3	10.5	11.0	11.5	12.1	10.4	11.7	12.2	12.8	13.5	11.5	13.0	13.6	14.3	15.0
	-10	7.2	8.1	8.5	8.8	9.2	8.1	9.1	9.4	9.9	10.3	8.9	10.1	10.5	11.0	11.5	9.9	11.2	11.7	12.3	12.9	11.0	12.5	13.1	13.7	14.4
	-5	6.8	7.6	7.9	8.2	8.6	7.6	8.5	8.9	9.3	9.7	8.4	9.5	9.9	10.4	10.9	9.4	10.6	11.1	11.6	12.2	10.5	11.9	12.4	13.0	13.7
	0	5.9	6.7	6.9	7.2	7.6	6.7	7.5	7.8	8.2	8.6	7.5	8.5	8.8	9.2	9.7	8.5	9.5	10.0	10.4	10.9	9.5	10.7	11.2	11.7	12.3
	5	5.0	5.5	5.8	6.0	6.3	5.7	6.4	6.6	6.9	7.2	6.5	7.2	7.6	7.9	8.3	7.3	8.2	8.6	9.0	9.4	8.3	9.3	9.8	10.2	10.7
	10	4.0	4.5	4.7	4.9	5.1	4.7	5.2	5.4	5.7	5.9	5.4	6.1	6.3	6.6	6.9	6.2	7.0	7.3	7.6	8.0	7.1	8.0	8.4	8.8	9.2

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Figure 4-52* (Sheet 4)

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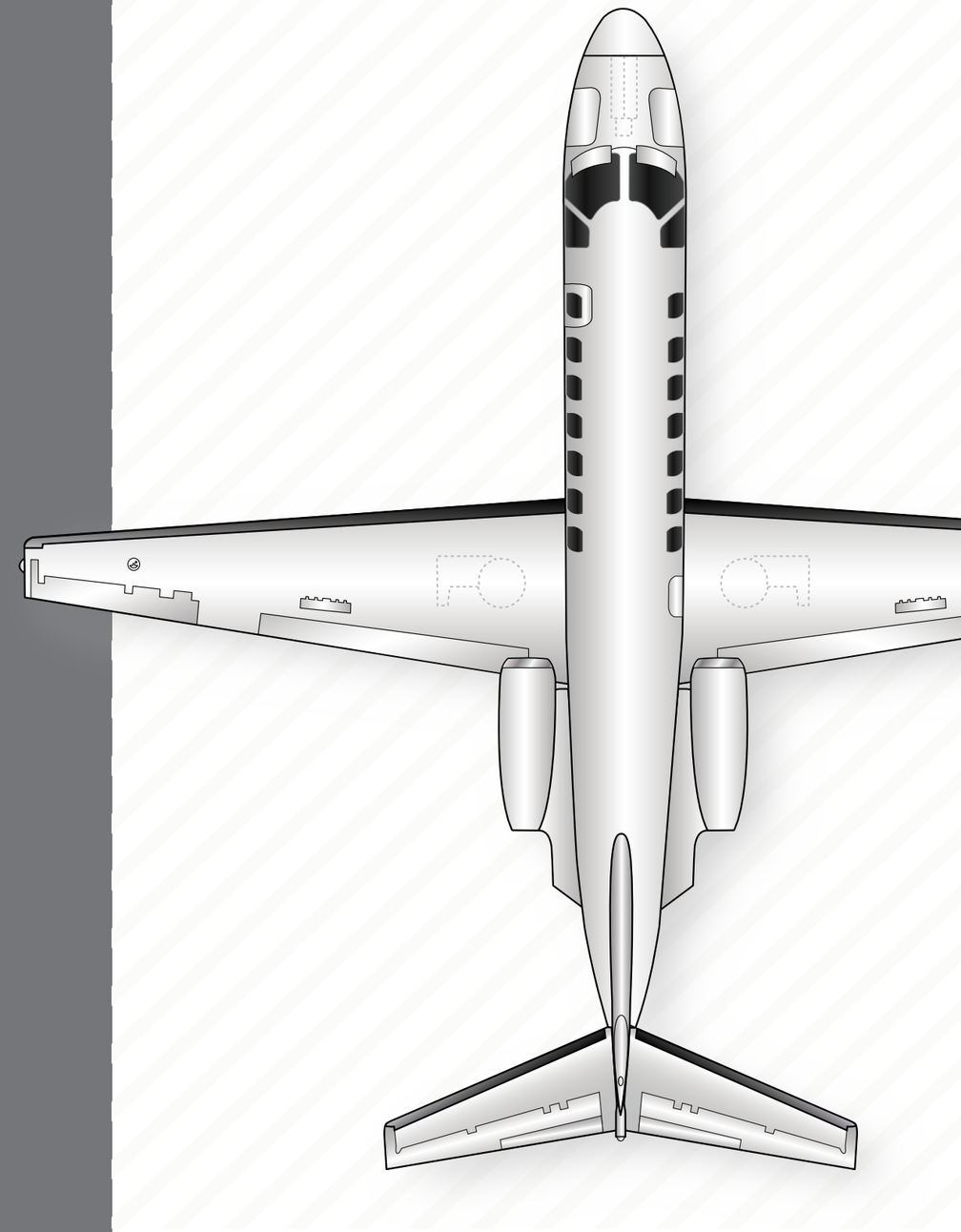
ADVISORY DATA



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DATA FOR WET, SLUSH, SNOW, AND ICE COVERED RUNWAYS

INTRODUCTION

The following information is considered the most accurate and practical guidance material available for wet and contaminated runway operations. This advisory information is not FAA approved. The information is based on JAR 25X1591 and airplane certification basis. This performance information does not in any way replace or amend the Operating Limitations and Performance Information for non-contaminated runways.

PERFORMANCE

The takeoff field length tables and the landing distance tables presented in Section IV are based on smooth, dry, paved runways. For takeoffs and landings on wet and precipitation covered runways, use the following tables and correction factors. The performance information assumes runway contamination to be of uniform depth and density over the entire runway surface. The impingement drag is based on testing performed on a Cessna Citation CJ3. The performance data presented are based on weights up to the following weights:

Takeoff Weight . . . . . 13,870 Pounds
Landing Weight . . . . . 12,750 Pounds

WARNING

These distances and correction factors for wet and adverse runway conditions are approximate and are to be considered minimums, as actual runway conditions may require distances greater than those determined. where possible, every effort should be made to ensure that the runway surface is cleared of any significant contamination. ground handling characteristics, particularly following engine failure, or in crosswinds may be degraded.

DEFINITIONS

Runway Contaminated by Compacted Snow: A runway is considered contaminated by compacted snow when covered by snow which has been compressed into a solid mass such that the airplane wheels at representative operating pressures and loadings will run on the surface without causing significant rutting.

Runway Contaminated by Wet Snow: A runway is considered contaminated by wet snow when covered by snow, which if compacted by hand will cause water to be squeezed out, with a specific gravity of 0.85.

Runway Contaminated by Dry Snow: A runway is considered contaminated by dry snow when covered by fresh snow with relatively little water content, such that water cannot be squeezed out when compacted by hand, and with a specific gravity of no greater than 0.2.

(Continued Next Page)

DEFINITIONS (Continued)

Runway Contaminated by Standing Water: A runway is considered contaminated by standing water when covered by water of a depth greather than 3mm.

Runway Contaminated by Slush: A runway is considered contaminated by slush when covered by partly melted snow or ice with a high water content, such that it cannot significantly resist compression by hand, and of an assumed specific gravity of 0.85.

Runway Contaminated by Wet or Dry Ice (untreated): A frozen surface which is presumed to be slippery whether wet or dry.

Takeoff Field Length (Wet and Contaminated): The takeoff field length given for each combination of gross weight, ambient temperature, altitude, wind, and runway gradients is the greatest of the following:

a. 115 percent of the two-engine horizontal takeoff distance from start to a height of 35 feet above runway surface.
b. Accelerate-stop distance.
c. The engine-out accelerate-go distance to 15 feet.
d. The Dry Takeoff Field Length.

No specific identification is made on the charts as to which of these distances governs a specific case.

Wet Runway: A runway is considered wet when there is sufficient moisture on the surface to appear reflective, but without significant areas of standing water.

WET RUNWAY TAKEOFF PERFORMANCE

Determine the dry runway takeoff field length as described in Procedures for Use of Takeoff Performance Tables in Section IV of the basic FAA Approved Airplane Flight Manual. Using the same procedures, determine the wet runway takeoff field length, V_1, V_R, V_2, and V_{ENR} from the following figures. If the runway has a gradient, the takeoff field length and V_1 must be adjusted in accordance with the following figures:

	LEVEL RUNWAY	RUNWAY GRADIENT ADJUSTMENT
Flaps UP, anti-ice OFF	Figure 7-2	Figure 7-1
Flaps UP, anti-ice ON	Figure 7-4	Figure 7-3
Flaps 15°, anti-ice OFF	Figure 7-6	Figure 7-5
Flaps 15°, anti-ice ON	Figure 7-8	Figure 7-7

The takeoff field length is the longer of the wet or dry takeoff field lengths. Use the speeds determined from the wet runway performance.

(Continued Next Page)

WET RUNWAY TAKEOFF PERFORMANCE (Continued)

EXAMPLE FOR TAKEOFF WITH FLAPS UP ON A WET RUNWAY:

Pressure Altitude = 2000 FEET
Gross Weight = 12,000 POUNDS
Ambient Temperature = 10°C
Wind = 10 KNOTS (HEADWIND)
Runway Gradient = ZERO (level)
Anti-Ice Systems = OFF
Runway Condition = WET

From Figure 4-19, the Takeoff Field Length is 3180 FEET (dry runway, anti-ice systems off).

From Figure 7-2, the Takeoff Field Length is 3510 FEET (wet runway, anti-ice systems off). V_1 = 93 KNOTS, V_R = 115 KNOTS, V_2 = 124 KNOTS, V_{ENR} = 130 KNOTS.

Takeoff Field Length for above conditions = 3150 FEET. V_1 = 93 KNOTS, V_R = 115 KNOTS, V_2 = 124 KNOTS, V_{ENR} = 130 KNOTS.

EXAMPLE FOR TAKEOFF WITH FLAPS 15° ON A WET RUNWAY:

Pressure Altitude =3000 FEET
Gross Weight = 13,000 POUNDS
Ambient Temperature = 5°C
Wind = 10 KNOTS (HEADWIND)
Runway Gradient = ZERO (level)
Anti-Ice Systems = ON
Runway Condition = WET

From Figure 4-25, the Takeoff Field Length is 2890 FEET (dry runway, anti-ice systems on).

From Figure 7-8, the Takeoff Field Length is 3520 FEET (wet runway, anti-ice systems on). V_1 = 90 KNOTS, V_R = 101 KNOTS, V_2 = 110 KNOTS, V_{ENR} = 130 KNOTS.

Takeoff Field Length for above conditions = 3520 FEET. V_1 = 90 KNOTS, V_R = 101 KNOTS, V_2 = 110 KNOTS, V_{ENR} = 130 KNOTS.

CONTAMINATED RUNWAY TAKEOFF PERFORMANCE

Determine the dry runway takeoff field length, V_1, V_R, V_2, and V_{ENR} as described in Procedures for Use of Takeoff Performance tables in Section IV of the basic FAA Approved Airplane Flight Manual. Any runway gradient adjustment for runway field length and V_1 should be applied. From Figure 7-9 (flaps UP), or Figure 7-10 (flaps 15°), determine the takeoff field length for the precipitation type and depth.

EXAMPLE FOR TAKEOFF WITH FLAPS UP ON A CONTAMINATED RUNWAY:

Pressure Altitude = SEA LEVEL
Gross Weight = 13,600 POUNDS
Ambient Temperature = 0°C
Wind = 10 KNOTS (HEADWIND)
Runway Gradient = ZERO (level)
Anti-Ice Systems = OFF
Runway Condition = 0.2 INCHES OF SLUSH

From Figure 4-19, the Takeoff Field Length is 3400 FEET (dry runway, anti-ice systems off), and V_1 = 115 KNOTS, V_R = 120 KNOTS, V_2 = 128 KNOTS, V_{ENR} = 130 KNOTS.

From Figure 7-9, for a takeoff on a runway covered with 0.2 INCHES of slush, the takeoff field length is 9450 FEET. V_1 = 115 KNOTS, V_R = 120 KNOTS, V_2 = 128 KNOTS, V_{ENR} = 130 KNOTS.

CONTAMINATED RUNWAY TAKEOFF PERFORMANCE (Continued)

EXAMPLE FOR TAKEOFF WITH FLAPS 15° ON A CONTAMINATED RUNWAY:

Pressure Altitude = 7000 FEET
Gross Weight = 13,400 POUNDS
Ambient Temperature = -5°C
Wind = 10 KNOTS (HEADWIND)

Runway Gradient = ZERO (level)
Anti-Ice Systems = ON
Runway Condition = 0.2 INCHES OF SLUSH

From Figure 4-25, the Takeoff Field Length is 3600 FEET (dry runway, anti-ice systems on), and V_1 = 102 KNOTS, V_R = 104 KNOTS, V_2 = 112 KNOTS, V_{ENR} = 130 KNOTS.

From Figure 7-10, for a takeoff on a runway covered with 0.2 INCHES of slush, the takeoff field length is 9450 FEET. V_1 = 102 KNOTS, V_R = 104 KNOTS, V_2 = 112 KNOTS, V_{ENR} = 130 KNOTS.

WET AND CONTAMINATED RUNWAY LANDING PERFORMANCE

Determine the dry runway landing distance, V_{APP}, and V_{REF} as described in Procedures for Use of Approach and Landing Performance Tables in Section IV of the basic FAA Approved Airplane Flight Manual. Any runway gradient adjustment for runway landing distance should be applied. From Figure 7-11 (V_{REF}) and Figure 7-12 (V_{REF}+10 KNOTS), determine the landing distance for the precipitation type and depth. The difference between the V_{REF} table and the V_{REF}+10 KNOTS table presents the comparison in distances of an overspeed at V_{REF}.

NOTE

The published limiting maximum tailwind component for this airplane is 10 knots, however, landings on precipitation covered runways with any tailwind component are not recommended.

EXAMPLE FOR LANDING ON A WET OR CONTAMINATED RUNWAY:

Pressure Altitude = 4000 FEET
Gross Weight = 10,000 POUNDS
Ambient Temperature = 10°C
Wind = 0 KNOTS

Runway Gradient = ZERO
Anti-Ice Systems = OFF
Runway Condition = WET

From Figure 4-50, the Dry Landing Distance is 2600 FEET. V_{REF} = 97 KNOTS, V_{APP} = 105 KNOTS.

From Figure 7-11, the Wet Landing Distance at V_{REF} = 97 KNOTS is 3500 FEET.

From Figure 7-12, the Wet Landing Distance at V_{REF}+10 KNOTS = 107 KNOTS is 4150 FEET.

TAKEOFF FIELD LENGTH - FEET, FLAPS UP (WET RUNWAY OVER A 15 FOOT SCREEN HEIGHT) (ANTI-ICE OFF)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 7-2. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 7-1.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS UP, ANTI-ICE OFF

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 7-2	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
2000	2150	2100	2100	2050	2000	2000	2100	2150
2200	2350	2350	2300	2250	2200	2150	2300	2400
2400	2550	2550	2500	2450	2400	2350	2550	2600
2600	2800	2750	2700	2650	2600	2550	2750	2850
2800	3050	3000	2950	2900	2800	2750	2950	3050
3000	3300	3200	3150	3100	3000	2950	3200	3300
3200	3500	3450	3350	3300	3200	3150	3400	3500
3400	3750	3700	3600	3500	3400	3350	3600	3700
3600	4000	3900	3850	3700	3600	3550	3800	3950
3800	4200	4100	4050	3950	3800	3750	4000	4150
4000	4500	4350	4300	4150	4000	3950	4200	4350
4200	4800	4550	4500	4350	4200	4150	4400	4550
4400	5050	4800	4750	4550	4400	4350	4600	4750
4600	5400	5100	5000	4800	4600	4550	4850	5000
4800	5750	5400	5250	5000	4800	4700	5050	5200
5000	6100	5650	5500	5250	5000	4900	5250	5400
5200	6500	5950	5750	5450	5200	5100	5450	5600
5400	6900	6250	6000	5650	5400	5300	5700	5800
5600	7250	6500	6250	5900	5600	5450	5900	6050
5800	7600	6800	6500	6100	5750	5650	6100	6300
6000	8000	7100	6750	6350	5950	5800	6350	6500
6200	8350	7350	6950	6550	6150	6000	6550	6750
6400	8800	7650	7200	6750	6300	6200	6750	6950
6600	9250	7950	7450	7000	6500	6350	7000	7150
6800	9600	8200	7700	7200	6700	6550	7200	7400
7000	9950	8550	7950	7400	6900	6700	7400	7650
7200	10350	8750	8150	7650	7050	6900	7650	7850
7400	10750	9000	8400	7850	7250	7050	7850	8100
7600	11200	9400	8700	8100	7450	7200	8050	8300
7800	11600	9700	8950	8300	7600	7400	8300	8550
8000	12100	10150	9250	8550	7800	7550	8500	8750
8500	13650	11150	10000	9150	8200	7950	9050	9300
9000	15200	12000	10650	9700	8650	8300	9600	9850
9500		12800	11350	10300	9050	8700	10050	10300
10000		13450	11950	10800	9500	9100	10550	10800
10500			12600	11350	9950	9450	11000	11250
11000				11900	10300	9800	11450	11700
11500					10750	10150	11900	12150
12000					11150	10500	12350	12600
12500					11550	10850	12800	13050
13000					12000	11200	13250	13500
13500					12400	11500	13700	13950
14000					12800	11850	14150	14400
14500					13200	12200	14600	14850
15000					13600	12550	15050	15300
V_1 ADJUSTMENT*	V_1 + 5 Knots	V_1 + 4 Knots	V_1 + 2 Knots	V_1 + 1 Knot	V_1 - 4 Knots	V_1 - 8 Knots	V_1 + 1 Knot	V_1 + 1 Knot

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* If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

Figure 7-1*

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	104	4520	103	3630	103	3410	104	3190	105	2990	121	129
-30	104	4590	103	3700	103	3470	104	3260	105	3050	121	129
-25	104	4670	103	3770	103	3540	104	3320	105	3110	121	129
-20	104	4740	103	3840	103	3610	104	3390	105	3170	121	129
-15	104	4820	103	3900	103	3670	104	3450	105	3230	121	129
-10	104	4900	103	3970	104	3740	104	3510	105	3300	121	129
-5	104	4980	103	4040	104	3810	104	3580	105	3360	121	129
0	103	5070	103	4110	104	3870	104	3650	105	3420	121	129
5	103	5160	103	4180	104	3940	104	3710	105	3480	121	129
10	103	5260	103	4250	104	4010	104	3780	105	3550	121	129
15	103	5350	103	4320	104	4080	104	3850	105	3620	121	129
20	103	5450	103	4390	104	4150	104	3910	105	3680	121	129
25	102	5550	103	4470	104	4220	104	3980	105	3740	121	129
30	103	5760	104	4610	105	4360	105	4110	106	3870	121	128
35	104	6100	105	4830	106	4560	106	4300	107	4050	120	127
40	105	6500	106	5090	107	4800	107	4530	108	4260	119	125
45	106	7020	108	5440	108	5110	109	4830	109	4540	119	124
50	108	7720	110	5940	111	5550	111	5220	111	4910	119	124
54	110	8340	111	6370	112	5950	113	5550	113	5230	120	124

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	102	4400	101	3530	102	3310	102	3100	103	2900	120	128
-30	102	4470	101	3600	102	3380	102	3170	103	2960	120	128
-25	102	4540	101	3660	102	3440	102	3230	103	3020	120	128
-20	102	4620	101	3730	102	3510	103	3290	103	3080	120	128
-15	102	4690	101	3800	102	3570	103	3350	103	3140	120	128
-10	102	4760	101	3860	102	3640	103	3420	103	3200	120	128
-5	102	4840	101	3930	102	3700	103	3480	103	3260	120	128
0	102	4910	101	4000	102	3770	103	3540	103	3320	120	128
5	102	4990	101	4060	102	3830	103	3610	103	3390	120	128
10	102	5070	102	4130	102	3900	103	3670	103	3450	120	128
15	102	5160	102	4200	102	3970	103	3730	103	3510	120	128
20	102	5260	102	4270	102	4030	103	3800	103	3570	120	128
25	102	5350	102	4340	102	4100	103	3860	103	3640	120	128
30	102	5550	103	4480	103	4230	104	3990	104	3750	120	127
35	103	5870	104	4690	104	4430	105	4170	105	3930	119	126
40	104	6240	105	4930	105	4660	106	4390	106	4130	118	124
45	105	6670	106	5210	107	4920	107	4640	107	4360	117	123
50	107	7320	108	5650	109	5310	109	5010	109	4710	118	122
54	109	7880	110	6040	110	5640	111	5320	111	5010	118	122

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	101	4310	100	3460	101	3240	101	3040	102	2830	119	128
-30	101	4380	100	3520	101	3310	101	3100	102	2890	119	128
-25	101	4450	100	3590	101	3370	101	3160	102	2950	119	128
-20	101	4520	100	3650	101	3430	101	3220	102	3010	120	128
-15	101	4600	100	3720	101	3500	101	3280	102	3070	120	128
-10	101	4670	100	3780	101	3560	101	3340	102	3130	120	128
-5	101	4740	100	3850	101	3620	101	3410	102	3190	120	128
0	101	4810	100	3910	101	3690	101	3460	102	3250	120	128
5	101	4890	100	3980	101	3750	102	3530	102	3310	120	128
10	101	4960	100	4050	101	3820	102	3590	102	3370	120	128
15	101	5040	100	4110	101	3880	102	3650	102	3440	120	128
20	101	5120	101	4180	101	3950	102	3720	102	3490	120	128
25	101	5210	101	4250	101	4010	102	3780	102	3560	120	128
30	101	5410	101	4390	102	4140	102	3900	103	3670	119	127
35	102	5700	103	4590	103	4330	104	4080	104	3840	118	125
40	103	6060	104	4820	104	4550	105	4290	105	4030	117	123
45	104	6450	105	5080	105	4790	106	4510	106	4240	116	122
50	106	7040	107	5460	107	5150	108	4860	108	4570	117	121
54	108	7550	108	5810	109	5470	109	5150	110	4850	117	121

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	99	4220	99	3390	99	3180	100	2970	101	2780	119	127
-30	99	4290	99	3450	99	3240	100	3030	101	2830	119	127
-25	99	4360	99	3510	99	3300	100	3090	101	2890	119	127
-20	99	4430	99	3580	100	3360	100	3150	101	2950	119	127
-15	99	4500	99	3640	100	3420	100	3210	101	3010	119	127
-10	99	4570	99	3700	100	3480	100	3270	101	3060	119	127
-5	100	4650	99	3770	100	3550	100	3330	101	3120	119	127
0	100	4710	99	3830	100	3610	100	3390	101	3180	119	127
5	100	4790	99	3900	100	3670	100	3450	101	3240	119	127
10	100	4860	99	3960	100	3740	100	3510	101	3300	119	127
15	100	4930	99	4030	100	3800	100	3580	101	3360	119	127
20	100	5010	99	4090	100	3860	101	3640	101	3420	119	127
25	100	5080	99	4160	100	3930	101	3700	101	3480	119	127
30	101	5260	100	4290	101	4050	101	3820	102	3590	118	126
35	102	5540	101	4490	102	4240	102	3990	103	3750	117	124
40	103	5880	103	4710	103	4450	104	4190	104	3940	117	123
45	104	6250	104	4960	104	4680	105	4400	105	4140	116	121
50	105	6770	106	5300	106	5000	106	4710	107	4430	116	121
54	107	7250	107	5610	108	5300	108	4990	108	4690	116	120

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	98	4130	98	3320	98	3110	99	2910	100	2710	118	127
-30	98	4210	98	3380	98	3170	99	2970	100	2770	118	127
-25	98	4270	98	3440	98	3230	99	3020	100	2830	118	127
-20	98	4340	98	3500	98	3290	99	3080	100	2880	118	127
-15	98	4410	98	3570	98	3350	99	3140	100	2940	118	127
-10	98	4480	98	3630	98	3410	99	3200	100	3000	118	127
-5	98	4550	98	3690	98	3470	99	3260	100	3050	118	127
0	98	4620	98	3750	99	3530	99	3320	100	3110	118	127
5	98	4690	98	3820	99	3600	99	3380	100	3170	118	127
10	98	4760	98	3880	99	3650	99	3440	100	3230	118	127
15	99	4840	98	3940	99	3720	99	3500	100	3290	118	127
20	99	4900	98	4010	99	3780	99	3560	100	3350	118	127
25	99	4980	98	4070	99	3850	99	3620	100	3410	118	126
30	100	5140	99	4200	100	3970	100	3740	101	3510	118	125
35	101	5390	100	4390	101	4140	101	3900	102	3660	117	124
40	102	5720	102	4610	102	4350	102	4090	103	3850	116	122
45	103	6070	103	4840	103	4570	103	4300	104	4040	115	121
50	104	6520	104	5140	105	4850	105	4570	105	4290	115	120
54	106	6970	106	5440	106	5130	107	4840	107	4550	115	119

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	95	3930	94	3150	95	2950	96	2760	97	2570	116	125
-30	95	4000	94	3210	95	3010	96	2810	97	2620	116	125
-25	95	4060	94	3260	95	3060	96	2870	97	2680	116	125
-20	95	4130	95	3320	95	3120	96	2920	97	2730	116	125
-15	95	4190	95	3380	95	3180	96	2980	97	2790	116	125
-10	95	4260	95	3440	95	3230	96	3030	97	2840	116	125
-5	95	4320	95	3500	95	3290	96	3090	97	2890	116	125
0	95	4390	95	3560	95	3350	96	3150	97	2950	116	125
5	95	4460	95	3620	96	3410	96	3200	97	3000	116	125
10	95	4520	95	3680	96	3460	96	3260	97	3050	116	125
15	95	4590	95	3740	96	3530	96	3320	97	3110	116	125
20	95	4660	95	3800	96	3590	96	3370	97	3170	116	125
25	96	4730	95	3860	96	3650	97	3430	97	3220	116	125
30	96	4880	96	3980	97	3750	97	3530	98	3320	116	124
35	98	5090	97	4150	98	3910	98	3680	99	3460	115	122
40	100	5350	99	4350	99	4100	100	3860	100	3620	114	121
45	101	5630	100	4560	100	4300	101	4050	101	3800	113	119
50	102	5970	101	4800	101	4520	102	4250	102	3990	112	118
54	103	6320	102	5040	103	4750	103	4470	103	4200	112	117

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Figure 7-2* (Sheet 1 of 30)

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3840	93	3090	93	2850	93	2630	93	2430	115	124
-30	93	3900	93	3140	93	2900	93	2680	94	2480	115	124
-25	93	3960	93	3190	93	2950	93	2730	94	2530	115	124
-20	93	4020	93	3240	93	3010	93	2770	94	2590	115	124
-15	93	4070	93	3300	93	3050	93	2820	94	2630	115	124
-10	93	4130	93	3350	93	3100	93	2870	94	2680	115	124
-5	93	4190	93	3400	93	3150	93	2930	94	2740	115	124
0	93	4240	93	3450	93	3200	93	2980	94	2790	115	124
5	93	4290	93	3500	93	3250	93	3030	94	2840	115	124
10	93	4350	93	3540	93	3290	93	3080	94	2890	115	124
15	93	4400	93	3590	93	3340	93	3140	94	2940	115	124
20	93	4450	93	3640	93	3400	93	3190	94	3000	115	124
25	92	4500	92	3680	93	3450	93	3250	94	3050	115	124
30	93	4620	93	3770	94	3550	94	3340	95	3140	114	123
35	95	4820	94	3930	95	3700	96	3480	96	3260	113	121
40	96	5060	96	4110	96	3870	97	3640	97	3410	112	119
45	98	5310	97	4300	97	4050	98	3810	98	3570	111	118
50	99	5580	98	4510	99	4250	99	3990	99	3740	111	116
54	100	5810	99	4690	99	4410	100	4140	100	3890	110	115

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3860	93	3110	93	2880	93	2650	93	2440	113	122
-30	93	3920	93	3170	93	2930	93	2700	93	2490	113	122
-25	93	3980	93	3220	93	2980	93	2750	93	2530	113	122
-20	93	4040	93	3270	93	3030	93	2800	93	2580	113	122
-15	93	4100	93	3320	93	3080	93	2850	93	2620	113	122
-10	93	4150	93	3370	93	3130	93	2900	93	2670	113	122
-5	93	4210	93	3420	93	3180	93	2940	93	2720	113	122
0	93	4270	93	3470	93	3230	93	2990	93	2760	113	122
5	93	4320	93	3520	93	3270	93	3030	93	2810	113	122
10	93	4370	93	3570	93	3320	93	3080	93	2850	113	122
15	93	4420	93	3610	93	3360	93	3120	93	2880	113	122
20	93	4480	93	3660	93	3410	93	3170	93	2930	113	122
25	93	4520	93	3710	93	3450	93	3210	93	2970	113	122
30	91	4460	91	3640	91	3390	91	3160	92	2970	112	121
35	92	4570	91	3710	92	3500	93	3290	93	3080	111	119
40	93	4780	93	3870	93	3650	94	3430	94	3210	110	118
45	95	5010	94	4050	95	3810	95	3580	96	3360	110	116
50	96	5260	95	4240	96	3990	96	3750	97	3510	109	115
54	97	5460	96	4400	96	4140	97	3880	97	3640	108	114

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3900	93	3150	93	2910	93	2690	93	2470	111	121
-30	93	3960	93	3200	93	2960	93	2740	93	2520	111	121
-25	93	4010	93	3250	93	3020	93	2790	93	2570	111	121
-20	93	4070	93	3300	93	3060	93	2830	93	2610	111	121
-15	93	4130	93	3360	93	3110	93	2880	93	2660	111	121
-10	93	4190	93	3410	93	3160	93	2930	93	2700	111	121
-5	93	4240	93	3450	93	3210	93	2980	93	2750	111	121
0	93	4290	93	3510	93	3260	93	3020	93	2790	111	121
5	93	4350	93	3560	93	3310	93	3070	93	2840	111	121
10	93	4400	93	3600	93	3350	93	3110	93	2880	111	121
15	93	4450	93	3650	93	3400	93	3150	93	2920	111	121
20	93	4500	93	3690	93	3440	93	3200	93	2960	111	121
25	93	4550	93	3740	93	3480	93	3240	93	3000	111	121
30	91	4480	91	3670	91	3420	91	3170	91	2940	111	120
35	88	4320	88	3520	89	3300	89	3100	90	2900	110	118
40	90	4510	90	3660	90	3440	91	3230	91	3020	109	116
45	92	4720	91	3820	92	3590	92	3370	93	3150	108	115
50	93	4950	92	3990	93	3750	93	3520	94	3290	107	113
54	94	5130	93	4130	94	3880	94	3640	94	3410	106	112

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	3940	94	3190	94	2950	94	2730	94	2510	109	120
-30	94	4000	94	3240	94	3000	94	2780	94	2560	109	120
-25	94	4060	94	3290	94	3050	94	2820	94	2600	110	120
-20	94	4110	94	3340	94	3100	94	2870	94	2650	110	120
-15	94	4170	94	3400	94	3150	94	2920	94	2700	110	120
-10	94	4230	94	3440	94	3200	94	2970	94	2740	110	120
-5	93	4280	93	3500	93	3250	93	3020	93	2790	110	120
0	93	4340	93	3550	93	3300	93	3060	93	2830	110	120
5	93	4390	93	3600	93	3350	93	3110	93	2880	110	120
10	93	4440	93	3640	93	3390	93	3150	93	2920	110	120
15	93	4490	93	3680	93	3440	93	3190	93	2960	110	120
20	93	4540	93	3730	93	3480	93	3240	93	3000	110	120
25	93	4590	93	3780	93	3520	93	3280	93	3040	110	120
30	91	4510	91	3700	91	3450	91	3210	91	2970	109	119
35	88	4350	88	3550	88	3300	88	3060	88	2820	108	117
40	87	4260	86	3450	87	3240	88	3040	88	2850	107	115
45	88	4450	88	3600	88	3380	89	3170	90	2960	106	113
50	90	4660	89	3750	90	3520	90	3300	91	3090	105	112
54	91	4820	90	3870	91	3640	91	3410	92	3190	105	111

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	3990	94	3230	94	3000	94	2780	94	2560	108	119
-30	94	4050	94	3290	94	3050	94	2820	94	2600	108	119
-25	94	4100	94	3340	94	3100	94	2870	94	2650	108	119
-20	94	4160	94	3390	94	3150	94	2920	94	2700	108	119
-15	94	4220	94	3440	94	3200	94	2970	94	2750	108	119
-10	94	4270	94	3500	94	3250	94	3020	94	2790	108	119
-5	94	4330	94	3550	94	3300	94	3060	94	2830	108	119
0	94	4390	94	3600	94	3350	94	3110	94	2880	108	119
5	94	4440	94	3650	94	3400	94	3160	94	2920	108	119
10	93	4490	93	3690	93	3440	93	3200	93	2970	108	119
15	93	4540	93	3730	93	3480	93	3240	93	3010	108	119
20	93	4590	93	3780	93	3530	93	3290	93	3050	108	119
25	93	4640	93	3830	93	3570	93	3320	93	3090	108	119
30	91	4560	91	3750	91	3490	91	3250	91	3010	107	117
35	89	4380	89	3580	89	3330	89	3090	89	2860	106	116
40	86	4200	86	3410	86	3170	86	2930	86	2700	105	114
45	85	4200	85	3380	85	3180	86	2980	87	2780	104	112
50	87	4380	86	3520	87	3310	87	3100	88	2890	104	110
54	88	4530	87	3640	88	3410	88	3200	89	2990	103	109

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4050	94	3290	94	3060	94	2830	94	2610	106	118
-30	94	4100	94	3350	94	3110	94	2880	94	2660	106	118
-25	94	4160	94	3400	94	3160	94	2930	94	2710	106	118
-20	94	4220	94	3450	94	3210	94	2980	94	2750	106	118
-15	94	4280	94	3500	94	3260	94	3020	94	2800	106	118
-10	94	4330	94	3550	94	3310	94	3070	94	2850	106	118
-5	94	4390	94	3600	94	3360	94	3120	94	2890	106	118
0	94	4450	94	3650	94	3410	94	3170	94	2940	106	118
5	94	4500	94	3700	94	3450	94	3210	94	2980	106	118
10	94	4550	94	3750	94	3500	94	3260	94	3020	106	118
15	94	4600	94	3790	94	3540	94	3300	94	3060	106	118
20	94	4650	94	3840	94	3590	94	3340	94	3100	106	117
25	93	4700	93	3880	93	3630	93	3380	93	3140	106	117
30	92	4610	92	3800	92	3540	92	3300	92	3060	106	116
35	89	4420	89	3620	89	3370	89	3130	89	2900	105	114
40	86	4230	86	3440	86	3200	86	2960	86	2740	104	112
45	83	4070	83	3290	83	3050	83	2810	83	2610	103	111
50	83	4120	83	3310	83	3100	84	2900	85	2710	102	109
54	84	4250	84	3410	84	3200	85	2990	86	2790	101	108

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Figure 7-2* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	104	4720	103	3820	103	3590	104	3370	105	3160	121	129
-25	104	4800	103	3890	103	3660	104	3440	105	3220	121	129
-20	104	4880	103	3960	103	3730	104	3500	105	3280	121	129
-15	104	4960	103	4030	104	3800	104	3570	105	3350	121	129
-10	103	5060	103	4100	104	3860	104	3640	105	3420	121	129
-5	103	5150	103	4170	104	3940	104	3700	105	3480	121	129
0	103	5250	103	4250	104	4010	104	3770	105	3540	121	129
5	103	5340	103	4320	104	4070	104	3840	105	3610	121	129
10	103	5440	103	4390	104	4150	104	3910	105	3680	121	129
15	102	5540	103	4470	104	4220	104	3980	105	3740	121	129
20	102	5650	103	4540	104	4290	104	4050	105	3820	121	129
25	102	5840	104	4670	104	4410	105	4170	105	3920	121	128
30	103	6140	105	4870	105	4600	106	4340	106	4090	120	127
35	104	6530	106	5110	106	4830	107	4560	107	4290	119	125
40	105	6980	107	5430	108	5100	108	4820	108	4540	119	124
45	107	7700	109	5940	110	5550	110	5220	111	4920	119	124
50	109	8640	111	6520	112	6090	112	5680	113	5340	120	124
51	109	8900	111	6640	112	6200	113	5780	113	5430	120	124
52	108	9180	111	6770	112	6320	113	5890	114	5520	120	124

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	102	4520	101	3650	102	3430	102	3210	103	3000	120	128
-30	102	4600	101	3710	102	3490	102	3270	103	3060	120	129
-25	102	4680	101	3780	102	3560	103	3340	103	3130	120	129
-20	102	4750	101	3850	102	3630	103	3410	103	3190	120	129
-15	102	4830	101	3920	102	3690	103	3470	103	3250	120	129
-10	102	4900	101	3990	102	3760	103	3530	103	3320	120	129
-5	102	4980	101	4060	102	3830	103	3600	103	3380	120	129
0	102	5070	101	4130	102	3890	103	3660	103	3440	120	129
5	102	5160	102	4200	102	3960	103	3730	103	3510	120	128
10	102	5250	102	4270	102	4030	103	3800	103	3570	120	128
15	101	5350	102	4340	102	4100	103	3860	103	3640	120	128
20	101	5450	102	4420	102	4170	103	3930	103	3700	120	128
25	102	5620	102	4540	103	4290	103	4050	104	3810	120	128
30	102	5910	103	4730	104	4470	104	4220	105	3970	119	126
35	103	6270	105	4960	105	4690	105	4420	106	4160	118	125
40	104	6680	106	5230	106	4940	106	4660	107	4380	117	123
45	106	7300	107	5660	108	5310	108	5010	109	4720	118	122
50	108	8050	109	6180	110	5770	111	5430	111	5110	118	122
52	109	8370	110	6410	111	5980	111	5600	112	5280	118	122

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	101	4430	100	3570	101	3350	101	3140	102	2940	119	128
-30	101	4500	100	3640	101	3420	101	3210	102	3000	120	128
-25	101	4580	100	3700	101	3480	101	3270	102	3060	120	128
-20	101	4660	100	3770	101	3550	101	3330	102	3120	120	128
-15	101	4730	100	3840	101	3610	101	3400	102	3180	120	128
-10	101	4800	100	3910	101	3680	101	3460	102	3240	120	128
-5	101	4880	100	3970	101	3740	101	3520	102	3310	120	128
0	101	4950	100	4040	101	3810	102	3590	102	3370	120	128
5	101	5030	100	4110	101	3880	102	3650	102	3430	120	128
10	101	5110	100	4180	101	3940	102	3720	102	3490	120	128
15	101	5210	101	4250	101	4010	102	3780	102	3560	120	128
20	101	5310	101	4320	101	4080	102	3850	102	3630	120	128
25	101	5470	101	4440	102	4200	102	3960	103	3720	119	127
30	102	5750	102	4630	103	4370	103	4120	104	3880	118	126
35	103	6090	103	4850	104	4580	104	4320	105	4060	118	124
40	104	6480	105	5100	105	4820	105	4550	106	4280	117	122
45	105	7020	106	5460	107	5160	107	4860	107	4580	117	122
50	107	7720	108	5940	109	5570	109	5260	110	4950	117	121
52	108	8020	109	6160	110	5750	110	5420	110	5110	117	121

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	99	4340	99	3500	99	3280	100	3070	101	2870	119	127
-30	99	4420	99	3560	99	3350	100	3140	101	2930	119	127
-25	99	4490	99	3630	100	3410	100	3200	101	3000	119	127
-20	99	4560	99	3690	100	3470	100	3260	101	3050	119	127
-15	99	4630	99	3760	100	3540	100	3320	101	3110	119	127
-10	99	4700	99	3830	100	3600	100	3390	101	3170	119	127
-5	100	4780	99	3890	100	3660	100	3450	101	3230	119	127
0	100	4850	99	3960	100	3730	100	3510	101	3290	119	127
5	100	4930	99	4030	100	3800	100	3570	101	3360	119	127
10	100	5000	99	4090	100	3860	100	3640	101	3420	119	127
15	100	5080	99	4160	100	3930	101	3700	101	3480	119	127
20	100	5160	99	4230	100	4000	101	3770	101	3550	119	127
25	100	5330	100	4350	101	4110	101	3870	102	3640	118	126
30	101	5590	101	4530	102	4270	102	4030	103	3790	118	125
35	102	5910	102	4740	103	4480	103	4220	104	3970	117	123
40	103	6280	103	4990	104	4710	104	4440	105	4170	116	122
45	104	6760	105	5300	105	5000	106	4710	106	4440	116	121
50	106	7400	107	5720	107	5400	108	5090	108	4790	116	120
52	107	7690	108	5920	108	5570	109	5250	109	4940	116	120

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	98	4260	98	3430	98	3220	99	3010	100	2810	118	127
-30	98	4320	98	3490	98	3280	99	3070	100	2870	118	127
-25	98	4400	98	3550	98	3340	99	3130	100	2930	118	127
-20	98	4470	98	3620	98	3400	99	3190	100	2990	118	127
-15	98	4540	98	3680	98	3460	99	3250	100	3050	118	127
-10	98	4610	98	3750	98	3530	99	3310	100	3110	118	127
-5	98	4680	98	3810	98	3590	99	3370	100	3170	118	127
0	98	4750	98	3870	99	3650	99	3440	100	3230	118	127
5	98	4830	98	3940	99	3710	99	3500	100	3280	118	127
10	98	4900	98	4010	99	3780	99	3560	100	3340	118	127
15	99	4980	98	4070	99	3850	99	3620	100	3410	118	127
20	99	5060	98	4140	99	3910	99	3690	100	3470	118	127
25	99	5190	99	4260	99	4020	100	3790	101	3560	118	126
30	100	5440	100	4430	100	4180	101	3940	102	3710	117	124
35	101	5740	101	4640	102	4380	102	4120	103	3880	116	123
40	102	6100	102	4880	103	4600	103	4330	104	4070	115	121
45	103	6510	103	5140	104	4860	104	4570	105	4300	115	120
50	105	7120	106	5540	106	5240	106	4930	107	4640	115	119
52	106	7370	107	5710	107	5390	107	5090	107	4780	115	119

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	95	4040	94	3250	95	3050	96	2850	97	2660	116	125
-30	95	4110	94	3310	95	3110	96	2910	97	2720	116	125
-25	95	4180	95	3370	95	3170	96	2970	97	2770	116	125
-20	95	4250	95	3430	95	3230	96	3020	97	2830	116	125
-15	95	4310	95	3490	95	3280	96	3080	97	2880	116	125
-10	95	4380	95	3550	95	3340	96	3140	97	2940	116	125
-5	95	4450	95	3620	95	3400	96	3200	97	3000	116	125
0	95	4520	95	3670	96	3460	96	3250	97	3050	116	125
5	95	4590	95	3740	96	3520	96	3310	97	3110	116	125
10	95	4660	95	3800	96	3580	96	3370	97	3170	116	125
15	95	4730	95	3860	96	3650	96	3430	97	3220	116	125
20	96	4800	95	3930	96	3710	97	3490	97	3280	116	125
25	96	4920	96	4030	96	3810	97	3580	98	3370	116	124
30	98	5120	97	4190	98	3950	98	3720	99	3500	115	123
35	99	5370	98	4380	99	4130	99	3890	100	3660	114	121
40	100	5660	99	4600	100	4330	100	4080	101	3840	113	120
45	101	6010	101	4840	101	4560	101	4290	102	4030	113	118
50	103	6450	102	5130	103	4840	103	4560	103	4280	112	117
52	103	6670	103	5290	103	4980	104	4690	104	4410	113	117

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Figure 7-2* (Sheet 3)

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3940	93	3180	93	2940	93	2720	94	2520	115	124
-30	93	4010	93	3230	93	3000	93	2770	94	2570	115	124
-25	93	4060	93	3290	93	3050	93	2810	94	2620	115	124
-20	93	4120	93	3340	93	3100	93	2860	94	2680	115	124
-15	93	4180	93	3400	93	3150	93	2920	94	2730	115	124
-10	93	4240	93	3450	93	3200	93	2970	94	2780	115	124
-5	93	4300	93	3500	93	3250	93	3030	94	2830	115	124
0	93	4360	93	3550	93	3300	93	3080	94	2890	115	124
5	93	4410	93	3610	93	3350	93	3140	94	2940	115	124
10	93	4470	93	3650	93	3400	93	3190	94	3000	115	124
15	93	4520	93	3700	93	3450	93	3250	94	3050	115	124
20	92	4570	92	3740	93	3510	93	3310	94	3100	115	124
25	93	4670	93	3820	93	3600	94	3390	95	3190	114	123
30	94	4860	94	3970	95	3740	95	3520	96	3300	113	121
35	96	5080	95	4140	96	3900	96	3670	97	3450	113	120
40	97	5330	97	4330	97	4080	98	3840	98	3610	112	118
45	99	5610	98	4550	98	4290	99	4030	99	3790	111	116
50	100	5910	99	4780	99	4500	100	4240	100	3970	110	115
52	101	6050	99	4890	100	4600	100	4330	100	4060	110	115

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3970	93	3210	93	2970	93	2740	93	2520	113	122
-30	93	4030	93	3260	93	3020	93	2790	93	2570	113	122
-25	93	4090	93	3320	93	3070	93	2840	93	2620	113	122
-20	93	4150	93	3370	93	3130	93	2890	93	2670	113	122
-15	93	4210	93	3420	93	3180	93	2940	93	2720	113	122
-10	93	4270	93	3470	93	3230	93	2990	93	2760	113	122
-5	93	4320	93	3530	93	3280	93	3040	93	2810	113	122
0	93	4380	93	3580	93	3330	93	3090	93	2850	113	122
5	93	4440	93	3630	93	3380	93	3130	93	2900	113	122
10	93	4490	93	3680	93	3430	93	3180	93	2940	113	122
15	93	4540	93	3730	93	3470	93	3230	93	2990	113	122
20	93	4590	93	3770	93	3510	93	3260	93	3020	113	122
25	91	4560	91	3740	91	3480	91	3230	92	3010	113	122
30	91	4600	91	3750	92	3530	92	3320	93	3120	112	120
35	93	4800	92	3910	93	3680	93	3460	94	3250	111	118
40	94	5030	94	4080	94	3850	95	3620	95	3390	110	117
45	96	5290	95	4280	95	4030	96	3790	96	3550	109	115
50	97	5560	96	4490	96	4230	97	3970	97	3720	108	114
52	98	5670	96	4570	97	4300	97	4050	98	3790	108	113

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4000	93	3240	93	3000	93	2780	93	2560	111	121
-30	93	4060	93	3290	93	3050	93	2820	93	2600	111	121
-25	93	4120	93	3350	93	3110	93	2880	93	2650	111	121
-20	93	4180	93	3400	93	3160	93	2930	93	2700	111	121
-15	93	4240	93	3450	93	3210	93	2980	93	2750	111	121
-10	93	4300	93	3510	93	3260	93	3020	93	2800	111	121
-5	93	4360	93	3560	93	3310	93	3070	93	2840	111	121
0	93	4410	93	3610	93	3360	93	3120	93	2890	111	121
5	93	4470	93	3660	93	3410	93	3170	93	2930	111	121
10	93	4520	93	3710	93	3460	93	3210	93	2980	111	121
15	93	4570	93	3760	93	3500	93	3260	93	3020	111	121
20	93	4620	93	3800	93	3540	93	3290	93	3050	111	121
25	92	4580	92	3760	92	3510	92	3260	92	3020	111	120
30	89	4450	89	3640	89	3380	89	3140	90	2940	110	119
35	89	4540	89	3690	90	3470	90	3260	91	3060	109	117
40	91	4750	91	3850	91	3620	92	3400	92	3190	108	115
45	93	4980	92	4030	92	3790	93	3560	93	3330	107	114
50	94	5220	93	4210	93	3960	94	3720	94	3480	107	112
52	95	5320	93	4290	94	4040	94	3790	95	3550	106	112

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4040	94	3280	94	3040	94	2810	94	2600	110	120
-30	94	4100	94	3340	94	3100	94	2870	94	2640	110	120
-25	94	4160	94	3390	94	3150	94	2920	94	2690	110	120
-20	94	4220	94	3440	94	3200	94	2970	94	2740	110	120
-15	94	4280	94	3500	94	3250	94	3020	94	2790	110	120
-10	93	4340	93	3550	93	3300	93	3060	93	2830	110	120
-5	93	4400	93	3600	93	3350	93	3110	93	2880	110	120
0	93	4450	93	3650	93	3400	93	3160	93	2930	110	120
5	93	4510	93	3700	93	3450	93	3210	93	2970	110	120
10	93	4560	93	3750	93	3500	93	3250	93	3020	110	120
15	93	4620	93	3800	93	3540	93	3300	93	3060	110	120
20	93	4660	93	3840	93	3580	93	3330	93	3090	110	120
25	92	4620	92	3800	92	3540	92	3300	92	3060	109	119
30	89	4480	89	3660	89	3410	89	3170	89	2930	108	117
35	86	4310	86	3510	87	3270	87	3070	88	2880	107	115
40	88	4480	87	3630	88	3410	89	3200	89	3000	106	114
45	89	4690	89	3790	89	3560	90	3340	90	3130	106	112
50	91	4900	90	3950	91	3720	91	3490	92	3260	105	111
52	91	5000	90	4020	91	3780	91	3550	92	3320	104	110

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4090	94	3330	94	3090	94	2860	94	2640	108	119
-30	94	4150	94	3390	94	3150	94	2910	94	2690	108	119
-25	94	4210	94	3440	94	3200	94	2970	94	2740	108	119
-20	94	4270	94	3490	94	3250	94	3020	94	2790	108	119
-15	94	4330	94	3550	94	3300	94	3060	94	2840	108	119
-10	94	4390	94	3600	94	3350	94	3110	94	2880	108	119
-5	94	4450	94	3650	94	3400	94	3160	94	2930	108	119
0	94	4500	94	3700	94	3450	94	3210	94	2980	108	119
5	94	4560	94	3750	94	3500	94	3260	94	3020	108	119
10	93	4610	93	3800	93	3550	93	3300	93	3060	108	119
15	93	4670	93	3850	93	3590	93	3350	93	3110	108	119
20	93	4710	93	3890	93	3630	93	3380	93	3140	108	119
25	92	4660	92	3850	92	3590	92	3340	92	3100	108	118
30	89	4510	89	3700	89	3450	89	3210	89	2970	107	116
35	87	4340	87	3540	87	3290	87	3050	87	2810	106	114
40	84	4220	84	3420	85	3210	86	3010	86	2820	105	112
45	86	4410	86	3560	86	3340	87	3140	87	2930	104	111
50	88	4610	87	3710	88	3480	88	3270	89	3050	103	109
52	88	4690	87	3770	88	3540	88	3320	89	3100	103	109

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4150	94	3390	94	3150	94	2920	94	2700	106	118
-30	94	4210	94	3440	94	3200	94	2970	94	2750	106	118
-25	94	4270	94	3500	94	3250	94	3020	94	2800	106	118
-20	94	4330	94	3550	94	3310	94	3070	94	2840	106	118
-15	94	4390	94	3610	94	3360	94	3120	94	2890	106	118
-10	94	4450	94	3660	94	3410	94	3170	94	2940	106	118
-5	94	4510	94	3710	94	3460	94	3220	94	2990	106	118
0	94	4560	94	3760	94	3510	94	3270	94	3030	106	118
5	94	4620	94	3810	94	3560	94	3310	94	3080	106	118
10	94	4670	94	3860	94	3610	94	3360	94	3120	106	118
15	94	4720	94	3910	94	3650	94	3400	94	3160	106	118
20	93	4770	93	3950	93	3690	93	3440	93	3200	106	117
25	92	4720	92	3900	92	3640	92	3400	92	3160	106	117
30	90	4560	90	3750	90	3490	90	3250	90	3010	105	115
35	87	4370	87	3570	87	3320	87	3080	87	2850	104	113
40	84	4200	84	3410	84	3160	84	2930	84	2700	103	111
45	83	4150	82	3340	83	3140	84	2940	84	2750	102	109
50	84	4330	84	3480	84	3260	85	3060	86	2860	101	108
52	85	4400	84	3530	85	3320	85	3110	86	2900	101	107

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Figure 7-2* (Sheet 4)

TAKEOFF FIELD LENGTH - FEET, FLAPS UP (WET RUNWAY OVER A 15 FOOT SCREEN HEIGHT) (ANTI-ICE ON)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 7-4. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 7-3.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS UP, ANTI-ICE ON

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 7-4	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
2000	2150	2100	2050	2050	1950	1900	2100	2200
2200	2350	2350	2250	2250	2150	2100	2350	2400
2400	2550	2550	2450	2450	2350	2300	2550	2600
2600	2800	2750	2750	2650	2600	2500	2750	2850
2800	3050	3000	2950	2900	2800	2750	2950	3050
3000	3250	3200	3150	3100	3000	2950	3200	3300
3200	3500	3400	3400	3300	3200	3150	3400	3500
3400	3700	3650	3600	3500	3400	3350	3600	3700
3600	3950	3850	3800	3700	3600	3550	3800	3900
3800	4200	4100	4000	3900	3800	3750	4000	4150
4000	4400	4300	4250	4100	4000	3900	4200	4350
4200	4650	4550	4450	4350	4200	4100	4400	4550
4400	4900	4750	4650	4550	4400	4300	4600	4750
4600	5150	5000	4900	4750	4600	4450	4850	5000
4800	5400	5200	5100	4950	4800	4650	5050	5200
5000	5650	5500	5350	5150	5000	4850	5250	5400
5200	5950	5750	5600	5400	5200	5000	5450	5600
5400	6250	6050	5850	5600	5350	5200	5700	5800
5600	6550	6250	6100	5850	5550	5400	5900	6050
5800	6900	6500	6350	6050	5750	5550	6100	6250
6000	7250	6750	6600	6250	5950	5750	6350	6500
6200	7650	7050	6850	6500	6150	5950	6550	6700
6400	8100	7350	7100	6700	6300	6100	6750	6950
6600	8600	7700	7350	6950	6500	6300	7000	7150
6800	9150	8000	7650	7150	6700	6450	7200	7400
7000	9700	8400	7950	7400	6850	6600	7400	7650
7200	10450	8850	8250	7600	7050	6800	7600	7850
7400	11300	9250	8550	7850	7200	6950	7850	8050
7600	13200	9850	8850	8050	7400	7100	8050	8300
7800	15050	10500	9300	8400	7550	7250	8300	8550
8000		11050	9600	8650	7750	7450	8500	8750
8500		12300	10250	9200	8200	7850	9000	9300
9000		13250	11000	9750	8650	8200	9550	9850
9500		14300	11650	10350	9050	8600	10050	10350
10000		15450	12400	10900	9450	8900	10550	10800
10500			13050	11500	9900	9300	11000	11250
11000				12050	10300	9650	11450	11700
11500					10750	10000	11900	12150
12000					11150	10350	12350	12600
12500					11550	10700	12800	13050
13000					11950	11050	13250	13500
13500					12350	11400	13700	13950
14000					12750	11750	14150	14400
14500					13150	12100	14600	14850
15000					13550	12450	15050	15300
V_1 ADJUSTMENT*	V_1 + 5 Knots	V_1 + 4 Knot	V_1 + 2 Knots	V_1 + 1 Knot	V_1 - 4 Knots	V_1 - 7 Knots	V_1 + 1 Knot	V_1 + 1 Knot

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* If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

Figure 7-3*

TAKEOFF FIELD LENGTH - FEET
(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS													WEIGHT = 13600 LBS VENR = 130 KIAS											
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	104	4630	103	3720	104	3500	104	3280	105	3070	121	129	-30	102	4500	102	3620	102	3400	103	3190	103	2980	120	128
-25	104	4710	103	3800	104	3570	104	3340	105	3130	121	129	-25	102	4580	102	3690	102	3460	103	3250	103	3040	120	128
-20	104	4780	103	3860	104	3630	104	3410	105	3190	121	129	-20	102	4650	102	3760	102	3530	103	3310	103	3100	120	128
-15	104	4860	103	3930	104	3700	104	3470	105	3250	121	129	-15	102	4730	102	3820	102	3600	103	3380	103	3160	120	128
-10	104	4940	103	4000	104	3770	104	3540	105	3320	121	129	-10	102	4800	102	3890	102	3660	103	3440	103	3220	120	128
-5	104	5030	103	4070	104	3840	104	3610	105	3380	121	129	-5	102	4880	102	3960	102	3730	103	3500	104	3280	120	128
0	104	5120	103	4140	104	3900	104	3670	105	3440	121	129	0	102	4950	102	4030	102	3790	103	3570	104	3350	120	128
5	104	5210	103	4210	104	3970	105	3740	105	3510	121	129	5	103	5030	102	4090	102	3860	103	3630	104	3410	120	128
10	103	5310	103	4280	104	4040	105	3810	105	3580	121	129	10	102	5120	102	4160	102	3930	103	3690	104	3470	120	128

WEIGHT = 13400 LBS VENR = 130 KIAS													WEIGHT = 13200 LBS VENR = 130 KIAS											
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	101	4410	100	3550	101	3330	102	3120	102	2910	119	127	-30	100	4320	99	3470	100	3260	100	3050	101	2850	119	127
-25	101	4480	100	3610	101	3390	102	3180	102	2970	119	127	-25	100	4400	99	3540	100	3320	100	3110	101	2910	119	127
-20	101	4560	100	3680	101	3450	102	3240	102	3030	119	127	-20	100	4470	99	3600	100	3380	100	3170	101	2970	119	127
-15	101	4630	100	3740	101	3520	102	3300	102	3090	119	127	-15	100	4540	99	3660	100	3440	101	3230	101	3020	119	127
-10	101	4700	101	3810	101	3580	102	3360	102	3150	119	127	-10	100	4610	99	3730	100	3510	101	3290	101	3080	119	127
-5	101	4780	101	3870	101	3650	102	3430	102	3210	119	127	-5	100	4680	99	3800	100	3570	101	3350	101	3140	119	127
0	101	4850	101	3940	101	3710	102	3490	102	3270	119	127	0	100	4750	99	3860	100	3640	101	3420	101	3200	119	127
5	101	4930	101	4010	101	3780	102	3550	102	3330	119	127	5	100	4830	99	3930	100	3700	101	3480	101	3260	119	127
10	101	5000	101	4080	101	3840	102	3620	102	3400	119	127	10	100	4900	100	3990	100	3760	101	3540	101	3320	119	127

WEIGHT = 13000 LBS VENR = 130 KIAS													WEIGHT = 12500 LBS VENR = 130 KIAS											
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	98	4240	98	3400	99	3190	99	2990	100	2790	118	126	-30	95	4020	95	3230	96	3020	96	2830	97	2640	116	125
-25	98	4300	98	3460	99	3250	99	3040	100	2840	118	126	-25	95	4090	95	3280	96	3080	96	2880	97	2690	116	125
-20	99	4380	98	3530	99	3310	99	3100	100	2900	118	126	-20	95	4160	95	3340	96	3140	96	2940	97	2750	116	125
-15	99	4450	98	3590	99	3370	99	3160	100	2960	118	126	-15	95	4220	95	3410	96	3200	96	3000	97	2800	116	125
-10	99	4510	98	3650	99	3440	99	3220	100	3020	118	126	-10	95	4290	95	3460	96	3250	96	3050	97	2850	116	125
-5	99	4590	98	3710	99	3490	99	3280	100	3070	118	126	-5	95	4350	95	3520	96	3310	96	3110	97	2910	116	125
0	99	4660	98	3780	99	3560	99	3340	100	3130	118	126	0	95	4420	95	3580	96	3370	97	3170	97	2960	116	125
5	99	4730	98	3840	99	3620	100	3400	100	3190	118	126	5	96	4490	95	3650	96	3430	97	3220	97	3020	116	125
10	99	4800	98	3910	99	3680	100	3460	100	3250	118	126	10	96	4560	95	3710	96	3490	97	3280	97	3070	116	125

WEIGHT = 12000 LBS VENR = 130 KIAS													WEIGHT = 11500 LBS VENR = 130 KIAS											
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	92	3820	92	3060	92	2860	93	2680	94	2500	114	123	-30	92	3820	92	3070	92	2840	92	2610	92	2400	113	122
-25	92	3880	92	3110	92	2920	93	2730	94	2550	114	123	-25	92	3870	92	3120	92	2890	92	2660	92	2440	113	122
-20	92	3940	92	3170	92	2970	93	2780	94	2600	114	123	-20	91	3930	91	3170	91	2940	91	2710	91	2490	113	122
-15	92	4010	92	3230	93	3030	93	2830	94	2650	114	123	-15	91	3990	91	3220	91	2980	91	2750	91	2530	113	122
-10	92	4070	92	3280	93	3080	93	2890	94	2700	114	123	-10	91	4040	91	3270	91	3030	91	2800	91	2580	113	122
-5	92	4130	92	3340	93	3140	93	2940	94	2750	114	123	-5	91	4090	91	3320	91	3080	91	2840	91	2620	113	122
0	92	4200	92	3400	93	3190	93	3000	94	2800	114	123	0	91	4150	91	3370	91	3120	91	2890	91	2660	113	122
5	92	4260	92	3450	93	3250	94	3050	94	2850	114	123	5	91	4200	91	3410	91	3170	91	2930	91	2700	113	122
10	92	4320	92	3510	93	3300	94	3100	94	2910	114	123	10	91	4250	91	3450	91	3210	91	2970	91	2750	113	122

WEIGHT = 10500 LBS VENR = 130 KIAS													WEIGHT = 9500 LBS VENR = 130 KIAS											
TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS	TEMP DEG C	TAILWIND 10 KTS V1 KIAS	DIST FT	ZERO WIND V1 KIAS	DIST FT	HEADWINDS 10 KTS V1 KIAS	DIST FT	20 KTS V1 KIAS	DIST FT	30 KTS V1 KIAS	DIST FT	VR KIAS	V2 KIAS
-30	92	3890	92	3140	92	2910	92	2680	92	2470	109	119	-30	93	3990	93	3240	93	3010	93	2790	93	2570	106	117
-25	92	3940	92	3190	92	2960	92	2730	92	2510	109	119	-25	92	4050	92	3290	92	3060	92	2830	92	2610	106	117
-20	92	4000	92	3240	92	3010	92	2780	92	2560	109	119	-20	92	4100	92	3340	92	3110	92	2880	92	2660	106	117
-15	92	4060	92	3290	92	3050	92	2820	92	2600	109	119	-15	92	4160	92	3390	92	3150	92	2920	92	2700	106	117
-10	92	4110	92	3340	92	3100	92	2870	92	2650	109	119	-10	92	4210	92	3440	92	3200	92	2970	92	2750	106	117
-5	92	4160	92	3390	92	3150	92	2910	92	2690	109	119	-5	92	4270	92	3490	92	3250	92	3020	92	2790	106	117
0	92	4210	92	3440	92	3190	92	2960	92	2730	109	119	0	92	4320	92	3540	92	3290	92	3060	92	2830	106	117
5	92	4260	92	3480	92	3230	92	3000	92	2770	109	119	5	92	4370	92	3580	92	3340	92	3100	92	2870	106	117
10	91	4310	91	3520	91	3280	91	3040	91	2810	109	119	10	92	4420	92	3630	92	3380	92	3140	92	2910	106	117

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Figure 7-4* (Sheet 1 of 15)

TAKEOFF FIELD LENGTH - FEET
(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - UP
1000 FEET

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	104	4770	103	3850	104	3620	104	3400	105	3180	121	129
-25	104	4850	103	3920	104	3690	104	3460	105	3240	121	129
-20	104	4920	103	3990	104	3760	104	3530	105	3310	121	129
-15	104	5010	103	4060	104	3830	104	3600	105	3370	121	129
-10	104	5110	103	4130	104	3890	104	3660	105	3440	121	129
-5	103	5200	103	4210	104	3970	104	3730	105	3500	121	129
0	103	5300	103	4280	104	4040	105	3800	105	3570	121	129
5	103	5400	103	4350	104	4110	105	3870	105	3640	121	129
10	103	5500	104	4430	104	4180	105	3940	105	3700	121	129

WEIGHT = 13600 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	102	4640	102	3740	102	3520	103	3300	103	3080	120	128
-25	102	4710	102	3810	102	3580	103	3360	103	3150	120	128
-20	102	4790	102	3880	102	3650	103	3430	103	3210	120	128
-15	102	4870	102	3950	102	3720	103	3490	103	3270	120	128
-10	102	4940	102	4020	102	3790	103	3560	104	3340	120	128
-5	102	5020	102	4090	102	3850	103	3630	104	3400	120	128
0	102	5110	102	4160	102	3920	103	3690	104	3470	120	128
5	102	5210	102	4230	102	3990	103	3760	104	3530	120	128
10	102	5310	102	4300	103	4060	103	3830	104	3600	120	128

WEIGHT = 13400 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	101	4540	100	3660	101	3440	102	3230	102	3020	119	127
-25	101	4620	100	3730	101	3510	102	3290	102	3080	119	127
-20	101	4690	100	3800	101	3570	102	3360	102	3140	119	127
-15	101	4770	101	3870	101	3640	102	3420	102	3210	119	127
-10	101	4840	101	3930	101	3700	102	3480	102	3270	119	127
-5	101	4920	101	4000	101	3770	102	3550	102	3330	119	127
0	101	5000	101	4070	101	3840	102	3610	102	3390	119	127
5	101	5080	101	4140	101	3910	102	3680	102	3450	119	127
10	101	5160	101	4210	101	3980	102	3740	103	3520	119	127

WEIGHT = 13200 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	100	4450	99	3590	100	3370	100	3160	101	2950	119	127
-25	100	4520	99	3650	100	3440	101	3220	101	3020	119	127
-20	100	4600	99	3720	100	3500	101	3280	101	3070	119	127
-15	100	4670	99	3790	100	3560	101	3350	101	3130	119	127
-10	100	4740	99	3850	100	3630	101	3410	101	3200	119	127
-5	100	4820	99	3920	100	3690	101	3470	101	3260	119	127
0	100	4900	99	3990	100	3760	101	3530	101	3320	119	127
5	100	4970	100	4060	100	3830	101	3600	101	3380	119	127
10	100	5050	100	4120	100	3890	101	3660	101	3440	119	127

WEIGHT = 13000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	99	4360	98	3510	99	3300	99	3090	100	2890	118	126
-25	99	4430	98	3580	99	3360	99	3150	100	2950	118	126
-20	99	4500	98	3640	99	3430	99	3210	100	3010	118	126
-15	99	4580	98	3710	99	3490	99	3270	100	3070	118	126
-10	99	4650	98	3770	99	3550	99	3330	100	3130	118	126
-5	99	4720	98	3840	99	3620	99	3400	100	3190	118	126
0	99	4800	98	3900	99	3680	100	3460	100	3240	118	126
5	99	4870	98	3970	99	3740	100	3520	100	3310	118	126
10	99	4940	98	4040	99	3810	100	3580	100	3370	118	126

WEIGHT = 12500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	95	4140	95	3330	96	3130	96	2930	97	2740	116	125
-25	95	4210	95	3390	96	3190	96	2990	97	2790	116	125
-20	95	4280	95	3450	96	3240	96	3040	97	2840	116	125
-15	95	4350	95	3520	96	3310	96	3100	97	2900	116	125
-10	95	4410	95	3580	96	3370	96	3160	97	2960	116	125
-5	96	4480	95	3640	96	3430	97	3220	97	3020	116	125
0	96	4550	95	3700	96	3490	97	3270	97	3070	116	125
5	96	4620	95	3770	96	3550	97	3330	97	3130	116	125
10	96	4690	95	3830	96	3610	97	3390	97	3190	116	125

WEIGHT = 12000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	3930	92	3160	92	2960	93	2770	94	2590	114	123
-25	92	4000	92	3220	93	3020	93	2820	94	2640	114	123
-20	92	4060	92	3270	93	3070	93	2880	94	2690	114	123
-15	92	4120	92	3330	93	3130	93	2940	94	2750	114	123
-10	92	4190	92	3390	93	3190	93	2990	94	2800	114	123
-5	92	4260	92	3450	93	3240	93	3040	94	2850	114	123
0	92	4320	92	3510	93	3300	94	3100	94	2900	114	123
5	92	4390	92	3570	93	3360	94	3160	94	2960	114	123
10	92	4450	92	3630	93	3420	94	3210	94	3010	114	123

WEIGHT = 11500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	3920	92	3160	92	2930	92	2700	92	2480	113	122
-25	91	3980	91	3210	91	2980	91	2750	91	2530	113	122
-20	91	4040	91	3260	91	3020	91	2800	91	2570	113	122
-15	91	4090	91	3310	91	3070	91	2840	91	2620	113	122
-10	91	4150	91	3370	91	3120	91	2890	91	2660	113	122
-5	91	4200	91	3420	91	3170	91	2930	91	2710	113	122
0	91	4260	91	3460	91	3220	91	2980	91	2750	113	122
5	91	4310	91	3510	91	3260	91	3020	91	2800	113	122
10	91	4360	91	3560	91	3310	91	3070	91	2850	113	122

WEIGHT = 10500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	3990	92	3230	92	3000	92	2770	92	2550	109	119
-25	92	4050	92	3280	92	3040	92	2810	92	2600	109	119
-20	92	4100	92	3330	92	3090	92	2860	92	2640	109	119
-15	92	4160	92	3390	92	3140	92	2910	92	2690	109	119
-10	92	4220	92	3440	92	3190	92	2960	92	2730	109	119
-5	92	4270	92	3480	92	3240	92	3010	92	2780	109	119
0	92	4320	92	3530	92	3290	92	3050	92	2820	109	119
5	92	4370	92	3580	92	3330	92	3090	92	2860	109	119
10	91	4430	91	3630	91	3380	91	3140	91	2900	109	119

WEIGHT = 9500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWIND 10 KTS V1 KIAS	HEADWIND 10 KTS DIST FT	HEADWIND 20 KTS V1 KIAS	HEADWIND 20 KTS DIST FT	HEADWIND 30 KTS V1 KIAS	HEADWIND 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4090	92	3330	92	3100	92	2870	92	2650	106	117
-25	92	4150	92	3390	92	3150	92	2920	92	2690	106	117
-20	92	4210	92	3440	92	3200	92	2960	92	2740	106	117
-15	92	4270	92	3490	92	3240	92	3010	92	2790	106	117
-10	92	4320	92	3540	92	3290	92	3060	92	2830	106	117
-5	92	4370	92	3590	92	3340	92	3100	92	2880	106	117
0	92	4430	92	3640	92	3390	92	3150	92	2920	106	117
5	92	4480	92	3680	92	3440	92	3190	92	2960	106	117
10	92	4530	92	3730	92	3480	92	3240	92	3000	106	117

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Figure 7-4* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET, FLAPS 15°
(WET RUNWAY OVER A 15 FOOT SCREEN HEIGHT) (ANTI-ICE OFF)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 7-6. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 7-5.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS 15°, ANTI-ICE OFF

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 7-6	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED 2%	1.5%	1%	0.5%	DOWNHILL GRADIENT SHADED -1%	-2%	NON-SHADED -1%	-2%
2000	2100	2100	2050	2050	2050	1850	2100	2150
2200	2350	2300	2250	2250	2250	2050	2300	2400
2400	2550	2500	2450	2450	2450	2250	2550	2600
2600	2900	2800	2750	2700	2650	2550	2750	2850
2800	3150	3050	2950	2900	2850	2750	3000	3100
3000	3400	3300	3200	3100	3050	2950	3200	3350
3200	3700	3550	3400	3300	3250	3150	3400	3550
3400	4000	3800	3650	3550	3450	3350	3650	3800
3600	4350	4100	3900	3750	3650	3550	3850	4000
3800	4700	4350	4150	3950	3800	3750	4050	4200
4000	5200	4750	4450	4200	4000	3950	4250	4450
4200	5700	5100	4700	4450	4200	4100	4450	4650
4400	6300	5500	5000	4650	4400	4300	4650	4850
4600	7150	5950	5300	4900	4600	4500	4850	5050
4800	7900	6300	5600	5150	4800	4650	5100	5300
5000	8850	6750	5850	5350	4950	4850	5300	5500
5200	9450	7050	6100	5600	5150	5000	5500	5700
5400	10000	7450	6450	5800	5350	5200	5700	5950
5600	10850	7850	6650	6050	5550	5350	5900	6050
5800	11650	8250	6900	6250	5700	5550	6100	6250
6000	12600	8650	7250	6500	5900	5700	6350	6500
6200	13200	9000	7450	6700	6100	5900	6550	6700
6400	13850	9350	7700	6900	6250	6050	6750	6950
6600	14500	9700	7900	7150	6450	6200	6950	7150
6800	15400	10000	8200	7350	6650	6350	7200	7400
7000		10350	8550	7650	6800	6550	7400	7600
7200		10950	8900	7850	6950	6700	7600	7850
7400		11600	9350	8150	7150	6850	7850	8050
7600		12200	9650	8400	7300	7000	8050	8300
7800		12850	10000	8600	7500	7150	8250	8500
8000		13450	10350	8900	7700	7300	8500	8750
8500		14550	11000	9450	8100	7650	9050	9350
9000		15600	11700	10000	8500	8000	9550	9850
9500			12300	10550	8900	8350	10100	10400
10000			12950	11150	9300	8700	10600	10900
10500			13550	11650	9700	9000	11050	11300
11000			14150	12200	10100	9350	11500	11700
11500			14800	12750	10500	9650	11950	12100
12000			15550	13300	10900	10000	12400	12500
12500				13850	11300	10300	12850	12900
13000				14500	11700	10600	13300	13300
13500				15100	12100	10900	13700	13700
14000					12500	11200	14100	14100
14500					12900	11500	14500	14500
15000					13300	11800	14900	14900
V_1 ADJUSTMENT*	**V_1 + 4 Knots**	**V_1 + 3 Knots**	**V_1 + 2 Knots**	**V_1 + 1 Knot**	**V_1 - 4 Knots**	**V_1 - 7 Knots**	**V_1 + 1 Knot**	**V_1 + 1 Knot**

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* **If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.**

Figure 7-5*

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	92	3920	92	3150	92	2900	92	2670	92	2450	104	114
-30	92	3990	92	3200	92	2960	92	2720	92	2500	104	114
-25	92	4050	92	3250	92	3010	92	2770	92	2540	104	114
-20	92	4110	92	3310	92	3060	92	2820	92	2590	104	114
-15	92	4170	92	3360	92	3110	92	2870	92	2640	105	114
-10	92	4230	92	3420	92	3160	92	2920	92	2690	105	114
-5	92	4280	92	3470	92	3220	92	2970	92	2730	105	114
0	92	4340	92	3520	92	3260	92	3020	92	2780	105	114
5	92	4400	92	3570	92	3310	92	3070	92	2830	105	114
10	92	4460	92	3620	92	3360	92	3110	92	2870	105	114
15	92	4500	92	3670	92	3410	92	3160	92	2910	105	114
20	92	4560	92	3720	92	3460	92	3200	92	2960	105	114
25	92	4610	92	3770	92	3500	92	3240	92	3000	105	114
30	93	4760	92	3810	92	3580	93	3360	93	3140	105	114
35	96	5110	94	4090	95	3850	95	3610	96	3370	106	114
40	98	5590	97	4430	97	4160	98	3900	98	3650	107	114
45	100	6140	100	4790	100	4500	100	4230	101	3960	107	114
50	103	6790	102	5190	102	4890	103	4600	103	4310	108	114
54	105	7370	104	5540	104	5220	105	4900	105	4600	109	114

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3930	93	3160	93	2910	93	2680	93	2460	103	113
-30	92	4000	92	3210	92	2970	92	2730	92	2510	103	113
-25	92	4060	92	3260	92	3020	92	2780	92	2560	103	113
-20	92	4120	92	3320	92	3070	92	2830	92	2600	103	113
-15	92	4180	92	3370	92	3120	92	2880	92	2650	103	113
-10	92	4240	92	3430	92	3180	92	2930	92	2700	103	113
-5	92	4290	92	3480	92	3230	92	2980	92	2750	103	113
0	92	4350	92	3530	92	3270	92	3030	92	2790	103	113
5	92	4410	92	3580	92	3320	92	3080	92	2840	103	113
10	92	4460	92	3630	92	3370	92	3120	92	2880	103	113
15	92	4510	92	3680	92	3420	92	3170	92	2920	103	113
20	92	4570	92	3730	92	3470	92	3220	92	2970	103	113
25	92	4620	92	3780	92	3510	92	3250	92	3010	103	113
30	91	4600	90	3710	90	3450	91	3230	91	3020	104	113
35	94	4940	92	3950	93	3700	93	3470	94	3240	105	113
40	97	5340	95	4260	96	4010	96	3760	96	3510	105	113
45	99	5850	98	4610	98	4330	98	4060	99	3810	106	113
50	101	6440	100	4990	100	4690	101	4410	101	4130	107	113
54	103	6960	102	5310	102	5000	103	4700	103	4400	107	113

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3940	93	3170	93	2920	93	2690	93	2470	102	112
-30	93	4000	93	3220	93	2980	93	2740	93	2520	102	112
-25	93	4060	93	3270	93	3030	93	2790	93	2570	102	112
-20	93	4120	93	3330	93	3080	93	2840	93	2610	102	112
-15	92	4180	92	3380	92	3130	92	2890	92	2660	102	112
-10	92	4240	92	3440	92	3180	92	2940	92	2710	102	112
-5	92	4300	92	3490	92	3230	92	2990	92	2760	102	112
0	92	4360	92	3540	92	3280	92	3040	92	2800	102	112
5	92	4420	92	3590	92	3330	92	3080	92	2850	102	112
10	92	4470	92	3640	92	3380	92	3130	92	2890	102	112
15	92	4520	92	3690	92	3430	92	3170	92	2930	102	112
20	92	4580	92	3740	92	3470	92	3220	92	2980	102	112
25	92	4630	92	3780	92	3520	92	3260	92	3020	102	112
30	90	4560	90	3720	90	3460	90	3200	90	2960	103	112
35	92	4810	91	3840	91	3600	92	3380	92	3150	104	112
40	95	5200	94	4140	94	3890	95	3650	95	3410	104	112
45	98	5640	96	4480	97	4210	97	3940	97	3690	105	112
50	100	6200	99	4840	99	4550	99	4270	100	4000	106	112
54	102	6680	101	5150	101	4850	101	4550	102	4260	106	112

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3950	93	3180	93	2930	93	2700	93	2480	101	111
-30	93	4010	93	3230	93	2990	93	2750	93	2530	101	111
-25	93	4070	93	3280	93	3040	93	2800	93	2580	101	111
-20	93	4130	93	3340	93	3090	93	2850	93	2620	101	111
-15	93	4190	93	3390	93	3140	93	2900	93	2670	101	111
-10	93	4250	93	3440	93	3190	93	2950	93	2720	101	111
-5	92	4310	92	3500	92	3240	92	3000	92	2770	101	111
0	92	4370	92	3550	92	3290	92	3050	92	2810	101	111
5	92	4420	92	3600	92	3340	92	3090	92	2860	101	111
10	92	4480	92	3650	92	3390	92	3140	92	2900	101	111
15	92	4530	92	3690	92	3440	92	3180	92	2940	101	111
20	92	4590	92	3750	92	3480	92	3230	92	2990	101	111
25	92	4640	92	3790	92	3530	92	3270	92	3030	101	111
30	90	4570	90	3730	90	3460	90	3210	90	2970	102	111
35	91	4680	90	3730	90	3500	91	3280	91	3060	103	111
40	94	5060	92	4030	93	3780	93	3540	94	3310	103	111
45	97	5470	95	4350	95	4080	96	3830	96	3580	104	111
50	99	5970	97	4700	98	4420	98	4140	98	3880	105	111
54	101	6410	99	4990	100	4690	100	4410	100	4120	105	111

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3960	93	3190	93	2940	93	2710	93	2490	101	111
-30	93	4020	93	3240	93	3000	93	2760	93	2540	101	111
-25	93	4080	93	3290	93	3050	93	2810	93	2590	101	111
-20	93	4140	93	3350	93	3100	93	2860	93	2630	101	111
-15	93	4200	93	3400	93	3150	93	2910	93	2680	101	111
-10	93	4260	93	3450	93	3210	93	2960	93	2730	101	111
-5	93	4320	93	3510	93	3250	93	3010	93	2780	101	111
0	92	4380	92	3560	92	3300	92	3060	92	2820	101	111
5	92	4430	92	3610	92	3350	92	3110	92	2870	101	111
10	92	4490	92	3660	92	3400	92	3150	92	2910	101	111
15	92	4540	92	3700	92	3440	92	3200	92	2950	101	111
20	92	4600	92	3760	92	3490	92	3240	92	3000	101	111
25	92	4650	92	3800	92	3540	92	3280	92	3040	101	111
30	90	4580	90	3730	90	3470	90	3220	90	2980	101	110
35	89	4560	88	3630	89	3410	89	3190	90	2970	102	110
40	92	4920	91	3920	91	3670	92	3440	92	3220	102	110
45	95	5310	94	4230	94	3970	94	3720	95	3470	103	110
50	98	5750	96	4560	96	4280	97	4020	97	3760	104	110
54	100	6160	98	4840	98	4550	98	4270	99	3990	104	110

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	3990	93	3220	93	2980	93	2740	93	2520	99	110
-30	93	4050	93	3270	93	3030	93	2790	93	2570	99	110
-25	93	4110	93	3320	93	3080	93	2840	93	2610	99	110
-20	93	4170	93	3380	93	3130	93	2890	93	2660	100	110
-15	93	4230	93	3430	93	3180	93	2940	93	2710	100	110
-10	93	4290	93	3480	93	3230	93	2990	93	2760	100	110
-5	93	4350	93	3540	93	3280	93	3040	93	2810	100	110
0	93	4410	93	3590	93	3340	93	3090	93	2850	100	110
5	93	4460	93	3640	93	3390	93	3140	93	2900	100	110
10	92	4520	92	3690	92	3430	92	3180	92	2940	100	110
15	92	4570	92	3730	92	3470	92	3230	92	2980	100	110
20	92	4620	92	3790	92	3520	92	3270	92	3030	100	110
25	92	4670	92	3830	92	3570	92	3310	92	3070	100	110
30	91	4600	91	3760	91	3500	91	3240	91	3000	99	109
35	88	4440	88	3610	88	3350	88	3100	88	2860	99	108
40	89	4590	88	3650	88	3420	88	3200	89	2980	100	108
45	92	4950	90	3930	91	3680	91	3440	91	3220	101	108
50	94	5340	93	4230	93	3970	93	3720	94	3470	101	108
54	96	5660	94	4480	95	4210	95	3940	95	3680	102	108

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Figure 7-6* (Sheet 1 of 30)

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4030	93	3250	93	3010	93	2780	93	2560	98	109
-30	93	4090	93	3310	93	3060	93	2830	93	2600	98	109
-25	93	4150	93	3360	93	3120	93	2880	93	2650	98	109
-20	93	4210	93	3420	93	3170	93	2930	93	2700	98	109
-15	93	4270	93	3470	93	3220	93	2980	93	2750	98	109
-10	93	4330	93	3520	93	3270	93	3030	93	2800	98	109
-5	93	4390	93	3580	93	3320	93	3080	93	2840	98	109
0	93	4450	93	3630	93	3370	93	3130	93	2890	98	109
5	93	4500	93	3680	93	3420	93	3180	93	2940	98	109
10	93	4550	93	3730	93	3470	93	3220	93	2980	98	109
15	93	4600	93	3770	93	3510	93	3260	93	3020	98	109
20	92	4660	92	3830	92	3560	92	3310	92	3060	98	109
25	92	4710	92	3870	92	3610	92	3350	92	3100	98	109
30	91	4630	91	3790	91	3530	91	3280	91	3030	98	108
35	88	4460	88	3630	88	3370	88	3120	88	2880	97	106
40	85	4290	85	3470	85	3210	85	2970	85	2760	97	106
45	88	4610	87	3650	87	3420	88	3190	88	2970	98	106
50	91	4960	89	3920	89	3680	90	3440	90	3210	99	106
54	93	5250	91	4150	91	3890	92	3640	92	3400	99	106

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4080	93	3300	93	3060	93	2820	93	2600	97	108
-30	93	4140	93	3360	93	3110	93	2880	93	2650	97	108
-25	93	4200	93	3410	93	3160	93	2930	93	2700	97	108
-20	93	4260	93	3460	93	3220	93	2980	93	2750	97	108
-15	93	4320	93	3520	93	3270	93	3030	93	2800	97	108
-10	93	4380	93	3570	93	3320	93	3080	93	2840	97	108
-5	93	4440	93	3620	93	3370	93	3130	93	2890	97	108
0	93	4490	93	3670	93	3420	93	3170	93	2940	97	108
5	93	4550	93	3730	93	3470	93	3220	93	2980	97	108
10	93	4600	93	3770	93	3520	93	3270	93	3020	97	108
15	93	4650	93	3820	93	3560	93	3310	93	3060	97	108
20	93	4710	93	3870	93	3610	93	3360	93	3110	97	108
25	93	4750	93	3910	93	3650	93	3400	93	3150	97	108
30	91	4670	91	3830	91	3570	91	3320	91	3070	96	107
35	88	4490	88	3660	88	3400	88	3150	88	2910	95	105
40	85	4300	85	3490	85	3230	85	2990	85	2750	95	104
45	84	4280	83	3380	83	3160	84	2950	84	2750	96	104
50	87	4600	85	3630	86	3400	86	3170	87	2960	96	104
54	89	4860	87	3840	88	3590	88	3350	89	3130	97	104

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4140	93	3360	93	3120	93	2880	93	2650	96	107
-30	93	4200	93	3410	93	3170	93	2930	93	2700	96	107
-25	93	4260	93	3470	93	3220	93	2980	93	2750	96	107
-20	93	4320	93	3520	93	3270	93	3030	93	2800	96	107
-15	93	4380	93	3580	93	3330	93	3080	93	2850	96	107
-10	93	4440	93	3630	93	3380	93	3130	93	2900	96	107
-5	93	4490	93	3680	93	3430	93	3180	93	2940	96	107
0	93	4550	93	3730	93	3480	93	3230	93	2990	96	107
5	93	4610	93	3780	93	3530	93	3280	93	3030	96	107
10	93	4660	93	3830	93	3570	93	3320	93	3080	96	107
15	93	4710	93	3880	93	3620	93	3360	93	3120	96	107
20	93	4770	93	3930	93	3660	93	3410	93	3170	96	107
25	93	4810	93	3970	93	3710	93	3450	93	3210	96	107
30	91	4720	91	3880	91	3620	91	3370	91	3120	95	106
35	88	4520	88	3700	88	3440	88	3190	88	2950	94	104
40	85	4330	85	3520	85	3260	85	3020	85	2780	93	102
45	83	4170	83	3360	83	3110	83	2870	83	2640	93	102
50	83	4270	82	3360	82	3140	83	2930	83	2720	94	102
54	85	4500	84	3540	84	3310	85	3090	85	2870	94	102

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4210	94	3430	94	3180	94	2950	94	2720	95	107
-30	94	4270	94	3480	94	3230	94	3000	94	2770	95	107
-25	94	4330	94	3540	94	3290	94	3050	94	2820	95	107
-20	94	4390	94	3590	94	3340	94	3100	94	2870	95	107
-15	94	4450	94	3650	94	3390	94	3150	94	2920	95	107
-10	93	4510	93	3700	93	3440	93	3200	93	2960	95	107
-5	93	4570	93	3750	93	3500	93	3250	93	3010	95	107
0	93	4630	93	3800	93	3550	93	3300	93	3060	95	107
5	93	4680	93	3850	93	3600	93	3350	93	3100	95	107
10	93	4730	93	3900	93	3640	93	3390	93	3150	95	107
15	93	4780	93	3950	93	3680	93	3430	93	3190	95	107
20	93	4840	93	4000	93	3730	93	3480	93	3230	95	107
25	93	4890	93	4040	93	3780	93	3520	93	3270	95	107
30	91	4780	91	3940	91	3680	91	3430	91	3180	94	105
35	88	4570	88	3750	88	3490	88	3240	88	3000	93	103
40	85	4370	85	3550	85	3300	85	3050	85	2820	92	101
45	83	4190	83	3390	83	3140	83	2900	83	2660	91	100
50	80	4040	80	3240	80	3000	80	2760	80	2530	91	99
54	81	4160	80	3270	80	3050	81	2840	81	2640	92	99

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4300	94	3510	94	3260	94	3020	94	2800	95	108
-30	94	4360	94	3570	94	3320	94	3080	94	2850	95	108
-25	94	4420	94	3620	94	3370	94	3130	94	2900	95	108
-20	94	4480	94	3680	94	3430	94	3180	94	2950	95	108
-15	94	4540	94	3730	94	3480	94	3230	94	3000	95	108
-10	94	4600	94	3790	94	3530	94	3280	94	3040	95	108
-5	94	4660	94	3840	94	3580	94	3330	94	3090	95	108
0	94	4720	94	3890	94	3630	94	3380	94	3140	95	108
5	94	4770	94	3940	94	3680	94	3430	94	3180	95	108
10	93	4830	93	3990	93	3730	93	3470	93	3230	95	107
15	93	4880	93	4030	93	3770	93	3510	93	3270	95	107
20	93	4930	93	4080	93	3820	93	3560	93	3310	95	107
25	93	4980	93	4130	93	3860	93	3600	93	3350	95	107
30	91	4860	91	4020	91	3760	91	3500	91	3250	93	105
35	89	4640	89	3810	89	3550	89	3300	89	3060	92	103
40	86	4420	86	3600	86	3350	86	3100	86	2870	91	101
45	83	4230	83	3430	83	3180	83	2930	83	2700	90	99
50	80	4060	80	3270	80	3020	80	2790	80	2560	89	97
54	79	3970	79	3180	79	2930	79	2700	79	2470	89	97

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4410	94	3610	94	3360	94	3120	94	2890	95	108
-30	94	4470	94	3670	94	3420	94	3170	94	2940	95	108
-25	94	4530	94	3720	94	3470	94	3230	94	2990	95	108
-20	94	4590	94	3780	94	3520	94	3280	94	3040	95	108
-15	94	4650	94	3830	94	3580	94	3330	94	3090	95	108
-10	94	4710	94	3890	94	3630	94	3380	94	3140	95	108
-5	94	4770	94	3940	94	3680	94	3430	94	3190	95	108
0	94	4830	94	3990	94	3730	94	3480	94	3230	95	108
5	94	4880	94	4040	94	3780	94	3520	94	3280	95	108
10	94	4930	94	4090	94	3830	94	3570	94	3320	95	108
15	94	4980	94	4140	94	3870	94	3610	94	3360	95	108
20	94	5040	94	4190	94	3920	94	3660	94	3410	95	108
25	93	5090	93	4230	93	3960	93	3700	93	3440	95	108
30	92	4960	92	4110	92	3850	92	3590	92	3340	93	106
35	89	4720	89	3880	89	3630	89	3370	89	3130	91	102
40	86	4480	86	3660	86	3410	86	3160	86	2920	89	100
45	83	4270	83	3470	83	3220	83	2980	83	2750	88	98
50	80	4100	80	3310	80	3060	80	2820	80	2600	87	96
54	79	3990	79	3210	79	2960	79	2730	79	2500	87	95

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Figure 7-6* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET

FLAPS - 15°
1000 FEET

(OVER 15 FOOT SCREEN HEIGHT)

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4100	92	3300	92	3050	92	2810	92	2590	104	114
-25	92	4160	92	3360	92	3110	92	2860	92	2630	104	114
-20	92	4220	92	3410	92	3160	92	2920	92	2680	104	114
-15	92	4280	92	3470	92	3220	92	2970	92	2730	105	114
-10	92	4340	92	3520	92	3270	92	3020	92	2780	105	114
-5	92	4410	92	3580	92	3320	92	3070	92	2830	105	114
0	92	4470	92	3630	92	3370	92	3120	92	2880	105	114
5	92	4520	92	3680	92	3420	92	3170	92	2930	105	114
10	92	4580	92	3740	92	3470	92	3220	92	2970	105	114
15	92	4640	92	3790	92	3520	92	3260	92	3020	105	114
20	92	4690	92	3830	92	3560	92	3300	92	3060	105	114
25	92	4780	91	3840	92	3610	92	3380	93	3160	105	114
30	95	5100	93	4090	94	3850	94	3610	95	3380	106	114
35	97	5550	96	4410	96	4150	97	3890	97	3650	106	114
40	99	6100	99	4770	99	4490	99	4220	100	3960	107	114
45	102	6750	101	5180	102	4880	102	4590	102	4300	108	114
50	104	7510	104	5640	104	5310	104	5000	105	4690	109	114
51	105	7680	104	5740	105	5400	105	5090	105	4780	109	114
52	105	7850	105	5850	105	5500	105	5180	106	4860	109	114

WEIGHT = 13600 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4040	93	3250	93	3010	93	2770	93	2550	103	113
-30	92	4100	92	3310	92	3060	92	2820	92	2600	103	113
-25	92	4170	92	3370	92	3120	92	2880	92	2640	103	113
-20	92	4230	92	3420	92	3170	92	2930	92	2690	103	113
-15	92	4290	92	3480	92	3230	92	2980	92	2750	103	113
-10	92	4350	92	3530	92	3280	92	3030	92	2800	103	113
-5	92	4410	92	3590	92	3330	92	3080	92	2840	103	113
0	92	4470	92	3640	92	3380	92	3130	92	2890	103	113
5	92	4530	92	3690	92	3430	92	3180	92	2940	103	113
10	92	4590	92	3750	92	3480	92	3230	92	2980	103	113
15	92	4650	92	3800	92	3530	92	3270	92	3030	103	113
20	92	4690	92	3840	92	3570	92	3310	92	3070	103	113
25	91	4670	91	3810	91	3540	91	3290	91	3040	104	113
30	93	4920	92	3950	92	3710	93	3480	93	3250	104	113
35	96	5310	94	4250	95	4000	95	3750	96	3510	105	113
40	98	5810	97	4590	97	4320	98	4060	98	3800	106	113
45	100	6410	99	4980	100	4690	100	4400	100	4130	107	113
50	103	7100	102	5410	102	5090	102	4790	103	4490	107	113
52	104	7400	103	5590	103	5270	103	4950	104	4650	108	113

WEIGHT = 13400 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4050	93	3260	93	3020	93	2780	93	2550	102	112
-30	93	4110	93	3320	93	3070	93	2830	93	2600	102	112
-25	93	4180	93	3380	93	3130	93	2890	93	2650	102	112
-20	93	4240	93	3430	93	3180	93	2940	93	2700	102	112
-15	92	4300	92	3490	92	3230	92	2990	92	2750	102	112
-10	92	4360	92	3540	92	3290	92	3040	92	2800	102	112
-5	92	4420	92	3600	92	3340	92	3090	92	2850	102	112
0	92	4480	92	3650	92	3390	92	3140	92	2900	102	112
5	92	4540	92	3700	92	3440	92	3190	92	2950	102	112
10	92	4600	92	3750	92	3490	92	3240	92	2990	102	112
15	92	4650	92	3800	92	3540	92	3280	92	3040	102	112
20	92	4700	92	3850	92	3580	92	3320	92	3070	102	112
25	91	4670	91	3820	91	3550	91	3290	91	3040	103	112
30	91	4800	90	3840	91	3610	91	3380	92	3160	103	112
35	94	5170	93	4130	93	3880	94	3640	94	3410	104	112
40	97	5610	95	4460	96	4200	96	3940	97	3690	105	112
45	99	6170	98	4840	98	4550	99	4270	99	4000	106	112
50	102	6810	101	5240	101	4930	101	4640	101	4350	106	112
52	103	7090	101	5410	102	5100	102	4790	102	4490	107	112

WEIGHT = 13200 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4060	93	3270	93	3030	93	2790	93	2570	101	111
-30	93	4120	93	3330	93	3080	93	2840	93	2610	101	111
-25	93	4190	93	3390	93	3140	93	2900	93	2660	101	111
-20	93	4250	93	3440	93	3190	93	2950	93	2710	101	111
-15	93	4310	93	3500	93	3240	93	3000	93	2760	101	111
-10	93	4370	93	3550	93	3300	93	3050	93	2810	101	111
-5	92	4430	92	3610	92	3350	92	3100	92	2860	101	111
0	92	4490	92	3660	92	3400	92	3150	92	2910	101	111
5	92	4550	92	3710	92	3450	92	3200	92	2960	101	111
10	92	4600	92	3760	92	3500	92	3250	92	3000	101	111
15	92	4660	92	3810	92	3550	92	3290	92	3050	101	111
20	92	4710	92	3850	92	3590	92	3330	92	3080	101	111
25	91	4680	91	3830	91	3560	91	3300	91	3050	102	111
30	90	4670	89	3730	89	3510	90	3280	90	3070	102	111
35	93	5030	92	4020	92	3770	92	3540	93	3310	103	111
40	96	5430	94	4340	95	4070	95	3820	95	3580	104	111
45	98	5940	97	4690	97	4420	97	4140	98	3880	105	111
50	101	6540	99	5080	99	4780	100	4490	100	4210	105	111
52	101	6800	100	5250	100	4940	101	4640	101	4350	106	111

WEIGHT = 13000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4070	93	3280	93	3040	93	2800	93	2580	101	111
-30	93	4130	93	3340	93	3090	93	2850	93	2620	101	111
-25	93	4200	93	3400	93	3150	93	2910	93	2670	101	111
-20	93	4260	93	3450	93	3200	93	2960	93	2730	101	111
-15	93	4320	93	3510	93	3250	93	3010	93	2780	101	111
-10	93	4380	93	3560	93	3310	93	3060	93	2820	101	111
-5	93	4440	93	3620	93	3360	93	3110	93	2870	101	111
0	92	4500	92	3670	92	3410	92	3160	92	2920	101	111
5	92	4560	92	3720	92	3460	92	3210	92	2970	101	111
10	92	4610	92	3770	92	3510	92	3260	92	3010	101	111
15	92	4670	92	3820	92	3560	92	3300	92	3060	101	111
20	92	4710	92	3860	92	3600	92	3340	92	3090	101	111
25	91	4680	91	3830	91	3570	91	3310	91	3060	101	110
30	88	4550	88	3710	88	3440	88	3190	89	2980	101	110
35	91	4890	90	3910	91	3670	91	3440	92	3210	102	110
40	94	5280	93	4210	93	3960	94	3710	94	3470	103	110
45	97	5730	95	4560	96	4280	96	4020	96	3760	104	110
50	99	6290	98	4930	98	4640	98	4350	99	4070	104	110
52	100	6530	99	5080	99	4780	99	4490	100	4210	105	110

WEIGHT = 12500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4100	93	3310	93	3070	93	2830	93	2600	99	110
-30	93	4160	93	3370	93	3120	93	2880	93	2660	100	110
-25	93	4230	93	3430	93	3180	93	2940	93	2710	100	110
-20	93	4290	93	3480	93	3230	93	2990	93	2760	100	110
-15	93	4350	93	3540	93	3280	93	3040	93	2810	100	110
-10	93	4410	93	3590	93	3340	93	3090	93	2850	100	110
-5	93	4470	93	3650	93	3390	93	3140	93	2900	100	110
0	93	4530	93	3700	93	3440	93	3190	93	2950	100	110
5	93	4590	93	3750	93	3490	93	3240	93	3000	100	110
10	92	4640	92	3800	92	3540	92	3290	92	3040	100	110
15	92	4690	92	3850	92	3590	92	3330	92	3090	100	110
20	92	4740	92	3890	92	3630	92	3370	92	3130	100	110
25	91	4700	91	3860	91	3590	91	3340	91	3090	99	109
30	89	4570	89	3730	89	3460	89	3210	89	2970	99	108
35	88	4570	87	3640	87	3410	88	3190	88	2980	100	108
40	91	4920	89	3920	90	3680	90	3440	91	3220	101	108
45	94	5320	92	4230	92	3970	93	3720	93	3480	101	108
50	96	5750	94	4560	95	4290	95	4020	95	3760	102	108
52	97	5930	95	4700	95	4420	96	4140	96	3870	102	108

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Figure 7-6* (Sheet 3)

TAKEOFF FIELD LENGTH - FEET

FLAPS - 15°
1000 FEET

(OVER 15 FOOT SCREEN HEIGHT)

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE OFF
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 12000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4140	93	3350	93	3110	93	2870	93	2640	98	109
-30	93	4200	93	3410	93	3160	93	2920	93	2690	98	109
-25	93	4260	93	3460	93	3220	93	2980	93	2740	98	109
-20	93	4320	93	3520	93	3270	93	3030	93	2800	98	109
-15	93	4390	93	3580	93	3320	93	3080	93	2840	98	109
-10	93	4450	93	3630	93	3380	93	3130	93	2890	98	109
-5	93	4510	93	3680	93	3430	93	3180	93	2940	98	109
0	93	4570	93	3740	93	3480	93	3230	93	2990	98	109
5	93	4620	93	3790	93	3530	93	3280	93	3030	98	109
10	93	4680	93	3840	93	3580	93	3330	93	3080	98	109
15	93	4730	93	3890	93	3630	93	3370	93	3130	98	109
20	92	4780	92	3930	92	3670	92	3410	92	3160	98	109
25	91	4740	91	3890	91	3630	91	3370	91	3120	98	108
30	89	4590	89	3750	89	3490	89	3240	89	2990	97	107
35	86	4420	86	3590	86	3330	86	3080	86	2840	97	106
40	87	4590	86	3640	86	3410	87	3190	87	2980	98	106
45	90	4950	88	3920	89	3680	89	3440	90	3210	99	106
50	93	5330	91	4220	91	3960	91	3710	92	3460	99	106
52	94	5490	92	4350	92	4080	92	3820	93	3570	100	106

WEIGHT = 11500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4190	93	3400	93	3150	93	2920	93	2690	97	108
-30	93	4250	93	3450	93	3210	93	2970	93	2740	97	108
-25	93	4310	93	3510	93	3260	93	3020	93	2790	97	108
-20	93	4370	93	3570	93	3320	93	3070	93	2840	97	108
-15	93	4440	93	3620	93	3370	93	3130	93	2890	97	108
-10	93	4490	93	3680	93	3430	93	3180	93	2940	97	108
-5	93	4550	93	3730	93	3470	93	3230	93	2990	97	108
0	93	4610	93	3790	93	3530	93	3280	93	3030	97	108
5	93	4670	93	3840	93	3580	93	3330	93	3080	97	108
10	93	4730	93	3890	93	3630	93	3370	93	3130	97	108
15	93	4780	93	3940	93	3670	93	3420	93	3170	97	108
20	93	4830	93	3980	93	3710	93	3450	93	3210	97	108
25	91	4780	91	3930	91	3670	91	3410	91	3170	97	107
30	89	4620	89	3790	89	3520	89	3270	89	3020	96	106
35	86	4440	86	3620	86	3360	86	3110	86	2870	95	104
40	83	4280	83	3460	83	3200	83	2960	84	2750	95	104
45	86	4590	85	3640	85	3410	86	3180	86	2960	96	104
50	89	4940	87	3910	88	3660	88	3420	88	3190	97	104
52	90	5080	88	4020	88	3770	89	3520	89	3280	97	104

WEIGHT = 11000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	93	4250	93	3460	93	3210	93	2970	93	2740	96	107
-30	93	4310	93	3510	93	3260	93	3020	93	2800	96	107
-25	93	4370	93	3570	93	3320	93	3080	93	2840	96	107
-20	93	4430	93	3630	93	3370	93	3130	93	2890	96	107
-15	93	4490	93	3680	93	3430	93	3180	93	2950	96	107
-10	93	4560	93	3740	93	3480	93	3230	93	3000	96	107
-5	93	4620	93	3790	93	3530	93	3280	93	3040	96	107
0	93	4680	93	3850	93	3590	93	3330	93	3090	96	107
5	93	4730	93	3900	93	3640	93	3380	93	3140	96	107
10	93	4790	93	3950	93	3680	93	3430	93	3180	96	107
15	93	4840	93	4000	93	3730	93	3470	93	3230	96	107
20	93	4890	93	4040	93	3770	93	3510	93	3260	96	107
25	92	4830	92	3990	92	3720	92	3460	92	3220	95	106
30	89	4670	89	3830	89	3570	89	3310	89	3070	94	105
35	86	4470	86	3650	86	3390	86	3140	86	2900	93	103
40	83	4300	83	3480	83	3230	83	2980	83	2750	93	102
45	82	4260	81	3360	82	3150	82	2930	83	2730	94	102
50	85	4570	84	3610	84	3380	84	3150	85	2930	94	102
52	86	4700	84	3710	85	3470	85	3240	86	3020	95	102

WEIGHT = 10500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4320	94	3530	94	3280	94	3040	94	2810	95	107
-30	94	4380	94	3580	94	3330	94	3090	94	2860	95	107
-25	94	4450	94	3640	94	3390	94	3150	94	2910	95	107
-20	94	4510	94	3700	94	3440	94	3200	94	2960	95	107
-15	93	4570	93	3750	93	3500	93	3250	93	3010	95	107
-10	93	4630	93	3810	93	3550	93	3300	93	3060	95	107
-5	93	4690	93	3860	93	3600	93	3350	93	3110	95	107
0	93	4750	93	3920	93	3650	93	3400	93	3160	95	107
5	93	4810	93	3970	93	3700	93	3450	93	3210	95	107
10	93	4860	93	4020	93	3750	93	3500	93	3250	95	107
15	93	4910	93	4070	93	3800	93	3540	93	3290	95	107
20	93	4960	93	4110	93	3840	93	3580	93	3330	95	107
25	92	4900	92	4050	92	3780	92	3530	92	3280	94	106
30	89	4720	89	3880	89	3620	89	3370	89	3120	93	104
35	86	4510	86	3690	86	3430	86	3180	86	2940	92	102
40	84	4320	84	3510	84	3260	84	3010	84	2780	91	100
45	81	4160	81	3350	81	3100	81	2860	81	2630	91	99
50	81	4230	80	3330	80	3110	81	2900	81	2700	92	99
52	82	4350	81	3420	81	3200	82	2980	82	2770	92	99

WEIGHT = 10000 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4410	94	3610	94	3360	94	3120	94	2890	95	108
-30	94	4480	94	3670	94	3420	94	3170	94	2940	95	108
-25	94	4540	94	3730	94	3470	94	3230	94	2990	95	108
-20	94	4600	94	3780	94	3530	94	3280	94	3040	95	108
-15	94	4660	94	3840	94	3580	94	3330	94	3090	95	108
-10	94	4720	94	3890	94	3640	94	3390	94	3140	95	108
-5	94	4780	94	3950	94	3690	94	3440	94	3190	95	108
0	94	4840	94	4000	94	3740	94	3480	94	3240	95	108
5	94	4900	94	4060	94	3790	94	3530	94	3290	95	108
10	93	4950	93	4100	93	3840	93	3580	93	3330	95	108
15	93	5010	93	4150	93	3890	93	3630	93	3380	95	107
20	93	5050	93	4190	93	3920	93	3660	93	3410	95	107
25	92	4980	92	4130	92	3860	92	3600	92	3350	94	106
30	89	4790	89	3950	89	3680	89	3430	89	3180	92	103
35	87	4570	87	3740	87	3480	87	3230	87	2990	91	101
40	84	4360	84	3550	84	3300	84	3050	84	2820	90	99
45	81	4190	81	3380	81	3130	81	2890	81	2660	89	98
50	79	4040	79	3240	79	3000	79	2760	79	2530	89	97
52	78	4010	78	3200	78	2950	78	2730	78	2540	90	97

WEIGHT = 9500 LBS VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-35	94	4520	94	3710	94	3460	94	3220	94	2980	95	108
-30	94	4580	94	3770	94	3520	94	3270	94	3030	95	109
-25	94	4650	94	3830	94	3570	94	3320	94	3080	95	109
-20	94	4710	94	3880	94	3630	94	3380	94	3140	95	109
-15	94	4770	94	3940	94	3680	94	3430	94	3190	95	109
-10	94	4830	94	4000	94	3740	94	3480	94	3240	95	109
-5	94	4890	94	4050	94	3790	94	3530	94	3290	95	109
0	94	4950	94	4110	94	3840	94	3590	94	3340	95	109
5	94	5010	94	4160	94	3890	94	3640	94	3380	95	109
10	94	5060	94	4210	94	3940	94	3680	94	3430	95	108
15	94	5120	94	4260	94	3990	94	3730	94	3470	95	108
20	93	5160	93	4290	93	4030	93	3760	93	3510	95	108
25	92	5090	92	4230	92	3960	92	3690	92	3440	94	107
30	90	4870	90	4030	90	3760	90	3510	90	3260	91	103
35	87	4630	87	3810	87	3550	87	3300	87	3050	90	101
40	84	4420	84	3600	84	3350	84	3100	84	2870	89	99
45	81	4220	81	3420	81	3170	81	2930	81	2700	88	97
50	79	4060	79	3270	79	3020	79	2790	79	2560	87	95
52	78	4010	78	3220	78	2980	78	2740	78	2510	87	95

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Figure 7-6* (Sheet 4)

13 ADVISORY DATA

13 ADVISORY DATA

TAKEOFF FIELD LENGTH - FEET, FLAPS 15°
(WET RUNWAY OVER A 15 FOOT SCREEN HEIGHT) (ANTI-ICE ON)

Determine takeoff field length, V_1, V_R, V_2 and V_{ENR} from Figure 7-8. If the runway has a gradient, adjust V_1 and takeoff field length using Figure 7-7.

If the required distance is greater than the available distance, the airplane weight must be reduced until distance required is less than or equal to distance available.

TAKEOFF FIELD LENGTH AND V_1 ADJUSTED FOR RUNWAY GRADIENT - FLAPS 15°, ANTI-ICE ON

TAKEOFF FIELD LENGTH (ZERO GRADIENT) FROM FIG. 7-8	UPHILL GRADIENT FOR BOTH SHADED AND NON-SHADED				DOWNHILL GRADIENT SHADED		DOWNHILL GRADIENT NON-SHADED	
	2%	1.5%	1%	0.5%	-1%	-2%	-1%	-2%
2000	2200	2150	2150	2050	2000	1950	2100	2200
2200	2400	2350	2350	2300	2200	2150	2350	2400
2400	2600	2550	2550	2500	2400	2350	2550	2600
2600	2850	2800	2800	2700	2600	2550	2750	2850
2800	3100	3000	3000	2900	2800	2750	3000	3100
3000	3300	3250	3200	3100	3000	2950	3200	3350
3200	3500	3450	3450	3300	3200	3150	3400	3550
3400	3800	3700	3650	3500	3400	3350	3600	3800
3600	4000	3950	3900	3700	3600	3500	3850	4000
3800	4250	4150	4100	3950	3800	3700	4050	4200
4000	4650	4350	4350	4150	4000	3900	4250	4450
4200	4850	4600	4550	4350	4200	4100	4450	4650
4400	5200	4900	4800	4600	4400	4250	4650	4850
4600	5550	5150	5050	4800	4600	4450	4850	5100
4800	5950	5450	5300	5050	4800	4650	5100	5300
5000	6450	5800	5550	5250	4950	4800	5300	5500
5200	7000	6150	5850	5500	5150	5000	5500	5700
5400	7850	6550	6150	5700	5350	5150	5700	5900
5600	9000	7000	6450	5950	5500	5350	5900	6100
5800	10350	7600	6800	6200	5700	5500	6100	6350
6000	11000	7950	7050	6400	5900	5700	6300	6550
6200	11850	8300	7350	6650	6050	5850	6550	6750
6400	12600	8600	7600	6850	6250	6000	6750	6950
6600	13550	8950	7850	7100	6450	6200	6950	7200
6800	14550	9250	8100	7300	6600	6350	7200	7400
7000	15550	9600	8400	7550	6800	6450	7400	7600
7200		9950	8650	7750	6950	6650	7600	7850
7400		10350	8900	8000	7150	6800	7850	8050
7600		10700	9150	8200	7300	6950	8050	8300
7800		11150	9450	8400	7450	7100	8300	8500
8000		11650	9700	8650	7650	7250	8500	8750
8500		12800	10550	9250	8050	7650	9050	9300
9000		14500	11650	10000	8500	8000	9550	9850
9500		16200	12300	10550	8900	8350	10050	10350
10000			12950	11150	9300	8700	10600	10850
10500			13600	11650	9700	9050	11050	11350
11000			14250	12200	10100	9400	11500	11850
11500			14900	12800	10500	9750	11950	12350
12000			15550	13350	10900	10100	12400	12850
12500				13900	11300	10450	12850	13350
13000				14450	11700	10800	13300	13850
13500				15000	12100	11150	13750	14350
14000					12500	11500	14200	14850
14500					12900	11850	14650	15350
15000					13300	12200	15100	
V_1 ADJUSTMENT*	V_1 + 5 Knots	V_1 + 4 Knots	V_1 + 2 Knots	V_1 + 1 Knot	V_1 - 4 Knots	V_1 - 7 Knots	V_1 + 1 Knot	V_1 + 1 Knot

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* If the adjusted V_1 is greater than V_R, the value of V_R must be used for V_1.

Figure 7-7*

TAKEOFF FIELD LENGTH - FEET
(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - 15°
SEA LEVEL

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3900	91	3100	91	2860	91	2650	92	2460	105	114
-25	91	3970	91	3150	91	2910	91	2710	92	2510	105	114
-20	91	4030	91	3210	91	2960	91	2760	92	2560	105	114
-15	91	4090	91	3250	91	3020	91	2810	92	2610	105	114
-10	91	4150	91	3310	91	3070	91	2860	92	2660	105	114
-5	91	4220	91	3360	91	3120	91	2910	92	2710	105	114
0	91	4280	91	3410	91	3180	91	2970	92	2760	105	114
5	91	4350	90	3450	91	3230	92	3020	92	2820	105	114
10	92	4410	90	3510	91	3290	92	3080	92	2870	105	114

WEIGHT = 13600 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3880	91	3110	91	2870	91	2640	91	2420	103	113
-25	91	3940	91	3160	91	2920	91	2690	91	2460	103	113
-20	91	4000	91	3220	91	2970	91	2740	91	2510	103	113
-15	91	4060	91	3260	91	3020	91	2780	91	2560	103	113
-10	91	4110	91	3320	91	3070	91	2830	91	2600	103	113
-5	91	4170	91	3370	91	3120	91	2880	91	2640	103	113
0	91	4230	91	3420	91	3170	91	2920	91	2690	103	113
5	91	4280	91	3460	91	3210	91	2970	91	2730	103	113
10	90	4330	90	3510	90	3250	90	3010	90	2770	103	113

WEIGHT = 13400 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3890	91	3120	91	2880	91	2650	91	2420	102	112
-25	91	3950	91	3170	91	2930	91	2700	91	2470	102	112
-20	91	4010	91	3220	91	2980	91	2740	91	2520	102	112
-15	91	4060	91	3270	91	3030	91	2790	91	2560	102	112
-10	91	4120	91	3320	91	3080	91	2840	91	2610	102	112
-5	91	4180	91	3380	91	3130	91	2880	91	2650	102	112
0	91	4230	91	3430	91	3170	91	2930	91	2700	102	112
5	91	4280	91	3470	91	3220	91	2970	91	2740	102	112
10	90	4340	90	3520	90	3260	90	3020	90	2780	102	112

WEIGHT = 13200 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3900	91	3130	91	2890	91	2660	91	2430	101	111
-25	91	3960	91	3180	91	2940	91	2700	91	2480	101	111
-20	91	4020	91	3230	91	2990	91	2750	91	2530	101	111
-15	91	4070	91	3280	91	3040	91	2800	91	2570	101	111
-10	91	4130	91	3330	91	3090	91	2850	91	2620	101	111
-5	91	4190	91	3380	91	3130	91	2890	91	2660	101	111
0	91	4240	91	3430	91	3180	91	2940	91	2710	101	111
5	91	4290	91	3480	91	3230	91	2980	91	2750	101	111
10	91	4340	91	3530	91	3270	91	3020	91	2790	101	111

WEIGHT = 13000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3910	91	3140	91	2900	91	2670	91	2440	101	110
-25	91	3970	91	3190	91	2950	91	2720	91	2490	101	110
-20	91	4030	91	3240	91	3000	91	2760	91	2540	101	110
-15	91	4080	91	3290	91	3050	91	2810	91	2580	101	110
-10	91	4140	91	3340	91	3100	91	2860	91	2630	101	110
-5	91	4190	91	3390	91	3140	91	2900	91	2670	101	110
0	91	4250	91	3440	91	3190	91	2950	91	2720	101	110
5	91	4300	91	3490	91	3230	91	2990	91	2760	101	110
10	91	4350	91	3540	91	3280	91	3030	91	2800	101	110

WEIGHT = 12500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3940	91	3170	91	2930	91	2700	91	2470	99	109
-25	91	4000	91	3220	91	2980	91	2740	91	2520	99	109
-20	91	4050	91	3270	91	3020	91	2790	91	2570	99	109
-15	91	4110	91	3320	91	3070	91	2840	91	2610	99	109
-10	91	4170	91	3370	91	3120	91	2890	91	2660	99	109
-5	91	4220	91	3420	91	3170	91	2930	91	2700	99	109
0	91	4270	91	3470	91	3220	91	2980	91	2750	99	109
5	91	4330	91	3520	91	3260	91	3020	91	2790	99	109
10	91	4380	91	3560	91	3310	91	3060	91	2830	99	109

WEIGHT = 12000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3970	91	3200	91	2960	91	2730	91	2510	98	109
-25	91	4030	91	3250	91	3010	91	2780	91	2560	98	109
-20	91	4090	91	3310	91	3060	91	2830	91	2600	98	109
-15	91	4150	91	3360	91	3110	91	2870	91	2650	98	109
-10	91	4200	91	3410	91	3160	91	2920	91	2690	98	109
-5	91	4260	91	3460	91	3210	91	2970	91	2740	98	109
0	91	4310	91	3510	91	3250	91	3010	91	2780	98	109
5	91	4360	91	3550	91	3300	91	3060	91	2820	98	109
10	91	4410	91	3600	91	3350	91	3100	91	2860	98	108

WEIGHT = 11500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4020	92	3250	92	3010	92	2780	92	2550	97	108
-25	91	4080	91	3300	91	3060	91	2820	91	2600	97	108
-20	91	4130	91	3350	91	3110	91	2870	91	2640	97	108
-15	91	4190	91	3400	91	3160	91	2920	91	2690	97	108
-10	91	4250	91	3450	91	3210	91	2970	91	2740	97	108
-5	91	4300	91	3500	91	3250	91	3010	91	2780	97	108
0	91	4360	91	3550	91	3300	91	3060	91	2820	97	108
5	91	4410	91	3600	91	3340	91	3100	91	2860	97	108
10	91	4460	91	3640	91	3390	91	3140	91	2910	97	108

WEIGHT = 10500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4140	92	3370	92	3120	92	2890	92	2660	94	106
-25	92	4200	92	3420	92	3170	92	2940	92	2710	94	106
-20	92	4260	92	3470	92	3220	92	2990	92	2760	94	106
-15	92	4310	92	3520	92	3270	92	3030	92	2800	94	106
-10	92	4370	92	3570	92	3320	92	3080	92	2850	94	106
-5	92	4430	92	3620	92	3370	92	3130	92	2890	94	106
0	92	4480	92	3670	92	3420	92	3170	92	2940	94	106
5	92	4530	92	3720	92	3460	92	3220	92	2980	94	106
10	91	4580	91	3760	91	3510	91	3260	91	3020	94	106

WEIGHT = 9500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4330	92	3540	92	3290	92	3050	92	2820	94	107
-25	92	4390	92	3590	92	3340	92	3100	92	2870	94	107
-20	92	4450	92	3650	92	3400	92	3150	92	2920	94	107
-15	92	4500	92	3700	92	3440	92	3200	92	2970	94	107
-10	92	4560	92	3750	92	3490	92	3250	92	3010	94	107
-5	92	4620	92	3800	92	3540	92	3300	92	3060	94	107
0	92	4670	92	3850	92	3590	92	3340	92	3100	94	107
5	92	4720	92	3890	92	3640	92	3390	92	3140	94	107
10	92	4770	92	3940	92	3680	92	3430	92	3190	94	107

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Figure 7-8* (Sheet 1 of 15)

TAKEOFF FIELD LENGTH - FEET

(OVER 15 FOOT SCREEN HEIGHT)

FLAPS - 15°

1000 FEET

CONDITIONS: WET RUNWAY
RUNWAY GRADIENT - ZERO
LANDING GEAR - DOWN
SPEEDBRAKES - RETRACT

ANTI-ICE ON
INOPERATIVE ENGINE - WINDMILLING AFTER V1
OPERATIVE ENGINE - TAKEOFF THRUST

SOME CONDITIONS DO NOT MEET CLIMB REQUIREMENTS. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM TAKEOFF WEIGHT TABLES.

WEIGHT = 13870 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4010	91	3200	91	2950	91	2750	92	2550	105	114
-25	91	4080	91	3250	91	3010	91	2800	92	2600	105	114
-20	91	4140	91	3300	91	3060	91	2850	92	2650	105	114
-15	91	4210	91	3350	91	3110	91	2910	92	2700	105	114
-10	91	4270	91	3410	91	3170	91	2960	92	2760	105	114
-5	91	4340	91	3460	91	3230	91	3020	92	2810	105	114
0	91	4400	90	3510	91	3280	91	3070	92	2860	105	114
5	91	4470	90	3560	91	3340	92	3130	92	2920	105	114
10	92	4540	91	3630	91	3400	92	3180	92	2970	105	114

WEIGHT = 13600 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	3990	91	3210	91	2960	91	2730	91	2500	103	113
-25	91	4050	91	3260	91	3010	91	2780	91	2550	103	113
-20	91	4110	91	3310	91	3060	91	2820	91	2600	103	113
-15	91	4170	91	3360	91	3110	91	2870	91	2640	103	113
-10	91	4230	91	3420	91	3170	91	2920	91	2690	103	113
-5	91	4280	91	3470	91	3220	91	2970	91	2740	103	113
0	91	4340	91	3520	91	3260	91	3020	91	2780	103	113
5	90	4390	90	3570	90	3310	90	3060	90	2820	103	113
10	90	4450	90	3620	90	3360	90	3110	90	2870	104	113

WEIGHT = 13400 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4000	91	3210	91	2970	91	2730	91	2510	102	112
-25	91	4060	91	3260	91	3020	91	2780	91	2560	102	112
-20	91	4110	91	3320	91	3070	91	2830	91	2600	102	112
-15	91	4170	91	3370	91	3120	91	2880	91	2650	102	112
-10	91	4230	91	3430	91	3170	91	2930	91	2700	102	112
-5	91	4290	91	3470	91	3220	91	2980	91	2740	102	112
0	91	4350	91	3530	91	3270	91	3020	91	2790	102	112
5	91	4400	91	3580	91	3320	91	3070	91	2830	102	112
10	90	4460	90	3630	90	3370	90	3120	90	2880	103	112

WEIGHT = 13200 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4010	91	3220	91	2980	91	2740	91	2520	101	111
-25	91	4060	91	3270	91	3030	91	2790	91	2570	101	111
-20	91	4120	91	3330	91	3080	91	2840	91	2610	101	111
-15	91	4180	91	3380	91	3130	91	2890	91	2660	101	111
-10	91	4240	91	3430	91	3180	91	2940	91	2710	101	111
-5	91	4300	91	3480	91	3230	91	2990	91	2750	101	111
0	91	4350	91	3530	91	3280	91	3030	91	2800	101	111
5	91	4410	91	3590	91	3330	91	3080	91	2840	101	111
10	90	4460	90	3630	90	3380	90	3130	90	2880	102	111

WEIGHT = 13000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4010	91	3230	91	2990	91	2750	91	2530	101	110
-25	91	4070	91	3280	91	3040	91	2800	91	2580	101	110
-20	91	4130	91	3340	91	3090	91	2850	91	2620	101	110
-15	91	4190	91	3390	91	3140	91	2900	91	2670	101	110
-10	91	4250	91	3440	91	3190	91	2950	91	2720	101	110
-5	91	4310	91	3490	91	3240	91	3000	91	2760	101	110
0	91	4360	91	3540	91	3290	91	3040	91	2810	101	110
5	91	4420	91	3590	91	3340	91	3090	91	2850	101	110
10	91	4470	91	3640	91	3390	91	3140	91	2890	101	110

WEIGHT = 12500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4040	91	3260	91	3020	91	2780	91	2560	99	110
-25	91	4100	91	3310	91	3070	91	2830	91	2600	99	110
-20	91	4160	91	3370	91	3120	91	2880	91	2650	99	110
-15	91	4220	91	3420	91	3170	91	2930	91	2700	99	110
-10	91	4280	91	3470	91	3220	91	2980	91	2750	99	110
-5	91	4330	91	3520	91	3270	91	3020	91	2790	99	110
0	91	4390	91	3570	91	3320	91	3070	91	2830	99	109
5	91	4440	91	3620	91	3370	91	3120	91	2880	99	109
10	91	4500	91	3670	91	3410	91	3160	91	2920	99	109

WEIGHT = 12000 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4080	91	3290	91	3050	91	2820	91	2590	98	109
-25	91	4140	91	3350	91	3100	91	2870	91	2640	98	109
-20	91	4200	91	3400	91	3160	91	2920	91	2690	98	109
-15	91	4260	91	3450	91	3210	91	2970	91	2730	98	109
-10	91	4310	91	3510	91	3260	91	3020	91	2780	98	109
-5	91	4370	91	3560	91	3310	91	3060	91	2830	98	109
0	91	4420	91	3610	91	3350	91	3110	91	2870	98	109
5	91	4480	91	3660	91	3400	91	3150	91	2910	98	109
10	91	4530	91	3700	91	3450	91	3200	91	2960	98	109

WEIGHT = 11500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	91	4120	91	3340	91	3100	91	2860	91	2630	97	108
-25	91	4180	91	3390	91	3150	91	2910	91	2680	97	108
-20	91	4240	91	3440	91	3200	91	2960	91	2730	97	108
-15	91	4300	91	3500	91	3250	91	3010	91	2780	97	108
-10	91	4360	91	3550	91	3300	91	3060	91	2820	97	108
-5	91	4410	91	3600	91	3350	91	3110	91	2870	97	108
0	91	4470	91	3650	91	3400	91	3150	91	2910	97	108
5	91	4520	91	3700	91	3440	91	3200	91	2960	97	108
10	91	4580	91	3750	91	3490	91	3240	91	3000	97	108

WEIGHT = 10500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4250	92	3460	92	3220	92	2980	92	2750	94	106
-25	92	4310	92	3510	92	3260	92	3020	92	2800	94	106
-20	92	4370	92	3570	92	3320	92	3080	92	2840	94	106
-15	92	4430	92	3620	92	3370	92	3130	92	2890	94	106
-10	92	4480	92	3670	92	3420	92	3180	92	2940	94	106
-5	92	4540	92	3720	92	3470	92	3220	92	2990	94	106
0	92	4590	92	3770	92	3520	92	3270	92	3030	94	106
5	91	4650	91	3820	91	3560	91	3310	91	3070	94	106
10	91	4700	91	3870	91	3610	91	3360	91	3120	94	106

WEIGHT = 9500 LBS — VENR = 130 KIAS

TEMP DEG C	TAILWIND 10 KTS V1 KIAS	TAILWIND 10 KTS DIST FT	ZERO WIND V1 KIAS	ZERO WIND DIST FT	HEADWINDS 10 KTS V1 KIAS	HEADWINDS 10 KTS DIST FT	HEADWINDS 20 KTS V1 KIAS	HEADWINDS 20 KTS DIST FT	HEADWINDS 30 KTS V1 KIAS	HEADWINDS 30 KTS DIST FT	VR KIAS	V2 KIAS
-30	92	4440	92	3640	92	3390	92	3140	92	2910	94	107
-25	92	4490	92	3690	92	3440	92	3200	92	2960	94	107
-20	92	4550	92	3740	92	3490	92	3240	92	3010	94	107
-15	92	4610	92	3800	92	3540	92	3290	92	3060	95	108
-10	92	4670	92	3850	92	3590	92	3350	92	3100	95	108
-5	92	4730	92	3900	92	3650	92	3390	92	3150	95	107
0	92	4780	92	3950	92	3690	92	3440	92	3200	95	107
5	92	4840	92	4000	92	3740	92	3480	92	3240	94	107
10	92	4890	92	4050	92	3790	92	3530	92	3280	94	107

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Figure 7-8* (Sheet 2)

TAKEOFF FIELD LENGTH - FEET

FLAPS - UP

DRY RUNWAY	ADVERSE RUNWAY CONDITIONS (ALL WINDS, 15 FT SCREEN HEIGHT)													
	WATER COVERED RUNWAY - INCHES*					SLUSH COVERED RUNWAY - INCHES*					SNOW INCHES*		COMPACT SNOW	WET ICE
	0.125	0.2	0.3	0.4	0.5	0.125	0.2	0.3	0.4	0.5	1.0	2.0		
1600	3450	3250	2950	2800	2650	3500	3300	3100	2900	2750	3450	3000	3450	10550
1800	3900	3650	3350	3100	3200	4000	3750	3450	3250	3050	3850	3350	3850	12050
2000	4400	4050	3700	3450	4050	4450	4150	3850	3600	3400	4250	3700	4300	13500
2200	5100	4500	4100	3800	5200	5250	4650	4250	3950	3800	4650	4050	4700	15000
2400	6000	5350	4700	4150	8150	6150	5600	4950	4450	4200	5050	4350	5100	
2600	6850	6100	5350	4800	15050	7050	6350	5650	5100	4850	5450	4700	5550	
2800	7650	6850	6050	5400		7850	7150	6300	5700	5600	5850	5050	5950	
3000	8450	7550	6650	5950		8700	7850	6950	6300	6100	6250	5350	6350	
3200	9300	8300	7300	6550		9600	8650	7650	6900	6550	6650	5700	6800	
3400	10150	9100	7950	7100		10450	9450	8400	7550	7050	7000	6000	7200	
3600	10650	9600	8500	7650		10950	9950	8900	8050	7500	7300	6300	7450	
3800	11200	10150	9050	8200		11500	10500	9450	8600	8050	7600	6650	7750	
4000	11700	10650	9550	8750		12000	11000	10000	9150	8600	7900	6900	8050	
4200	12150	11100	10050	9200		12450	11500	10450	9600	9050	8200	7150	8350	
4400	12650	11550	10450	9600		13000	11950	10850	10000	9450	8500	7350	8650	
4600	13150	12050	10900	10050		13450	12400	11300	10450	9850	8800	7600	8950	
4800	13600	12450	11250	10400		13950	12850	11750	10900	10250	9100	7900	9250	
5000	14100	12900	11700	10850		14400	13300	12150	11350	10650	9400	8450	9500	
5200	14550	13350	12150	11300		14900	13750	12600	11750	11100	9650	9350	9750	
5400	14850	13650	12500	11600		15250	14100	12950	12100	11500	9850	10350	10000	
5600	15200	14050	12800	12050			14400	13300	12400	11850	10050	11650	10200	
5800		14350	13100	12300			14750	13600	12700	12200	10200	13250	10400	
6000		14650	13400	12700			15050	13900	13000	12550	10400	14850	10600	
6200		14950	13700	12950				14200	13300	12850	10550	16450	10800	
6400		15250	14000	13250				14500	13600	13150	10750		11000	
6600			14300	13550				14800	13900	13450	10950		11200	
6800			14650	13850				15100	14200	13750	11100		11400	
7000			15000	14150					14500	14050	11300		11600	
7200				14450					14800	14350	11500		11800	
7400				14750					15100	14650	11750		12000	
7600				15050						14950	12000		12200	
7800										15250	12250		12400	
8000											12550		12600	
8500											13300		13100	
9000											14050		13600	
9500											14900		14100	
10000											15750		14600	
10500													15100	
11000														
11500														
12000														
12500														

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Figure 7-9*

* Takeoffs should not be attempted in any precipitation depth greater than the highest depth presented or if any of the following limits are exceeded. If no limit is presented use the dry runway limit.

Contaminate	Temperature	Altitude	Wind
0.4 Inches Water	Greater than ISA+25° C	—	—
0.5 Inches Water	Greater than ISA+15° C	Greater than 13,000 ft	—
0.5 Inches Slush	Greater than ISA+20° C	—	—
2.0 Inches Snow	Greater than ISA+5° C	Greater than 10,000 ft	Any Tailwind

TAKEOFF FIELD LENGTH - FEET

FLAPS - 15°

DRY RUNWAY	ADVERSE RUNWAY CONDITIONS (ALL WINDS, 15 FT SCREEN HEIGHT)													
	WATER COVERED RUNWAY - INCHES*					SLUSH COVERED RUNWAY - INCHES*					SNOW INCHES*		COMPACT SNOW	WET ICE
	0.125	0.2	0.3	0.4	0.5	0.125	0.2	0.3	0.4	0.5	1.0	2.0		
1600	3350	3150	2900	2750	2650	3350	3200	3000	2850	2700	3350	2950	3350	9350
1800	3800	3550	3300	3100	2950	3850	3600	3400	3200	3050	3750	3300	3850	10700
2000	4250	3950	3650	3450	3400	4350	4050	3750	3550	3350	4150	3650	4300	12050
2200	4700	4350	4000	3800	4550	4800	4500	4150	3900	3950	4550	4000	4700	13400
2400	5400	4800	4400	4300	6500	5550	5050	4550	4250	5500	4950	4350	5100	14750
2600	6200	5600	4950	5000	8650	6350	5800	5200	4750	7700	5350	4700	5550	16100
2800	7000	6300	5600	5600	10800	7200	6550	5900	5400	9800	5750	5050	5950	
3000	7750	7000	6250	6100	12950	7950	7250	6500	5950	11900	6150	5350	6350	
3200	8550	7700	6850	6500	15100	8750	7950	7150	6500	15050	6550	5650	6800	
3400	9350	8400	7450	6950		9600	8700	7800	7100		6950	6000	7200	
3600	10100	9100	8050	7350		10400	9450	8450	7700		7300	6300	7600	
3800	10500	9450	8500	7800		10850	9850	8850	8150		7600	6550	7850	
4000	10950	9850	8900	8200		11250	10250	9300	8550		7850	6850	8100	
4200	11400	10300	9300	8600		11700	10650	9700	8950		8150	7100	8350	
4400	11850	10700	9650	8950		12100	11100	10050	9300		8400	7350	8600	
4600	12300	11150	10100	9350		12500	11500	10500	9750		8700	7650	8850	
4800	12750	11550	10500	9650		12900	11900	10900	10100		8950	7900	9100	
5000	13150	11900	10850	9950		13300	12300	11200	10450		9150	8200	9350	
5200	13550	12250	11200	10250		13600	12600	11600	10800		9350	8700	9550	
5400	13850	12550	11550	10550		13900	12900	11850	11100		9550	9550	9750	
5600	14150	12800	11850	10850		14150	13200	12150	11400		9700	10750	9950	
5800	14450	13100	12150	11150		14450	13500	12450	11700		9900	12150	10100	
6000	14750	13400	12450	11450		14700	13750	12750	12000		10100	14000	10250	
6200	15050	13700	12750	11750		15000	14050	13000	12250		10250	16000	10400	
6400		14000	13050	12000			14300	13250	12550		10450		10550	
6600		14300	13300	12250			14550	13500	12850		10650		10700	
6800		14600	13550	12500			14800	13800	13100		10850		10850	
7000		14900	13800	12750			15100	14100	13400		11050		11000	
7200		15200	14000	13000				14350	13650		11300		11150	
7400			14200	13250				14600	13900		11550		11300	
7600			14400	13500				14800	14100		11800		11450	
7800			14600	13750				15000	14300		12050		11600	
8000			14800	14000					14500		12300		11750	
8500			15300	14650					15000		12950		12150	
9000				15250							13550		12500	
9500											14200		12900	
10000											14800		13250	
10500											15450		13650	
11000													14000	
11500													14400	
12000													14750	
12500													15150	

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Figure 7-10*

* Takeoffs should not be attempted in any precipitation depth greater than the highest depth presented or if any of the following limits are exceeded. If no limit is presented use the dry runway limit.

Contaminate	Temperature	Altitude	Wind
0.4 Inches Water	Greater than ISA+20° C	Greater than 11,000 ft	—
0.5 Inches Water	Greater than ISA	Greater than 7,000 ft	—
0.5 Inches Slush	Greater than ISA+20°C	Greater than 11,000 ft	—
2.0 Inches Snow	—	Greater than 10,000 ft	Any Tailwind

LANDING DISTANCE - FEET

FLAPS - LAND

AIRSPEED - V_{REF}

DRY RUNWAY	WET RUNWAY	ADVERSE RUNWAY CONDITIONS (ALL WINDS, 50 FT SCREEN HEIGHT)													
		WATER COVERED RUNWAY - INCHES *					SLUSH OR WET SNOW COVERED RUNWAY - INCHES *					DRY SNOW INCHES *		COMPACT SNOW	WET ICE **
		0.125	0.2	0.3	0.4	0.5	0.125	0.2	0.3	0.4	0.5	1.0	2.0		
1600	2050	2550	2450	2350	2250	2150	2600	2600	2500	2350	2250	2750	2400	2850	6600
1800	2350	2850	2750	2650	2500	2400	3050	2950	2800	2700	2550	3250	2750	3350	7300
2000	2600	3300	3150	3000	2800	2700	3600	3400	3200	3050	2900	3700	3150	3800	8500
2200	2900	3750	3550	3300	3150	3000	4100	3850	3600	3350	3200	4150	3500	4300	10950
2400	3200	4200	3900	3650	3450	3250	4550	4250	3950	3700	3500	4650	3850	4800	15450
2600	3500	4600	4300	4000	3750	3550	4850	4550	4250	4000	3800	4850	4200	5000	
2800	3800	4950	4650	4300	4050	3800	5150	4800	4550	4300	4050	5050	4450	5200	
3000	4100	5350	5000	4650	4350	4100	5500	5150	4850	4600	4350	5300	4700	5450	
3200	4350	5850	5400	5000	4650	4400	5950	5550	5200	4900	4650	5600	4950	5800	
3400	4650	6350	5850	5350	5000	4700	6450	6050	5550	5200	4950	5900	5150	6150	
3600	4950	6850	6300	5750	5350	5050	6950	6450	5950	5550	5250	6200	5400	6450	
3800	5250	7300	6750	6150	5700	5350	7450	6900	6350	5900	5550	6550	5600	6800	
4000	5550	7800	7200	6550	6050	5650	7950	7400	6800	6300	5900	6850	5850	7150	
4200	5850	8250	7600	6950	6400	6000	8400	7800	7200	6700	6250	7150	6100	7500	
4400	6200	8700	8050	7350	6800	6350	8900	8250	7600	7050	6600	7450	6350	7750	
4600	6500	9200	8450	7700	7150	6650	9350	8700	8000	7400	6950	7700	6600	7950	
4800	6800	9650	8900	8100	7500	7000	9850	9150	8400	7800	7300	7900	6800	8150	
5000	7100	10050	9300	8500	7850	7300	10250	9550	8800	8150	7650	8150	7050	8350	
5200	7450	10450	9700	8850	8200	7650	10650	9950	9200	8550	8000	8300	7250	8500	
5400	7750	10800	10050	9250	8550	8000	11000	10350	9550	8900	8350	8600	7450	8750	
5600	8050	11200	10400	9600	8900	8300	11350	10700	9900	9250	8700	8800	7600	9000	
5800	8350	11600	10750	9950	9250	8650	11700	11050	10150	9500	8950	9000	7800	9250	
6000	8650	12000	11100	10300	9600	9000	12050	11400	10400	9750	9200	9200	8000	9500	
6200	8950	12400	11450	10650	9950	9350	12400	11750	10750	10150	9600	9400	8200	9750	
6400	9250	12800	11800	11000	10300	9700	12750	12100	11100	10500	9950	9600	8400	10000	
6600	9550	13200	12150	11350	10650	10050	13100	12450	11400	10850	10300	9800	8600	10250	
6800	9850	13600	12500	11700	11000	10400	13450	12800	11750	11200	10650	10000	8800	10500	
7000	10150	14000	12850	12050	11350	10750	13800	13150	12100	11550	11000	10200	9000	10750	
7200	10450	14400	13200	12400	11700	11100	14150	13500	12400	11900	11350	10400	9200	11000	
7400	10750	14800	13550	12750	12050	11450	14500	13850	12750	12250	11700	10600	9400	11250	
7600	11050	15200	13900	13100	12400	11800	14850	14200	13100	12600	12050	10800	9600	11500	
7800	11350		14250	13450	12750	12150	15200	14550	13400	12950	12400	11000	9800	11750	
8000	11650		14600	13800	13100	12500		14900	13750	13350	12800	11200	10000	12000	
8500	12400		15500	14700	14000	13400		15800	14600	14200	13650	11700	10500	12650	
9000	13150			15550	14850	14250			15400	15100	14550	12200	11000	13250	
9500	13900				15750	15150					15450	12700	11500	13900	
10000	14650											13200	12000	14500	
10500	15400											13700	12500	15150	
11000												14200	13000		
11500												14700	13500		
12000												15200	14000		
12500													14500		
13000													15000		
13500													15500		
14000															

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NOTE

The published limiting maximum tailwind component for this airplane is 10 knots: however, Cessna does not recommend landings on precipitation-covered runways with any tailwind component.

* Landings should not be attempted in any precipitation depth greater than the highest depth presented.

** Landings on Wet Ice should not be attempted at temperatures less than 0°C, or weights less than 11,000 lbs, or with any Tailwind.

Figure 7-11

LANDING DISTANCE - FEET

FLAPS - LAND

AIRSPEED - V_{REF} + 10 KNOTS

DRY RUNWAY	ADVERSE RUNWAY CONDITIONS (ALL WINDS, 50 FT SCREEN HEIGHT)														
	WET RUNWAY	WATER COVERED RUNWAY - INCHES *					SLUSH OR WET SNOW COVERED RUNWAY - INCHES *					DRY SNOW INCHES *		COMPACT SNOW	WET ICE **
		0.125	0.2	0.3	0.4	0.5	0.125	0.2	0.3	0.4	0.5	1.0	2.0		
1600	2450	3000	2850	2700	2600	2450	3050	2950	2850	2700	2600	3200	2800	3350	7200
1800	2750	3350	3200	3050	2900	2800	3550	3400	3250	3100	2950	3700	3200	3850	8100
2000	3100	3800	3650	3400	3250	3100	4100	3900	3650	3450	3250	4200	3600	4350	9250
2200	3450	4300	4050	3800	3550	3400	4650	4350	4050	3800	3550	4700	3950	4850	11900
2400	3800	4750	4450	4150	3900	3700	5150	4850	4500	4150	3900	5200	4300	5400	16200
2600	4150	5250	4900	4550	4250	4000	5500	5150	4800	4500	4250	5400	4650	5600	
2800	4500	5750	5400	4950	4650	4350	5950	5550	5150	4850	4600	5650	4950	5900	
3000	4850	6300	5850	5400	5050	4750	6400	6000	5550	5250	4950	5950	5200	6200	
3200	5200	6850	6350	5850	5450	5100	6950	6500	6000	5650	5300	6300	5450	6600	
3400	5600	7450	6900	6300	5850	5500	7550	7050	6500	6050	5700	6650	5700	7000	
3600	5950	8000	7400	6750	6250	5850	8150	7600	7000	6500	6100	7050	6000	7400	
3800	6300	8600	7950	7250	6700	6250	8700	8150	7500	6950	6500	7400	6300	7800	
4000	6650	9100	8450	7700	7150	6650	9300	8650	7950	7400	6950	7750	6600	8200	
4200	7050	9650	8950	8200	7600	7100	9850	9200	8450	7850	7400	8150	6850	8600	
4400	7400	10200	9450	8650	8000	7500	10400	9700	8950	8300	7800	8450	7100	8850	
4600	7800	10700	9950	9100	8450	7900	10900	10200	9400	8750	8200	8700	7400	9050	
4800	8200	11200	10450	9600	8900	8300	11400	10700	9900	9250	8650	8950	7650	9300	
5000	8600	11700	10900	10000	9300	8750	11850	11150	10350	9650	9100	9150	7850	9550	
5200	9000	12200	11350	10450	9750	9150	12300	11550	10800	10100	9500	9400	8100	9800	
5400	9450	12700	11800	10900	10150	9550	12750	12000	11250	10500	9900	9650	8300	10050	
5600	9900	13200	12250	11350	10550	9950	13150	12450	11700	10900	10300	9900	8500	10300	
5800	10350	13700	12700	11800	10950	10350	13600	12900	12150	11300	10700	10150	8700	10550	
6000	10800	14200	13150	12250	11350	10750	14050	13350	12600	11700	11100	10400	8900	10800	
6200	11250	14700	13600	12700	11750	11150	14500	13800	13050	12100	11500	10650	9100	11050	
6400	11700	15200	14050	13150	12150	11550	14950	14250	13500	12500	11900	10900	9300	11300	
6600	12150		14500	13600	12550	11950	15400	14700	13950	12900	12300	11150	9500	11550	
6800	12600		14950	14050	12950	12350		15150	14400	13300	12700	11400	9700	11800	
7000	13050		15400	14500	13350	12750			14850	13700	13100	11650	9900	12050	
7200	13500			14950	13750	13150			15300	14100	13500	11900	10100	12300	
7400	13950			15400	14150	13550				14500	13900	12150	10300	12550	
7600	14400				14550	13950				14900	14300	12400	10500	12800	
7800	14850				14950	14350				15300	14700	12650	10700	13050	
8000	15300				15350	14750					15100	12900	10900	13300	
8500						15750						13550	11400	13950	
9000												14150	11900	14550	
9500												14800	12400	15200	
10000												15400	12900		
10500													13400		
11000													13900		
11500													14400		
12000													14900		
12500													15400		
13000															
13500															
14000															

525BFM-04-00

NOTE

The published limiting maximum tailwind component for this airplane is 10 knots: however, Cessna does not recommend landings on precipitation-covered runways with any tailwind component.

* Landings should not be attempted in any precipitation depth greater than the highest depth presented.

** Landings on Wet Ice should not be attempted at temperatures less than 0°C, or weights less than 11,000 lbs, or with any Tailwind.

Figure 7-12

CREW TRAINING REQUIREMENTS

In addition to the minimum crew requirements specified in Section 2, Limitations, Cessna recommends that the pilot in command complete an FAA approved proficiency check as required for more-than-one-required-pilot operation by FAR 61.58 regardless of whether the airplane is to be operated by a single required pilot or more than one required pilot.

SUPPLEMENTAL A-WEIGHTED NOISE LEVELS

The following A-weighted noise levels were established for 14 CFR 36 reference conditions used in CERTIFICATED NOISE LEVELS.

NOISE REFERENCE	dBA
FLYOVER	61.7
LATERAL	77.2
APPROACH	78.3

The supplemental A-Weighted levels are not intended to demonstrate compliance with Part 36.

Refer to Section IV, Performance, for Certificated Noise Levels.

GROUND DEICE/ANTI-ICE OPERATIONS

During cold weather operations, flight crews are responsible for ensuring the airplane is free of ice contaminants.

Ground icing may occur whenever there is high humidity with temperatures of +10°C or colder. Type I deice, and Type II, Type III or Type IV anti-ice fluids may be used sequentially to ensure compliance with FAA regulations (clean wing concept) requiring critical component airframe deicing and anti-icing.

NOTE

It is recommended that flight crews refamiliarize themselves seasonally with the following publications for expanded deice and anti-ice procedures:

- Cessna Maintenance Manual Chapter 12.
- FAA Advisory Circular AC 120-58 (large aircraft), dated September 30, 1992 or later.
- FAA Advisory Circular AC 135-17 (small aircraft), dated December 14, 1994 or later.
- Cessna Citation Service Letter CIL-30-01, dated October 8, 2012 or later.

DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, TYPE III AND TYPE IV FLUIDS)

ONE STEP DEICING - Type I fluid is used to remove ice, slush and snow from the airplane prior to departure, and to provide minimal anti-icing protection as provided in the Type I holdover timetable (refer to applicable service letter).

TWO STEP DEICE/ANTI-ICE - May be used to ensure the airplane remains clean after deicing. Type II, Type III or Type IV fluid is used to provide longer term anti-icing protection as provided in the Type II, Type III or Type IV holdover timetable (refer to applicable service letter).

CAUTION

TYPE I, TYPE II, TYPE III AND TYPE IV FLUIDS ARE NOT COMPATIBLE AND MAY NOT BE MIXED. ADDITIONALLY, MOST MANUFACTURERS PROHIBIT MIXING OF BRANDS WITHIN A TYPE.

Line personnel should be supervised by the PIC or SIC to ensure proper application of deice or anti-ice, fluids. Refer to Figures 7-13 and 7-14. Make sure airplane is always sprayed from the front. Spraying from the rear can force fluid into aerodynamic quiet areas where it will not drain from the airplane.

NOTE

The first area to be deiced/anti-iced should be easily visible from the cabin/cockpit and should be used to provide a conservative estimate for unseen areas of the airplane before initiating takeoff roll.

Holdover timetables (refer to applicable service letter) are only estimates and vary depending on many factors to include temperature, precipitation type, precipitation rate, wind and airplane skin temperature. Holdover times are based on mixture ratio. Times start when the last application begins.

(Continued Next Page)

DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, TYPE III AND TYPE IV FLUIDS) (Continued)

Guidelines for holdover times anticipated by SAE Type I, Type II, Type III or Type IV, and ISO Type I, Type II, or Type IV fluid mixtures are a function of weather conditions and outside air temperature (OAT).

CAUTION

- AIRPLANE OPERATORS ARE SOLELY RESPONSIBLE FOR ENSURING HOLDOVER TIMETABLES CONTAIN CURRENT DATA.
- TABLES ARE FOR USE IN DEPARTURE PLANNING ONLY AND THEY SHOULD BE USED IN CONJUNCTION WITH THE PRETAKEOFF CONTAMINATION CHECK PROCEDURES.

NOTE

- Tables do not apply to other than SAE or ISO Type I, Type II, Type III or Type IV FPD fluids.
- The responsibility for the application of this data remains with the user.
- The freezing point of Type I, Type II, Type III and Type IV fluid mixture must be at least 10°C (18°F) below the current OAT.

SPRAYING TECHNIQUE - TYPE I FLUID

Type I fluid should be sprayed on the airplane in a manner which minimizes heat loss on the airplane. If spraying is conducted with engines running, the engines should be at idle with all engine bleed off. If possible, fluid should be sprayed in a solid cone pattern of large coarse droplets at a temperature of 160° to 180°F at the nozzle. The fluid should be sprayed as close as possible to the airplane surfaces, but not closer than 10 feet if a high pressure nozzle is used. Refer to Figures 7-13 and 7-14 for essential areas to be deiced and anti-iced.

SPRAYING TECHNIQUE - TYPE II, III AND IV FLUID

Application techniques for Type II, III and IV fluid are the same as for Type I, except that since the airplane is already clean, the application should last only long enough to properly coat the airplane surfaces. Refer to Figure 7-13 and 7-14 for essential areas to be deiced/anti-iced.

(Continued Next Page)

13 ADVISORY DATA

DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, TYPE III AND TYPE IV FLUIDS) (Continued)

Type II, III and IV fluids should be applied cold to a "clean" airplane. They are, however, sometimes heated and sprayed as a deicing fluid. For this case, it should be considered a Type I fluid, as the heat may change the characteristics of the thickening agents in the fluid. Type II III and IV fluids, therefore, applied in this manner, will not be as effective as if they were applied cold.

NOTE

- Holdover time starts when last application has begun.
- Some Type IV fluids could form a thick or high-strength gel during "dryout" and when rehydrated form a slippery film.
- Some Type IV fluids exhibit poor aerodynamic elimination (flow-off) qualities at colder temperatures.
- Heated areas of aircraft (i.e., heated leading edge) should be avoided due to the fact that fluid may "dry-out" into hard globular nodules.
- Type IV fluid should not be used undiluted below -24°C (-11°F).

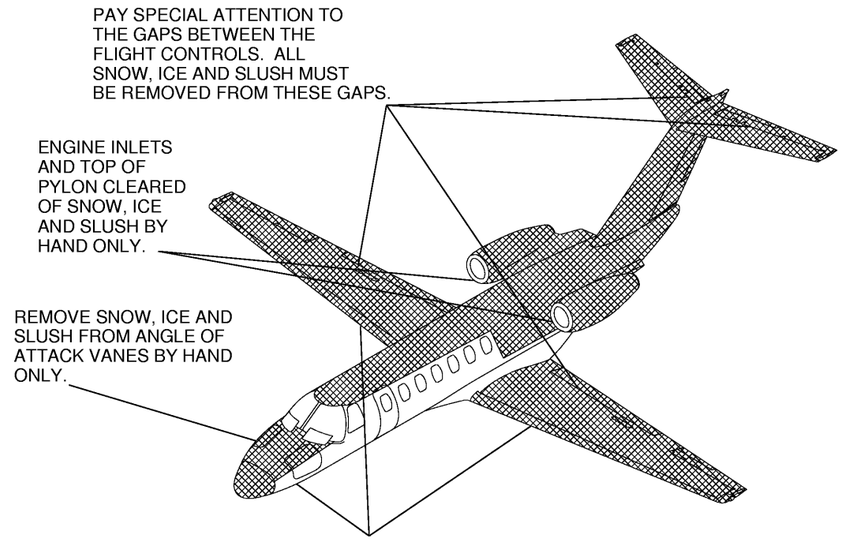
PRETAKEOFF CONTAMINATION CHECK - GROUND ICING CONDITIONS

When ground icing conditions are present, a pretakeoff contamination check should be conducted by the PIC/SIC within 5 minutes prior to takeoff, preferably just prior to taxiing onto the active runway. Critical areas of the airplane such as empennage, wing, windshield and control surfaces should be checked to ensure they are free of ice, slush and snow or that the deice/anti-ice fluids are still protecting the airplane. Refer to Figure 7-13 and 7-14 for essential areas to be deiced/anti-iced.

A36355

MINIMUM DIRECT SPRAY AREAS:	ENGINE INLETS, AND EXHAUSTS, ENGINE PYLONS, RAM AIR INLETS, BRAKES, PITOT HEADS, STATIC PORTS, WINDSHIELD, CABIN WINDOWS, AND AOA VANES.

NOTE: SHADED AREAS INDICATE ESSENTIAL AREAS TO BE DEICED.



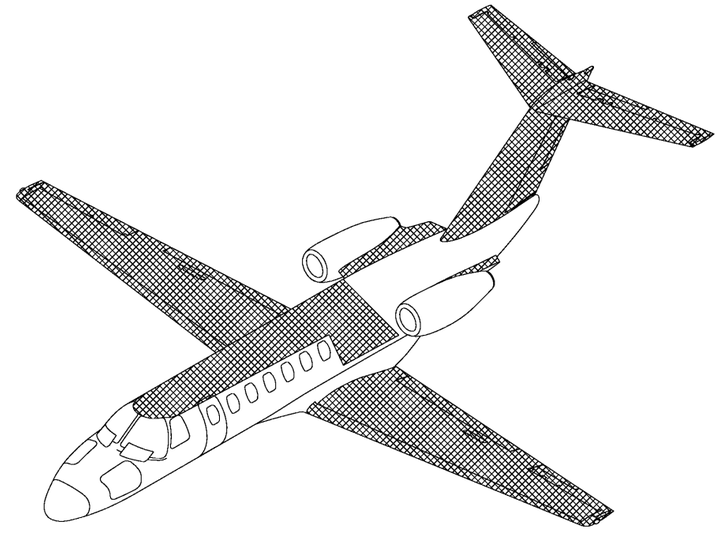
6380T1061

Figure 7-13

A36356

MINIMUM DIRECT SPRAY AREAS: ENGINE INLETS, AND EXHAUSTS, ENGINE PYLONS, RAM AIR INLETS, BRAKES, PITOT HEADS, STATIC PORTS, WINDSHIELD, CABIN WINDOWS, AND AOA VANES.

NOTE: THE SHADED AREAS INDICATE AREAS WHERE ANTI-ICE FLUID IS APPLIED. UPPER FUSELAGE IS ANTI-ICED TO PRECLUDE ICE FORMATION WHICH COULD BE INGESTED INTO ENGINE INLETS.



6380T1062

Figure 7-14

TAKEOFF PERFORMANCE

Takeoff is limited to the flaps up configuration per Section II, Takeoff and Landing Operational Limits when Type II, III, or IV anti-ice fluid has been applied to the airplane.

Takeoff performance is degraded when Type II, III, or IV anti-ice fluid has been applied to the airplane. The fluid that remains on the airplane during takeoff causes the elevator forces at rotation and the takeoff distance to increase. Determine the normal flaps up takeoff field length and apply any adjustments to speed and field length required by runway gradients or runway contamination; then multiply the resulting takeoff field length by the appropriate factor from the following table to determine the takeoff field length with Type II, III, or IV anti-ice fluid applied to the airplane:

FLAPS UP TAKEOFF FIELD LENGTH	FACTOR
Dry Runway	1.30
Wet Runway	1.30
Contaminated Runway	1.15

POSTFLIGHT INSPECTION - TYPE II, III, OR IV ANTI-ICE FLUID

Cessna recommends all operators that use heated Type I fluid for deicing followed then by Type II, III, or IV fluid for anti-icing perform periodic visual inspections for fluid residues. The visual inspection should include:

1. Along the wing rear spar area with the flaps extended,
2. Around the perimeter of the aileron surface,
3. The gaps around the elevator and elevator trim tab,
4. The gaps around the rudder and rudder trim tab.

Initially, these inspections should be performed after a maximum of three applications of Type II, III, or IV fluid. If the airplane is washed or if Type I fluid is used for deicing, then the frequency of inspection may be reduced. The frequency of inspections should be determined by the operator based on the results of the inspections for fluid residues, frequency of deicing/anti-icing operations, as well as frequency of aircraft washing.

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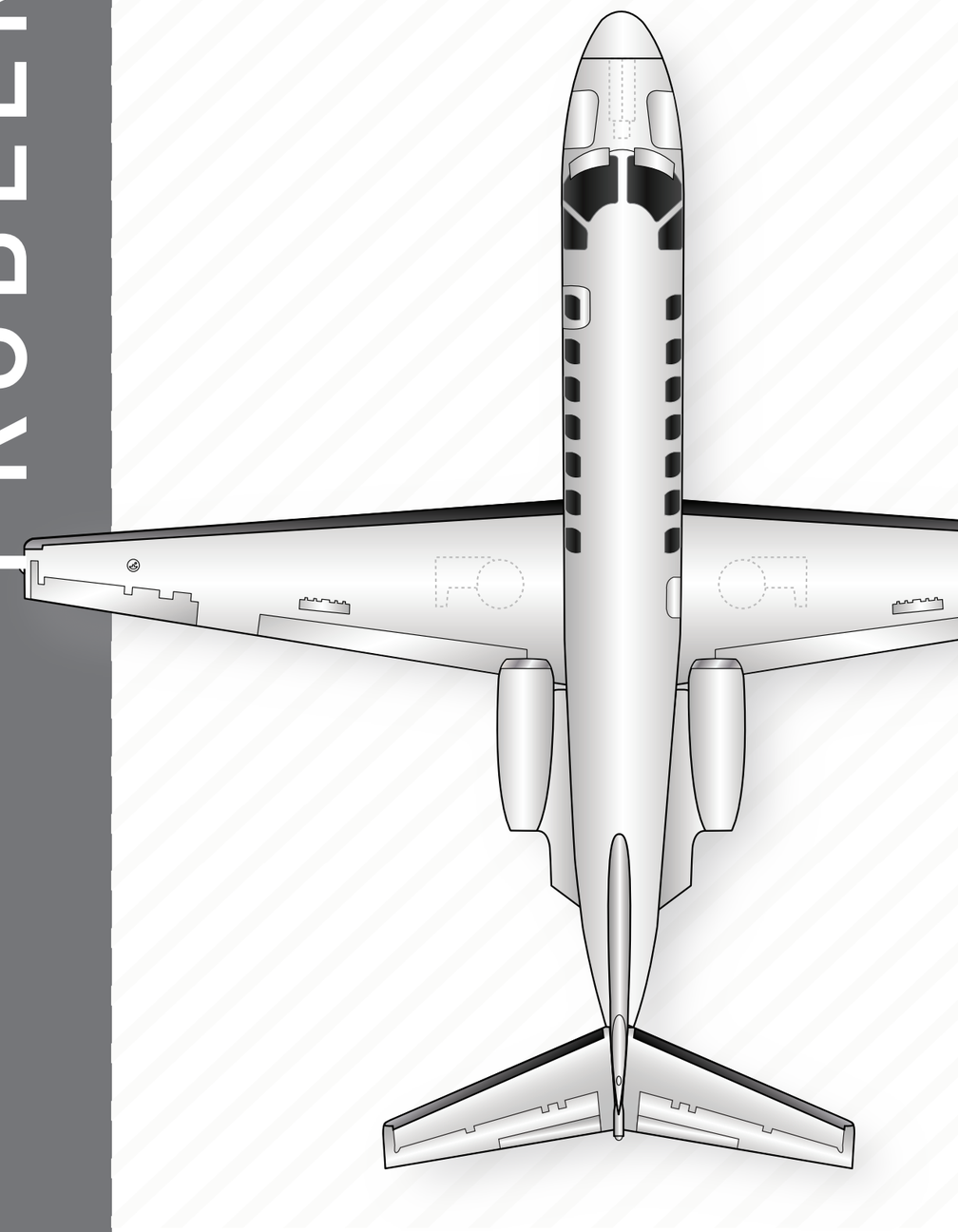
PERFORMANCE PROBLEM



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FLIGHT PLANNING AND PERFORMANCE EXERCISE

Aspen (KASE) to Van Nuys (KVNY)

Your Chief Pilot has sent you the following information for your CJ3 charter flight this afternoon. There are 6 passengers, and he has said that 3 days ago the following similar route/alt/fuel load "worked out just great" for him. Will it work for you?

I. PLANNING DATA:

Weight and Balance Information

- Basic Empty Weight and Moment: 8160 lbs. / 308.41
- 2 pilots weighing 190 pounds each
- 6 passengers: 210 lbs., 180 lbs., 200 lbs., 180 lbs., 150 lbs., 200 lbs.
- 50 lbs. of baggage forward, 250 lbs. baggage aft (Tailcone)
- 3500 lbs. fuel load
    - **Weather**
- KASE 042048Z WIND CALM SKY CLR 5SM HZ 28/19 A29.92 Departing RWY 33
- KVNY 042050Z 29010KTS 1 1/2SM HZ OVC 020 25/23 A29.92 ILS RWY 16R
    - **Route**
- LINDZ1.LINDZ JNC PURSE.JANNY5 KNVY
- FL430
- Alternate KBUR
- Estimated Fuel Burn: Taxi 200 lbs. Enroute 1810 lbs.
- Planned Fuel: 3500 lbs.

II. PROBLEM:

A. WEIGHT & BALANCE

B. Using the provided data, complete a weight and balance form.

MODEL 525B **SECTION VI - WEIGHT AND BALANCE DATA**

A35324

WEIGHT AND BALANCE COMPUTATION FORM

PAYLOAD COMPUTATIONS				ITEM	WEIGHT (KG)	MOMENT/ 1000
'A'	'B'	'C'	'D'	'E'	'F'	'G'
ITEM	ARM (MM)	WEIGHT (KG)	MOMENT/ 1000	1. BASIC EMPTY WEIGHT *Airplane CG = _____		
OCCUPANTS PILOT COPILOT				2. PAYLOAD		
				3. ZERO FUEL WEIGHT (sub-total) Do not exceed maximum zero fuel weight of 4767.3 kilograms. *Airplane CG = _____		
				4. FUEL LOADING		
				5. RAMP WEIGHT (sub-total) Do not exceed maximum ramp weight of 6382.0 kilograms. *Airplane CG = _____ * * *	* * *	
				6. LESS FUEL FOR TAXIING		
				7. TAKEOFF WEIGHT * * Do not exceed maximum takeoff weight of 6291.3 kilograms. *Airplane CG = _____	* * *	
CONTENTS LH CHART CASE RH REF CENTER LH EVAP CABINET VANITY STORAGE	 3833 4250 3970 8513			8. LESS FUEL TO DESTINATION		
				9. LANDING WEIGHT * * Do not exceed maximum landing weight of 5783.3 kilograms. *Airplane CG = _____		
NOSE BAGGAGE	1880			* Airplane CG = MOMENT/1000 / WEIGHT X 1000		
CAB STORAGE	8387			* * Totals must be within approved weight and center-of-gravity limits. It is the responsibility of the operator to ensure that the airplane is loaded properly. The Basic Empty Weight CG is noted on the Airplane Weighing Form. If the airplane has been altered, refer to the Weight and Balance Record for information.		
TAILCONE BAGGAGE	10,516					
PAYLOAD (sub-total)				* * * Enter the Center-of-Gravity Limits Envelope Graph to verify airplane is loaded within approved limits.		

FORM NUMBER 2177, 13 October 2004
REVISED 03 November 2004

Weight and Balance Computation Form **(Metric Units)**
Figure 6-6 (Sheet 2)

This table is the same as the AFM, but the format is for your convenience.

CJ3 WEIGHT and BALANCE FORM

FLIGHT: KASE to KVNY — **REFERENCE DATA: AFM PAGES 6-12, 6-14, 6-18, 6-24**

PAYLOAD COMPUTATIONS				ITEM	WEIGHT	MOMENT/100	CG
ARM X WEIGHT = MOMENT							
ITEM	ARM	WEIGHT	MOMENT/100	1. BASIC EMPTY WEIGHT	8160	25166	308.41
OCCUPANTS							
PILOT	131.00	190	248.9	2. PAYLOAD			
COPILOT	131.00						
SEAT 3	202.50			3. ZERO FUEL WEIGHT (1+2) (10,510 lbs. MAX)			
SEAT 4	202.50						
SEAT 5	260.50						
SEAT 6	260.50			4. FUEL LOADING (4,710 lbs. MAX)			
SEAT 7	295.50						
SEAT 8	295.50						
TOILET	322.50			5. RAMP WEIGHT (3+4) (14,070 lbs. MAX)			
SIDE FACING	174.20						
CABINETS							
LH CHART	150.90	0		6. LESS TAXI FUEL	200	642	
RH REFRESH	167.30	0					
LH EVAP	156.30	0		7. TAKEOFF WEIGHT (5-6) (13,870 lbs. MAX)			
VANITY	335.20	0					
BAGGAGE							
NOSE CARGO	74.00			8. ENROUTE FUEL BURN			
CAB STORAGE	330.20						
TAILCONE	414.60			9. LANDING WEIGHT (7-8) (12,750 lbs. MAX)			
PAYLOAD				AIRPLANE CG = ((MOMENT x 100)/ WT) x 100			

Using FLIGHTPLAN.COM, the following NavData is produced:

11/16/24, 8:18 PM FltPlan - Dashboard

Navigation Log

Monday 01-01-01
Dep:1400L (GMT-6) - Arr: 1506L (GMT-7)

IFR	TRNR01	Type: C25B/X	395Kts	Dep: KASE
Dept: 2000Z	FL430	ROUTE (see below)		
Dest: KVNY	ETE: 2:06			
FOB: 0330	Altn: KBUR	JOE PILOT (sic:sam)	SOB: 8	Color: W

ATIS:120.4 ASOS Ph: 970-925-9168
Clnc:123.75
FSS: 800-992-7433 (1-26)
ATC Clnc issues? FltPlan:1-203-262-8383
Elev:7838 Gnd:121.9 Twr:118.85

LINDZ1.LINDZ JNC PURSE.JANNY5

NOTE==> Your Departure Date/Time needs to be updated. No Forecast winds for that far in the past: using winds valid for 11/16/2024 19:00:00Z
NOTE==> You have filed for an altitude above FL280 yet your ICAO or Aircraft data does not show RVSM certification !!
Please correct your ICAO and/or Aircraft Data to reflect RVSM certification.
Expect ATC delays and/or being limited to an altitude of FL280 or below.
(FMS winds: 242°/ 24) : MC= 233° : ST. LINE=**634nm** : AIRWAY=**664nm** : Extra=**5%**

Winds Aloft	FL470 ISA(-57) Comp	FL430 ISA(-57) Comp	FL400 ISA(-57) Comp	FL380 ISA(-57) Comp
LINDZ	234/064 +01 -023	231/076 +03 -026	231/084 +06 -029	231/086 +07 -030
JNC	238/047 +02 -045	237/056 +04 -053	237/061 +07 -058	237/062 +08 -059
PURSE0200	249/033 +02 -032	247/035 +04 -035	247/036 +07 -036	247/036 +08 -036
PURSE0100	252/027 +02 -026	250/029 +05 -028	250/029 +08 -028	250/029 +09 -028
PURSE	282/019 +02 -013	288/022 +05 -013	298/023 +07 -011	302/023 +08 -009
NIPIY	283/018 +02 -011	290/021 +05 -010	301/023 +07 -007	305/024 +08 -006
Avg. Trip Winds=>	- 23 Headwind	- 24 Headwind	- 24 Headwind	- 24 Headwind
FLT TIME==>	ABOVE MAX ALT.	2:06(+00) 395TAS	2:02(-04) 404TAS	2:01(-05) 407TAS
Fuel Burn==>	---	2,068 Lbs	2,138 Lbs	2,209 Lbs

FIX	ST	LAT/LON	InB/Out Mag Crs	Leg	Rem	Fuel Burn Leg	Fuel Burn Tot.	Leg	Rem	ETE	ATA	WX
KASE ASPEN	CO	N3913.3W10652.1	---/297	0	664	200	200.0 |	0:00	2:06	0:00	|	
SEE DP FOR ROUTE PRIOR TO LINDZ INTERSECTION												
LINDZ	CO	N3923.3W10709.5	297/247	17	647	218	418.4 |	0:06	2:00	0:06	|	N/A
JNC 112.4 GRAND JUNCTI	CO	N3903.6W10847.6	241/222	79	568	369	787.3 |	0:19	1:41	0:25	|	N/A
PURSE0200		N3730.3W11148.7	224/222	170	398	388	1175 |	0:29	1:12	0:54	|	122.2
PURSE0100		N3633.3W11331.6	224/223	100	298	218	1393 |	0:16	0:56	1:10	|	122.2
PURSE	NV	N3534.9W11511.9	223/217	100	198	210	1603 |	0:16	0:40	1:26	|	N/A
NIPIY	CA	N3507.6W11548.7	217/227	41	157	78	1681 |	0:06	0:34	1:32	|	N/A
KREME	CA	N3455.1W11613.1	227/234	24	133	39	1720 |	0:04	0:30	1:36	|	N/A
DNUTT	CA	N3447.2W11633.4	234/252	18	115	30	1750 |	0:03	0:27	1:39	|	N/A
JOHHN	CA	N3446.4W11642.3	252/252	7	108	12	1762 |	0:01	0:26	1:40	|	N/A
BASAL	CA	N3445.5W11651.7	252/252	8	100	14	1777 |	0:01	0:25	1:41	|	N/A
DYVER	CA	N3441.8W11727.8	252/251	30	70	57	1834 |	0:05	0:20	1:46	|	N/A
CHKNZ	CA	N3440.7W11737.4	251/251	8	62	16	1850 |	0:02	0:18	1:48	|	N/A
KOPLE	CA	N3439.2W11751.8	251/251	12	50	25	1874 |	0:02	0:16	1:50	|	N/A
PMD 115.55PALMDALE	CA	N3437.9W11803.8	251/240	10	40	22	1896 |	0:02	0:14	1:52	|	N/A
JANNY 115.55/240/15	CA	N3434.0W11821.4	240/243	15	25	34	1930 |	0:03	0:11	1:55	|	N/A
PUCCK	CA	N3433.0W11825.9	243/176	4	21	9	1939 |	0:01	0:10	1:56	|	N/A
SEE STAR FOR ROUTE AFTER PUCCK WAYPOINT												
KVNY 113.1 VAN NUYS	CA	N3412.6W11829.4	176/---	21	0	129	2068 |	0:10	0:00	2:06	|	

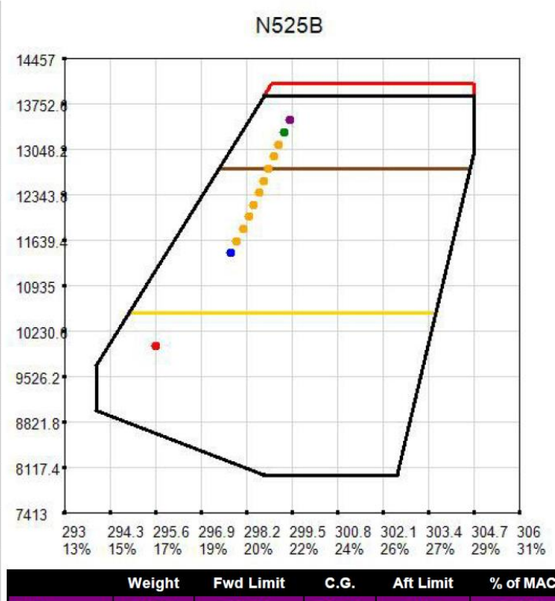
Elev:802 Atis: 127.55 Twr: 119.3/120.2 Gnd: 121.7 Fuel hourly method: **2,498**

ALTN: KBUR BURBANK BOB HOPE,CA | Alt: **FL030** Brg:**083°** **7nm** Time:**0:04** Fuel:**182**

Fuel (lbs.) | Taxi: 200 | Trip: 1,868 | Altn: 182 | 45 min: 608 | Min Fuel Required: 2,858

The following Weight and Balance information is generated by FLIGHTPLAN.COM:

Departure	KASE
Arrival	KVNY
PIC	JOE
SIC	SAM
Total Pax	4
AC Performance	CESSNA-525B CITATIONJET CJ3
BEW/C.G.	8160/308.41
Captain	190
Co-Pilot	190
Seat 1	210
Seat 2	180
Seat 3	200
Seat 4	180
Seat 5	150
Seat 6	200
Seat 7	0
Baggage Compartment 1	100
Baggage Compartment 2	0
Baggage Compartment 3	250
Fuel Units	lbs.
Fuel Tank (Max. 4710 lbs.)	3500
Fuel Burn	1868
Taxi Fuel Burn	200
Max. Takeoff Weight	13870 lbs.
Under Gross Weight	560 lbs.
Zero Fuel Weight	10010 lbs.
Payload	1850 lbs.
Time Stamp UTC - 11/25/2024 23:01	



	Weight	Fwd Limit	C.G.	Aft Limit	% of MAC
Ramp	13510	298.29	299.44	304.7	21.94%
Takeoff	13310	298.06	299.28	304.7	21.72%
Landing	11442	295.91	297.73	304.01	19.64%
Zero Fuel	10010	294.26	295.6	303.38	16.78%

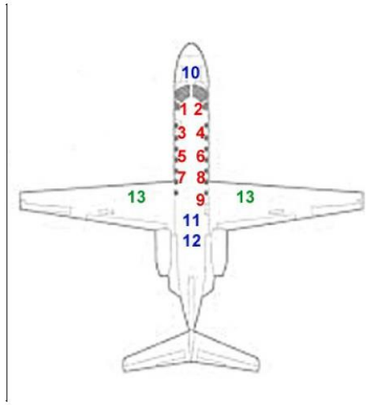


Chart Legend
- TakeOff C.G.
- Landing C.G.
- FuelBurn C.G.
- Zero Fuel Weight
- Ramp Weight
- Envelope
- Maximum Ramp Weight
- Maximum Landing Weight
- Maximum Zero Fuel Weight

1 = Captain
2 = Co-Pilot
3 = Seat 1
4 = Seat 2
5 = Seat 3
6 = Seat 4
7 = Seat 5
8 = Seat 6
9 = Seat 7
10 = Baggage Compartment 1
11 = Baggage Compartment 2
12 = Baggage Compartment 3
13 = Fuel Tank

B: TAKEOFF – CLIMB:

1. What is the climb requirement for the LINDZ.1? _____ **LINDZ1**

2. What is the AFM 2nd Stage climb capability at Flaps 15 (Use 10K FT PA, 13,000 lbs. and 25 degrees OAT)? _____ **Fig 4-40, Sht 5**

3. What is the AFM maximum weight (nearest 500 lbs.) for Flaps15 takeoff that meets the climb requirements of the LINDZ1 ? _____ **Fig 4-40, Sht 6**

4. In what FAA document do you find the obstacle departure procedure?
_____

USE APG AND FLIGHT PLANNING NUMBERS TO DETERMINE THE FOLLOWING:

5. What is max TOW for APG straight out RWY 33? _____

6. Using RWY 33/DP-1, what is Flaps 15 max TOW? _____

7. What is the limiting factor for an Emergency Return? _____

8. What is the TOFL and V1 for RWY33/DP-1/Flaps 15? _____

9. What are the APG V-Speeds?
V_1 _____ V_R _____ V_2 _____ V_{ENR} _____

10. What is the ISA at KASE if ATIS is reporting a temperature of 28 Deg? **Fig 4-7**
_____

11. Can you climb to FL340 at your weight? **Fig 4-10, Sht 2**
- Use ISA +10°, Wind Calm – _____

A weather front has just lowered the temperature to ISA +10

12. How many MIN / NM / LB for your climb to FL430? **AOM Fig 4-10, Sht 1 AOM Fig 4-10, Sht 2**
_____

C. DESCENT

- Note: Assume wind calm, ISA +10, average ground speed 395KTAS

13. What is the first descent crossing restriction? **JANNY5**
_____

14. Assuming a 395 KTAS / 2,000 FPM descent, when should you start down?
_____

D: APPROACH - LAND

KVNY INFO "F" 042250Z 34010 1 1/2SM HZ OVC 020 25/23 A29.92 ILS RWY 16R IN USE

15. With ATIS "F" data, what is your landing distance on 16R? _____ **Fig 4-50 Sht 4**

16. What is the landing distance if the runway is reported to be wet? **Fig 7-11**
_____

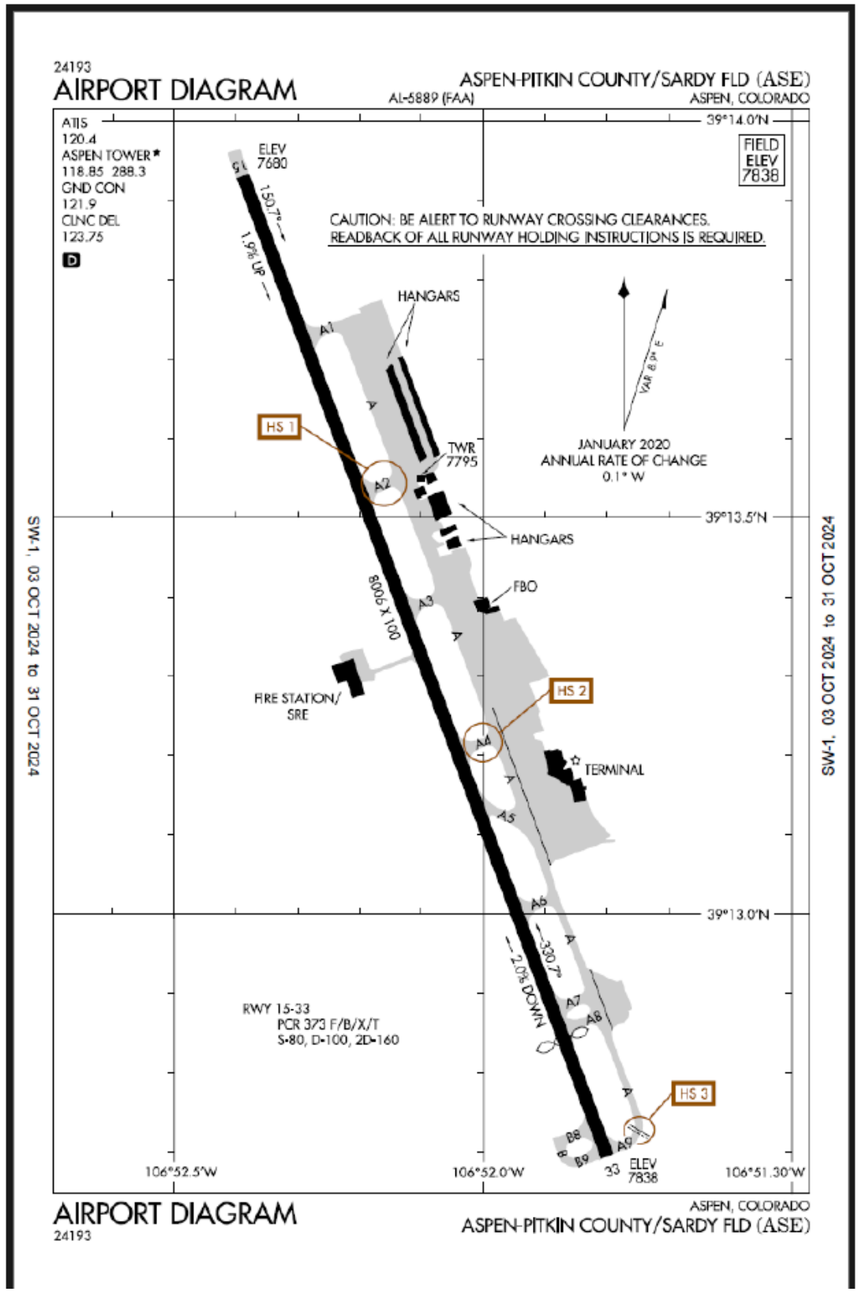
17. V_{REF}'s may be obtained from the FMS, AFM, APG or abbreviated checklist. For this landing at KVNY, what will be the V_{REF} for landing on RWY 16R?
_____

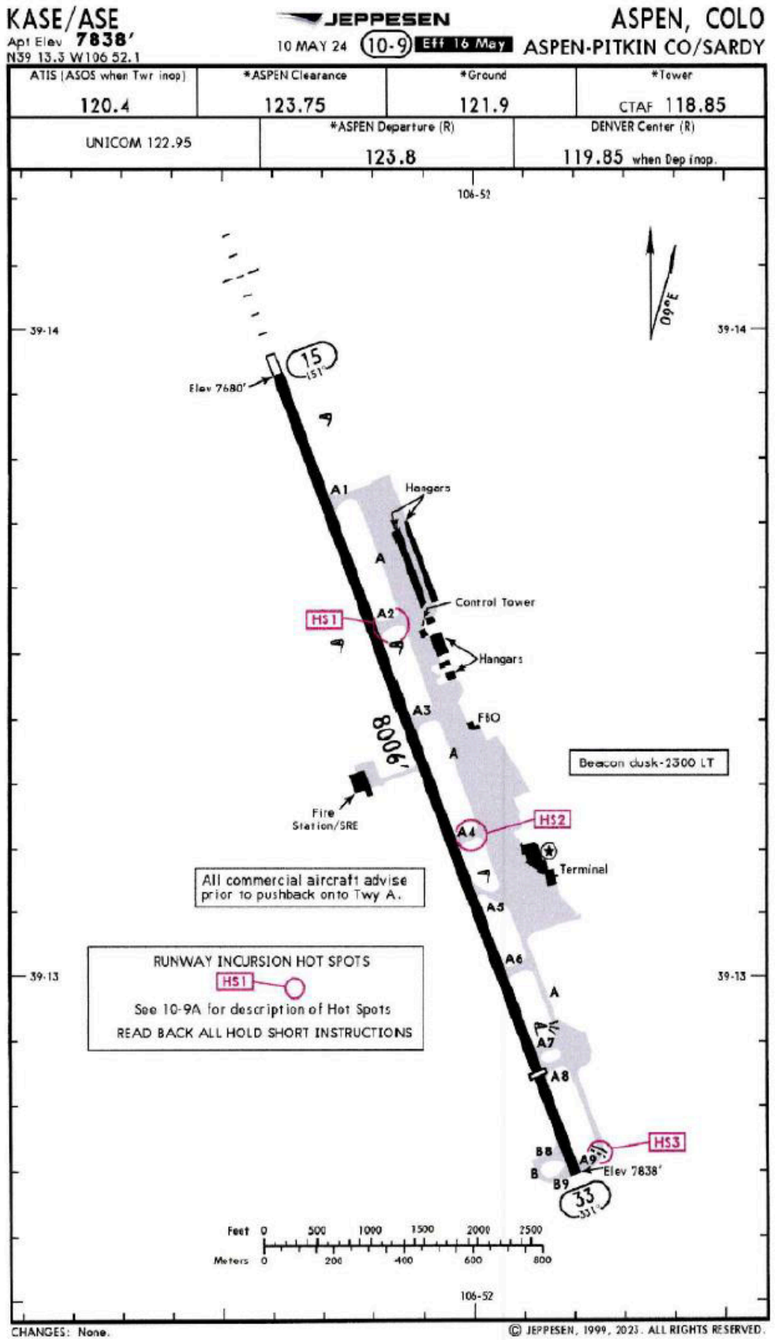
18. DME is required for this approach. The LOC doesn't have DME. How are you going to get the DME requirement resolved? **APPCH PLATES**
_____

19. What is your plan if the wind exceeds 34010?
_____

20. What is the note regarding Autopilot Coupled approaches to RWY 16R
_____

SUPPLEMENTARY DATA





KASE/ASE JEPPESEN ASPEN, COLO

10 MAY 24 (10-9A) Eff 16 May ASPEN-PITKIN CO/SARDY

GENERAL

Birds and other wildlife on and in vicinity of runway. Watch for wildlife on or near runway.
Airport closed 2300 to 0700 LT daily.
FBO requires 2 hrs advance notice for staging aircraft prior to departure.
Aircraft restricted to maximum wingspan of 95'.
Due to poor visibility in valley, use landing lights in traffic pattern.
Hang gliders, para gliders, hot air balloons & glider operations in vicinity of airport up to 18000' MSL.
Airport located in high mountain valley with mountainous terrain from 12500'-14000' MSL in near proximity to airport; numerous unlighted obstructions. All adverse weather situations magnified in mountains. Operations during periods of reduced visibility discouraged for pilots unfamiliar with area. Unless ceilings are at least 2000' above highest terrain and visibility is 15 miles or more, mountain flying is not recommended.
Terrain will not allow for normal traffic patterns. High rates of descent may be required due to terrain & local procedures.
Unique VFR departure procedures exist, call airport manager or fixed base operator for more information.
For all general aviation operations between 30 minutes after sunset to 2300 LT the following applies: aircraft equipped as required under FAR 91.205(D) for instrument flight, pilot is instrument rated, VFR pilot-in-command has completed at least one take-off or landing in the preceding 12 months at KASE. IFR: execute approach/departure procedures with ATC clearance.
All arriving aircraft from 2000 to 2300 LT must announce CTAF 118.85 when they are 20, 15, 10 and 5 miles out on short final. Equipment may be on runway.
Noise abatement procedures in effect. Contact airport operations.
Prior permission required for takeoff on Rwy 15. Contact FBO.
Uncontrolled traffic on the ramp. Rwy 33 run-up area not visible from the tower.
Pilots are responsible for passengers in ramp area. Pedestrians and vehicles cannot enter taxiways without ATC clearance. Stay on the solid side of the red boundary marking line.
Rwy 33 right traffic pattern.

ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS — LANDING BEYOND Threshold	Glide Slope	TAKE-OFF	WIDTH
15	❶ ❷MIRL ❷MALSF ❺REIL ❷❹PAPI-L (angle 3.50°)	❺		7600'	100'
33	❷MIRL ❷REIL	7006'			

❶Grooved.
❷Activate 118.85 when Twr inop.
❸Twr operation day VFR only.
❹Unusable beyond 4 NM from runway threshold and beyond 7° right of runway centerline.
❺LDA 7006'.

RUNWAY INCURSION HOT SPOTS HS1

For information only, not to be construed as ATC instructions.

HS1 Twy A2. Short taxi distance from ramp to runway.
HS2 CAUTION: high traffic intersection-aircraft routinely hold short of Twy A4 on Twy A when inbound to terminal or general aviation ramp.
HS3 Rwy 33 and Twy A9. Non typical location for Rwy holding position marking.

TERPS

TAKE-OFF

Rwy 15

NA

OBSTACLE DEPARTURE PROCEDURE

Rwy 33 - Use SARDD Departure.

(For TAKE-OFF OBSTACLE NOTES see 10-9A1)

FOR FILING AS ALTERNATE

	RNAV (GPS)-F	LOC DME-E
A	2400-2	NA
B		
C	3200-3	
D	NA	

CHANGES: Take-off mins format, ODP, notes, amendment, chart format.

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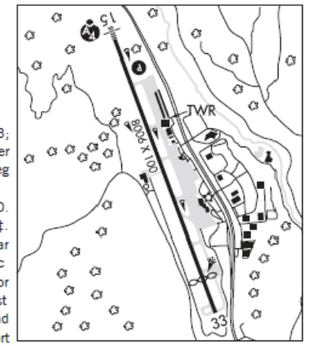
ASPEN–PITKIN CO/SARDY FLD (ASE)(KASE) 3 NW UTC–7(–6DT) N39°13.31´ W106°52.09´ DENVER
7838 B TPA—See Remarks Class I, ARFF Index B NOTAM FILE ASE H–3E, L–9E
RWY 15–33: H8006X100 (ASPH–GRVD) S–80, D–100, 2D–160 IAP, AD
PCR 373 F/B/X/T MIRL
RWY 15: MALSF. REIL. PAPI(P4L)—GA 3.5° TCH 55´. 1.9% up.
RWY 33: REIL. Thld dsplcd 1000´. Road. Rgt tfc. 2.0% down.
RUNWAY DECLARED DISTANCE INFORMATION
RWY 15: TORA–7006 TODA–7006 ASDA–7006 LDA–7006
RWY 33: TORA–8006 TODA–8006 ASDA–8006 LDA–7006
SERVICE: S2 **FUEL** 100LL, JET A1+ **OX** 1, 3 **LGT** Bcn lgts ops dusk–0600Z‡. When ATCT clsd ACTVT MALSF Rwy 15; REIL Rwy 33; PAPI Rwy 15; MIRL Rwy 15–33—CTAF. REIL Rwy 15—ATCT ctl, oper day VFR only. Rwy 15 PAPI unusbl byd 4 NM fm rwy thr and byd 7 deg rgt of rwy cntrln.



NOISE: NS ABTMT procedures in effect, ctc arpt ops 970–920–5760 ext 0.
AIRPORT REMARKS: Attended 1400–0600Z‡. Arpt CLOSED 0600–1400Z‡. Birds and other wildlife on and invof rwys. Watch for wildlife on or near rwys. Wind cones lctd 60 ft west of Twy A cntrln. CAUTION: High tfc intxn — acft rtnely hold short of Twy A4 on Twy A when inbd to trml or general aviation ramp. All arriving acft from 2000 to 2300 local must announce CTAF 118.85 when they are 20, 15, 10 and 5 miles out and on short final. Equipment may be on the rwy. Rwy 00X exists to support the PKN LDA assoc with this arpt. For acft svc ctc UNICOM. Hang gliders, para gliders, hot air balloons and glider ops on and invof arpt up to 18,000´ MSL. All commercial acft advise prior to pushback onto Twy A. Arpt lctd in high mountain valley with mountainous terrain from 12,500´–14,000´ MSL in near proximity to arpt, numerous unlgtd obst. All adverse wx situations magnified in mountains. Arpt rstd to max acft wingspan of 95´. Ops dur periods of reduced visibility discouraged for pilots unfamiliar with area. Unless ceilings are at least 2000´ abv highest terrain and visibility is 15 miles or more, mountain flying is not recommended. Due to high apch minimums pilots may need an IFR alternate even though wx is forecast to be higher than 2000´–3,000´. Terrain will not allow for normal tfc patterns. High rates of descent may be rqrd due to terrain and lcl procedures. Unique VFR dep procedures exist, call arpt ops 970–920–5760, or FBO 970–920–2016 for more info. FBO rqr 2 hrs advance ntc for staging acft prior to dep. For all general aviation ops btn 30 min after SS to 0600Z‡ the following applies, acft equipped as rqrd under FAR 91.205(D) for instr flt, pilot is instrument rated, VFR pilot–in–command has completed at least one tkf or ldg in the preceding 12 months at ASE. IFR, execute apch/dep procedures with ATC clnc. Acft rqrg IFR should file flt plan with flt svc 45 min prior to estimated dep. PPR for tkf on Rwy 15 ctc FBO 970–920–2016. Review of airplane performance recommended incl density altitude, weight and balance and climb performance. Due to poor visibility in valley, use ldg lgts in tfc pat. TPA for light acft 9023(1185), TPA for heavy ACFT 9523(1685). Unctl tfc on the ramps. Rwy 33 run–up area not visible from twr. Pilots are responsible for pax in ramp area. Pedestrians and vehicles cannot enter twys without ATC clnc. Stay on the solid side of the red boundary marking line. Cold temperature airport. Altitude correction required at or below –22C. Ldg fee. NOTE: See Special Notices—Special Procedures Aspen County/Sardy Field (KASE) Aspen, Colorado, "Cozy One VFR Departure (KASE)".
AIRPORT MANAGER: (970) 429-2851
WEATHER DATA SOURCES: ASOS 120.4 (970) 205–2482. LAWRS.
COMMUNICATIONS: CTAF 118.85 **ATIS** 120.4 **UNICOM** 122.95
Ⓡ **APP/DEP CON** 123.8 (1400–0300Z‡)
Ⓡ **DENVER CENTER APP/DEP CON** 119.85 (0300–1400Z‡)
TOWER 118.85 (1400–0300Z‡) **GND CON** 121.9 **CLNC DEL** 123.75
AIRSPACE: CLASS D svc 1400–0300Z‡; other times CLASS E.
RADIO AIDS TO NAVIGATION: NOTAM FILE DEN.
RED TABLE (VH) (DH) VORW/DME 113.0 DBL Chan 77 N39°26.36´ W106°53.68´ 163° 13.1 NM to fld. 11800/12E.
VOR unusable:
040°–056° byd 40 NM
057°–074° byd 40 NM blo 16,300´
057°–074° byd 65 NM
075°–100° byd 40 NM
115°–130° byd 40 NM
160°–200° byd 40 NM
LDA 108.5 I–PKN Rwy 00X. Localizer course width: 6.00 reverse sensing. This facility will be used as a departure NAVAID and a missed approach NAVAID. LDA sensing will be reversed. LDA 108.5 I–PKN available for missed approach/departures only. LDA unusable byd 25° back left/south of course. LDA unusable byd 30° back right/north of course.
LOC/DME 111.15 I–ASE Chan 48(Y) Rwy 15. LOC front unusable byd 14 NM blw 12,500´; byd 25° left and right of course. DME unusable byd 14 NM blw 12,500´; byd 25° left and right of course.
COMM/NAV/WEATHER REMARKS: Primary radar not avbl. Radar tfc advisories and svcs avbl for transponder equipped acft only. LDA 108.5 I–PKN avbl for missed apch/dep only. LDA unmonitored when twr clsd. LDA unusable byd 30° south of crs.

14 PERFORMANCE PROBLEM

L3

TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)

24193

ASPEN, CO
ASPEN-PITKIN COUNTY/SARDY FLD (ASE)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 9 16MAY24 (24137) (FAA)
TAKEOFF MINIMUMS:
Rwy 15, NA - Environmental.
DEPARTURE PROCEDURE:
Rwy 33, use SARDD DEPARTURE.
TAKEOFF OBSTACLE NOTES:
Rwy 33, terrain beginning 4' from DER, 351' left of centerline, up to 7720' MSL.
Tree 23' from DER, 395' right of centerline, 7713' MSL.
Trees beginning 112' from DER, 408' right of centerline, up to 47' AGL/7715' MSL.
Fences, terrain beginning 147' from DER, 358' left of centerline, up to 7721' MSL.
Tree 234' from DER, 478' right of centerline, 7718' MSL.
Trees beginning 256' from DER, 537' right of centerline, up to 7719' MSL.
Trees beginning 696' from DER, 600' left of centerline, up to 7727' MSL.
Trees beginning 989' from DER, 624' left of centerline, up to 7760' MSL.
Trees beginning 1085' from DER, 593' left of centerline, up to 7788' MSL.
Vegetation, trees, terrain beginning 1232' from DER, 673' left of centerline, up to 7809' MSL.
Trees beginning 1768' from DER, 679' left of centerline, up to 7814' MSL.
Trees beginning 2183' from DER, 723' left of centerline, up to 7821' MSL.
Trees beginning 2398' from DER, 800' left of centerline, up to 7835' MSL.
Terrain 2519' from DER, 1172' left of centerline, 7872' MSL.
Trees beginning 2535' from DER, 966' left of centerline, up to 7875' MSL.
Terrain, trees beginning 2627' from DER, 732' left of centerline, up to 7931' MSL.
Tree 3040' from DER, 1230' left of centerline, 7946' MSL.
Vegetation, trees, terrain beginning 3047' from DER, 773' left of centerline, up to 7995' MSL.
Terrain, trees beginning 3269' from DER, 770' left of centerline, up to 8004' MSL.
Vegetation, trees, terrain beginning 3355' from DER, 751' left of centerline, up to 8079' MSL.
Trees, terrain, vegetation, building, pole beginning 4447' from DER, 934' left of centerline, up to 7963' MSL.
Trees, terrain beginning 1.7 NM from DER, 2697' left of centerline, up to 8191' MSL.
Trees beginning 1.8 NM from DER, 3058' left of centerline, up to 8227' MSL.
Trees, terrain beginning 2.4 NM from DER, 2322' left of centerline, up to 8543' MSL.

03 OCT 2024 to 31 OCT 2024

03 OCT 2024 to 31 OCT 2024

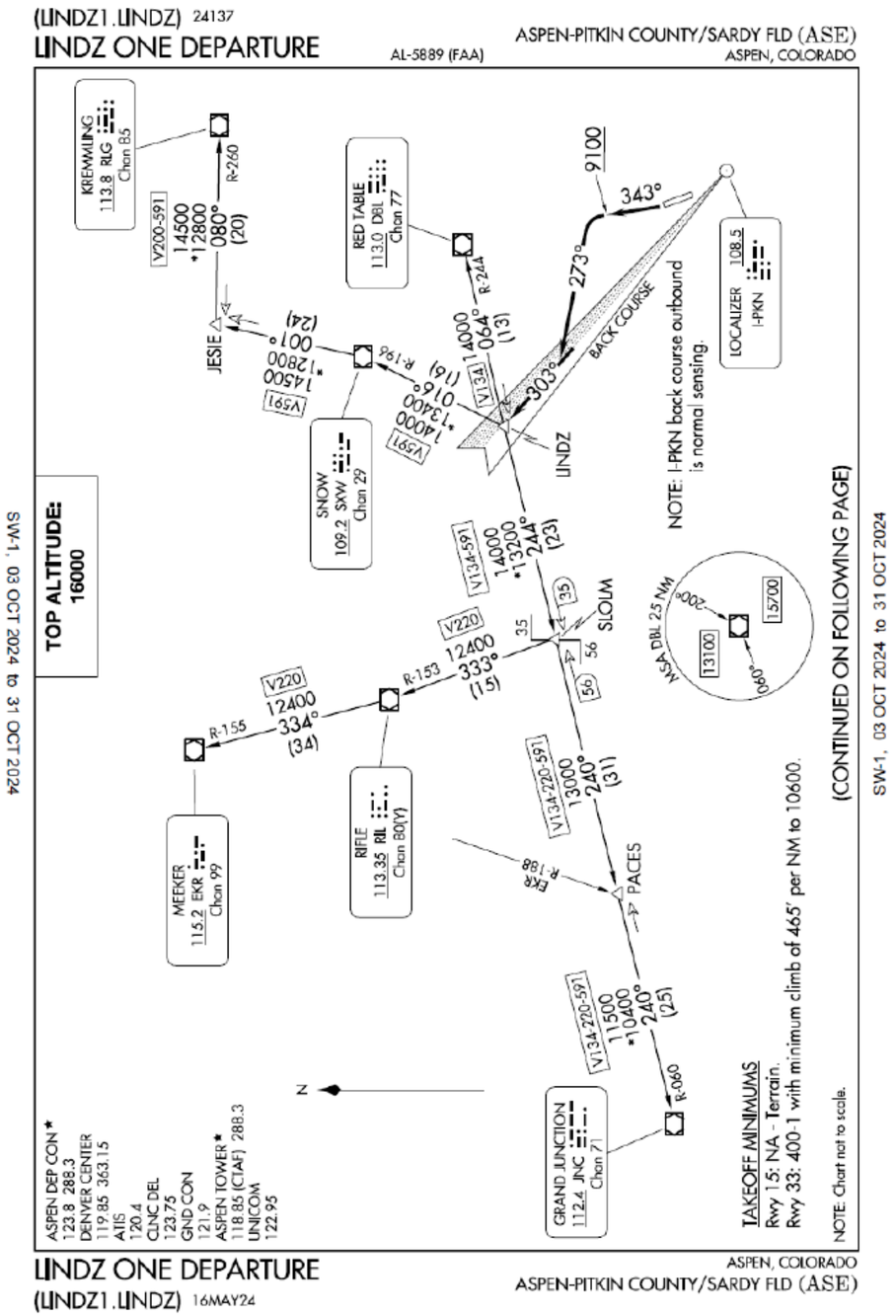
BELEN, NM
BELEN RGNL (BRG)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 1B 13SEP18 (18256) (FAA)
TAKEOFF MINIMUMS:
Rwys 13, 31, NA - Environmental.
Rwy 3, std. w/min. climb of 350' per NM to 12000, or 3300-3 for VCOA.
Rwy 21, std. w/min. climb of 325' per NM to 11900, or 3300-3 for VCOA.
VCOA:
Rwys 3, 21, obtain ATC approval for VCOA when requesting IFR clearance. Climb in visual conditions to cross Belen Regional Airport at or above 8400 before proceeding on course.
TAKEOFF OBSTACLE NOTES:
Rwy 21, power poles beginning 1150' from DER, 275' left of centerline, up to 34' AGL/5236' MSL.

BUCKLEY SFB (KBKF)
AURORA, CO
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
02DEC21 (21336) (USAF)
Diverse departure NA. Use published departure procedures for obstacle avoidance.

BUENA VISTA, CO
CENTRAL COLORADO RGNL (AEJ)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 2 10AUG23 (23222) (FAA)
TAKEOFF MINIMUMS:
Rwy 33, NA-Terrain.
DEPARTURE PROCEDURE:
Rwy 15, use PUEBLO (RNAV) DEPARTURE.
TAKEOFF OBSTACLE NOTES:
Rwy 15, electrical system 8' from DER, 27' left of centerline, 1' AGL/7905' MSL.
Fence 68' from DER, 473' right of centerline, 9' AGL/7910' MSL.
Vehicles on road beginning 85' from DER, 505' right of centerline, up to 7917' MSL.

TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)

24193 L3 SW-1



(LINDZ1.LINDZ) 24137

LINDZ ONE DEPARTURE

AL-5889 (FAA)

ASPEN-PITKIN COUNTY/SARDY FLD (ASE)
ASPEN, COLORADO

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 33: Climb heading 343° to 9100, then climbing left turn to 16000 on heading 273° to intercept I-PKN NW course outbound to LINDZ INT/DBL 13 DME. Then on assigned transition, maintain 16000, expect clearance to filed altitude 10 minutes after departure.

LOST COMMUNICATIONS: If no transmissions are received for one minute after departure or by DBL VOR/DME 9 DME, turn left on heading 273° to intercept and proceed via the I-PKN NW course (outbound) to LINDZ INT/DBL VOR/DME 13 DME, then via assigned route/transition.

GRAND JUNCTION TRANSITION (LINDZ1.JNC): From over LINDZ on DBL R-244 to SLOLM, then on JNC R-060 to JNC VOR/DME.

KREMMLING TRANSITION (LINDZ1.RLG): From over LINDZ on SXW R-196 to SXW VOR/DME, then on SXW R-001 to JESIE, then on RLG R-260 to RLG VOR/DME.

MEEKER TRANSITION (LINDZ1.EKR): From over LINDZ on DBL R-244 to SLOLM, then on RIL R-153 to RIL VOR/DME, then on RIL R-334 and EKR R-155 to EKR VOR/DME.

RED TABLE TRANSITION (LINDZ1.DBL): From over LINDZ on DBL R-244 to DBL VOR/DME.

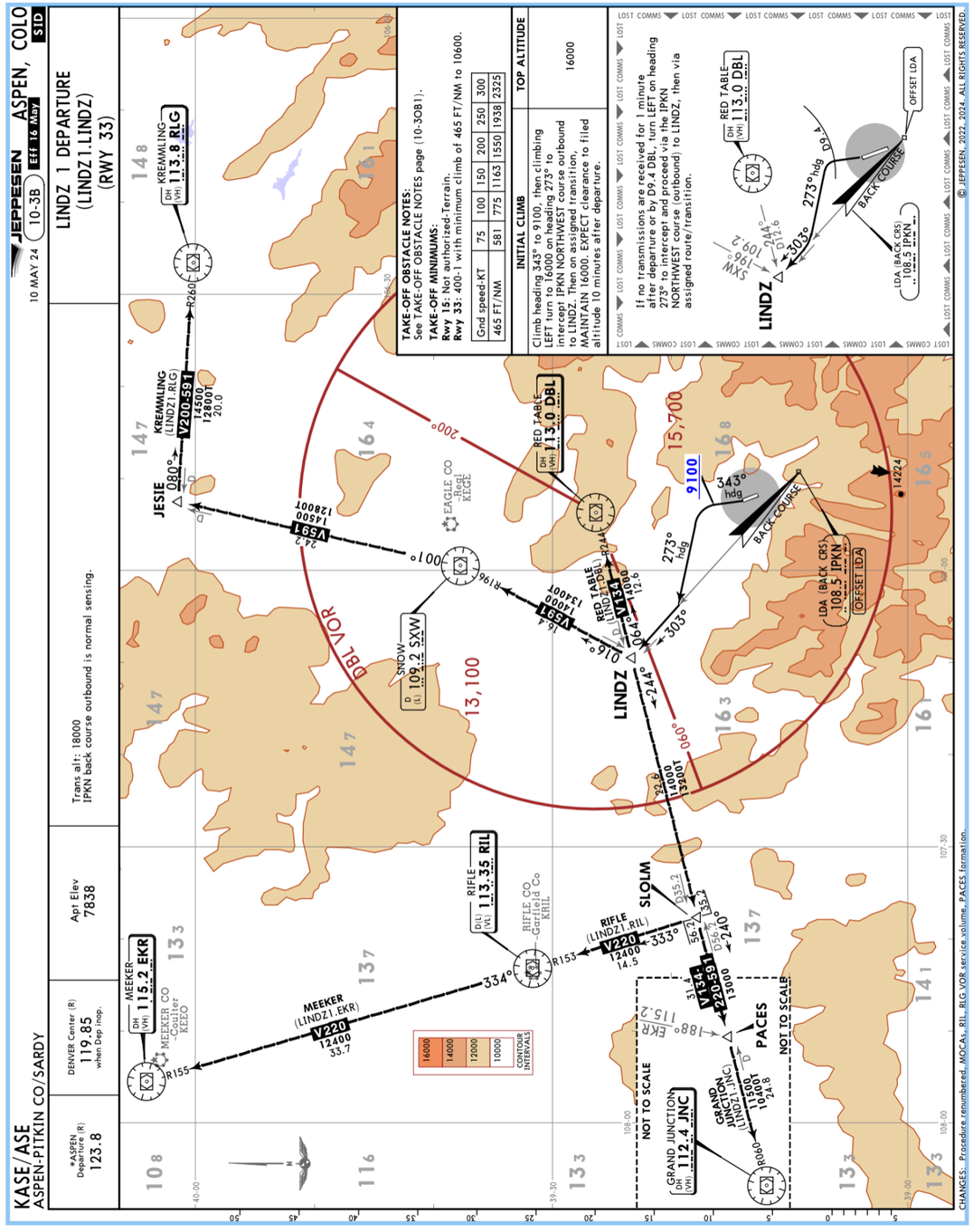
RIFLE TRANSITION (LINDZ1.RIL): From over LINDZ on DBL R-244 to SLOLM, then on RIL R-153 to RIL VOR/DME.

SW-1, 03 OCT 2024 to 31 OCT 2024

SW-1, 03 OCT 2024 to 31 OCT 2024

LINDZ ONE DEPARTURE
(LINDZ1.LINDZ) 16MAY24

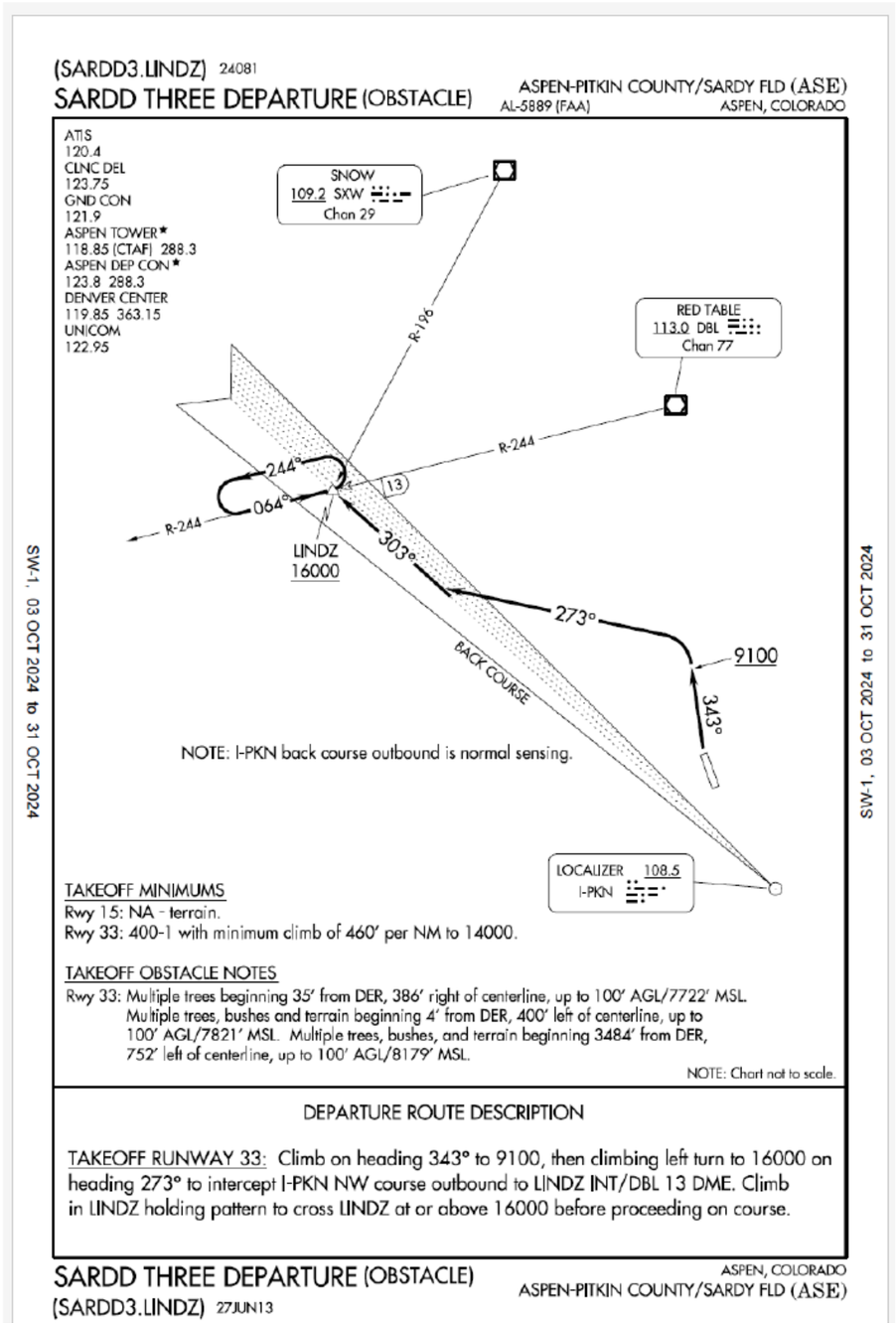
ASPEN, COLORADO
ASPEN-PITKIN COUNTY/SARDY FLD (ASE)

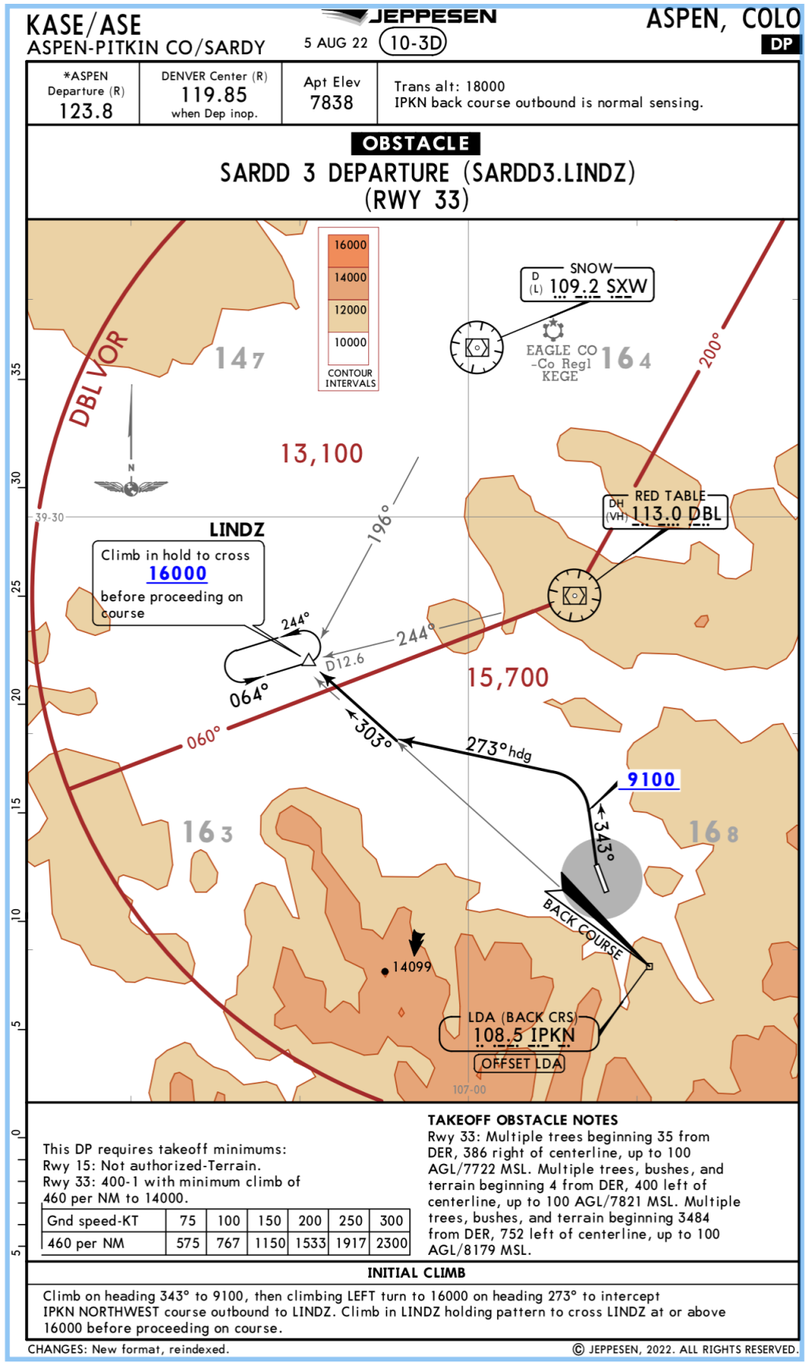


14 PERFORMANCE PROBLEM

Climb Gradient Conversion Chart

Deg	%	Ft/NM	Deg	%	Ft/NM
1.0	1.7	106	5.0	8.7	532
1.2	2.1	127	5.2	9.1	553
1.4	2.4	148	5.4	9.5	574
1.6	2.8	170	5.6	9.8	596
1.8	3.1	191	5.8	10.2	617
2.0	3.5	212	6.0	10.5	639
2.2	3.8	233	6.2	10.9	660
2.4	4.2	255	6.4	11.2	682
2.6	4.5	276	6.6	11.6	703
2.8	4.9	297	6.8	11.9	725
3.0	5.2	318	7.0	12.3	746
3.2	5.6	340	7.2	12.6	768
3.4	5.9	361	7.4	13.0	789
3.6	6.3	382	7.6	13.3	811
3.8	6.6	404	7.8	13.7	832
4.0	7.0	425	8.0	14.1	854
4.2	7.3	446	8.2	14.4	876
4.4	7.7	468	8.4	14.8	897
4.6	8.0	489	8.6	15.1	919
4.8	8.4	510	8.8	15.5	941




KASE/ASE
ASPEN-PITKIN CO/SARDY
JEPPESEN
5 AUG 22
10-3D
ASPEN, COLO
DP
*ASPEN Departure (R) 123.8
DENVER Center (R) 119.85 when Dep inop.
Apt Elev 7838
Trans alt: 18000
IPKN back course outbound is normal sensing.
OBSTACLE
SARDD 3 DEPARTURE (SARDD3.LINDZ)
(RWY 33)
16000
14000
12000
10000
CONTOUR INTERVALS
SNOW
D (L) 109.2 SXW
EAGLE CO -Co Regl KEGE
DBL VOR
13,100
15,700
LINDZ
Climb in hold to cross 16000 before proceeding on course
244°
064°
060°
303°
273° hdg
343°
200°
196°
D12.6
9100
BACK COURSE
14099
RED TABLE
DH (VH) 113.0 DBL
LDA (BACK CRS)
108.5 IPKN
OFFSET LDA
This DP requires takeoff minimums:
Rwy 15: Not authorized-Terrain.
Rwy 33: 400-1 with minimum climb of 460 per NM to 14000.
Gnd speed-KT 75 100 150 200 250 300
460 per NM 575 767 1150 1533 1917 2300
TAKEOFF OBSTACLE NOTES
Rwy 33: Multiple trees beginning 35 from DER, 386 right of centerline, up to 100 AGL/7722 MSL. Multiple trees, bushes, and terrain beginning 4 from DER, 400 left of centerline, up to 100 AGL/7821 MSL. Multiple trees, bushes, and terrain beginning 3484 from DER, 752 left of centerline, up to 100 AGL/8179 MSL.
INITIAL CLIMB
Climb on heading 343° to 9100, then climbing LEFT turn to 16000 on heading 273° to intercept IPKN NORTHWEST course outbound to LINDZ. Climb in LINDZ holding pattern to cross LINDZ at or above 16000 before proceeding on course.
CHANGES: New format, reindexed.
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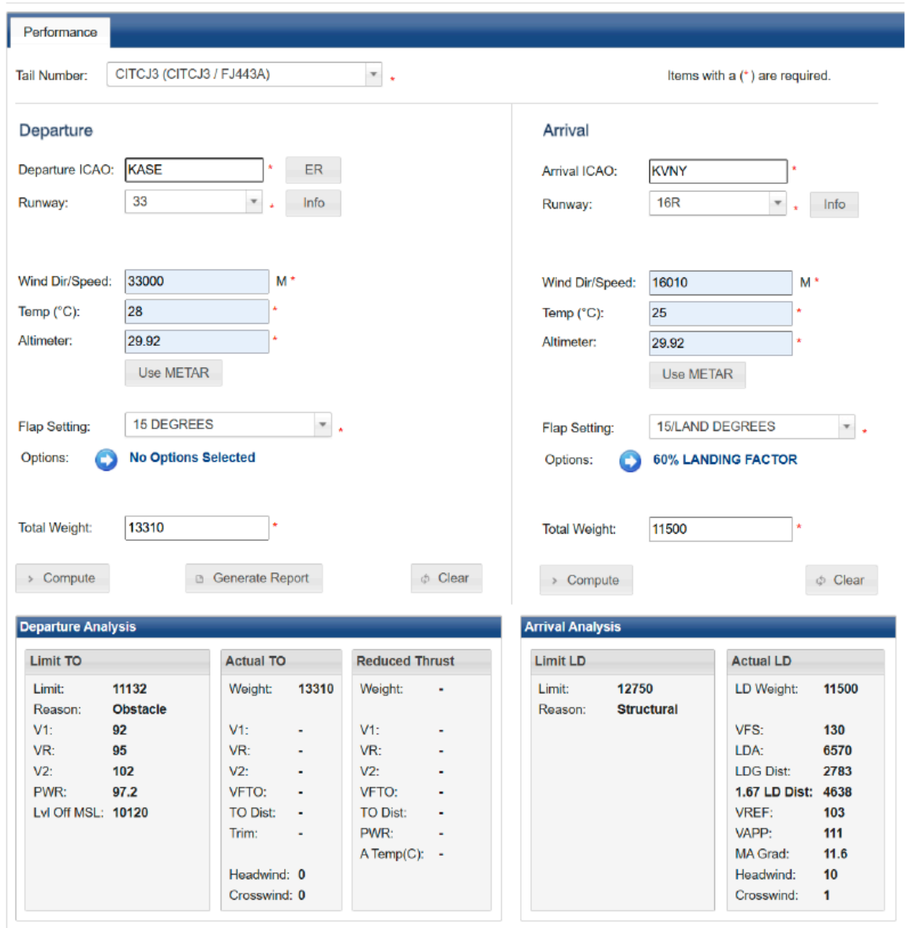

Performance
Tail Number: CITCJ3 (CITCJ3 / FJ443A)
Items with a (*) are required.
Departure
Departure ICAO: KASE
ER
Runway: 33
Info
Wind Dir/Speed: 33000 M
Temp (°C): 28
Altimeter: 29.92
Use METAR
Flap Setting: 15 DEGREES
Options: No Options Selected
Total Weight: 13310
Compute
Generate Report
Clear
Arrival
Arrival ICAO: KVNY
Runway: 16R
Info
Wind Dir/Speed: 16010 M
Temp (°C): 25
Altimeter: 29.92
Use METAR
Flap Setting: 15/LAND DEGREES
Options: 60% LANDING FACTOR
Total Weight: 11500
Compute
Clear
Departure Analysis
Limit TO
Limit: 11132
Reason: Obstacle
V1: 92
VR: 95
V2: 102
PWR: 97.2
Lvl Off MSL: 10120
Actual TO
Weight: 13310
V1: -
VR: -
V2: -
VFTO: -
TO Dist: -
Trim: -
Headwind: 0
Crosswind: 0
Reduced Thrust
Weight: -
V1: -
VR: -
V2: -
VFTO: -
TO Dist: -
PWR: -
A Temp(C): -
Arrival Analysis
Limit LD
Limit: 12750
Reason: Structural
Actual LD
LD Weight: 11500
VFS: 130
LDA: 6570
LDG Dist: 2783
1.67 LD Dist: 4638
VREF: 103
VAPP: 111
MA Grad: 11.6
Headwind: 10
Crosswind: 1

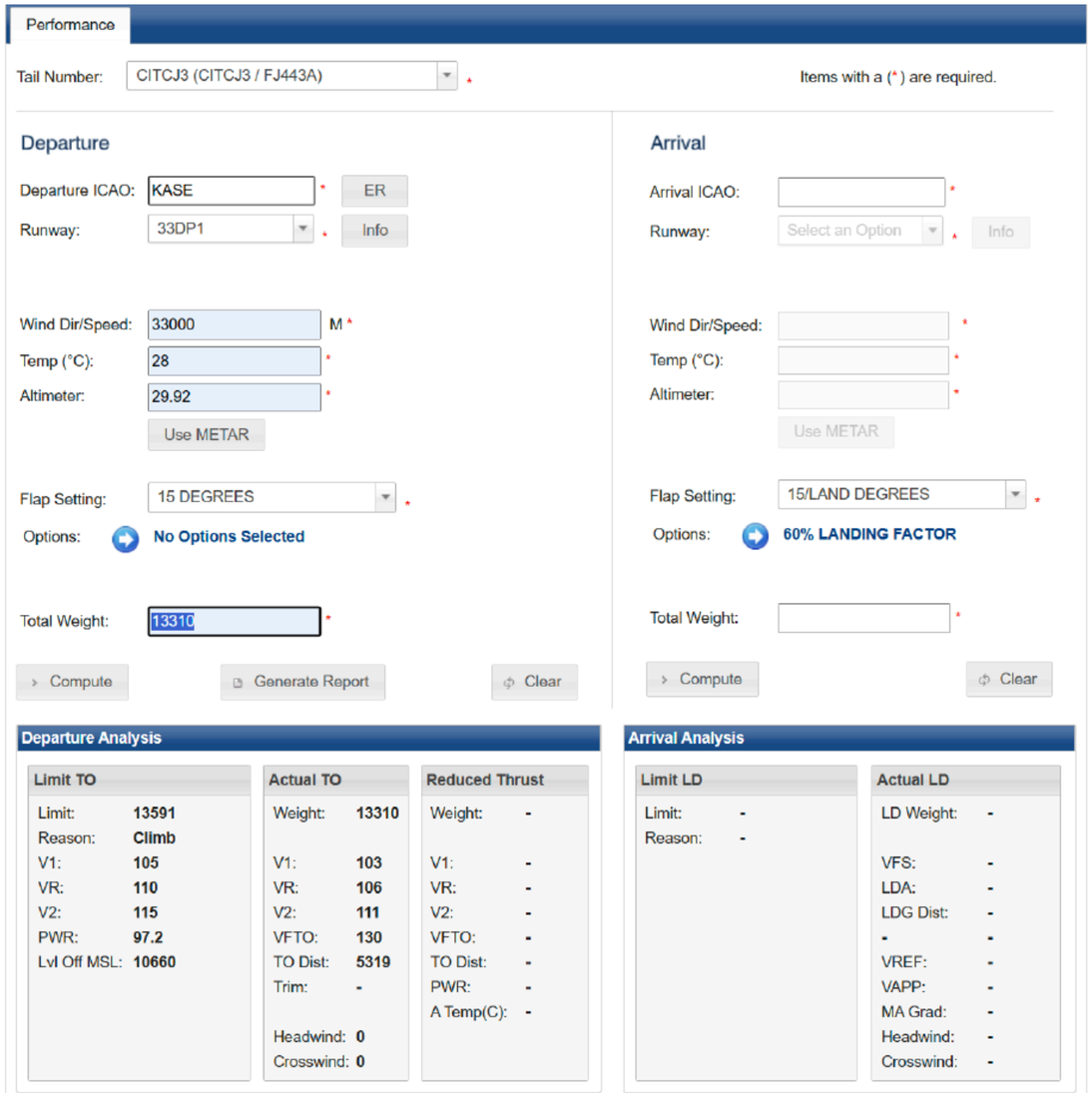
Takeoff
CITCJ3 CITCJ3 FJ443A
Flap: 15 DEGREES

Actual TOW: 11130
Wind: 33000 M
Altimeter: 29.92

KASE	33	33DP1	33DP2	33DP3	Runway
TEMP C PWR	8006/8006/8006	8006/8006/8006	8006/8006/8006	8006/8006/8006	TORA/TODA/ASDA
19 99.2	12393 / -O 89 / 94 / 102 / 130 3296 / 10189	13870 / ST 89 / 94 / 102 / 130 3296 / 9560	13300 / -O 89 / 94 / 102 / 130 3296 / 9491	13870 / ST 89 / 94 / 102 / 130 3296 / 9560	Limit Weight/Code V1/VR/V2/VFTO TOFL/Accel (MSL)
22 98.6	11980 / -O 90 / 95 / 102 / 130 3423 / 10166	13870 / ST 90 / 95 / 102 / 130 3423 / 9638	12868 / -O 90 / 95 / 102 / 130 3423 / 9483	13870 / ST 90 / 95 / 102 / 130 3423 / 9638	
25 97.9	11580 / -O 91 / 95 / 102 / 130 3563 / 10143	13870 / ST 91 / 95 / 102 / 130 3563 / 10606	12412 / -O 91 / 95 / 102 / 130 3563 / 9462	13538 / -O 91 / 95 / 102 / 130 3563 / 9645	
28 97.2	11132 / -O 92 / 95 / 102 / 130 3757 / 10120	13591 / CL 92 / 95 / 102 / 130 3757 / 10660	11965 / -O 92 / 95 / 102 / 130 3757 / 9454	13052 / -O 92 / 95 / 102 / 130 3757 / 9653	
31 96.5	10737 / -O OVERWEIGHT	13124 / -O 93 / 96 / 102 / 130 3958 / 10637	11531 / -O 93 / 96 / 102 / 130 3958 / 9437	12577 / -O 93 / 96 / 102 / 130 3958 / 9635	
34 95.9	10362 / -O OVERWEIGHT	12656 / -O 94 / 96 / 102 / 130 4174 / 10727	11119 / -O OVERWEIGHT	12128 / -O 94 / 96 / 102 / 130 4174 / 9616	
37 0.00	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	

KASE	33DP5	33DP7	33DP8	33DP9	Runway
TEMP C PWR	8006/8006/8006	8006/8006/8006	8006/8006/8006	8006/8006/8006	TORA/TODA/ASDA
19 99.2	12789 / -O 89 / 94 / 102 / 130 3296 / 9448	13870 / ST 89 / 94 / 102 / 130 3296 / 9560	13726 / -O 89 / 94 / 102 / 130 3296 / 9541	13870 / ST 89 / 94 / 102 / 130 3296 / 9560	Limit Weight/Code V1/VR/V2/VFTO TOFL/Accel (MSL)
22 98.6	12375 / -O 90 / 95 / 102 / 130 3423 / 9436	13870 / ST 90 / 95 / 102 / 130 3423 / 9638	13375 / -O 90 / 95 / 102 / 130 3423 / 11481	13870 / ST 90 / 95 / 102 / 130 3423 / 9638	
25 97.9	11938 / -O 91 / 95 / 102 / 130 3563 / 9418	13724 / -O 91 / 95 / 102 / 130 3563 / 10846	12931 / -O 91 / 95 / 102 / 130 3563 / 11374	13870 / ST 91 / 95 / 102 / 130 3563 / 9740	
28 97.2	11508 / -O 92 / 95 / 102 / 130 3757 / 9406	13231 / -O 92 / 95 / 102 / 130 3757 / 10784	12462 / -O 92 / 95 / 102 / 130 3757 / 11225	13492 / -O 92 / 95 / 102 / 130 3757 / 9808	
31 96.5	11095 / -O OVERWEIGHT	12748 / -O 93 / 96 / 102 / 130 3958 / 10785	12007 / -O 93 / 96 / 102 / 130 3958 / 11643	12998 / -O 93 / 96 / 102 / 130 3958 / 9771	
34 95.9	10696 / -O OVERWEIGHT	12293 / -O 94 / 96 / 102 / 130 4174 / 10827	11576 / -O 94 / 96 / 102 / 130 4174 / 11570	12531 / -O 94 / 96 / 102 / 130 4174 / 9753	
37 0.00	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	

05-Dec-2024 Aircraft Performance Group Inc.



Takeoff

CITCJ3 CITCJ3 FJ443A

Flap: 0 DEGREES

Actual TOW: 13310

Wind: 33000 M

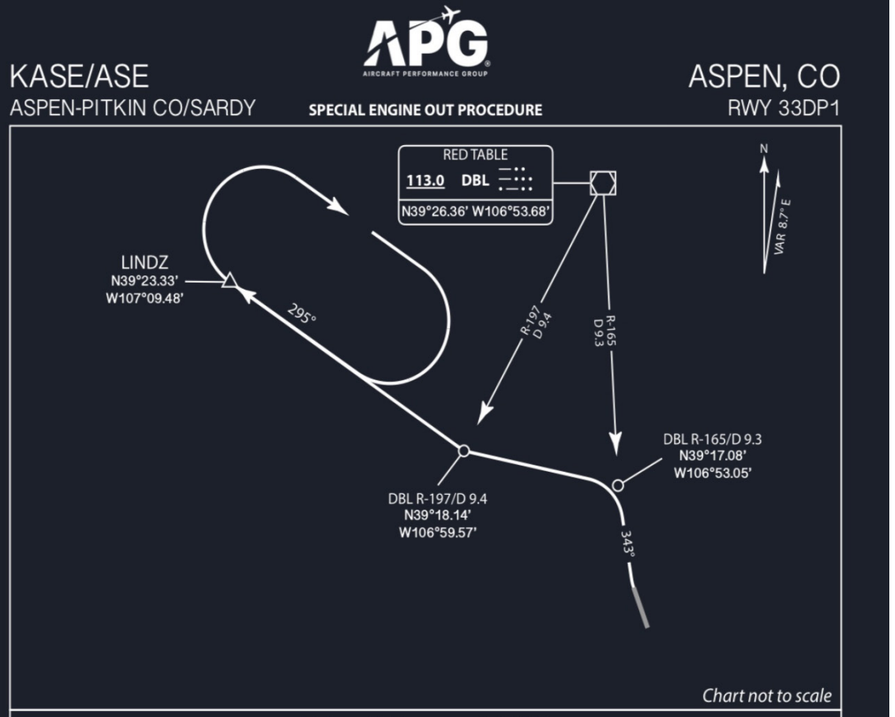
Altimeter: 29.92

KASE	33	33DP1	33DP2	33DP3	Runway
TEMP C PWR	8006/8006/8006	8006/8006/8006	8006/8006/8006	8006/8006/8006	TORA/TODA/ASDA
19 99.2	13031 / -O OVERWEIGHT	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	Limit Weight/Code V1/VR/V2/VFTO TOFL/Accel (MSL)
22 98.6	12584 / -O OVERWEIGHT	13870 / ST 108 / 116 / 121 / 130 5742 / 9445	13534 / -O 108 / 116 / 121 / 130 5742 / 9424	13870 / ST 108 / 116 / 121 / 130 5742 / 9445	
25 97.9	12169 / -O OVERWEIGHT	13870 / ST 108 / 117 / 121 / 130 6055 / 9475	13075 / -O OVERWEIGHT	13870 / ST 108 / 117 / 121 / 130 6055 / 9475	
28 97.2	11704 / -O OVERWEIGHT	13763 / CL 108 / 117 / 121 / 130 6469 / 10323	12610 / -O OVERWEIGHT	13759 / -O 108 / 117 / 121 / 130 6469 / 9521	
31 96.5	11295 / -O OVERWEIGHT	13384 / -O 109 / 118 / 121 / 130 6841 / 10246	12159 / -O OVERWEIGHT	13327 / -O 109 / 118 / 121 / 130 6841 / 9521	
34 95.9	10908 / -O OVERWEIGHT	12831 / CL OVERWEIGHT	11726 / -O OVERWEIGHT	12831 / CL OVERWEIGHT	
37 0.00	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	

KASE	33DP5	33DP7	33DP8	33DP9	Runway
TEMP C PWR	8006/8006/8006	8006/8006/8006	8006/8006/8006	8006/8006/8006	TORA/TODA/ASDA
19 99.2	13437 / -O 108 / 116 / 121 / 130 5471 / 9402	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	13870 / ST 108 / 116 / 121 / 130 5471 / 9423	Limit Weight/Code V1/VR/V2/VFTO TOFL/Accel (MSL)
22 98.6	13000 / -O OVERWEIGHT	13870 / ST 108 / 116 / 121 / 130 5742 / 9445	13870 / ST 108 / 116 / 121 / 130 5742 / 10946	13870 / ST 108 / 116 / 121 / 130 5742 / 9445	
25 97.9	12547 / -O OVERWEIGHT	13870 / ST 108 / 117 / 121 / 130 6055 / 10382	13679 / -O 108 / 117 / 121 / 130 6055 / 11616	13870 / ST 108 / 117 / 121 / 130 6055 / 9475	
28 97.2	12100 / -O OVERWEIGHT	13763 / CL 108 / 117 / 121 / 130 6469 / 10559	13223 / -O OVERWEIGHT	13763 / CL 108 / 117 / 121 / 130 6469 / 9521	
31 96.5	11669 / -O OVERWEIGHT	13357 / -O 109 / 118 / 121 / 130 6841 / 10642	12747 / -O OVERWEIGHT	13392 / CL 109 / 118 / 121 / 130 6841 / 9530	
34 95.9	11252 / -O OVERWEIGHT	12740 / -O OVERWEIGHT	12289 / -O OVERWEIGHT	12831 / CL OVERWEIGHT	
37 0.00	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	0 / TP OVERWEIGHT	

11 Nov 2024
Aircraft Performance Group Inc

Engine Out Procedure for KASE 33DP1



Takeoff Runway 33DP1
RNAV

TAKEOFF WEIGHTS FOR RWY 33DP1 REQUIRE THE USE OF THIS TAILORED RNAV DEPARTURE PROCEDURE

*** RNAV PROCEDURE. ALL FIXES ARE FLY-BY FIXES UNLESS OTHERWISE NOTED. ALL TURNS ARE CLIMBING 15 DEGREES OF BANK UNLESS OTHERWISE NOTED. ***

AT DEPARTURE END OF RUNWAY TURN RIGHT TO AN INITIAL HEADING OF 343 DEGREES

THEN DIRECT TO RNAV WPT (DBL R-165/D9.3)

THEN DIRECT TO RNAV WPT (DBL R-197/D9.4)

THEN DIRECT TO LINDZ **DO NOT EXCEED 180 KIAS UNTIL ESTABLISHED INBOUND TO LINDZ**

CLIMB IN HOLDING PATTERN AT LINDZ (HOLD SOUTHEAST, RIGHT TURNS, 25 DEGREE BANK, 5NM LEGS, 295 COURSE INBOUND) **DO NOT EXCEED 200 KIAS IN HOLD**

###

Effective: 20-JUL-2022

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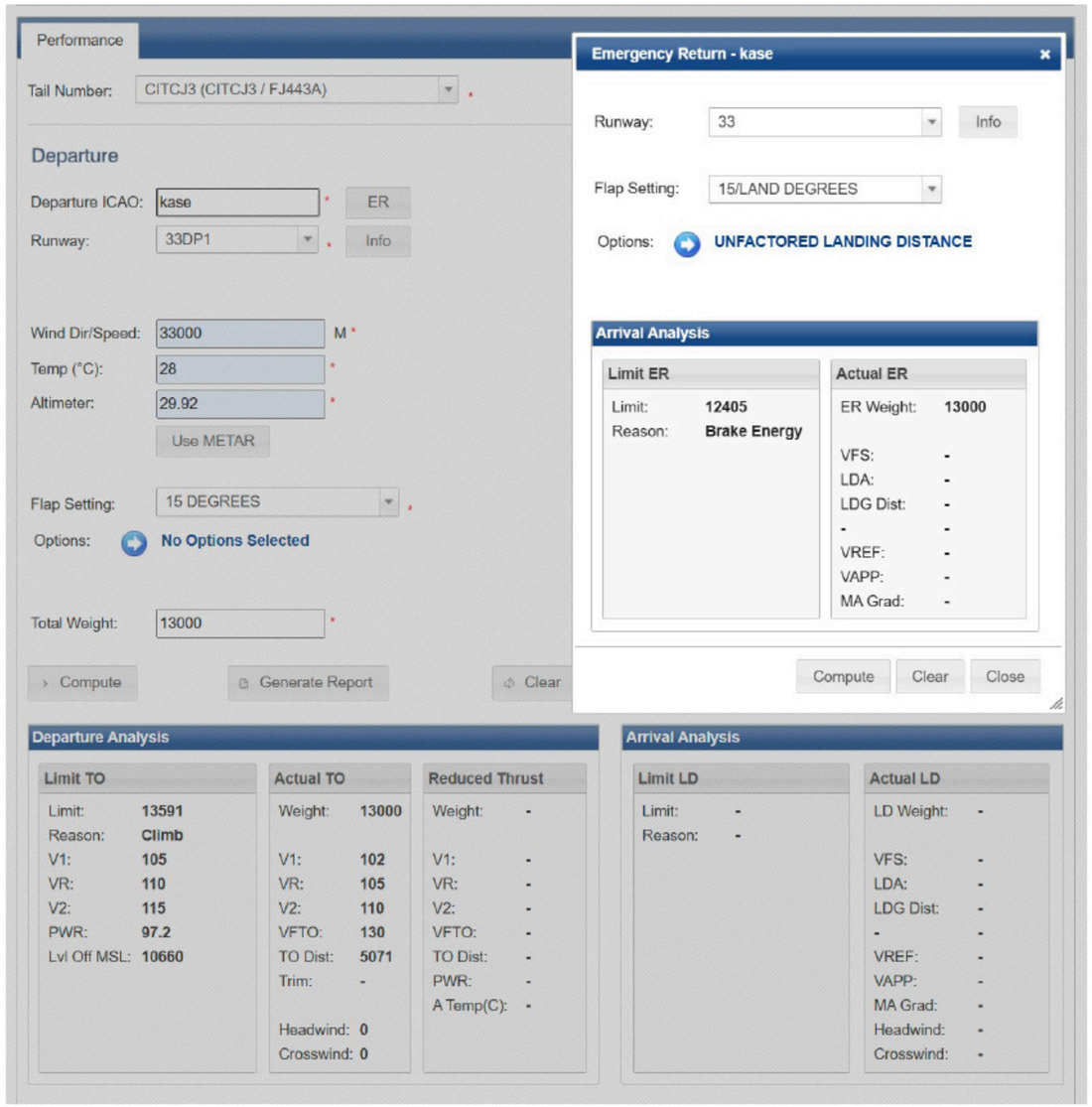
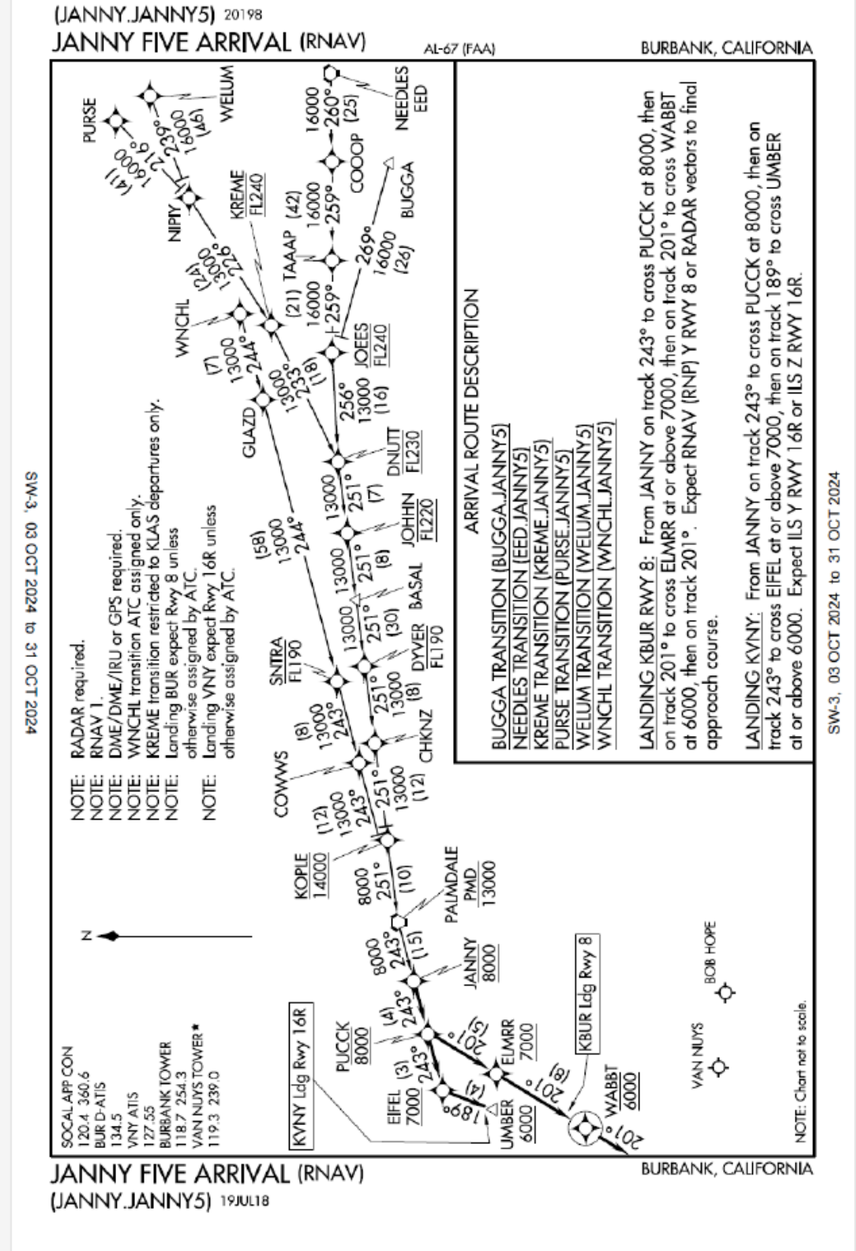
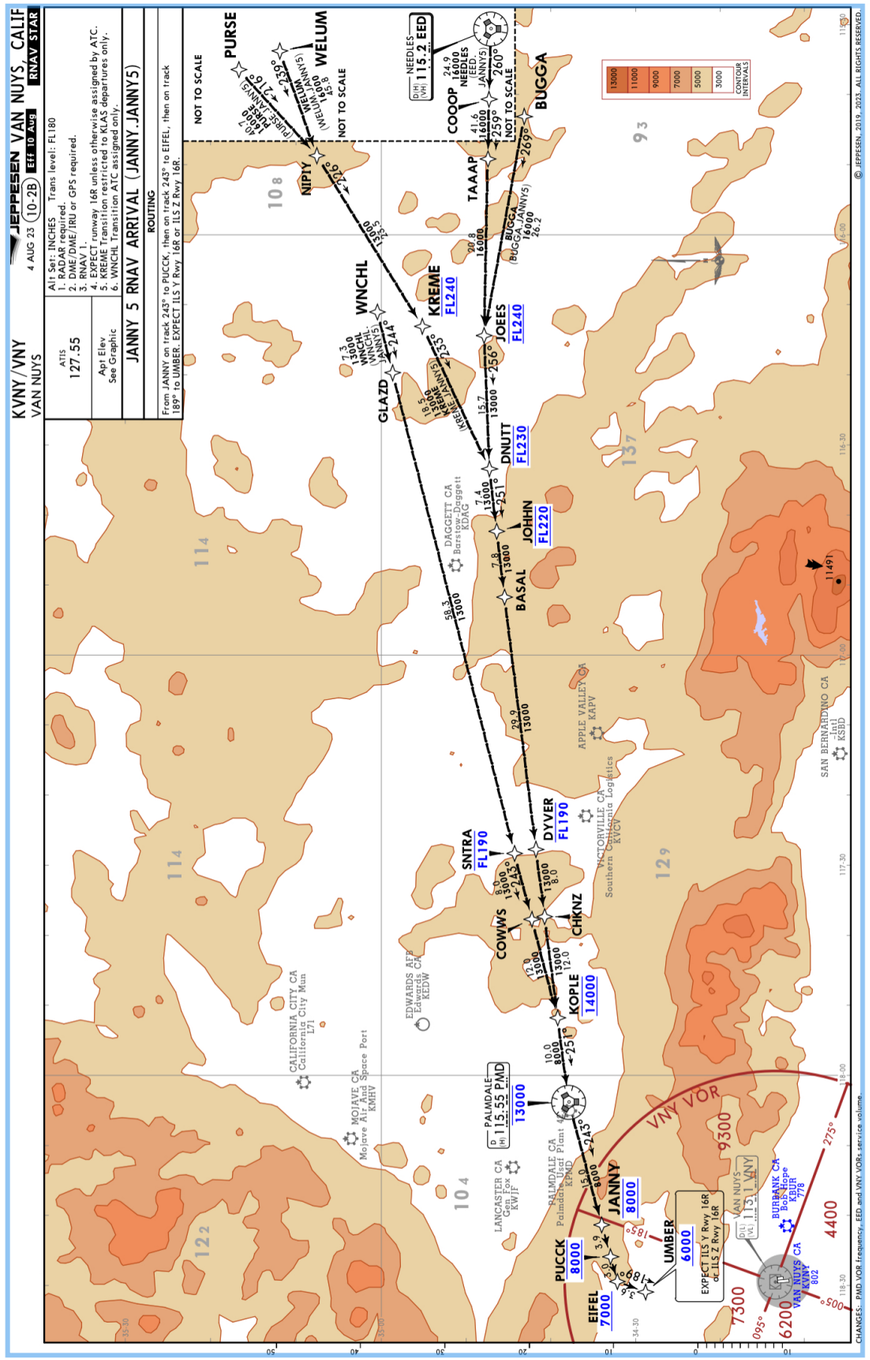
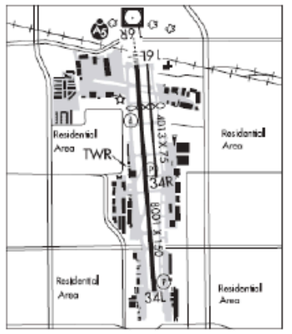

Performance
Tail Number: CITCJ3 (CITCJ3 / FJ443A)
Departure
Departure ICAO: kase
ER
Runway: 33DP1
Info
Wind Dir/Speed: 33000 M
Temp (°C): 28
Altimeter: 29.92
Use METAR
Flap Setting: 15 DEGREES
Options: No Options Selected
Total Weight: 13000
Compute
Generate Report
Clear
Emergency Return - kase
Runway: 33
Info
Flap Setting: 15/LAND DEGREES
Options: UNFACTORED LANDING DISTANCE
Arrival Analysis
Limit ER
Limit: 12405
Reason: Brake Energy
Actual ER
ER Weight: 13000
VFS: -
LDA: -
LDG Dist: -
- -
VREF: -
VAPP: -
MA Grad: -
Compute
Clear
Close
Departure Analysis
Limit TO
Limit: 13591
Reason: Climb
V1: 105
VR: 110
V2: 115
PWR: 97.2
Lvl Off MSL: 10660
Actual TO
Weight: 13000
V1: 102
VR: 105
V2: 110
VFTO: 130
TO Dist: 5071
Trim: -
Headwind: 0
Crosswind: 0
Reduced Thrust
Weight: -
V1: -
VR: -
V2: -
VFTO: -
TO Dist: -
PWR: -
A Temp(C): -
Arrival Analysis
Limit LD
Limit: -
Reason: -
Actual LD
LD Weight: -
VFS: -
LDA: -
LDG Dist: -
- -
VREF: -
VAPP: -
MA Grad: -
Headwind: -
Crosswind: -

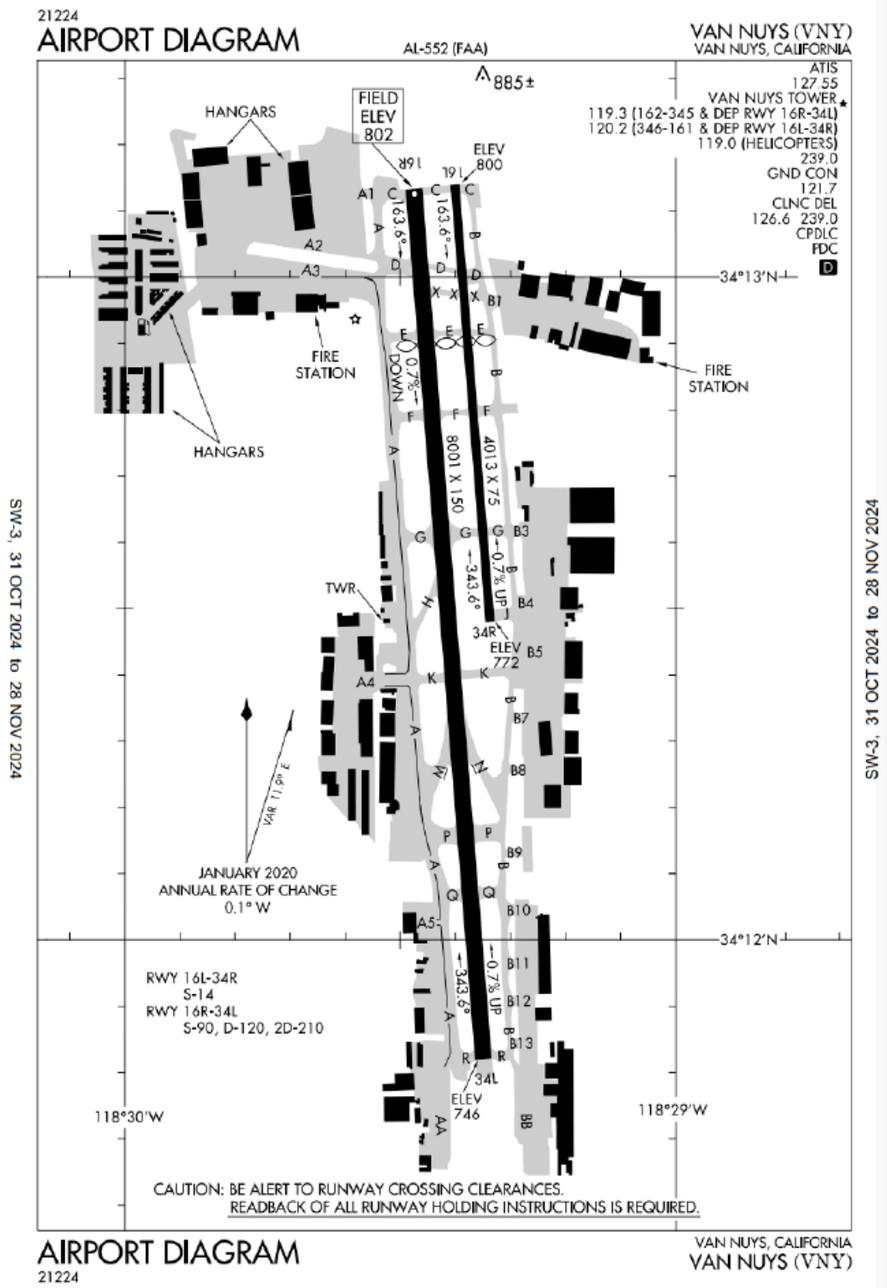

(JANNY.JANNY5) 20198
JANNY FIVE ARRIVAL (RNAV)
AL-67 (FAA)
BURBANK, CALIFORNIA
ARRIVAL ROUTE DESCRIPTION
BUGGA TRANSITION (BUGGA.JANNY5)
NEEDLES TRANSITION (EED.JANNY5)
KREME TRANSITION (KREME.JANNY5)
PURSE TRANSITION (PURSE.JANNY5)
WELUM TRANSITION (WELUM.JANNY5)
WNCHL TRANSITION (WNCHL.JANNY5)
RWY 8: From JANNY on track 243° to cross PUCCK at 8000, then
cross ELMRR at or above 7000, then on track 201° to cross WABBT
track 201°. Expect RNAV (RNP) Y RWY 8 or RADAR vectors to final
LANDING KBUR RWY 8: From JANNY on track 243° to cross PUCCK at 8000, then
on track 201° to cross ELMRR at or above 7000, then on track 189° to cross UMBER
at 6000, then on track 201° to cross WABBT at or above 6000. Expect ILS Z RWY 16R or ILS Y RWY 16R.
approach course.
LANDING KVNY: From JANNY on track 243° to cross PUCCK at 8000, then on
track 243° to cross EIFEL at or above 7000, then on track 189° to cross UMBER
at or above 6000. Expect ILS Z RWY 16R or ILS Y RWY 16R.
SW-3, 03 OCT 2024 to 31 OCT 2024
NOTE: RADAR required.
NOTE: RNAV 1.
NOTE: DME/DME/IRU or GPS required.
NOTE: WNCHL transition ATC assigned only.
NOTE: KREME transition restricted to KLAS departures only.
NOTE: Landing BUR expect Rwy 8 unless otherwise assigned by ATC.
NOTE: Landing VNY expect Rwy 16R unless otherwise assigned by ATC.
SOCAL APP CON 120.4 360.6
BUR D-ATIS 134.5
VNY ATIS 127.55
BURBANK TOWER 118.7 254.3
VAN NUYS TOWER* 119.3 239.0
KVNY Ldg Rwy 16R
KBUR Ldg Rwy 8
PURSE
WELUM
NIPPY
KREME FL240
NEEDLES EED
BUGGA
COOOP
TAAAP
WNCHL
JOEES FL240
GLAZD
DNUTT FL230
JOHHN FL220
BASAL
SNTRA FL190
DYYER FL190
CHKNZ
COWWS
KOPLE 14000
PALMDALE PMD 13000
JANNY 8000
PUCCK 8000
EIFEL 7000
ELMRR 7000
UMBER 6000
WABBT 6000
BOB HOPE
VAN NUYS
NOTE: Chart not to scale.
JANNY FIVE ARRIVAL (RNAV)
(JANNY.JANNY5) 19JUL18
BURBANK, CALIFORNIA

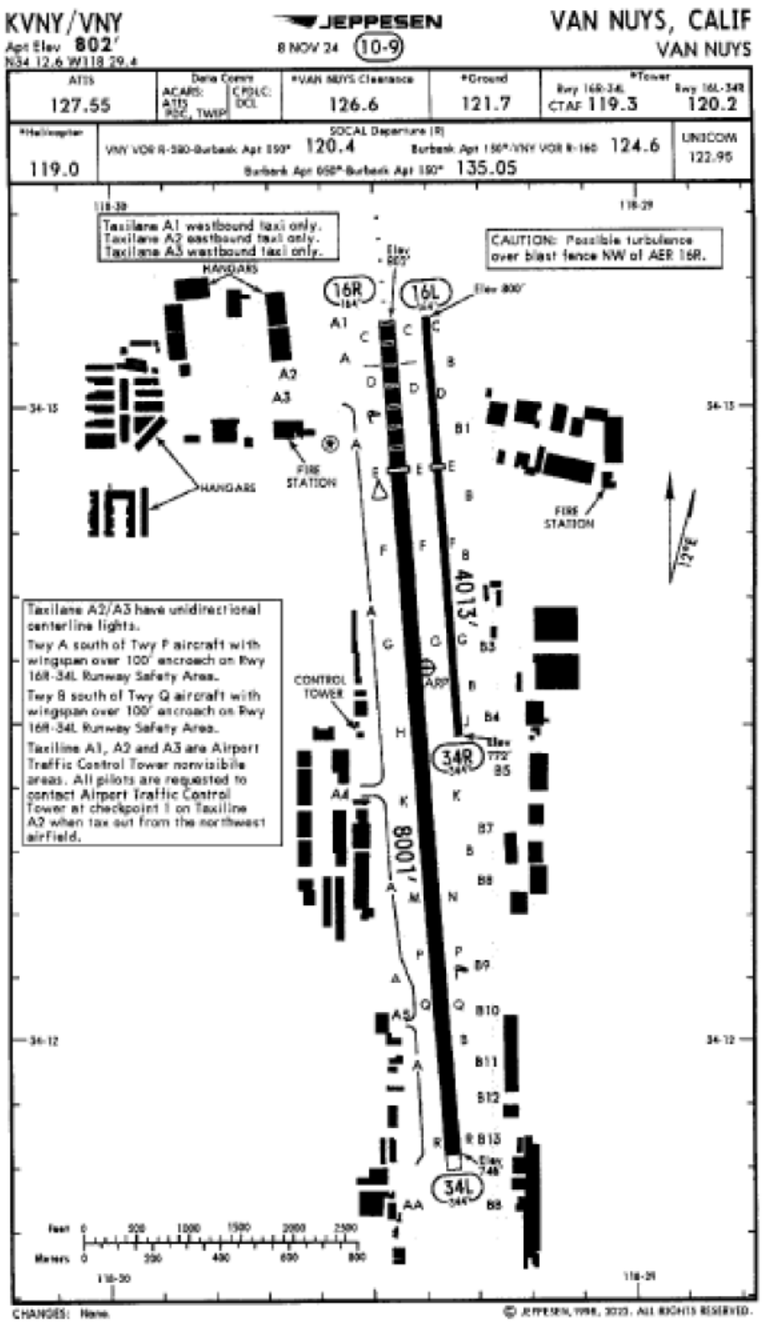


VAN NUYS (VNY)(KVNY) P (ANG) 3 NW UTC–8(–7DT) N34°12.59´ W118°29.40´ LOS ANGELES COPTER H–4I, L–3E, 4G, 7B IAP, AD
802 B TPA—See Remarks NOTAM FILE VNY MON Airport
RWY 16R–34L: H8001X150 (ASPH) S–90, D–120, 2S–152, 2D–210 HIRL
RWY 16R: MALSR. PAPI(P4R)—GA 3.5° TCH 49´. RVR–T Thld dsplcd 1432´. Fence. Rgt tfc. 0.7% down.
RWY 34L: PAPI(P4R)—GA 3.0° TCH 54´. Trees. 0.7% up.
RWY 16L–34R: H4013X75 (ASPH) S–14 MIRL 0.7% up N
RWY 16L: Thld dsplcd 1434´. Railroad.
RWY 34R: PAPI(P4L)—GA 3.0° TCH 30´. Rgt tfc.
RUNWAY DECLARED DISTANCE INFORMATION
RWY 16L: TORA–4013 TODA–4013 ASDA–4013 LDA–2582
RWY 16R: TORA–8001 TODA–8001 ASDA–8001 LDA–6570
RWY 34L: TORA–8001 TODA–8001 ASDA–7261 LDA–7261
RWY 34R: TORA–4013 TODA–4013 ASDA–3906 LDA–3906
SERVICE: S4 **FUEL** 100LL, JET A **OX** 1, 3 **LGT** When ATCT clsd ACTIVATE MALSR Rwy 16R , HIRL Rwy 16R–34L, twy lgts—CTAF. A2 and A3 have unidirectional centerline lgt. Rwy 16R VGSI unusbl byd 6 NM due to trrn. **MILITARY**— **FUEL** A+ (C818–989–2300.) (NC–100LL, A) **FLUID** OX.
NOISE: Extreme noise sensitive area. Noise Ordinance Curfew: No tkf for acft exceeding 74 DBA (PER AC36–3) between 0600–1500Z‡, except military, mercy flights and law enforcement acft. Rwy 16L and Rwy 16R no turns before the flood basin, unless directed by twr. Rwy 34L and Rwy 34R no turns before reaching 1800´ MSL unless directed by twr. No acft may arrive or depart the arpt whose AC36–3 tkof noise level equals or exceeds 77 DBA. Jets: Avoid dep and arr btn 11 pm and 7 am to rdc noise over community. Turbine/jet aircraft operators are requested to use NBAA noise abatement program procedures or comparable procedures of aircraft manufacturer.
AIRPORT REMARKS: Attended continuously. Arpt CLOSED to air carrier ops. Birds on and invof arpt. Bird abatement may occur between rwys when twr is open. When twr clsd, acft must self announce on freq 119.3 prior to ldg or departing. Rwy 16R left tfc when ATCT clsd. Rwy 16L–34R CLOSED and unlgtd when twr clsd. Helicopter ctc twr for apch–dep routes. TPA—2002(1200) Rwy 16R–34L, 1802(1000) Rwy 16L–34R. All jet acft must use full rwy length for departure unless otherwise directed by twr. Formation arrivals and departures prohibited except for emerg response acft. Txl A1 WB taxi only. Taxilane A3 westbound taxi only. Taxilane A2 eastbound taxi only. Taxilane A2/A3 have undirectional centerline lgts. Twy A south of Twy P acft with wingspan over 100 ft encroach on Rwy 16R–34L rsa. Twy B south of Twy Q acft with wingspan over 100 ft encroach on Rwy 16R–34L rsa. Txl A1, A2 and A3 are ATCT nonvisible areas. All pilots are reqstd to ctc ATCT at checkpoint 1 on Txl A2 when tax out from the NW airfield. Due to acft on KBUR Rwy 8 final rcvg TCAS RA, pls ahere strictly to TPA and climb gradients. NOTE: See Special Notices—Arrival Alert.
AIRPORT MANAGER: 818-442-6500
WEATHER DATA SOURCES: ASOS (818) 904–9213 LAWRS.
COMMUNICATIONS: CTAF 119.3 **ATIS** 127.55 818–780–4993 **UNICOM** 122.95
Ⓡ **SOCAL APP/DEP CON** 124.6 (South btn BUR 150°–VNY 160°), 134.2 (160°–280° VNY, West), 120.4 (VNY 280°–BUR 050°, North), 135.05 (050°–150° BUR)
TOWER 119.3 (162°–345° and dep Rwy 16R–34L), 120.2 (346°–161° and dep Rwy 16L–34R), 119.0 (helicopters)(1400–0645Z‡) **GND CON** 121.7
CLNC DEL 126.6
CPDLC (LOGON KUSA)
PDC
CLEARANCE DELIVERY PHONE: For CD when ATCT clsd ctc SoCal Apch at 800-448-3724.
AIRSPACE: CLASS D svc 1400–0645Z‡; other times CLASS E.
RADIO AIDS TO NAVIGATION: NOTAM FILE VNY.
(VL) (L) VORW/DME 113.1 VNY Chan 78 N34°13.41´ W118°29.50´ at fld. 812/15E.
VOR unusable:
103°–108° byd 35 NM
118°–226° byd 25 NM
305°–055° byd 19 NM
DME unusable:
055°–078° byd 23 NM
103°–108° byd 30 NM
118°–299° byd 20 NM
300°–315° byd 15 NM
316°–054° byd 19 NM
ILS 111.3 I–VNY Rwy 16R Class IA. Unmonitored when ATCT closed. LOC unusable within 0.6 NM. Autopilot coupled apch NA below 1,509 MSL.



SW, 5 SEP 2024 to 31 OCT 2024


21224
AIRPORT DIAGRAM
AL-552 (FAA)
VAN NUYS (VNY)
VAN NUYS, CALIFORNIA
ATIS
127.55
VAN NUYS TOWER
119.3 (162-345 & DEP RWY 16R-34L)
120.2 (346-161 & DEP RWY 16L-34R)
119.0 (HELICOPTERS)
239.0
GND CON
121.7
CLNC DEL
126.6 239.0
CPDLC
FDC
885±
FIELD ELEV 802
ELEV 800
HANGARS
FIRE STATION
TWR
ELEV 772
ELEV 746
8001 X 150
4013 X 75
-343.6°
-0.7% UP
-0.7% DOWN
163.6°
34°13'N
34°12'N
118°30'W
118°29'W
VAR 11.9° E
JANUARY 2020
ANNUAL RATE OF CHANGE
0.1° W
RWY 16L-34R
S-14
RWY 16R-34L
S-90, D-120, 2D-210
CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
AIRPORT DIAGRAM
21224
VAN NUYS, CALIFORNIA
VAN NUYS (VNY)
SW-3, 31 OCT 2024 to 28 NOV 2024


KVNY/VNY
Apt Elev 802'
N34 12.6 W118 29.4
JEPPESEN
8 NOV 24 (10-9)
VAN NUYS, CALIF
VAN NUYS
ATIS 127.55
Data Comm ACARS: ATIS PDC, TWEP CPDLC: DCL
*VAN NUYS Clearance 126.6
*Ground 121.7
*Tower Rwy 16R-34L CTAF 119.3 Rwy 16L-34R 120.2
*Helicopter 119.0
SOCAL Departure (R)
VNY VOR R-330-Burbank Apt 150° 120.4
Burbank Apt 150°-VNY VOR R-160 124.6
Burbank Apt 050°-Burbank Apt 150° 135.05
UNICOM 122.95
Taxilane A1 westbound taxi only.
Taxilane A2 eastbound taxi only.
Taxilane A3 westbound taxi only.
CAUTION: Possible turbulence over blast fence NW of AER 16R.
HANGARS
FIRE STATION
CONTROL TOWER
16R
16L
34R
34L
8001'
4013'
Elev 800'
Elev 772'
Elev 746'
12°E
Taxilane A2/A3 have unidirectional centerline lights.
Twy A south of Twy F aircraft with wingspan over 100' encroach on Rwy 16R-34L Runway Safety Area.
Twy B south of Twy Q aircraft with wingspan over 100' encroach on Rwy 16R-34L Runway Safety Area.
Taxilane A1, A2 and A3 are Airport Traffic Control Tower nonvisible areas. All pilots are requested to contact Airport Traffic Control Tower at checkpoint 1 on Taxilane A2 when tax out from the northwest airfield.
Feet 0 500 1000 1500 2000 2500
Meters 0 200 400 600 800
CHANGES: None.
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KVNY/VNY

JEPPESEN

8 NOV 24 (10-9A)

VAN NUYS, CALIF
VAN NUYS

GENERAL

Turbine/jet aircraft operators are requested to use NBAA Noise Abatement Program procedures or comparable procedures of aircraft manufacturer.
Noise Ordinance Restriction: Turbojet or fan powered aircraft prohibited from repetitive operations at all times.
Noise Ordinance Curfew: No take-offs for aircraft exceeding 74 DBA (per AC36-3) between 2200-0700 LT; except military, mercy flights & law enforcement aircraft.
Noise Ordinance Curfew: Prop powered aircraft prohibited from repetitive operations (touch and go landings, stop and go, or where aircraft takes off within five minutes after landing) between 2200-0700 LT (June 21-September 15) and between 2100-0700 LT (September 16-June 20).
Jets: Avoid departure and arrival between 23:00-07:00 LT to reduce noise over community.
No aircraft may arrive or depart the airport whose AC36-3 take-off noise level equals or exceeds 77 DBA.
Formation arrival/departure prohibited.
All aircraft must use full runway length for departure unless otherwise directed by ATC.
Birds in vicinity of airport.
Rwy 16R right traffic pattern only when Twr operating.
Rwy 34R right traffic pattern.
Due to aircraft on KBUR Rwy 8 final receiving Traffic Alert and Collision Avoidance System Resolution Advisory, please adhere strictly to traffic pattern altitude and climb gradients.

ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS — LANDING BEYOND: Threshold	Glide Slope	TAKE OFF	WIDTH
16R	❶ HIRL ❶ MALSR ❷ PAPI-R (angle 3.50°) RVR	❺ 6569'	5669'		150'
34L	❶ HIRL PAPI-R (angle 3.00°)	❹			
❶ Activate on 119.3 when Twr inop. ❷ Unusable beyond 6 NM due to terrain. ❸ LDA 6570'. ❹ LDA 7261'.					
16L	MIRL	❻ 2579'			75'
34R	MIRL PAPI-L (angle 3.00°)	❼			
❶ Closed and unlighted when Twr is closed. ❻ LDA 2582'. ❼ LDA 3906'.					

TERPS — TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE (AMND 6)

All Rwys

With Min climb of 370'/NM to 7100'

LOWER THAN STANDARD OpSpec Authorization Required	STANDARD	
RCLM or HIRL or Adequate Vis Ref	3 & 4 Eng	1 & 2 Eng
TDZ RVR 16 or ¼	RVR 24 or ½	RVR 50 or 1

OBSTACLE DP

Rwys 16L and 16R climbing left turn on heading 053° and VNY VOR R-095 to DARTS intersection, thence...
Rwys 34L and 34R climbing right turn on heading 143° and VNY VOR R-095 to DARTS intersection, thence...
...aircraft eastbound on V186 and southeast bound on V459 climb on course, all others climb in DARTS holding pattern (hold west, right turns, 095° inbound) to depart DARTS intersection at or above 7100'.

(For TAKE-OFF OBSTACLE NOTES see 10-9A1)

DIVERSE VECTOR AREA (DVA) (ORIG)

Rwy 16L: Heading as assigned by ATC; requires minimums climb of 380'/NM to 2600'.
Rwy 16R: Heading as assigned by ATC; requires minimum climb of 450'/NM to 2600'.

FOR FILING AS ALTERNATE

	Authorized Only When Twr Operating — Authorized Only When Local Weather Available: ILS Z Rwy 16R	ILS Y Rwy 16R	VOR-A	Authorized Only When Burbank Twr Operating: LDA-C	VOR-B
A	600-2	700-2	800-2	800-2	900-2
B					
C					900-2½
D			1000-3	1300-3	1000-3

CHANGES: Noise ordinance notes added

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VAN NUYS, CALIFORNIA — AL-552 (FAA) — 24081

ILS Y RWY 16R
VAN NUYS (VNY)

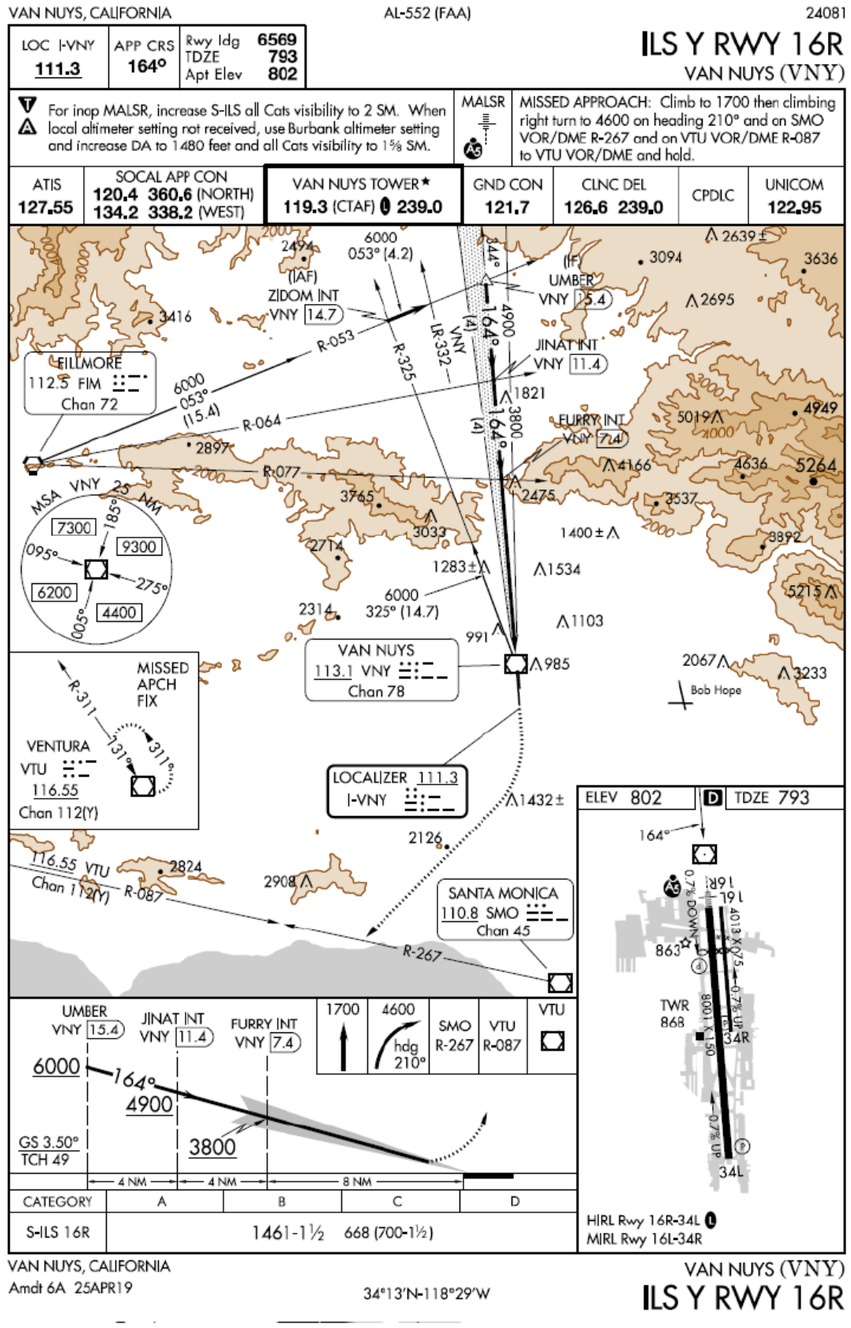
LOC I-VNY	APP CRS	Rwy Idg	6569
111.3	164°	TDZE	793
		Apt Elev	802

For inop MALSR, increase S-ILS all Cats visibility to 2 SM. When local altimeter setting not received, use Burbank altimeter setting and increase DA to 1480 feet and all Cats visibility to 1⅝ SM.

MALSR

MISSED APPROACH: Climb to 1700 then climbing right turn to 4600 on heading 210° and on SMO VOR/DME R-267 and on VTU VOR/DME R-087 to VTU VOR/DME and hold.

ATIS	SOCAL APP CON	VAN NUYS TOWER*	GND CON	CLNC DEL	CPDLC	UNICOM
127.55	120.4 360.6 (NORTH) 134.2 338.2 (WEST)	119.3 (CTAF) 239.0	121.7	126.6 239.0		122.95



CATEGORY	A	B	C	D
S-ILS 16R	1461-1½	668 (700-1½)		

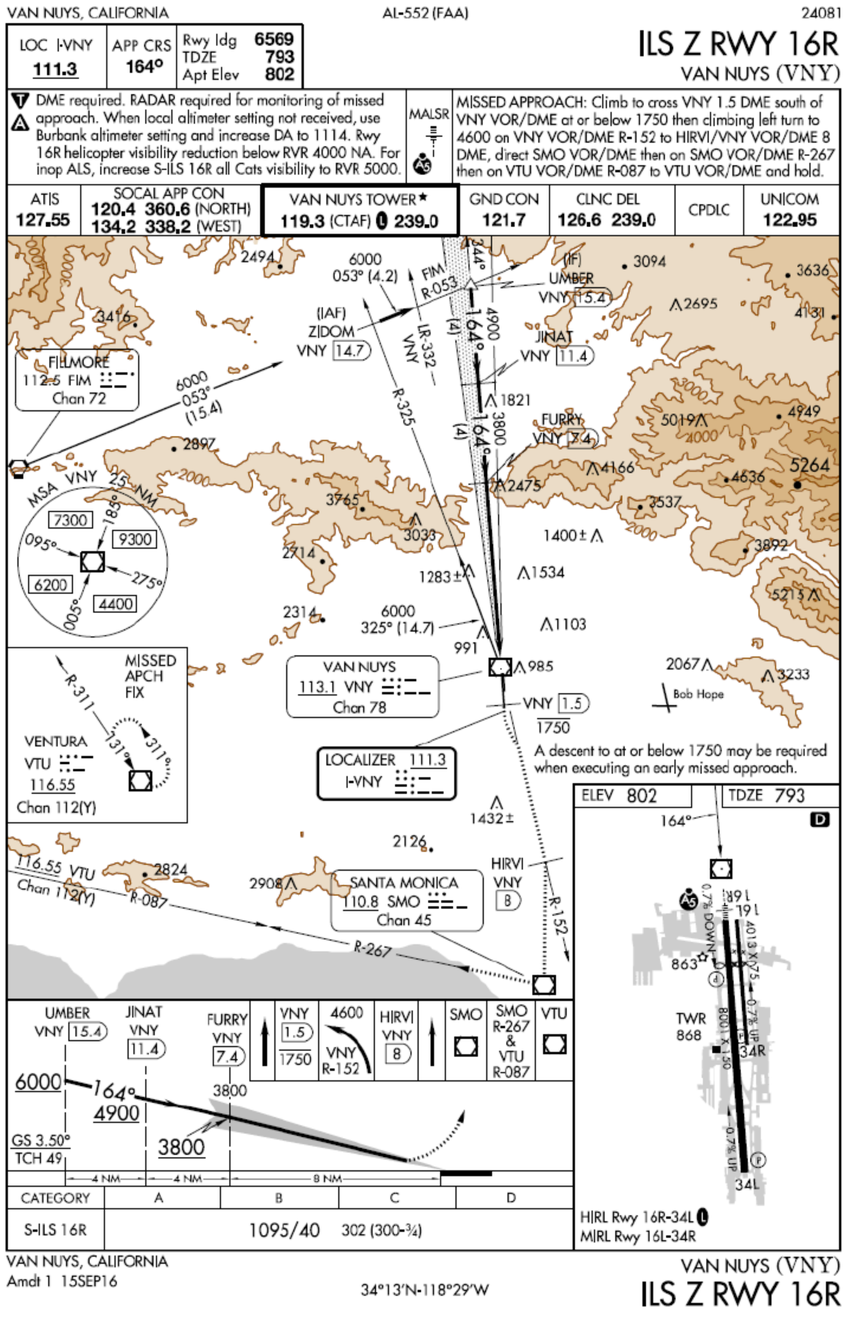
GS 3.50° TCH 49 — 6000 — 164° — 4900 — 3800 — 4 NM — 4 NM — 8 NM

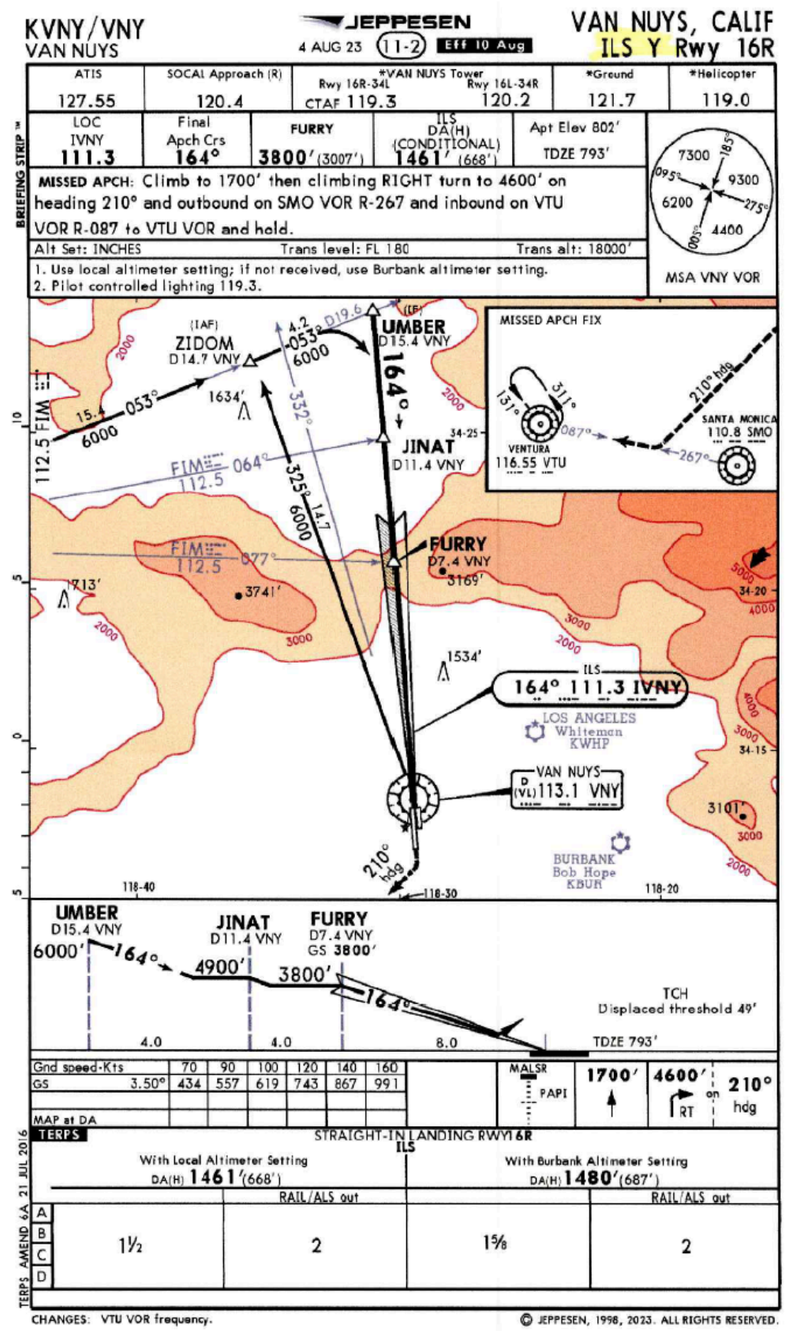
VAN NUYS, CALIFORNIA
Amdt 6A 25APR19

34°13'N-118°29'W

VAN NUYS (VNY)
ILS Y RWY 16R

SW-3, 03 OCT 2024 to 31 OCT 2024


VAN NUYS, CALIFORNIA
AL-552 (FAA)
24081
ILS Z RWY 16R
VAN NUYS (VNY)
LOC I-VNY 111.3
APP CRS 164°
Rwy Idg 6569
TDZE 793
Apt Elev 802
DME required. RADAR required for monitoring of missed approach. When local altimeter setting not received, use Burbank altimeter setting and increase DA to 1114. Rwy 16R helicopter visibility reduction below RVR 4000 NA. For inop ALS, increase S-ILS 16R all Cats visibility to RVR 5000.
MALSR
MISSED APPROACH: Climb to cross VNY 1.5 DME south of VNY VOR/DME at or below 1750 then climbing left turn to 4600 on VNY VOR/DME R-152 to HIRVI/VNY VOR/DME 8 DME, direct SMO VOR/DME then on SMO VOR/DME R-267 then on VTU VOR/DME R-087 to VTU VOR/DME and hold.
ATIS 127.55
SOCAL APP CON 120.4 360.6 (NORTH) 134.2 338.2 (WEST)
VAN NUYS TOWER* 119.3 (CTAF) 239.0
GND CON 121.7
CLNC DEL 126.6 239.0
CPDLC
UNICOM 122.95
FILLMORE 112.5 FIM Chan 72
MSA VNY 25 NM
7300
9300
6200
4400
MISSED APCH FIX
VENTURA VTU 116.55 Chan 112(Y)
VAN NUYS 113.1 VNY Chan 78
LOCALIZER 111.3 I-VNY
SANTA MONICA 110.8 SMO Chan 45
(IAF) ZIDOM VNY 14.7
(IF) UMBER VNY 15.4
JINAT VNY 11.4
FURRY VNY 7.4
VNY 1.5 1750
HIRVI VNY 8
A descent to at or below 1750 may be required when executing an early missed approach.
ELEV 802
TDZE 793
TWR 868
HIRL Rwy 16R-34L
MIRL Rwy 16L-34R
UMBER VNY 15.4
JINAT VNY 11.4
FURRY VNY 7.4
6000
164°
4900
3800
GS 3.50°
TCH 49
4 NM
4 NM
8 NM
CATEGORY A B C D
S-ILS 16R 1095/40 302 (300-¾)
VAN NUYS, CALIFORNIA
Amdt 1 15SEP16
34°13'N-118°29'W
VAN NUYS (VNY)
ILS Z RWY 16R
SW-3, 03 OCT 2024 to 31 OCT 2024


KVNY/VNY
VAN NUYS
JEPPESEN
4 AUG 23 (11-2) Eff 10 Aug
VAN NUYS, CALIF
ILS Y Rwy 16R
ATIS 127.55
SOCAL Approach (R) 120.4
*VAN NUYS Tower Rwy 16R-34L CTAF 119.3 Rwy 16L-34R 120.2
*Ground 121.7
*Helicopter 119.0
LOC IVNY 111.3
Final Apch Crs 164°
FURRY 3800' (3007')
ILS DA(H) (CONDITIONAL) 1461' (668')
Apt Elev 802'
TDZE 793'
MISSED APCH: Climb to 1700' then climbing RIGHT turn to 4600' on heading 210° and outbound on SMO VOR R-267 and inbound on VTU VOR R-087 to VTU VOR and hold.
Alt Set: INCHES
Trans level: FL 180
Trans alt: 18000'
1. Use local altimeter setting; if not received, use Burbank altimeter setting.
2. Pilot controlled lighting 119.3.
7300
9300
6200
4400
MSA VNY VOR
MISSED APCH FIX
VENTURA 116.55 VTU
SANTA MONICA 110.8 SMO
(IAF) ZIDOM D14.7 VNY
(IF) UMBER D15.4 VNY
JINAT D11.4 VNY
FURRY D7.4 VNY 3169'
ILS 164° 111.3 IVNY
LOS ANGELES Whiteman KWHP
VAN NUYS (VL) 113.1 VNY
BURBANK Bob Hope KBUR
UMBER D15.4 VNY
JINAT D11.4 VNY
FURRY D7.4 VNY GS 3800'
6000'
164°
4900'
3800'
TCH Displaced threshold 49'
TDZE 793'
Gnd speed-Kts 70 90 100 120 140 160
GS 3.50° 434 557 619 743 867 991
MALSR PAPI
1700'
4600' on RT
210° hdg
MAP at DA
TERPS
STRAIGHT-IN LANDING RWY16R
ILS
With Local Altimeter Setting DA(H) 1461'(668')
With Burbank Altimeter Setting DA(H) 1480'(687')
RAIL/ALS out
A 1½ 2
B 1⅝ 2
C
D
TERPS AMEND 6A 21 JUL 2016
CHANGES: VTU VOR frequency.
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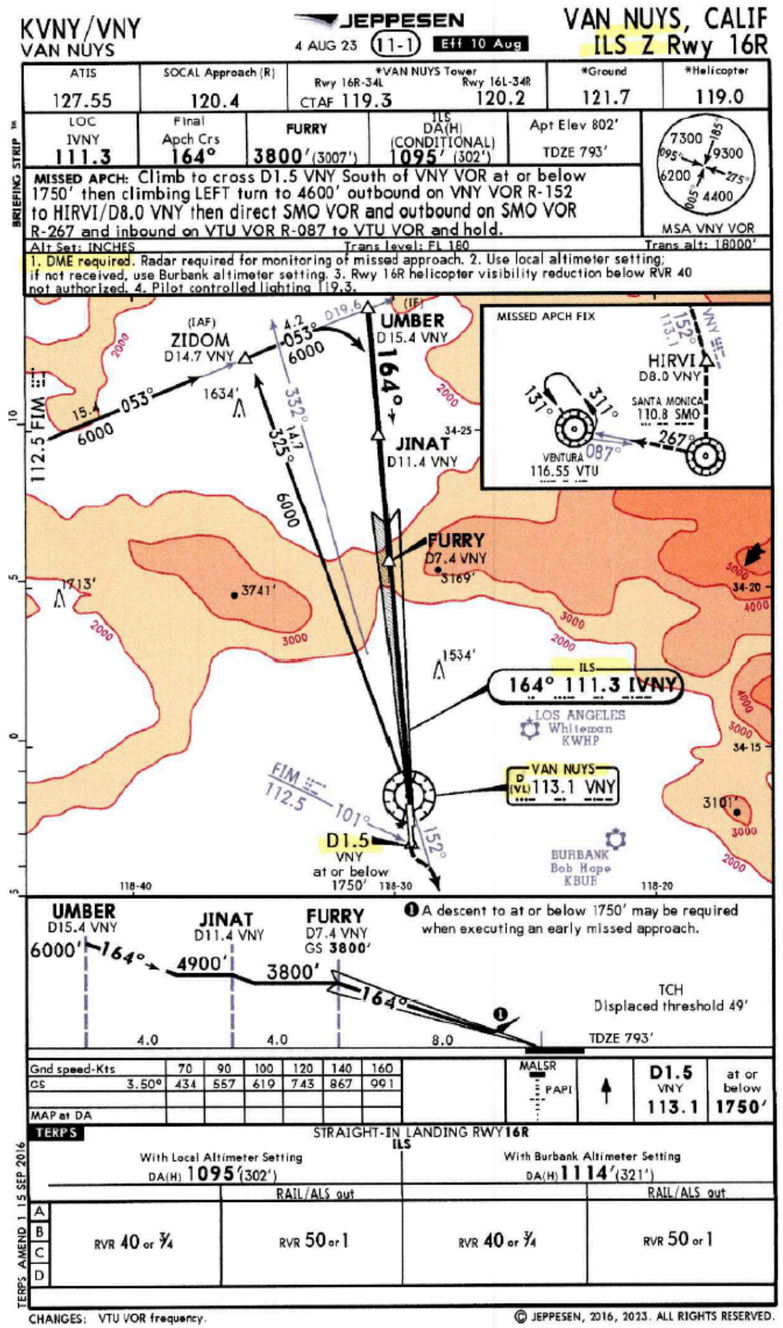

COMPLETED FORMS AND ANSWERS TO QUESTIONS

A. WEIGHT & BALANCE

Using the provided data, complete a weight and balance form

CJ3 WEIGHT and BALANCE FORM

FLIGHT: ASE - VNY

PAYLOAD COMPUTATIONS				ITEM	WEIGHT	MOMENT/100	CG
ITEM	ARM	WEIGHT	MOMENT/100	1. BASIC EMPTY WEIGHT	8160	25166.26	308.41
OCCUPANTS							
PILOT	131.0	190	248.90	2. PAYLOAD	1850	3296.70	178.20
COPILOT	131.0	190	248.90				
SEAT 3	202.5	210	425.25	3. ZERO FUEL WEIGHT (1+2)	10010	28462.96	284.35
SEAT 4	202.5	180	364.50	(10,510# MAX)			
SEAT 5	260.5	200	521.00				
SEAT 6	260.5	180	468.90	4. FUEL LOADING	3500	9934.08	
SEAT 7	295.5	150	443.25	(4,710# MAX)			
SEAT 8	295.5	200	591.00				
TOILET	322.5	0	0.00	5. RAMP WEIGHT (3+4)	13510	38397.04	284.21
SIDE FACING	174.2	0	0.00	(14,070# MAX)			
CABINETS							
LH CHART	150.9	0	0.00	6. LESS TAXI FUEL	200	642.06	
RH REFRESH	167.3	0	0.00				
LH EVAP	156.3	0	0.00	7. TAKEOFF WEIGHT (5-6)	13310	37754.98	283.66
VANITY	335.2	0	0.00	(13,870# MAX)			
BAGGAGE							
NOSE CARGO	74.0	100	74.00	8. ENROUTE FUEL BURN	1868	6539.82	
CAB STORAGE	330.2	0	0.00				
TAILCONE	414.6	250	1036.50	9. LANDING WEIGHT (7-8)	11442	31215.16	272.81
				(12,750# MAX)			
PAYLOAD		1850	4422.20	AIRPLANE CG = (MOMENT x 100) / WT			

B: TAKEOFF – CLIMB:

1. What is the climb requirement for the LINDZ.1? 7.6% **LINDZ1**

2. What is the AFM 2nd Stage climb capability at Flaps 15 (Use 10K FT PA, 13,000 lbs. and 25 degrees OAT)? 1.2% **Fig 4-40, Sht 5**

3. What is the AFM maximum weight (nearest 500 lbs.) for Flaps15 takeoff that meets the climb requirements of the LINDZ1 ? 9,500 lbs. **Fig 4-40, Sht 6**

4. In what FAA document do you find the obstacle departure procedure?
The **TPP** – Terminal Procedures Publication

USE APG AND FLIGHT PLANNING NUMBERS TO DETERMINE THE FOLLOWING:

5. What is max TOW for APG straight out RWY 33? 11,132 lbs.

6. Using RWY 33/DP-1, what is Flaps 15 max TOW? 13,591 lbs.

7. What is the limiting factor for an Emergency Return? Brake Energy

8. What is the TOFL and V1 for RWY33/DP-1/Flaps 15? 5,319 ft, V_1 = 103Kts

9. What are the APG V-Speeds?
V_1 103 V_R 106 V_2 111 V_{ENR} 130

10. What is the ISA at KASE if ATIS is reporting a temperature of 28 Deg? **Fig 4-7**
ISA + 28

11. Can you climb to FL340 at your weight? **Fig 4-10, Sht 2**
- Use ISA +10°, Wind Calm – No. No flight data in AOM

A weather front has just lowered the temperature to ISA +10

12. How many MIN / NM / LB for your climb to FL430? **AOM Fig 4-10, Sht 1 AOM Fig 4-10, Sht 2**
17 MIN / 122 NM / 521 lbs

C. DESCENT

- Note: Assume wind calm, ISA +10, average ground speed 395KTAS

13. What is the first descent crossing restriction? **JANNY5**
KREME at FL240

14. Assuming a 395 KTAS / 2,000 FPM descent, when should you start down?
2.5NM past PURSE to make KREME FL240

D: APPROACH - LAND

KVNY INFO "F" 042250Z 34010 1 1/2SM HZ OVC 020 25/23 A29.92 ILS RWY 16R IN USE

15. With ATIS "F" data, what is your landing distance on 16R? 3,270 ft **Fig 4-50 Sht 4**

16. What is the landing distance if the runway is reported to be wet? **Fig 7-11**
4,650 ft (4,455 interpolated)

17. V_{REF}'s may be obtained from the FMS, AFM, APG or abbreviated checklist. For this landing at KVNY, what will be the V_{REF} for landing on RWY 16R?
Use the VNY VOR DME and the "Hold" function on the RTU.

18. DME is required for this approach. The LOC doesn't have DME. **APPCH PLATES**
How are you going to get the DME requirement resolved?
Use the VNY VOR DME (113.1) and the HOLD function on the RTU.

19. What is your plan if the wind exceeds 34010?
Divert to KBUR. The available circling approaches are below minimums.

20. What is the note regarding Autopilot Coupled approaches to RWY 16R
"LOC unusable within 0.6NM. Autopilot coupled appch NA below 1,509 MSL."

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