



FLIGHT PLANNING AND PERFORMANCE MANUAL



757-200 PW2037 FAA LB/°F/FT CATEGORY A & B BRAKES

OPTIONS Slush EI

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General

This Flight Planning and Performance Manual has been prepared by Boeing Commercial Airplanes, Commercial Aviation Services. The purpose of this manual is to provide a complete operational performance data reference including dispatch and inflight performance data applicable to a specific airframe, engine rating, and regulatory agency as identified on the cover page of the document.

This manual is suitable for use for any airplane configuration that meets the criteria identified on the cover page of the document.

Owners/operators are solely responsible for ensuring the performance documentation they are using is complete and matches the current configuration identified on the cover page of the document. This includes the accuracy and validity of all information furnished by the owner/operator or any other party.

The manual is periodically revised to incorporate pertinent flight planning and performance information. Items of a more critical nature will be incorporated in Flight Planning and Performance Manual Bulletins and will be distributed in a timely manner. In all cases, such revisions and changes must remain compatible with the approved AFM with which the operator must comply. In the event of conflict with the AFM, the AFM shall supersede.

This manual assumes the user is familiar with basic jet airplane performance and regulatory requirements common to airplanes of this type.

Any questions about the content or use of this manual can be directed to:

Commercial Aviation Services
Boeing Commercial Airplanes
P.O. Box 3707, M/C 20-88
Seattle, Washington 98124-2207 USA

Attention: Manager, Performance Data Flight Operations Engineering

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Preface
Revision Record

Chapter 0
Section 2

Revision Transmittal Letter

To: All holders of Flight Planning and Performance Manual, Boeing Document Number D632N002-NZ077.

Subject: Flight Planning and Performance Manual Revision

This revision reflects the most current information available to The Boeing Company 45 days before the subject revision date. The following revision highlights explain changes in this revision. General information below explains the use of revision bars to identify new or revised information.

Revision Record

No.	Revision Date	Date Filed
init	June 15, 2009	
2	July 30, 2010	

No.	Revision Date	Date Filed
1	July 31, 2009	

General

The Boeing Company issues Flight Planning and Performance Manual revisions to provide new or revised information. Formal revisions also incorporate appropriate information from previously issued Flight Planning and Performance Manual bulletins.

The revision date is the approximate date the manual is mailed to the customer.

Formal revisions include a new Revision Record, Revision Highlights, and a current List of Effective Pages. Use the information on the new Revision Record and List of Effective Pages to verify the Flight Planning and Performance Manual content.

Pages containing revised material have revision bars associated with the changed text or illustration.

The Revision Record should be completed by the person incorporating the revision into the manual.

Filing Instructions

Consult the List of Effective Pages (0.3.1). Pages identified with an asterisk (*) are either replacement pages or new (original) issue pages. Remove corresponding old pages and replace or add new pages. Remove pages marked DELETED; there are no replacement pages for deleted pages.

Be careful when inserting changes not to throw away pages from the manual that are not replaced. The List of Effective Pages determines the correct content of the manual.

Revision Highlights

This manual is published from a database; the text and illustrations are marked with configuration information. Occasionally, because the editors rearrange the database markers, or mark items with configuration information due to the addition of new database content, some customers may receive revision bars on content that appears to be unchanged. Pages may also be republished without revision bars due to slight changes in the flow of the document.

Chapter 0 - Chapter Name

Title Page - Revised brake category in header and title page to clarify takeoff and landing data is the conservative of CAT A and CAT B braking performance. No change in data.

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Preface

List of Effective Pages

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Section 3

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General

The Boeing Company issues Flight Planning and Performance Manual Bulletins to provide important information prior to the next formal revision of the Flight Planning and Performance Manual.

Bulletins are dated and numbered sequentially. When appropriate, the next formal Flight Planning and Performance Manual revision will include an updated bulletin record page to reflect current bulletin status.

Bulletin status is defined as follows:

- In Effect (IE) – the bulletin contains pertinent information not otherwise covered in the Flight Planning and Performance Manual. The bulletin remains active and should be retained in the manual
- Incorporated (INC) – the bulletin operating information has been incorporated into the Flight Planning and Performance Manual. The bulletin remains active and should be retained in the manual
- Cancelled (CANC) – the bulletin is no longer active and should be removed from the Flight Planning and Performance Manual. All bulletins previously cancelled are no longer listed in the Bulletin Record.

The person filing a new or revised bulletin should amend the Bulletin Record as instructed in the Administrative Information section of the bulletin. When a bulletin includes replacement pages for the Flight Planning and Performance Manual, the included pages should be filed as instructed in the Flight Planning and Performance Manual Information section of the bulletin.

[illegible]

Flight Planning and Performance Manual Bulletin
for
The Boeing Company

The Boeing Company
Seattle, Washington 98124-2207



757

Number: NZ077-1

Issue Date: July 15, 2009

Document Effectivity: D632N002-NZ077

Subject: Performance Adjustments for Thrust Shortfall of PW2000 Series Powered Airplanes with Cutback Fan Blades Installed

Reason: To provide subject adjustments for Flight Planning and Performance Manual (FPPM) in conjunction with the AFM appendix release.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

Background Information

This bulletin advises operators of revised performance information applicable to the 757-200 with Pratt & Whitney PW2000 engines equipped with Cutback Fan Blades. PW2000 series engines equipped with 3 or more pairs of Cutback Fan Blades that have accumulated greater than 1000 cycles since new or since fan blade leading edge contour restoration refurbishment per Pratt & Whitney Service Bulletin PW2000 72-729 have been shown to be subject to thrust degradation. PW2000 engines equipped with 1 or 2 pairs of Cutback Fan Blades are not subject to this effect.



Flight Planning and Performance Manual

Operating Instructions

The following airplane performance adjustments apply when operating with PW2000 engines equipped with 3 or more pairs of Cutback Fan Blades that have accumulated greater than 1000 cycles since new or refurbishment.

Reductions to the applicable performance limit weights are provided in the tables below. Takeoff speeds are not changed.

Normal Mode

WEIGHT (LB)	FIELD (LB)	CLIMB (LB)	OBSTACLE (LB)	GEAR DOWN CLIMB (LB)	GEAR DOWN OBSTACLE (LB)	NET LEVEL OFF (LB)	APPROACH/ LANDING CLIMB (LB)
273000	4000	6900	7400	7000	7150	7300	7050
270000	4000	6800	7350	6900	7100	7200	6950
260000	3850	6550	7150	6650	6900	6950	6700
255000	3850	6450	7150	6550	6900	6800	6550
250000	3800	6300	7050	6400	6900	6700	6400
240000	3650	6050	6850	6150	6900	6450	6150
230000	3500	5800	6650	5850	6900	6150	5900
220000	3350	5550	6450	5600	6900	5900	5600
210000	3200	5300	6250	5350	6550	5650	5350
200000	3050	5050	6050	5100	6200	5350	5100
190000	2850	4800	5800	4850	5800	5100	4800
180000	2750	4550	5600	4550	5450	4850	4550
170000	2600	4300	5400	4300	5100	4650	4300
160000	2450	4050	5200	4050	4800	4400	4000
150000	2300	3800	5000	3800	4600	4200	3750
140000	2200	3500	4800	3500	4400	4000	3500

Normal Mode

WEIGHT (KG)	FIELD (KG)	CLIMB (KG)	OBSTACLE (KG)	GEAR DOWN CLIMB (KG)	GEAR DOWN OBSTACLE (KG)	NET LEVEL OFF (KG)	APPROACH/ LANDING CLIMB (KG)
124000	1850	3150	3350	3200	3250	3350	3200
120000	1800	3050	3300	3100	3200	3200	3100
115660	1750	2950	3250	2950	3150	3100	3000
110000	1700	2800	3150	2850	3150	2950	2850
100000	1550	2550	2950	2550	3150	2700	2550
90000	1400	2300	2750	2300	2800	2450	2300
80000	1250	2050	2550	2050	2450	2200	2050
70000	1100	1800	2300	1800	2150	1950	1750
60000	950	1500	2100	1500	1950	1750	1500

Alternate N1 Mode

WEIGHT (LB)	FIELD (LB)	CLIMB (LB)	OBSTACLE (LB)	GEAR DOWN CLIMB (LB)	GEAR DOWN OBSTACLE (LB)	NET LEVEL OFF (LB)	APPROACH/ LANDING CLIMB (LB)
273000	8350	14300	15350	14500	14850	15150	14600
270000	8250	14150	15200	14350	14700	14950	14400
260000	8000	13600	14800	13800	14350	14400	13850
255000	8000	13350	14850	13550	14350	14150	13600
250000	7850	13100	14650	13250	14350	13850	13300
240000	7550	12550	14250	12700	14350	13300	12750
230000	7200	12050	13800	12150	14350	12750	12200
220000	6900	11500	13350	11650	14350	12200	11650
210000	6600	11000	12950	11100	13600	11650	11100
200000	6250	10450	12500	10550	12800	11100	10550
190000	5950	9950	12050	10000	12050	10550	10000
180000	5650	9400	11650	9450	11300	10050	9450
170000	5350	8850	11200	8900	10550	9600	8850
160000	5100	8350	10750	8400	10000	9150	8300
150000	4800	7800	10350	7850	9550	8700	7750
140000	4500	7300	9900	7300	9100	8250	7200



Alternate N1 Mode

WEIGHT (KG)	FIELD (KG)	CLIMB (KG)	OBSTACLE (KG)	GEAR DOWN CLIMB (KG)	GEAR DOWN OBSTACLE (KG)	NET LEVEL OFF (KG)	APPROACH/ LANDING CLIMB (KG)
124000	3800	6500	7000	6600	6750	6900	6650
120000	3700	6300	6800	6400	6600	6650	6400
115660	3650	6050	6750	6150	6500	6450	6150
110000	3450	5750	6500	5850	6500	6100	5850
100000	3150	5250	6100	5300	6500	5550	5300
90000	2850	4700	5650	4750	5800	5000	4750
80000	2550	4200	5200	4200	5000	4500	4200
70000	2250	3650	4800	3650	4450	4050	3650
60000	1950	3150	4350	3150	4000	3600	3100

The following adjustments to the Altitude Capability, Fuel Requirements, Engine Inoperative Area of Operation and ETOPS Net Level Off Weights apply when operating with PW2000 engines equipped with 3 or more pairs of Cutback Fan Blades that have accumulated greater than 1000 cycles since new or refurbishment.

Reduce Long Range Cruise Maximum Operating Altitude by 1000 ft.

Reduce Engine Inoperative Long Range Cruise Altitude Capability by 3000 ft.

Reduce Gear Down Long Range Cruise Altitude Capability by 1300 ft.

Reduce Engine Inoperative Gear Down Long Range Cruise Altitude Capability by 2900 ft.

Increase Driftdown/LRC Cruise Range Capability fuel required by 1%.

Area of Operation Decrement (NM)

SPEED M/KIAS	TIME (MINUTES)				
	60	90	120	150	180
.78/290	4	6	8	10	13
.80/310	4	6	9	11	14
.80/330	4	7	10	12	16
.80/340	5	8	11	14	17
LRC	5	8	9	11	13

ETOPS Net Level Off Weight Reduction (LB)

WEIGHT (LB)	CRUISE SPEED (KIAS)				
	LRC	290	310	330	340
280000	11000	9800	11300	12400	13500
260000	10100	9800	11300	13200	14400
240000	9300	9900	11300	14000	15400
220000	8400	9900	11900	14200	16300
200000	7600	10000	13000	15800	18000
180000	6700	10500	14000	17400	19800
160000	5900	11500	15100	19000	21600
140000	5000	12500	16200	20600	23400
120000	4100	13400	17200	22200	25300

ETOPS Net Level off Weight Reduction (KG)

WEIGHT (KG)	CRUISE SPEED (KIAS)				
	LRC	290	310	330	340
130000	5100	4450	5100	5500	5950
120000	4700	4450	5100	5900	6450
110000	4250	4500	5100	6300	6900
100000	3850	4500	5400	6450	7400
90000	3400	4550	5950	7250	8250
80000	2950	4850	6450	8050	9150
70000	2550	5350	7000	8850	10050
	2100	5800	7500	9650	10950



Administrative Information

Insert this bulletin behind the List of Effective Pages for your Flight Planning and Performance Manual (FPPM). At that time you will be able to amend the Flight Planning and Performance Manual Bulletin Record to show bulletin NZ077-1 “In Effect” (IE).

This Flight Planning and Performance Manual Bulletin will remain in effect as long as the anticipated regulatory action is effective. Application of information contained herein may change if and when alternate means of compliance with the anticipated regulatory action are granted.

Please send all correspondence regarding Flight Planning and Performance Manual Bulletin status to one of the following addresses:

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TAKEOFF AND LANDING

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Introduction

This chapter contains data to determine takeoff and landing performance limitations, based on engine bleed effects for normal air conditioning operation and anti-ice off, i.e., two packs at normal flow, one pack bleed from each engine.

The data is presented in simplified form and is therefore conservative. In the event of any conflict between data presented in this section and those contained in the approved Airplane Flight Manual, the Flight Manual shall always take precedence.

Takeoff

The maximum brake release weight is the least of the field length, climb, obstacle, tire speed, brake energy and structural limit weights.

Altimeter Setting To Station Pressure

The determination of thrust setting and takeoff/landing performance generally requires station pressure altitude. If station pressure or station pressure altitude are not available, enter the chart with altimeter setting (QNH) and read the pressure altitude adjustment. Apply this correction to the station elevation to obtain station pressure altitude.

For boundary QNH values, read the midpoint between tabulated corrections to elevation, e.g., for QNH of 29.66 inches (1004 mb), the elevation adjustment is 250 ft.

If station pressure (QFE) is required, use conversion scale on left of chart for station pressure altitude versus QFE.

Alternatively, station pressure altitude may be determined by setting the cockpit altimeter to 29.92 inches (1013.2 mb); the altimeter will then read station pressure altitude.

Wind Component

The Wind Component chart provides crosswind and head/tail wind components, appropriate to the runway headings, reported wind velocity and direction. To use the chart, find the intersection between reported wind velocity in knots (circular lines) and the angle in degrees between reported wind direction and the runway (radial lines). Then read head/tail wind component to the left and crosswind component from the bottom scale.

Takeoff Field Limit

Maximum field length limited brake release weights are presented for the certified takeoff flap settings. The field length available is the amount of paved surface

which may be used to accelerate to the decision speed and either stop at the end of the runway or climb to 35 ft. These field limited weights do not account for clearway or stopway.

The reference takeoff condition is flap position 5 at zero slope and wind. To determine the field length limit brake release weight, enter the left portion of the chart with OAT, move vertically to airport pressure altitude and project a line horizontally to the field length reference line. Enter the right hand portion of the chart with field length available, adjust for slope, wind, runway condition and flap position and continue vertically to intersect the OAT/altitude line projected along the guidelines from the field length reference line. At this intersection, read the field length limit weight to the right. Adjust the field length limit weight according to the notes below the chart to account for the appropriate engine bleed configuration.

Takeoff Climb Limit

Maximum climb limited brake release weights are presented for the certified takeoff flap settings. The weights are limited by second segment climb performance and do not account for obstacles.

To determine the climb limit weight, enter with OAT, move vertically to airport pressure altitude and project a horizontal line to the flap position reference line. Adjust for flap position and read the climb limit weight to the left. Adjust the climb limit weight according to the notes below the chart to account for the appropriate engine bleed configuration.

Obstacle Limit

Obstacle clearance charts are provided for each certified takeoff flap setting. The charts are intended for use only when an airport analysis is not available. Detailed analysis for the specific case from the Airplane Flight Manual may result in a less restrictive weight. The data is not valid for takeoffs using improved climb technique.

To determine the obstacle limit weight, enter with obstacle height (measured from the lowest point on the runway) and move horizontally to the obstacle distance from brake release. Follow the guidelines vertically, adjusting for OAT, pressure altitude and wind as necessary. Read obstacle limit weight at the top.

Tire Speed Limit

Maximum tire speed limited weights are presented for 225 MPH tires. Tire speeds are not limiting unless Improved Climb Performance is used. To determine the tire speed limit weight, enter the chart with OAT, move vertically to airport pressure altitude and read the Flaps

5 tire speed limit weight to the left. Adjust the tire speed limit weight according to the notes below the chart to account for flap position and wind.

Brake Energy Limit VMBE

For normal takeoffs V1 will not generally be limited by maximum brake energy. Brake energy speed limits should be checked at hot/high airports, or when operating with tailwinds and/or improved climb where higher V1's are involved.

To determine if brake energy speed (VMBE) is limiting, enter the upper portion of the chart with brake release weight and airport pressure altitude. If inside the shaded area making a normal takeoff with no tailwind, brake energy will not be limiting and VMBE does not need to be checked. If outside the shaded area making a normal takeoff, brake energy may be limiting and VMBE must be checked. Always check VMBE when operating with a tailwind or when using improved climb performance. To check VMBE, move horizontally at the airport pressure altitude to the airport OAT, proceed vertically downwards to the brake release weight and read VMBE to the right. Adjust VMBE for slope, wind and brake configuration. If V1 exceeds VMBE for a normal takeoff, decrease brake release weight as indicated for each knot that V1 exceeds VMBE and determine normal takeoff speeds, V1, VR, and V2 for the lower brake release weight. If V1 exceeds VMBE for improved climb takeoff, decrease the climb weight improvement by the amount indicated for each knot that V1 exceeds VMBE and determine new V1, VR, and V2 increments for the lower climb weight improvement.

Improved Climb Performance

If the maximum brake release weight is limited by climb, the climb performance limited weight may be increased by use of improved climb technique. This increase in climb weight is obtained by utilizing the excess runway available to accelerate to higher takeoff speeds thereby achieving higher gradient capability. Improved climb is not allowed with flaps 1.

Charts are provided for determining the climb weight improvement available in terms of the difference between the climb limit weight and either the field or tire limit weight. For a given climb weight improvement the associated takeoff speed increments to be added to the normal V1, VR and V2's are also shown.

To determine the maximum allowable climb weight improvement and associated takeoff speed increments, enter the horizontal scale with the weight difference (field or tire limit minus climb limit), move vertically to intersect the line for the appropriate normal field limit weight, and read climb weight improvement to the left

and normal takeoff speed increments to the right. The horizontal lines indicate the maximum climb weight improvement for normal climb limited weights. The improved climb weight is the normal climb weight plus the climb weight improvement. The maximum improved climb weight is the lower of the field limit and tire limit improved climb weights. Apply the associated takeoff speed increments to the normal speeds for the improved climb weight. Brake Energy Limits should be checked.

Slush/Standing Water Takeoff

Experience has shown that aircraft performance may deteriorate significantly on runways covered with snow, slush, standing water or ice. Therefore, reductions in runway/obstacle limited takeoff weight and revised takeoff speeds are necessary. The tables are intended for guidance in accordance with advisory material and assumes an engine failure at the critical point during the takeoff.

The entire runway is assumed to be completely covered by a contaminant of uniform thickness and density. Therefore, this information is conservative when operating under typical colder weather conditions where patches of slush exist and some degree of sanding is common. Takeoffs in slush depths greater than 0.5 inches (13mm) are not recommended because of possible airplane damage as a result of slush impingement on the airplane structure. The use of assumed temperature for reduced thrust is not allowed on contaminated runways. Interpolation for slush/standing water depths between the values shown is permitted.

Takeoff weight is determined as follows:

1. Determine the field/obstacle limit weight for the takeoff flap setting.
2. Enter the Weight Adjustment table with the field/obstacle limit weight to obtain the weight reduction for the slush/standing water depth and airport pressure altitude.
3. Adjust field length available for temperature by amount shown on chart.
4. Enter the V1(MCG) Limit Weight table with the adjusted field length and pressure altitude to obtain the slush/standing water limit weight with respect to minimum field length required for V1(MCG) speed.

The maximum allowable takeoff weight in slush/standing water is the lesser of the limit weights found in steps 2 and 4.

Takeoff speed determination:

1. Determine takeoff speeds V1, VR and V2 for actual brake release weight using the Takeoff Speeds table in this section.

2. If V1(MCG) limited, set V1=V1(MCG). If not limited by V1(MCG) considerations, enter the V1 Adjustment table with actual brake release weight to determine the V1 reduction to apply to V1 speed. If the adjusted V1 is less than V1(MCG), set V1=V1(MCG).

Slippery Runway Takeoff

Airplane braking action is reported as good, medium or poor, depending on existing runway conditions. If braking action is reported as good, conditions should not be expected to be as good as on clean, dry runways. The value “good” is comparative and is intended to mean that airplanes should not experience braking or directional control difficulties when stopping. Good reported braking action denotes wet runway conditions or runways covered by compact snow. Similarly, poor braking action denotes runways covered with wet ice. Performance is based on reversers operating and a 15 ft. screen height at the end of the runway. The tables provided are used in the same manner as the Slush/Standing Water tables.

Takeoff Speeds

The speeds presented in the Takeoff Speeds table can be used for all performance conditions except where adjustments must be made to V1 for clearway, stopway, anti-skid inoperative, brakes deactivated, improved climb, contaminated runway situations, brake energy limits or obstacle clearance with unbalanced V1. These speeds may be used for weights less than or equal to the performance limited weight.

Normal takeoff speeds, V1, VR, and V2, with anti-skid on and all brakes operative, are read from the table by entering with takeoff flap setting, brake release weight and appropriate column. The appropriate column is obtained by entering the Column Reference chart with the airport pressure altitude and the actual temperature or assumed temperature for reduced thrust takeoffs. Slope and wind adjustments to V1 are obtained by entering the V1 Adjustment chart. Adjusted V1 must not exceed VR. These takeoff speeds are not valid when the brake release weight is based on clearway, stopway, improved climb or is limited by tire speed or brake energy.

If takeoffs are scheduled using these simplified speeds in conjunction with airport analyses that include clearway and/or stopway credits, adjustments to V1 speed are required.

Adjust V1 by the amount shown in the Clearway/Stopway table. The adjusted V1 must not exceed VR.

The maximum allowable clearway limits shown are provided for guidance when more precise data is unavailable.

V1(MCG)

Regulations prohibit scheduling takeoff with a V1 less than minimum V1 for control on the ground, V1(MCG). Therefore compare the adjusted V1 to the V1(MCG). To find V1(MCG) enter the V1(MCG) table with the airport pressure altitude and actual OAT. If the adjusted V1 is less than V1(MCG), set V1 equal to V1(MCG). If VR is less than V1(MCG), set VR equal to V1(MCG), and determine a new V2 by adding the difference between the normal VR and V1(MCG) to the normal V2. No takeoff weight adjustment is necessary provided that the actual field length exceeds the minimum field length.

Anti-Skid Inoperative

When operating with anti-skid inoperative, the field limit weight and V1 must be reduced to account for the effect on accelerate-stop performance. A simplified method which conservatively accounts for the effects of anti-skid inoperative on a dry runway is to reduce the normal runway/obstacle limited weight by 28000 lb and the V1 associated with the reduced weight by the amount shown in the table below.

ANTI-SKID INOPERATIVE ADJUSTMENT				
FIELD LENGTH (FT)	V1 ADJUSTMENT (KTS)*			
	FLAPS 1	FLAPS 5	FLAPS 15	FLAPS 20
6000	-46	-41	-39	-36
8000	-37	-33	-31	-29
10000	-30	-27	-26	-25
12000	-25	-23		
14000	-20	-19		

*Reduce V1 adjustment by 1 knot per 10000 lb below 240000 lb.

If the resulting V1 is less than minimum V1, takeoff is permitted with V1 set equal to V1(MCG) provided the accelerate-stop distance corrected for wind and slope exceeds approximately 7150 ft.

Brakes Deactivated

When operating with brakes deactivated, the field and brake energy limit weights and the V1 and VMBE must be reduced to allow for reduced braking capability. A simplified method which conservatively accounts for the reduced braking capability of one brake deactivated

is to reduce the normal runway/obstacle limited weight by 4000 lb and the V1 associated with the reduced weight by the amount shown in the table below.

ONE BRAKE DEACTIVATED SPEED ADJUSTMENT	
FIELD LENGTH (FT)	V1 ADJUSTMENT (KTS)
6000	-3
8000	-2
10000	-2
12000	-2
14000	-1

If the resulting V1 is less than minimum V1, takeoff is permitted with V1 set equal to V1(MCG) provided the accelerate-stop distance exceeds approximately 3750 ft for one brake deactivated.

Takeoff EPR

To find Max Takeoff EPR based on normal engine bleed for air conditioning, 2 bleeds/2 packs, enter Takeoff EPR table with airport pressure altitude and airport OAT and read EPR. EPR adjustments are shown for packs off and wing anti-ice on.

Assumed Temperature Reduced Thrust

Regulations permit the use of up to 25% takeoff thrust reduction for operation with assumed temperature reduced thrust. Use of reduced thrust is not allowed on runways contaminated with water, ice, slush or snow. Use of assumed temperature reduced thrust is not recommended if potential windshear conditions exist. The assumed temperature reduced takeoff EPR is read from the Takeoff EPR table at the assumed temperature. The minimum allowable EPR for reduced thrust, based on 25% takeoff thrust reduction, is shown below. It is not recommended to set takeoff EPR lower than the scheduled Climb EPR.

MINIMUM ALLOWABLE EPR FOR REDUCED THRUST	
MAX TAKEOFF EPR FOR ACTUAL OAT	MIN TAKEOFF EPR ALLOWED
1.60	1.38
1.55	1.36
1.50	1.33
1.45	1.30
1.40	1.27
1.35	1.24
1.30	1.20

Stab Trim Setting

To find takeoff stabilizer trim setting, enter the appropriate Stab Trim Setting table with anticipated brake release weight and center of gravity (C.G. % MAC) and read required stabilizer trim units.

Landing

Charts are provided for determining the maximum landing weight as limited by field length or climb requirements for flap positions 25 and 30. Maximum

performance landing weight is the smaller of the field length limit weight and climb limit weight; do not exceed maximum structural landing weight.

Landing Field Length Limit

To determine the field length limit landing weight, enter the field length limit chart with field length available and adjust for runway condition, wind and flap setting. Proceed vertically to the airport pressure altitude for either anti-skid operating or inoperative and read the field length limited weight at the right.

Landing Climb Limit Weight

To determine climb limit weight, enter the climb limit chart with airport OAT, move vertically to airport pressure altitude and read the flaps 30 climb limit weight to the left. Adjust the climb limit weight according to the notes below the chart to account for the appropriate landing and engine bleed configuration. Make the appropriate ice correction as shown on the chart, when operating in icing conditions during any part of the flight when the forecast landing temperature is below 46°F.

Quick Turnaround Limit

Maximum quick turnaround weights are presented for flap positions 25 and 30. If landing weight exceeds the maximum quick turnaround weight for the airport OAT and pressure altitude shown in the table, adjusted for slope and wind, wait the specified time and check that the wheel thermal plugs have not melted before executing a subsequent takeoff. For brakes deactivated, reduce the maximum quick turnaround weight by the amount shown on the chart. Brake temperature monitor indication on EICAS may be used as an alternate method for determining quick turnaround limit.

Recommended Brake Cooling Schedule

The Recommended Brake Cooling Schedule chart is advisory information intended to assist the operator in avoiding problems associated with hot brakes. The Maximum Quick Turnaround Limit table takes precedence over the brake cooling schedule in case of conflict.

For normal operations most landings are at weights below the quick turnaround limit. Application of the recommended cooling procedures shown will avoid brake overheat and fuse plug problems that could result from repeated landings at short time intervals or a rejected takeoff. The chart shows the brake energy per brake added by a single stop. Total brake energy is assumed to be equally distributed among the operating brakes. Total brake energy is the sum of the residual energy from previous stops plus the energy added.

To determine the brake energy added by a single stop enter the top of the chart with weight, proceed horizontally to the brakes on indicated airspeed, adjusted for wind, then vertically downwards adjusting for airport pressure altitude and OAT. If the ground speed at brakes on is known from the ADI or IRU displays, use ground speed and ignore the wind, airport pressure altitude, and OAT adjustments.

The chart is based on a rejected takeoff with maximum manual braking effort. Make the adjustments shown for braking during normal landing using either maximum manual braking effort or a preselected autobrake setting. Increase the brake energy per brake by 0.65 million foot pounds for every mile of taxi distance. Continue vertically downwards at the brake energy per brake to determine the recommended cooling procedures.

In general, the brakes on indicated airspeed during landing will be 5-7 knots lower than approach speed when recommended braking procedures are followed due to deceleration in the flare to touchdown. To conservatively account for wind gusts, adjust the brakes on speed by subtracting one-half the headwind or adding 1.5 times the tailwind.

If brake temperature monitor indication on EICAS is available, the hottest brake indication 10 to 15 minutes after the airplane has come to a complete stop, or inflight with gear retracted, may be used to determine the recommended cooling schedule by entering at the bottom of the chart. The brake temperature light illuminates when the hottest brake is registering 5 on the EICAS indication and extinguishes as the hottest brake cools with an EICAS indication of 4.

CAT III Automatic Landing

The CAT III Autoland field length information is advisory information to assist operators in determining landing field length corrections with CAT III Autoland. This guidance information may be used to comply with FAA Advisory Circular 120-28D.

If anti-skid systems are operative and the landing runway surface braking action is expected to be medium or better, CAT III Autoland field lengths can be obtained by entering the Landing Field Length Limit chart, for the selected flap, with field length available divided by 1.15. If either of these conditions are not met, then CAT III Autoland field lengths can be obtained by entering the Landing Field Length Limits chart with field length available divided by 1.3, unless it has been demonstrated to the regulatory authority that a factor less than 1.3 is acceptable.

Normal Configuration Landing Distance

Tables are provided as advisory information for normal configuration landing distances on dry runways and slippery runways with good, medium, and poor reported braking action. These values are actual landing distances and do not include the 1.67 regulatory factor. Therefore, they cannot be used to determine the dispatch required landing field length.

To use these tables, determine the reference landing distance for the selected braking configuration. Then adjust the reference distance for landing weight, altitude, wind, slope, temperature, approach speed, and the number of operative thrust reversers to obtain the actual landing distance.

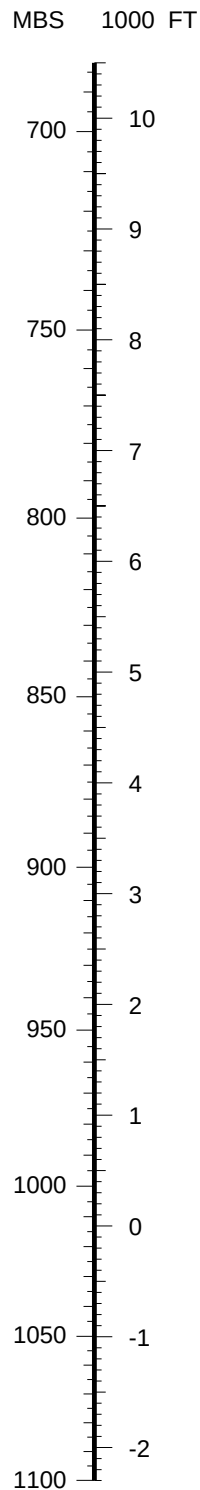
When landing on slippery runways or runways contaminated with ice, snow, slush, or standing water, the reported braking action must be considered. If the surface is affected by water, snow, or ice, and the braking action is reported as "good", conditions should not be expected to be as good as on clean, dry runways. The value "good" is comparative and is intended to mean that airplanes should not experience braking or directional control difficulties when landing. The performance level used to calculate the "good" data is consistent with wet runway testing done on early Boeing jets. The performance level used to calculate "poor" data reflects runways covered with wet ice.

Use of the autobrake system commands the airplane to a constant deceleration rate. In some conditions, such as a runway with "poor" braking action, the airplane may not be able to achieve these deceleration rates. In these cases, runway slope and inoperative reversers influence the stopping distance. Since it cannot be determined quickly when this becomes a factor, it is appropriate to add the effects of slope and inoperative reversers when using the autobrake system.

Intentionally
Blank

Altimeter Setting to Station Pressure

QFE Station Pressure

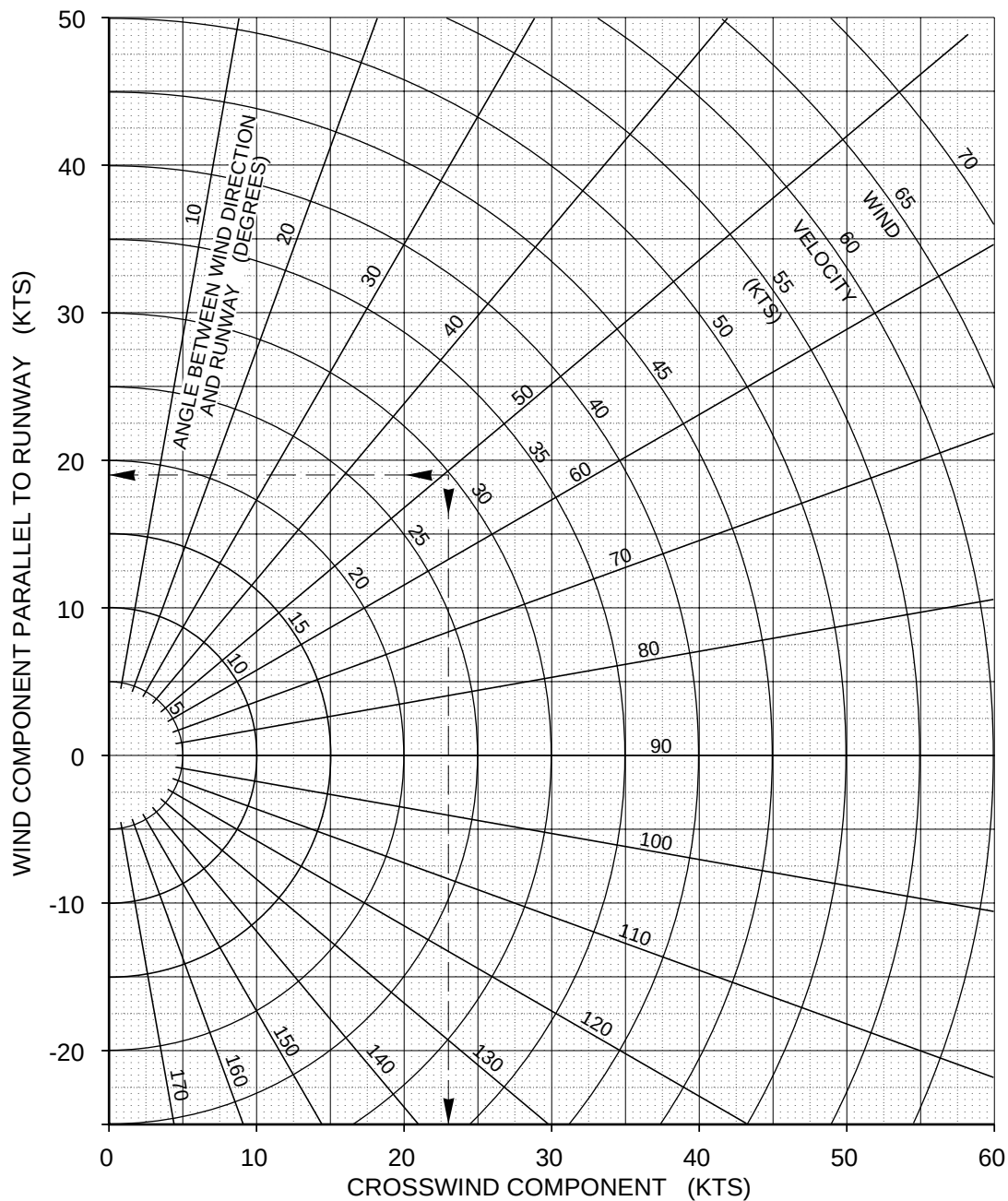


QNH to Pressure Altitude

QNH (IN. HG.)		CORRECTION TO ELEVATION FOR PRESS ALT (FT)		QNH (MILLIBARS)	
28.81	to	28.91	1000	976	to 979
28.91	to	29.02	900	979	to 983
29.02	to	29.12	800	983	to 986
29.12	to	29.23	700	986	to 990
29.23	to	29.34	600	990	to 994
29.34	to	29.44	500	994	to 997
29.44	to	29.55	400	997	to 1001
29.55	to	29.66	300	1001	to 1004
29.66	to	29.76	200	1004	to 1008
29.76	to	29.87	100	1008	to 1012
29.87	to	29.97	0	1012	to 1015
29.97	to	30.08	-100	1015	to 1019
30.08	to	30.19	-200	1019	to 1022
30.19	to	30.30	-300	1022	to 1026
30.30	to	30.41	-400	1026	to 1030
30.41	to	30.52	-500	1030	to 1034
30.52	to	30.63	-600	1034	to 1037
30.63	to	30.74	-700	1037	to 1041
30.74	to	30.85	-800	1041	to 1045
30.85	to	30.96	-900	1045	to 1048
30.96	to	31.07	-1000	1048	to 1052

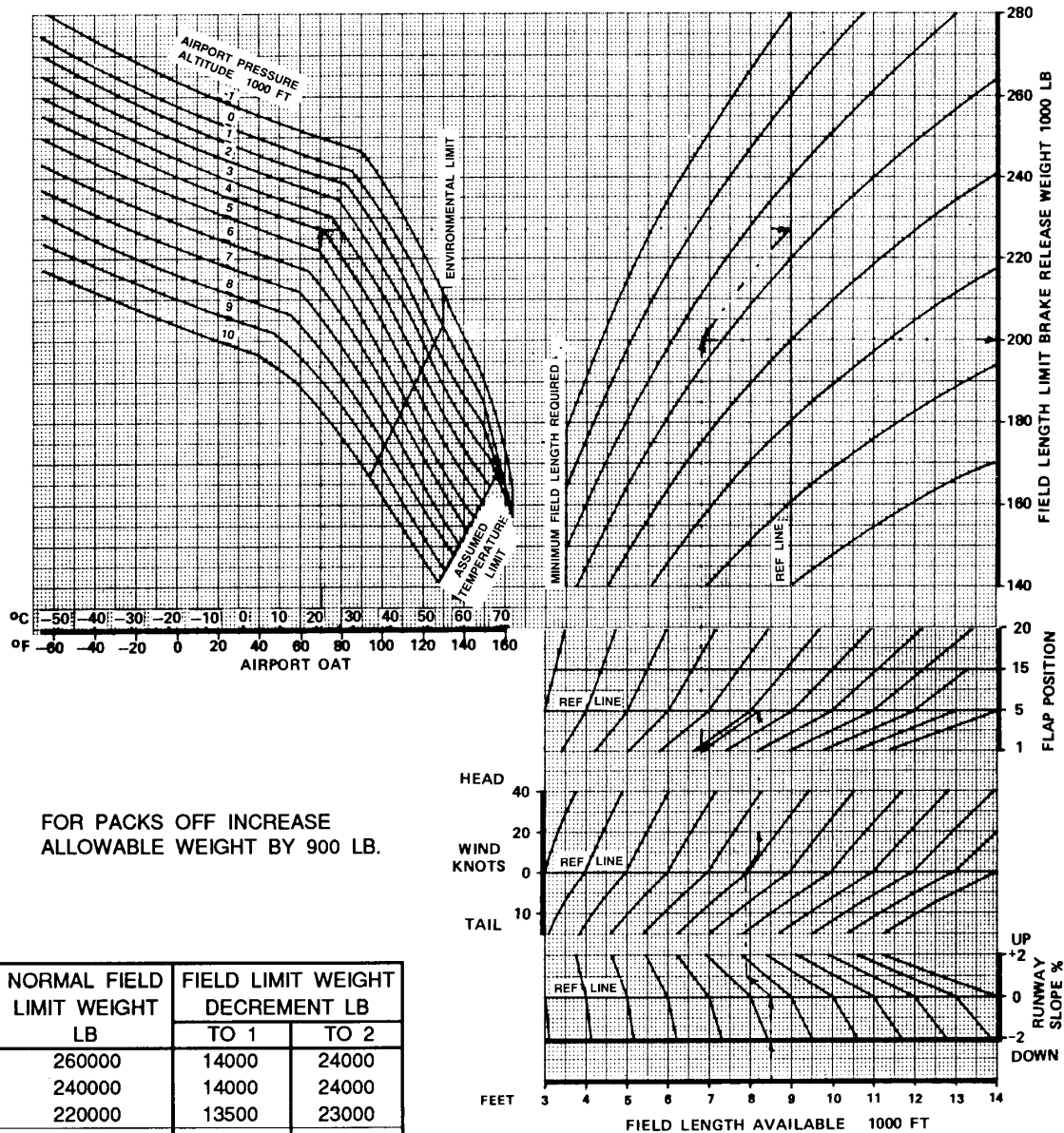
Example: Elevation = 2500 FT
QNH = 29.48 IN. HG.
Correction = 400 FT
Press Alt = 2900 FT

Wind Component



Takeoff Field Limit

Based on engine bleed for packs on and anti-ice off



FOR PACKS OFF INCREASE
ALLOWABLE WEIGHT BY 900 LB.

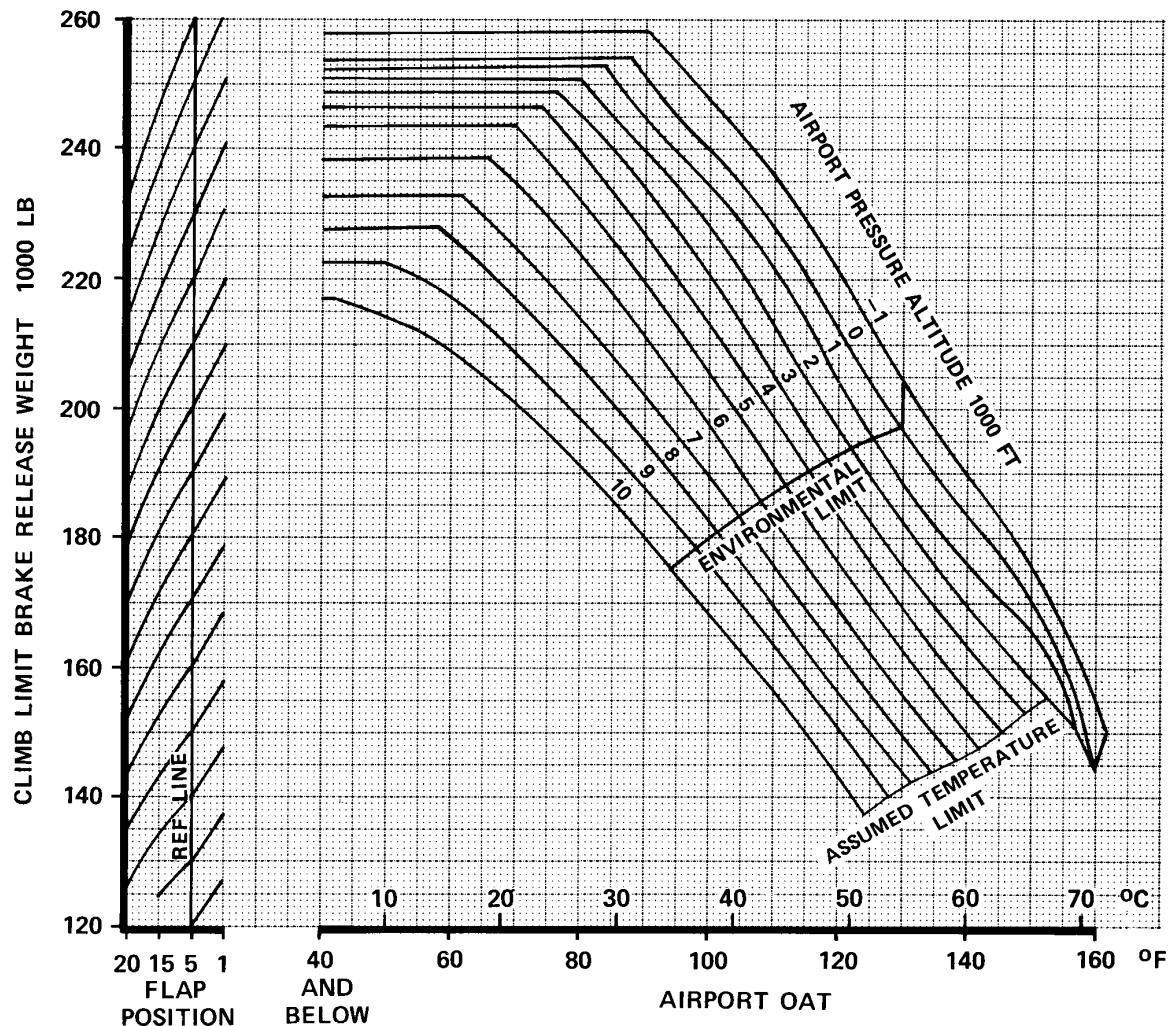
NORMAL FIELD LIMIT WEIGHT LB	FIELD LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
260000	14000	24000
240000	14000	24000
220000	13500	23000
200000	12500	21500
180000	11500	19000

REDUCE WEIGHT BY AN ADDITIONAL
1500 LB FOR TO 1 OR 2500 LB FOR TO 2
FOR EACH PERCENT OF UPHILL SLOPE.

ANTI-ICE OPERATION DECREMENT LB				
ENGINE RATING	AT OR BELOW 8000 FT		ABOVE 8000 FT	
	ENGINE	ENGINE & WING	ENGINE	ENGINE & WING
FULL	0	4600	0	4600
TO 1	0	6000	2200	9100
TO 2	100	8400	4700	12400

Takeoff Climb Limit

Based on engine bleed for packs on and anti-ice off



BASED ON PACKS ON WITH APU OFF. FOR PACKS OFF INCREASE ALLOWABLE WEIGHT BY 1600 LB. FOR APU ON DECREASE ALLOWABLE WEIGHT BY 500 LB.

FOR ANTI-ICE ON DECREASE ALLOWABLE WEIGHT BY THE AMOUNT SHOWN IN THE APPROPRIATE TABLE. WHEN OPERATING WITH DERATED THRUST APPLY THE APPROPRIATE DECREMENT FROM THE TABLE LISTED.

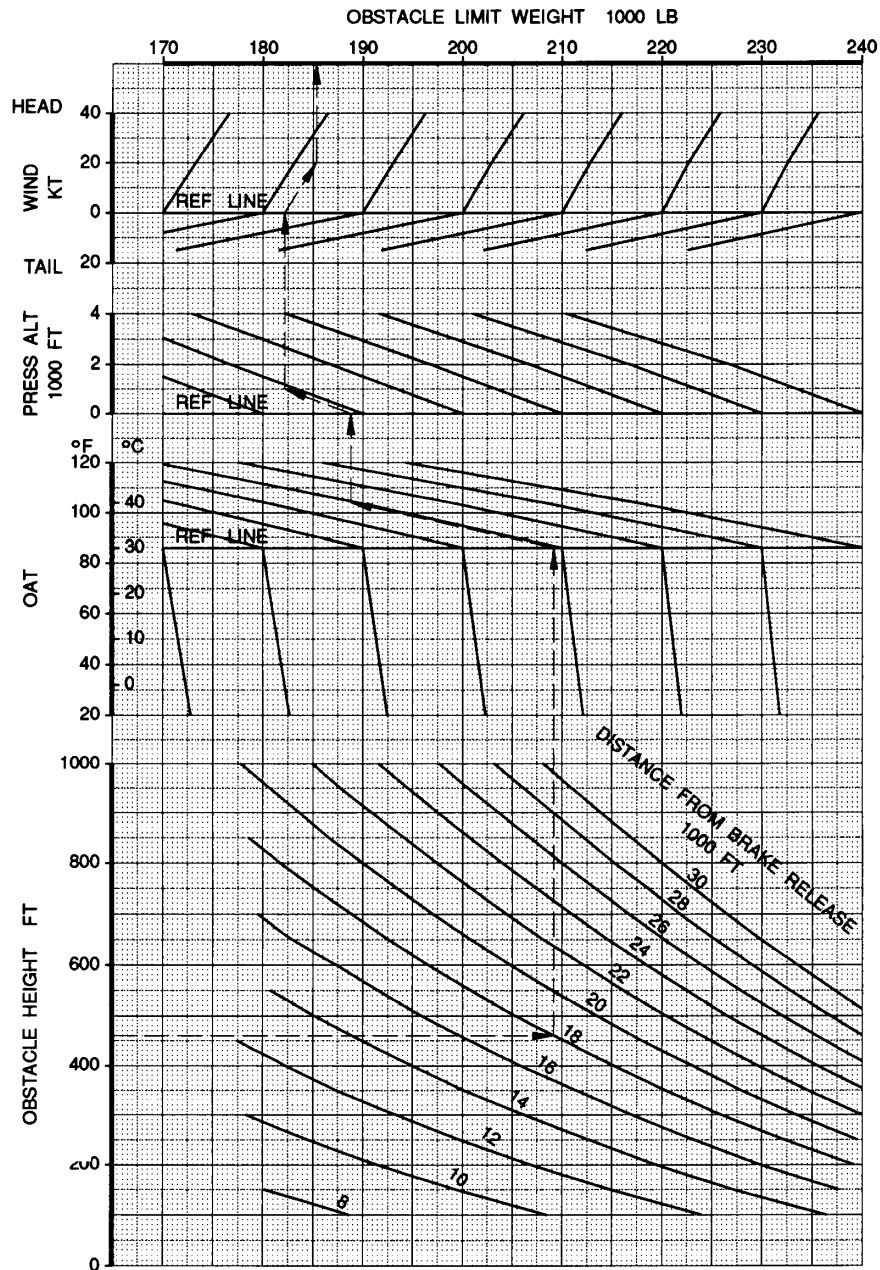
ANTI-ICE OPERATION DECREMENT LB				
FLAPS	AT OR BELOW 8000 FT		ABOVE 8000 FT	
	ENGINE	ENGINE & WING	ENGINE	ENGINE & WING
1	1100	7800	8300	14700
5	1000	7400	7500	13600
15	800	7000	7100	12900
20	700	6400	6500	12000
TO 1	1000	8600	8900	16700
TO 2	1000	9100	9600	18200

DERATED TAKEOFF CLIMB LIMIT DECREMENT LB		
NORMAL CLIMB LIMIT WEIGHT LB	TO 1	TO 2
260000	25000	45000
240000	24000	43000
220000	24000	41000
200000	23000	39000
180000	22000	37000
160000	21000	35000

Obstacle Limit

Flaps 1

Based on engine bleed for packs on and anti-ice off



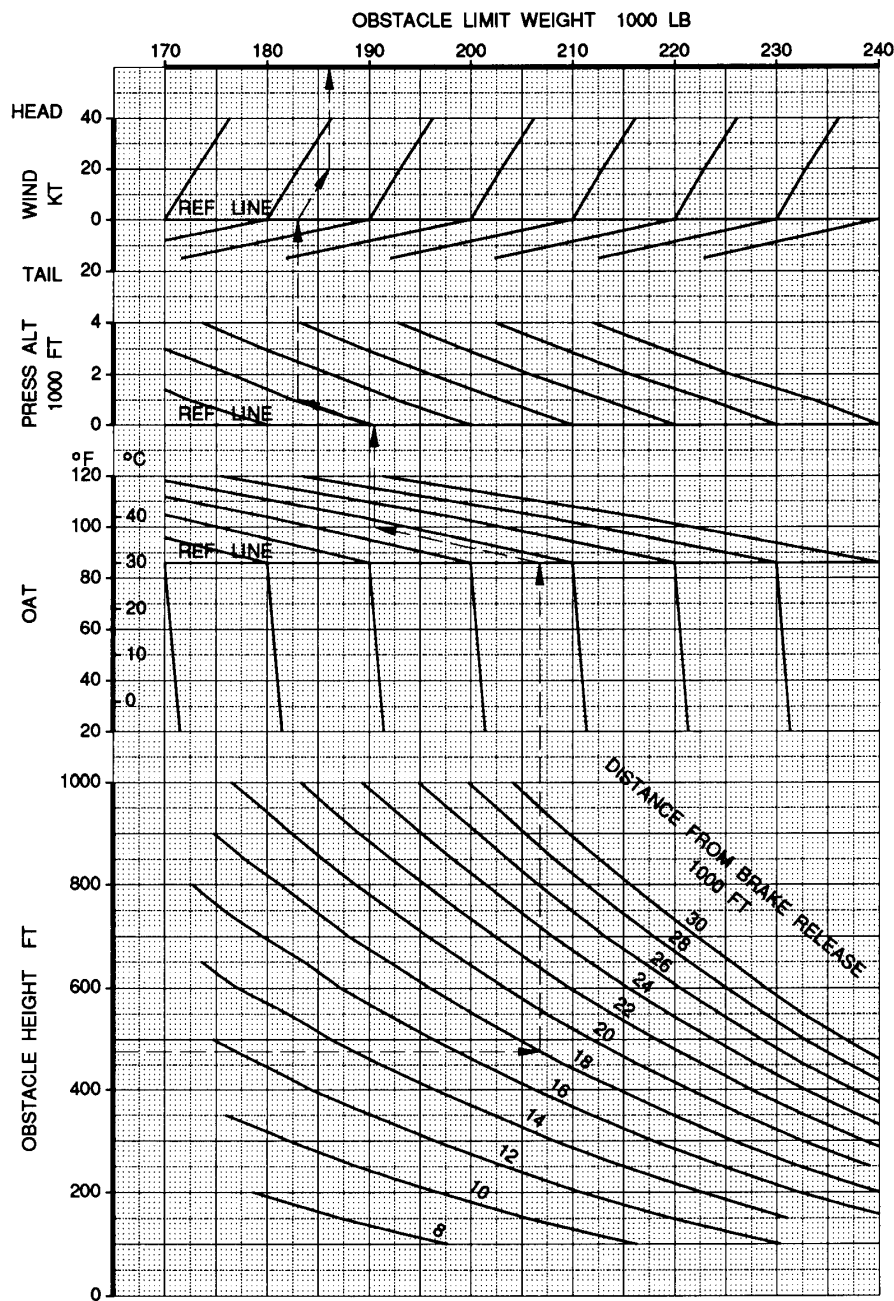
NORMAL OBSTACLE LIMIT WEIGHT LB	OBSTACLE LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
260000	25900	46900
240000	24200	44000
220000	22600	41000
200000	21000	38200
180000	19400	35400
160000	17800	32600

OBSTACLE HEIGHT MUST BE CALCULATED FROM THE LOWEST POINT OF THE RUNWAY TO CONSERVATIVELY ACCOUNT FOR RUNWAY SLOPE.

Obstacle Limit

Flaps 5

Based on engine bleed for packs on and anti-ice off



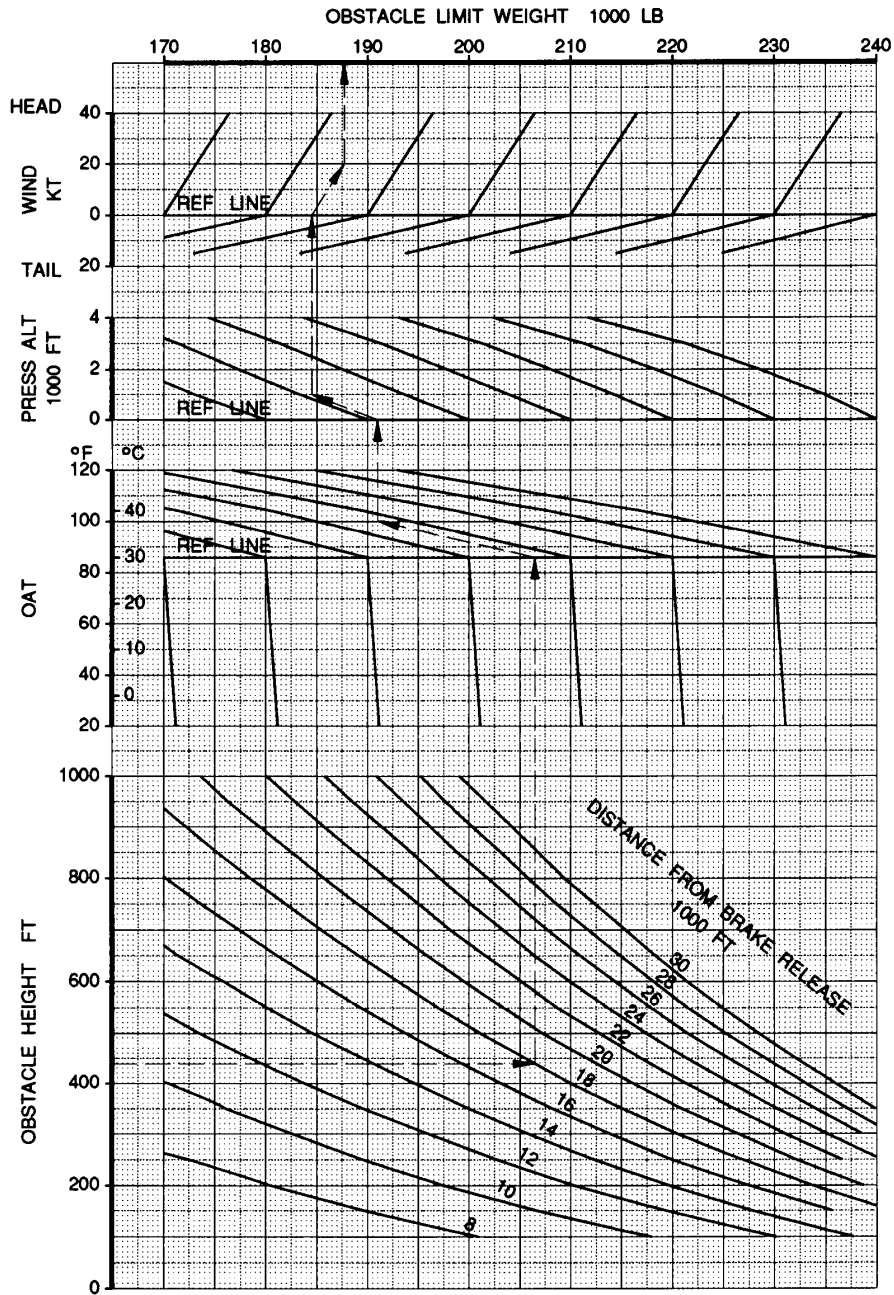
NORMAL OBSTACLE LIMIT WEIGHT LB	OBSTACLE LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
260000	25900	46900
240000	24200	44000
220000	22600	41000
200000	21000	38200
180000	19400	35400
160000	17800	32600

OBSTACLE HEIGHT MUST BE CALCULATED FROM THE LOWEST POINT OF THE RUNWAY TO CONSERVATIVELY ACCOUNT FOR RUNWAY SLOPE.

Obstacle Limit

Flaps 15

Based on engine bleed for packs on and anti-ice off



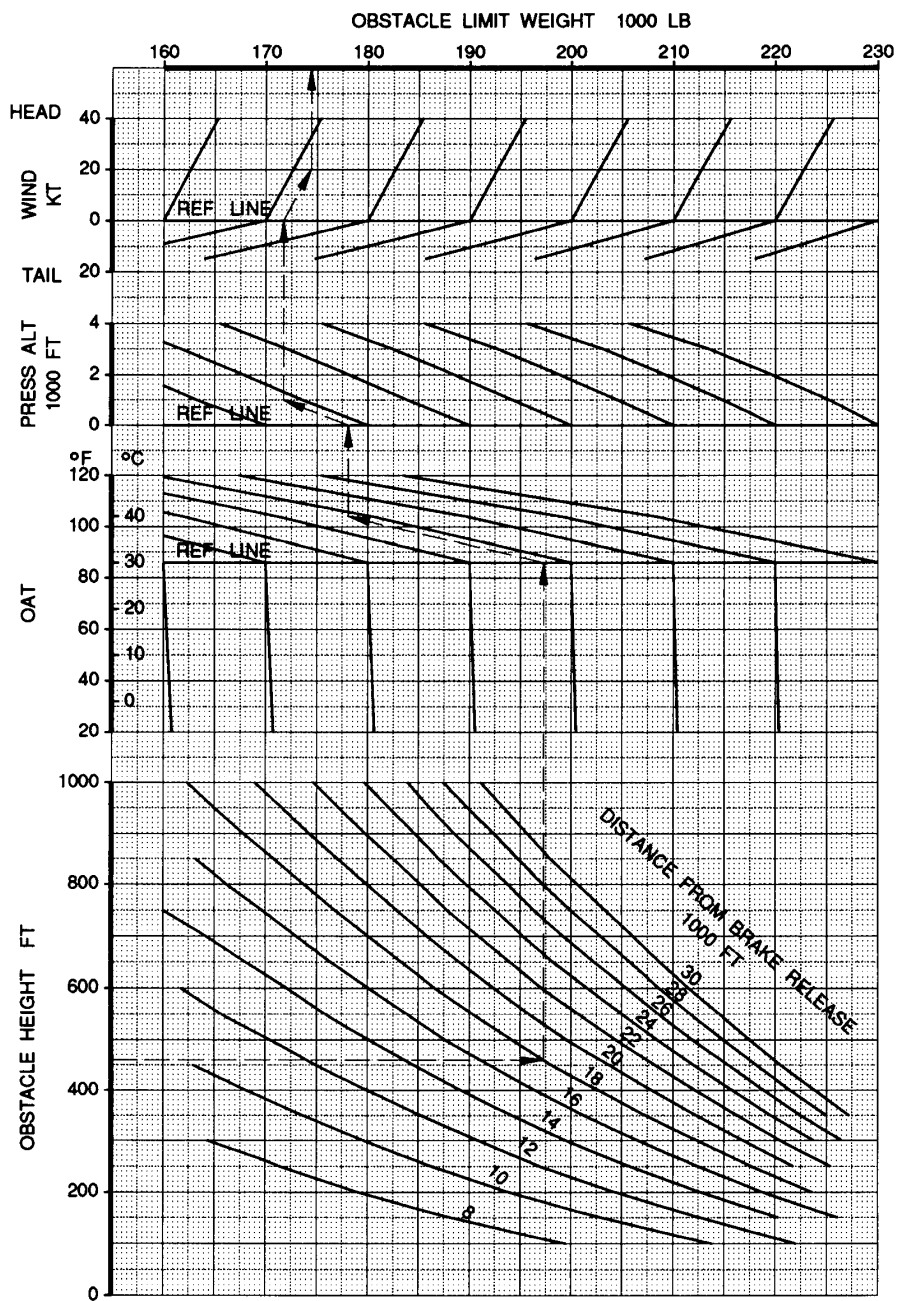
NORMAL OBSTACLE LIMIT WEIGHT LB	OBSTACLE LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
260000	25900	46900
240000	24200	44000
220000	22600	41000
200000	21000	38200
180000	19400	35400
160000	17800	32600

OBSTACLE HEIGHT MUST BE CALCULATED FROM THE LOWEST POINT OF THE RUNWAY TO CONSERVATIVELY ACCOUNT FOR RUNWAY SLOPE.

Obstacle Limit

Flaps 20

Based on engine bleed for packs on and anti-ice off

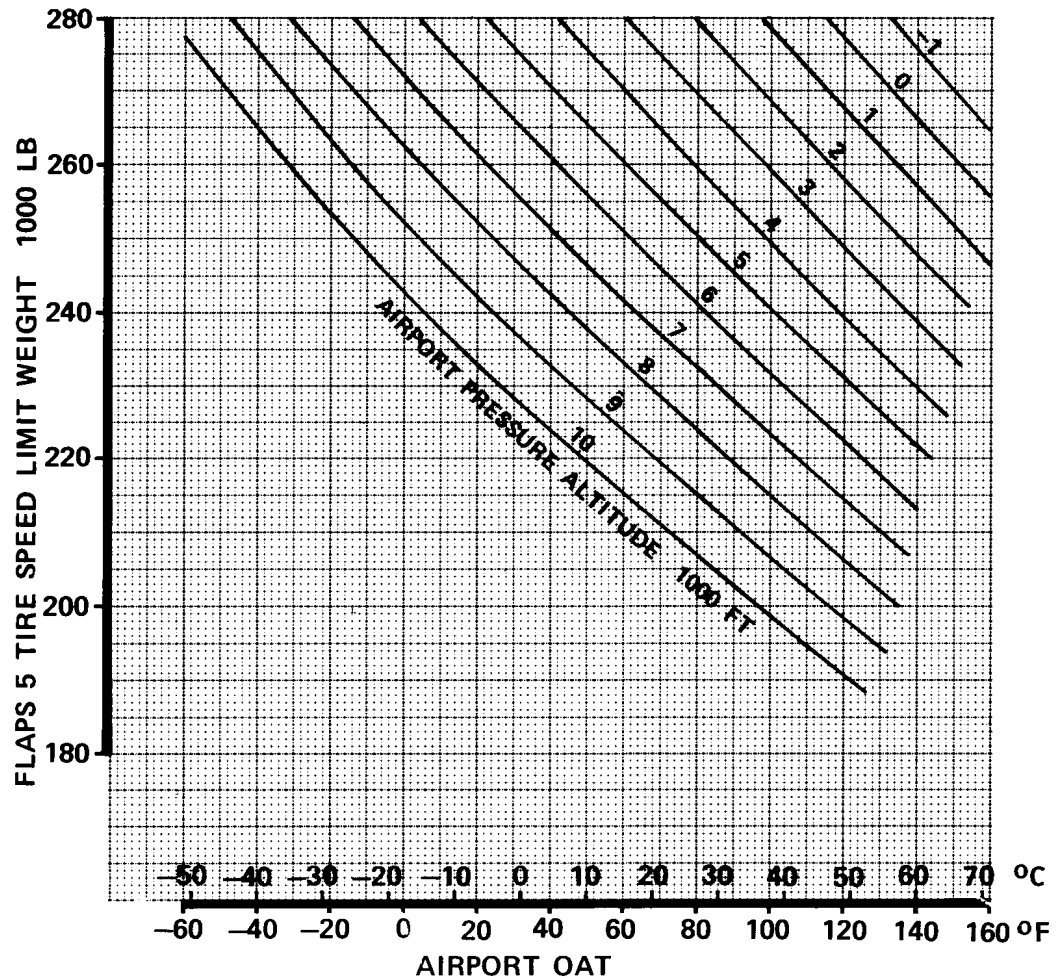


NORMAL OBSTACLE LIMIT WEIGHT LB	OBSTACLE LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
260000	25900	46900
240000	24200	44000
220000	22600	41000
200000	21000	38200
180000	19400	35400
160000	17800	32600

OBSTACLE HEIGHT MUST BE CALCULATED FROM THE LOWEST POINT OF THE RUNWAY TO CONSERVATIVELY ACCOUNT FOR RUNWAY SLOPE.

Tire Speed Limit

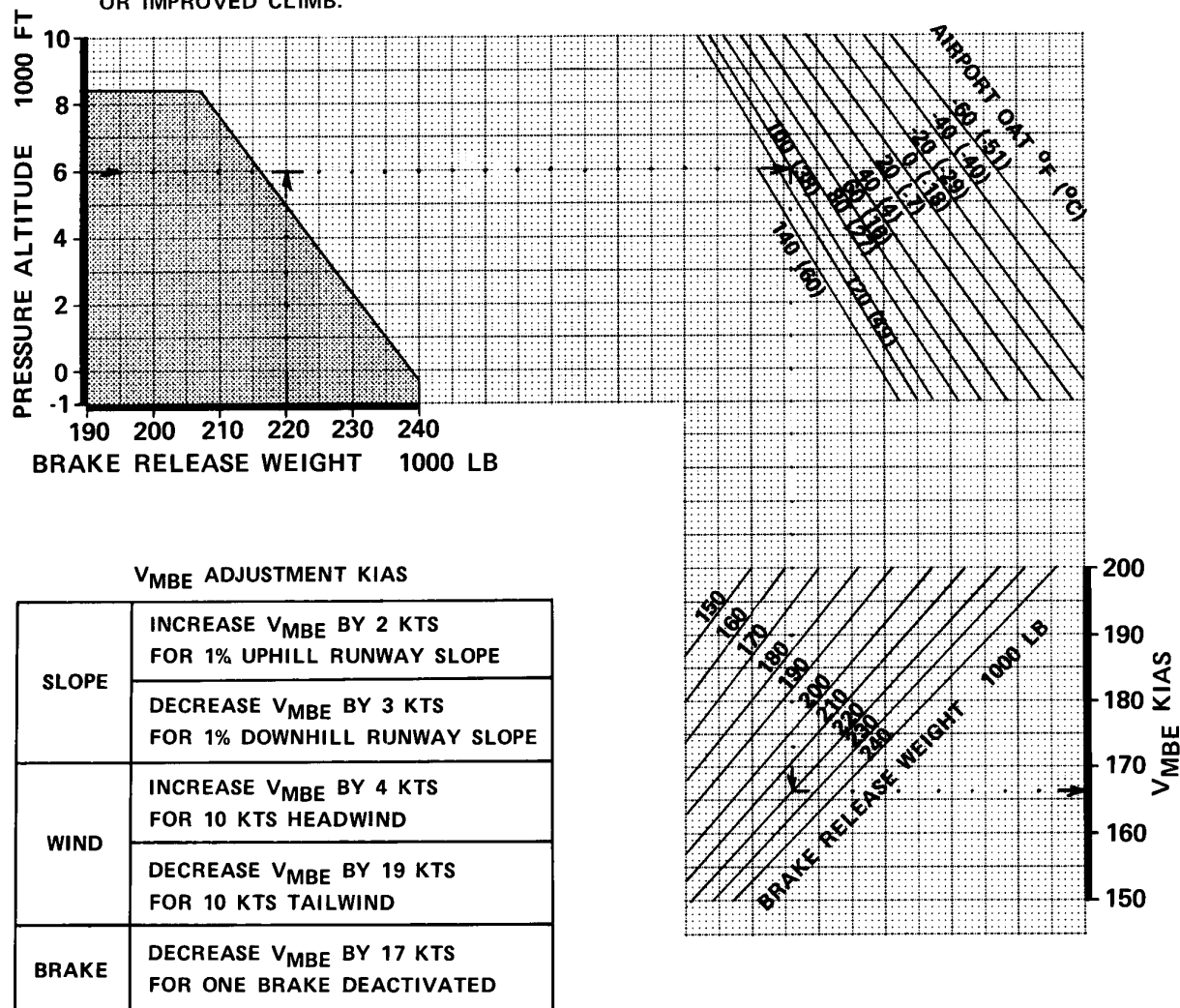
225 MPH TIRES



FOR FLAPS 1 DECREASE TIRE SPEED LIMIT WEIGHT BY 49600 LB.
FOR FLAPS 15 INCREASE TIRE SPEED LIMIT WEIGHT BY 24900 LB.
FLAPS 20 IS NOT TIRE SPEED LIMITED.
INCREASE TIRE SPEED LIMIT WEIGHT BY 1700 LB PER KNOT HEADWIND.
DECREASE TIRE SPEED LIMIT WEIGHT BY 2500 LB PER KNOT TAILWIND.
FOR 210 MPH TIRES DECREASE TIRE SPEED LIMIT WEIGHT BY 41200 LB.
DECREASE TIRE SPEED LIMIT WEIGHT BY 2000 LB FOR TO 1.
DECREASE TIRE SPEED LIMIT WEIGHT BY 4000 LB FOR TO 2.

Brake Energy Limits V_{MBE}

CHECK V_{MBE} WHEN OUTSIDE SHADED AREA OR WHEN OPERATING WITH TAILWIND, 1 BRAKE DEACTIVATED OR IMPROVED CLIMB.



ADJUST V_{MBE} FOR SLOPE, WIND AND BRAKE CONFIGURATION.

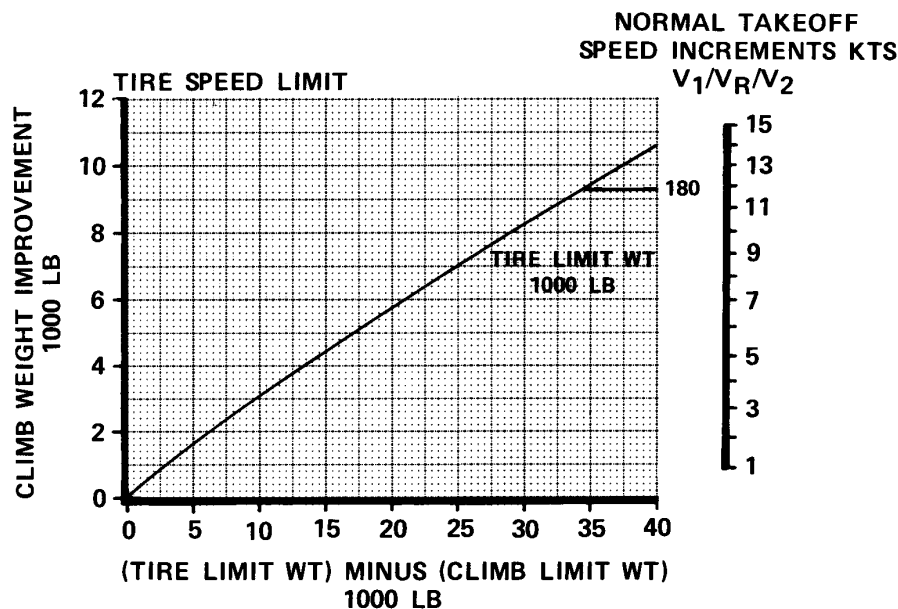
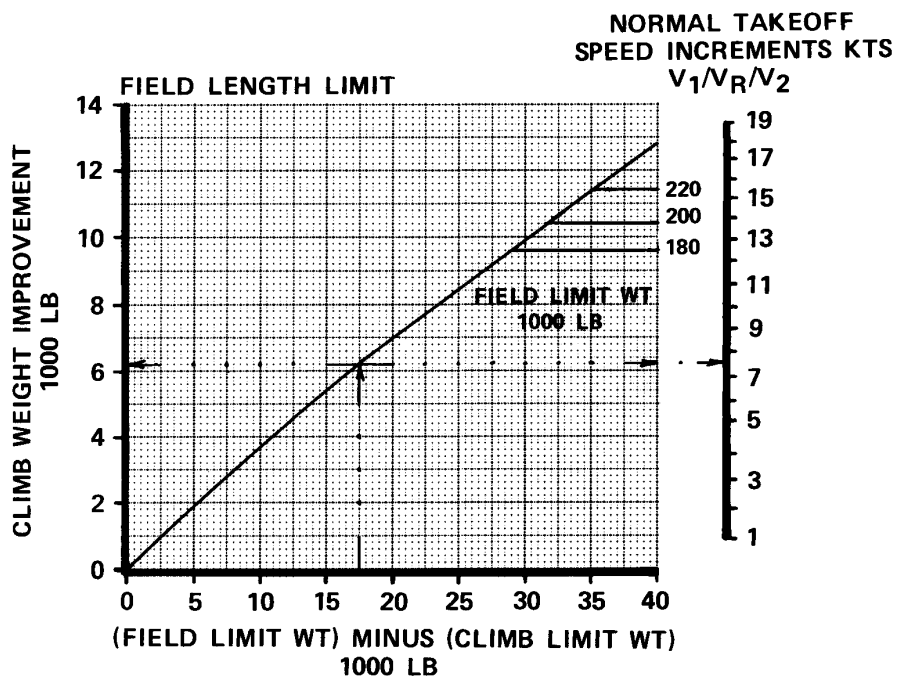
NORMAL TAKEOFF: DECREASE BRAKE RELEASE WEIGHT BY 1300 LB FOR EACH KNOT V₁ EXCEEDS

V_{MBE}. DETERMINE NORMAL V₁, V_R, V₂ SPEEDS FOR LOWER BRAKE RELEASE WEIGHT.

IMPROVED CLIMB TAKEOFF: DECREASE CLIMB WEIGHT IMPROVEMENT BY 500 LB FOR EACH KNOT V₁ EXCEEDS

V_{MBE}. DETERMINE V₁, V_R, V₂ SPEED INCREMENTS FOR THE LOWER CLIMB WEIGHT IMPROVEMENT.

Improved Climb



- NOTES:**
1. USE SMALLER OF IMPROVED CLIMB WT. (FIELD LENGTH LIMITS) OR (TIRE SPEED LIMITS).
 2. APPLY SPEED INCREMENTS TO NORMAL V_1 , V_R , V_2 FOR ACTUAL TAKEOFF WT.
 3. CHECK BRAKE ENERGY LIMITS.
 4. IMPROVED CLIMB NOT ALLOWED WITH FLAPS 1.

ADVISORY INFORMATION

Slush/Standing Water Takeoff
Maximum Reverse Thrust
Weight Adjustment (1000 LB)

FIELD/OBSTACLE LIMIT WEIGHT (1000 LB)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-29.0	-29.2	-30.6	-33.0	-33.8	-33.5	-45.8	-42.3	-38.5
260	-26.7	-27.0	-28.8	-31.0	-32.0	-32.5	-42.8	-41.5	-39.5
240	-24.3	-24.7	-27.0	-28.3	-30.0	-31.2	-39.2	-39.9	-40.2
220	-21.2	-21.8	-24.5	-24.6	-26.8	-28.6	-33.4	-36.4	-38.5
200	-17.6	-18.2	-21.0	-20.2	-22.6	-24.9	-27.0	-30.7	-34.6
180	-13.9	-14.5	-17.3	-15.5	-18.0	-20.8	-20.8	-24.0	-29.3
160	-10.2	-10.9	-13.9	-10.5	-13.2	-16.8	-14.8	-17.0	-23.3

V1(MCG) Limit Weight (1000 LB)

ADJUSTED FIELD LENGTH (FT)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
3800	129.8			139.2			156.8		
4200	173.2	120.4		183.0	133.9		198.9	153.2	122.1
4600	217.2	155.8		226.8	168.7	130.9	240.0	187.2	149.7
5000	262.4	191.1	146.2	270.7	203.5	160.0	281.0	221.3	177.2
5400	307.6	228.1	176.9	314.5	238.3	189.1		255.3	205.0
5800		266.0	207.6		273.0	218.2		289.4	233.6
6200		303.9	238.0		307.8	247.3			262.1
6600			268.3			276.4			290.7
7000			298.6			305.5			319.3

1. Enter Weight Adjustment table with slush/standing water depth and field/obstacle limit weight to obtain slush/standing water weight adjustment.
2. Adjust field length available by -100 ft /+100 ft for every 10°F above/below 40°F.
3. Find V1(MCG) limit weight for adjusted field length and pressure altitude.
4. Max allowable slush/standing water limited weight is lesser of weights from 1 and 3.

V1 Adjustment (KIAS)

WEIGHT (1000 LB)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
260	-13	-13	-13	-8	-10	-10	-1	-6	-10
240	-14	-14	-13	-9	-10	-10	-1	-5	-8
220	-15	-15	-14	-11	-10	-10	-2	-3	-6
200	-16	-16	-14	-12	-11	-10	-3	-2	-4
180	-17	-16	-15	-13	-12	-11	-5	-3	-2
160	-17	-17	-15	-15	-13	-12	-9	-6	-2

- 1 Obtain V1, VR and V2 for the actual weight.
- 2 If V1(MCG) limited, set V1 = V1(MCG). If not V1(MCG) limited, enter V1 Adjustment table with the actual weight to obtain V1 speed adjustment. If adjusted V1 is less than V1(MCG), set V1 = V1(MCG). V1 not to exceed VR.

ADVISORY INFORMATION

Slush/Standing Water Takeoff No Reverse Thrust Weight Adjustment (1000 LB)

FIELD/OBSTACLE LIMIT WEIGHT (1000 LB)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-39.9	-42.7	-45.5	-43.6	-46.4	-49.2	-56.7	-60.7	-64.7
260	-37.3	-40.1	-42.9	-42.4	-45.2	-48.0	-54.8	-58.8	-62.8
240	-33.7	-36.5	-39.3	-38.9	-41.7	-44.5	-50.6	-54.6	-58.6
220	-29.4	-32.2	-35.0	-34.0	-36.8	-39.6	-44.6	-48.6	-52.6
200	-24.7	-27.5	-30.3	-28.4	-31.2	-34.0	-37.3	-41.3	-45.3
180	-19.9	-22.7	-25.5	-22.7	-25.5	-28.3	-29.1	-33.1	-37.1
160	-15.4	-18.2	-21.0	-17.7	-20.5	-23.3	-20.5	-24.5	-28.5

V1(MCG) Limit Weight (1000 LB)

ADJUSTED FIELD LENGTH (FT)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
4600							124.0		
5000							170.4		
5400	133.0						219.0	124.0	
5800	198.0			230.3			266.9	170.4	
6200	259.9	133.0		281.3	172.2		311.4	219.0	124.0
6600	308.7	198.0			230.3			266.9	170.4
7000		259.9	133.0		281.3	172.2		311.4	219.0
7400		308.7	198.0			230.3			266.9
7800			259.9			281.3			311.4
8200			308.7						

1. Enter Weight Adjustment table with slush/standing water depth and field/obstacle limit weight to obtain slush/standing water weight adjustment.
2. Adjust field length available by -135 ft/+135 ft for every 5°C above/below 4°C.
3. Find V1(MCG) limit weight for adjusted field length and pressure altitude.
4. Max allowable slush/standing water limited weight is lesser of weights from 1 and 3.

V1 Adjustment (KIAS)

WEIGHT (1000 LB)	SLUSH/STANDING WATER DEPTH								
	0.12 INCHES (3 mm)			0.25 INCHES (6 mm)			0.50 INCHES (13 mm)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-19	-19	-19	-13	-13	-13	-5	-1	0
260	-21	-21	-21	-14	-14	-14	-3	0	0
240	-22	-22	-22	-16	-16	-16	-3	0	0
220	-24	-24	-24	-17	-17	-17	-3	0	0
200	-25	-25	-25	-19	-19	-19	-5	-1	0
180	-26	-26	-26	-21	-21	-21	-8	-4	0
160	-26	-26	-26	-23	-23	-23	-12	-8	-4

- 1 Obtain V1, VR and V2 for the actual weight.
- 2 If V1(MCG) limited, set V1 = V1(MCG). If not V1(MCG) limited, enter V1 Adjustment table with the actual weight to obtain V1 speed adjustment. If adjusted V1 is less than V1(MCG), set V1 = V1(MCG). V1 not to exceed VR.

ADVISORY INFORMATION

Slippery Runway Takeoff
Maximum Reverse Thrust
Weight Adjustment (1000 LB)

FIELD/OBSTACLE LIMIT WEIGHT (1000 LB)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-0.4	-0.8	-1.2	-13.5	-13.9	-14.3	-23.8	-24.4	-25.0
260	-2.4	-2.8	-3.2	-14.1	-14.5	-14.9	-23.1	-23.7	-24.3
240	-3.1	-3.5	-3.9	-13.7	-14.1	-14.5	-21.6	-22.2	-22.8
220	-3.0	-3.4	-3.8	-12.5	-12.9	-13.3	-19.4	-20.0	-20.6
200	-2.3	-2.7	-3.1	-10.7	-11.1	-11.5	-16.8	-17.4	-18.0
180	-1.4	-1.8	-2.2	-8.8	-9.2	-9.6	-13.9	-14.5	-15.1
160	-0.6	-1.0	-1.4	-6.8	-7.2	-7.6	-10.8	-11.4	-12.0

V1(MCG) Limit Weight (1000 LB)

ADJUSTED FIELD LENGTH (FT)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
3000	137.4								
3400	204.9								
3800	270.4	171.4		129.9					
4200		237.9	137.4	176.9					
4600		302.4	204.9	226.4	153.3				
5000			270.4	278.1	201.3	129.9	149.7		
5400					252.1	176.9	180.6		
5800					304.3	226.4	213.5	142.1	
6200						278.1	248.5	172.7	
6600							285.3	205.1	134.5
7000								239.5	165.0
7400								276.0	196.8
7800								313.3	230.7
8200									266.7
8600									304.0

1. Enter Weight Adjustment table with reported braking action and field/obstacle limit weight to obtain slippery runway weight adjustment.
2. Adjust "Good" field length available by -80 ft/+80 ft for every 10°F above/below 40°F.
Adjust "Medium" field length available by -80 ft/+80 ft for every 10°F above/below 40°F.
Adjust "Poor" field length available by -100 ft/+100 ft for every 10°F above/below 40°F.
3. Find V1(MCG) limit weight for adjusted field length and pressure altitude.
4. Max allowable slippery runway limited weight is lesser of weights from 1 and 3.

V1 Adjustment (KIAS)

WEIGHT (1000 LB)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
260	-6	-5	-4	-12	-11	-10	-21	-19	-17
240	-6	-5	-4	-15	-14	-13	-24	-22	-20
220	-7	-6	-5	-16	-15	-14	-27	-25	-23
200	-8	-7	-6	-18	-17	-16	-29	-27	-25
180	-8	-7	-6	-19	-18	-17	-30	-28	-26
160	-9	-8	-7	-20	-19	-18	-31	-29	-27

- 1 Obtain V1, VR and V2 for the actual weight.
- 2 If V1(MCG) limited, set V1 = V1(MCG). If not V1(MCG) limited, enter V1 Adjustment table with the actual weight to obtain V1 speed adjustment. If adjusted V1 is less than V1(MCG), set V1 = V1(MCG). V1 not to exceed VR.

ADVISORY INFORMATION

Slippery Runway Takeoff No Reverse Thrust Weight Adjustment (1000 LB)

FIELD/OBSTACLE LIMIT WEIGHT (1000 LB)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-0.4	-1.2	-2.0	-21.2	-22.0	-22.8	-39.3	-40.5	-41.7
260	-4.3	-5.1	-5.9	-22.6	-23.4	-24.2	-37.6	-38.8	-40.0
240	-6.2	-7.0	-7.8	-22.5	-23.3	-24.1	-35.2	-36.4	-37.6
220	-6.5	-7.3	-8.1	-21.1	-21.9	-22.7	-32.1	-33.3	-34.5
200	-5.7	-6.5	-7.3	-18.7	-19.5	-20.3	-28.1	-29.3	-30.5
180	-4.5	-5.3	-6.1	-15.8	-16.6	-17.4	-22.8	-24.0	-25.2
160	-3.2	-4.0	-4.8	-12.7	-13.5	-14.3	-16.2	-17.4	-18.6

V1(MCG) Limit Weight (1000 LB)

ADJUSTED FIELD LENGTH (FT)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
3400	133.8								
3800	228.8	144.7							
4200		237.1	155.6						
4600			245.6						
5400				193.3					
5800				273.9	157.3				
6200					243.2	120.5			
6600					318.1	210.4			
7000						288.7			
8200							159.8		
8600							220.6		
9000							269.8	133.2	
9400							304.9	189.0	
9800								248.1	
10200								287.6	159.8
10600									220.6
11000									269.8
11400									304.9

1. Enter Weight Adjustment table with reported braking action and field/obstacle limit weight to obtain slippery runway weight adjustment.
2. Adjust "Good" field length available by -100 ft/+100 ft for every 10°F above/below 40°F.
Adjust "Medium" field length available by -100 ft/+100 ft for every 10°F above/below 40°F.
Adjust "Poor" field length available by -160 ft/+160 ft for every 10°F above/below 40°F.
3. Find V1(MCG) limit weight for adjusted field length and pressure altitude.
4. Max allowable slippery runway limited weight is lesser of weights from 1 and 3.

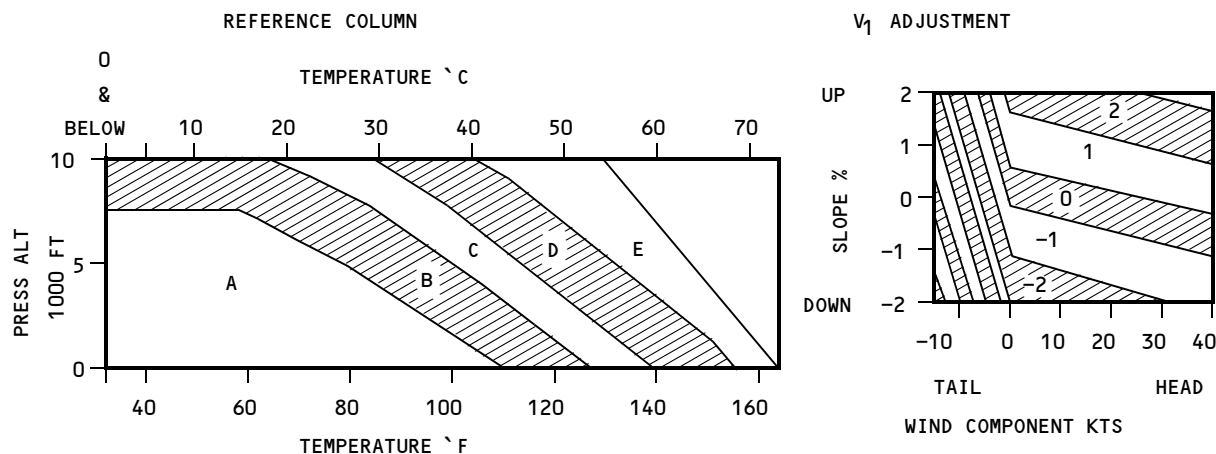
V1 Adjustment (KIAS)

WEIGHT (1000 LB)	REPORTED BRAKING ACTION								
	GOOD			MEDIUM			POOR		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
280	-1	0	0	-9	-5	-1	-29	-25	-21
260	-5	-1	0	-14	-10	-6	-32	-28	-24
240	-7	-3	0	-18	-14	-10	-36	-32	-28
220	-9	-5	-1	-22	-18	-14	-41	-37	-33
200	-10	-6	-2	-24	-20	-16	-44	-40	-36
180	-10	-6	-2	-26	-22	-18	-47	-43	-39
160	-11	-7	-3	-28	-24	-20	-49	-45	-41

- 1 Obtain V1, VR and V2 for the actual weight.
- 2 If V1(MCG) limited, set V1 = V1(MCG). If not V1(MCG) limited, enter V1 Adjustment table with the actual weight to obtain V1 speed adjustment. If adjusted V1 is less than V1(MCG), set V1 = V1(MCG). V1 not to exceed VR.

Takeoff Speeds

Max Takeoff Thrust



FLAPS	WEIGHT (1000 LB)	A			B			C			D			E		
		V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
1	260	180	183	185	182	185	186									
	240	171	174	177	173	176	177									
	220	162	165	169	164	167	169	166	169	170						
	200	153	155	161	155	157	161	157	159	161	159	162	162			
	180	143	145	153	145	148	153	147	150	153	149	152	153	152	154	154
	160	132	135	144	134	137	144	136	139	144	138	141	144	141	144	144
5	260	165	168	171	167	169	170									
	240	157	160	163	159	161	163									
	220	149	152	155	151	153	156	153	155	156						
	200	140	143	148	142	145	148	144	147	148						
	180	131	134	140	133	136	140	135	138	140	137	140	141			
	160	121	124	132	123	126	132	125	128	132	127	130	132	130	133	133
15	260	157	160	161												
	240	149	152	154												
	220	141	144	147	143	146	147									
	200	133	136	140	134	138	140	136	140	141						
	180	124	127	133	126	129	133	128	131	133	130	133	133			
	160	115	119	125	117	120	125	118	122	126	120	124	126	122	126	126
20	260	147	150	152												
	240	140	143	146												
	220	133	136	140												
	200	125	128	133	127	130	133									
	180	117	120	126	119	122	126	120	123	127						
	160	108	112	119	110	113	119	111	115	119	113	117	119			

Maximum Allowable Clearway

FIELD LENGTH (FT)	4000	6000	8000	10000	12000	14000
MAX ALLOWABLE CLEARWAY (FT)	350	450	550	650	700	750

Clearway and Stopway V₁ Adjustments

NORMAL V ₁ (KIAS)	CLEARWAY MINUS STOPWAY (FT)									
	800	600	400	200	0	-200	-400	-600	-800	
120	-5	-4	-3	-1	0	1	3	4	5	
140	-4	-3	-2	-1	0	1	2	3	4	
160	-2	-2	-1	-1	0	1	1	2	2	
180	-1	-1	-1	0	0	0	1	1	1	

V1(MCG)

Max Takeoff Thrust

ACTUAL OAT		PRESSURE ALTITUDE (FT)					
°F	°C	0	2000	4000	6000	8000	10000
131	55	88					
122	50	92	88				
113	45	95	91	88	85		
104	40	97	94	91	88	84	
95	35	99	96	94	90	87	83
86	30	101	98	96	92	89	85
77	25	101	100	98	94	91	87
68	20	101	100	99	96	92	89
59	15	101	100	99	97	94	90
50 & BELOW	10 & BELOW	102	101	99	97	95	92

Takeoff EPR

Based on engine bleeds for packs on, engine anti-ice on or off and wing anti-ice off

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)							
°F	°C	0	1000	2000	3000	4000	5000	6000	8000
158	70	1.20	1.21	1.21	1.22	1.22	1.23	1.23	1.23
149	65	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
140	60	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
131	55	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
122	50	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32
113	45	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
104	40	1.37	1.38	1.38	1.39	1.39	1.39	1.39	1.39
95	35	1.39	1.40	1.41	1.41	1.42	1.43	1.43	1.43
86	30	1.41	1.42	1.43	1.44	1.45	1.45	1.45	1.45
77	25	1.41	1.43	1.45	1.47	1.48	1.49	1.49	1.49
68	20	1.41	1.43	1.45	1.47	1.49	1.51	1.52	1.52
59	15	1.41	1.43	1.45	1.47	1.49	1.51	1.53	1.55
50 & BELOW	10 & BELOW	1.41	1.43	1.45	1.47	1.49	1.51	1.53	1.56

EPR Adjustments for Engine Bleeds

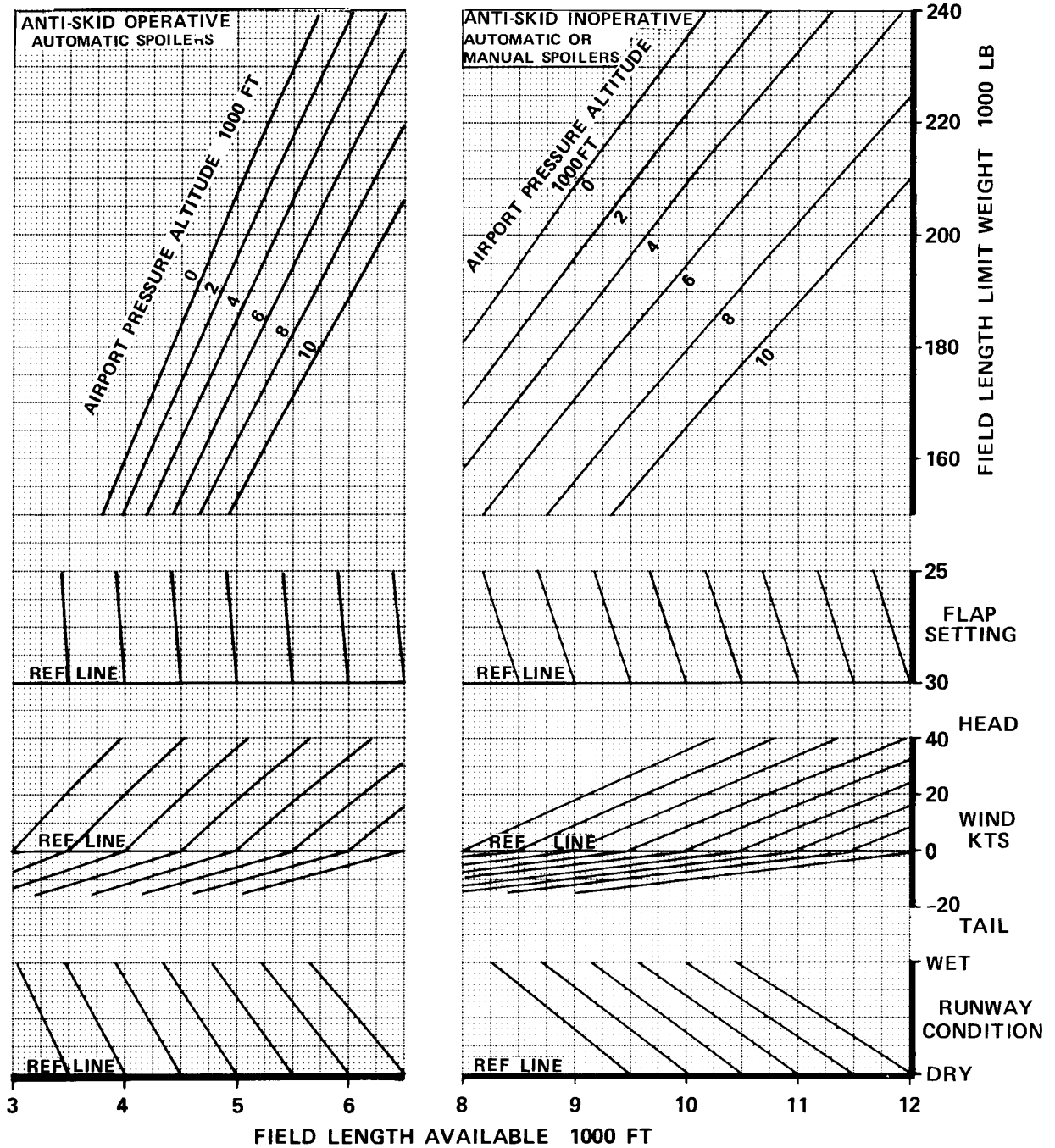
BLEED CONFIGURATION	AIRPORT PRESSURE ALTITUDE (FT)							
	0	1000	2000	3000	4000	5000	6000	8000
PACKS OFF	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
WING ANTI-ICE ON	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

Stab Trim Setting

WEIGHT (1000 LB)	C.G. %MAC						
	9	14	19	24	29	34	39
260	7	7	6	5	4 1/4	3 1/4	2 1/2
240	7	6 3/4	5 3/4	4 3/4	4	3 1/4	2 1/2
220	7	6 1/4	5 1/4	4 1/2	3 3/4	3 1/4	2 1/2
200	7	6	5	4 1/4	3 1/2	3	2 1/4
180	6 1/2	5 1/2	4 1/2	4	3 1/4	2 3/4	2 1/4
160	6 1/4	5 1/4	4 1/4	3 3/4	3	2 1/2	2

Intentionally
Blank

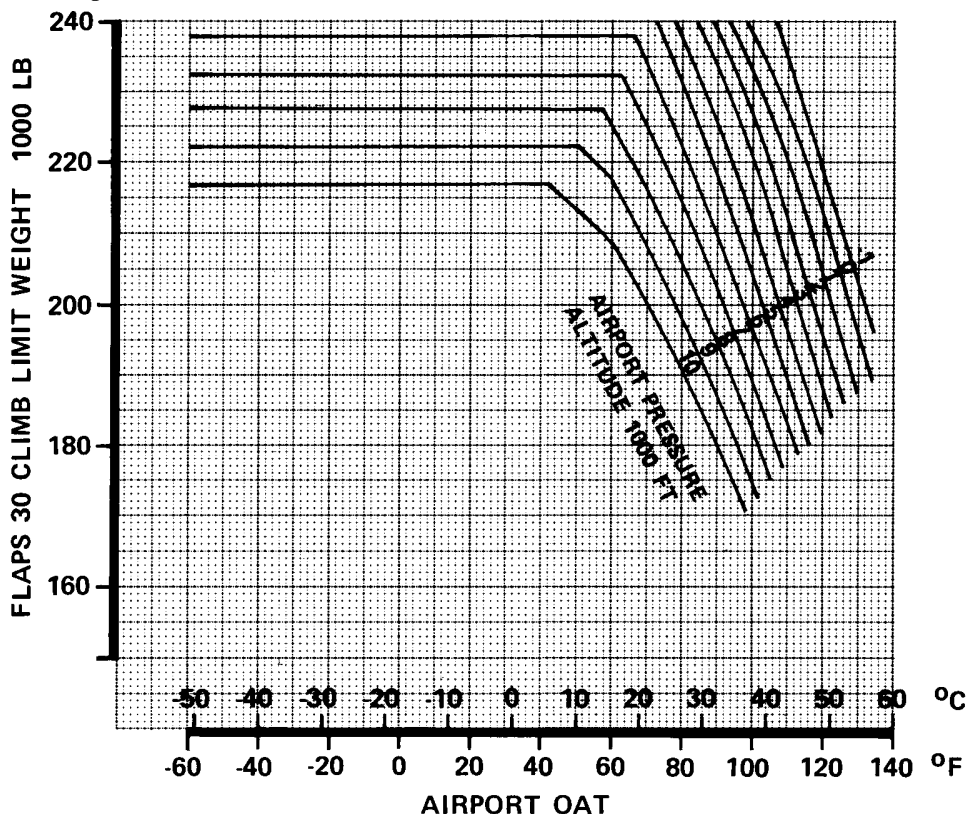
Landing Field Length Limit



- NOTES:
- 1) FOR MANUAL SPOILERS, ANTI-SKID OPERATIVE, DECREASE FIELD LENGTH AVAILABLE BY 700 FEET.
 - 2) FOR ONE BRAKE DEACTIVATED, ANTI-SKID OPERATIVE, DECREASE FIELD LENGTH AVAILABLE BY 600 FEET

Landing Climb Limit Weight

Based on engine bleed for packs on and APU off



FOR FLAPS 25 INCREASE FLAPS 30 CLIMB LIMIT WEIGHT BY 12000 LB.

BASED ON PACKS ON WITH APU OFF. FOR PACKS OFF INCREASE ALLOWABLE WEIGHT BY 2200 LB.
FOR APU ON DECREASE ALLOWABLE WEIGHT BY 700 LB.

IF OPERATING IN ICING CONDITIONS DURING ANY PART OF THE FLIGHT WHEN THE FORECAST LANDING TEMPERATURE IS BELOW 8°C REDUCE THE FLAPS 30 CLIMB LIMIT WEIGHT BY 10900 LB OR THE FLAPS 25 CLIMB LIMIT WEIGHT BY 9150 LB. FOR ANTI-ICE OPERATION DECREASE ALLOWABLE WEIGHT BY AMOUNT SHOWN IN TABLE.

ANTI-ICE OPERATION DECREMENT LB				
THRUST RATING	AT OR BELOW 7000 FT		ABOVE 7000 FT	
	ENGINE	ENGINE & WING	ENGINE	ENGINE & WING
FULL	1150	14000	8250	21000
TO 1	1100	16850	10150	26100
TO 2	1100	18150	12050	28150

FULL RATED CLIMB LIMITED WEIGHT LB	CLIMB LIMIT WEIGHT DECREMENT LB	
	TO 1	TO 2
240000	24000	43000
220000	22000	39000
200000	20000	35000
180000	18000	30000
160000	15000	25000



Flight Planning and Performance Manual

Quick Turnaround Limit

Flaps 30 Limit Weight (1000 LB)

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)											
°F	°C	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
120	49	224	220	217	213	209							
100	38	228	224	220	216	213	209	205	201	197	193	189	
80	27	232	228	224	220	216	213	209	204	200	196	193	189
60	16	236	232	228	224	220	216	212	208	204	200	196	192
40	4	240	236	232	228	224	220	216	212	208	204	200	196
20	-7	245	241	237	233	229	225	221	216	212	208	204	200
0	-18	250	245	241	237	233	229	225	221	216	212	208	204
-20	-29			247	242	238	234	230	225	221	217	213	209
-40	-40				248	244	239	235	231	226	222	218	213
-60	-51					249	245	240	236	232	227	223	219

Flaps 25 Limit Weight (1000 LB)

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)											
°F	°C	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
120	49	219	216	212	208	204	200						
100	38	223	219	215	212	208	204	200	196	192	188	184	
80	27	227	223	219	215	211	208	204	199	196	191	188	184
60	16	231	227	223	219	215	211	207	203	199	195	191	187
40	4	236	232	227	223	219	215	211	207	203	199	195	191
20	-7	240	236	232	228	224	220	216	211	207	203	199	195
0	-18	245	241	237	233	228	225	220	216	211	207	203	199
-20	-29		247	242	238	233	229	225	221	216	212	208	203
-40	-40			248	243	239	235	230	226	221	217	212	208
-60	-51				249	244	240	236	231	227	222	218	213

Increase weight by 2200 lb per 1% uphill slope. Decrease weight by 2900 lb per 1% downhill slope.

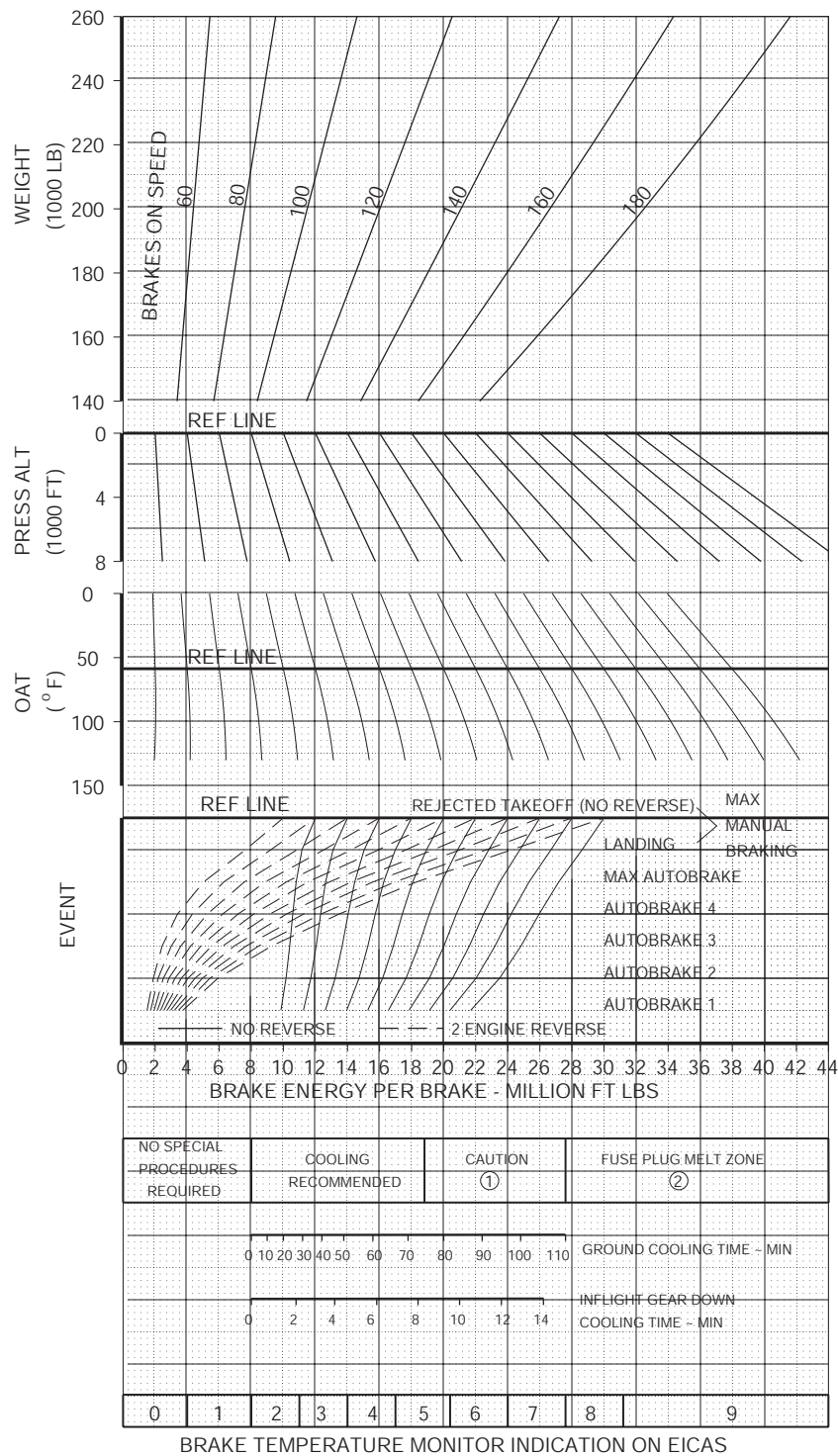
Increase weight by 5000 lb per 10 knots headwind. Decrease weight by 22000 lb per 10 knots tailwind.

When one brake is deactivated, decrease weight by 14500 lb.

After landing at weights exceeding those shown above, adjusted for slope and wind, wait at least 45 minutes and check that wheel thermal plugs have not melted before executing a takeoff.

ADVISORY INFORMATION

Recommended Brake Cooling Schedule



GUIDANCE INFORMATION ONLY

OBSERVE MAXIMUM QUICK
TURNAROUND LIMITATION

TO CORRECT FOR WIND, ENTER
CHART WITH BRAKES ON SPEED
MINUS ONE HALF THE HEADWIND
OR PLUS 1.5 TIMES THE TAILWIND.

CHART SHOWS ENERGY PER BRAKE
ADDED BY A SINGLE STOP WITH ALL
BRAKES OPERATING. ENERGY IS
ASSUMED TO BE EQUALLY DISTRIBUTED
AMONG THE OPERATING BRAKES.
TOTAL ENERGY IS THE SUM OF
RESIDUAL ENERGY PLUS ENERGY ADDED

ADD 0.65 MILLION FOOT POUNDS
PER BRAKE FOR EACH TAXI MILE

FOR ONE BRAKE DEACTIVATED
INCREASE BRAKE ENERGY PER
BRAKE BY 15 PERCENT

IF GROUND SPEED IS USED FOR
BRAKES ON SPEED, IGNORE WIND,
ALTITUDE, AND OAT EFFECTS

①

WHEEL FUSE PLUGS MAY MELT.
DELAY TAKEOFF AND INSPECT
AFTER ONE HOUR. IF OVERHEAT
OCCURS AFTER TAKEOFF,
EXTEND GEAR SOON FOR AT
LEAST 8 MINUTES.

②

CLEAR RUNWAY IMMEDIATELY. UNLESS
REQUIRED, DO NOT SET PARKING
BRAKE. DO NOT APPROACH GEAR OR
ATTEMPT TAXI FOR ONE HOUR. TIRE,
WHEEL AND BRAKE REPLACEMENT MAY
BE REQUIRED. IF OVERHEAT OCCURS
AFTER TAKEOFF, EXTEND GEAR SOON
FOR AT LEAST 12 MINUTES.

BRAKE TEMPERATURE MONITOR
INDICATION MAY BE USED 10 TO 15
MINUTES AFTER AIRPLANE HAS COME
TO A COMPLETE STOP, OR INFLIGHT
WITH GEAR RETRACTED TO DETERMINE
RECOMMENDED COOLING SCHEDULE.

ADVISORY INFORMATION

Normal Configuration Landing Distance

Flaps 30

Dry Runway

	LANDING DISTANCE AND ADJUSTMENTS (FT)											
	REFERENCE DISTANCE	WEIGHT ADJUSTMENT	ALTITUDE ADJ	WIND ADJ PER 10 KTS		SLOPE ADJ PER 1%		TEMP ADJ PER 10°C		VREF ADJ	REVERSE THRUST ADJ	
BRAKING CONFIGURATION	190000 LB LANDING WEIGHT	PER 10000 LB ABOVE/ BELOW 190000 LB	PER 1000 FT STD/HIGH*	HEAD WIND	TAIL WIND	DOWN HILL	UP HILL	ABOVE ISA	BELOW ISA	PER10 KTS ABOVE VREF30	ONE REV	NO REV
MAX MANUAL	2700	+100/-90	60/70	-110	380	40	-30	50	-50	210	60	130
MAX AUTO	4050	+160/-160	90/120	-180	570	50	-50	90	-90	310	180	360
AUTOBRAKE 4	4380	+190/-180	110/140	-210	680	60	-60	110	-100	360	190	390
AUTOBRAKE 3	4950	+240/-240	140/180	-250	850	90	-90	140	-130	410	240	470
AUTOBRAKE 2	5300	+290/-280	170/220	-290	980	150	-150	160	-140	410	540	800
AUTOBRAKE 1	5540	+330/-290	190/270	-320	1110	190	-170	170	-150	410	960	1450

Good Reported Braking Action

MAX MANUAL	3520	+150/-130	90/120	-170	610	80	-70	80	-80	280	220	540
MAX AUTO	4210	+180/-170	100/140	-200	690	90	-80	100	-90	310	360	910
AUTOBRAKE 4	4430	+190/-190	110/140	-220	730	80	-70	110	-110	360	240	670
AUTOBRAKE 3	4950	+240/-240	140/180	-250	850	90	-90	140	-130	410	240	480

Medium Reported Braking Action

MAX MANUAL	4570	+220/-190	130/180	-260	970	180	-140	120	-110	340	590	1640
MAX AUTO	4820	+240/-220	140/190	-280	1000	190	-160	130	-110	340	740	2050
AUTOBRAKE 4	4850	+240/-220	140/190	-280	1000	180	-150	130	-110	360	720	2020
AUTOBRAKE 3	5190	+250/-250	150/190	-300	1060	160	-150	140	-130	410	460	1660

Poor Reported Braking Action

MAX MANUAL	5630	+290/-260	170/250	-370	1470	390	-260	150	-130	380	1200	3850
MAX AUTO	5630	+300/-280	180/250	-400	1480	390	-280	160	-130	370	1320	4200
AUTOBRAKE 4	5630	+300/-280	180/250	-400	1480	390	-280	160	-130	380	1320	4200
AUTOBRAKE 3	5740	+300/-280	170/250	-400	1490	370	-270	160	-140	410	1200	4080

Reference distance is for sea level, standard day, no wind or slope, VREF30 approach speed and 2 engine reverse thrust.

Max Manual braking data valid for auto speedbrakes. For manual speedbrakes, increase reference landing distance by 270 ft.

Autobrake data valid for both auto and manual speedbrakes.

Actual (unfactored) distances are shown.

Includes distance from 50 ft above threshold (1000 ft of air distance).

*For landing distance at or below 8000 ft pressure altitude, apply the STD adjustment. For altitudes higher than 8000 ft, first apply the STD adjustment to derive a new reference landing distance for 8000 ft, then apply the HIGH adjustment to this new reference distance.

ADVISORY INFORMATION

Normal Configuration Landing Distance

Flaps 25

Dry Runway

	LANDING DISTANCE AND ADJUSTMENTS (FT)											
	REFERENCE DISTANCE	WEIGHT ADJUSTMENT	ALTITUDE ADJ	WIND ADJ PER 10 KTS		SLOPE ADJ PER 1%		TEMP ADJ PER 10°C		VREF ADJ	REVERSE THRUST ADJ	
BRAKING CONFIGURATION	190000 LB LANDING WEIGHT	PER 10000 LB ABOVE/ BELOW 190000 LB	PER 1000 FT STD/HIGH*	HEAD WIND	TAIL WIND	DOWN HILL	UP HILL	ABOVE ISA	BELOW ISA	PER 10 KTS ABOVE VREF25	ONE REV	NO REV
MAX MANUAL	2730	+90/-90	60/80	-110	390	40	-30	60	-50	210	60	140
MAX AUTO	4170	+160/-160	100/130	-180	580	50	-50	100	-90	320	190	400
AUTOBRAKE 4	4520	+190/-190	110/150	-210	690	60	-60	120	-110	380	210	430
AUTOBRAKE 3	5120	+240/-240	140/190	-260	860	90	-100	150	-130	430	270	530
AUTOBRAKE 2	5480	+290/-290	180/240	-300	1000	160	-160	180	-150	430	610	900
AUTOBRAKE 1	5720	+330/-300	200/280	-330	1120	200	-180	190	-150	430	1070	1600

Good Reported Braking Action

MAX MANUAL	3580	+150/-130	90/120	-170	610	80	-70	80	-80	280	230	580
MAX AUTO	4320	+180/-170	100/140	-210	690	90	-80	100	-100	320	380	990
AUTOBRAKE 4	4570	+190/-190	110/150	-220	740	80	-80	120	-110	380	250	720
AUTOBRAKE 3	5120	+240/-240	140/190	-260	860	90	-100	150	-130	430	270	530

Medium Reported Braking Action

MAX MANUAL	4670	+220/-190	130/190	-260	980	180	-150	120	-110	350	640	1810
MAX AUTO	4950	+240/-220	140/200	-290	1010	190	-160	140	-120	350	810	2270
AUTOBRAKE 4	4990	+230/-220	140/200	-290	1010	180	-150	130	-120	380	770	2230
AUTOBRAKE 3	5360	+250/-250	150/200	-310	1080	170	-150	150	-140	430	500	1840

Poor Reported Braking Action

MAX MANUAL	5780	+290/-260	170/250	-370	1490	400	-270	160	-140	390	1300	4320
MAX AUTO	5780	+300/-280	180/260	-400	1490	400	-290	170	-140	390	1440	4730
AUTOBRAKE 4	5780	+300/-280	180/260	-400	1490	400	-290	170	-140	390	1430	4720
AUTOBRAKE 3	5920	+300/-280	180/250	-410	1510	380	-270	170	-140	430	1290	4590

Reference distance is for sea level, standard day, no wind or slope, VREF25 approach speed and 2 engine reverse thrust.

Max Manual braking data valid for auto speedbrakes. For manual speedbrakes, increase reference landing distance by 270 ft.

Autobrake data valid for both auto and manual speedbrakes.

Actual (unfactored) distances are shown.

Includes distance from 50 ft above threshold (1000 ft of air distance).

*For landing distance at or below 8000 ft pressure altitude, apply the STD adjustment. For altitudes higher than 8000 ft, first apply the STD adjustment to derive a new reference landing distance for 8000 ft, then apply the HIGH adjustment to this new reference distance.

FLIGHT PLANNING

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Introduction

This chapter contains flight planning data to determine trip fuel/time, reserve fuel and enroute terrain clearance capability. The data includes engine bleed effects for normal air conditioning operation, i.e. two packs at normal flow, one pack bleeding each engine.

Simplified Flight Planning

Flight Planning Allowances

Simplified Flight Planning charts enable rapid determination of estimated trip time and fuel from brake release to landing. Additional flight planning information including maneuver allowances is summarized below.

Ground Operations

Fuel can be saved by minimizing APU utilization. Average APU fuel flow rate under normal operation is 235 lb per hour on the ground.

Taxi fuel allowance is approximately 35 lb per minute.

APU Operation During Flight

For APU operation during flight, increase fuel flow according to the following table. These increments include the APU fuel flow and the effect of increased drag from the APU door.

PRESSURE ALTITUDE (1000 FT)	APU FUEL FLOW (LB/HR)
39	160
35	160
31	190
25	210
20	230
15	240
10	280
5	300

Climb

Trip Fuel and Time charts are based on 290/.78 climb speed. Local ATC may require that 250 KIAS not be exceeded below 10000 ft. Approximately 88 lb of additional fuel is burned when this restriction is imposed.

Altitude Selection

Best fuel mileage for a given speed schedule is achieved at optimum altitude. Fuel mileage penalties for operation at off-optimum altitudes are shown in the following table.

OFF-OPTIMUM CONDITION	FUEL MILEAGE PENALTY %	
	LRC	.80M
2000 FT ABOVE OPTIMUM ALTITUDE	1	1
2000 FT BELOW	0	0
4000 FT BELOW	1	1
8000 FT BELOW	3	4
12000 FT BELOW	12	14
	18	24

Cruise

Long Range Cruise is recommended as an approximation for minimum trip fuel. Long Range Cruise is the speed which gives 99% of the maximum fuel mileage at zero wind. For cruise within 2000 ft of optimum altitude Long Range Cruise may be approximated by a constant .80M schedule.

Increase total fuel flow during cruise approximately 200 lb/hr for engine anti-ice on or 300 lb/hr for engine and wing anti-ice on.

Every 1000 lb reduction in landing weight decreases trip fuel at optimum altitude by approximately 0.5%.

Descent

Optimum descent speeds for minimum trip fuel are a function of weight. Trip Fuel and Time charts are based on .78/290/250 descent speed, and include straight in approach allowances only. Each additional minute of flaps down maneuvering consumes approximately 170 lb of additional fuel.

Missed Approach

Approximately 500 lb of additional fuel is burned during the missed approach maneuver, based on applying go-around power from the final approach configuration, retracting flaps and gear while climbing to 1500 ft and accelerating to 250 KIAS.

Optimum Altitude

Optimum altitude for best fuel mileage is presented for LRC/.80M speed schedule. Fuel mileage penalties for flying off-optimum altitude are tabulated under Altitude Selection.

Short Trip Cruise Altitude

Short range operation may be limited by the distance required to perform the climb and descent. The Short Trip Cruise Altitude chart shows the maximum altitude at which it is possible to cruise for at least one minute in level flight.

Trip Fuel and Time

Trip Fuel and Time charts are provided for Long Range Cruise and .80M at constant altitude to determine trip fuel and time from brake release to touchdown. APU usage, taxi, inflight flaps down maneuvering (other than straight in approach) and reserve fuel should be added to the trip fuel obtained from the Trip Fuel and Time charts to obtain the total fuel required. These fuel allowances are presented under Flight Planning Allowances. Additional fuel for extended inflight traffic delays should be determined from the holding table.

To determine trip fuel and time enter the appropriate chart with trip ground distance, adjust for the anticipated wind condition, and proceed vertically to cruise pressure altitude. Trip fuel is read to the right from the lower set of altitude lines by going to the reference landing weight and adjusting to the planned landing weight using the guidelines. Trip time is read to the left from the upper altitude lines, adjusting for ISA deviation as necessary.

For winds greater than those shown, enter chart directly with adjusted ground distance and ignore wind adjustment guidelines. Adjusted ground distance is ground distance multiplied by the ratio Average TAS/ (Average TAS + Wind Component), where headwind is negative and tailwind is positive.

Step Climb Trip Fuel and Time

Best fuel mileage is obtained if the flight is planned at optimum altitude for the cruise weight and speed schedule. Since optimum altitude increases as the airplane weight decreases, a step climb procedure bracketing optimum altitude is necessary.

The Step Climb Planning charts provide trip fuel and time for LRC or .80M from brake release to touchdown, similar to the constant altitude Trip Fuel and Time charts. The charts are based on 4000 ft step climbs to 2000 ft above optimum altitude.

Short Trip Fuel and Time

Short Trip Fuel and Time charts include fuel and time to climb to cruise altitude, cruise, descent and straight in approach. The charts are based on the altitude that yields the minimum fuel for trip distances up to 500 nm. For distances greater than 500 nm, or other altitudes, use the Trip Fuel and Time charts.

To determine fuel and time, enter with ground distance, adjust for wind and proceed vertically to the planned landing weight. Trip fuel is read to the right from the lower set of landing weight curves. Trip time is read to the left from the upper curve and is valid for all landing weights.

Holding Planning

This table provides total fuel flow information necessary for planning holding and reserve fuel requirements. The chart is based on the higher of the maximum endurance speed and the maneuvering speed. The fuel flow is based upon flight in a racetrack holding pattern. For holding in straight and level flight reduce the table values by 5%.

Fuel Tankering

The Fuel Tankering table below is provided for LRC/.80M cruise schedule based on a step climb procedure to bracket optimum altitude. When a fuel price differential exists between two stations, this table may be used to determine if fuel may be economically transported for a subsequent flight sector.

Enter the table with the trip distance to read the break-even fuel price ratio. As noted, the break-even fuel price is the fuel price at departure multiplied by the break-even fuel price ratio. To justify tanker operation economically, the fuel price at destination must be greater than the break-even fuel price.

TRIP DISTANCE (NM)	BREAK-EVEN PRICE RATIO
200	1.016
400	1.029
600	1.041
800	1.055
1000	1.068
2000	1.140
3000	1.220
4000	1.307

Oxygen Requirements

Passenger Oxygen System - Chemical

This airplane is equipped with a 12 minute or optional 22 minute chemical passenger oxygen system. The altitude envelopes provided show the maximum altitude that the airplane may be flown during a cabin depressurization event and still support the physiological requirements of the passengers using the oxygen system installed. The envelopes are intended to assist in terrain clearance planning.

The maximum altitude envelopes assume an immediate descent is made to 10000 ft or the lowest safe altitude whichever is higher as stipulated in the Emergency Descent procedure of the Quick Reference Handbook. Should the presence of terrain necessitate a level-off at an altitude higher than 10000 ft, the required terrain clearance descent profile should at no time exceed the maximum altitude capability of the passenger oxygen system shown by the envelope. Once terrain is cleared, the descent to 10000 ft should be completed.

Flight Crew System

Regulations require that sufficient oxygen be provided to the flight crew to account for the greater of supplemental breathing oxygen in the event of a cabin depressurization or protective breathing in the event of smoke or harmful fumes in the flight deck.

This airplane model is equipped with a 12 minute or optional 22 minute chemical passenger oxygen system which limits the extent to which the airplane can be

operated at altitudes above 10000 ft following depressurization. As a result the flight crew supplemental oxygen quantity requirement is determined using the fixed maximum cabin altitude envelope allowed by the passenger oxygen system. Consideration must also be given to protective breathing oxygen, which is the quantity of oxygen necessary for 15 minutes of pressurized 100% oxygen flow (Emergency setting) for each flight crew member in a fully pressurized cabin (8000 ft cabin pressure altitude). The greater quantity of either the supplemental or protective breathing requirements is used to determine the minimum dispatch cylinder pressures provided. An additional 10% of oxygen quantity is supplied by the values provided in the tables to account for normal system leakage and for use by one active duty pilot at flight altitudes above 25000 feet should the other active duty pilot leave the flight deck.

To determine the minimum dispatch oxygen cylinder pressure enter the flight crew oxygen table with the number of crew plus observers using oxygen and read the minimum cylinder pressure required for the appropriate cylinder temperature.

An additional quantity of oxygen is required when flight altitudes above 41000 feet are planned. Above flight altitudes of 41000 feet one active duty pilot must don the oxygen mask and breathe diluted oxygen for the duration of the flight above 41000 feet. The additional quantity of oxygen required is 2.05 liters/pilot/minute. This is equivalent to 1.8 psi/pilot/minute for the 76 cu. ft. cylinder system, and 1.2 psi/pilot/minute for the 114 cu. ft. cylinder system.

Driftdown

Net Level Off Weight

This chart is used to determine the maximum weight for terrain clearance based on the approved Airplane Flight Manual net engine inoperative performance at the speed for optimum climb gradient. Regulations require terrain clearance flight planning based on net performance which is the gross (or actual) gradient performance degraded by 1.1%.

The net level off pressure altitude must clear the terrain by 1000 ft. Enter the chart to determine the maximum weight for terrain clearance, enter with net level off pressure altitude, proceed to the ISA deviation and read weight. Adjust altitude for engine bleed configuration with the altitude adjustment shown below the chart.

Driftdown Profiles Net Flight Path

These charts are provided to determine the time, fuel and distance from engine failure at any point during driftdown for legal enroute terrain clearance. Data is based on net performance, max continuous thrust following engine failure and level flight deceleration to optimum driftdown speed (speed for optimum climb gradient).

To determine driftdown time, fuel and distance, enter the appropriate chart with pressure altitude for terrain clearance (terrain height plus 2000 ft), move horizontally to equivalent weight at engine failure (corrected for ISA deviation and anti-ice operation as indicated) and read fuel burned from the point of engine failure by interpolating between dashed lines. Read time and ground distance from point of engine failure by moving vertically downward from equivalent weight, adjusting distance for wind.

Driftdown/LRC Cruise Range Capability

This chart shows the range capability from the start of driftdown/cruise based on level off following driftdown and targeting the one engine inoperative Long Range Cruise speed.

To determine the fuel required, enter the chart with the desired ground distance, adjust for the anticipated wind, and proceed vertically to the start of driftdown weight and read the fuel required to the right. The time required is read to the left from the single weight line on top. The chart may be used in reverse to determine the range capability knowing the fuel remaining from the start of driftdown.

ETOPS

Regulations require that flights conducted over a route that contains a point further than one hour's time at "normal one engine inoperative speed" from an adequate diversion airport comply with rules set up specifically for extended range operation with two engine airplanes. If the airplane meets these requirements, the approved Airplane Flight Manual (AFM) will contain a statement to this effect.

This section provides the planning and inflight performance information necessary to conduct operations under these regulations. Information is presented for several different driftdown/cruise speed schedules. The information is based on drifting down using Max Continuous thrust at the Mach number shown until reaching the corresponding airspeed and maintaining that airspeed throughout the remainder of the driftdown and level cruise. Based on route requirements, operators may select any one of these

speeds for their operation, or may elect to use an entirely different speed which is not contained in this section.

Flight Planning

The following information is shown for flight planning purposes and is intended for use mainly by ground personnel.

In addition to the four basic speed schedules for which data is included throughout this section (LRC, .78/290, .80/310, .80/330), information is included on the Area of Operation, Critical Fuel Reserves and Net Level Off Altitude for a speed schedule of .80/340 to allow the operator to evaluate the effect of using speeds up to (VMO -10).

Area of Operation (Diversion Distance)

The maximum diversion distance used to establish the Area of Operation may be obtained from this chart. The Area of Operation is defined as the region within which the operator is authorized to conduct extended range operation. The distance to the diversion airport from any point along the intended route must be covered within the approved time using the single engine cruise speed (assuming still air and ISA conditions) selected by the operator.

Enter the chart for the appropriate speed with the weight at the point of diversion using the speed schedule and time selected and read the maximum diversion distance.

Critical Fuel Reserves

ETOPS Regulations require reserve planning to include a "Critical Fuel Scenario" calculation. The information shown is the fuel required to satisfy flight profiles as described on the charts. This information is shown for All-Engines operation at Long Range Cruise, as well as Engine-Inop operation at Long Range Cruise, 290, 310, 330 and 340 KIAS. There are two separate Engine-Inop scenarios; one assumes a loss of pressurization and subsequent cruise at 10000 ft, the other assumes only an engine failure with the airplane drifting down to an applicable level-off altitude for the remainder of the diversion. The ETOPS Critical Fuel required is the greater of All-Engine fuel or Engine-Inop fuel for the speed schedule selected. This fuel is compared to the amount of fuel normally onboard the airplane at that point in the route. If the fuel required by critical fuel reserves exceeds the amount of fuel normally expected, fuel load must be adjusted accordingly.

To determine the fuel required, enter the appropriate chart with desired diversion distance, adjust for forecast wind (factored if applicable), proceed vertically to the weight at critical point and read the fuel required to the

right. If the operator is using a wind forecasting model acceptable to the FAA (such as the World Area Forecast System, WAFS), regulations allow the wind factor applied in this step to be 5% of the forecast wind (increase headwinds, decrease tailwinds), as indicated in the note at the bottom of the chart. If the operator is not using an acceptable wind forecasting model, the calculated diversion fuel is to be increased by 5% instead of factoring the forecast wind values.

Adjustments for non-standard conditions are shown at the bottom of the page.

The data does not include an allowance for performance deterioration. However, regulations require a 5% allowance for performance deterioration unless a value has been established by the operator for in-service deterioration.

Net Level Off Weight

These charts are used to determine the maximum weight for terrain clearance based on net engine inoperative performance for the speed schedules shown and is for planning purposes only. Regulations require terrain clearance flight planning based on net performance which is the gross (or actual) gradient performance degraded by 1.1%.

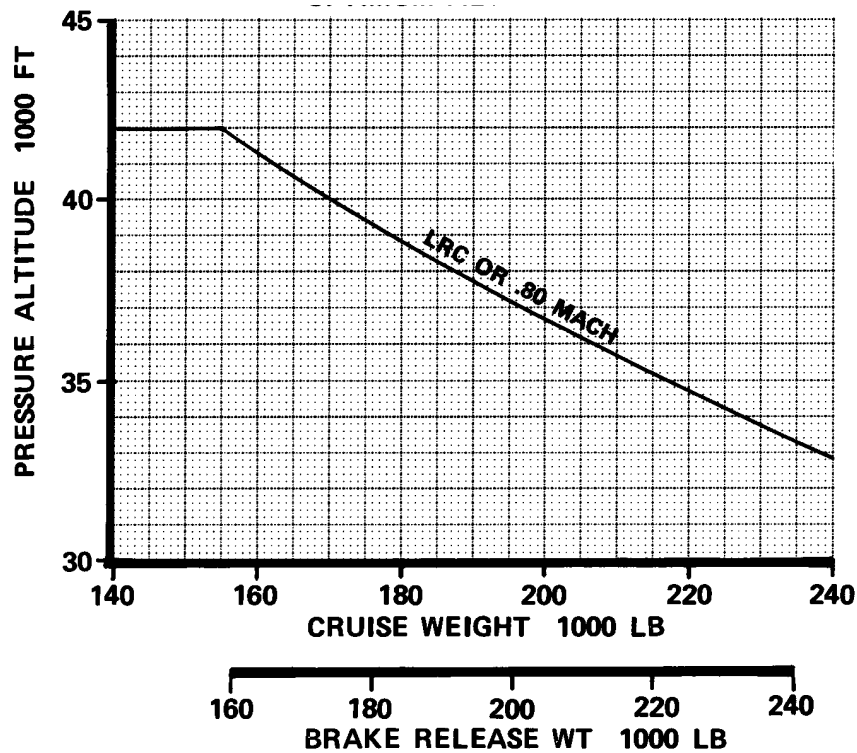
Net level off weight is determined by entering the appropriate chart at the left with the desired level off pressure altitude, adjusting for anti-ice as shown, proceeding across to the correct ISA deviation line and reading the allowable weight at the bottom. The net level off altitude may be obtained by entering the chart with weight and proceeding up to the correct ISA deviation line and reading across to the altitude on the left.

Driftdown/Cruise Range Capability

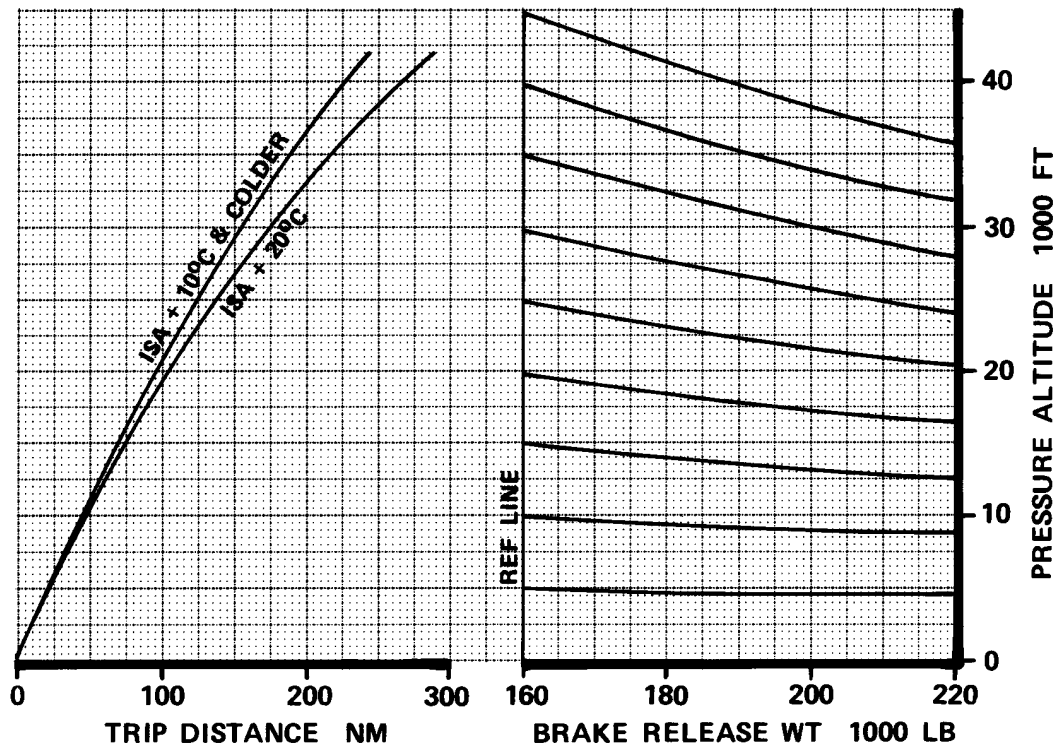
These charts show range capability from the start of driftdown/cruise when the driftdown/cruise procedure outlined in this section is followed. Charts are shown for each of the speed schedules discussed previously.

To determine the fuel required, enter the appropriate chart with the desired ground distance, adjust for the anticipated wind, and proceed vertically to the start of driftdown weight and read the fuel required to the right. The time required is read to the left from the single weight line on top. The chart may be used in reverse to determine the range capability knowing the fuel remaining from the start of driftdown.

Optimum Altitude



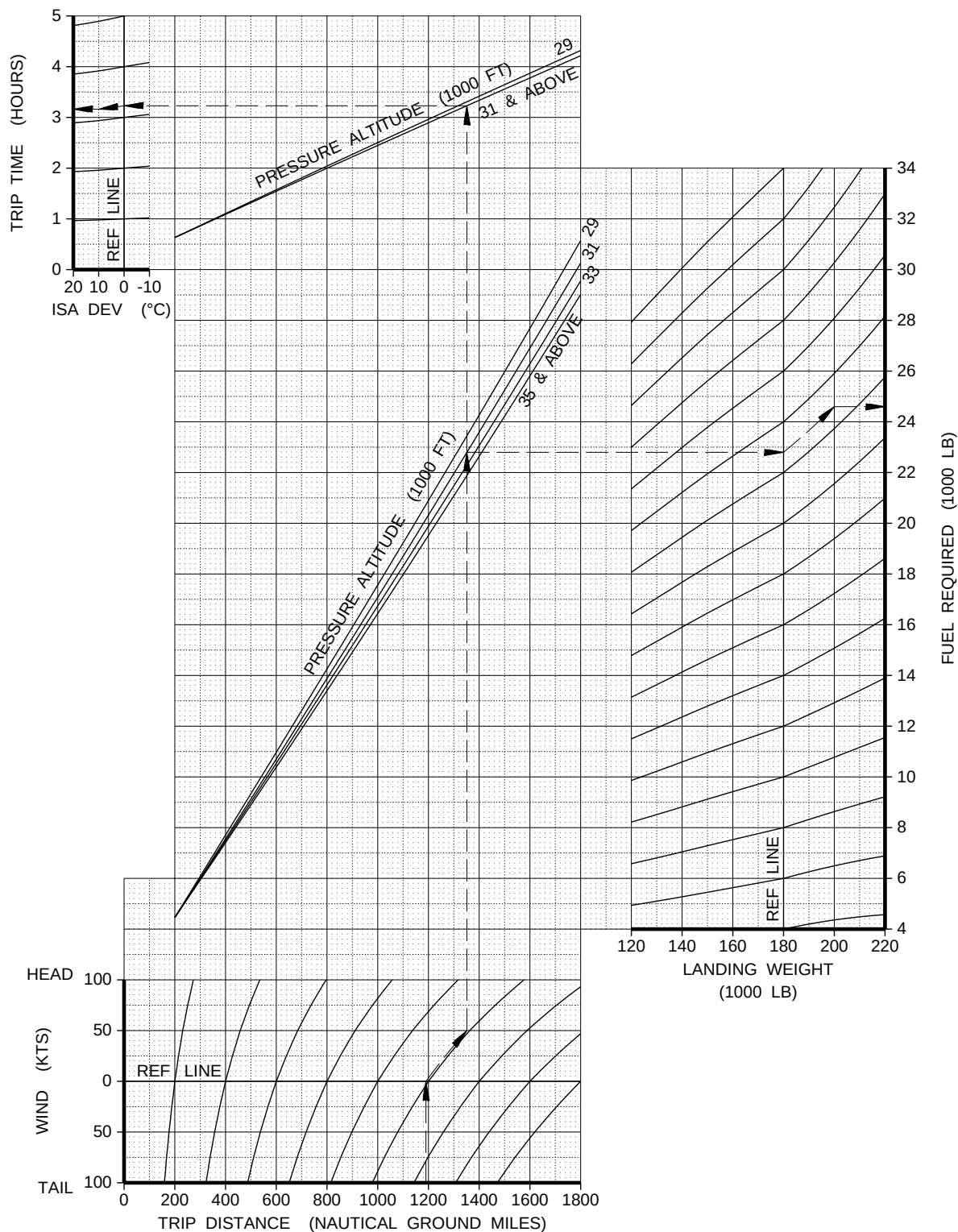
Short Trip Cruise Altitude



Long Range Cruise Trip Fuel and Time

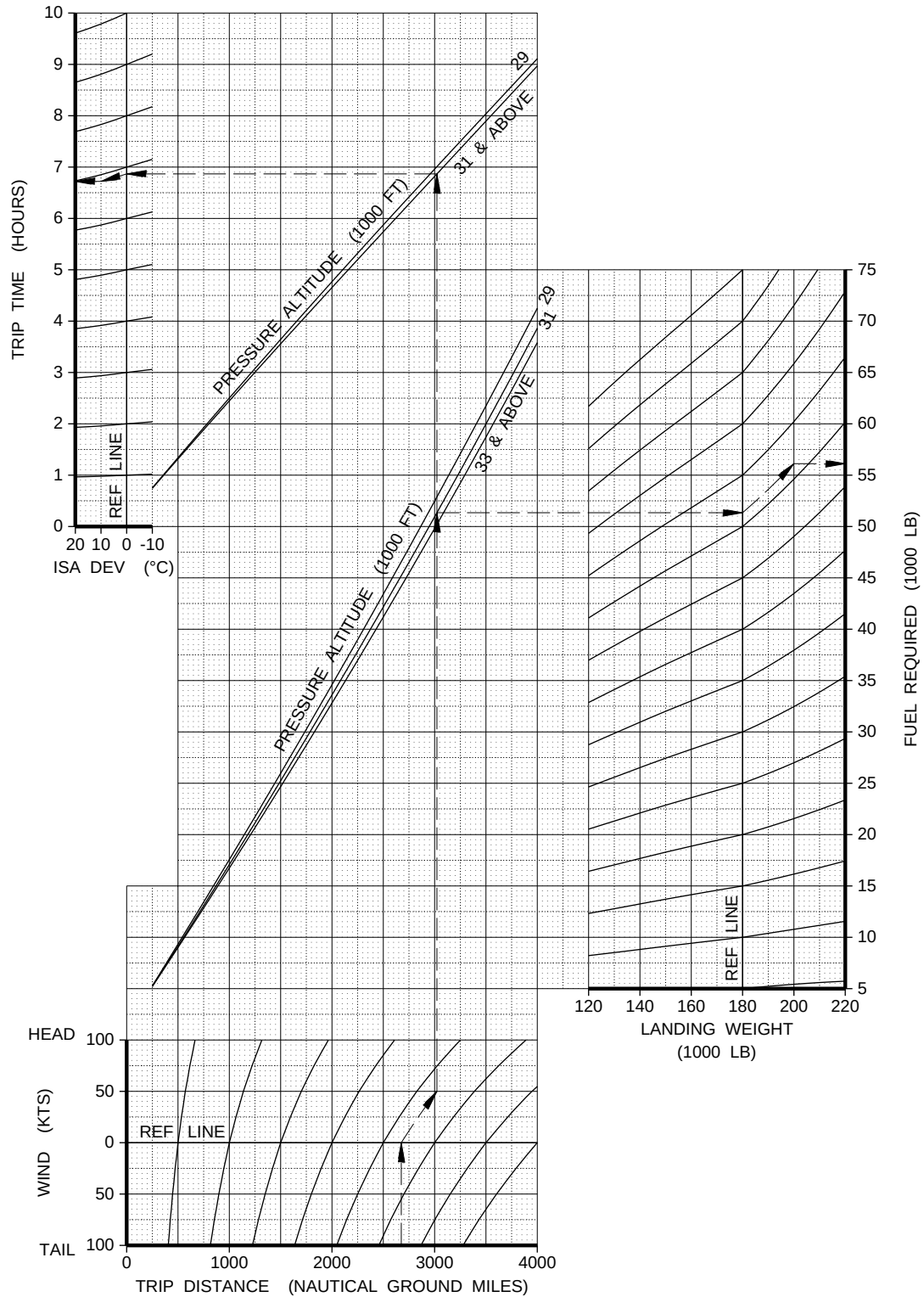
0 to 1800 NM Distance

Based on .290/.78 climb and .78/.290/250 descent



Long Range Cruise Trip Fuel and Time

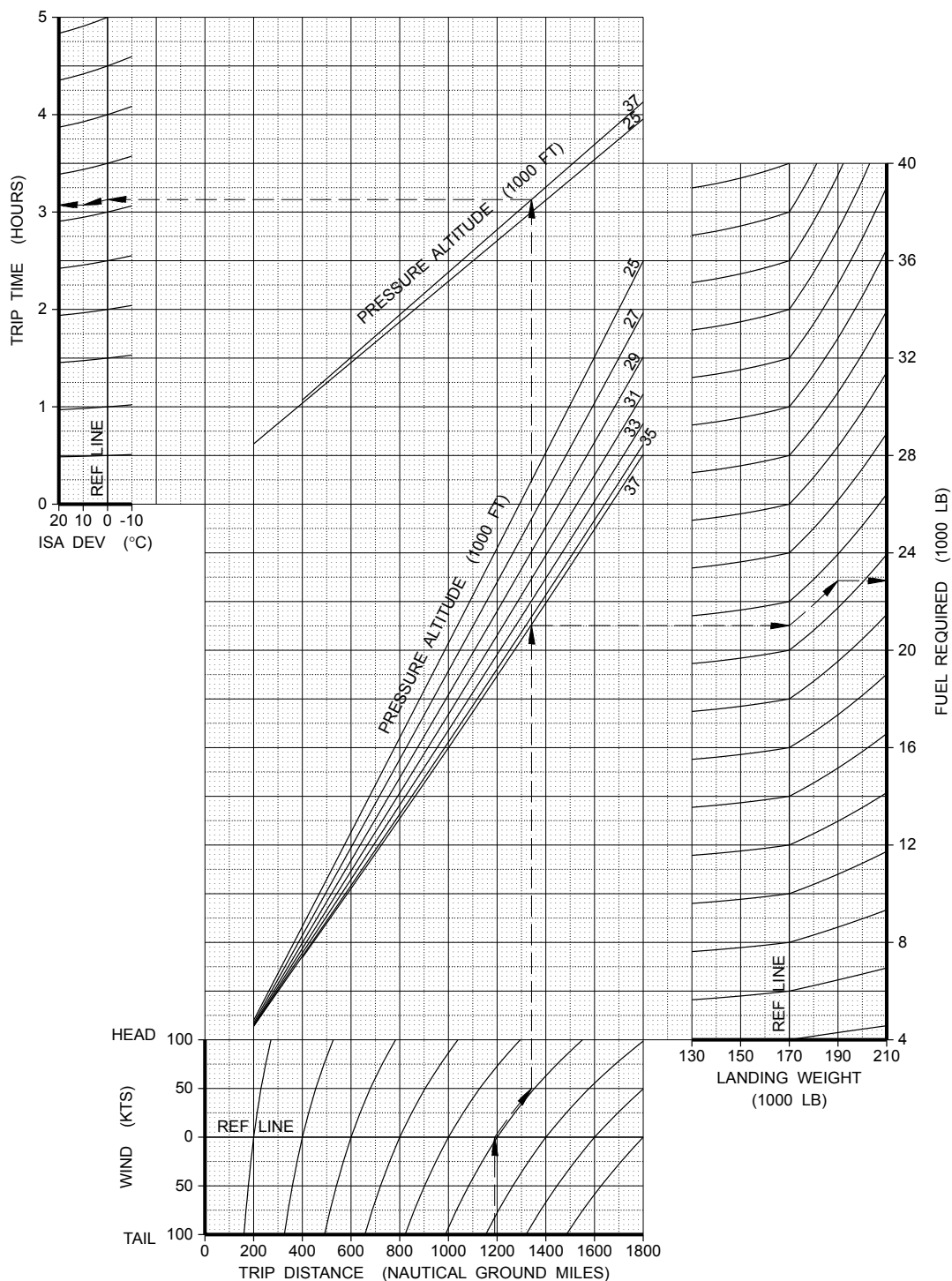
0 to 4000 NM Distance
Based on 290/.78 climb and .78/290/250 descent



.80M Trip Fuel and Time

0 to 1800 NM Distance

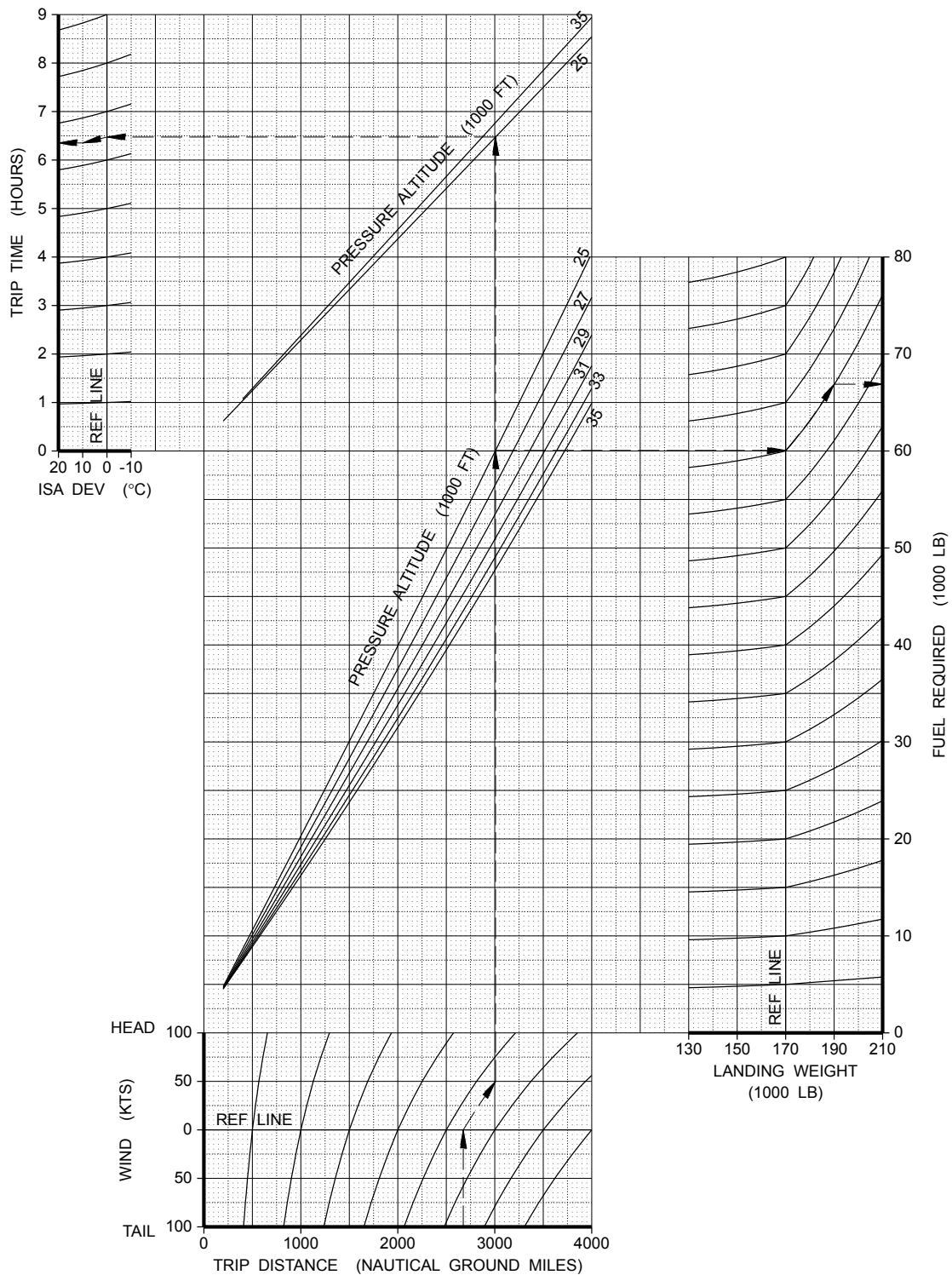
Based on 290/.78 climb and .78/290/250 descent



.80M Trip Fuel and Time

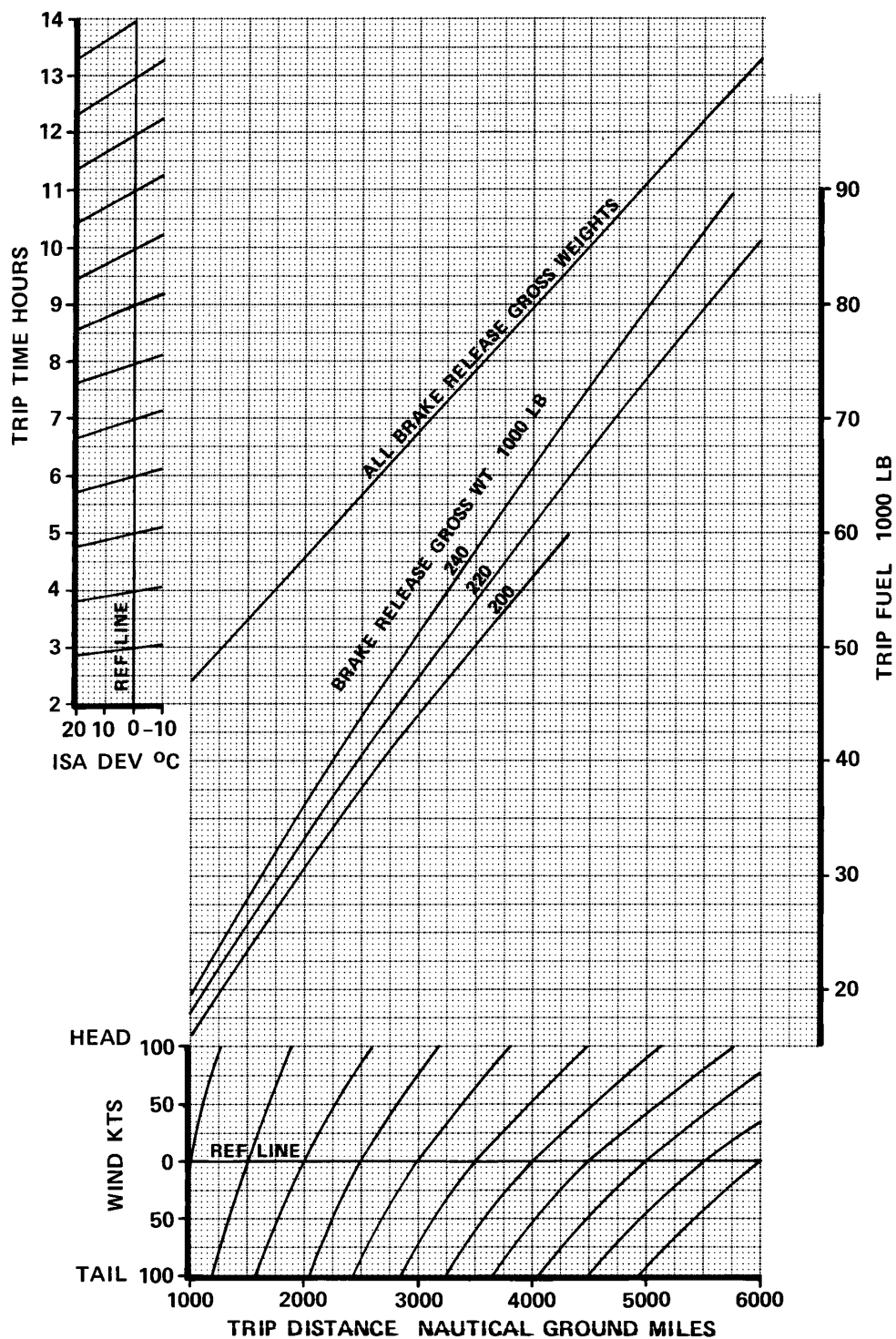
0 to 4000 NM Distance

Based on 290/.78 climb and .78/290/250 descent



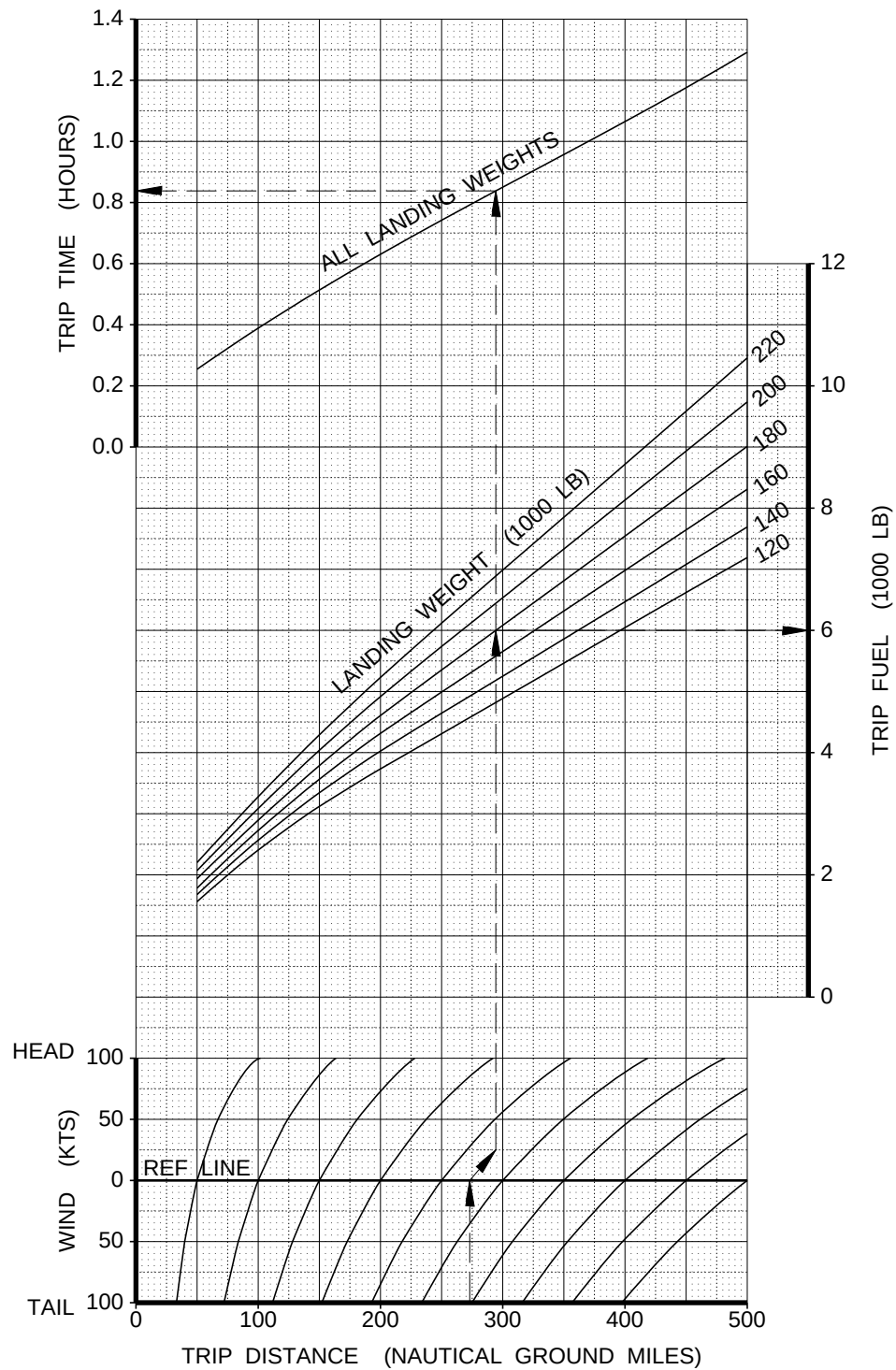
Long Range Cruise Step Climb Trip Fuel and Time

Based on .290/.78 climb, LRC or .80M cruise and .78/290/250 descent



Long Range Cruise Short Trip Fuel and Time

Based on 290/.78 climb, short trip cruise altitude and .78/290/250 descent



Holding Planning

Flaps Up

PRESSURE ALTITUDE (FT)	TOTAL FUEL FLOW (LB/HR)												
	WEIGHT (1000 LB)												
	260	250	240	230	220	210	200	190	180	170	160	150	140
40000							7460	6820	6370	6010	5610	5210	4820
35000		8870	8370	7940	7530	7120	6730	6320	5940	5580	5280	4930	4590
30000	8860	8450	8040	7650	7350	6990	6620	6270	5920	5570	5240	4910	4600
25000	8620	8260	7900	7540	7190	6920	6590	6250	5920	5600	5280	4960	4640
20000	8530	8190	7860	7530	7200	6940	6600	6270	5940	5610	5300	5000	4700
15000	8590	8250	7910	7570	7230	6900	6640	6330	6020	5720	5420	5130	4840
10000	8700	8370	8040	7720	7400	7090	6780	6540	6240	5950	5660	5370	5090
5000	8990	8670	8350	8030	7720	7410	7110	6810	6580	6280	5980	5690	5390
1500	9160	8840	8530	8220	7920	7610	7300	7000	6690	6460	6150	5840	5540

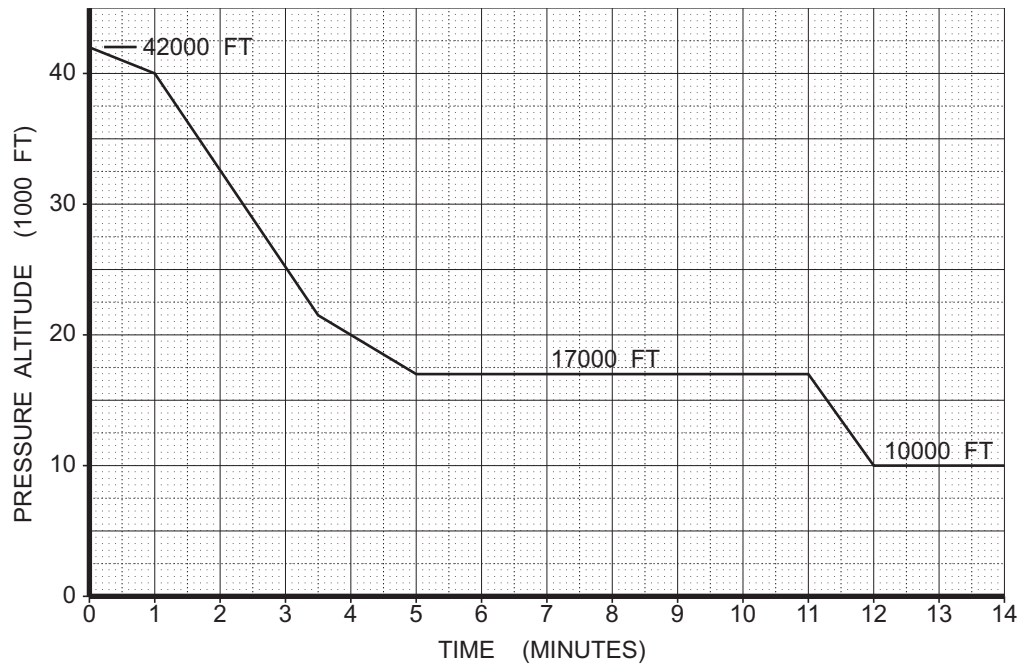
This table includes 5% additional fuel for holding in a racetrack pattern.

Oxygen Requirements

Passenger Oxygen Requirements - Chemical

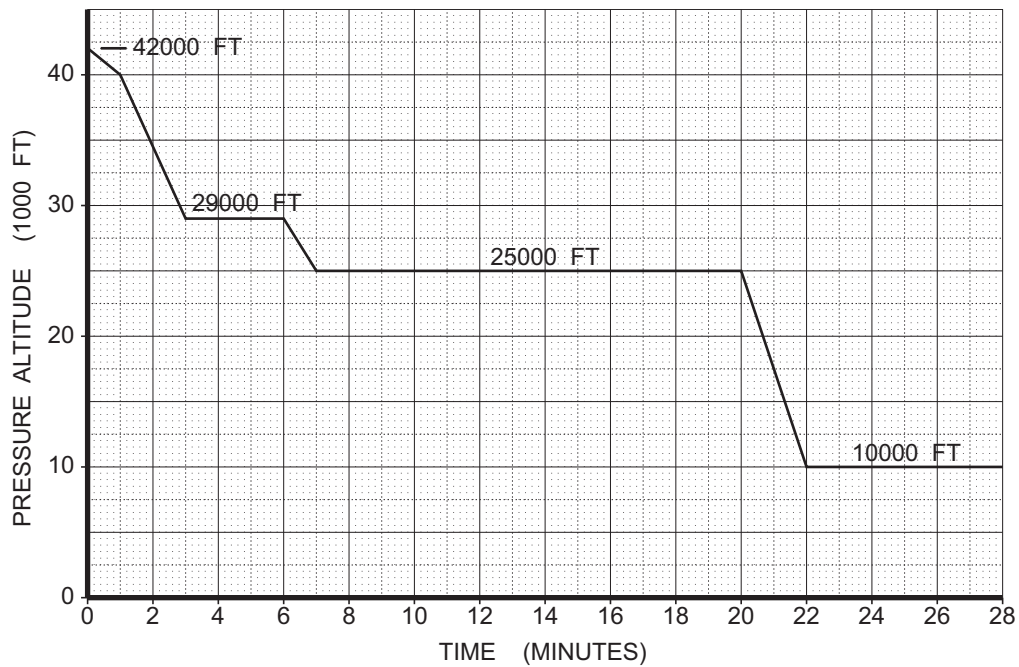
Maximum Altitude Envelope

Based on 12 Minute System



The passenger oxygen system will provide sufficient supplemental breathing oxygen for altitudes at or below this envelope.

Based on 22 Minute System



The passenger oxygen system will provide sufficient supplemental breathing oxygen for altitudes at or below this envelope.

Oxygen Requirements

Crew Oxygen Requirements

Required Pressure (PSI) for 76 Cubic Ft. Cylinder

BOTTLE TEMPERATURE		NUMBER OF CREW USING OXYGEN				
°C	°F	2	3	4	5	6
50	122	735	1055	1360	1680	2000
45	113	725	1040	1340	1655	1970
40	104	715	1020	1320	1630	1940
35	95	700	1005	1300	1600	1900
30	86	690	990	1280	1580	1880
25	77	680	975	1255	1550	1845
20	68	670	960	1240	1530	1820
15	59	655	940	1215	1500	1785
10	50	645	925	1195	1475	1755
5	41	635	910	1175	1445	1715
0	32	620	890	1150	1420	1690
-5	23	610	875	1130	1395	1660
-10	14	600	860	1110	1370	1630

Required Pressure (PSI) for 114 Cubic Ft. Cylinders

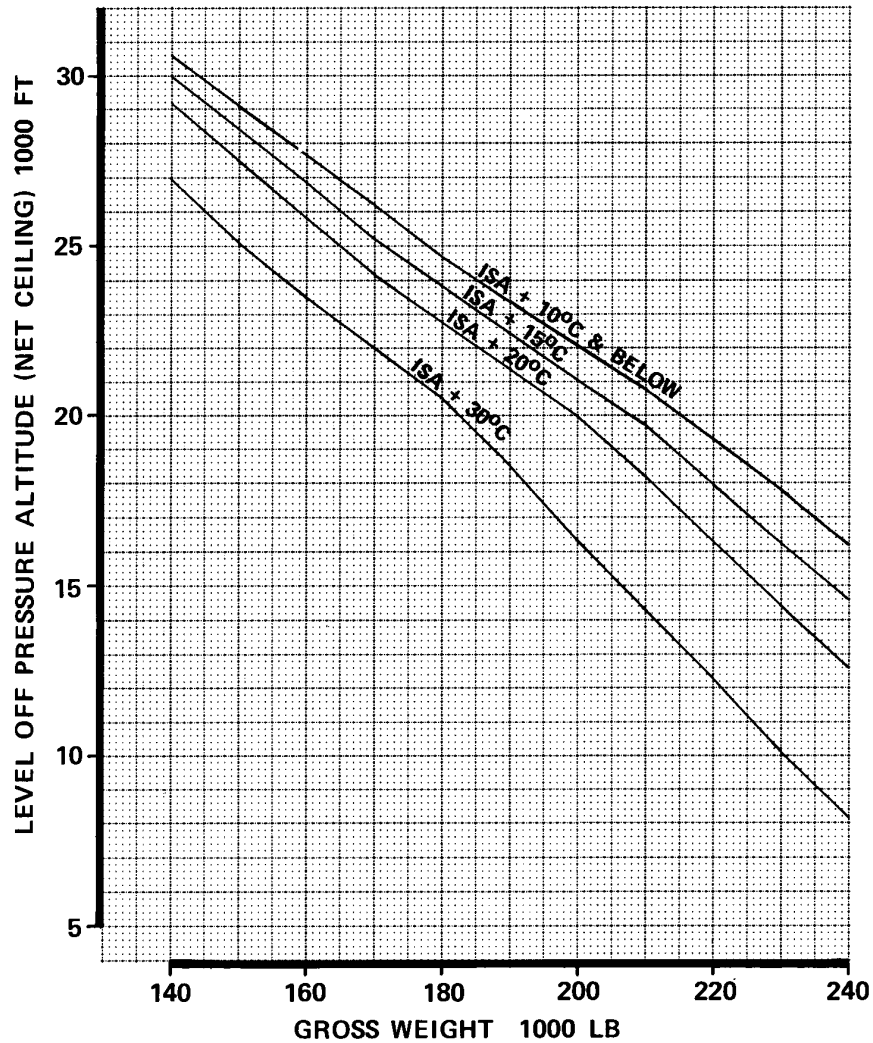
BOTTLE TEMPERATURE		NUMBER OF CREW USING OXYGEN				
°C	°F	2	3	4	5	6
50	122	530	735	945	1155	1365
45	113	520	725	930	1135	1340
40	104	510	715	915	1120	1325
35	95	505	700	900	1100	1300
30	86	495	690	885	1080	1275
25	77	485	680	870	1065	1260
20	68	480	670	860	1050	1240
15	59	470	655	840	1030	1220
10	50	460	645	830	1010	1190
5	41	455	635	815	995	1175
0	32	445	620	800	975	1150
-5	23	440	610	785	960	1135
-10	14	430	600	770	940	1110

ENGINE INOP

MAX CONTINUOUS THRUST

Net Level Off Weight

Based on engine bleed for one pack on and APU off



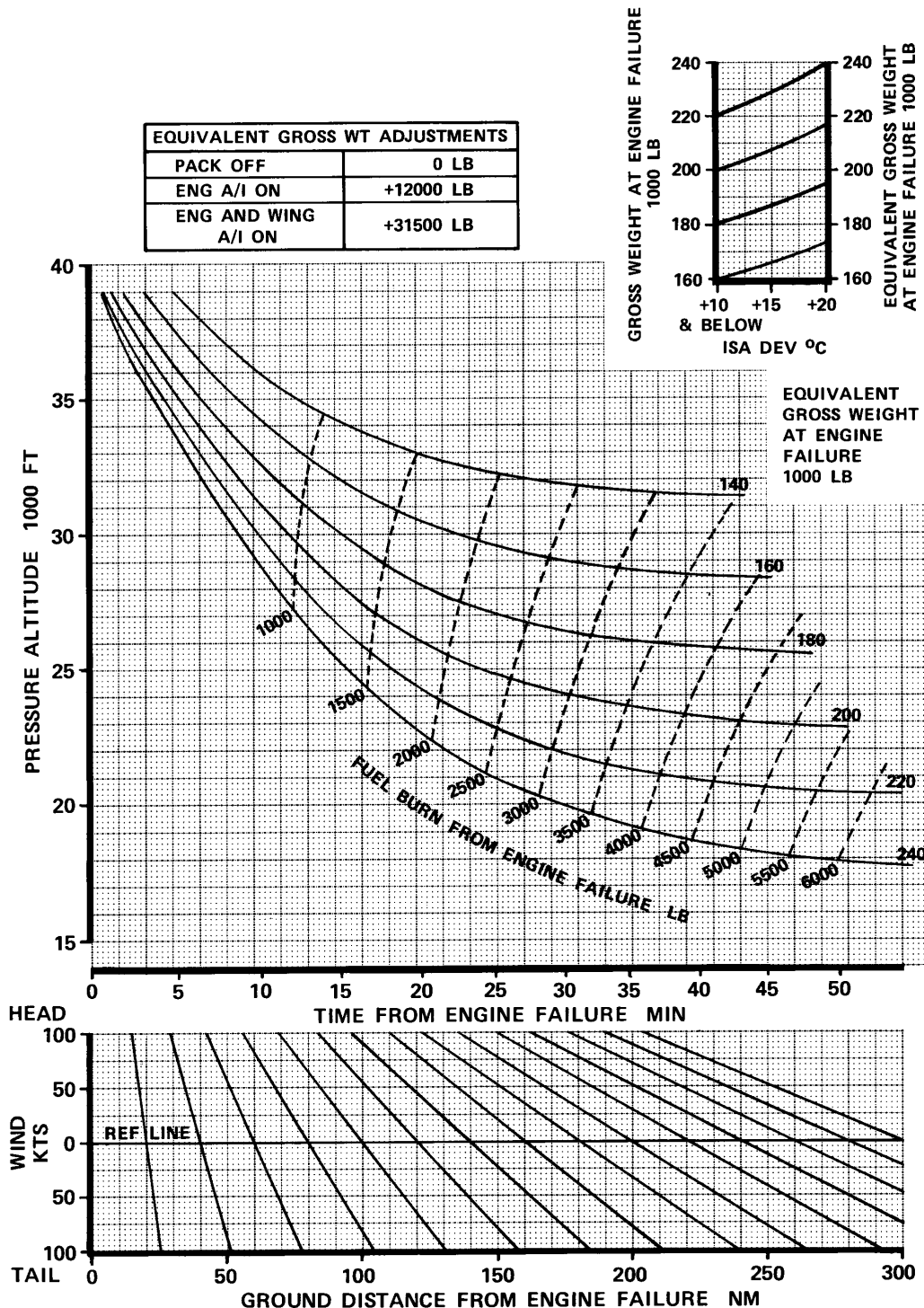
FOR ALTERNATE BLEED CONFIGURATIONS MAKE CORRECTIONS SHOWN IN TABLE FOR APU ON DECREASE LEVEL OFF ALTITUDE BY 300 FT.

ALTITUDE CORRECTION FOR ENGINE BLEED		
PACK OFF	18000 FT AND BELOW	+ 500 FT
	ABOVE 18000 FT	0
ENG A/I ON		-2500 FT
ENG AND WING A/I ON		-6500 FT

ENGINE INOP MAX CONTINUOUS THRUST

Driftdown Profiles Net Flight Path

Based on engine bleed for packs on and APU on or off
39000 FT & Above



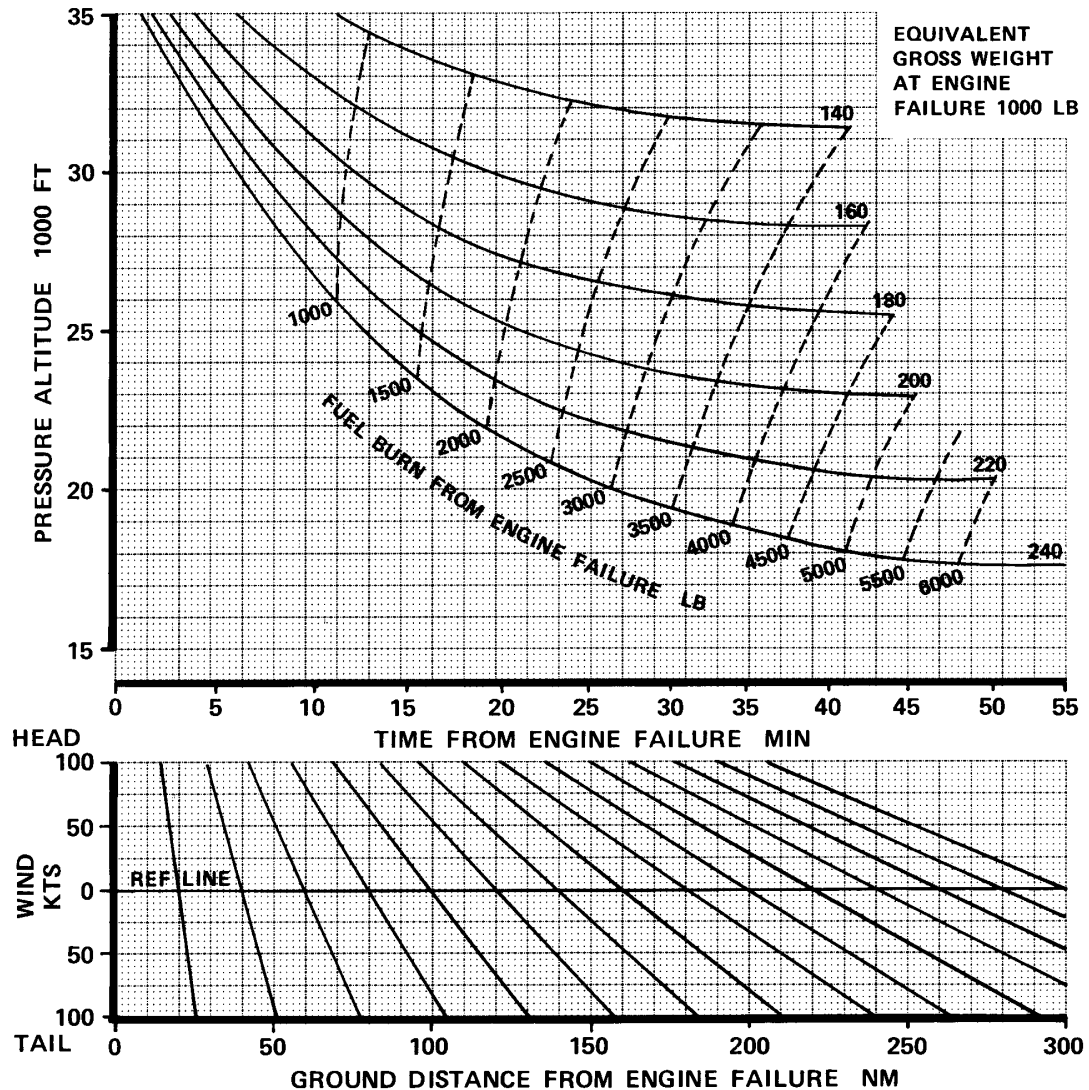
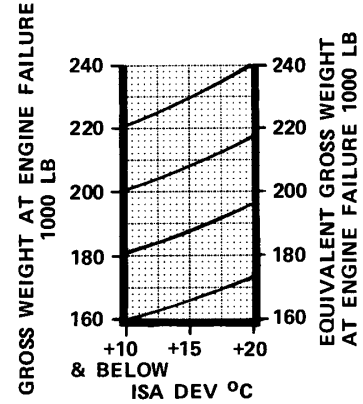
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown Profiles Net Flight Path

Based on engine bleed for packs on and APU on or off
35000 FT to 37000 FT

EQUIVALENT GROSS WT ADJUSTMENTS	
PACK OFF	0 LB
ENG A/I ON	+12000 LB
ENG AND WING A/I ON	+31500 LB



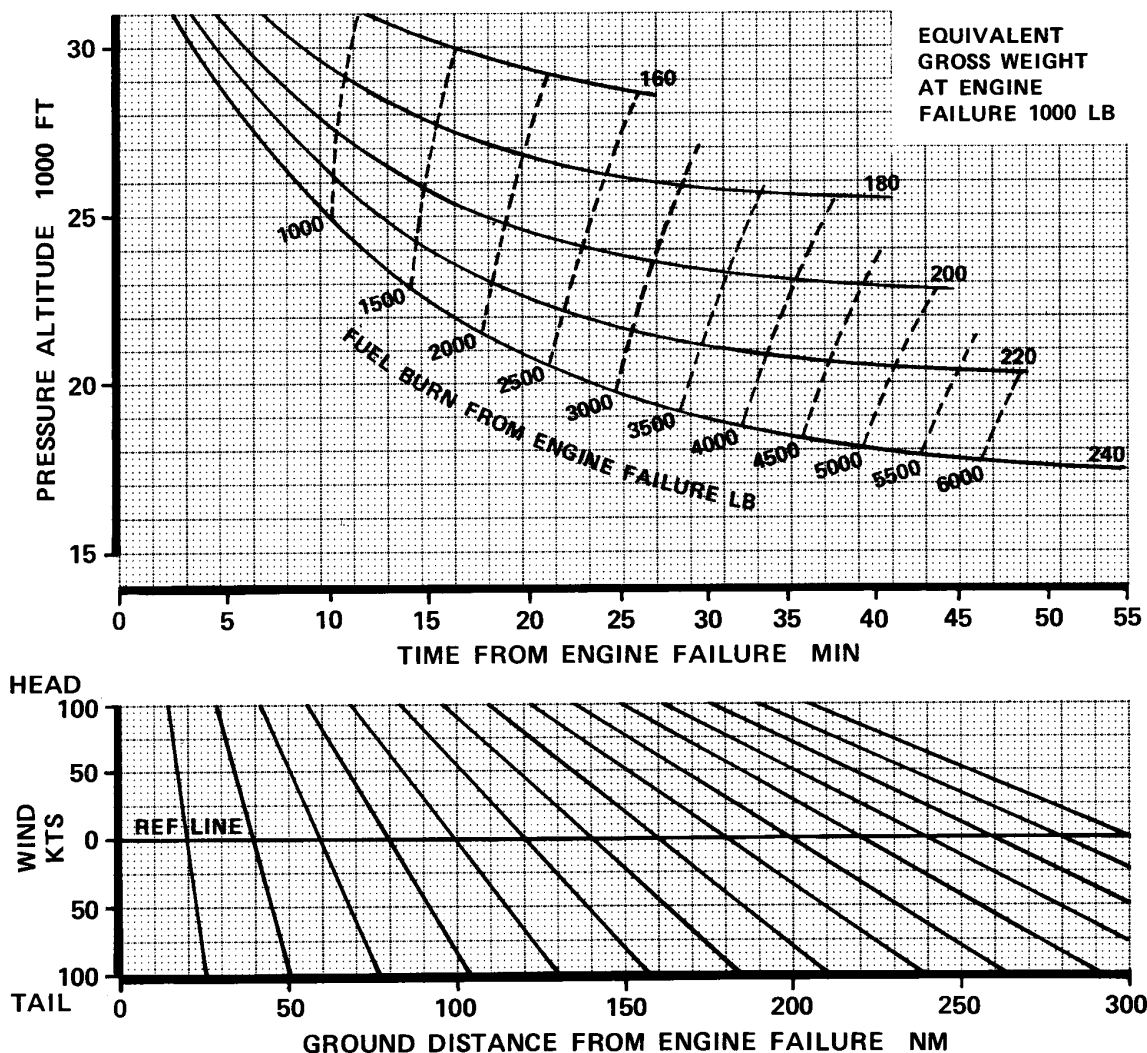
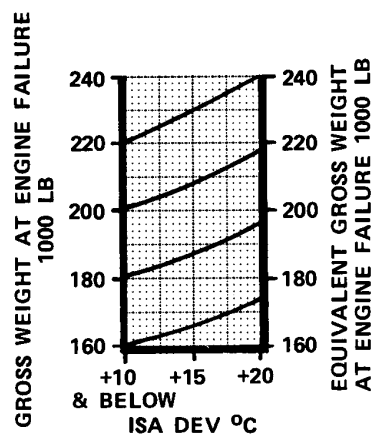
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown Profiles Net Flight Path

Based on engine bleed for packs on and APU on or off
31000 FT to 33000 FT

EQUIVALENT GROSS WT ADJUSTMENTS	
PACK OFF	0 LB
ENG A/I ON	+12000 LB
ENG AND WING A/I ON	+31500 LB



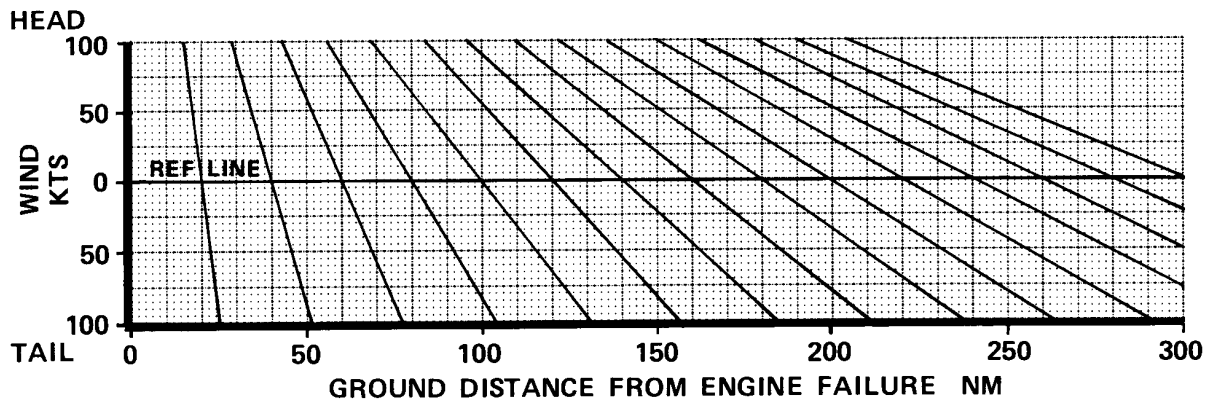
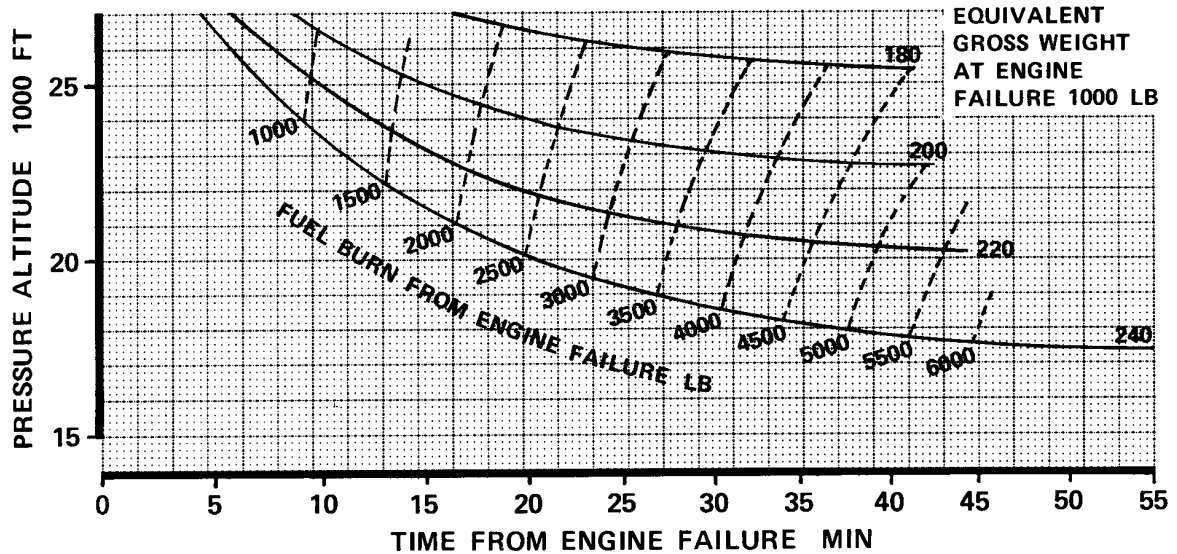
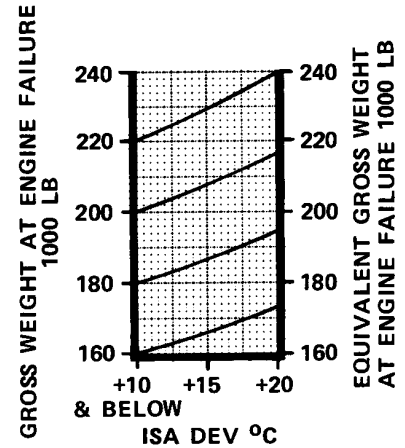
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown Profiles Net Flight Path

Based on engine bleed for packs on and APU on or off
 27000 FT to 29000 FT

EQUIVALENT GROSS WT ADJUSTMENTS	
PACK OFF	0 LB
ENG A/I ON	+12000 LB
ENG AND WING A/I ON	+31500 LB



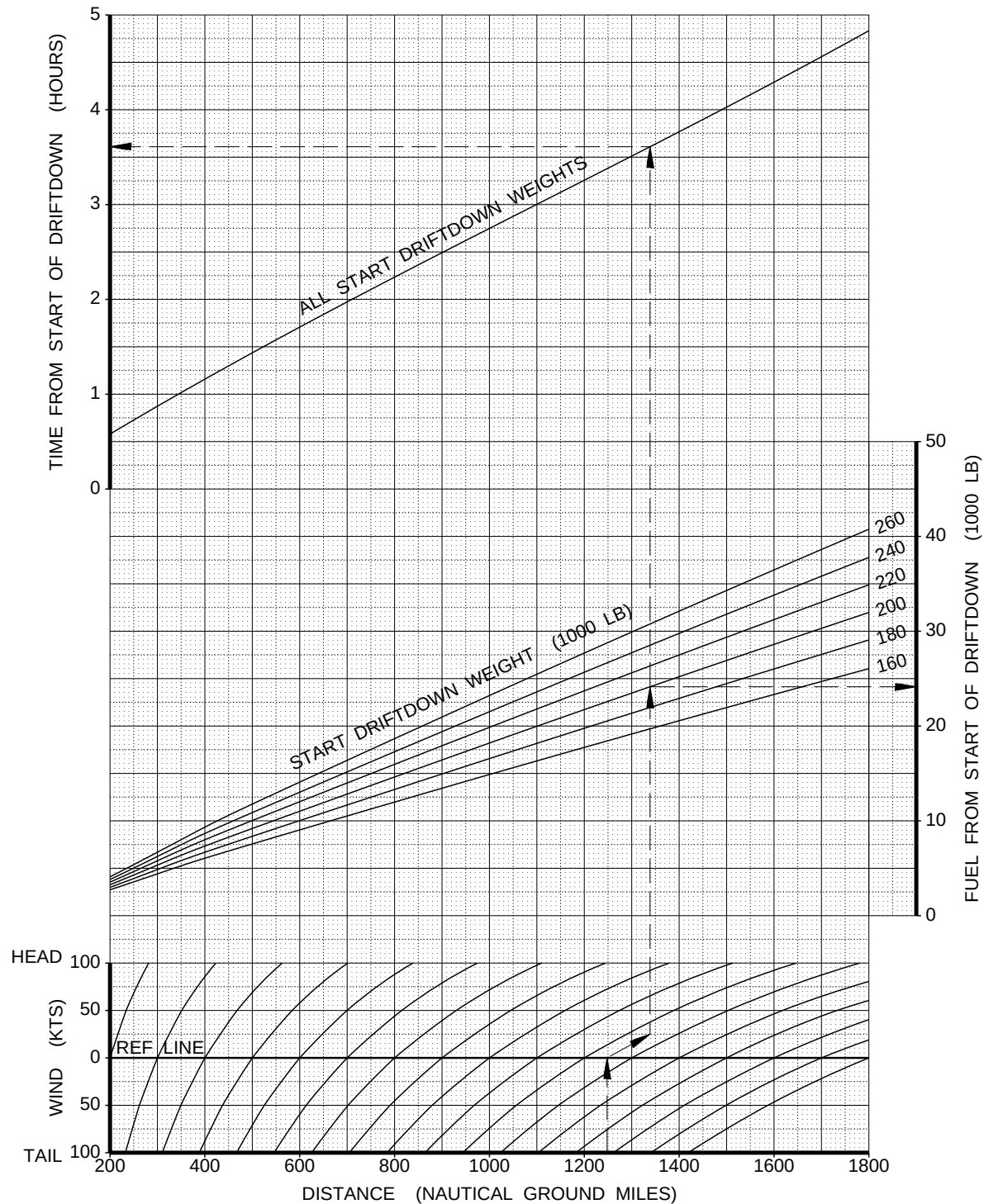
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown/LRC Cruise Range Capability

Includes APU fuel burn

Driftdown at optimum speed and cruise at Long Range Cruise speed



ENGINE INOP

MAX CONTINUOUS THRUST

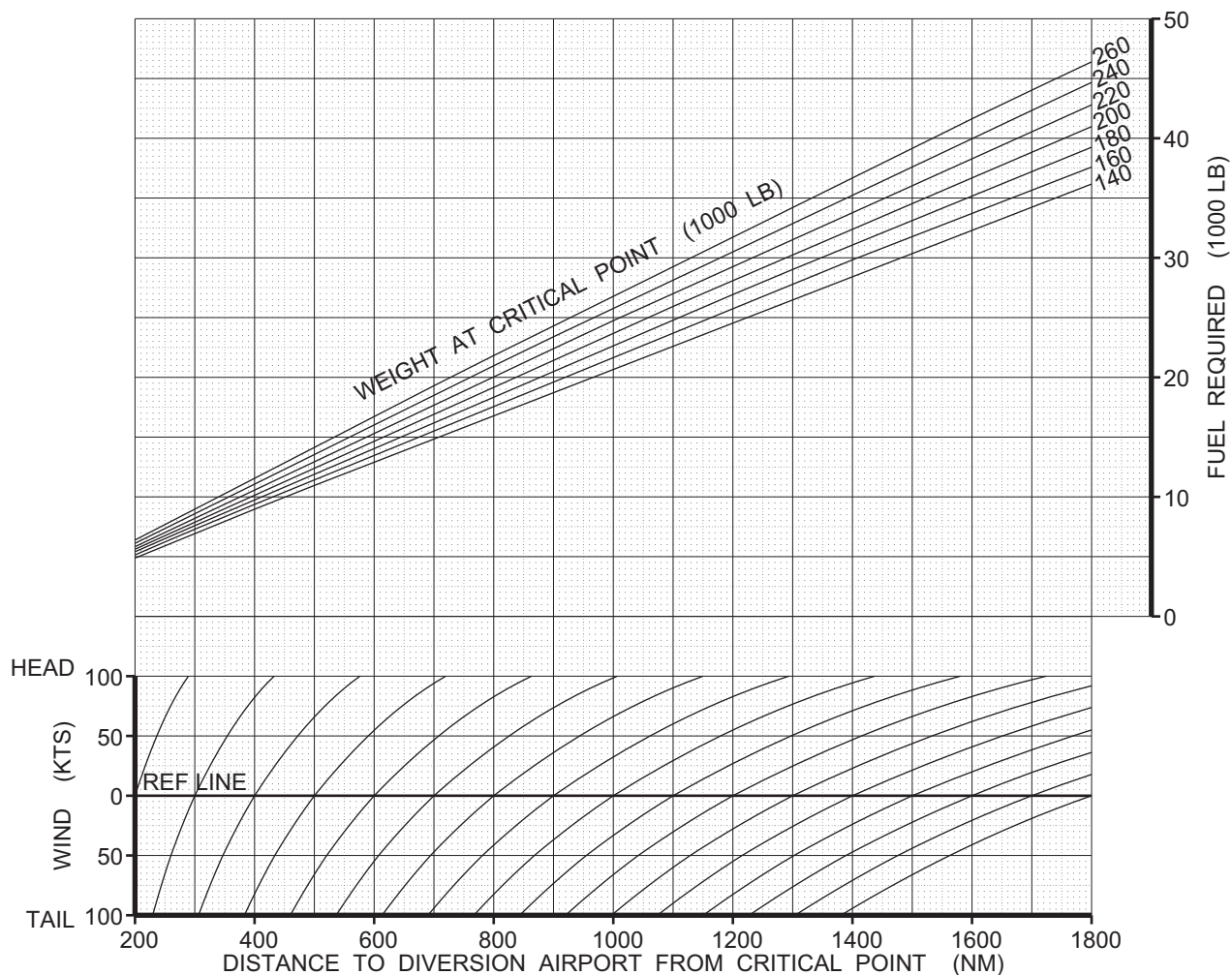
Area of Operation

Based on standard day and driftdown starting at or near optimum altitude

SPEED (M/KIAS)	WEIGHT AT DIVERSION (1000 LB)	DIVERSION DISTANCE (NM)												
		TIME (MINUTES)												
		60	75	90	100	110	120	130	138	140	150	160	170	180
.78/290	260	398	493	589	653	716	780	844	895	907	971	1035	1099	1162
	240	403	501	599	664	729	794	859	911	924	989	1054	1119	1184
	220	410	509	608	674	740	807	873	926	939	1005	1071	1137	1203
	200	416	516	617	684	752	819	886	940	953	1020	1088	1155	1222
	180	422	524	626	695	763	831	899	954	968	1036	1104	1172	1241
	160	427	531	635	704	773	842	911	967	980	1050	1119	1188	1257
	140	431	536	640	710	780	850	921	976	990	1060	1130	1200	1270
	120	433	539	645	715	786	857	927	984	998	1068	1139	1210	1280
.80/310	260	412	511	609	675	741	806	872	925	938	1003	1069	1135	1200
	240	417	517	618	685	752	819	886	939	953	1020	1087	1154	1221
	220	423	526	628	696	765	833	901	956	970	1038	1106	1175	1243
	200	429	533	637	706	775	845	914	969	983	1052	1122	1191	1260
	180	433	538	643	713	783	853	924	980	994	1064	1134	1204	1274
	160	437	543	650	720	791	862	933	990	1004	1075	1145	1216	1287
	140	439	546	653	725	796	867	939	996	1010	1082	1153	1224	1296
	120	440	548	656	728	799	871	943	1001	1015	1087	1159	1230	1302
.80/330	260	423	524	624	691	758	825	893	946	960	1027	1094	1161	1228
	240	427	529	632	700	768	836	904	959	972	1040	1108	1177	1245
	220	432	536	640	709	778	847	917	972	986	1055	1124	1194	1263
	200	437	542	647	718	788	858	928	984	998	1069	1139	1209	1279
	180	440	547	654	725	796	867	938	995	1009	1080	1151	1222	1293
	160	444	552	659	731	803	875	947	1004	1019	1090	1162	1234	1306
	140	445	554	662	735	807	879	952	1010	1024	1097	1169	1241	1314
	120	446	555	664	737	810	883	955	1014	1028	1101	1174	1246	1319
.80/340	260	427	528	629	697	764	832	899	953	967	1034	1102	1169	1237
	240	430	533	636	705	773	842	911	965	979	1048	1116	1185	1253
	220	435	540	644	714	783	853	922	978	992	1061	1131	1201	1270
	200	439	544	650	720	790	861	931	987	1001	1071	1142	1212	1282
	180	442	549	655	726	797	868	939	996	1010	1082	1153	1224	1295
	160	445	553	660	732	804	876	947	1005	1019	1091	1162	1234	1306
	140	446	554	663	735	807	879	951	1009	1024	1096	1168	1240	1312
	120	446	555	664	737	809	882	954	1012	1027	1099	1172	1244	1317
LRC	260	409	507	604	670	734	799	864	916	929	994	1058	1123	1187
	240	407	505	603	668	733	798	863	914	927	992	1056	1120	1185
	220	404	502	599	664	728	793	857	908	921	985	1049	1113	1177
	200	401	498	594	658	722	786	850	901	913	977	1040	1104	1167
	180	397	493	589	652	716	779	842	893	905	968	1031	1094	1156
	160	395	490	585	647	710	773	835	885	897	960	1022	1084	1146
	140	394	489	583	646	709	771	834	884	896	958	1020	1082	1144
	120	388	483	577	639	702	764	826	875	887	949	1010	1072	1133

ALL ENGINES

Decompression Critical Fuel Reserves - LRC Cruise



Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land.
Allowance for performance deterioration not included.

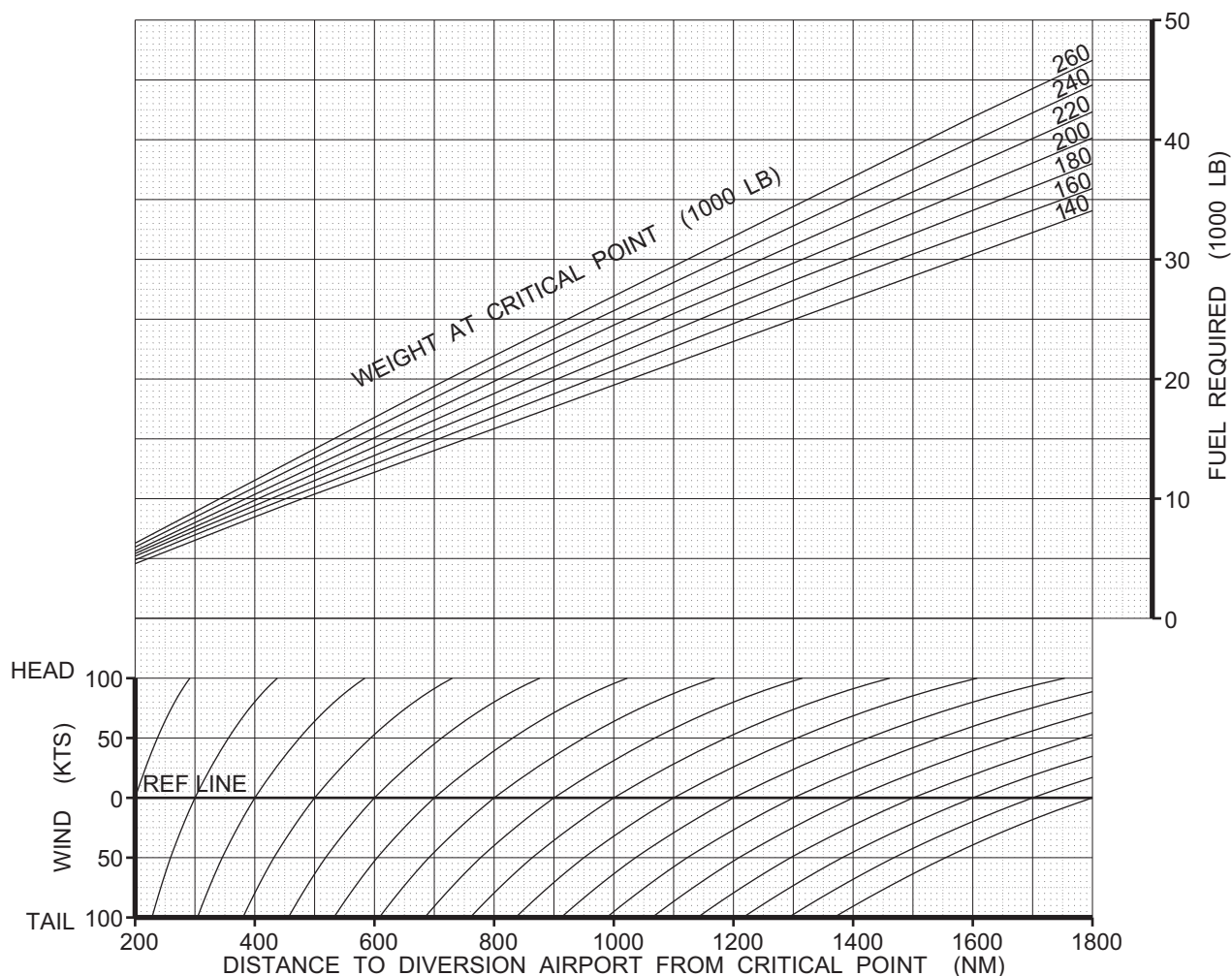
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (7%) for the total forecast time or engine and wing anti-ice on and ice drag (11%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Decompression Critical Fuel Reserves - LRC Cruise

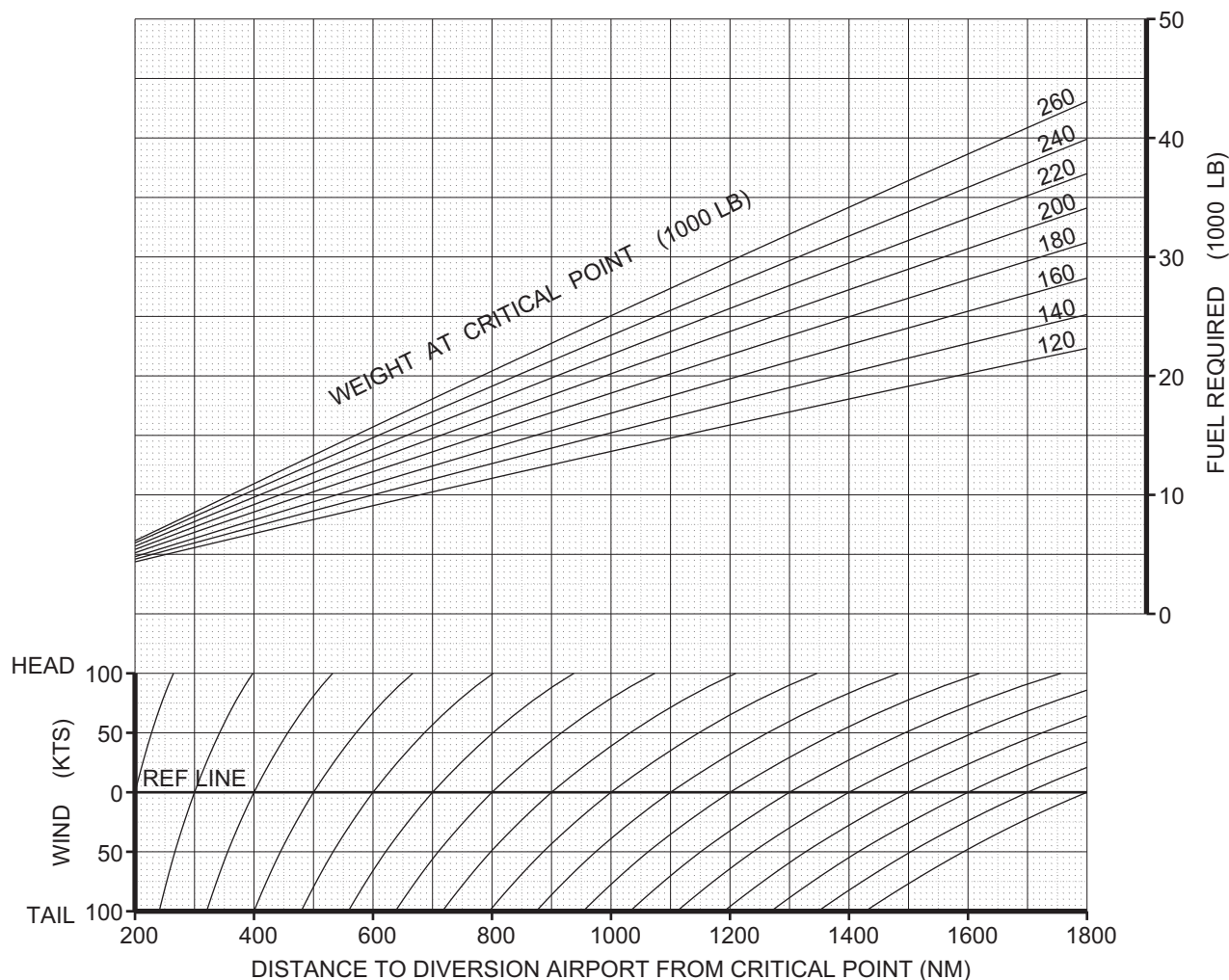


Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land.
Allowance for performance deterioration not included. Includes APU fuel burn.

Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (6%) for the total forecast time or engine and wing anti-ice on and ice drag (16%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP**Driftdown Critical Fuel Reserves - LRC Driftdown/Cruise**

Based on: Driftdown to and cruise at level off altitude, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

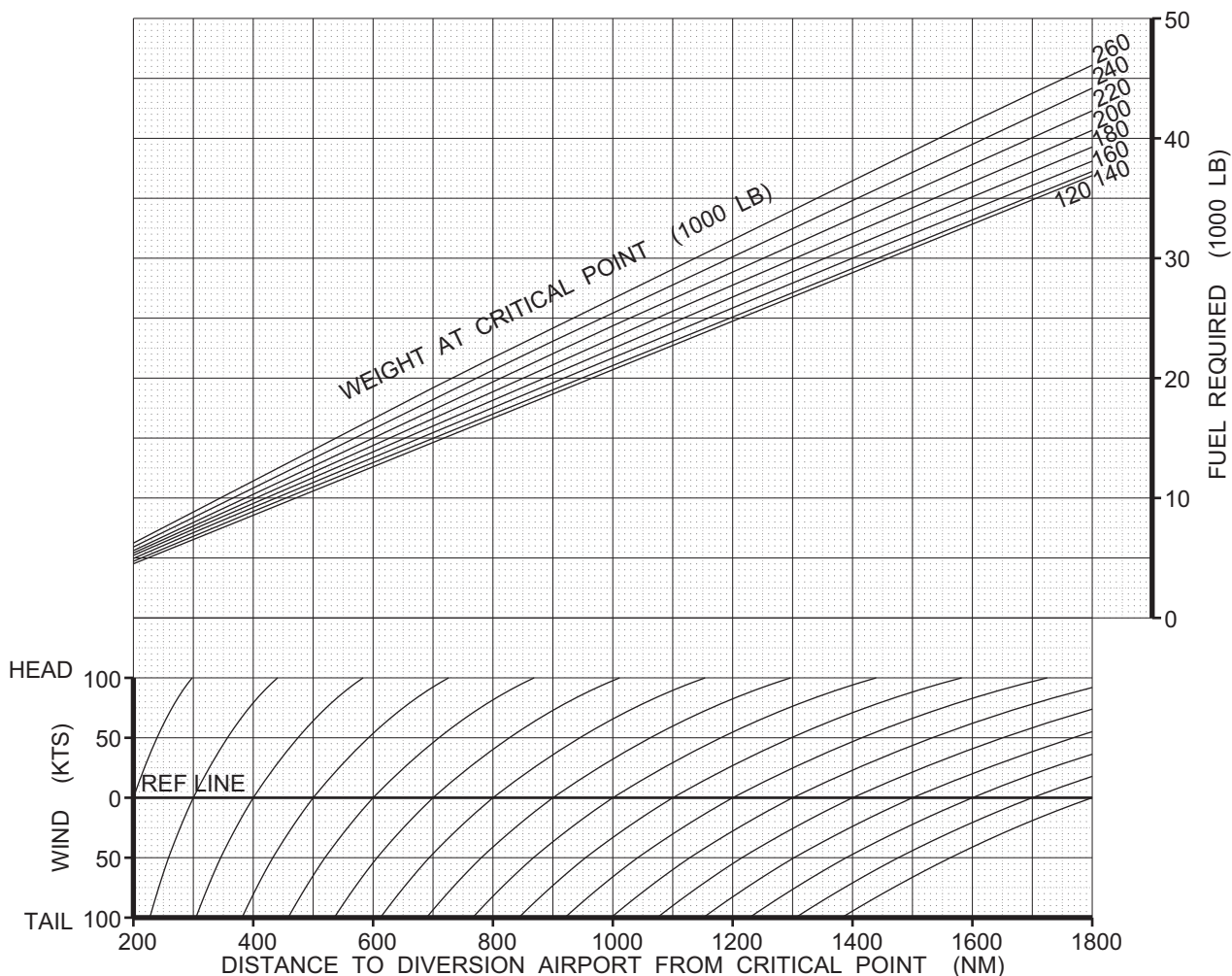
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (11%) for the total forecast time or engine and wing anti-ice on and ice drag (26%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Decompression Critical Fuel Reserves -290 KIAS Cruise



Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land.
 Allowance for performance deterioration not included. Includes APU fuel burn.

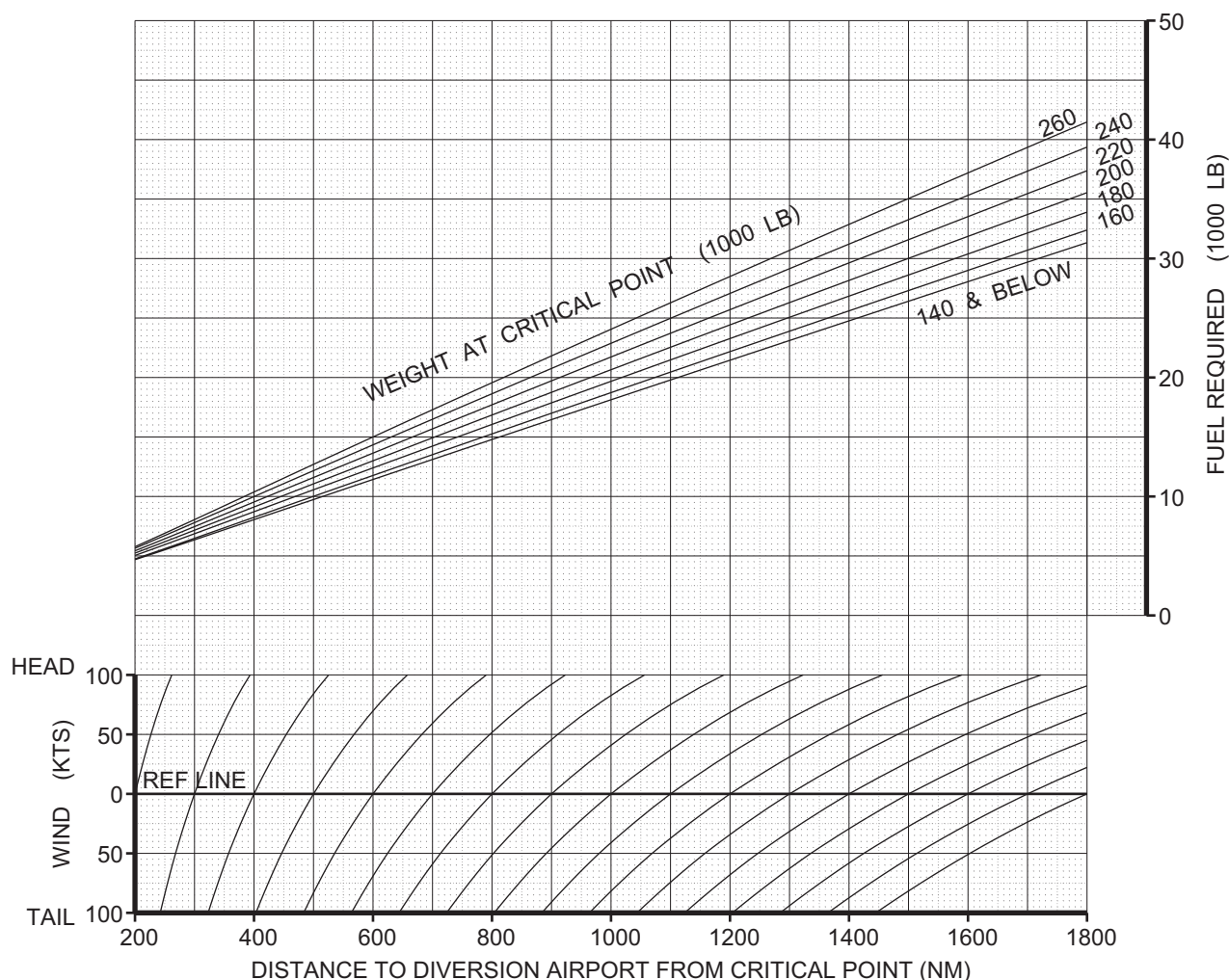
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (6%) for the total forecast time or engine and wing anti-ice on and ice drag (15%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Driftdown Critical Fuel Reserves - .78M/290 KIAS Driftdown/Cruise



Based on: Driftdown to and cruise at level off altitude, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

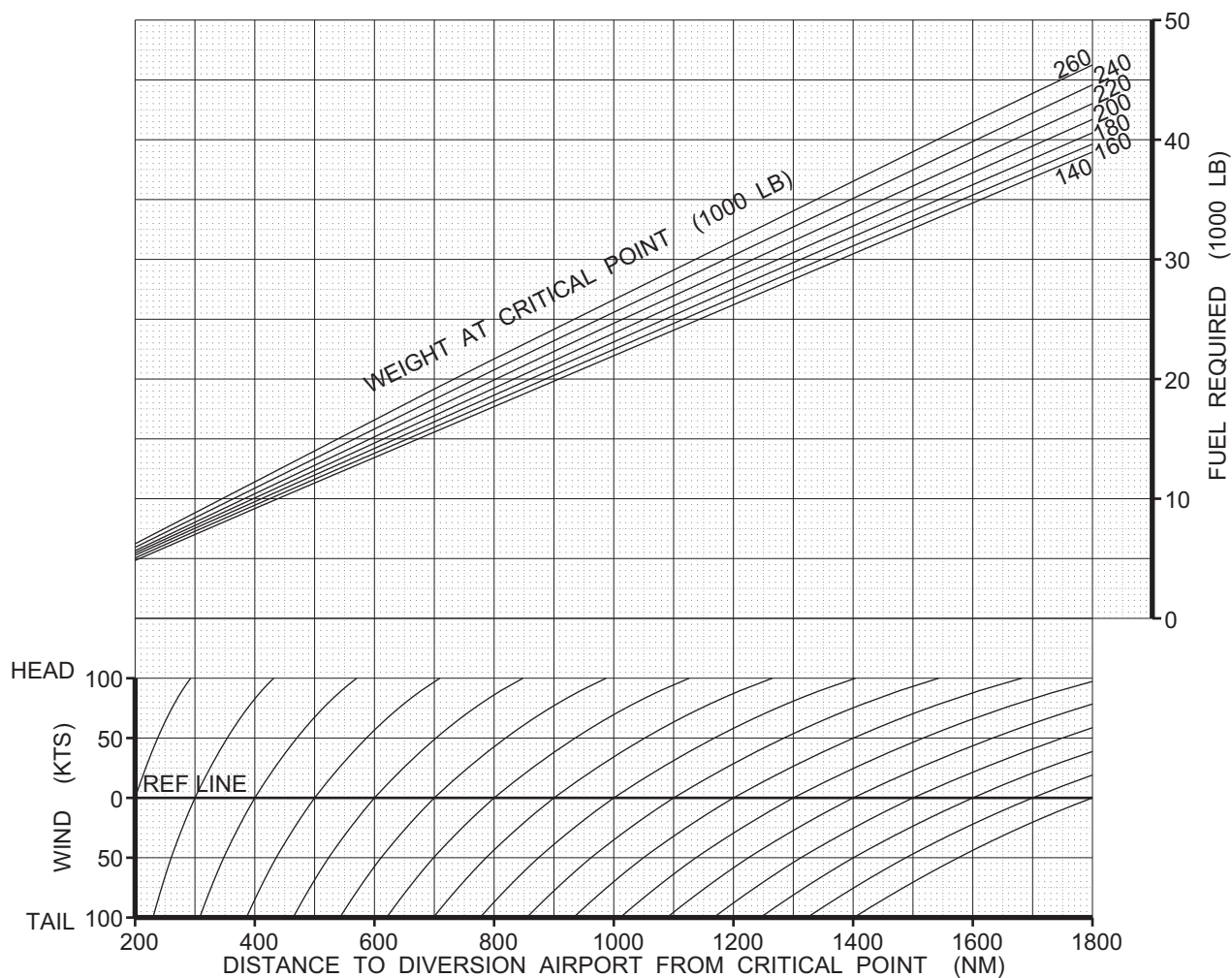
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (5%) for the total forecast time or engine and wing anti-ice on and ice drag (18%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Decompression Critical Fuel Reserves -310 KIAS Cruise



Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

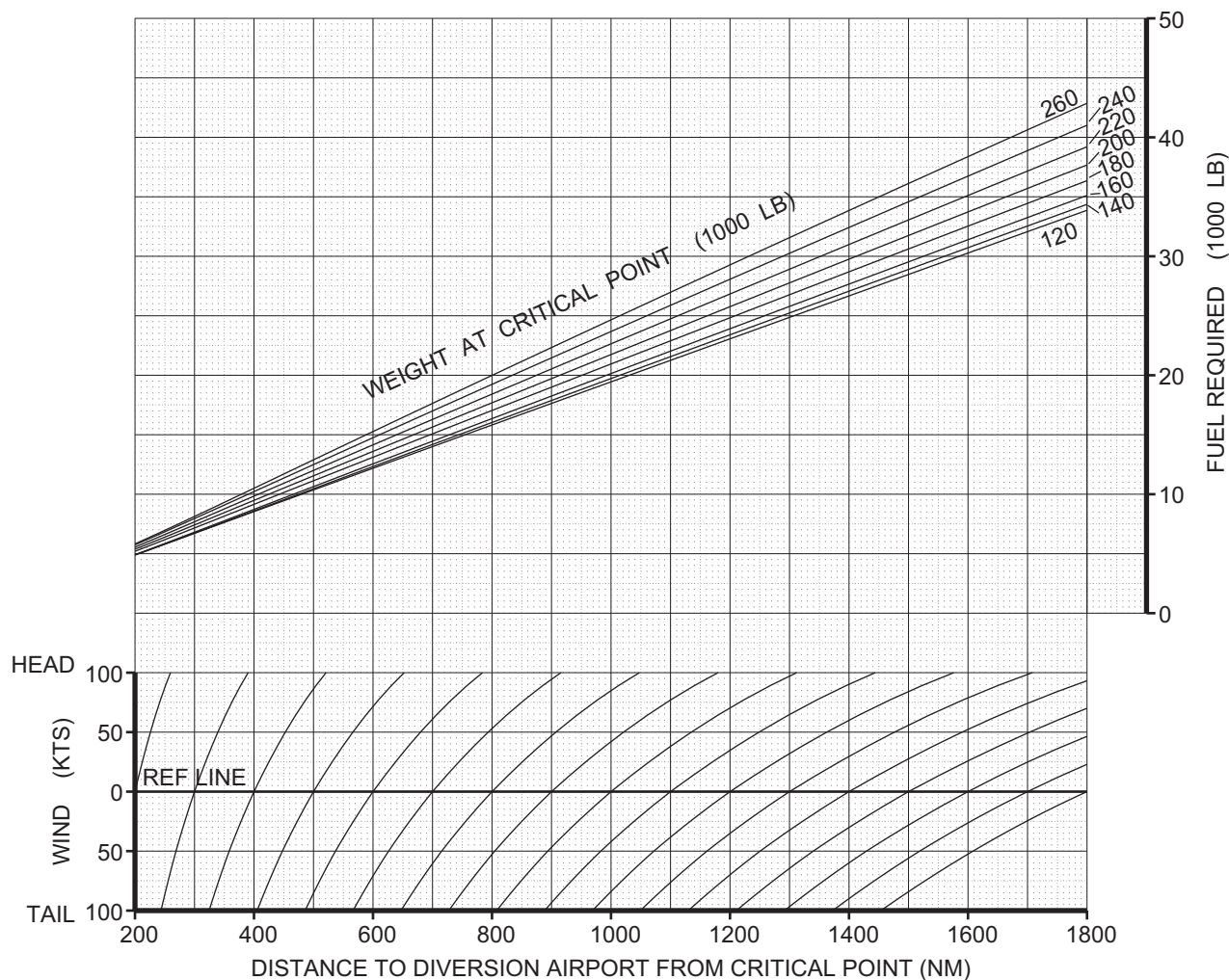
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (6%) for the total forecast time or engine and wing anti-ice on and ice drag (16%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Driftdown Critical Fuel Reserves - .80M/310 KIAS Driftdown/Cruise



Based on: Driftdown to and cruise at level off altitude, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

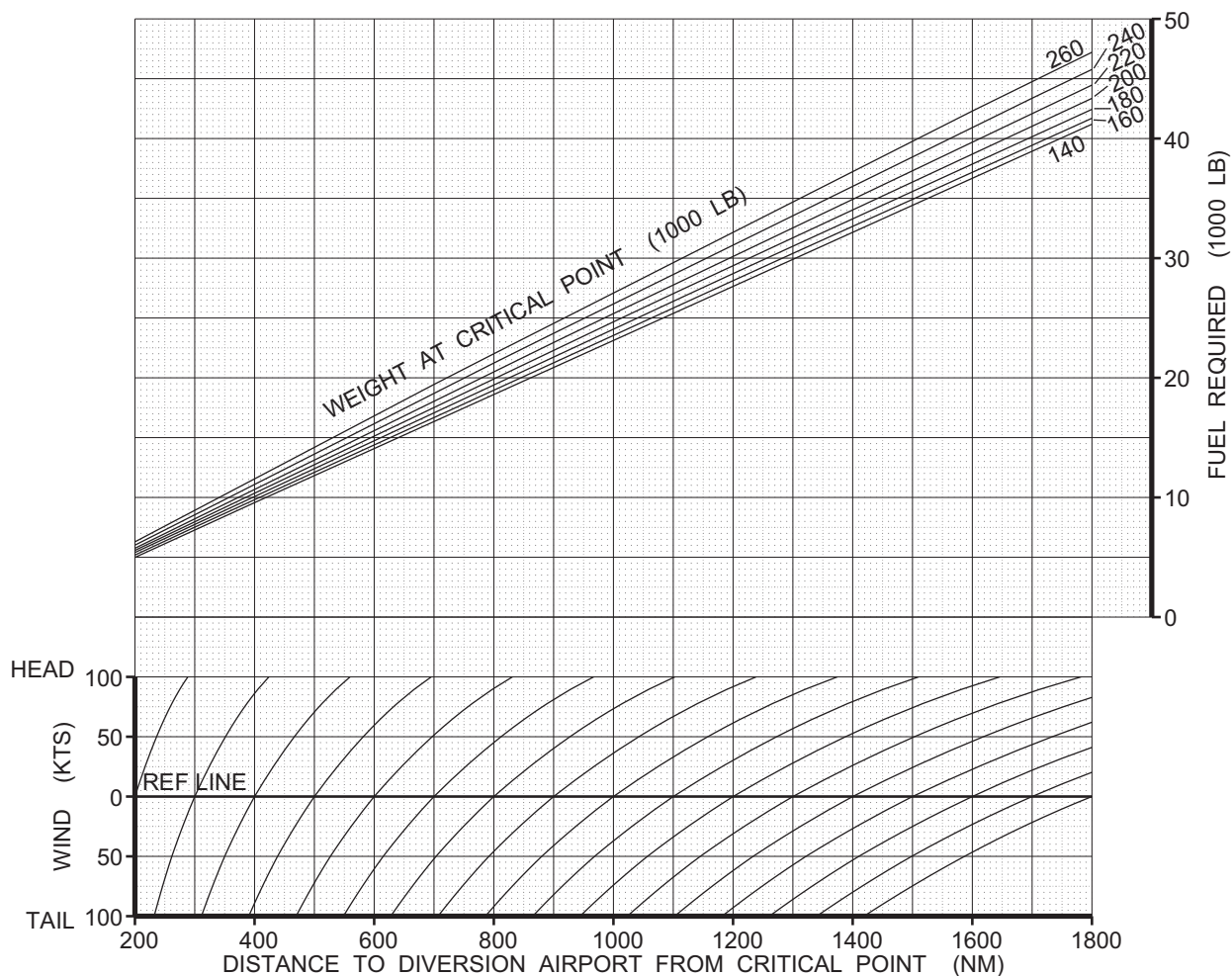
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (7%) for the total forecast time or engine and wing anti-ice on and ice drag (20%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Decompression Critical Fuel Reserves -330 KIAS Cruise



Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land.
 Allowance for performance deterioration not included. Includes APU fuel burn.

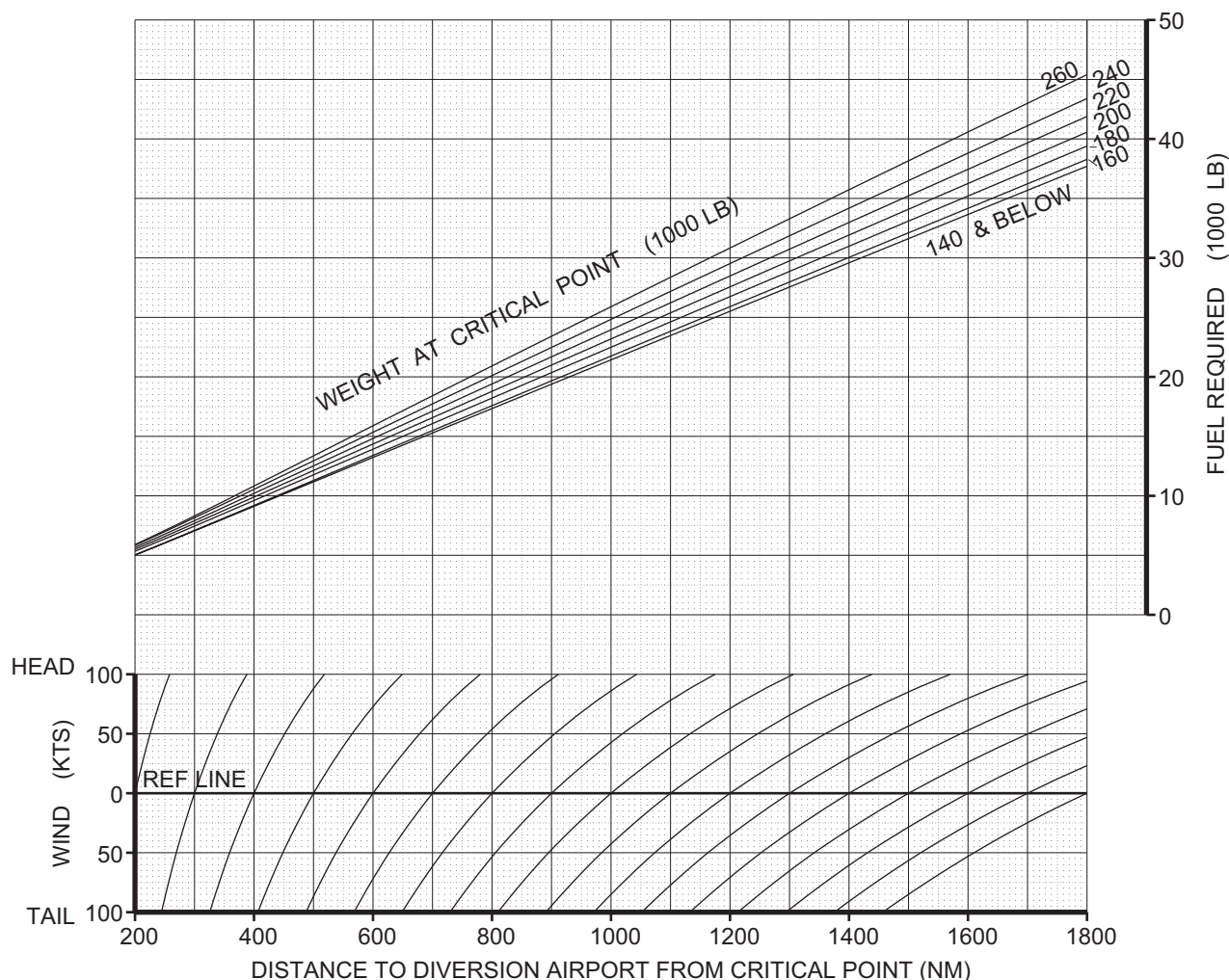
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (6%) for the total forecast time or engine and wing anti-ice on and ice drag (17%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Driftdown Critical Fuel Reserves - .80M/330 KIAS Driftdown/Cruise



Based on: Driftdown to and cruise at level off altitude, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

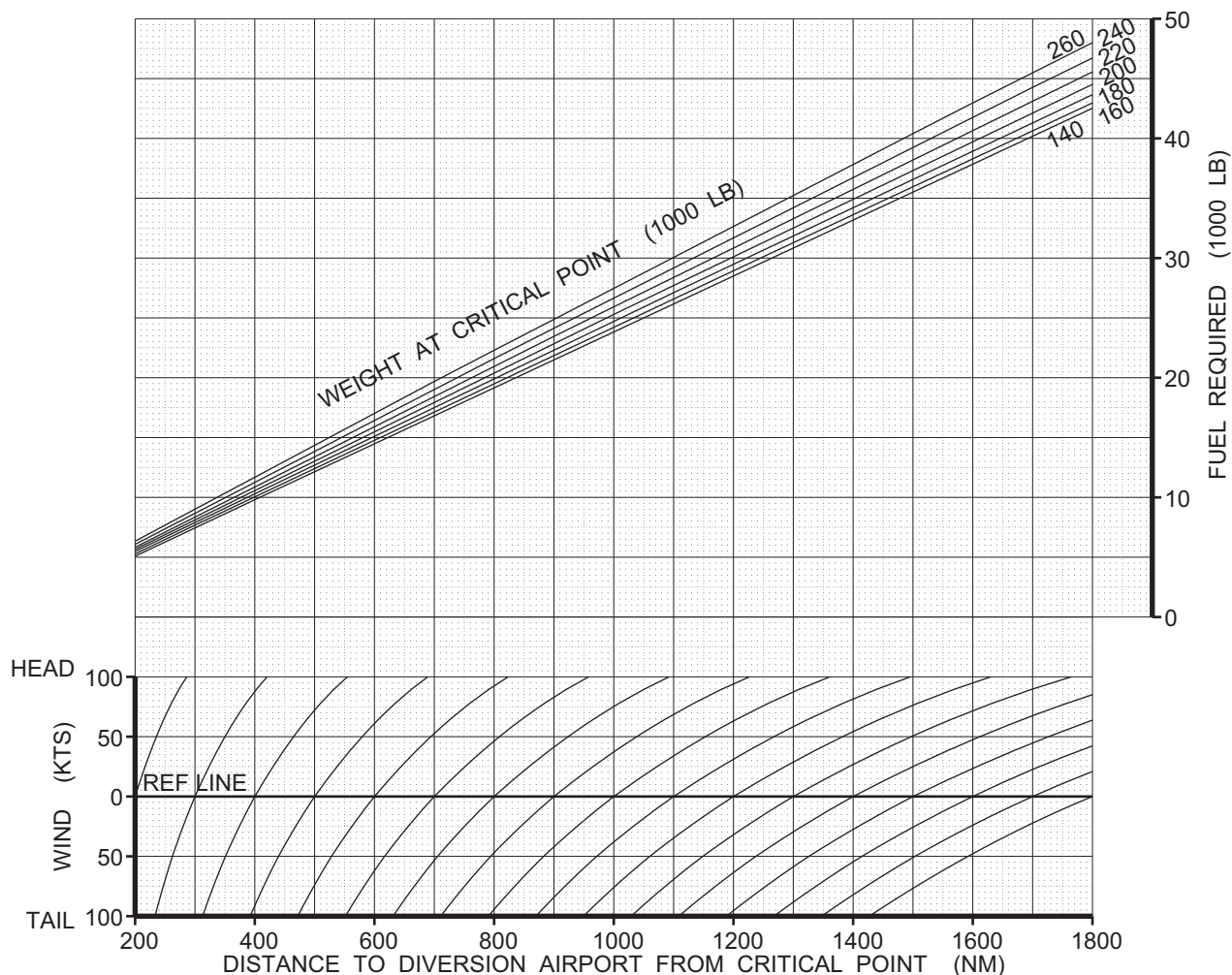
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (8%) for the total forecast time or engine and wing anti-ice on and ice drag (23%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Decompression Critical Fuel Reserves -340 KIAS Cruise



Based on: Emergency descent to 10000 ft, level cruise at 10000 ft, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

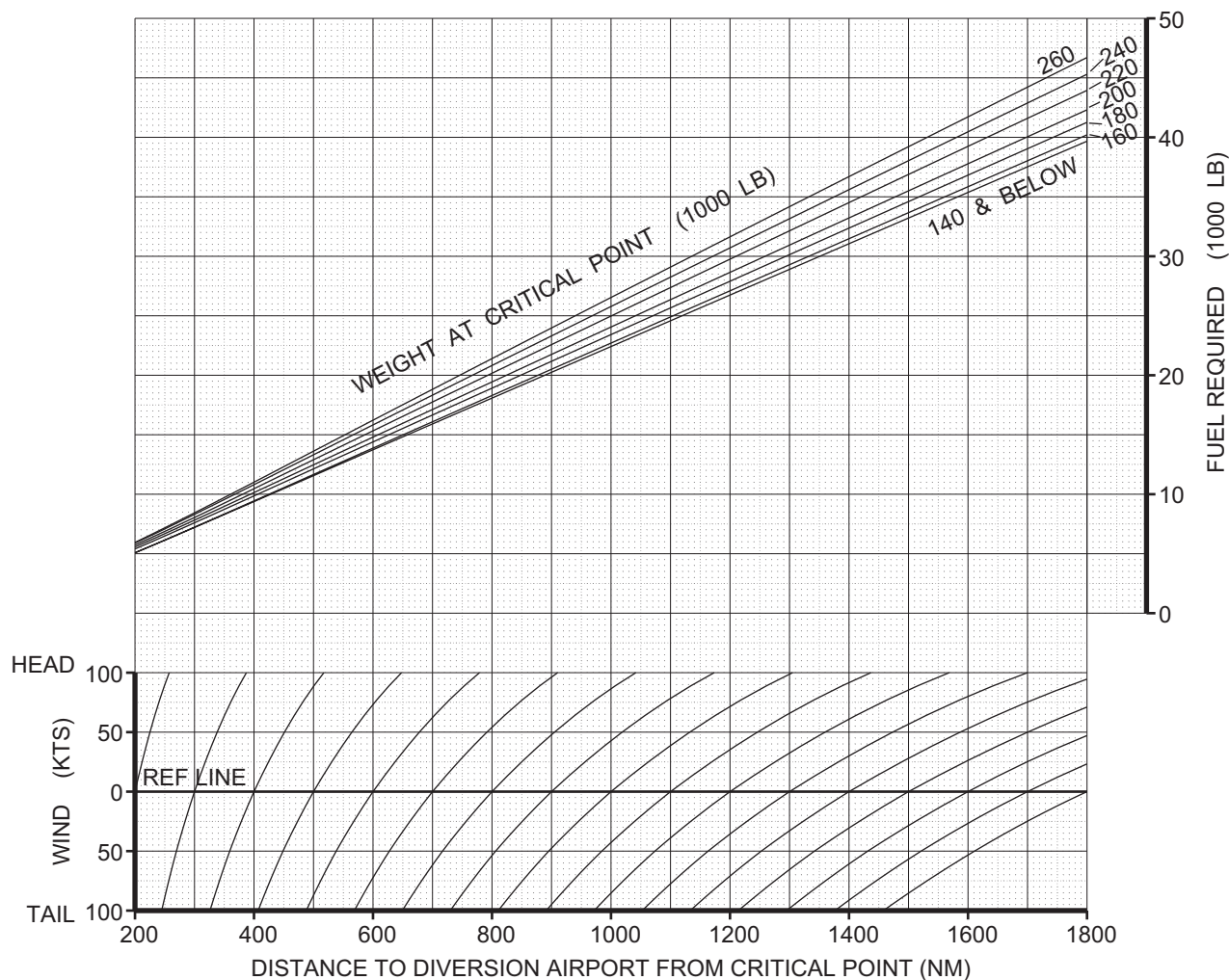
Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (6%) for the total forecast time or engine and wing anti-ice on and ice drag (17%) for 10% of the forecast time.

Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

Driftdown Critical Fuel Reserves - .80M/340 KIAS Driftdown/Cruise



Based on: Driftdown to and cruise at level off altitude, 250 KIAS descent to 1500 ft, 15 minutes hold at 1500 ft, approach and land. Allowance for performance deterioration not included. Includes APU fuel burn.

Adjustments:

- Increase forecast headwind or decrease forecast tailwind by 5% if an acceptable wind forecasting model is used; otherwise, increase diversion fuel by 5% to account for wind errors.
- Increase fuel required by 0.9% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (8%) for the total forecast time or engine and wing anti-ice on and ice drag (23%) for 10% of the forecast time.

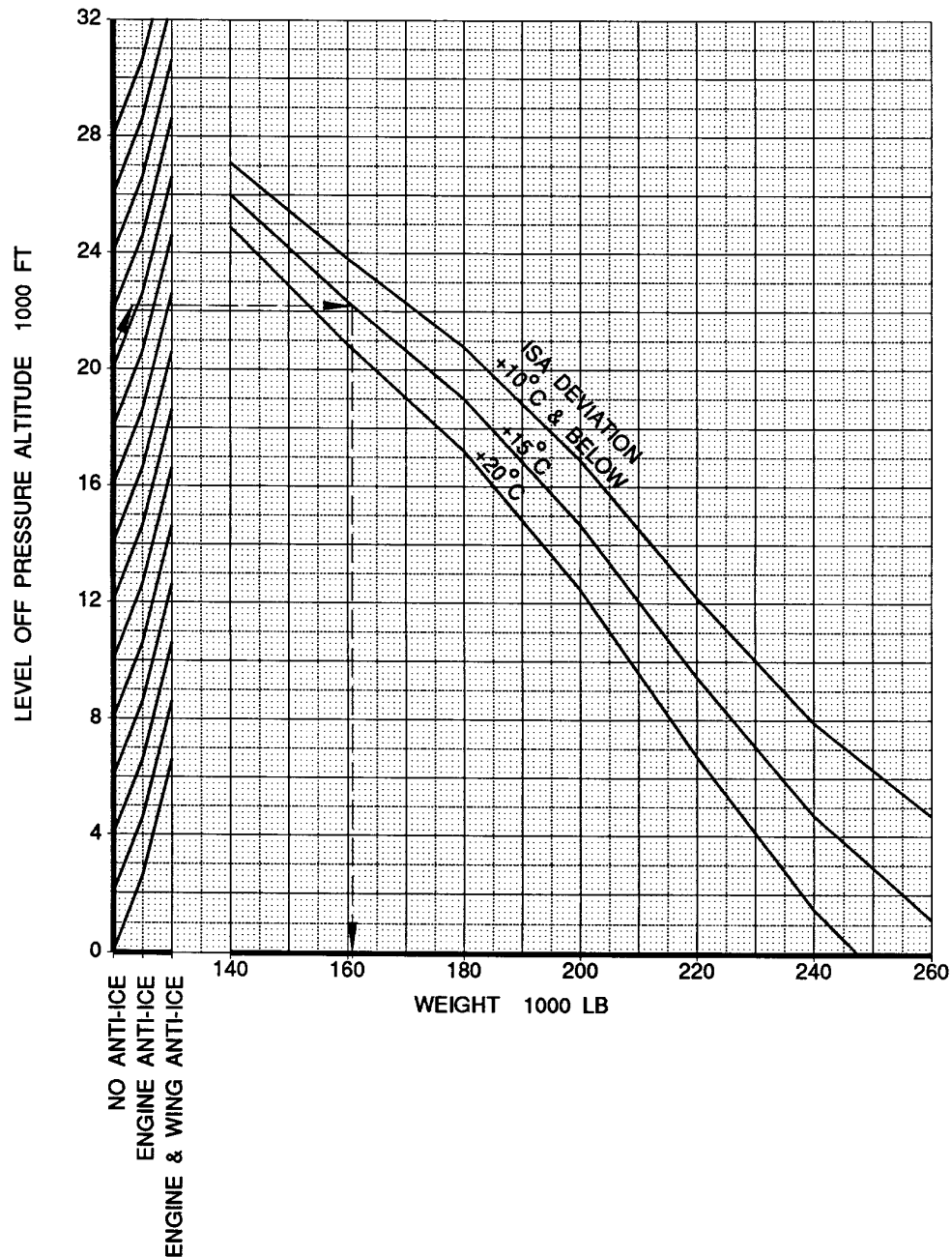
Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Net Level Off Weight

Based on engine bleed for packs on or off and APU on or off

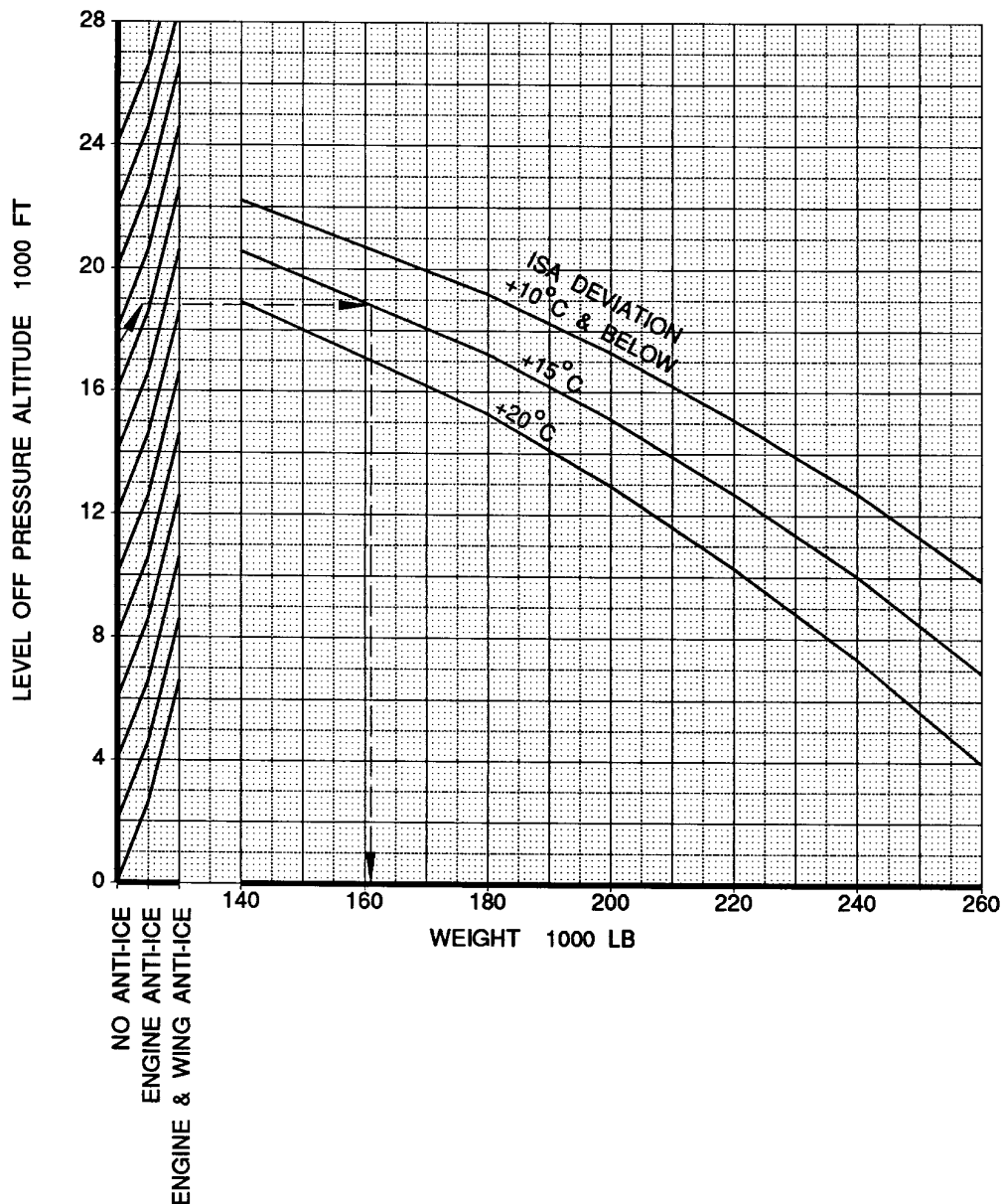


ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Cruise Net Level Off Weight

Based on engine bleed for packs on or off and APU on or off

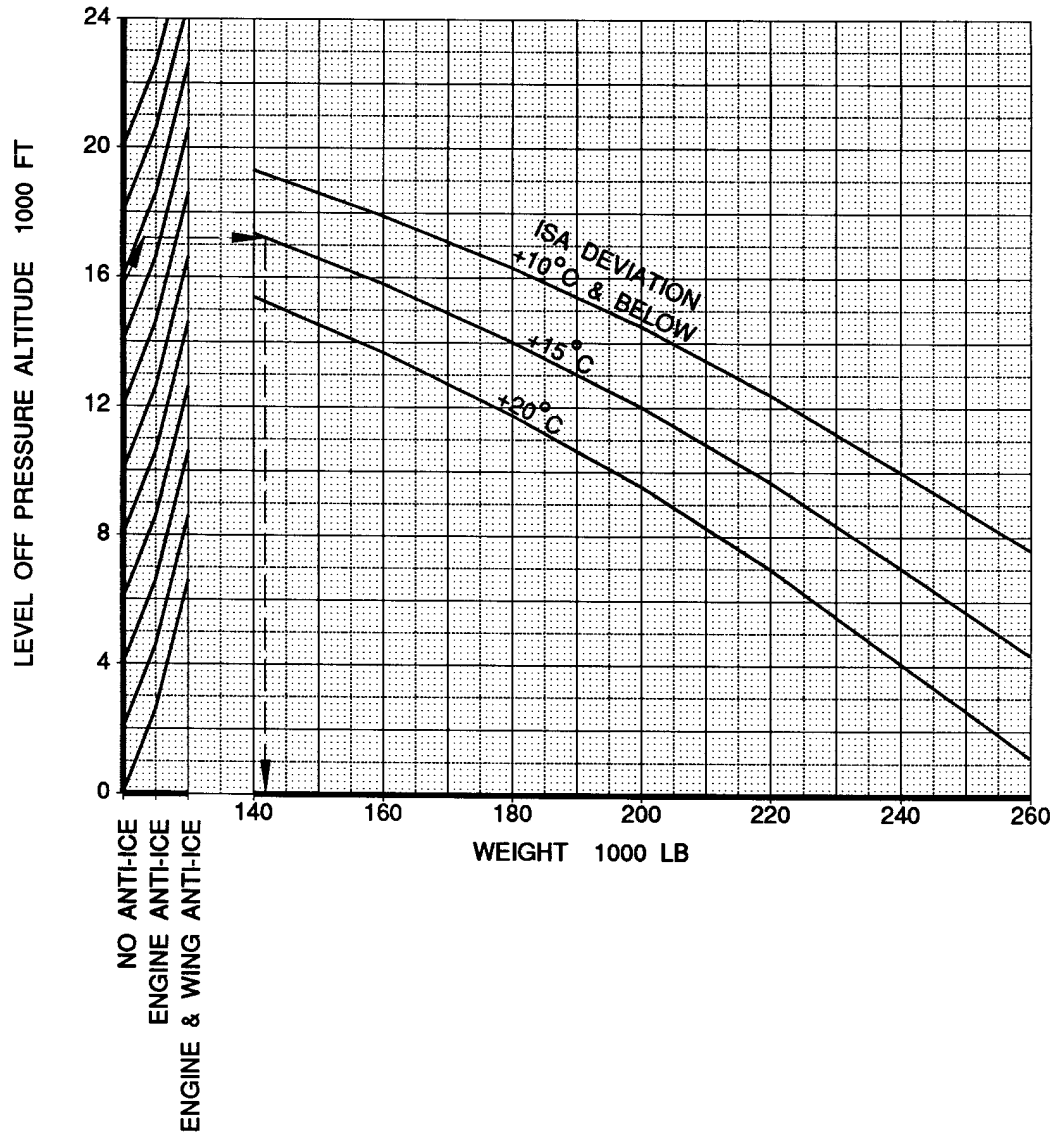


ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Cruise Net Level Off Weight

Based on engine bleed for packs on or off and APU on or off

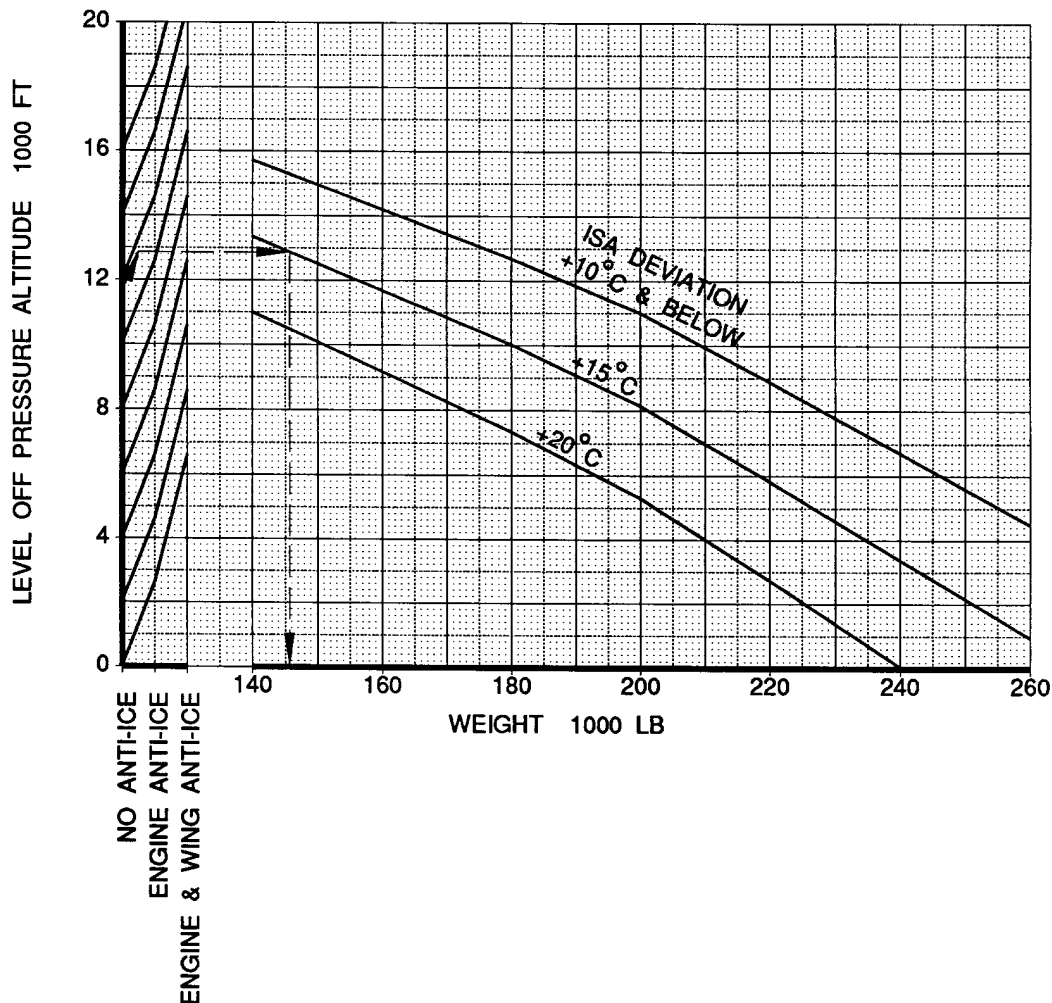


ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Net Level Off Weight

Based on engine bleed for packs on or off and APU on or off

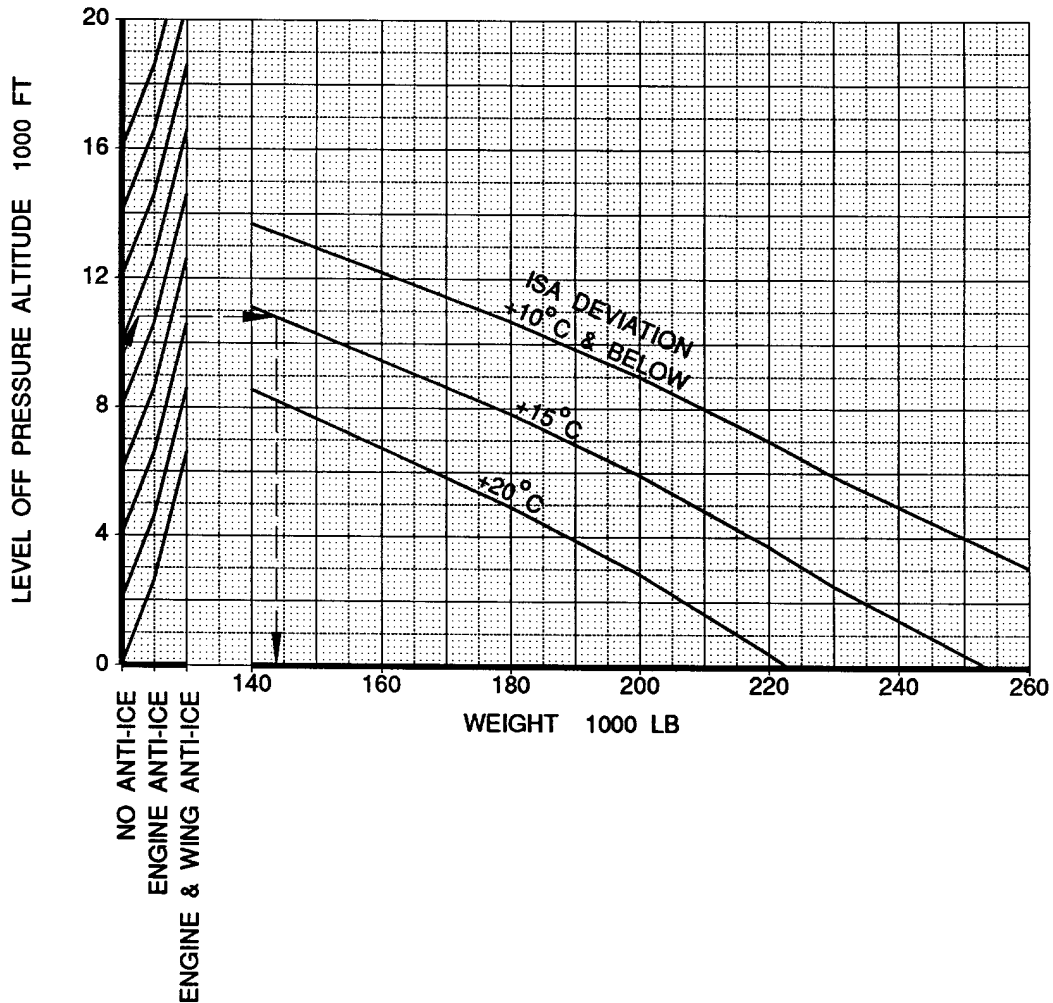


ENGINE INOP

MAX CONTINUOUS THRUST

340 KIAS Cruise Net Level Off Weight

Based on engine bleed for packs on or off and APU on or off

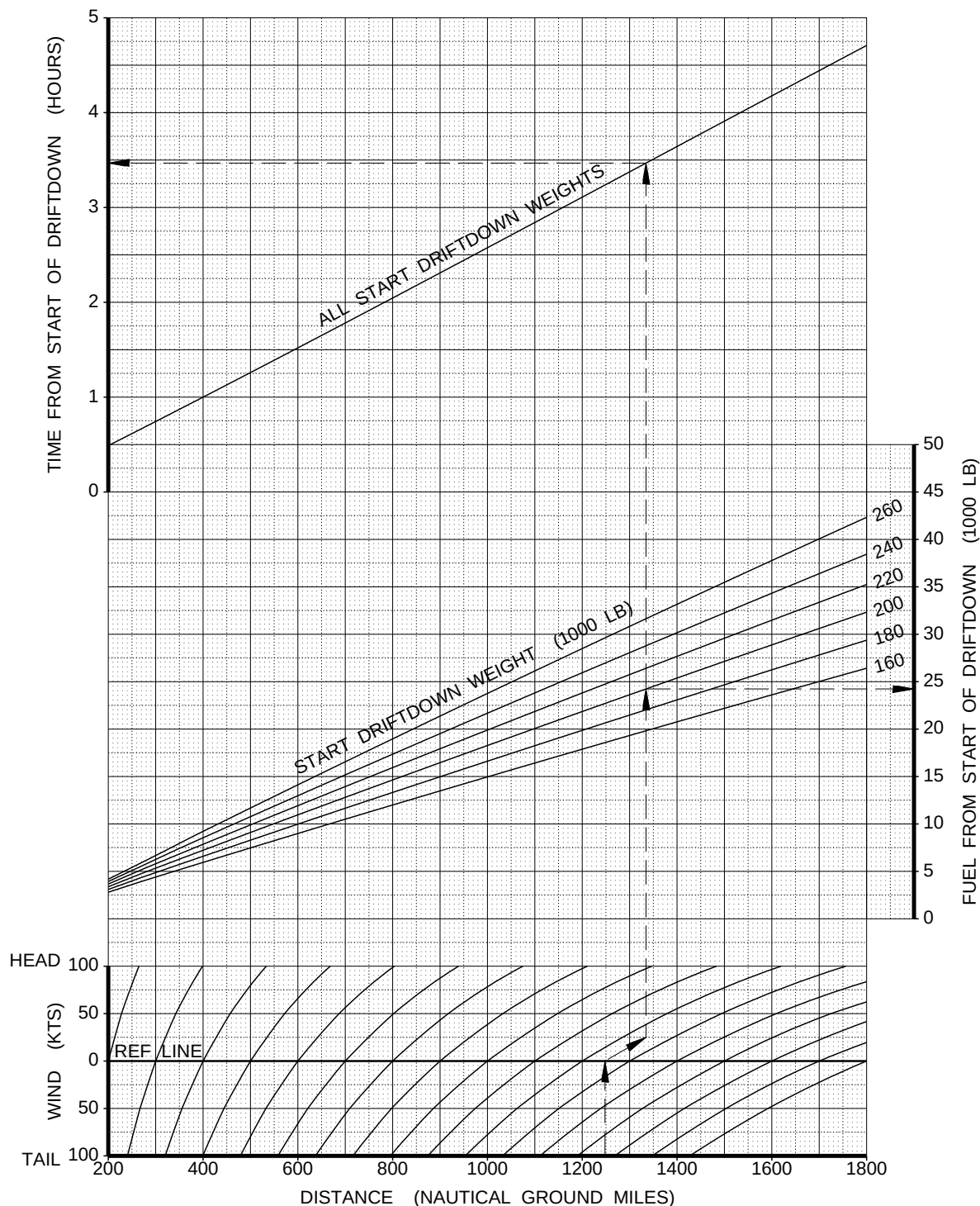


ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Driftdown/Cruise Range Capability

Includes APU fuel burn

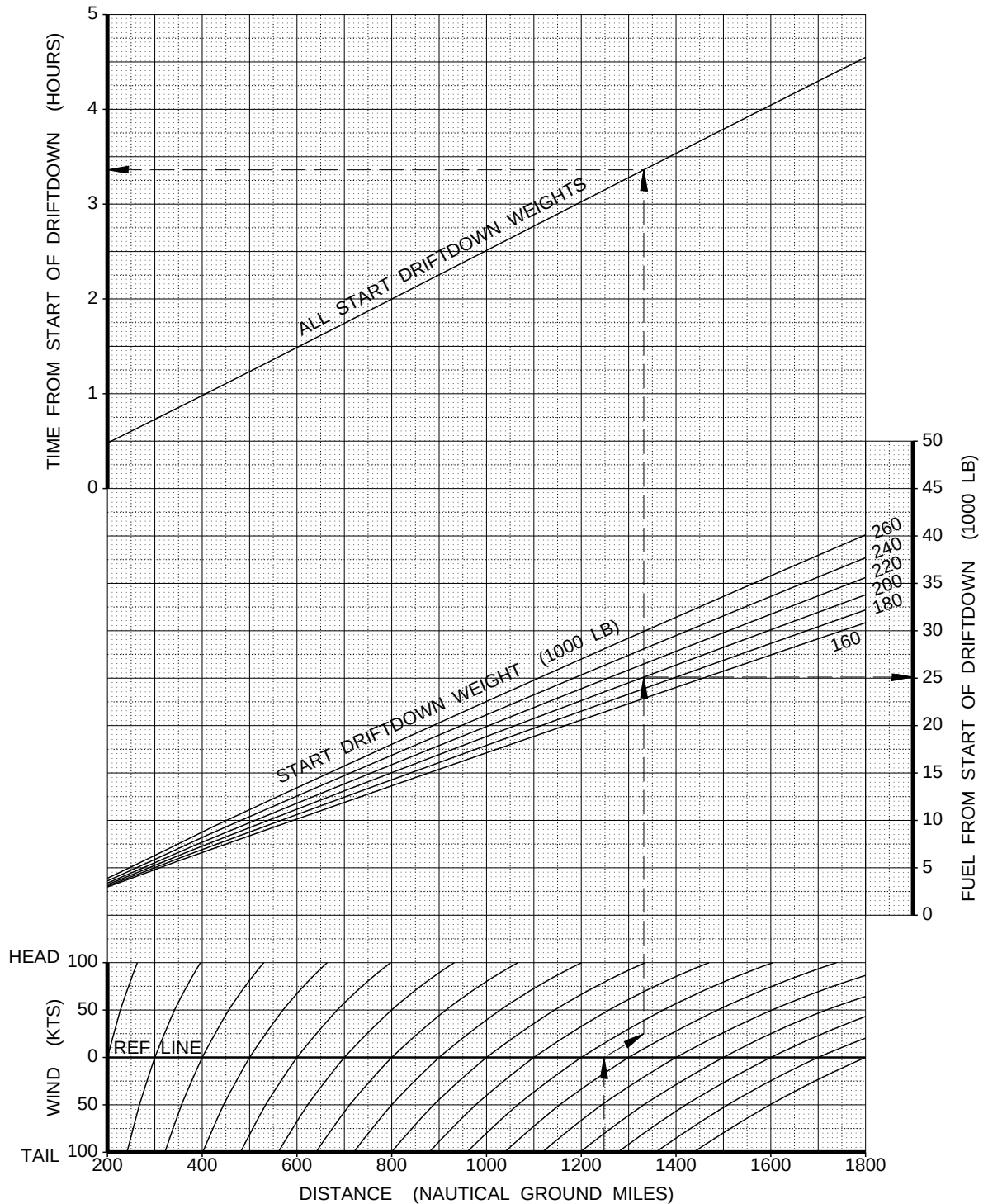


ENGINE INOP

MAX CONTINUOUS THRUST

.78M/290 KIAS Driftdown/Cruise Range Capability

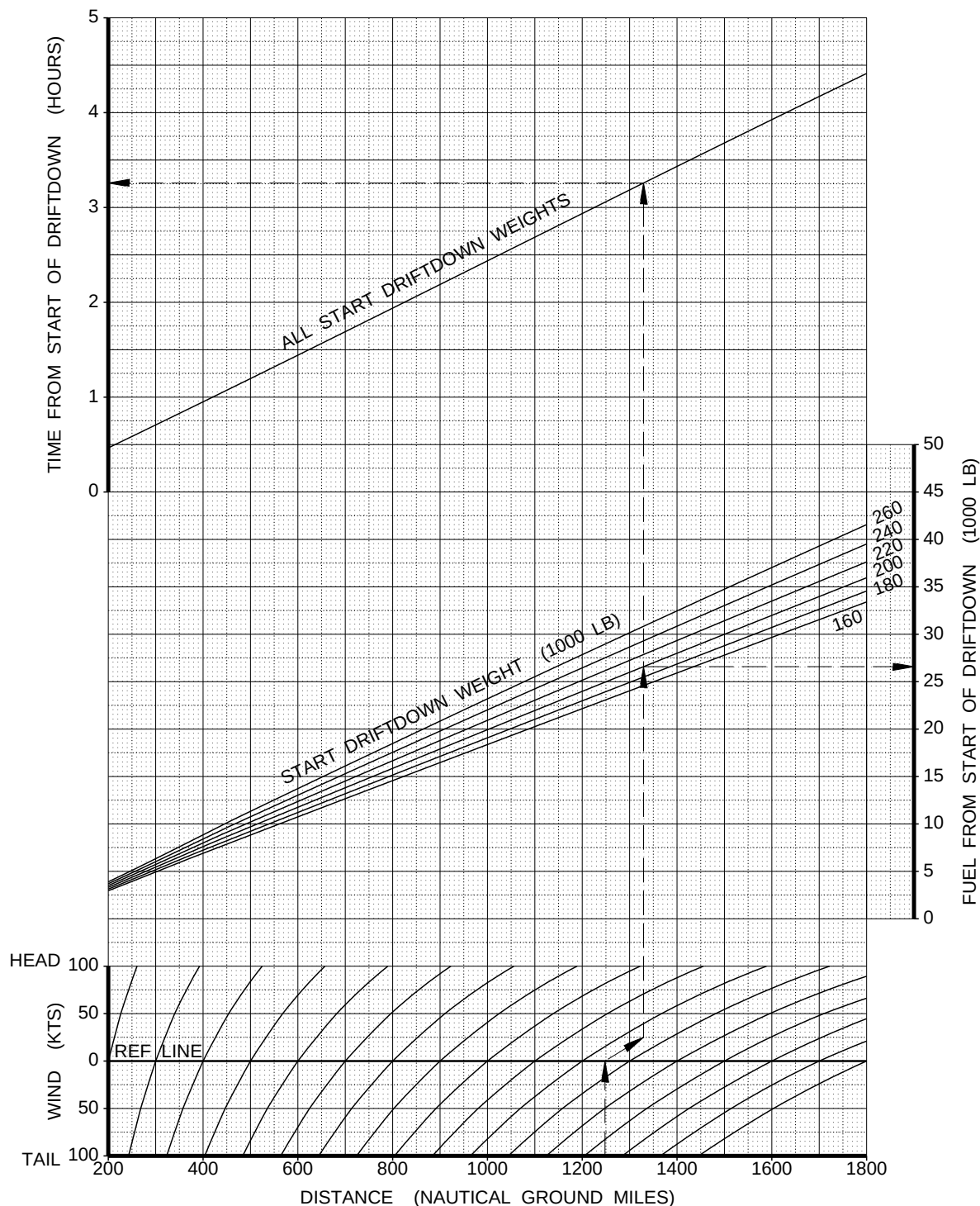
Includes APU fuel burn



ENGINE INOP MAX CONTINUOUS THRUST

.80M/310 KIAS Driftdown/Cruise Range Capability

Includes APU fuel burn

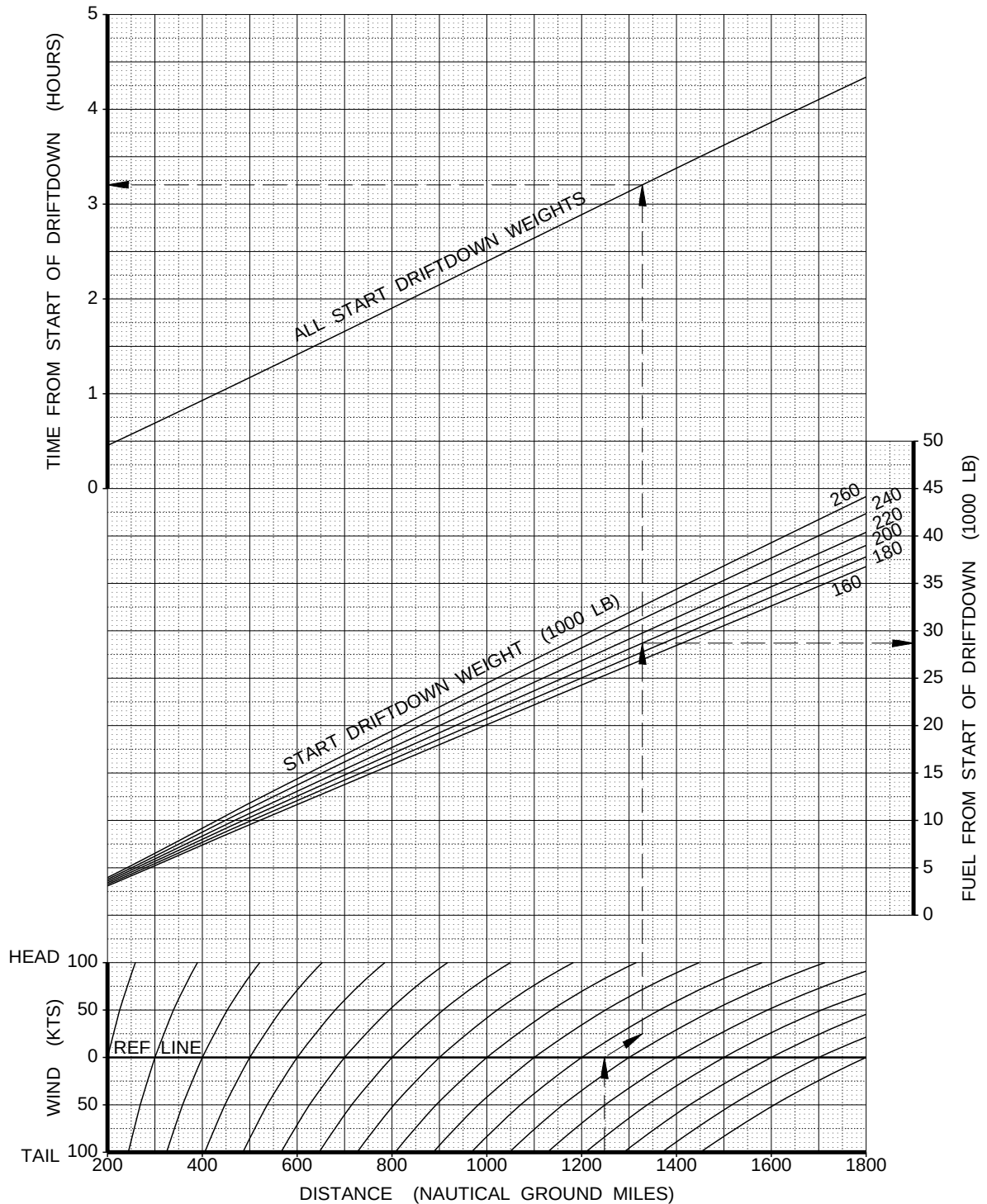


ENGINE INOP

MAX CONTINUOUS THRUST

.80M/330 KIAS Driftdown/Cruise Range Capability

Includes APU fuel burn



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Introduction

This chapter contains inflight data for use as general reference in airplane performance monitoring, flight planning studies and as a supplement to information provided in the Operations Manual.

All Engines

Long Range Cruise Maximum Operating Altitude

These tables provide the maximum operating altitude in the same manner as the FMC. Maximum altitudes are shown for a given cruise weight and maneuver capability. Note that these tables consider both thrust and buffet limits, providing the more limiting of the two. Any data that is thrust limited is denoted by an asterisk and represents only a thrust limited condition in level flight with maximum cruise thrust at 0 ft/min residual rate of climb or maximum climb thrust at 100 ft/min residual rate of climb. Flying above these altitudes with sustained banks in excess of approximately 12° may cause the airplane to lose speed and/or altitude.

Note that optimum altitudes shown in the tables result in buffet related maneuver margins of 1.5g (48° bank) or more. The altitudes shown in the tables are limited to the maximum certified altitude of 42000 ft.

Enroute Climb

The Enroute Climb charts are based on 290/.78 climb speed. Local ATC may require that 250 KIAS not be exceeded below 10000 ft. See Flight Planning Allowances in Chapter 2 for additional fuel burn when this restriction is imposed.

Long Range Cruise Enroute Fuel and Time

These charts are provided to determine if the fuel remaining is sufficient to complete the trip at Long Range Cruise and to approximate the time remaining. The charts also enable rapid determination of fuel and time required to proceed to an alternate airfield.

Fuel and time are read in a similar manner to the Long Range Cruise trip fuel and time charts in Chapter 2 with distance to destination replacing total trip distance; i.e., climb phase is excluded.

Cruise Table

Cruise tables are provided for Long Range Cruise and .80M speed schedules with both engines operating assuming normal engine bleed for air conditioning (2 bleeds/2 packs on). These tables are similar to the cruise control tables presented in the Performance Inflight chapter of the QRH and are expanded to include true airspeed and Max Cruise Thrust setting information.

To account for APU fuel burn, refer to the APU Operation During Flight table in the chapter 2 text.

Wind-Altitude Trade

Wind is a factor which may justify operations considerably above or below optimum altitude. For example, a favorable wind component may have an effect on ground speed which more than compensates for the loss in air range.

Using the applicable table, it is possible to determine the break-even wind (advantage necessary or disadvantage that can be tolerated) to maintain the same range at another altitude. Tables are provided for Long Range Cruise and .80M. The tables make no allowance for climb or descent time, fuel or distance, and are based on comparing ground fuel mileage.

Descent

Time, fuel, and distance for descent are shown for a .78/290/250 speed schedule. This data includes the effect of a 250 KIAS speed restriction below 10000 ft and includes a straight in approach with flaps down at the outer marker.

Holding

EPR required, indicated airspeed and fuel flow information are tabulated for holding at flaps up based on the recommended holding speeds. Small variations in airspeed will not appreciably affect the overall endurance time. The fuel flow is based on a racetrack holding pattern. For holding in straight and level flight, these values may be reduced by 5%.

Engine Inoperative

Altitude Capability

The Engine Inoperative Altitude Capability tables are based on the thrust limited capability with 100 ft/min residual rate of climb. For the engine inoperative case, buffet capability is not considered limiting. Tables are shown for Long Range Cruise and constant speeds of 290, 310, and 330 KIAS for both Max Continuous and Max Cruise Thrust. Adjust the table values for thermal anti-ice operation as shown below the tables.

Cruise Table

Cruise tabulations for engine inoperative are based on use of Max Continuous Thrust. A heavy line is shown to denote the approximate Max Cruise Thrust limits. Tables are provided for Long Range Cruise and constant speeds of 290, 310, and 330 KIAS. The fuel flow values in these tables reflect only the engine fuel burn. To conservatively account for APU fuel burn, refer to the APU Operation During Flight table in the chapter 2 text.

Diversion Fuel and Time

These charts enable rapid determination of fuel and time required to proceed to an alternate airfield (or continue to destination) with one engine inoperative. Data are shown for Long Range Cruise and constant speeds of 290, 310 and 330 KIAS. The fuel required is based on cruise plus descent with straight in approach to touchdown. Diversion fuel and time are determined in a manner similar to the All Engine Long Range Cruise Enroute Fuel and Time chart.

Holding

EPR required, indicated airspeed and fuel flow are shown for one engine inoperative holding based on the recommended speeds described earlier in this chapter. The fuel flow is based on a racetrack holding pattern and may be reduced by 5% for holding in straight and level flight.

Long Range Cruise Maximum Operating Altitude

ISA + 10°C and Below

WEIGHT (1000 LB)	OPTIMUM ALT (FT)	TAT (°C)	MARGIN TO INITIAL BUFFET 'G' (BANK ANGLE)				
			1.20 (33°)	1.25 (36°)	1.30 (39°)	1.40 (44°)	1.50 (48°)
260	31100	-6	34700*	34700*	34700	33100	31600
250	31900	-8	35800*	35800*	35500	33900	32500
240	32800	-10	36700*	36700*	36300	34800	33300
230	33700	-12	37500*	37500*	37200	35700	34200
220	34700	-14	38400*	38400*	38100	36600	35200
210	35600	-17	39300*	39300*	39100	37600	36100
200	36600	-18	40200*	40200*	40100	38600	37200
190	37700	-18	41200*	41200*	41200	39700	38200
180	38800	-18	42000	42000	42000	40800	39400
170	40000	-18	42000	42000	42000	42000	40500
160	41300	-18	42000	42000	42000	42000	41800
150	42000	-18	42000	42000	42000	42000	42000
140	42000	-18	42000	42000	42000	42000	42000

ISA + 15°C

WEIGHT (1000 LB)	OPTIMUM ALT (FT)	TAT (°C)	MARGIN TO INITIAL BUFFET 'G' (BANK ANGLE)				
			1.20 (33°)	1.25 (36°)	1.30 (39°)	1.40 (44°)	1.50 (48°)
260	31100	-1	33100*	33100*	33100*	33100	31600
250	31900	-3	34400*	34400*	34400*	33900	32500
240	32800	-5	35700*	35700*	35700*	34800	33300
230	33700	-7	36700*	36700*	36700*	35700	34200
220	34700	-9	37500*	37500*	37500*	36600	35200
210	35600	-11	38400*	38400*	38400*	37600	36100
200	36600	-12	39300*	39300*	39300*	38600	37200
190	37700	-12	40300*	40300*	40300*	39700	38200
180	38800	-12	41300*	41300*	41300*	40800	39400
170	40000	-12	42000	42000	42000	42000	40500
160	41300	-12	42000	42000	42000	42000	41800
150	42000	-12	42000	42000	42000	42000	42000
140	42000	-12	42000	42000	42000	42000	42000

ISA + 20°C

WEIGHT (1000 LB)	OPTIMUM ALT (FT)	TAT (°C)	MARGIN TO INITIAL BUFFET 'G' (BANK ANGLE)				
			1.20 (33°)	1.25 (36°)	1.30 (39°)	1.40 (44°)	1.50 (48°)
260	31100	5	30600*	30600*	30600*	30600*	30600*
250	31900	3	32100*	32100*	32100*	32100*	32100*
240	32800	1	33700*	33700*	33700*	33700*	33300
230	33700	-1	35200*	35200*	35200*	35200*	34200
220	34700	-3	36400*	36400*	36400*	36400*	35200
210	35600	-5	37300*	37300*	37300*	37300*	36100
200	36600	-6	38200*	38200*	38200*	38200*	37200
190	37700	-6	39200*	39200*	39200*	39200*	38200
180	38800	-6	40200*	40200*	40200*	40200*	39400
170	40000	-6	41200*	41200*	41200*	41200*	40500
160	41300	-6	42000	42000	42000	42000	41800
150	42000	-6	42000	42000	42000	42000	42000
140	42000	-6	42000	42000	42000	42000	42000

*Denotes altitude thrust limited in level flight.

290/.78 Enroute Climb
ISA & Below

PRESSURE ALTITUDE FT	UNITS MIN/LB NAM/KNOTS	BRAKE RELEASE WEIGHT LB										
		260000	250000	240000	230000	220000	210000	200000	180000	160000	140000	120000
42000	TIME/FUEL DIST/TAS								22/ 4800 140/413	17/ 4000 110/409	14/ 3300 89/407	11/ 2700 73/405
41000	TIME/FUEL DIST/TAS							26/ 5700 168/415	20/ 4600 126/409	16/ 3800 102/407	13/ 3200 84/405	10/ 2700 69/403
40000	TIME/FUEL DIST/TAS						27/ 5900 170/413	23/ 5300 146/410	19/ 4400 116/406	15/ 3700 95/404	12/ 3100 79/402	10/ 2600 65/401
39000	TIME/FUEL DIST/TAS					27/ 6200 171/411	24/ 5500 148/408	22/ 5000 132/406	18/ 4300 108/404	15/ 3600 90/402	12/ 3100 75/400	9/ 2600 62/399
38000	TIME/FUEL DIST/TAS			33/ 7400 214/414	27/ 6400 171/409	24/ 5800 150/406	22/ 5300 134/404	20/ 4800 121/403	17/ 4100 107/401	14/ 3500 85/399	11/ 3000 71/398	9/ 2500 59/397
37000	TIME/FUEL DIST/TAS		33/ 7500 207/411	28/ 6600 172/407	25/ 6000 152/404	23/ 5500 137/403	21/ 5100 124/401	19/ 4700 113/400	16/ 4000 95/398	13/ 3400 80/397	11/ 2900 67/396	8/ 2400 56/394
36000	TIME/FUEL DIST/TAS	33/ 7700 206/409	28/ 6800 175/405	25/ 6200 155/403	23/ 5700 139/401	21/ 5300 127/400	20/ 4900 116/398	18/ 4500 106/398	15/ 3900 90/396	13/ 3300 76/395	10/ 2800 64/393	8/ 2400 53/392
35000	TIME/FUEL DIST/TAS	29/ 7100 179/404	26/ 6500 159/401	24/ 6000 143/399	22/ 5500 130/398	20/ 5100 119/397	19/ 4800 109/396	17/ 4400 101/395	15/ 3800 86/394	12/ 3300 73/392	10/ 2800 61/391	8/ 2300 51/390
34000	TIME/FUEL DIST/TAS	27/ 6700 163/399	25/ 6200 147/398	23/ 5700 134/396	21/ 5300 122/395	19/ 5000 112/394	18/ 4600 104/393	17/ 4300 96/392	14/ 3700 81/391	12/ 3200 69/390	10/ 2700 59/389	8/ 2300 49/388
33000	TIME/FUEL DIST/TAS	25/ 6500 151/396	23/ 6000 137/394	22/ 5500 125/393	20/ 5200 115/392	19/ 4800 106/391	17/ 4500 98/390	16/ 4200 91/390	14/ 3600 77/388	11/ 3100 66/387	9/ 2700 56/386	7/ 2200 47/385
32000	TIME/FUEL DIST/TAS	24/ 6200 140/392	22/ 5800 128/391	21/ 5400 118/390	19/ 5000 109/389	18/ 4700 100/388	17/ 4400 93/387	15/ 4100 86/387	13/ 3500 74/386	11/ 3000 63/384	9/ 2600 53/383	7/ 2200 45/382
31000	TIME/FUEL DIST/TAS	23/ 6000 131/388	21/ 5600 120/387	20/ 5200 111/386	18/ 4900 103/385	17/ 4500 95/385	16/ 4200 88/384	15/ 4000 82/384	13/ 3400 70/382	11/ 3000 60/381	9/ 2500 51/380	7/ 2100 43/379
30000	TIME/FUEL DIST/TAS	21/ 5700 120/383	20/ 5300 111/382	19/ 5000 102/381	17/ 4700 95/381	16/ 4400 88/380	15/ 4100 82/380	14/ 3800 76/379	12/ 3300 65/378	10/ 2900 56/377	8/ 2500 48/376	6/ 2100 40/375
29000	TIME/FUEL DIST/TAS	20/ 5500 110/378	19/ 5100 102/377	17/ 4800 95/377	16/ 4500 88/376	15/ 4200 82/376	14/ 3900 76/375	13/ 3700 71/375	12/ 3200 61/374	10/ 2800 52/373	8/ 2400 44/372	6/ 2000 37/371
28000	TIME/FUEL DIST/TAS	19/ 5200 102/373	18/ 4900 94/373	16/ 4600 88/372	15/ 4300 81/372	15/ 4000 76/371	14/ 3800 71/371	13/ 3500 66/371	11/ 3100 57/370	9/ 2700 49/369	7/ 2300 41/368	6/ 1900 35/367
27000	TIME/FUEL DIST/TAS	18/ 5000 94/369	17/ 4700 87/368	16/ 4400 81/368	15/ 4100 75/368	14/ 3900 70/367	13/ 3600 66/367	12/ 3400 61/366	11/ 3000 53/366	9/ 2600 45/365	7/ 2200 39/364	5/ 1900 32/363
26000	TIME/FUEL DIST/TAS	17/ 4800 86/365	16/ 4500 80/364	15/ 4200 75/364	14/ 4000 70/364	13/ 3700 65/363	12/ 3500 61/363	11/ 3300 57/363	10/ 2900 49/362	8/ 2500 42/361	7/ 2100 36/360	5/ 1800 30/359
25000	TIME/FUEL DIST/TAS	16/ 4600 80/361	15/ 4300 74/360	14/ 4100 69/360	13/ 3800 65/360	12/ 3600 61/359	12/ 3400 57/359	11/ 3200 53/359	10/ 2800 46/358	8/ 2400 39/357	6/ 2100 34/356	5/ 1700 28/355
24000	TIME/FUEL DIST/TAS	15/ 4400 74/357	14/ 4100 69/357	13/ 3900 64/356	12/ 3700 60/356	12/ 3500 56/356	11/ 3300 53/355	10/ 3000 49/355	9/ 2700 43/354	7/ 2300 37/354	6/ 2000 31/353	4/ 1700 26/352
23000	TIME/FUEL DIST/TAS	14/ 4200 68/353	13/ 4000 64/353	13/ 3700 59/353	12/ 3500 56/352	11/ 3300 52/352	10/ 3100 49/352	10/ 2900 45/352	9/ 2600 39/351	7/ 2200 34/350	6/ 1900 29/349	4/ 1600 24/348
22000	TIME/FUEL DIST/TAS	13/ 4000 63/350	13/ 3800 59/349	12/ 3600 55/349	11/ 3400 51/349	11/ 3200 48/349	10/ 3000 45/348	9/ 2800 42/348	8/ 2500 37/347	7/ 2100 32/347	5/ 1800 27/346	4/ 1600 23/345
21000	TIME/FUEL DIST/TAS	13/ 3800 58/346	12/ 3600 54/346	11/ 3400 51/346	11/ 3200 48/345	10/ 3100 45/345	9/ 2900 42/345	9/ 2700 39/345	8/ 2400 34/344	6/ 2100 29/343	5/ 1800 25/343	4/ 1500 21/341
20000	TIME/FUEL DIST/TAS	12/ 3700 53/343	11/ 3500 50/343	11/ 3300 47/342	10/ 3100 44/342	9/ 2900 41/342	9/ 2800 39/342	8/ 2600 36/342	7/ 2300 31/341	6/ 2000 27/340	5/ 1700 23/339	3/ 1400 20/338
19000	TIME/FUEL DIST/TAS	11/ 3500 49/340	11/ 3300 46/339	10/ 3100 43/339	9/ 3000 40/339	9/ 2800 38/339	8/ 2700 36/339	8/ 2500 33/338	7/ 2200 29/338	6/ 1900 25/337	4/ 1600 21/336	3/ 1400 18/335
18000	TIME/FUEL DIST/TAS	11/ 3400 45/337	10/ 3200 42/336	9/ 3000 40/336	9/ 2800 37/336	8/ 2700 35/336	8/ 2500 33/336	8/ 2400 31/335	7/ 2100 27/335	5/ 1800 23/334	4/ 1600 20/333	3/ 1300 17/332
16000	TIME/FUEL DIST/TAS	9/ 3000 37/331	9/ 2900 35/330	8/ 2700 33/330	8/ 2600 31/330	8/ 2500 29/330	7/ 2300 27/330	7/ 2200 26/329	6/ 1900 22/329	5/ 1700 19/328	4/ 1400 17/327	3/ 1200 14/326
14000	TIME/FUEL DIST/TAS	8/ 2700 31/325	8/ 2600 29/325	7/ 2500 27/325	7/ 2300 26/324	7/ 2200 24/324	6/ 2100 23/324	6/ 2000 21/324	5/ 1700 18/323	4/ 1500 16/323	3/ 1300 14/322	2/ 1100 12/320
12000	TIME/FUEL DIST/TAS	7/ 2400 25/319	7/ 2300 23/319	6/ 2200 22/319	6/ 2100 21/319	6/ 2000 19/319	6/ 1900 18/319	5/ 1800 17/318	5/ 1600 15/318	4/ 1400 13/317	3/ 1200 11/316	2/ 1000 9/315
10000	TIME/FUEL DIST/TAS	6/ 2200 19/314	6/ 2100 18/314	6/ 2000 17/314	5/ 1900 16/314	5/ 1800 15/314	5/ 1700 14/314	5/ 1600 13/313	4/ 1400 12/313	3/ 1200 10/312	2/ 1100 9/311	1/ 900 7/309
5000	TIME/FUEL DIST/TAS	4/ 1400 7/303	4/ 1400 7/302	4/ 1300 6/302	4/ 1300 6/302	3/ 1200 6/302	3/ 1200 5/302	3/ 1100 5/302	3/ 1000 4/301	2/ 800 4/300	1/ 700 3/299	1/ 600 3/297
1500	TIME/FUEL	3/ 1000	2/ 900	2/ 900	2/ 900	2/ 800	2/ 800	2/ 800	2/ 700	1/ 600	1/ 500	0/ 400

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS				AIRPORT ELEVATION	2000	4000	6000	8000	10000	12000
EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE				FUEL ADJUSTMENT	-200	-400	-600	-800	-1000	-1300



Flight Planning and Performance Manual

290/.78 Enroute Climb
ISA + 10°C

PRESSURE ALTITUDE FT	UNITS MIN/LB NAM/KNOTS	BRAKE RELEASE WEIGHT LB										
		260000	250000	240000	230000	220000	210000	200000	180000	160000	140000	120000
42000	TIME/FUEL DIST/TAS								23/ 5100 147/422	18/ 4200 115/418	14/ 3500 94/416	11/ 2900 76/414
41000	TIME/FUEL DIST/TAS							27/ 6000 177/424	21/ 4800 133/418	17/ 4000 107/415	13/ 3400 88/413	10/ 2800 72/412
40000	TIME/FUEL DIST/TAS						28/ 6200 179/422	24/ 5600 153/419	19/ 4600 122/415	16/ 3900 100/413	13/ 3300 83/411	10/ 2700 68/409
39000	TIME/FUEL DIST/TAS					28/ 6500 179/420	25/ 5800 155/417	22/ 5300 138/415	18/ 4400 113/412	15/ 3800 94/410	12/ 3200 78/409	10/ 2700 65/407
38000	TIME/FUEL DIST/TAS			34/ 7800 225/423	28/ 6700 180/418	25/ 6000 157/415	23/ 5500 141/413	21/ 5100 127/412	17/ 4300 106/409	14/ 3700 89/408	12/ 3100 74/406	9/ 2600 62/405
37000	TIME/FUEL DIST/TAS		34/ 7900 218/420	29/ 6900 181/416	26/ 6300 160/413	23/ 5700 143/411	21/ 5300 130/410	19/ 4900 119/409	17/ 4200 100/407	14/ 3600 84/405	11/ 3000 71/404	9/ 2500 59/403
36000	TIME/FUEL DIST/TAS	34/ 8100 217/418	29/ 7100 184/414	26/ 6500 163/411	24/ 6000 146/410	22/ 5500 133/408	20/ 5100 122/407	19/ 4700 112/406	16/ 4100 94/404	13/ 3500 80/403	11/ 3000 67/402	8/ 2500 56/400
35000	TIME/FUEL DIST/TAS	30/ 7400 188/412	27/ 6800 167/410	25/ 6200 150/408	23/ 5800 150/408	21/ 5300 125/405	19/ 5000 115/404	18/ 4600 106/403	15/ 4000 90/402	13/ 3400 76/400	10/ 2900 63/399	8/ 2400 54/398
34000	TIME/FUEL DIST/TAS	28/ 7000 171/408	25/ 6500 154/406	23/ 6000 140/404	21/ 5600 128/403	20/ 5200 118/402	18/ 4800 109/401	17/ 4500 100/401	15/ 3900 85/399	12/ 3300 73/398	10/ 2800 61/397	8/ 2400 51/396
33000	TIME/FUEL DIST/TAS	26/ 6700 158/404	24/ 6200 143/402	22/ 5800 131/401	20/ 5400 121/400	19/ 5000 111/399	18/ 4700 103/398	16/ 4400 95/398	14/ 3800 81/396	12/ 3200 69/395	10/ 2800 59/394	7/ 2300 49/393
32000	TIME/FUEL DIST/TAS	25/ 6500 147/400	23/ 6000 134/399	21/ 5600 123/398	20/ 5200 114/397	18/ 4900 105/396	17/ 4500 97/395	16/ 4200 90/395	14/ 3700 77/393	11/ 3200 66/392	9/ 2700 56/391	7/ 2300 47/390
31000	TIME/FUEL DIST/TAS	23/ 6200 137/396	22/ 5800 126/395	20/ 5400 116/394	19/ 5100 107/393	17/ 4700 99/393	16/ 4400 92/392	15/ 4100 85/391	13/ 3600 73/390	11/ 3100 63/389	9/ 2600 53/388	7/ 2200 44/387
30000	TIME/FUEL DIST/TAS	22/ 6000 126/391	20/ 5600 116/390	19/ 5200 107/389	18/ 4900 99/388	17/ 4600 92/388	15/ 4300 86/387	14/ 4000 80/387	13/ 3400 68/386	10/ 3000 59/385	8/ 2500 50/384	6/ 2100 42/383
29000	TIME/FUEL DIST/TAS	20/ 5700 116/386	19/ 5300 107/385	18/ 5000 99/384	17/ 4700 92/384	16/ 4400 85/383	15/ 4100 79/383	14/ 3800 74/382	12/ 3300 64/381	10/ 2900 55/380	8/ 2500 46/379	6/ 2100 39/378
28000	TIME/FUEL DIST/TAS	19/ 5400 106/381	18/ 5100 99/380	17/ 4800 92/380	16/ 4500 85/379	15/ 4200 79/379	14/ 3900 74/378	13/ 3700 69/378	11/ 3200 59/377	9/ 2800 51/376	8/ 2400 43/375	6/ 2000 36/374
27000	TIME/FUEL DIST/TAS	18/ 5200 98/376	17/ 4900 91/376	16/ 4600 85/375	15/ 4300 79/375	14/ 4000 74/374	13/ 3800 69/374	12/ 3500 64/374	11/ 3100 55/373	9/ 2700 47/372	7/ 2300 40/371	5/ 1900 34/370
26000	TIME/FUEL DIST/TAS	17/ 5000 90/372	16/ 4700 84/372	15/ 4400 78/371	14/ 4100 73/371	13/ 3900 68/370	12/ 3600 64/370	12/ 3400 59/370	10/ 3000 51/369	8/ 2600 44/368	7/ 2200 38/367	5/ 1900 32/366
25000	TIME/FUEL DIST/TAS	16/ 4700 83/368	15/ 4500 78/367	14/ 4200 72/367	13/ 4000 68/367	13/ 3700 63/366	12/ 3500 59/366	11/ 3300 55/366	10/ 2900 48/365	8/ 2500 41/364	6/ 2100 35/363	5/ 1800 29/362
24000	TIME/FUEL DIST/TAS	15/ 4500 77/364	14/ 4300 72/364	13/ 4000 67/363	13/ 3800 63/363	12/ 3600 59/363	11/ 3400 55/362	11/ 3200 51/362	9/ 2800 44/361	8/ 2400 38/361	6/ 2100 33/360	5/ 1700 27/358
23000	TIME/FUEL DIST/TAS	14/ 4300 71/360	14/ 4100 66/360	13/ 3900 62/359	12/ 3600 58/359	11/ 3400 54/359	11/ 3200 51/359	10/ 3000 47/358	9/ 2800 41/358	7/ 2300 36/357	6/ 2000 30/356	4/ 1700 25/355
22000	TIME/FUEL DIST/TAS	14/ 4200 65/356	13/ 3900 61/356	12/ 3700 57/356	11/ 3500 54/356	11/ 3300 50/355	10/ 3100 47/355	9/ 2900 44/355	8/ 2500 38/354	7/ 2200 33/353	5/ 1900 28/353	4/ 1600 24/351
21000	TIME/FUEL DIST/TAS	13/ 4000 60/353	12/ 3800 56/353	11/ 3500 53/352	11/ 3400 50/352	10/ 3200 46/352	10/ 3000 43/352	9/ 2800 41/351	8/ 2400 35/351	6/ 2100 31/350	5/ 1800 26/349	4/ 1500 22/348
20000	TIME/FUEL DIST/TAS	12/ 3800 56/349	11/ 3600 52/349	11/ 3400 49/349	10/ 3200 46/349	10/ 3000 43/348	9/ 2900 40/348	9/ 2700 38/347	8/ 2300 33/347	6/ 2000 28/347	5/ 1800 24/346	4/ 1500 20/344
19000	TIME/FUEL DIST/TAS	11/ 3600 51/346	11/ 3400 48/346	10/ 3200 45/346	10/ 3100 42/345	9/ 2900 39/345	9/ 2700 37/345	8/ 2600 35/345	7/ 2300 30/344	6/ 2000 26/343	5/ 1700 22/343	3/ 1400 19/341
18000	TIME/FUEL DIST/TAS	11/ 3500 47/343	10/ 3300 44/343	10/ 3100 41/342	9/ 2900 39/342	9/ 2800 36/342	8/ 2600 34/342	8/ 2500 32/342	7/ 2200 28/341	5/ 1900 24/340	4/ 1600 21/339	3/ 1400 17/338
16000	TIME/FUEL DIST/TAS	9/ 3100 39/337	9/ 3000 37/336	9/ 2800 34/336	8/ 2700 32/336	8/ 2500 30/336	7/ 2400 28/336	7/ 2200 27/336	6/ 2000 23/335	5/ 1700 20/334	4/ 1500 17/333	3/ 1300 15/332
14000	TIME/FUEL DIST/TAS	8/ 2800 32/331	8/ 2700 30/331	8/ 2500 28/331	7/ 2400 27/330	7/ 2300 25/330	6/ 2200 23/330	6/ 2000 22/330	5/ 1800 19/329	4/ 1600 17/329	3/ 1300 14/328	2/ 1100 12/326
12000	TIME/FUEL DIST/TAS	7/ 2500 26/325	7/ 2400 24/325	7/ 2300 23/325	6/ 2200 21/325	6/ 2100 20/325	6/ 1900 19/324	5/ 1800 18/324	5/ 1600 16/324	4/ 1400 13/323	3/ 1200 12/322	2/ 1000 10/320
10000	TIME/FUEL DIST/TAS	6/ 2200 20/320	6/ 2100 19/320	6/ 2000 18/320	5/ 1900 17/320	5/ 1800 16/319	5/ 1700 15/319	5/ 1600 14/319	4/ 1400 12/318	3/ 1200 10/318	2/ 1100 9/317	1/ 900 8/315
5000	TIME/FUEL DIST/TAS	4/ 1500 7/308	4/ 1400 7/308	4/ 1400 7/308	4/ 1300 6/307	3/ 1200 6/307	3/ 1200 5/307	3/ 1100 5/307	3/ 1000 5/306	2/ 900 4/305	1/ 700 3/304	1/ 600 3/302
1500	TIME/FUEL	3/ 1000	2/ 900	2/ 900	2/ 900	2/ 800	2/ 800	2/ 800	2/ 700	1/ 600	1/ 500	0/ 400

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS				AIRPORT ELEVATION	2000	4000	6000	8000	10000	12000
EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE				FUEL ADJUSTMENT	-200	-400	-600	-900	-1100	-1300

290/.78 Enroute Climb
ISA + 15°C

PRESSURE ALTITUDE FT	UNITS MIN/LB NAM/KNOTS	BRAKE RELEASE WEIGHT LB										
		260000	250000	240000	230000	220000	210000	200000	180000	160000	140000	120000
42000	TIME/FUEL DIST/TAS								27/ 5600 179/429	20/ 4500 135/424	16/ 3700 108/421	12/ 3100 87/419
41000	TIME/FUEL DIST/TAS								24/ 5200 157/425	19/ 4300 124/421	15/ 3600 101/419	12/ 3000 82/417
40000	TIME/FUEL DIST/TAS						35/ 7200 233/431	28/ 6100 186/426	22/ 5000 143/421	18/ 4200 116/418	14/ 3500 95/416	11/ 2900 78/415
39000	TIME/FUEL DIST/TAS					35/ 7400 231/428	29/ 6400 188/424	25/ 5800 164/421	21/ 4800 132/418	17/ 4000 109/416	14/ 3400 90/414	11/ 2800 74/413
38000	TIME/FUEL DIST/TAS				35/ 7600 229/426	29/ 6700 191/422	26/ 6000 168/419	24/ 5500 150/418	20/ 4600 123/415	16/ 3900 102/413	13/ 3300 85/412	10/ 2800 70/410
37000	TIME/FUEL DIST/TAS			35/ 7800 228/424	30/ 6900 194/420	27/ 6300 171/418	24/ 5800 154/416	22/ 5300 139/411	19/ 4500 115/412	15/ 3800 97/411	12/ 3200 81/409	10/ 2700 67/408
36000	TIME/FUEL DIST/TAS		35/ 8100 231/422	31/ 7200 198/418	28/ 6600 176/416	25/ 6000 158/414	23/ 5500 143/413	21/ 5100 130/412	18/ 4300 109/410	15/ 3700 92/408	12/ 3100 77/407	9/ 2600 64/406
35000	TIME/FUEL DIST/TAS	37/ 8500 239/420	32/ 7600 205/417	29/ 6900 181/414	26/ 6300 163/413	24/ 5800 147/411	22/ 5400 134/410	20/ 5000 123/409	17/ 4200 104/407	14/ 3600 87/406	11/ 3100 73/404	9/ 2600 61/403
34000	TIME/FUEL DIST/TAS	33/ 7900 212/415	30/ 7200 187/413	27/ 6600 168/411	25/ 6100 152/409	23/ 5600 138/408	21/ 5200 127/407	19/ 4800 116/406	16/ 4100 98/404	14/ 3500 83/403	11/ 3000 70/402	9/ 2500 58/401
33000	TIME/FUEL DIST/TAS	31/ 7500 193/411	28/ 6900 173/409	25/ 6300 156/407	23/ 5900 142/406	22/ 5400 130/405	20/ 5000 120/404	18/ 4700 110/403	16/ 4000 93/402	13/ 3400 79/400	11/ 2900 67/399	8/ 2500 56/398
32000	TIME/FUEL DIST/TAS	29/ 7200 178/406	26/ 6600 161/405	24/ 6100 146/403	22/ 5700 134/402	21/ 5300 123/401	19/ 4900 113/401	18/ 4500 104/400	15/ 3900 89/399	13/ 3400 75/397	10/ 2900 64/396	8/ 2400 53/395
31000	TIME/FUEL DIST/TAS	27/ 6900 165/402	25/ 6400 150/401	23/ 5900 137/400	21/ 5500 126/399	20/ 5100 116/398	18/ 4700 107/397	17/ 4400 99/396	15/ 3800 84/395	12/ 3300 72/394	10/ 2800 61/393	8/ 2300 51/392
30000	TIME/FUEL DIST/TAS	25/ 6500 150/396	23/ 6000 137/395	22/ 5600 126/394	20/ 5200 116/394	19/ 4900 107/393	17/ 4600 99/392	16/ 4200 92/392	14/ 3700 78/391	12/ 3200 67/390	9/ 2700 57/389	7/ 2300 47/388
29000	TIME/FUEL DIST/TAS	24/ 6200 137/391	22/ 5800 126/390	20/ 5400 116/389	19/ 5000 107/389	18/ 4700 99/388	16/ 4400 92/388	15/ 4100 85/387	13/ 3500 73/386	11/ 3000 62/385	9/ 2600 53/384	7/ 2200 44/383
28000	TIME/FUEL DIST/TAS	22/ 5900 125/385	20/ 5500 115/385	19/ 5100 106/385	18/ 4800 99/384	17/ 4500 91/383	15/ 4200 85/383	14/ 3900 79/383	12/ 3400 68/382	10/ 2900 58/381	8/ 2500 49/380	6/ 2100 41/379
27000	TIME/FUEL DIST/TAS	21/ 5600 115/381	19/ 5200 106/380	18/ 4900 98/380	17/ 4600 91/379	16/ 4300 85/379	15/ 4000 79/379	14/ 3800 73/378	12/ 3300 63/377	10/ 2800 54/377	8/ 2400 46/376	6/ 2000 38/375
26000	TIME/FUEL DIST/TAS	19/ 5400 105/377	18/ 5000 98/376	17/ 4700 91/376	16/ 4400 84/375	15/ 4100 78/375	14/ 3900 73/374	13/ 3600 68/374	11/ 3100 58/373	9/ 2700 50/372	7/ 2300 42/372	6/ 2000 36/370
25000	TIME/FUEL DIST/TAS	18/ 5100 97/372	17/ 4800 90/372	16/ 4500 84/371	15/ 4200 78/371	14/ 4000 72/371	13/ 3700 67/370	12/ 3500 63/370	11/ 3000 54/369	9/ 2600 46/368	7/ 2200 40/368	5/ 1900 33/367
24000	TIME/FUEL DIST/TAS	17/ 4900 89/368	16/ 4600 83/368	15/ 4300 77/367	14/ 4000 72/367	13/ 3800 67/367	12/ 3600 62/366	12/ 3300 58/366	10/ 2900 50/365	8/ 2500 43/365	7/ 2200 37/364	5/ 1800 31/363
23000	TIME/FUEL DIST/TAS	16/ 4700 82/364	15/ 4400 76/364	14/ 4100 71/363	13/ 3900 66/363	12/ 3600 62/363	12/ 3400 58/363	11/ 3200 54/362	10/ 2800 47/362	8/ 2400 40/361	6/ 2100 34/360	5/ 1700 29/359
22000	TIME/FUEL DIST/TAS	15/ 4400 75/360	14/ 4200 70/360	13/ 3900 66/360	13/ 3700 61/359	12/ 3500 57/359	11/ 3300 53/359	10/ 3100 50/359	9/ 2700 43/358	7/ 2300 37/357	6/ 2000 32/357	4/ 1700 27/355
21000	TIME/FUEL DIST/TAS	14/ 4200 69/357	13/ 4000 65/356	13/ 3800 60/356	12/ 3500 56/356	11/ 3300 53/356	10/ 3100 49/355	10/ 2900 46/355	9/ 2600 40/354	7/ 2200 34/354	6/ 1900 29/353	4/ 1600 25/352
20000	TIME/FUEL DIST/TAS	13/ 4000 64/353	13/ 3800 59/353	12/ 3600 56/353	11/ 3400 52/352	11/ 3200 49/352	10/ 3000 45/352	9/ 2800 42/352	8/ 2500 37/351	7/ 2100 32/350	5/ 1800 27/350	4/ 1500 23/349
19000	TIME/FUEL DIST/TAS	13/ 3800 58/350	12/ 3600 55/349	11/ 3400 51/349	11/ 3200 48/349	10/ 3100 45/349	9/ 2900 42/349	9/ 2700 39/348	8/ 2400 34/348	6/ 2000 29/347	5/ 1800 25/346	4/ 1500 21/345
18000	TIME/FUEL DIST/TAS	12/ 3700 53/346	11/ 3500 50/346	10/ 3300 47/346	10/ 3100 44/346	9/ 2900 41/346	9/ 2700 38/345	8/ 2600 36/345	7/ 2200 31/345	6/ 2000 27/344	5/ 1700 23/343	3/ 1400 19/342
16000	TIME/FUEL DIST/TAS	10/ 3300 44/340	10/ 3100 41/340	9/ 3000 39/340	9/ 2800 36/339	8/ 2600 34/339	8/ 2500 32/339	7/ 2300 30/339	6/ 2000 26/338	5/ 1800 23/338	4/ 1500 19/337	3/ 1300 16/336
14000	TIME/FUEL DIST/TAS	9/ 3000 36/334	9/ 2800 34/334	8/ 2700 32/334	8/ 2500 30/334	7/ 2400 28/333	7/ 2200 26/333	6/ 2100 25/333	6/ 1900 21/333	5/ 1600 19/332	3/ 1400 16/331	2/ 1200 13/330
12000	TIME/FUEL DIST/TAS	8/ 2600 29/328	7/ 2500 27/328	7/ 2400 25/328	7/ 2200 24/328	6/ 2100 22/328	6/ 2000 21/328	6/ 1900 20/327	5/ 1700 17/327	4/ 1400 15/326	3/ 1200 13/325	2/ 1100 11/324
10000	TIME/FUEL DIST/TAS	7/ 2300 22/323	6/ 2200 21/323	6/ 2100 20/323	6/ 2000 19/323	6/ 1900 17/322	5/ 1800 16/322	5/ 1700 15/322	4/ 1500 13/322	3/ 1300 12/321	2/ 1100 10/320	2/ 900 8/319
5000	TIME/FUEL DIST/TAS	4/ 1500 8/311	4/ 1400 8/311	4/ 1300 7/310	4/ 1300 7/310	4/ 1300 7/310	3/ 1200 6/310	3/ 1100 6/310	3/ 1000 5/309	2/ 900 4/309	1/ 800 4/308	1/ 600 3/306
1500	TIME/FUEL	3/ 1000	2/ 900	2/ 900	2/ 900	2/ 800	2/ 800	2/ 800	2/ 700	1/ 600	1/ 500	0/ 400

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS	AIRPORT ELEVATION	2000	4000	6000	8000	10000	12000
EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	FUEL ADJUSTMENT	-200	-500	-700	-900	-1100	-1400



Flight Planning and Performance Manual

290/.78 Enroute Climb
ISA + 20°C

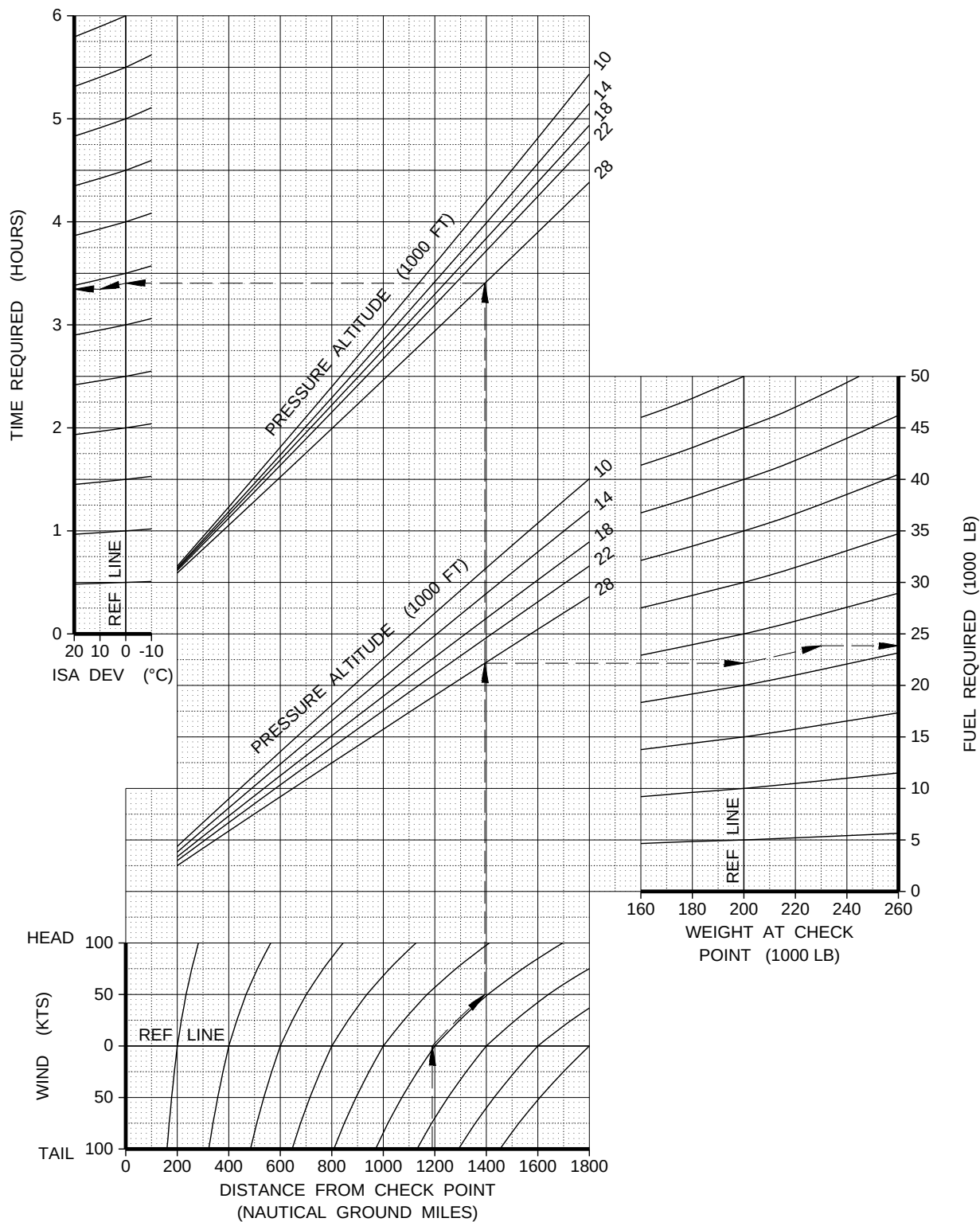
PRESSURE ALTITUDE FT	UNITS MIN/LB NAM/KNOTS	BRAKE RELEASE WEIGHT LB										
		260000	250000	240000	230000	220000	210000	200000	180000	160000	140000	120000
42000	TIME/FUEL DIST/TAS								33/ 6400 229/437	24/ 4900 161/430	18/ 4000 126/427	14/ 3300 101/425
41000	TIME/FUEL DIST/TAS								29/ 5800 192/431	22/ 4700 147/427	17/ 3900 118/425	13/ 3200 95/423
40000	TIME/FUEL DIST/TAS							35/ 7100 239/434	26/ 5500 171/427	20/ 4500 136/424	16/ 3800 110/422	13/ 3100 90/420
39000	TIME/FUEL DIST/TAS						36/ 7400 241/432	30/ 6400 201/428	24/ 5200 156/424	19/ 4400 127/421	15/ 3600 104/420	12/ 3000 85/418
38000	TIME/FUEL DIST/TAS					36/ 7600 243/430	31/ 6700 206/426	28/ 6100 181/424	23/ 5000 145/421	18/ 4200 119/419	15/ 3500 98/417	12/ 2900 81/416
37000	TIME/FUEL DIST/TAS				37/ 8000 247/428	32/ 7100 211/425	29/ 6400 186/422	26/ 5800 166/421	21/ 4900 136/418	17/ 4100 112/416	14/ 3500 93/415	11/ 2900 77/413
36000	TIME/FUEL DIST/TAS		47/ 9800 317/432	38/ 8300 253/427	33/ 7400 217/423	30/ 6700 192/421	27/ 6100 171/419	24/ 5600 155/418	20/ 4700 128/415	17/ 4000 106/414	14/ 3400 89/412	11/ 2800 73/411
35000	TIME/FUEL DIST/TAS		40/ 8800 266/426	35/ 7800 227/422	31/ 7000 199/420	28/ 6400 178/418	25/ 5900 161/416	23/ 5400 146/415	19/ 4600 121/413	16/ 3900 102/411	13/ 3300 85/410	10/ 2700 70/409
34000	TIME/FUEL DIST/TAS	42/ 9300 278/425	36/ 8200 236/421	32/ 7400 207/418	29/ 6700 184/416	26/ 6200 166/414	24/ 5700 151/413	22/ 5200 137/412	19/ 4500 115/410	15/ 3800 96/409	12/ 3200 81/407	10/ 2700 67/406
33000	TIME/FUEL DIST/TAS	38/ 8700 246/419	33/ 7800 215/416	30/ 7100 191/414	27/ 6500 172/412	25/ 6000 156/411	23/ 5500 142/410	21/ 5100 130/409	18/ 4300 109/407	15/ 3700 92/406	12/ 3100 77/405	9/ 2600 64/404
32000	TIME/FUEL DIST/TAS	35/ 8200 223/414	31/ 7400 197/412	28/ 6800 177/410	26/ 6200 160/409	24/ 5800 146/407	22/ 5300 134/406	20/ 4900 123/406	17/ 4200 103/404	14/ 3600 87/403	12/ 3000 73/402	9/ 2500 61/401
31000	TIME/FUEL DIST/TAS	32/ 7800 204/409	29/ 7100 183/407	27/ 6500 165/406	25/ 6000 150/405	23/ 5600 137/404	21/ 5200 126/403	19/ 4800 116/402	16/ 4100 98/401	14/ 3500 82/399	11/ 3000 73/398	9/ 2500 58/397
30000	TIME/FUEL DIST/TAS	30/ 7300 183/403	27/ 6700 165/401	25/ 6200 150/400	23/ 5700 138/399	21/ 5300 126/398	20/ 4900 116/398	18/ 4600 107/397	16/ 3900 91/396	13/ 3400 77/395	10/ 2900 65/394	8/ 2400 54/393
29000	TIME/FUEL DIST/TAS	27/ 6900 165/397	25/ 6300 150/396	23/ 5900 137/395	21/ 5400 126/394	20/ 5100 116/393	18/ 4700 107/393	17/ 4400 99/392	15/ 3800 84/391	12/ 3200 71/390	10/ 2700 60/389	8/ 2300 50/388
28000	TIME/FUEL DIST/TAS	25/ 6500 150/391	23/ 6000 137/390	22/ 5600 125/390	20/ 5200 115/389	19/ 4800 107/388	17/ 4500 98/388	16/ 4200 91/387	14/ 3600 78/386	12/ 3100 66/385	9/ 2600 56/384	7/ 2200 47/383
27000	TIME/FUEL DIST/TAS	24/ 6100 136/386	22/ 5700 125/385	20/ 5300 115/385	19/ 5000 106/384	18/ 4600 98/384	16/ 4300 91/383	15/ 4000 84/383	13/ 3500 72/382	11/ 3000 61/381	9/ 2500 52/380	7/ 2100 43/379
26000	TIME/FUEL DIST/TAS	22/ 5800 124/381	20/ 5400 114/381	19/ 5100 106/380	18/ 4700 98/380	17/ 4400 90/379	15/ 4100 84/379	14/ 3800 78/378	12/ 3300 67/378	10/ 2900 57/377	8/ 2400 48/376	6/ 2100 40/375
25000	TIME/FUEL DIST/TAS	21/ 5500 114/377	19/ 5200 105/376	18/ 4800 97/376	17/ 4500 90/375	16/ 4200 83/375	15/ 4000 77/375	14/ 3700 72/374	12/ 3200 62/373	10/ 2800 53/373	8/ 2400 45/372	6/ 2000 37/371
24000	TIME/FUEL DIST/TAS	19/ 5300 104/372	18/ 4900 96/372	17/ 4600 89/372	16/ 4300 83/371	15/ 4100 77/370	14/ 3800 71/370	13/ 3500 66/370	11/ 3100 57/369	9/ 2600 49/369	7/ 2300 42/368	6/ 1900 35/367
23000	TIME/FUEL DIST/TAS	18/ 5000 96/368	17/ 4700 88/368	16/ 4400 82/367	15/ 4100 76/367	14/ 3900 71/367	13/ 3600 66/367	12/ 3400 61/366	11/ 2900 53/366	9/ 2500 45/365	7/ 2200 39/364	5/ 1800 32/363
22000	TIME/FUEL DIST/TAS	17/ 4800 88/364	16/ 4500 81/364	15/ 4200 75/364	14/ 3900 70/363	13/ 3700 65/363	12/ 3500 61/363	11/ 3200 57/362	10/ 2800 49/362	8/ 2400 42/361	7/ 2100 36/360	5/ 1800 30/359
21000	TIME/FUEL DIST/TAS	16/ 4500 80/360	15/ 4300 75/360	14/ 4000 69/360	13/ 3800 65/360	12/ 3500 60/359	12/ 3300 56/359	11/ 3100 52/359	9/ 2700 45/358	8/ 2300 39/358	6/ 2000 33/357	5/ 1700 28/356
20000	TIME/FUEL DIST/TAS	15/ 4300 73/357	14/ 4100 68/357	13/ 3800 64/356	12/ 3600 59/356	12/ 3400 55/356	11/ 3200 52/356	10/ 3000 48/355	9/ 2600 42/355	7/ 2200 36/354	6/ 1900 31/353	4/ 1600 26/352
19000	TIME/FUEL DIST/TAS	14/ 4100 67/353	13/ 3900 63/353	12/ 3600 58/353	12/ 3400 54/353	11/ 3200 51/352	10/ 3000 47/352	10/ 2800 44/352	8/ 2500 38/351	7/ 2100 33/351	5/ 1800 28/350	4/ 1500 24/349
18000	TIME/FUEL DIST/TAS	13/ 3900 61/350	12/ 3700 57/350	12/ 3500 53/349	11/ 3300 50/349	10/ 3100 47/349	10/ 2900 43/349	9/ 2700 41/349	8/ 2400 35/348	6/ 2000 30/348	5/ 1800 26/347	4/ 1500 22/346
16000	TIME/FUEL DIST/TAS	11/ 3500 51/343	11/ 3300 47/343	10/ 3100 44/343	10/ 2900 41/343	9/ 2800 39/343	8/ 2600 36/342	8/ 2400 34/342	7/ 2100 29/342	6/ 1900 25/341	4/ 1600 22/341	3/ 1300 18/339
14000	TIME/FUEL DIST/TAS	10/ 3100 41/337	9/ 2900 38/337	9/ 2800 36/337	8/ 2600 34/337	8/ 2500 32/337	7/ 2300 30/336	7/ 2200 28/336	6/ 1900 24/336	5/ 1700 21/335	4/ 1400 18/335	3/ 1200 15/333
12000	TIME/FUEL DIST/TAS	8/ 2700 33/331	8/ 2600 31/331	8/ 2500 29/331	7/ 2300 27/331	7/ 2200 25/331	6/ 2100 24/331	6/ 2000 22/331	5/ 1700 19/330	4/ 1500 17/330	3/ 1300 14/329	2/ 1100 12/328
10000	TIME/FUEL DIST/TAS	7/ 2400 25/326	7/ 2300 24/326	6/ 2200 22/326	6/ 2000 21/326	6/ 1900 20/325	6/ 1800 18/325	5/ 1700 17/325	5/ 1500 15/325	4/ 1300 13/324	3/ 1100 11/323	2/ 1000 9/322
5000	TIME/FUEL DIST/TAS	4/ 1500 9/313	4/ 1500 9/313	4/ 1400 8/313	4/ 1300 8/313	4/ 1300 7/313	3/ 1200 7/313	3/ 1100 6/313	3/ 1000 6/312	2/ 900 5/312	1/ 800 4/311	1/ 600 4/309
1500	TIME/FUEL	3/ 1000	2/ 900	2/ 900	2/ 900	2/ 800	2/ 800	2/ 800	2/ 700	1/ 600	1/ 500	0/ 400

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS	AIRPORT ELEVATION	2000	4000	6000	8000	10000	12000
EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	FUEL ADJUSTMENT	-200	-500	-700	-1000	-1200	-1500

Long Range Cruise Enroute Fuel and Time

0 to 1800 NM Distance

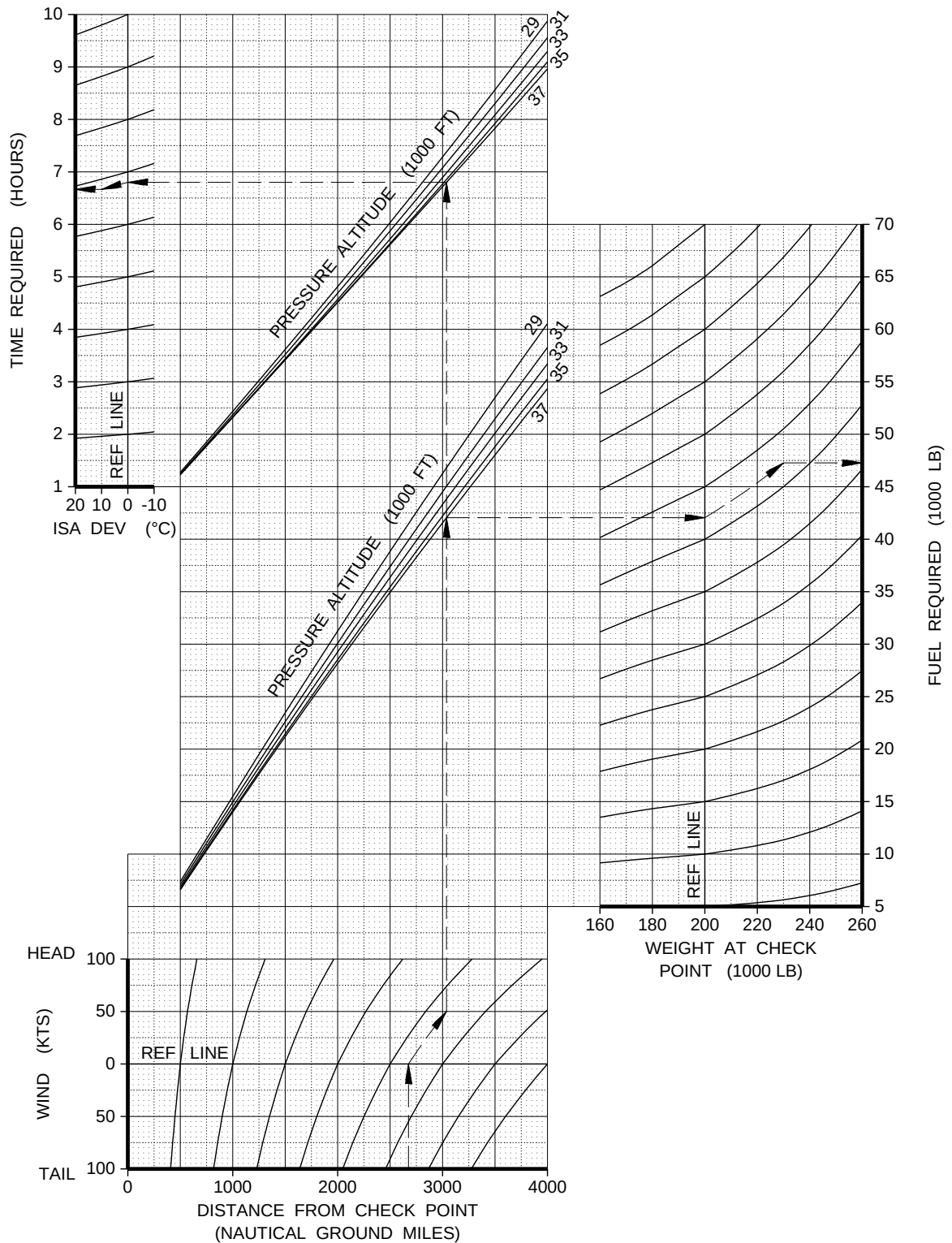
Based on .78/290/250 descent



Long Range Cruise Enroute Fuel and Time

0 to 4000 NM Distance

Based on .78/290/250 descent



Long Range Cruise Table

42000 FT to 37000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
42 (-29)	EPR									1.38	1.32	1.27	1.23	1.19	1.16	1.14
	MAX TAT									-17	-11	-5	1			
	KIAS									229	230	230	230	230	228	223
	MACH									.793	.795	.797	.798	.796	.790	.776
	FF/ENG KTAS									3332 455	3105 456	2927 457	2819 458	2680 456	2536 453	2633 445
41 (-29)	EPR								1.38	1.32	1.28	1.24	1.20	1.17	1.14	1.12
	MAX TAT								-17	-11	-6	0				
	KIAS								234	235	236	236	235	234	231	224
	MACH								.792	.795	.797	.798	.797	.792	.784	.762
	FF/ENG KTAS								3500 454	3263 456	3077 457	2928 458	2821 457	2682 454	2535 449	2611 437
40 (-30)	EPR							1.38	1.32	1.28	1.24	1.21	1.18	1.15	1.13	1.11
	MAX TAT							-17	-11	-6	-1					
	KIAS							240	240	241	242	241	240	238	232	224
	MACH							.792	.795	.797	.798	.797	.794	.788	.771	.746
	FF/ENG KTAS							3663 454	3420 456	3232 457	3072 458	2929 457	2797 455	2687 452	2520 442	2583 428
39 (-30)	EPR						1.38	1.32	1.28	1.24	1.21	1.18	1.15	1.13	1.11	1.09
	MAX TAT						-17	-11	-6	-2	3					
	KIAS						245	246	247	247	247	246	244	240	233	224
	MACH						.792	.794	.797	.798	.797	.795	.790	.778	.756	.731
	FF/ENG KTAS						3820 454	3575 456	3386 457	3223 458	3072 457	2937 456	2802 453	2682 446	2501 434	2559 419
38 (-30)	EPR					1.37	1.32	1.28	1.24	1.21	1.18	1.16	1.14	1.12	1.10	1.08
	MAX TAT					-16	-10	-6	-1	3						
	KIAS					251	252	252	253	253	252	251	248	241	233	225
	MACH					.792	.794	.796	.798	.798	.796	.791	.783	.765	.741	.717
	FF/ENG KTAS					3969 454	3728 456	3539 457	3374 458	3223 457	3079 456	2940 454	2804 449	2662 439	2472 425	2538 411
37 (-30)	EPR				1.37	1.32	1.28	1.24	1.21	1.18	1.16	1.14	1.12	1.10	1.08	1.07
	MAX TAT				-15	-10	-5	-1	3							
	KIAS				257	258	258	259	259	258	257	255	249	241	233	226
	MACH				.792	.794	.796	.798	.798	.796	.793	.787	.771	.749	.726	.706
	FF/ENG KTAS				4112 454	3877 456	3690 457	3525 457	3375 458	3230 457	3083 455	2949 451	2789 442	2636 430	2448 416	2278 405

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Shaded area approximates optimum altitude.

Max Cruise EPR

PRESS ALT (1000 FT)	37	38	39	40	41	42
LIMIT EPR	1.40	1.40	1.40	1.40	1.40	1.40
MAX TAT (°C)	-18	-18	-18	-18	-18	-18

Decrease limit EPR by 0.08 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.09.

With engine and wing anti-ice on, decrease limit EPR by 0.17.



Flight Planning and Performance Manual

Long Range Cruise Table
36000 FT to 31000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
36 (-30)	EPR			1.35	1.31	1.27	1.24	1.21	1.18	1.16	1.14	1.12	1.10	1.09	1.07	1.06
	MAX TAT			-14	-9	-5	-1	3								
	KIAS			263	264	264	265	265	264	263	261	257	250	242	234	227
	MACH			.793	.795	.796	.798	.798	.796	.793	.788	.776	.756	.734	.713	.694
	FF/ENG			4251	4025	3841	3677	3527	3383	3235	3092	2941	2769	2611	2434	2265
	KTAS			455	456	457	458	458	457	455	452	445	434	421	409	398
35 (-29)	EPR		1.34	1.30	1.27	1.24	1.21	1.18	1.16	1.14	1.12	1.11	1.09	1.07	1.06	1.05
	MAX TAT		-12	-8	-4	0	4									
	KIAS		269	270	271	271	271	271	270	268	264	257	250	242	236	226
	MACH		.793	.795	.797	.798	.798	.797	.794	.789	.779	.761	.740	.720	.703	.676
	FF/ENG		4412	4196	4013	3850	3701	3556	3407	3262	3109	2941	2759	2580	2446	2250
	KTAS		457	458	459	460	460	459	457	455	449	439	427	415	405	390
34 (-27)	EPR	1.33	1.29	1.26	1.23	1.21	1.18	1.16	1.14	1.12	1.11	1.09	1.08	1.06	1.05	1.04
	MAX TAT	-11	-7	-3	1	4	8									
	KIAS	276	276	277	277	277	277	276	274	271	265	258	250	244	236	225
	MACH	.793	.795	.797	.798	.798	.797	.794	.790	.781	.765	.746	.726	.709	.688	.659
	FF/ENG	4577	4372	4190	4030	3880	3734	3585	3438	3289	3117	2936	2757	2591	2442	2240
	KTAS	459	460	461	462	462	461	460	457	452	443	432	420	410	399	382
33 (-25)	EPR	1.29	1.26	1.23	1.20	1.18	1.16	1.14	1.12	1.11	1.09	1.08	1.07	1.05	1.04	1.04
	MAX TAT	-5	-2	2	5	9										
	KIAS	283	283	284	284	283	282	281	278	272	265	258	251	245	235	226
	MACH	.796	.797	.798	.798	.797	.794	.790	.783	.768	.750	.731	.714	.698	.670	.646
	FF/ENG	4551	4371	4213	4062	3916	3765	3617	3471	3298	3117	2936	2764	2603	2428	2242
	KTAS	463	463	464	464	463	462	460	455	447	436	425	415	406	390	376
32 (-23)	EPR	1.25	1.22	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.08	1.07	1.05	1.04	1.04	1.03
	MAX TAT	-1	3	6	10											
	KIAS	290	290	290	289	289	287	284	279	273	265	258	253	244	234	226
	MACH	.797	.798	.798	.796	.794	.790	.784	.771	.754	.736	.718	.704	.681	.655	.634
	FF/ENG	4550	4395	4244	4097	3945	3797	3653	3481	3295	3114	2938	2781	2595	2424	2252
	KTAS	466	466	466	465	464	462	458	450	440	430	419	411	398	383	371
31 (-22)	EPR	1.21	1.19	1.17	1.15	1.14	1.12	1.11	1.10	1.08	1.07	1.06	1.05	1.04	1.03	1.02
	MAX TAT	4	7	10	14											
	KIAS	297	296	296	295	293	291	286	280	273	266	260	253	243	235	228
	MACH	.798	.798	.796	.794	.790	.785	.772	.757	.739	.722	.707	.690	.664	.643	.625
	FF/ENG	4580	4428	4280	4127	3978	3835	3665	3479	3291	3113	2952	2781	2582	2428	2272
	KTAS	468	468	467	466	464	460	453	444	434	423	415	405	390	377	367

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Shaded area approximates optimum altitude.

Max Cruise EPR

PRESS ALT (1000 FT)	31	32	33	34	35	36
LIMIT EPR	1.30	1.32	1.34	1.36	1.38	1.40
MAX TAT (°C)	-6	-9	-11	-13	-15	-17

Decrease limit EPR by 0.08 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.06.

With engine and wing anti-ice on, decrease limit EPR by 0.11.

Long Range Cruise Table

30000 FT to 25000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30 (-20)	EPR	1.19	1.17	1.15	1.13	1.12	1.11	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03	1.02
	MAX TAT	8	11	14												
	KIAS	303	302	301	300	298	293	287	280	273	267	261	252	243	236	230
	MACH	.797	.796	.794	.790	.785	.773	.758	.742	.725	.711	.696	.672	.650	.632	.618
	FF/ENG	4616	4466	4312	4164	4021	3851	3666	3476	3331	3162	2998	2799	2611	2444	2300
29 (-18)	KTAS	470	469	468	466	462	456	447	437	427	419	410	396	383	372	364
	EPR	1.16	1.15	1.13	1.12	1.11	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03	1.02	1.01
	MAX TAT	12	15	18												
	KIAS	309	308	306	304	299	293	287	280	274	269	260	251	243	237	232
	MACH	.796	.793	.790	.785	.773	.759	.743	.728	.713	.701	.680	.657	.638	.623	.610
28 (-17)	FF/ENG	4654	4499	4351	4208	4038	3853	3662	3483	3345	3187	2994	2796	2620	2469	2326
	KTAS	471	470	468	464	458	449	440	431	422	415	402	389	378	369	361
	EPR	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03	1.02	1.01	1.01
	MAX TAT	16	19													
	KIAS	314	313	310	306	300	293	287	281	276	269	259	251	245	240	234
27 (-15)	MACH	.793	.790	.784	.773	.760	.745	.730	.715	.704	.686	.663	.645	.629	.616	.602
	FF/ENG	4686	4540	4395	4224	4038	3847	3667	3494	3370	3186	2983	2802	2641	2499	2352
	KTAS	471	469	466	460	452	443	434	425	418	408	394	383	374	366	358
	EPR	1.12	1.11	1.10	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03	1.02	1.02	1.01	1.00
	MAX TAT	20	22													
26 (-14)	KIAS	319	317	312	306	300	294	288	283	276	267	259	252	247	242	236
	MACH	.789	.783	.773	.760	.745	.731	.717	.706	.690	.668	.650	.634	.621	.608	.595
	FF/ENG	4730	4582	4410	4224	4032	3852	3676	3517	3376	3170	2986	2817	2668	2524	2381
	KTAS	471	468	461	454	445	436	428	421	412	399	388	378	370	363	355
	EPR	1.11	1.10	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00
25 (-13)	MAX TAT	23														
	KIAS	323	318	313	306	300	294	290	284	275	267	260	254	249	244	238
	MACH	.782	.772	.759	.745	.732	.718	.707	.694	.674	.655	.638	.625	.613	.601	.587
	FF/ENG	4770	4596	4409	4217	4037	3860	3698	3530	3365	3171	2996	2842	2698	2551	2404
	KTAS	469	463	455	447	439	431	424	416	404	392	383	375	368	360	352
25 (-13)	EPR	1.09	1.09	1.08	1.06	1.06	1.05	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00
	MAX TAT															
	KIAS	324	319	313	307	301	296	291	283	274	267	261	256	251	246	239
	MACH	.770	.758	.745	.732	.719	.708	.696	.678	.659	.643	.629	.618	.606	.594	.577
	FF/ENG	4781	4593	4403	4222	4044	3880	3716	3522	3324	3178	3018	2872	2725	2583	2422
25 (-13)	KTAS	464	457	448	441	433	426	419	408	396	387	378	372	365	358	348

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	25	26	27	28	29	30
LIMIT EPR	1.23	1.23	1.24	1.26	1.27	1.29
MAX TAT (°C)	5	4	2	0	-2	-4

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.05.

With engine and wing anti-ice on, decrease limit EPR by 0.09.



Flight Planning and Performance Manual

Long Range Cruise Table 24000 FT to 19000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
24 (-11)	EPR	1.08	1.07	1.06	1.05	1.05	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	.99
	MAX TAT															
	KIAS	325	319	313	307	303	298	290	281	274	268	263	258	253	247	239
	MACH	.757	.744	.732	.719	.709	.698	.681	.662	.646	.632	.621	.610	.599	.585	.567
	FF/ENG	4778	4589	4408	4229	4065	3904	3712	3510	3330	3198	3048	2903	2756	2606	2440
23 (-10)	KTAS	458	450	442	435	428	422	411	400	391	382	375	369	362	354	343
	EPR	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	.99	.99
	MAX TAT															
	KIAS	325	319	314	309	304	297	288	281	275	270	265	260	255	248	240
	MACH	.743	.731	.719	.709	.699	.683	.664	.649	.635	.624	.614	.603	.592	.576	.557
22 (-8)	FF/ENG	4776	4595	4415	4251	4092	3902	3697	3515	3346	3227	3082	2933	2790	2627	2456
	KTAS	451	444	436	430	424	414	403	394	386	379	373	366	359	350	338
	EPR	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	1.00	.99	.99
	MAX TAT															
	KIAS	325	320	315	311	304	295	288	282	277	272	267	263	256	249	240
21 (-7)	MACH	.730	.719	.709	.700	.684	.666	.652	.638	.627	.617	.607	.596	.583	.566	.547
	FF/ENG	4780	4601	4437	4279	4090	3883	3699	3528	3373	3261	3112	2968	2812	2644	2472
	KTAS	445	438	432	426	417	406	397	389	382	376	370	363	355	345	334
	EPR	1.05	1.04	1.03	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	1.00	.99	.99	.99
	MAX TAT															
20 (-5)	KIAS	326	322	317	310	302	295	289	283	279	274	270	264	257	249	241
	MACH	.718	.709	.700	.685	.668	.653	.640	.629	.619	.610	.600	.588	.573	.556	.537
	FF/ENG	4786	4623	4465	4277	4068	3883	3710	3551	3404	3258	3143	2996	2831	2659	2486
	KTAS	439	434	428	419	408	400	392	385	379	373	367	360	351	340	329
	EPR	1.04	1.03	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	1.00	.99	.99	.99	.99
19 (-4)	MAX TAT															
	KIAS	328	323	316	308	302	295	290	285	281	277	272	265	258	250	241
	MACH	.708	.699	.685	.668	.655	.642	.631	.621	.612	.603	.593	.579	.564	.546	.527
	FF/ENG	4812	4654	4465	4255	4069	3894	3733	3584	3438	3290	3180	3018	2849	2677	2501
	KTAS	435	430	421	411	402	394	387	382	376	370	364	356	346	336	324
19 (-4)	EPR	1.03	1.03	1.02	1.02	1.02	1.01	1.01	1.01	1.00	1.00	.99	.99	.99	.99	.98
	MAX TAT															
	KIAS	329	323	315	308	302	297	292	288	283	279	273	266	258	250	241
	MACH	.698	.685	.669	.655	.643	.632	.623	.614	.605	.596	.584	.570	.554	.537	.518
	FF/ENG	4846	4656	4446	4259	4083	3920	3768	3624	3474	3331	3177	3042	2870	2696	2517
	KTAS	431	422	412	404	397	390	384	379	373	368	360	352	342	331	319

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	19	20	21	22	23	24
LIMIT EPR	1.20	1.21	1.21	1.22	1.22	1.22
MAX TAT (°C)	13	11	10	9	7	6

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.04.

With engine and wing anti-ice on, decrease limit EPR by 0.07.

Long Range Cruise Table

18000 FT to 13000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
18 (-2)	EPR	1.03	1.02	1.02	1.02	1.01	1.01	1.01	1.00	1.00	.99	.99	.99	.99	.98	.98
	MAX TAT															
	KIAS	329	321	314	308	303	298	295	290	286	281	274	267	259	250	241
	MACH	.684	.669	.656	.644	.633	.624	.616	.607	.599	.588	.575	.560	.544	.527	.508
	FF/ENG	4850	4638	4451	4275	4110	3957	3812	3661	3516	3368	3205	3065	2892	2715	2535
17 (-1)	KTAS	424	414	406	399	392	386	382	376	371	364	356	347	337	326	314
	EPR	1.02	1.02	1.02	1.01	1.01	1.01	1.00	1.00	.99	.99	.99	.99	.99	.98	.98
	MAX TAT															
	KIAS	327	320	315	309	305	301	297	293	288	282	275	267	259	251	241
	MACH	.668	.656	.644	.634	.625	.617	.609	.601	.592	.580	.566	.551	.535	.517	.498
16 (1)	FF/ENG	4830	4643	4467	4301	4147	4000	3850	3702	3559	3398	3229	3089	2914	2734	2554
	KTAS	415	408	401	394	389	384	379	373	368	360	352	342	332	321	310
	EPR	1.02	1.02	1.01	1.01	1.01	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98
	MAX TAT															
	KIAS	326	321	316	311	307	303	299	295	289	283	275	268	259	251	241
15 (3)	MACH	.655	.644	.634	.626	.618	.610	.602	.594	.583	.570	.556	.541	.525	.507	.489
	FF/ENG	4837	4661	4494	4338	4190	4041	3892	3750	3591	3425	3253	3112	2934	2753	2575
	KTAS	409	402	396	390	386	381	376	371	364	356	347	338	328	317	305
	EPR	1.02	1.01	1.01	1.00	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98
	MAX TAT															
14 (4)	KIAS	327	322	317	314	310	306	302	296	290	283	276	268	260	251	242
	MACH	.644	.634	.626	.619	.612	.604	.596	.586	.574	.561	.547	.532	.515	.498	.481
	FF/ENG	4855	4687	4531	4381	4232	4082	3938	3784	3619	3448	3277	3103	2953	2773	2599
	KTAS	403	397	392	388	383	378	373	367	360	351	343	333	323	312	301
	EPR	1.01	1.01	1.00	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98
13 (6)	MAX TAT															
	KIAS	328	324	320	316	312	308	303	298	291	284	276	268	260	251	242
	MACH	.634	.626	.619	.612	.605	.597	.588	.577	.565	.552	.537	.522	.506	.489	.473
	FF/ENG	4923	4764	4613	4462	4310	4164	4012	3846	3674	3500	3325	3146	2995	2814	2643
	KTAS	399	394	389	385	380	376	370	363	355	347	338	328	318	307	297
13 (6)	EPR	1.01	1.00	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98
	MAX TAT															
	KIAS	330	326	322	318	315	310	305	298	291	284	277	268	260	251	243
	MACH	.626	.619	.613	.606	.598	.590	.580	.568	.556	.542	.528	.513	.497	.481	.465
	FF/ENG	4956	4804	4654	4501	4354	4205	4041	3870	3696	3522	3344	3163	3013	2838	2667
13 (6)	KTAS	395	391	387	382	378	373	366	359	351	342	333	324	313	303	293

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	13	14	15	16	17	18
LIMIT EPR	1.18	1.19	1.19	1.19	1.20	1.20
MAX TAT (°C)	21	19	18	16	15	14

Decrease limit EPR by 0.05 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.03.

With engine and wing anti-ice on, decrease limit EPR by 0.06.



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Long Range Cruise Table 12000 FT to 7000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
12 (7)	EPR	1.00	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98	.98
	MAX TAT															
	KIAS	332	329	325	321	317	311	305	299	292	285	277	269	260	252	244
	MACH	.619	.613	.606	.599	.592	.582	.571	.559	.546	.533	.519	.504	.488	.473	.457
	FF/ENG	5000	4850	4696	4548	4401	4238	4068	3894	3721	3544	3364	3183	3036	2864	2695
11 (9)	KTAS	392	388	384	380	375	369	362	354	346	338	329	319	309	300	290
	EPR	1.00	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98	.98	.98
	MAX TAT															
	KIAS	335	331	327	323	318	312	306	299	292	285	277	269	261	252	244
	MACH	.613	.606	.600	.593	.584	.573	.562	.550	.537	.524	.509	.494	.480	.465	.450
10 (11)	FF/ENG	5050	4896	4747	4602	4439	4270	4096	3923	3747	3568	3387	3206	3065	2894	2725
	KTAS	390	386	381	377	371	365	357	350	342	333	324	314	305	296	286
	EPR	1.00	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98	.98	.98	.98
	MAX TAT															
	KIAS	337	333	330	325	319	313	307	300	293	285	277	269	261	253	245
9 (12)	MACH	.606	.600	.593	.585	.575	.564	.553	.541	.528	.515	.500	.486	.472	.458	.443
	FF/ENG	5098	4948	4804	4642	4473	4300	4126	3951	3773	3592	3411	3235	3064	2925	2758
	KTAS	387	383	379	373	367	360	353	345	337	328	319	310	301	292	283
	EPR	.99	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98
	MAX TAT															
8 (14)	KIAS	340	336	331	326	320	314	307	300	293	285	277	269	262	254	246
	MACH	.600	.594	.586	.576	.566	.555	.544	.532	.519	.505	.491	.478	.464	.451	.437
	FF/ENG	5239	5093	4929	4759	4583	4407	4229	4048	3864	3680	3496	3322	3149	3008	2839
	KTAS	384	380	375	369	363	356	348	341	332	324	315	306	298	289	280
	EPR	.99	.99	.99	.99	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98
7 (16)	MAX TAT															
	KIAS	342	338	332	327	321	314	307	300	293	285	278	270	262	255	247
	MACH	.594	.586	.577	.567	.557	.546	.535	.523	.510	.496	.483	.470	.457	.444	.430
	FF/ENG	5303	5139	4968	4793	4616	4439	4259	4075	3890	3706	3528	3355	3183	3043	2875
	KTAS	382	377	371	365	358	351	344	336	328	319	311	302	294	285	277
	EPR	.99	.99	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98
	MAX TAT															
	KIAS	344	339	333	327	321	315	308	301	293	285	278	271	263	255	248
	MACH	.586	.578	.569	.559	.548	.537	.526	.514	.501	.488	.476	.463	.450	.437	.424
	FF/ENG	5350	5180	5005	4827	4650	4471	4288	4103	3918	3736	3562	3389	3218	3081	2913
	KTAS	378	373	367	360	354	347	339	331	323	315	307	299	291	282	274

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	7	8	9	10	11	12
LIMIT EPR	1.15	1.15	1.16	1.16	1.17	1.18
MAX TAT (°C)	31	29	27	26	24	22

Decrease limit EPR by 0.04 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.03.

With engine and wing anti-ice on, decrease limit EPR by 0.06.

.80M Cruise Table

42000 FT to 33000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
42	231 -29 459									1.39 -18 3404	1.32 -11 3144	1.27 -5 2948	1.23 0 2835	1.20	1.17	1.14
41	237 -29 459								1.39 -18 3579	1.33 -12 3310	1.28 -6 3103	1.24 -1 2943	1.20	1.17	1.15	1.13
40	242 -29 459							1.39 -18 3747	1.33 -12 3473	1.28 -6 3262	1.24 -2 3090	1.21 4 2950	1.18	1.15	1.13	1.11
39	248 -29 459						1.39 -18 3907	1.33 -12 3632	1.28 -6 3419	1.25 -2 3244	1.21 3 3092	1.18	1.16	1.14	1.12	1.10
38	254 -29 459					1.38 -17 4059	1.33 -11 3787	1.28 -6 3574	1.25 -2 3397	1.21 3 3243	1.19	1.16	1.14	1.12	1.11	1.09
37	260 -29 459			1.38 -16 4203	1.32 -11 3937	1.28 -6 3726	1.25 -2 3549	1.21 3 3395	1.19	1.16	1.14	1.12	1.11	1.10	1.09	1.07
36	266 -29 459		1.36 -15 4342	1.31 -10 4086	1.28 -5 3878	1.24 -1 3702	1.21 3 3548	1.19	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.06
35	272 -26 461	1.35 -13 4501	1.31 -9 4254	1.27 -4 4051	1.24 0 3877	1.21 4 3722	1.19	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.05
34	278 -24 463	1.34 -12 4664	1.30 -7 4427	1.27 -3 4229	1.24 1 4056	1.21 4 3903	1.18 8 3766	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.05
33	284 -22 465	1.29 -6 4603	1.26 -2 4409	1.23 1 4239	1.20 5 4086	1.18 8 3949	1.16 8 3819	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.06	1.04

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
 INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
 INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

TURBULENT AIR PENETRATION

TARGET SPEED IAS/MACH	PRESS ALT 1000 FT	WEIGHT 1000 LB						
		260	240	220	200	180	160	140
		APPROXIMATE POWER SETTING %N ₁						
290/.78	41					82	80	77
	37					79	77	75
	33	82	81	82	80	78	77	75
	29	79	78	77	76	75	74	73
	25	77	75	74	73	72	71	70
	20	73	72	70	70	68	67	67
	15	70	68	67	66	65	64	64
	10	67	65	65	63	62	62	60

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.09
WING	.08
ENGINE AND WING	.17

MAX CRUISE EPR

PRESS ALT 1000 FT	33	34	35	36	37	38	39	40	41	42
EPR LIMIT	1.34	1.36	1.38	1.40	1.40	1.40	1.40	1.40	1.40	1.39
TAT DEG C AND COLDER	-11	-13	-15	-17	-17	-17	-17	-17	-17	-17

REDUCE EPR BY 0.08 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE



Flight Planning and Performance Manual

.80M Cruise Table
32000 FT to 25000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
32	291 -20 467	1.25 -1 4588	1.22 2 4421	1.20 6 4270	1.18 9 4133	1.16 12 4002	1.14 13 3877	1.13 14 3768	1.11 15 3676	1.10 16 3596	1.09 17 3526	1.08 18 3465	1.07 19 3417	1.07 20 3380	1.06 21 3352	1.06 22 3331
31	297 -17 469	1.22 4 4605	1.19 7 4456	1.17 10 4320	1.16 13 4187	1.14 14 4062	1.12 15 3953	1.11 16 3860	1.10 17 3778	1.09 18 3706	1.08 19 3643	1.07 20 3589	1.07 21 3545	1.06 22 3514	1.06 23 3490	1.06 24 3473
30	304 -15 471	1.19 8 4646	1.17 11 4510	1.15 14 4377	1.14 17 4252	1.12 18 4143	1.11 19 4049	1.10 20 3966	1.09 21 3893	1.08 22 3828	1.07 23 3771	1.07 24 3724	1.06 25 3691	1.06 26 3664	1.05 27 3644	1.05 28 3631
29	311 -13 473	1.16 12 4703	1.15 15 4569	1.13 17 4445	1.12 20 4336	1.11 21 4242	1.10 22 4159	1.09 23 4084	1.08 24 4018	1.07 25 3960	1.07 26 3911	1.06 27 3875	1.06 28 3846	1.05 29 3823	1.05 30 3807	1.05 31 3797
28	317 -11 476	1.14 16 4762	1.13 18 4640	1.12 21 4532	1.11 23 4439	1.10 24 4355	1.09 25 4280	1.08 26 4212	1.07 27 4153	1.06 28 4102	1.06 29 4064	1.06 30 4033	1.05 31 4008	1.05 32 3990	1.05 33 3977	1.05 34 3970
27	324 -8 478	1.13 19 4837	1.11 21 4732	1.10 23 4639	1.09 24 4555	1.08 25 4479	1.08 26 4411	1.07 27 4350	1.06 28 4298	1.06 29 4259	1.05 30 4227	1.05 31 4200	1.05 32 4179	1.05 33 4165	1.04 34 4155	1.04 35 4149
26	331 -6 480	1.11 22 4935	1.10 24 4843	1.09 26 4759	1.08 27 4684	1.07 28 4615	1.07 29 4554	1.06 30 4501	1.06 31 4460	1.05 32 4427	1.05 33 4399	1.05 34 4376	1.04 35 4360	1.04 36 4348	1.04 37 4341	1.04 38 4337
25	338 -4 482	1.10 25 5052	1.09 27 4969	1.08 28 4893	1.07 29 4824	1.07 30 4762	1.06 31 4710	1.06 32 4668	1.05 33 4633	1.05 34 4604	1.04 35 4580	1.04 36 4561	1.04 37 4548	1.04 38 4540	1.04 39 4534	1.04 40 4533

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
 INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
 INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

TURBULENT AIR PENETRATION

TARGET SPEED IAS/MACH	PRESS ALT 1000 FT	WEIGHT 1000 LB						
		260	240	220	200	180	160	140
		APPROXIMATE POWER SETTING %N ₁						
290/.78	41							
	37							
	33							
	29	82	81	82	80	82	80	77
		79	78	77	76	75	74	73
	25	77	75	74	73	72	71	70
	20	73	72	70	70	68	67	67
	15	70	68	67	66	65	64	64
	10	67	65	65	63	62	62	60

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.05
WING	.04
ENGINE AND WING	.09

MAX CRUISE EPR

PRESS ALT 1000 FT	25	26	27	28	29	30	31	32
EPR LIMIT	1.21	1.22	1.23	1.25	1.27	1.28	1.30	1.32
TAT DEG C AND COLDER	7	5	3	1	-2	-4	-6	-8

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

Wind-Altitude Trade**LRC**

PRESSURE ALTITUDE (1000 FT)	CRUISE WEIGHT (1000 LB)											
	250	240	230	220	210	200	190	180	170	160	150	140
41							18	7	1	0	2	8
39					19	8	2	0	1	4	11	19
37			18	8	3	0	0	3	8	15	23	32
35	14	7	2	0	0	2	6	12	19	27	36	46
33	1	0	0	2	6	11	17	24	32	40	50	60
31	0	2	6	11	16	22	29	37	45	54	64	75
29	6	11	16	22	28	35	42	50	59	68	78	88
27	17	22	28	34	40	48	55	64	73	82	91	102
25	28	34	40	46	53	61	69	77	86	95	104	

.80M

PRESSURE ALTITUDE (1000 FT)	CRUISE WEIGHT (1000 LB)											
	250	240	230	220	210	200	190	180	170	160	150	140
41								15	3	0	2	8
39						18	5	0	1	4	11	22
37				18	5	0	0	3	8	15	27	44
35	30	16	5	0	0	2	6	12	21	34	52	74
33	3	0	0	2	6	11	18	29	43	61	83	109
31	0	2	6	11	17	26	38	53	72	94	119	
29	6	11	17	25	36	49	65	84	105	130		
27	19	26	35	47	61	78	97	118				
25	37	47	60	75	92	112	133					

Above wind factor tables are for calculation of wind required to maintain present range capability at new pressure altitude, i.e. break even wind.

Method:

1. Read wind factors for present and new altitudes from table.
2. Determine difference (new altitude wind factor minus present altitude wind factor); this difference may be positive or negative.
3. Break-even wind at new altitude is present altitude wind plus difference from step 2.

Example: LRC at 31000 ft, 210000 lb, present wind -20 knots (headwind)

To find break-even wind for

- A) Climb to 35000 ft
B) Descent to 27000 ft

A) Wind factors from LRC table at 210000 lb are 16 (31000 ft) and 0 (35000 ft). Difference is -16 so break even wind is -20 plus (-16), i.e. -36 knots (headwind).

B) Similarly, wind factors are 16 (31000 ft) and 40 (27000 ft). Difference is +24 so break even wind is -20 plus (+24), i.e. +4 knots (tailwind).

Descent**.78/290/250**

PRESSURE ALTITUDE (FT)	TIME (MIN)	FUEL (LB)	DISTANCE (NM)		
			LANDING WEIGHT (1000 LB)		
			200	170	140
41000	25	810	133	125	113
39000	24	790	126	118	106
37000	23	760	120	112	100
35000	22	740	114	106	95
33000	21	730	109	101	90
31000	21	710	104	96	86
29000	20	690	97	90	81
27000	19	670	90	84	75
25000	18	650	83	78	70
23000	17	630	77	72	64
21000	16	610	70	66	59
19000	16	590	64	60	54
17000	15	570	57	54	49
15000	14	550	51	48	44
10000	11	490	36	35	32
5000	7	390	17	16	16
1500	5	320	6	6	6

Allowances for a straight-in approach are included.



Flight Planning and Performance Manual

Holding Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 LB)												
		260	250	240	230	220	210	200	190	180	170	160	150	140
40000	EPR							1.37	1.34	1.31	1.29	1.26	1.23	1.19
	KIAS							234	220	211	204	197	193	188
	FF/ENG							3730	3410	3190	3010	2800	2600	2410
35000	EPR		1.35	1.32	1.30	1.29	1.26	1.24	1.22	1.20	1.18	1.16	1.14	1.12
	KIAS		256	246	238	231	225	220	214	207	201	197	193	188
	FF/ENG		4440	4180	3970	3760	3560	3360	3160	2970	2790	2640	2470	2300
30000	EPR	1.25	1.23	1.21	1.20	1.18	1.17	1.16	1.14	1.13	1.12	1.10	1.09	1.07
	KIAS	250	245	239	234	228	223	217	211	205	201	197	193	188
	FF/ENG	4430	4230	4020	3820	3680	3490	3310	3130	2960	2790	2620	2460	2300
25000	EPR	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.07	1.06	1.05	1.04
	KIAS	247	242	237	232	226	221	215	210	205	201	197	193	188
	FF/ENG	4310	4130	3950	3770	3600	3460	3290	3130	2960	2800	2640	2480	2320
20000	EPR	1.11	1.10	1.09	1.08	1.08	1.07	1.07	1.06	1.05	1.05	1.04	1.03	1.03
	KIAS	245	240	235	230	225	219	214	209	205	201	197	193	188
	FF/ENG	4260	4100	3930	3760	3600	3470	3300	3130	2970	2810	2650	2500	2350
15000	EPR	1.07	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.02	1.02
	KIAS	243	239	234	229	224	218	213	209	205	201	197	193	188
	FF/ENG	4290	4130	3960	3790	3620	3450	3320	3160	3010	2860	2710	2560	2420
10000	EPR	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.01	1.01
	KIAS	242	237	233	228	223	217	213	209	205	201	197	193	188
	FF/ENG	4350	4190	4020	3860	3700	3540	3390	3270	3120	2970	2830	2680	2540
5000	EPR	1.03	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01
	KIAS	241	237	232	227	222	217	213	209	205	201	197	193	188
	FF/ENG	4490	4330	4170	4020	3860	3710	3560	3410	3290	3140	2990	2840	2690
1500	EPR	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01
	KIAS	241	236	231	226	221	217	213	209	205	201	197	193	188
	FF/ENG	4580	4420	4270	4110	3960	3800	3650	3500	3350	3230	3070	2920	2770

This table includes 5% additional fuel for holding in a racetrack pattern.

Intentionally
Blank

ENGINE INOP

Long Range Cruise Altitude Capability

Max Continuous Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	12200	8100	5100
250	14700	10300	7100
240	16400	12700	9100
230	18300	15000	11200
220	20000	17400	13700
210	21200	19700	16000
200	22300	21100	18600
190	23600	22400	20700
180	24900	23700	22100
170	26200	25100	23500
160	27500	26500	25100
150	29000	28000	26600
140	30800	29500	28300
130	33100	31400	30000
120	35100	33900	32000

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

Max Cruise Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
240	1700		
230	3900		
220	6100	3400	
210	8300	5900	1500
200	10500	8200	5300
190	12800	10400	8200
180	15000	12800	10600
170	17600	15000	13000
160	20400	17600	15300
150	23600	20300	17900
140	26900	23300	20600
130	30800	26600	23500
120	33800	30600	26800

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

ENGINE INOP

290 KIAS Altitude Capability

Max Continuous Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	16400	14400	11800
250	17500	15400	13100
240	18400	16500	14200
230	19200	17500	15200
220	20000	18400	16300
210	20600	19300	17300
200	21200	20100	18300
190	21700	20600	19100
180	22300	21200	19900
170	22800	21700	20500
160	23300	22200	20900
150	23800	22600	21400
140	24200	23100	21800
130	24600	23500	22200
120	25000	23800	22500

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

Max Cruise Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	3500		
250	5000	1300	
240	6500	3000	
230	7900	4500	
220	9200	6000	2200
210	10400	7400	3800
200	11700	8700	5200
190	12800	9900	6600
180	13900	11000	7900
170	14800	12100	9000
160	15500	13100	10000
150	16400	13900	11000
140	17200	14700	11900
130	17900	15100	12700
120	18500	15800	13400

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

ENGINE INOP

310 KIAS Altitude Capability

Max Continuous Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	14500	12000	9300
250	15200	13000	10300
240	15900	14000	11300
230	16600	14800	12300
220	17400	15500	13200
210	18100	16200	14200
200	18800	17000	15000
190	19500	17700	15500
180	20100	18300	16200
170	20500	18900	16900
160	20800	19500	17500
150	21200	20000	18000
140	21500	20300	18500
130	21800	20600	18900
120	22100	20900	19400

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

Max Cruise Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
250	1600		
240	3000		
230	4200		
220	5400	1600	
210	6500	2900	
200	7600	4100	
190	8600	5200	1200
180	9500	6200	2400
170	10300	7100	3400
160	11000	8000	4300
150	11700	8800	5100
140	12400	9400	6000
130	13000	10000	6700
120	13500	10500	7300

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

ENGINE INOP

330 KIAS Altitude Capability

Max Continuous Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	11500	8900	6300
250	12300	9800	7100
240	13000	10600	8000
230	13700	11400	8800
220	14400	12100	9500
210	15000	12800	10200
200	15400	13400	10900
190	15900	14000	11600
180	16500	14500	12100
170	16900	15000	12700
160	17400	15300	13200
150	17800	15700	13600
140	18100	16100	14100
130	18500	16500	14400
120	18800	16800	14700

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

Max Cruise Thrust, 100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
210	1500		
200	2400		
190	3300		
180	4100		
170	4900		
160	5600	1700	
150	6200	2400	
140	6700	3000	
130	7200	3600	
120	7600	4000	

With engine anti-ice on, decrease altitude capability by 2600 ft.

With engine and wing anti-ice on, decrease altitude capability by 6600 ft.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Table 30000 FT to 25000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30 (-27)	EPR												1.47	1.41	1.37	1.33
	MAX TAT												-15	-7	-1	
	KIAS												241	235	231	227
	MACH												.645	.630	.619	.610
	FF/ENG KTAS												5551 380	5120 371	4777 365	4471 359
29 (-25)	EPR												1.43	1.38	1.35	1.31
	MAX TAT												-7	-1	4	
	KIAS												242	237	234	229
	MACH												.634	.623	.615	.602
	FF/ENG KTAS												5514 375	5142 369	4836 364	4504 356
28 (-23)	EPR											1.44	1.39	1.36	1.32	1.29
	MAX TAT											-7	-1	4		
	KIAS											249	244	240	236	230
	MACH											.639	.626	.618	.608	.594
	FF/ENG KTAS											5906 380	5506 372	5180 367	4868 361	4529 353
27 (-21)	EPR										1.45	1.40	1.37	1.33	1.30	1.27
	MAX TAT										-7	-1	4	8		
	KIAS										256	250	247	243	238	232
	MACH										.642	.630	.620	.612	.600	.584
	FF/ENG KTAS										6297 383	5872 376	5528 370	5225 366	4889 358	4555 349
26 (-19)	EPR									1.46	1.41	1.37	1.34	1.31	1.28	1.25
	MAX TAT									-7	0	4	9			
	KIAS									263	257	253	250	246	240	232
	MACH									.646	.632	.623	.616	.606	.592	.575
	FF/ENG KTAS									6692 387	6248 379	5884 373	5577 369	5255 363	4918 355	4568 344
25 (-17)	EPR									1.42	1.38	1.35	1.32	1.29	1.26	1.23
	MAX TAT									0	5	9	13			
	KIAS									264	259	256	253	247	241	233
	MACH									.635	.625	.618	.610	.598	.583	.564
	FF/ENG KTAS									6629 382	6247 376	5925 372	5618 367	5280 360	4945 351	4561 339

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Heavy line approximates max cruise thrust limit.

Max Continuous EPR

PRESS ALT (1000 FT)	25	26	27	28	29	30
LIMIT EPR	1.46	1.46	1.47	1.47	1.48	1.48
MAX TAT (°C)	-4	-6	-8	-11	-13	-15

Decrease limit EPR by 0.08 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.04.

With engine and wing anti-ice on, decrease limit EPR by 0.08.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Table 24000 FT to 19000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
24 (-15)	EPR								1.42	1.38	1.35	1.33	1.30	1.27	1.25	1.22
	MAX TAT								1	6	10	14				
	KIAS								270	266	262	259	255	249	242	232
	MACH								.638	.627	.620	.613	.602	.589	.573	.552
	FF/ENG KTAS								7013 385	6613 379	6280 375	5979 370	5647 364	5314 356	4954 346	4541 333
23 (-13)	EPR							1.42	1.39	1.36	1.33	1.31	1.28	1.26	1.23	1.20
	MAX TAT							2	7	11	14	18				
	KIAS							277	272	269	266	262	256	250	242	231
	MACH							.639	.629	.621	.615	.606	.594	.580	.562	.538
	FF/ENG KTAS							7396 388	6983 382	6640 377	6339 373	6015 368	5679 361	5337 352	4944 341	4527 327
22 (-11)	EPR						1.42	1.39	1.36	1.34	1.31	1.29	1.26	1.24	1.21	1.19
	MAX TAT						3	8	12	15	19					
	KIAS						283	279	275	272	269	264	258	251	241	230
	MACH						.641	.631	.623	.616	.609	.598	.586	.570	.550	.525
	FF/ENG KTAS						7777 391	7354 384	7002 380	6693 376	6381 371	6044 365	5712 357	5338 347	4922 335	4506 320
21 (-9)	EPR					1.42	1.39	1.36	1.34	1.32	1.29	1.27	1.25	1.22	1.20	1.17
	MAX TAT					5	9	13	17	20						
	KIAS					290	285	281	278	275	271	265	259	251	240	228
	MACH					.642	.632	.624	.618	.611	.602	.590	.576	.559	.537	.511
	FF/ENG KTAS					8155 393	7724 386	7365 382	7049 378	6746 374	6411 368	6080 361	5724 353	5322 342	4906 328	4477 313
20 (-7)	EPR				1.42	1.39	1.36	1.34	1.32	1.30	1.27	1.25	1.23	1.21	1.18	1.16
	MAX TAT				6	11	14	18	21	25						
	KIAS				296	291	287	284	282	277	272	266	259	250	239	227
	MACH				.643	.633	.625	.619	.613	.605	.594	.581	.566	.547	.523	.497
	FF/ENG KTAS				8533 395	8098 389	7733 384	7411 380	7112 377	6783 371	6449 365	6106 357	5717 348	5301 336	4882 322	4442 306
19 (-6)	EPR				1.39	1.36	1.34	1.32	1.30	1.28	1.26	1.24	1.21	1.19	1.17	1.15
	MAX TAT				11	15	18	21	24							
	KIAS				297	293	290	288	284	279	274	267	259	249	237	226
	MACH				.633	.626	.620	.614	.607	.597	.585	.572	.555	.534	.510	.487
	FF/ENG KTAS				8477 390	8108 386	7782 382	7484 379	7159 374	6824 368	6489 361	6112 353	5703 342	5288 329	4855 314	4438 300

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Heavy line approximates max cruise thrust limit.

Max Continuous EPR

PRESS ALT (1000 FT)	19	20	21	22	23	24
LIMIT EPR	1.42	1.43	1.43	1.44	1.45	1.45
MAX TAT (°C)	8	7	5	2	0	-2

Decrease limit EPR by 0.08 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.04.

With engine and wing anti-ice on, decrease limit EPR by 0.07.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Table 18000 FT to 13000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
18 (-4)	EPR			1.39	1.36	1.34	1.32	1.30	1.28	1.26	1.24	1.22	1.20	1.18	1.16	1.14
	MAX TAT			11	15	18	21	24	28							
	KIAS			303	300	297	294	291	286	281	275	267	258	247	236	227
	MACH			.633	.626	.620	.615	.608	.599	.589	.576	.561	.542	.520	.496	.479
	FF/ENG			8859	8488	8158	7860	7540	7202	6872	6507	6107	5690	5265	4823	4460
	KTAS			392	388	384	381	377	371	365	357	348	336	322	307	296
17 (-2)	EPR		1.39	1.36	1.34	1.32	1.30	1.28	1.26	1.25	1.23	1.20	1.18	1.16	1.15	1.13
	MAX TAT		-149	15	18	21	24	27								
	KIAS		309	306	303	300	297	293	288	282	275	267	257	246	235	228
	MACH		.633	.626	.621	.616	.609	.601	.591	.580	.566	.550	.529	.507	.486	.472
	FF/ENG		9240	8869	8537	8236	7921	7585	7254	6899	6506	6090	5673	5237	4823	4490
	KTAS		394	389	386	383	379	374	368	360	352	342	329	315	302	293
16 (0)	EPR		1.36	1.34	1.32	1.30	1.29	1.27	1.25	1.23	1.21	1.19	1.17	1.15	1.14	1.12
	MAX TAT		15	18	21	24	27	30								
	KIAS		312	309	306	303	299	295	289	283	275	266	255	244	236	229
	MACH		.626	.621	.616	.610	.603	.593	.583	.570	.555	.537	.516	.494	.478	.465
	FF/ENG		9252	8920	8617	8306	7971	7639	7291	6904	6496	6079	5647	5206	4847	4533
	KTAS		391	387	384	381	376	370	364	356	347	335	322	308	299	290
15 (2)	EPR	1.36	1.34	1.32	1.30	1.29	1.27	1.25	1.23	1.21	1.20	1.18	1.16	1.14	1.13	1.12
	MAX TAT	16	19	21	24	27	30	33								
	KIAS	317	315	312	309	306	301	296	290	283	274	264	253	244	237	230
	MACH	.626	.621	.616	.611	.604	.595	.585	.574	.560	.543	.524	.503	.485	.471	.459
	FF/ENG	9635	9303	8998	8690	8357	8024	7680	7300	6898	6479	6054	5613	5210	4878	4565
	KTAS	392	389	386	383	378	373	367	359	351	340	328	315	304	295	287
14 (3)	EPR	1.34	1.32	1.30	1.29	1.27	1.25	1.24	1.22	1.20	1.18	1.17	1.15	1.14	1.12	1.11
	MAX TAT	19	22	25	27	31	34									
	KIAS	321	318	316	312	308	303	297	290	282	273	262	252	245	238	231
	MACH	.621	.616	.611	.604	.596	.587	.576	.564	.549	.531	.511	.491	.477	.465	.451
	FF/ENG	9797	9487	9173	8834	8495	8151	7770	7365	6942	6519	6079	5640	5286	4970	4638
	KTAS	390	388	384	380	375	369	362	355	345	334	321	309	300	293	284
13 (5)	EPR	1.32	1.30	1.29	1.27	1.25	1.24	1.22	1.20	1.19	1.17	1.15	1.14	1.13	1.12	1.11
	MAX TAT	22	25	28	31	34	37									
	KIAS	324	322	318	314	309	304	297	290	281	271	261	252	246	240	232
	MACH	.616	.611	.605	.597	.588	.578	.567	.553	.536	.518	.498	.483	.470	.459	.444
	FF/ENG	9870	9557	9219	8879	8538	8161	7759	7342	6919	6482	6033	5647	5317	5000	4662
	KTAS	389	386	382	377	371	365	358	349	338	327	314	305	297	290	280

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Heavy line approximates max cruise thrust limit.

Max Continuous EPR

PRESS ALT (1000 FT)	13	14	15	16	17	18
LIMIT EPR	1.34	1.35	1.36	1.38	1.39	1.40
MAX TAT (°C)	20	18	16	14	13	10

Decrease limit EPR by 0.07 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.03.

With engine and wing anti-ice on, decrease limit EPR by 0.06.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Table 12000 FT to 7000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
12 (6)	EPR	1.30	1.29	1.27	1.25	1.24	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.10
	MAX TAT	25	28	31	34	37										
	KIAS	328	324	320	316	310	304	297	289	279	269	260	253	247	240	232
	MACH	.611	.605	.598	.589	.580	.569	.556	.541	.524	.505	.488	.475	.465	.452	.437
	FF/ENG	9949	9612	9272	8931	8556	8158	7746	7321	6888	6444	6022	5676	5364	5029	4694
	KTAS	387	383	379	373	367	360	352	343	332	320	309	301	294	286	277
11 (8)	EPR	1.28	1.27	1.25	1.24	1.22	1.21	1.19	1.18	1.16	1.15	1.14	1.13	1.11	1.10	1.09
	MAX TAT	28	31	34	37	41										
	KIAS	330	326	322	317	311	304	296	287	278	268	261	254	248	241	233
	MACH	.605	.598	.590	.581	.571	.559	.544	.528	.511	.493	.480	.469	.458	.444	.430
	FF/ENG	10013	9672	9331	8958	8561	8153	7727	7297	6855	6410	6045	5718	5399	5061	4729
	KTAS	385	380	375	370	363	355	346	336	325	314	305	298	291	283	273
10 (10)	EPR	1.27	1.25	1.24	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	MAX TAT	31	34	37	41											
	KIAS	332	328	323	318	311	304	295	286	276	268	262	256	249	242	234
	MACH	.598	.590	.582	.572	.561	.547	.532	.516	.498	.484	.473	.463	.451	.437	.423
	FF/ENG	10076	9734	9361	8965	8560	8133	7706	7265	6813	6420	6082	5770	5434	5098	4765
	KTAS	382	377	371	365	358	349	340	329	318	309	302	296	288	279	270
9 (11)	EPR	1.25	1.24	1.22	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08
	MAX TAT	34	37	41	44											
	KIAS	334	329	324	318	311	302	293	284	275	269	263	257	250	242	234
	MACH	.591	.582	.573	.562	.550	.535	.520	.503	.488	.477	.467	.456	.444	.430	.416
	FF/ENG	10138	9764	9369	8965	8538	8113	7674	7225	6804	6454	6132	5808	5479	5175	4861
	KTAS	378	373	367	360	352	343	333	322	313	305	299	292	284	276	267
8 (13)	EPR	1.24	1.22	1.21	1.20	1.18	1.17	1.16	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.08
	MAX TAT	38	41	44												
	KIAS	335	330	324	317	309	301	292	282	276	270	264	258	251	243	235
	MACH	.583	.574	.564	.552	.538	.523	.507	.492	.480	.470	.461	.449	.437	.424	.410
	FF/ENG	10168	9774	9371	8948	8521	8084	7636	7195	6829	6498	6183	5844	5537	5229	4905
	KTAS	375	369	362	355	346	336	326	316	309	302	296	289	281	272	263
7 (14)	EPR	1.22	1.21	1.20	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08
	MAX TAT	41	44	48												
	KIAS	336	331	324	316	308	299	290	283	277	272	265	258	251	243	236
	MACH	.574	.564	.553	.540	.526	.511	.495	.483	.473	.465	.454	.442	.430	.417	.404
	FF/ENG	10179	9777	9356	8927	8492	8045	7590	7209	6870	6557	6222	5900	5595	5281	4954
	KTAS	370	364	357	349	339	330	320	312	306	300	293	286	278	269	261

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Heavy line approximates max cruise thrust limit.

Max Continuous EPR

PRESS ALT (1000 FT)	7	8	9	10	11	12
LIMIT EPR	1.29	1.30	1.30	1.31	1.32	1.33
MAX TAT (°C)	30	28	27	25	23	22

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.03.

With engine and wing anti-ice on, decrease limit EPR by 0.06.

ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Cruise Table
30000 FT to 25000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30																
29																
28																
27																
26																
25	290 -12 418													1.41 -1 7040	1.40 1 6917	1.38 2 6812

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	25					
EPR LIMIT	1.42					
TAT DEG C AND COLDER	-1					

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.04
ENGINE AND WING	.08

REDUCE EPR BY 0.08 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Cruise Table

24000 FT to 19000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
24	290 -10 412											1.41 1 7250	1.39 3 7100	1.38 5 6968	1.36 7 6852	1.35 8 6753
23	290 -9 405									1.41 3 7512	1.39 5 7331	1.37 7 7169	1.36 9 7026	1.35 11 6901	1.33 13 6792	1.32 14 6697
22	290 -8 399							1.42 4 7830	1.40 7 7618	1.38 9 7423	1.36 11 7248	1.34 13 7095	1.33 15 6959	1.32 17 6838	1.31 18 6732	1.30 19 6641
21	290 -6 393					1.43 5 8172	1.40 7 7943	1.38 10 7727	1.36 13 7526	1.35 15 7343	1.33 17 7178	1.32 19 7029	1.30 21 6897	1.29 22 6782	1.28 24 6681	1.28 25 6594
20	290 -5 387			1.43 5 8546	1.41 8 8293	1.39 11 8059	1.37 14 7842	1.35 16 7640	1.33 18 7450	1.32 21 7275	1.30 23 7116	1.29 24 6973	1.28 26 6849	1.27 26 6741	1.26 26 6646	1.25 26 6563
19	290 -3 382		1.42 7 8707	1.40 10 8429	1.38 13 8188	1.36 16 7969	1.34 18 7765	1.32 20 7571	1.31 22 7388	1.29 25 7222	1.28 27 7071	1.27 27 6939	1.26 27 6822	1.25 27 6718	1.24 27 6623	1.24 27 6537

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	19	20	21	22	23	24
EPR LIMIT	1.43	1.44	1.43	1.43	1.43	1.42
TAT DEG C AND COLDER	7	6	5	3	2	1

REDUCE EPR BY 0.08 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.04
ENGINE AND WING	.07

ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Cruise Table
18000 FT to 13000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
18	290 -2 376	1.41 9 8877	1.39 12 8591	1.37 15 8334	1.35 17 8110	1.33 20 7901	1.32 22 7703	1.30 24 7518	1.29 26 7345	1.27 28 7189	1.26 28 7049	1.25 28 6919	1.24 28 6800	1.23 28 6692	1.23 28 6594	1.22 28 6508
17	290 -1 370	1.38 13 8771	1.36 16 8509	1.34 19 8269	1.32 21 8054	1.31 23 7854	1.29 26 7665	1.28 28 7491	1.27 30 7328	1.25 30 7175	1.24 30 7031	1.23 30 6896	1.22 30 6775	1.22 30 6669	1.21 30 6574	1.20 30 6492
16	290 1 365	1.35 17 8707	1.34 20 8460	1.32 22 8230	1.30 25 8025	1.29 27 7834	1.27 29 7658	1.26 31 7489	1.25 31 7322	1.24 31 7162	1.23 31 7015	1.22 31 6882	1.21 31 6767	1.20 31 6666	1.20 31 6576	1.19 31 6497
15	290 2 359	1.33 21 8660	1.31 24 8424	1.30 26 8205	1.28 28 8012	1.27 31 7831	1.26 33 7653	1.24 33 7476	1.23 33 7303	1.22 33 7144	1.21 33 7003	1.20 33 6878	1.20 33 6769	1.19 33 6671	1.18 33 6582	1.18 33 6502
14	290 4 354	1.31 25 8714	1.29 28 8487	1.28 30 8281	1.27 33 8089	1.25 33 7897	1.24 33 7707	1.23 33 7525	1.22 33 7356	1.21 33 7205	1.20 33 7068	1.19 33 6944	1.18 33 6833	1.18 33 6733	1.17 33 6641	1.16 33 6559
13	290 5 349	1.29 29 8690	1.28 31 8473	1.26 34 8262	1.25 34 8057	1.24 34 7861	1.22 34 7676	1.21 34 7505	1.20 34 7345	1.19 34 7198	1.19 34 7063	1.18 34 6938	1.17 34 6826	1.16 34 6726	1.16 34 6634	1.15 34 6553

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA +30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	13	14	15	16	17	18
EPR LIMIT	1.38	1.39	1.40	1.41	1.41	1.42
TAT DEG C AND COLDER	16	14	13	12	10	9

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Cruise Table

12000 FT to 7000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
12	290 7 344	1.27 32 8693	1.26 35 8466	1.25 8245	1.23 8040	1.22 7852	1.21 7678	1.20 7514	1.19 7356	1.18 7208	1.17 7073	1.17 6948	1.16 6837	1.15 6737	1.15 6645	1.14 6565
11	290 8 339	1.26 36 8692	1.24 39 8459	1.23 8244	1.22 8049	1.21 7870	1.20 7699	1.19 7534	1.18 7376	1.17 7229	1.16 7094	1.16 6970	1.15 6859	1.14 6759	1.14 6667	1.13 6588
10	290 10 334	1.24 40 8687	1.23 8464	1.22 8260	1.21 8071	1.20 7892	1.19 7719	1.18 7553	1.17 7397	1.16 7252	1.15 7116	1.15 6993	1.14 6882	1.13 6781	1.13 6691	1.13 6612
9	290 11 329	1.23 8694	1.22 8482	1.20 8282	1.19 8092	1.18 7911	1.17 7737	1.17 7572	1.16 7417	1.15 7272	1.14 7137	1.14 7014	1.13 6903	1.13 6803	1.12 6714	1.12 6636
8	290 13 325	1.21 8711	1.20 8502	1.19 8300	1.18 8109	1.17 7927	1.16 7753	1.16 7589	1.15 7435	1.14 7290	1.13 7155	1.13 7033	1.12 6924	1.12 6827	1.11 6740	1.11 6662
7	290 15 320	1.20 8725	1.19 8515	1.18 8314	1.17 8122	1.16 7941	1.15 7766	1.15 7602	1.14 7449	1.13 7305	1.13 7171	1.12 7051	1.12 6943	1.11 6846	1.11 6758	1.10 6680

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	7	8	9	10	11	12
EPR LIMIT	1.33	1.34	1.35	1.36	1.36	1.37
TAT DEG C AND COLDER	25	24	22	20	19	17

AI BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

REDUCE EPR BY 0.06 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Cruise Table
30000 FT to 25000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30																
29																
28		PERFORMANCE THRUST LIMITED														
27																
26																
25																

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT							
EPR LIMIT							
TAT DEG C AND COLDER							

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	
ENGINE AND WING	

ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Cruise Table

24000 FT to 19000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
24																
23																
22	310 -5 425												1.39 6 7982	1.38 7 7875	1.37 8 7782	1.36 9 7702
21	310 -3 419									1.40 7 8302	1.38 8 8156	1.37 10 8025	1.36 12 7907	1.35 13 7805	1.34 14 7717	1.34 15 7641
20	310 -2 413							1.40 9 8541	1.38 11 8370	1.37 13 8214	1.35 14 8075	1.34 16 7951	1.33 17 7840	1.32 19 7742	1.32 20 7657	1.31 21 7584
19	310 -1 407						1.38 11 8636	1.37 13 8453	1.35 15 8288	1.34 17 8140	1.33 19 8007	1.32 20 7887	1.31 21 7779	1.30 23 7684	1.29 24 7602	1.29 25 7530

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	19	20	21	22		
EPR LIMIT	1.40	1.41	1.40	1.40		
TAT DEG C AND COLDER	10	9	7	6		

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.04
ENGINE AND WING	.07

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Cruise Table
18000 FT to 13000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
18	310 0 401				1.39 11 8951	1.37 13 8745	1.35 16 8554	1.34 18 8380	1.33 19 8221	1.31 21 8076	1.30 23 7947	1.29 24 7832	1.28 25 7728	1.28 26 7637	1.27 27 7559	1.27 28 7492
17	310 2 395			1.37 13 9065	1.36 16 8860	1.34 18 8666	1.33 20 8483	1.31 22 8314	1.30 24 8161	1.29 25 8021	1.28 27 7898	1.27 28 7790	1.26 29 7693	1.26 30 7607	1.25 31 7532	1.25 32 7467
16	310 3 389	1.38 14 9406	1.36 16 9187	1.34 18 8980	1.33 20 8783	1.31 22 8595	1.30 24 8420	1.29 26 8260	1.28 27 8114	1.27 29 7984	1.26 30 7869	1.25 32 7765	1.25 33 7669	1.24 34 7581	1.23 35 7503	1.23 36 7434
15	310 5 383	1.35 18 9316	1.33 20 9105	1.32 22 8905	1.31 24 8716	1.29 26 8536	1.28 28 8371	1.27 29 8222	1.26 31 8085	1.25 32 7959	1.24 34 7841	1.23 35 7733	1.23 36 7634	1.22 37 7544	1.22 38 7465	1.21 39 7398
14	310 6 378	1.32 22 9337	1.31 24 9132	1.30 26 8938	1.28 28 8757	1.27 30 8587	1.26 32 8429	1.25 34 8280	1.24 35 8136	1.23 37 8001	1.23 38 7879	1.22 39 7770	1.21 40 7671	1.21 41 7582	1.20 42 7506	1.20 43 7440
13	310 8 372	1.30 26 9287	1.29 28 9092	1.28 30 8911	1.27 32 8738	1.25 33 8569	1.24 35 8403	1.23 37 8247	1.23 38 8101	1.22 39 7969	1.21 40 7852	1.20 41 7749	1.20 42 7655	1.19 43 7571	1.19 44 7496	1.18 45 7433

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA +30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	13	14	15	16	17	18
EPR LIMIT	1.36	1.37	1.37	1.38	1.39	1.39
TAT DEG C AND COLDER	18	17	15	14	13	11

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Cruise Table

12000 FT to 7000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
12	310 9 367	1.28 29 9266	1.27 31 9083	1.26 33 8904	1.25 35 8723	1.24 37 8544	1.23 39 8376	1.22 8222	1.21 8083	1.20 7958	1.20 7848	1.19 7748	1.18 7656	1.18 7572	1.18 7497	1.17 7435
11	310 10 362	1.27 33 9265	1.25 35 9074	1.24 37 8884	1.23 39 8698	1.22 41 8521	1.21 8361	1.21 8216	1.20 8083	1.19 7963	1.18 7853	1.18 7753	1.17 7660	1.17 7575	1.16 7501	1.16 7440
10	310 12 357	1.25 36 9244	1.24 38 9047	1.23 41 8857	1.22 43 8680	1.21 8514	1.20 8362	1.19 8220	1.18 8088	1.18 7967	1.17 7856	1.17 7756	1.16 7663	1.16 7578	1.15 7506	1.15 7445
9	310 13 352	1.23 40 9214	1.22 42 9025	1.21 44 8847	1.20 46 8679	1.20 8518	1.19 8366	1.18 8223	1.17 8091	1.17 7969	1.16 7859	1.16 7759	1.15 7666	1.15 7582	1.14 7511	1.14 7450
8	310 15 347	1.22 44 9222	1.21 46 9042	1.20 48 8869	1.19 50 8702	1.18 8540	1.18 8388	1.17 8246	1.16 8114	1.16 7993	1.15 7883	1.15 7783	1.14 7689	1.14 7607	1.13 7535	1.13 7474
7	310 17 342	1.21 46 9245	1.20 48 9066	1.19 50 8892	1.18 52 8723	1.17 8562	1.17 8411	1.16 8270	1.15 8138	1.15 8018	1.14 7908	1.14 7807	1.13 7715	1.13 7633	1.13 7562	1.12 7500

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	7	8	9	10	11	12
EPR LIMIT	1.31	1.32	1.33	1.34	1.34	1.35
TAT DEG C AND COLDER	27	26	24	23	21	20

AI BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

REDUCE EPR BY 0.06 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Table
30000 FT to 25000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30																
29																
28		PERFORMANCE THRUST LIMITED														
27																
26																
25																

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT						
EPR LIMIT						
TAT DEG C AND COLDER						

A/I BLEED CORRECTION	REDUCE EPR
ENGINE	
ENGINE AND WING	

ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Table

24000 FT to 19000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
24																
23																
22																
21																
20																
19	330 2 432													1.36 13 8829	1.35 14 8757	1.35 14 8697

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	19					
EPR LIMIT	1.37					
TAT DEG C AND COLDER	13					

A/ BLEED CORRECTION	REDUCE EPR
ENGINE	.04
ENGINE AND WING	.07

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Table
18000 FT to 13000 FT
EPR
MAX TAT
FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
18	330 3 425										1.36 14 9044	1.35 15 8941	1.34 16 8851	1.33 17 8772	1.33 18 8703	1.32 18 8646
17	330 4 419								1.35 16 9212	1.34 17 9090	1.33 18 8980	1.32 19 8881	1.31 20 8794	1.31 21 8717	1.30 22 8650	1.30 22 8593
16	330 6 413						1.34 17 9412	1.33 18 9270	1.32 20 9141	1.31 21 9023	1.31 22 8915	1.30 23 8819	1.29 24 8734	1.29 25 8660	1.28 26 8595	1.28 26 8540
15	330 7 407				1.34 18 9652	1.33 19 9488	1.32 21 9336	1.31 22 9197	1.30 24 9072	1.29 25 8958	1.28 26 8855	1.28 27 8763	1.27 28 8682	1.27 29 8612	1.26 29 8551	1.26 30 8499
14	330 8 401		1.34 19 10052	1.33 20 9865	1.32 22 9690	1.30 24 9528	1.29 25 9380	1.29 27 9245	1.28 28 9124	1.27 29 9015	1.26 30 8916	1.26 31 8828	1.25 32 8750	1.25 33 8680	1.24 34 8619	1.24 34 8566
13	330 10 396	1.33 21 10146	1.31 23 9954	1.30 24 9774	1.29 26 9607	1.28 28 9453	1.27 29 9313	1.27 30 9187	1.26 32 9073	1.25 33 8968	1.24 34 8871	1.24 35 8781	1.23 36 8699	1.23 37 8626	1.23 37 8562	1.22 38 8509

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	13	14	15	16	17	18
EPR LIMIT	1.34	1.34	1.35	1.35	1.36	1.36
TAT DEG C AND COLDER	21	19	18	17	15	14

A1 BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

REDUCE EPR BY 0.07 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Table

12000 FT to 7000 FT

EPR

MAX TAT

FF/ENG

PRESS ALT 1000 FT	IAS STD TAT TAS	WEIGHT 1000 LB														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
12	330 11 390	1.30 25 10060	1.29 26 9877	1.28 28 9706	1.27 30 9551	1.26 31 9407	1.25 33 9273	1.25 34 9148	1.24 35 9031	1.23 36 8922	1.23 37 8820	1.22 39 8727	1.22 40 8645	1.21 40 8572	1.21 41 8510	1.21 42 8461
11	330 13 385	1.28 28 10002	1.27 30 9830	1.26 32 9670	1.25 33 9518	1.25 35 9371	1.24 36 9232	1.23 38 9102	1.22 39 8982	1.22 40 8874	1.21 41 8775	1.21 42 8685	1.20 43 8606	1.20 43 8537	1.20 44 8479	1.19 44 8435
10	330 14 379	1.26 32 9984	1.26 33 9813	1.25 35 9646	1.24 37 9486	1.23 38 9335	1.22 40 9196	1.21 41 9068	1.21 43 8955	1.20 44 8852	1.20 45 8758	1.19 45 8673	1.19 46 8597	1.19 46 8530	1.18 47 8474	1.18 47 8431
9	330 16 374	1.25 35 9971	1.24 37 9791	1.23 39 9619	1.22 41 9460	1.21 42 9314	1.21 44 9181	1.20 45 9062	1.20 46 8954	1.19 46 8855	1.18 47 8762	1.18 48 8678	1.18 48 8601	1.17 49 8534	1.17 49 8480	1.17 50 8435
8	330 17 369	1.23 39 9944	1.22 41 9764	1.22 43 9600	1.21 44 9449	1.20 46 9311	1.19 48 9183	1.19 48 9067	1.18 49 8960	1.18 50 8860	1.17 50 8767	1.17 51 8682	1.16 51 8605	1.16 52 8539	1.16 52 8485	1.16 53 8440
7	330 19 363	1.22 43 9921	1.21 45 9753	1.20 46 9597	1.19 48 9452	1.19 48 9316	1.18 49 9188	1.18 50 9071	1.17 50 8963	1.17 51 8863	1.16 51 8770	1.16 52 8685	1.15 52 8609	1.15 53 8545	1.15 53 8490	1.15 54 8445

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE / DECREASE FUEL FLOW 3% PER 10°C ABOVE / BELOW STANDARD TAT
INCREASE / DECREASE TAS BY 1 KT PER 1°C ABOVE / BELOW STANDARD TAT

HEAVY LINE APPROXIMATES MAX CRUISE THRUST LIMIT

MAX CONTINUOUS EPR

PRESS ALT 1000 FT	7	8	9	10	11	12
EPR LIMIT	1.29	1.30	1.31	1.31	1.32	1.33
TAT DEG C AND COLDER	29	28	26	25	23	22

REDUCE EPR BY 0.05 PER 10 DEGREES C TAT HOTTER THAN TABLE VALUE

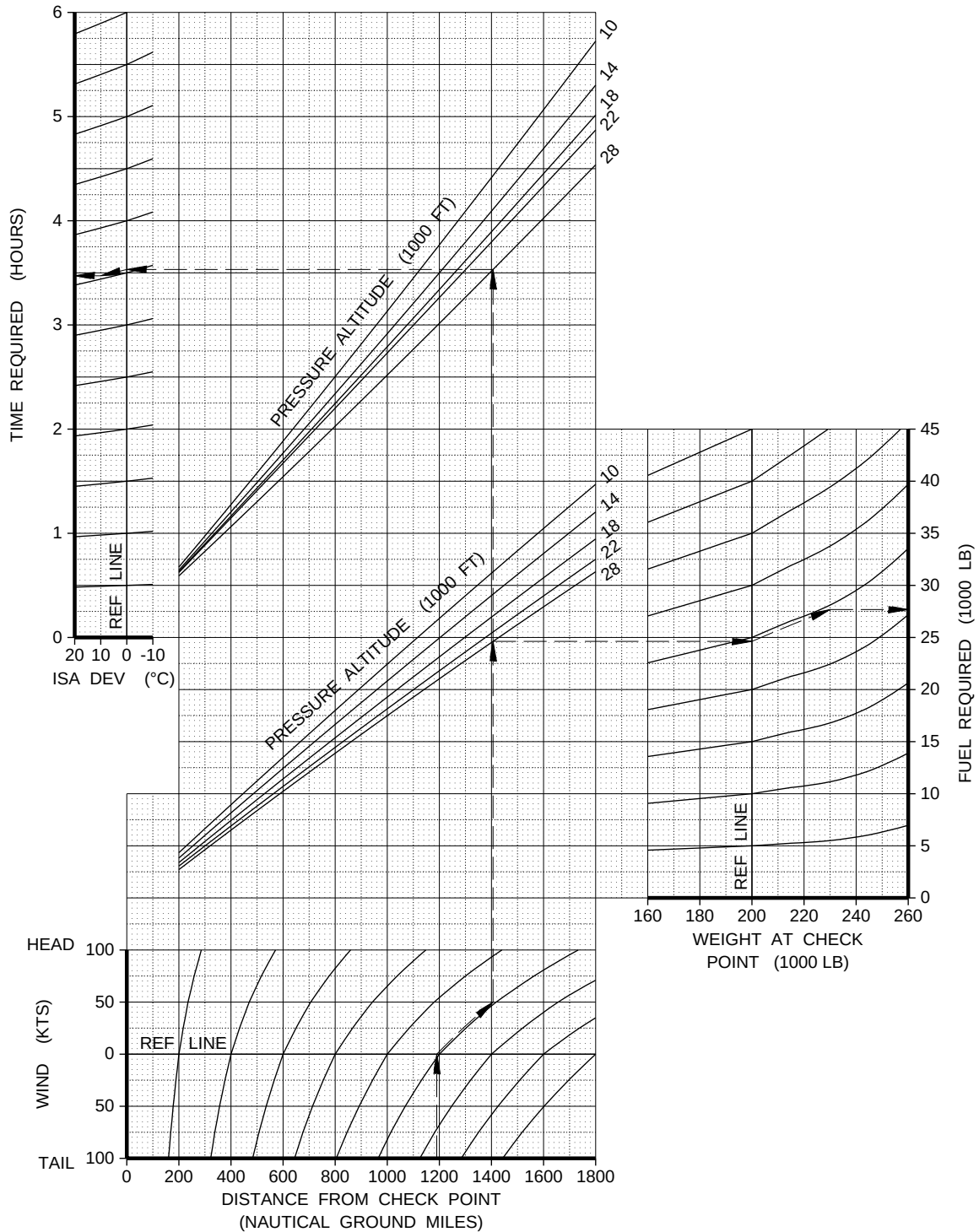
A/I BLEED CORRECTION	REDUCE EPR
ENGINE	.03
ENGINE AND WING	.06

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Diversion Fuel and Time

Based on .78/290/250 descent and includes APU fuel burn

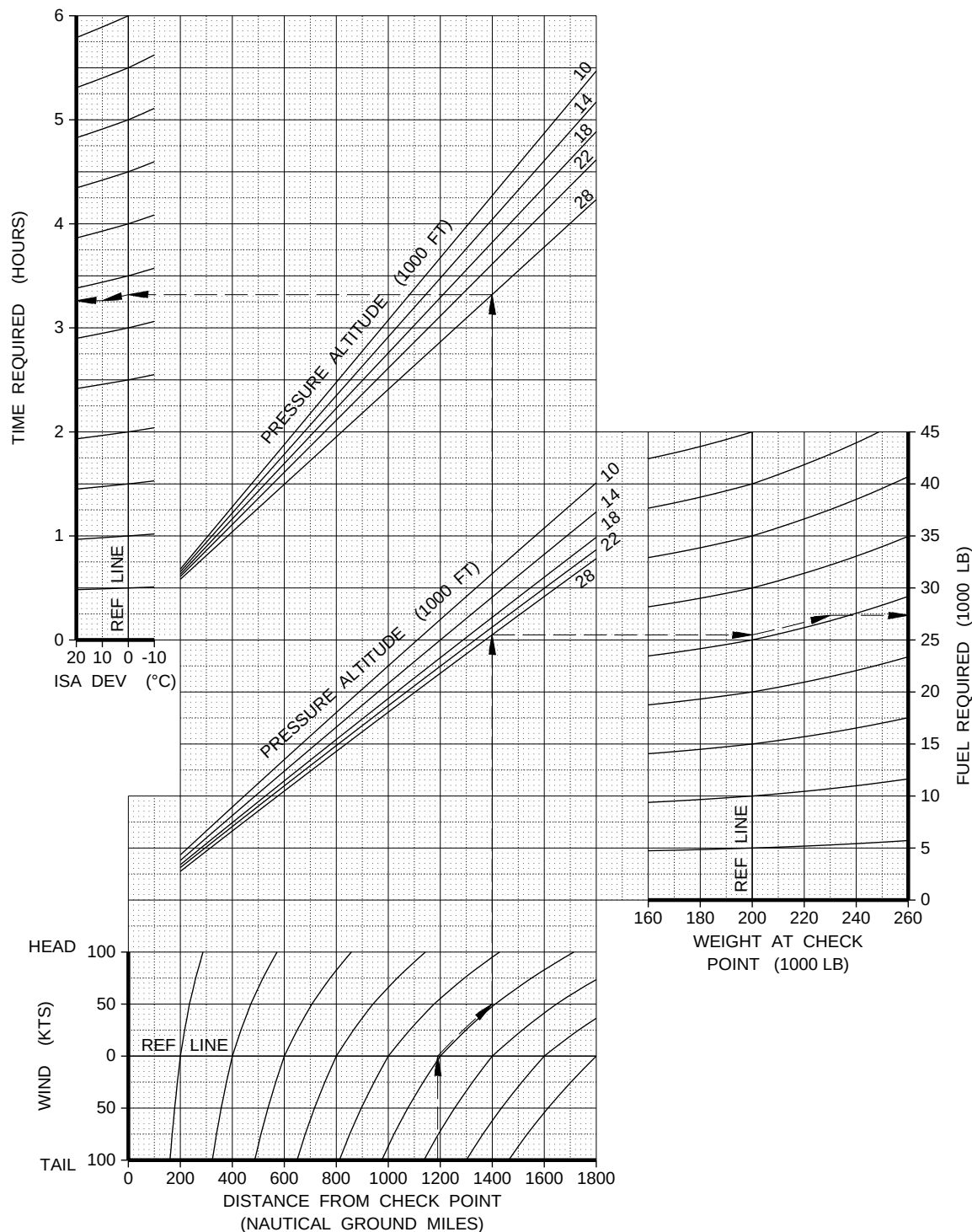


ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Diversion Fuel and Time

Based on 290/250 descent and includes APU fuel burn

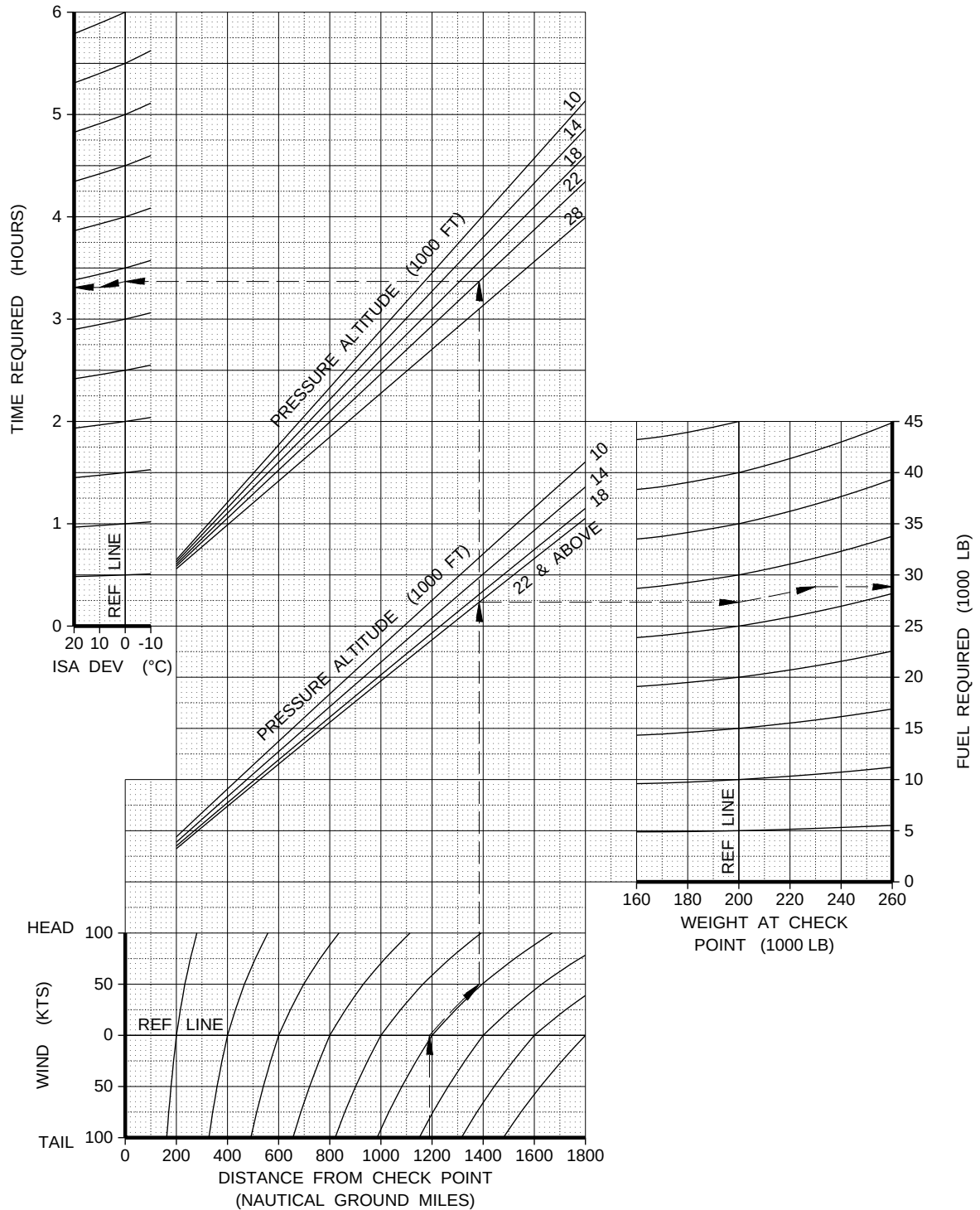


ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Diversion Fuel and Time

Based on 310/250 descent and includes APU fuel burn

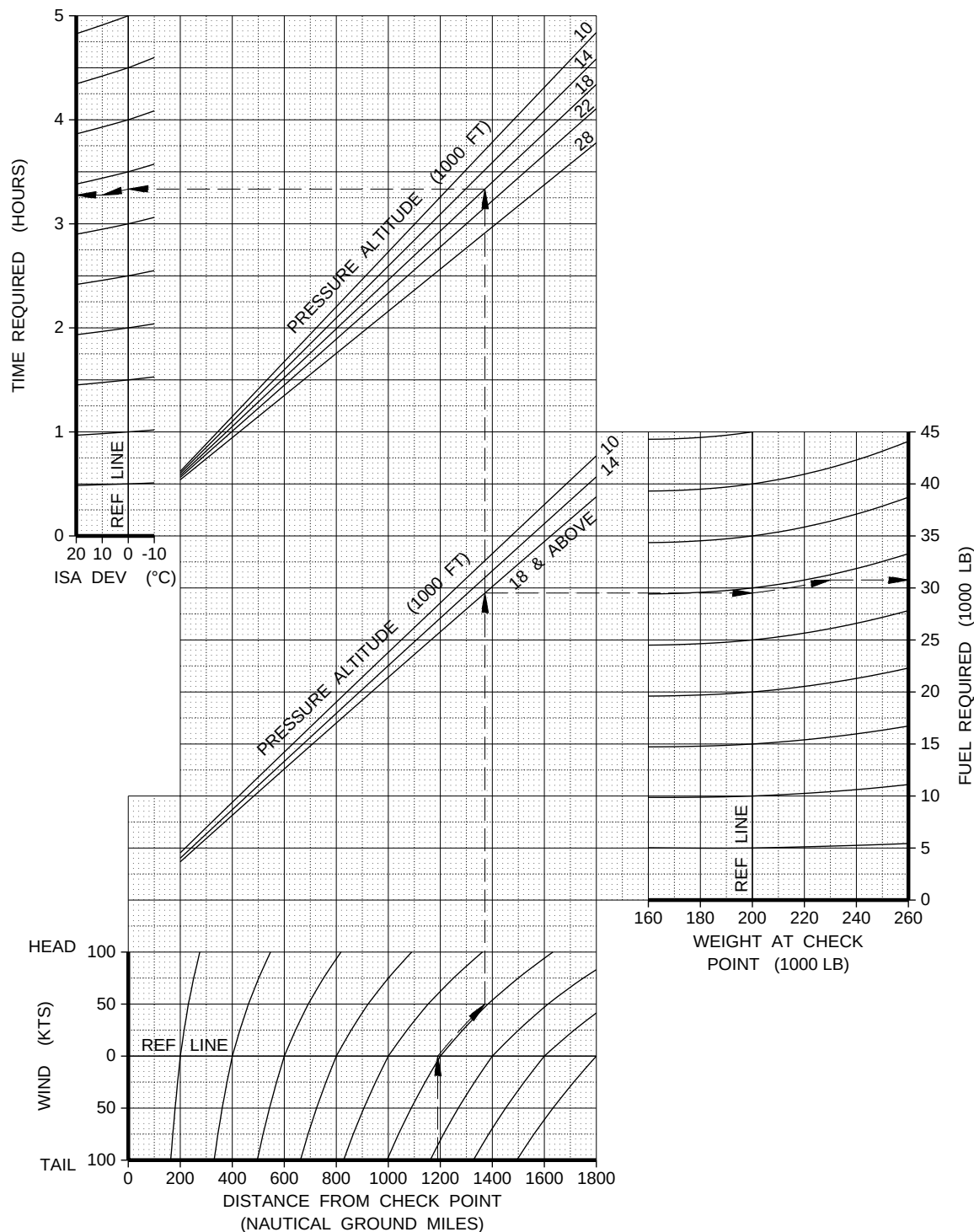


ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Diversion Fuel and Time

Based on 330/250 descent and includes APU fuel burn



ENGINE INOP

MAX CONTINUOUS THRUST

Holding Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30000	EPR											1.48	1.42	1.38	1.33	1.30
	KIAS											197	193	188	184	179
	FF/ENG											5270	4850	4480	4140	3870
25000	EPR						1.52	1.47	1.43	1.39	1.36	1.32	1.29	1.26	1.24	1.21
	KIAS						221	215	210	205	201	197	193	188	184	179
	FF/ENG						7140	6640	6190	5780	5420	5070	4750	4420	4100	3800
20000	EPR		1.47	1.43	1.40	1.38	1.35	1.33	1.30	1.28	1.26	1.23	1.21	1.19	1.17	1.15
	KIAS		240	235	230	225	219	214	209	205	201	197	193	188	184	179
	FF/ENG		8370	7910	7490	7100	6720	6360	6020	5690	5340	5020	4710	4400	4100	3800
15000	EPR	1.35	1.33	1.31	1.29	1.27	1.26	1.24	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.11
	KIAS	243	239	234	229	224	218	213	209	205	201	197	193	188	184	179
	FF/ENG	8440	8070	7710	7370	7020	6660	6320	5990	5670	5350	5040	4740	4430	4140	3860
10000	EPR	1.26	1.25	1.23	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	KIAS	242	237	233	228	223	217	213	209	205	201	197	193	188	184	179
	FF/ENG	8430	8070	7730	7390	7050	6720	6390	6070	5760	5440	5130	4840	4560	4280	4000
5000	EPR	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.07
	KIAS	241	237	232	227	222	217	213	209	205	201	197	193	188	184	179
	FF/ENG	8430	8090	7760	7430	7100	6770	6450	6140	5870	5610	5330	5040	4740	4450	4160
1500	EPR	1.16	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.08	1.08	1.07	1.06	1.06
	KIAS	241	236	231	226	221	217	213	209	205	201	197	193	188	184	179
	FF/ENG	8460	8130	7800	7470	7140	6860	6590	6320	6020	5720	5420	5120	4820	4520	4230

This table includes 5% additional fuel for holding in a racetrack pattern.

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NON-STANDARD CONFIGURATION

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Gear Down

Introduction

This section contains performance data for airplane operation with landing gear extended. The data includes engine bleed effects for normal air conditioning operation; i.e., two packs on at normal flow with all engines operating, and one pack at normal flow with engine inoperative.

NOTE: The Flight Management Computer System (FMCS) does not contain special provisions for operation with landing gear extended. As a result, the FMCS will generate inaccurate enroute speed schedules, display non-conservative predictions of fuel burn, estimated time of arrival (ETA), maximum altitude, and compute overly shallow descent path. To obtain accurate ETA predictions, gear down cruise speed and altitude should be entered on the CLB and CRZ pages. Gear down cruise speed should also be entered on the DES page and a STEP SIZE of zero should be entered on the PERF INIT or CRZ page. Use of the VNAV during descent under these circumstances is not recommended.

Tables for gear down performance in this section are identical in format and used in the same manner as tables for the gear up configuration previously described.

Planning

Takeoff/Landing Climb Limit

Runway limited takeoff and landing weights are unchanged from those shown in Chapter 1. The climb limited takeoff and landing weights are tabulated in this section as a function of airport OAT and pressure altitude, with adjustments for packs off and anti-ice operation. The landing climb limit weight is further restricted when operating in icing conditions during any part of the flight when the forecast landing temperature is below 46°F.

Maximum allowable takeoff and landing weights are the lesser of the normal runway limit weight and the corresponding climb limit weight with gear down.

Takeoff and landing speeds are unchanged from those shown in Chapter 1.

Net Level Off Weight

This chart is used to determine the dispatch maximum weight for terrain clearance based on the Approved Airplane Flight Manual net one engine inoperative, gear down performance at speed for optimum climb gradient. Refer to Chapter 2 text for description of net level off weight chart.

Long Range Cruise Trip Fuel and Time

A Long Range Cruise Trip Time and Fuel chart is provided at constant altitude to determine trip fuel and time from brake release to touchdown. Refer to Chapter 2 text for description of chart usage.

Enroute - All Engines

Long Range Cruise Altitude Capability

Long Range Cruise Altitude Capability is provided for the more limiting of Max Cruise Thrust with 0 ft/min residual rate of climb or Max Climb Thrust with 100 ft/min residual rate of climb.

VREF + 80 Enroute Climb

The Enroute Climb charts are based on VREF30 + 80 KIAS climb speed.

Max Climb EPR

Max Climb EPR based on normal air conditioning bleed is shown for a 210 KIAS climb schedule which approximates economy climb and turbulent air penetration speed, VREF30 + 80 KIAS with the landing gear extended. Max Climb EPR may be read directly from the table for the desired pressure altitude and TAT.

Long Range Cruise Table

Long Range Cruise tabulations are provided in the same format as the gear up cruise control tables in Chapter 3.

Long Range Cruise Enroute Fuel and Time

This chart is provided to determine fuel and time required to proceed to an alternate airfield or to complete the scheduled trip at Long Range Cruise. The chart is used in a similar manner to the Trip Fuel and Time chart with distance to destination replacing total trip distance.

Descent

Time, distance and fuel information is shown based on flight idle thrust at VREF30 + 80 KIAS and straight in approach.

Holding

EPR required, IAS and fuel flow with gear down are shown as described in Chapter 3 with a minimum maneuver speed of VREF30 + 80.

Enroute - Engine Inoperative

Driftdown/LRC Cruise Range Capability

Engine inoperative range capability is provided to determine the time and fuel required for a specified distance when the recommended driftdown procedure is followed.

Long Range Cruise Altitude Capability

Long Range Cruise altitude capability is provided at Max Continuous Thrust with 100 ft/min residual rate of climb.

Long Range Cruise Diversion Fuel and Time

This chart enables rapid determination of fuel and time required to proceed to an alternate airfield (or continue to destination) at Long Range Cruise with an engine inoperative. Diversion fuel and time are determined in a manner similar to the enroute fuel and time.

Long Range Cruise Tables

Long Range Cruise tabulations for engine inoperative are based on use of Max Continuous Thrust Limits.

Holding

Engine inoperative holding data is provided at VREF30 + 80 KIAS.

Alternate Thrust Setting

Introduction

This section contains performance data for airplane operation using %N1 as an alternate method to set thrust. The data includes engine bleed effects for normal air conditioning operation; i.e., two packs on at normal flow all engines operating, and one pack on at normal flow with engine inoperative.

In the event of any conflict between data presented in this section and that contained in the Approved Airplane Flight Manual, the Airplane Flight Manual shall take precedence.

Takeoff Performance

A simplified method which conservatively accounts for the effects of using %N1 as an alternate thrust setting is to reduce the normal limit weights. The Takeoff Performance table provides takeoff field, tire speed, climb and obstacle limit weight adjustments. To determine limit weight for operations with alternate thrust setting, enter the table with takeoff flap setting and apply the weight reduction to the normal full rate limit weight. The most limiting of the takeoff weights must be used.

Improved climb performance procedure and reduced thrust operation using assumed temperature method is not permitted. Use of autothrottle is not permitted.

Takeoff Speed Adjustment

Takeoff speeds for the reduced weights should be adjusted by the amount shown in the Takeoff Speeds table. The adjusted V1 should not exceed the adjusted VR.

NOTE: The FMC does not incorporate alternate thrust setting performance in its takeoff speeds calculations.

Enroute Performance

The Enroute Performance table provides the weight adjustment that must be applied to the enroute climb limit weight when using %N1 as an alternate thrust setting.

Landing Performance

The Landing Performance table provides the weight adjustment that must be applied to the Approach/Landing Climb limit weight. Enter the table with the appropriate flap setting and apply the weight reduction to the normal full rate limit weight. The alternate thrust setting Approach/Landing Climb limit must be compared to the Landing Field Length limit and the most limiting of the two be used as the landing limit weight.

Takeoff %N1/Go-around %N1

Takeoff and Go-around power setting are presented for normal air conditioning bleed. Max Takeoff or Go-around %N1 may be read directly from the tables for the desired pressure altitude and airport OAT.

Thrust protection is not provided in the alternate thrust setting and maximum rated thrust is reached at a thrust lever position less than full forward. As a result, thrust overboost can occur at full forward thrust lever positions.

Max Climb %N1

This table shows Max Climb %N1 for a 250/290/.78 climb speed schedule, normal engine bleed for packs on and anti-ice off. Enter the table with airport pressure altitude and TAT and read %N1. %N1 adjustments are shown for packs off and anti-ice operation.

Max Cruise %N1

Maximum Cruise %N1 is presented for .80M, which approximates Long Range Cruise speed. The table is based on normal air conditioning bleed, 2 bleeds/2 packs on. Enter the table with pressure altitude and TAT to read Max Cruise %N1. Appropriate bleed adjustments are shown.

Alternate Thrust Setting, Engine Inoperative

Initial Max Continuous %N1

The Initial Max Continuous %N1 setting, with normal engine bleed for packs on and anti-ice off, following engine failure in cruise is shown for .80M and a range of altitudes and TAT.

Max Continuous %N1

Max Continuous %N1 which can be set during engine out cruise conditions is presented. Enter the appropriate table with pressure altitude, TAT, and KIAS to obtain Maximum Continuous %N1. Intermediate airspeeds may be interpolated. Appropriate bleed adjustments are shown.

Intentionally
Blank

GEAR DOWN

Takeoff/Landing Climb Limit

Based on engine bleed for packs on and APU off

AIRPORT OAT		CLIMB LIMIT WEIGHT (1000 LB)											
		AIRPORT PRESSURE ALTITUDE (FT)											
°F	°C	- 1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
130	54	162	157	151	145								
120	49	175	170	165	159	153	147	141					
110	43	185	180	176	171	165	160	153	147	140			
100	38	195	190	185	180	176	170	163	156	150	144	137	
90	32	205	200	195	190	185	179	172	165	158	152	145	139
80	27	217	212	206	201	195	189	181	174	167	160	153	147
70	21	217	216	214	212	206	199	191	184	176	169	162	155
60	16	217	216	214	212	211	208	203	194	186	179	171	164
50	10	217	216	214	212	211	208	204	200	195	190	181	174
40 & BELOW	4 & BELOW	217	216	214	212	211	208	204	200	195	191	186	183
ICING CONDITIONS*		207	204	203	201	199	198	195	191	186	182	177	171

For APU on, decrease allowable weight by 1100 lb.

For packs off, increase allowable weight by 1800 lb.

For anti-ice on, apply adjustments in table below.

Anti-Ice Adjustments

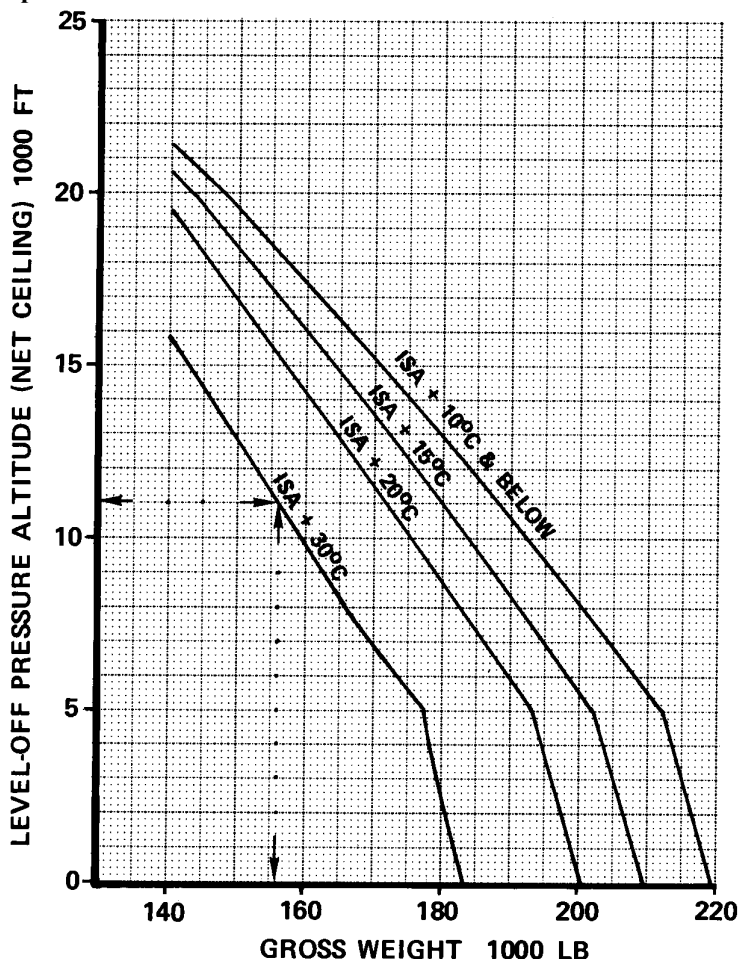
ENGINE BLEED CONFIGURATION	ANTI-ICE ADJUSTMENTS (LB)	
	PRESSURE ALTITUDE AT OR BELOW 6500 FT	PRESSURE ALTITUDE ABOVE 6500 FT
ENGINE ANTI-ICE ON	- 900	- 8300
ENGINE & WING ANTI-ICE ON	- 8300	- 18600

*** Landing climb limit weight when operating in icing conditons during any part of the flight when the forecast landing temperature is below 8 °C (46 °F)**

GEAR DOWN
ENGINE INOP
MAX CONTINUOUS THRUST

Net Level Off Weight

Based on engine bleed for one pack on and APU off



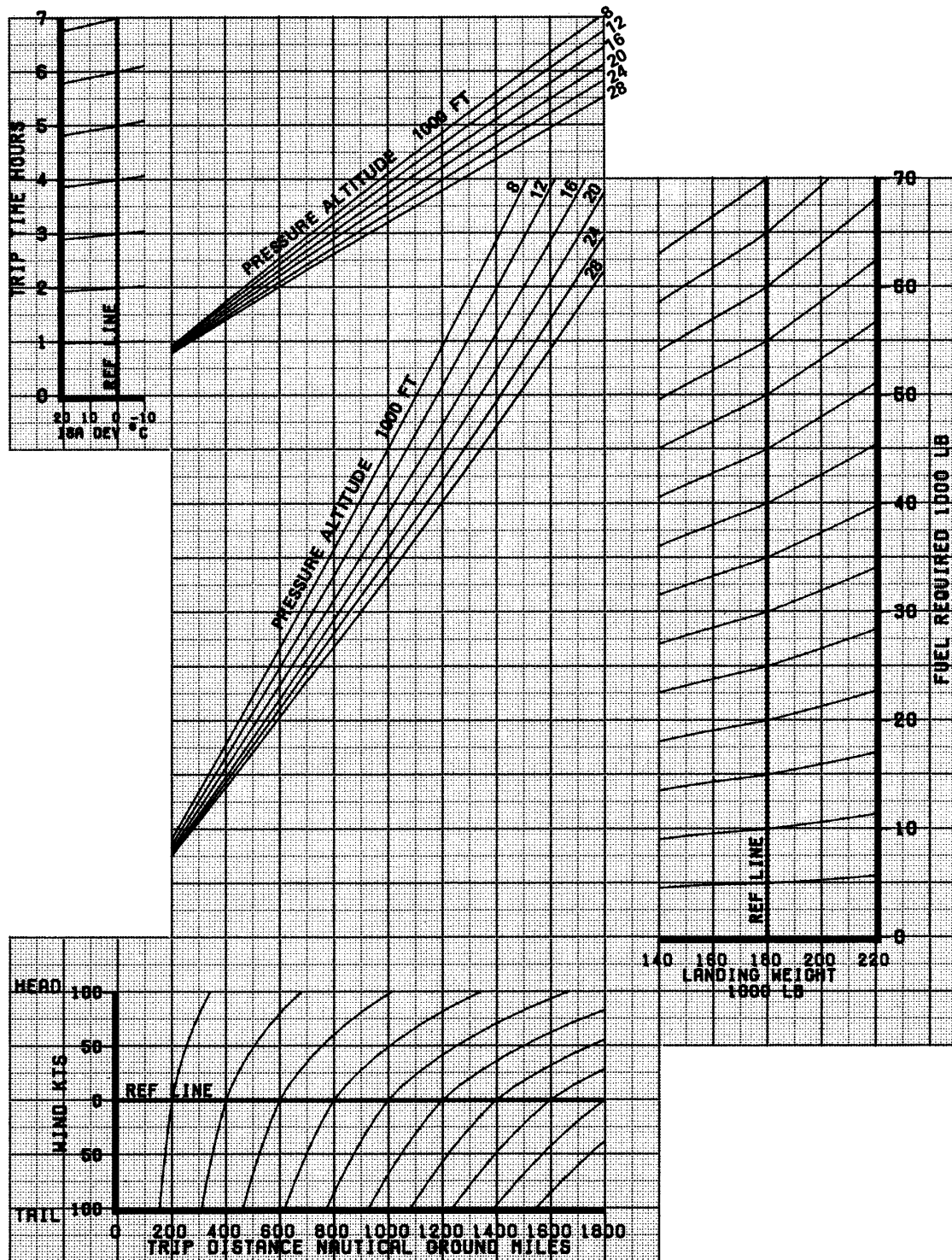
NOTE: BASED ON 1 BLEED/1 PACK ON WITH APU OFF. FOR ALTERNATE BLEED CONFIGURATIONS MAKE CORRECTIONS SHOWN IN TABLE. FOR APU ON DECREASE LEVEL OFF ALTITUDE BY 1200 FT.

ALTITUDE CORRECTION FOR ENGINE BLEED	
PACK OFF	+ 100 FT
ENG A/I ON	-5300 FT
ENG AND WING A/I ON	-9100 FT

GEAR DOWN

Long Range Cruise Trip Fuel and Time

Based on VREF30 + 80 climb/descent



Intentionally
Blank

GEAR DOWN

Long Range Cruise Altitude Capability

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
260	15500	13600	10700
250	17200	15100	12800
240	18900	16900	14800
230	20700	18600	16500
220	22600	20300	18400
210	24800	22100	20200
200	27000	24100	22100
190	29200	26300	24000
180	31500	28700	26000
170	33300	31300	28300
160	34600	33600	31100
150	35700	35500	33500
140	36900	36900	35600
130	38200	38100	37000
120	39500	39400	38200

210 KIAS Max Climb EPR

Based on engine bleed for packs on and anti-ice off

TAT (°C)	PRESSURE ALTITUDE (1000 FT)														
	0	5	10	12	14	16	18	20	22	24	26	28	30	32	34
55	1.18	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.11	1.10	1.09	1.07	1.06	1.04	1.03
50	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.09	1.08	1.06	1.05
45	1.21	1.21	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.12	1.11	1.10	1.08	1.07
40	1.23	1.22	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.16	1.14	1.13	1.12	1.10	1.09
35	1.25	1.24	1.23	1.23	1.22	1.22	1.21	1.20	1.19	1.18	1.17	1.15	1.14	1.12	1.11
30	1.26	1.26	1.25	1.25	1.24	1.24	1.23	1.22	1.21	1.20	1.19	1.18	1.16	1.15	1.14
25	1.26	1.29	1.28	1.27	1.27	1.26	1.25	1.25	1.24	1.22	1.21	1.20	1.19	1.17	1.16
20	1.26	1.30	1.30	1.30	1.29	1.29	1.28	1.27	1.26	1.25	1.24	1.23	1.21	1.20	1.19
15	1.26	1.30	1.33	1.33	1.32	1.31	1.31	1.30	1.29	1.28	1.27	1.25	1.24	1.23	1.22
10	1.26	1.30	1.34	1.35	1.35	1.34	1.34	1.33	1.32	1.31	1.30	1.28	1.27	1.26	1.25
5	1.26	1.30	1.34	1.36	1.37	1.38	1.37	1.36	1.35	1.34	1.33	1.32	1.30	1.29	1.28
0	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.40	1.39	1.37	1.36	1.35	1.34	1.33	1.32
-5	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.42	1.41	1.40	1.39	1.38	1.37	1.36
-10	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.44	1.46	1.45	1.44	1.43	1.42	1.41
-15	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.44	1.46	1.48	1.49	1.48	1.47	1.47
-20	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.44	1.46	1.48	1.50	1.53	1.54	1.53
-25	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.44	1.46	1.48	1.50	1.53	1.56	1.57
-30	1.26	1.30	1.34	1.36	1.37	1.39	1.40	1.42	1.44	1.46	1.48	1.50	1.53	1.56	1.57

EPR Adjustments for Engine Bleeds

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)												
	0	5	10	12	16	18	22	24	26	28	30	32	34
PACKS OFF	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04
ENGINE ANTI-ICE ON	0.00	0.00	-0.03	-0.03	-0.03	-0.03	-0.03	-0.04	-0.04	-0.04	-0.04	-0.05	-0.05
ENGINE & WING ANTI-ICE ON	-0.02	-0.02	-0.05	-0.06	-0.06	-0.06	-0.06	-0.07	-0.07	-0.08	-0.08	-0.09	-0.10



GEAR DOWN

VREF + 80 Enroute Climb ISA & Below

PRESSURE ALTITUDE FEET	UNITS MIN/LB NAM/ KNOTS	BRAKE RELEASE WEIGHT (1000 LB)												
		260	250	240	230	220	210	200	190	180	170	160	150	140
36000	TIME/FUEL DIST/SPD												29/5700 131/291	23/4600 96/278
35000	TIME/FUEL DIST/SPD											31/6200 141/293	24/5000 104/281	21/4200 82/271
34000	TIME/FUEL DIST/SPD										32/6800 151/295	25/5400 111/283	21/4500 88/274	19/3900 72/265
33000	TIME/FUEL DIST/SPD								35/7500 165/298	27/5900 119/286	22/4900 94/276	19/4200 77/268	17/3700 64/260	
32000	TIME/FUEL DIST/SPD								28/6400 129/288	23/5300 101/279	20/4600 82/271	18/4000 68/263	16/3500 58/255	
31000	TIME/FUEL DIST/SPD							31/7100 142/291	25/5800 109/282	21/4900 88/273	18/4300 73/266	17/3700 62/259	15/3300 52/251	
30000	TIME/FUEL DIST/SPD							34/7800 157/294	26/6300 118/284	22/5300 95/276	19/4600 78/269	17/4000 66/261	15/3600 56/255	14/3100 48/248
29000	TIME/FUEL DIST/SPD						36/8600 172/296	28/6800 127/286	23/5700 101/278	20/4900 84/271	18/4300 70/264	16/3800 60/258	14/3400 51/251	13/3000 44/244
28000	TIME/FUEL DIST/SPD						31/7500 140/289	25/6200 110/281	21/5300 90/274	18/4600 75/267	16/4100 64/260	15/3600 55/254	14/3200 47/247	13/2900 41/241
27000	TIME/FUEL DIST/SPD					33/8300 154/292	27/6700 118/283	22/5700 96/276	19/4900 80/269	17/4300 68/263	15/3900 58/257	14/3400 50/251	13/3100 43/244	12/2700 38/238
26000	TIME/FUEL DIST/SPD				37/9100 171/295	28/7300 128/286	24/6100 102/278	20/5300 85/272	18/4600 72/265	16/4100 61/259	14/3600 53/253	13/3300 46/247	12/2900 40/241	11/2600 35/235
25000	TIME/FUEL DIST/SPD			41/10200 192/297	31/7900 139/288	25/6600 110/281	21/5600 90/274	18/4900 76/268	16/4400 65/262	14/3900 56/256	13/3500 48/250	12/3100 42/244	11/2800 37/238	11/2500 32/232
24000	TIME/FUEL DIST/SPD			33/8700 152/290	27/7100 118/283	22/6000 96/276	19/5200 80/270	17/4600 68/264	15/4100 59/258	13/3700 51/253	12/3300 44/247	11/3000 39/241	11/2700 34/236	10/2400 30/230
23000	TIME/FUEL DIST/SPD		36/9500 167/293	28/7600 126/285	24/6400 102/278	20/5600 85/272	18/4900 72/266	16/4300 62/261	14/3900 53/255	13/3500 47/250	12/3100 41/244	11/2800 36/239	10/2500 31/233	10/2300 27/227
22000	TIME/FUEL DIST/SPD	39/10500 184/295	30/8300 136/287	25/6900 108/280	21/5900 89/274	18/5200 75/268	16/4600 64/263	14/4100 56/257	13/3700 49/252	12/3300 43/247	11/3000 37/241	10/2700 33/236	10/2400 29/230	9/2200 25/225
21000	TIME/FUEL DIST/SPD	33/9000 148/289	26/7400 115/282	22/6300 94/276	19/5500 79/270	17/4800 67/265	15/4300 58/260	13/3800 51/254	12/3400 44/249	11/3100 39/244	10/2800 34/239	10/2500 30/233	9/2300 27/228	9/2100 23/222
20000	TIME/FUEL DIST/SPD	28/7900 123/284	23/6700 100/278	20/5800 83/272	18/5100 70/267	16/4500 61/262	14/4000 53/257	12/3600 46/252	11/3300 40/247	10/2900 36/241	10/2700 32/236	9/2400 28/231	9/2200 25/226	8/2000 22/220
18000	TIME/FUEL DIST/SPD	22/6400 91/276	19/5600 76/271	16/4900 65/266	15/4400 56/261	13/3900 49/256	12/3500 43/251	11/3200 38/246	10/2900 34/241	9/2600 30/237	8/2400 26/232	8/2200 23/226	8/2000 21/221	8/1800 18/216
16000	TIME/FUEL DIST/SPD	17/5300 69/269	15/4700 59/265	14/4200 52/260	12/3800 45/255	11/3400 40/251	10/3100 35/246	9/2800 31/241	8/2600 28/237	8/2300 25/232	7/2100 22/227	7/2000 20/222	7/1800 17/217	7/1600 15/212
14000	TIME/FUEL DIST/SPD	14/4400 53/264	13/4000 46/259	11/3600 41/255	10/3300 36/251	9/3000 32/246	8/2700 28/242	8/2500 25/237	7/2300 23/232	7/2100 20/228	6/1900 18/223	6/1700 16/218	6/1600 14/213	6/1400 13/208
10000	TIME/FUEL DIST/SPD	9/3100 31/254	8/2800 27/250	8/2600 24/246	7/2400 21/242	7/2200 19/238	6/2000 17/233	6/1800 15/229	5/1700 14/225	5/1500 12/220	5/1400 11/215	5/1300 10/211	5/1200 9/206	5/1100 8/201
1500	TIME/FUEL	2/800	2/700	2/700	2/700	2/600	2/600	1/600	1/500	1/500	2/400	2/400	2/400	3/300
FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE						AIRPORT ELEVATION (FT)			2000	4000	6000	8000	10000	12000
						FUEL ADJUSTMENT (LB)			-300	-600	-900	-1200	-1600	-1900



Flight Planning and Performance Manual

GEAR DOWN

**VREF + 80 Enroute Climb
ISA + 10°C**

PRESSURE ALTITUDE FEET	UNITS MIN/LB NAM/ KNOTS	BRAKE RELEASE WEIGHT (1000 LB)												
		260	250	240	230	220	210	200	190	180	170	160	150	140
36000	TIME/FUEL DIST/SPD												30/6000 137/297	24/4800 101/284
35000	TIME/FUEL DIST/SPD											32/6500 148/300	25/5200 109/287	21/4400 85/277
34000	TIME/FUEL DIST/SPD										33/7100 159/302	26/5700 116/289	22/4700 92/280	19/4100 75/271
33000	TIME/FUEL DIST/SPD									35/7900 173/304	27/6200 125/292	23/5100 98/282	20/4400 80/274	18/3800 67/265
32000	TIME/FUEL DIST/SPD									29/6700 135/294	24/5600 105/285	20/4800 86/276	18/4100 71/268	16/3600 60/261
31000	TIME/FUEL DIST/SPD								31/7400 149/297	25/6100 114/288	21/5100 92/279	19/4500 76/271	17/3900 64/264	15/3400 55/257
30000	TIME/FUEL DIST/SPD							34/8200 164/300	27/6600 123/290	22/5500 99/282	19/4800 82/274	17/4200 69/267	16/3700 58/260	14/3300 50/253
29000	TIME/FUEL DIST/SPD						37/9000 180/303	29/7100 133/292	24/6000 106/284	20/5100 87/277	18/4500 73/270	16/4000 62/263	15/3500 53/256	14/3100 46/249
28000	TIME/FUEL DIST/SPD						31/7800 146/295	25/6500 114/287	21/5500 93/279	19/4800 78/272	17/4200 67/266	15/3800 57/259	14/3300 49/252	13/3000 42/246
27000	TIME/FUEL DIST/SPD					34/8600 161/298	27/7000 123/289	23/5900 100/281	20/5200 83/275	17/4500 71/268	15/4000 61/262	14/3600 52/255	13/3200 45/249	12/2800 39/243
26000	TIME/FUEL DIST/SPD				37/9600 179/301	29/7600 133/291	24/6400 107/284	21/5500 88/277	18/4800 75/271	16/4300 64/264	14/3800 55/258	13/3400 48/252	12/3000 42/246	12/2700 36/240
25000	TIME/FUEL DIST/SPD			41/10700 201/303	31/8300 145/294	26/6900 114/286	22/5900 94/279	19/5100 79/273	17/4500 68/267	15/4000 58/261	13/3600 50/255	12/3200 44/249	12/2900 38/243	11/2600 33/237
24000	TIME/FUEL DIST/SPD			34/9000 159/296	27/7400 123/288	23/6300 100/281	20/5500 83/275	17/4800 71/269	15/4300 61/263	14/3800 53/258	13/3400 46/252	12/3100 40/246	11/2800 35/240	10/2500 31/234
23000	TIME/FUEL DIST/SPD		37/9900 174/298	29/8000 132/290	24/6700 106/284	21/5800 88/277	18/5100 75/271	16/4500 64/266	14/4000 56/260	13/3600 48/254	12/3200 42/249	11/2900 37/243	10/2600 33/237	10/2400 29/231
22000	TIME/FUEL DIST/SPD	40/11000 193/300	31/8600 142/292	26/7200 113/286	22/6100 93/279	19/5400 78/273	17/4800 67/268	15/4200 58/262	13/3800 51/257	12/3400 44/252	11/3100 39/246	10/2800 34/240	10/2500 30/235	9/2300 26/229
21000	TIME/FUEL DIST/SPD	33/9300 154/294	27/7700 120/288	23/6500 98/281	20/5700 82/276	17/5000 70/270	15/4500 61/265	14/4000 53/259	12/3600 46/254	11/3200 41/249	10/2900 36/243	10/2600 31/238	9/2400 28/232	9/2200 24/226
20000	TIME/FUEL DIST/SPD	29/8200 129/289	24/6900 104/283	20/6000 86/278	18/5300 73/272	16/4700 63/267	14/4200 55/261	13/3800 48/256	11/3400 42/251	10/3100 37/246	10/2800 33/241	9/2500 29/235	9/2300 26/230	9/2100 23/224
18000	TIME/FUEL DIST/SPD	22/6600 95/281	19/5800 79/276	17/5100 68/271	15/4500 59/266	13/4100 51/261	12/3700 45/256	11/3300 39/251	10/3000 35/246	9/2700 31/241	9/2500 27/236	8/2300 24/231	8/2100 22/225	8/1900 19/220
16000	TIME/FUEL DIST/SPD	18/5500 72/274	16/4900 62/270	14/4400 54/265	13/3900 47/260	11/3600 41/255	10/3200 36/251	9/2900 32/246	8/2400 29/241	7/2200 26/236	7/2000 23/231	6/1800 20/226	6/1600 18/221	6/1500 16/215
14000	TIME/FUEL DIST/SPD	14/4600 56/269	13/4100 48/264	12/3700 42/260	11/3400 37/255	10/3100 33/251	9/2800 29/246	8/2600 26/241	7/2300 23/237	7/2100 21/232	6/2000 19/227	6/1800 17/222	6/1600 15/217	6/1500 13/212
10000	TIME/FUEL DIST/SPD	9/3200 32/259	8/2900 28/255	8/2600 25/250	7/2400 22/246	7/2200 20/242	6/2100 18/237	6/1900 16/233	5/1700 14/229	5/1600 13/224	5/1500 12/219	5/1300 10/215	5/1200 9/209	5/1100 8/204
1500	TIME/FUEL	2/800	2/700	2/700	2/700	2/600	2/600	1/600	1/500	1/500	2/400	2/400	2/400	3/300
FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE						AIRPORT ELEVATION (FT)		2000	4000	6000	8000	10000	12000	
						FUEL ADJUSTMENT (LB)		-300	-600	-900	-1300	-1600	-1900	

GEAR DOWN

VREF + 80 Enroute Climb ISA + 15°C

PRESSURE ALTITUDE FEET	UNITS MIN/LB NAM/ KNOTS	BRAKE RELEASE WEIGHT (1000 LB)													
		260	250	240	230	220	210	200	190	180	170	160	150	140	
36000	TIME/FUEL DIST/SPD												34/6600 158/300	26/5100 114/287	
35000	TIME/FUEL DIST/SPD											38/7600 186/305	29/5800 128/291	24/4700 98/280	
34000	TIME/FUEL DIST/SPD											31/6500 146/295	25/5200 109/284	21/4400 86/274	
33000	TIME/FUEL DIST/SPD										35/7400 168/300	27/5800 122/288	23/4800 95/278	20/4100 77/269	
32000	TIME/FUEL DIST/SPD										30/6500 136/292	24/5300 105/281	21/4500 84/273	18/3900 70/264	
31000	TIME/FUEL DIST/SPD									32/7300 153/295	26/5800 115/285	22/4900 92/276	19/4200 76/268	17/3700 63/260	
30000	TIME/FUEL DIST/SPD								36/8100 171/298	28/6400 126/288	23/5400 99/279	20/4600 82/271	18/4000 68/263	16/3500 57/256	
29000	TIME/FUEL DIST/SPD							39/9000 190/301	30/7000 137/290	24/5800 108/281	21/5000 88/274	18/4300 73/266	16/3800 62/259	15/3300 52/252	
28000	TIME/FUEL DIST/SPD							33/7800 152/293	26/6400 118/284	22/5400 95/277	19/4700 79/269	17/4100 66/262	15/3600 56/256	14/3200 48/249	
27000	TIME/FUEL DIST/SPD						36/8700 171/296	28/7000 128/287	23/5800 103/279	20/5000 85/272	18/4400 71/265	16/3900 61/259	14/3400 52/252	13/3000 44/246	
26000	TIME/FUEL DIST/SPD					41/9900 196/299	31/7700 141/290	25/6300 111/282	21/5400 91/275	18/4700 76/268	16/4100 65/262	15/3700 55/255	14/3200 48/249	13/2900 41/243	
25000	TIME/FUEL DIST/SPD					34/8500 157/292	27/6900 121/284	23/5800 98/277	19/5000 81/271	17/4400 69/264	15/3900 59/258	14/3500 51/252	13/3100 44/246	12/2800 38/240	
24000	TIME/FUEL DIST/SPD				37/9500 176/295	29/7500 131/287	24/6300 105/280	21/5400 87/273	18/4700 73/267	16/4200 62/261	14/3700 54/255	13/3300 46/249	12/2900 40/243	11/2600 35/237	
23000	TIME/FUEL DIST/SPD			42/10700 201/298	32/8200 144/289	26/6800 113/282	22/5800 92/275	19/5000 77/269	16/4400 66/263	15/3900 57/258	13/3500 49/252	12/3100 43/246	11/2800 37/240	11/2500 32/234	
22000	TIME/FUEL DIST/SPD			35/9100 159/292	28/7400 122/284	23/6200 99/278	20/5400 82/272	17/4700 70/266	15/4200 60/260	13/3700 52/255	12/3300 45/249	11/3000 39/243	11/2700 34/237	10/2400 30/232	
21000	TIME/FUEL DIST/SPD		38/10100 178/294	30/8000 133/287	24/6700 106/280	21/5700 87/274	18/5000 73/268	16/4400 63/262	14/3900 54/257	13/3500 47/252	12/3100 41/246	11/2800 36/241	10/2500 31/235	10/2300 27/229	
20000	TIME/FUEL DIST/SPD	43/11400 201/296	32/8700 145/289	26/7200 113/282	22/6100 92/276	19/5300 77/270	16/4600 66/265	15/4100 57/259	13/3700 49/254	12/3300 43/249	11/3000 38/243	10/2700 33/238	10/2400 29/232	9/2200 25/227	
18000	TIME/FUEL DIST/SPD	29/8300 131/286	24/6900 104/280	20/5900 86/274	18/5200 72/269	16/4600 62/264	14/4000 53/259	12/3600 46/254	11/3300 41/249	10/2900 36/244	9/2600 31/238	9/2400 28/233	9/2200 24/228	8/2000 21/222	
16000	TIME/FUEL DIST/SPD	22/6600 94/278	19/5700 78/273	17/5000 66/268	15/4400 57/263	13/3900 49/258	12/3500 43/253	11/3200 38/249	10/2900 33/244	9/2600 29/239	8/2400 26/234	8/2100 23/229	8/1900 20/223	8/1800 18/218	
14000	TIME/FUEL DIST/SPD	17/5300 70/272	15/4700 60/267	14/4200 51/262	12/3700 45/258	11/3400 39/253	10/3000 34/248	9/2800 30/244	8/2500 27/239	7/2300 24/234	7/2100 21/230	7/1900 19/225	7/1700 17/219	7/1600 15/214	
10000	TIME/FUEL DIST/SPD	11/3500 39/261	10/3200 34/257	9/2900 30/253	8/2600 26/249	7/2400 23/244	7/2200 21/240	6/2000 18/235	6/1800 16/231	5/1700 15/226	5/1500 13/222	5/1400 12/217	5/1300 10/212	5/1200 9/206	
1500	TIME/FUEL	2/800	2/700	2/700	2/700	2/600	2/600	1/600	1/500	1/500	2/400	2/400	2/400	3/300	

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (LB)	-300	-700	-1000	-1400	-1700	-2100



Flight Planning and Performance Manual

GEAR DOWN

VREF + 80 Enroute Climb
ISA + 20°C

PRESSURE ALTITUDE FEET	UNITS MIN/LB NAM/ KNOTS	BRAKE RELEASE WEIGHT (1000 LB)												
		260	250	240	230	220	210	200	190	180	170	160	150	140
36000	TIME/FUEL DIST/SPD													33/6000 149/295
35000	TIME/FUEL DIST/SPD												39/7200 183/301	29/5400 124/287
34000	TIME/FUEL DIST/SPD												32/6200 144/292	25/4900 106/280
33000	TIME/FUEL DIST/SPD											36/7200 170/297	28/5500 121/284	23/4600 93/274
32000	TIME/FUEL DIST/SPD											30/6300 137/289	25/5100 104/278	21/4300 83/269
31000	TIME/FUEL DIST/SPD										34/7100 157/293	26/5600 116/282	22/4700 91/273	19/4000 74/264
30000	TIME/FUEL DIST/SPD									38/8100 180/296	29/6200 128/285	24/5200 100/276	20/4400 81/267	18/3800 67/260
29000	TIME/FUEL DIST/SPD								42/9100 203/299	31/6900 142/288	25/5700 109/279	21/4800 88/271	19/4100 73/263	17/3600 61/256
28000	TIME/FUEL DIST/SPD								35/7800 161/291	27/6300 121/282	23/5200 97/274	20/4500 79/266	17/3900 66/259	16/3400 56/252
27000	TIME/FUEL DIST/SPD							39/9000 186/295	30/6900 135/285	24/5700 106/277	21/4900 86/269	18/4200 72/262	16/3700 60/256	15/3300 51/249
26000	TIME/FUEL DIST/SPD							33/7800 151/288	26/6300 116/280	22/5300 94/272	19/4600 77/265	17/4000 65/259	15/3500 55/252	14/3100 47/246
25000	TIME/FUEL DIST/SPD						37/8800 172/291	29/6900 128/283	24/5800 102/275	20/4900 84/268	18/4300 70/262	16/3800 59/255	14/3300 51/249	13/3000 43/243
24000	TIME/FUEL DIST/SPD					42/10100 200/295	31/7700 142/285	25/6300 111/278	21/5400 90/271	18/4600 75/264	16/4100 63/258	15/3600 54/252	14/3200 46/246	13/2800 40/240
23000	TIME/FUEL DIST/SPD					35/8600 159/288	27/6900 121/280	23/5800 97/273	19/5000 80/267	17/4300 68/261	15/3800 58/255	14/3400 49/249	13/3000 43/243	12/2700 37/237
22000	TIME/FUEL DIST/SPD				39/9700 182/291	30/7600 133/283	24/6300 105/276	21/5400 86/269	18/4600 72/264	16/4100 61/258	14/3600 53/252	13/3200 45/246	12/2900 39/240	11/2600 34/234
21000	TIME/FUEL DIST/SPD				33/8400 147/285	26/6800 114/278	22/5800 92/272	19/5000 77/266	16/4300 65/260	14/3800 56/255	13/3400 48/249	12/3000 41/243	11/2700 36/238	11/2400 31/232
20000	TIME/FUEL DIST/SPD			36/9400 164/288	28/7400 124/281	23/6200 99/274	20/5300 81/268	17/4600 69/263	15/4100 59/257	13/3600 50/252	12/3200 44/246	11/2900 38/241	11/2600 33/235	10/2300 29/229
18000	TIME/FUEL DIST/SPD		33/8900 149/285	26/7200 114/279	22/6100 92/273	19/5200 76/267	16/4500 64/262	14/4000 55/257	13/3600 48/251	11/3200 42/246	11/2900 36/241	10/2600 32/236	9/2300 28/230	9/2100 24/225
16000	TIME/FUEL DIST/SPD	30/8500 134/283	24/6900 104/277	20/5800 85/271	18/5000 71/266	15/4400 60/261	14/3900 51/256	12/3500 44/251	11/3100 39/246	10/2800 34/241	9/2500 30/236	9/2300 26/231	8/2100 23/226	8/1900 20/220
14000	TIME/FUEL DIST/SPD	22/6500 93/275	19/5500 76/270	16/4800 64/265	14/4200 54/261	13/3700 47/256	11/3300 41/251	10/3000 36/246	9/2700 31/242	8/2400 28/237	8/2200 24/232	7/2000 21/227	7/1800 19/222	7/1600 17/216
10000	TIME/FUEL DIST/SPD	13/4100 49/264	11/3600 42/260	10/3200 36/255	9/2900 31/251	8/2600 27/246	8/2400 24/242	7/2100 21/238	6/1900 19/233	6/1800 17/229	6/1600 15/224	5/1500 13/219	5/1300 12/214	6/1200 10/209
1500	TIME/FUEL	2/800	2/700	2/700	2/700	2/600	2/600	1/600	1/500	1/500	2/400	2/400	2/400	3/300
FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE						AIRPORT ELEVATION (FT)		2000	4000	6000	8000	10000	12000	
						FUEL ADJUSTMENT (LB)		-400	-700	-1100	-1500	-1900	-2300	

GEAR DOWN

Long Range Cruise Table 35000 FT to 30000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
35 (-40)	EPR											1.55	1.49	1.43	1.39	1.35
	MAX TAT											-28	-23	-18	-14	
	KIAS											197	193	188	184	179
	MACH											.589	.575	.563	.550	.537
	FF/ENG											4440	4088	3780	3507	3258
	KTAS											339	332	325	317	310
34 (-39)	EPR											1.49	1.44	1.40	1.36	1.32
	MAX TAT											-24	-19	-14	-10	
	KIAS											197	193	188	184	179
	MACH											.575	.563	.551	.539	.526
	FF/ENG											4338	4019	3741	3484	3252
	KTAS											333	326	319	312	304
33 (-37)	EPR										1.51	1.45	1.40	1.37	1.33	1.30
	MAX TAT										-24	-20	-15	-11		
	KIAS										202	197	193	188	184	179
	MACH										.577	.564	.551	.539	.527	.514
	FF/ENG										4638	4279	3976	3717	3477	3258
	KTAS										336	328	320	314	307	299
32 (-36)	EPR										1.46	1.41	1.37	1.34	1.31	1.28
	MAX TAT										-20	-16	-11	-7		
	KIAS										203	198	193	188	184	179
	MACH										.567	.554	.541	.528	.516	.503
	FF/ENG										4566	4248	3967	3705	3478	3263
	KTAS										331	324	316	308	301	294
31 (-34)	EPR									1.47	1.42	1.38	1.35	1.32	1.29	1.26
	MAX TAT									-21	-16	-12	-8			
	KIAS									208	204	199	194	188	184	179
	MACH									.569	.557	.545	.532	.517	.505	.493
	FF/ENG									4854	4531	4246	3970	3704	3487	3267
	KTAS									334	327	320	312	303	296	289
30 (-32)	EPR									1.43	1.39	1.36	1.32	1.29	1.27	1.24
	MAX TAT									-17	-13	-9	-5			
	KIAS									209	205	200	194	188	184	179
	MACH									.559	.548	.536	.520	.506	.494	.482
	FF/ENG									4832	4538	4254	3962	3712	3523	3296
	KTAS									330	323	316	306	298	291	284

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	30	31	32	33	34	35
LIMIT EPR	1.46	1.48	1.51	1.53	1.55	1.57
MAX TAT (°C)	-20	-21	-23	-25	-27	-28

Decrease limit EPR by 0.09 per 10°C TAT hotter than table value.

With engine anti-ice on, decrease limit EPR by 0.06.

With engine and wing anti-ice on, decrease limit EPR by 0.11.

GEAR DOWN

Long Range Cruise Table 29000 FT to 24000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
29 (-30)	EPR								1.43	1.40	1.36	1.33	1.30	1.27	1.25	1.23
	MAX TAT								-18	-14	-10	-6	0			
	KIAS								215	210	206	200	193	188	184	179
	MACH								.561	.550	.539	.525	.507	.495	.484	.472
	FF/ENG KTAS								5136 332	4831 326	4547 319	4258 311	3947 300	3713 293	3512 286	3287 279
28 (-28)	EPR								1.40	1.37	1.34	1.31	1.28	1.26	1.23	1.21
	MAX TAT								-14	-10	-6	-2				
	KIAS								216	211	206	200	193	188	184	179
	MACH								.552	.541	.529	.513	.495	.485	.474	.462
	FF/ENG KTAS								5115 328	4831 322	4546 314	4237 305	3938 294	3702 288	3507 282	3285 275
27 (-27)	EPR							1.40	1.37	1.35	1.32	1.29	1.26	1.24	1.22	1.20
	MAX TAT							-14	-11	-7	-3	3				
	KIAS							221	217	212	206	199	193	188	184	179
	MACH							.553	.543	.532	.517	.500	.485	.475	.464	.453
	FF/ENG KTAS							5396 330	5112 324	4828 318	4524 309	4210 298	3927 290	3696 283	3508 277	3287 270
26 (-25)	EPR							1.38	1.35	1.32	1.29	1.27	1.24	1.22	1.20	1.18
	MAX TAT							-11	-7	-3	2					
	KIAS							222	218	212	205	198	193	188	184	179
	MACH							.545	.534	.521	.504	.487	.475	.465	.454	.443
	FF/ENG KTAS							5396 327	5110 320	4813 312	4499 302	4178 292	3918 285	3694 279	3507 272	3287 266
25 (-23)	EPR							1.35	1.33	1.30	1.27	1.25	1.23	1.21	1.19	1.17
	MAX TAT							-8	-4	1	6					
	KIAS							223	218	211	204	198	193	188	184	179
	MACH							.536	.524	.508	.492	.477	.466	.456	.445	.434
	FF/ENG KTAS							5394 322	5101 315	4787 306	4467 296	4162 287	3914 280	3693 274	3507 268	3288 261
24 (-21)	EPR						1.35	1.33	1.30	1.28	1.25	1.23	1.21	1.19	1.18	1.16
	MAX TAT						-8	-4	0	5						
	KIAS						228	223	217	210	203	198	193	188	184	179
	MACH						.537	.526	.511	.496	.481	.468	.456	.446	.436	.425
	FF/ENG KTAS						5679 324	5388 318	5075 309	4756 300	4440 291	4165 283	3913 276	3693 270	3508 263	3289 257

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	24	25	26	27	28	29
LIMIT EPR	1.36	1.38	1.39	1.41	1.43	1.44
MAX TAT (°C)	-8	-10	-12	-14	-16	-17

Decrease limit EPR by 0.07 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.05.
With engine and wing anti-ice on, decrease limit EPR by 0.09.

GEAR DOWN

Long Range Cruise Table 23000 FT to 18000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
23 (-20)	EPR						1.33	1.30	1.28	1.26	1.24	1.22	1.20	1.18	1.17	1.15
	MAX TAT						-4	0	5	10						
	KIAS						229	223	216	209	204	198	193	188	184	179
	MACH						.527	.514	.499	.484	.472	.460	.447	.437	.427	.417
	FF/ENG KTAS						5675 320	5363 312	5044 303	4722 294	4437 286	4176 279	3913 271	3694 265	3509 259	3291 253
22 (-18)	EPR					1.33	1.31	1.28	1.26	1.24	1.22	1.20	1.19	1.17	1.15	1.14
	MAX TAT					-4	0	4	9							
	KIAS					234	228	221	215	209	204	199	193	188	184	179
	MACH					.528	.515	.501	.487	.475	.463	.451	.438	.429	.418	.408
	FF/ENG KTAS					5961 322	5649 314	5331 305	5005 297	4711 289	4446 282	4181 275	3913 267	3693 261	3474 255	3292 249
21 (-16)	EPR					1.31	1.28	1.26	1.24	1.23	1.21	1.19	1.17	1.16	1.15	1.13
	MAX TAT					0	4	9	13							
	KIAS					233	227	221	215	210	204	199	193	188	184	179
	MACH					.517	.503	.489	.477	.466	.455	.442	.429	.420	.410	.400
	FF/ENG KTAS					5934 316	5616 308	5290 299	4985 292	4714 285	4451 278	4183 271	3913 263	3692 257	3474 251	3294 245
20 (-14)	EPR				1.31	1.29	1.27	1.25	1.23	1.21	1.19	1.18	1.16	1.15	1.14	1.12
	MAX TAT				0	4	8	13								
	KIAS				239	232	226	220	215	210	205	199	193	188	184	179
	MACH				.517	.504	.491	.479	.468	.458	.446	.434	.421	.412	.402	.392
	FF/ENG KTAS				6220 318	5902 310	5575 302	5263 294	4987 288	4724 281	4456 274	4185 267	3916 259	3693 253	3476 247	3299 241
19 (-13)	EPR				1.29	1.27	1.25	1.23	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12
	MAX TAT				4	8	12	17								
	KIAS				237	231	226	220	216	210	205	199	193	188	184	179
	MACH				.505	.493	.481	.470	.460	.449	.438	.426	.413	.404	.394	.384
	FF/ENG KTAS				6192 312	5864 304	5546 296	5265 290	5002 284	4732 277	4461 270	4190 263	3922 255	3698 249	3482 243	3310 237
18 (-11)	EPR			1.29	1.27	1.25	1.23	1.22	1.20	1.19	1.17	1.16	1.14	1.13	1.12	1.11
	MAX TAT			4	8	12	16	20								
	KIAS			242	236	231	226	221	216	210	205	199	193	188	184	179
	MACH			.506	.493	.482	.472	.462	.452	.441	.429	.418	.405	.396	.386	.377
	FF/ENG KTAS			6483 313	6154 305	5832 298	5547 292	5282 286	5013 280	4741 273	4468 266	4198 259	3930 251	3705 245	3493 239	3325 233

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	18	19	20	21	22	23
LIMIT EPR	1.30	1.31	1.32	1.33	1.34	1.35
MAX TAT (°C)	3	1	-1	-3	-4	-7

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.04.
With engine and wing anti-ice on, decrease limit EPR by 0.07.

GEAR DOWN

Long Range Cruise Table 17000 FT to 12000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
17 (-9)	EPR		1.29	1.27	1.25	1.23	1.22	1.20	1.19	1.18	1.16	1.15	1.14	1.12	1.11	1.10
	MAX TAT		5	8	12	16	20									
	KIAS		247	241	236	231	226	221	216	211	205	199	193	188	184	179
	MACH		.505	.494	.483	.473	.464	.454	.444	.433	.421	.410	.398	.388	.379	.369
	FF/ENG KTAS		6774 314	6443 307	6119 300	5831 294	5562 288	5294 282	5022 276	4748 269	4476 262	4206 255	3946 247	3713 241	3503 235	3335 230
16 (-7)	EPR		1.27	1.25	1.24	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10
	MAX TAT		9	12	16	20	23									
	KIAS		246	241	236	231	227	222	216	211	205	199	194	188	184	179
	MACH		.494	.483	.474	.465	.456	.446	.435	.425	.414	.402	.391	.381	.371	.362
	FF/ENG KTAS		6733 308	6406 301	6116 296	5845 290	5577 284	5304 278	5030 272	4756 265	4484 258	4218 251	3967 244	3729 238	3518 232	3317 226
15 (-5)	EPR	1.27	1.25	1.24	1.22	1.21	1.19	1.18	1.17	1.16	1.14	1.13	1.12	1.11	1.10	1.09
	MAX TAT	9	13	16	20	23										
	KIAS	251	245	241	236	232	227	222	216	211	205	200	194	189	184	179
	MACH	.493	.483	.474	.466	.457	.447	.438	.427	.417	.406	.395	.385	.375	.364	.355
	FF/ENG KTAS	7020 309	6692 303	6400 297	6128 292	5860 286	5586 280	5311 274	5036 268	4763 261	4492 254	4236 248	3992 241	3759 235	3533 228	3330 223
14 (-4)	EPR	1.25	1.24	1.22	1.21	1.20	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	MAX TAT	13	17	20	24	27										
	KIAS	250	246	241	237	232	227	222	216	211	206	200	195	190	184	179
	MACH	.483	.474	.466	.458	.449	.439	.430	.419	.409	.399	.389	.379	.369	.357	.349
	FF/ENG KTAS	7051 304	6755 298	6477 293	6206 288	5928 282	5650 276	5371 270	5095 264	4821 257	4556 251	4304 245	4065 238	3828 232	3586 225	3380 219
13 (-2)	EPR	1.23	1.22	1.21	1.20	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08
	MAX TAT	17	20	24	27											
	KIAS	250	246	242	237	232	227	222	217	211	206	201	196	190	184	179
	MACH	.474	.466	.458	.450	.441	.431	.422	.412	.402	.392	.383	.373	.363	.351	.342
	FF/ENG KTAS	7038 299	6759 294	6487 289	6209 284	5931 278	5651 272	5373 266	5098 260	4828 254	4573 248	4328 242	4093 236	3853 229	3602 222	3392 216
12 (0)	EPR	1.22	1.21	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.09	1.08
	MAX TAT	21	24	27	31											
	KIAS	251	246	242	237	232	227	222	217	212	207	202	196	191	184	179
	MACH	.466	.459	.450	.442	.433	.423	.414	.404	.395	.386	.377	.367	.357	.345	.335
	FF/ENG KTAS	7047 295	6774 291	6495 285	6216 280	5935 274	5657 268	5380 262	5106 256	4847 250	4598 245	4361 239	4122 233	3878 226	3620 218	3410 213

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	12	13	14	15	16	17
LIMIT EPR	1.26	1.27	1.27	1.27	1.29	1.29
MAX TAT (°C)	13	11	10	8	6	5

Decrease limit EPR by 0.05 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.03.
With engine and wing anti-ice on, decrease limit EPR by 0.06.



GEAR DOWN

Long Range Cruise Table 11000 FT to 6000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
11 (2)	EPR	1.21	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.08	1.07
	MAX TAT	24	27	31												
	KIAS	251	247	242	237	232	227	222	217	212	207	202	197	191	184	179
	MACH	.459	.451	.442	.434	.425	.416	.406	.398	.389	.380	.371	.361	.350	.338	.329
	FF/ENG KTAS	7066 292	6786 287	6506 281	6224 276	5944 270	5666 264	5390 259	5127 253	4874 247	4632 242	4395 236	4156 230	3903 223	3644 215	3433 209
10 (3)	EPR	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.07
	MAX TAT	27	31	34												
	KIAS	251	247	242	237	232	227	222	218	213	208	203	197	191	184	179
	MACH	.451	.443	.434	.426	.417	.408	.400	.391	.383	.374	.365	.355	.344	.332	.323
	FF/ENG KTAS	7079 288	6798 283	6515 277	6234 272	5955 266	5678 261	5409 255	5153 250	4907 244	4671 239	4431 233	4186 227	3928 220	3669 212	3456 206
9 (5)	EPR	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.09	1.08	1.07	1.07
	MAX TAT	31	34													
	KIAS	252	247	242	237	233	228	223	218	214	209	203	197	191	184	179
	MACH	.443	.435	.427	.418	.410	.401	.393	.385	.377	.368	.359	.349	.338	.326	.317
	FF/ENG KTAS	7091 284	6806 279	6524 273	6244 268	5966 263	5694 257	5435 252	5190 247	4974 242	4754 236	4528 230	4269 223	4007 216	3742 209	3523 203
8 (7)	EPR	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.08	1.08	1.07	1.06
	MAX TAT	34	38													
	KIAS	252	247	242	238	233	228	224	219	214	209	204	197	191	184	179
	MACH	.435	.427	.419	.411	.403	.395	.387	.379	.371	.363	.353	.343	.331	.320	.311
	FF/ENG KTAS	7099 280	6816 275	6535 270	6256 264	5981 259	5720 254	5467 249	5247 244	5029 239	4806 233	4556 227	4293 220	4030 213	3760 206	3539 200
7 (9)	EPR	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.09	1.08	1.07	1.07	1.06
	MAX TAT	38														
	KIAS	252	247	243	238	233	229	224	220	215	210	204	198	191	184	179
	MACH	.427	.420	.412	.404	.396	.389	.381	.374	.365	.357	.347	.336	.325	.314	.305
	FF/ENG KTAS	7110 276	6828 271	6548 266	6270 261	6007 256	5751 251	5524 246	5306 241	5083 236	4845 230	4582 224	4318 217	4051 210	3776 202	3556 197
6 (11)	EPR	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.09	1.08	1.07	1.07	1.06	1.06
	MAX TAT	41														
	KIAS	252	247	243	238	234	229	225	220	215	210	204	198	191	184	179
	MACH	.420	.412	.405	.397	.390	.383	.376	.368	.360	.351	.341	.330	.319	.308	.300
	FF/ENG KTAS	7122 272	6840 267	6561 262	6295 257	6038 253	5803 248	5586 243	5363 238	5134 233	4874 227	4608 221	4342 214	4070 207	3791 199	3573 194

Max TAT not shown where EPR can be set in ISA + 30°C conditions.

Increase/decrease fuel flow 3% per 10°C above/below standard TAT.

Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Cruise EPR

PRESS ALT (1000 FT)	6	7	8	9	10	11
LIMIT EPR	1.23	1.24	1.24	1.25	1.25	1.26
MAX TAT (°C)	23	22	20	18	16	15

Decrease limit EPR by 0.05 per 10°C TAT hotter than table value.

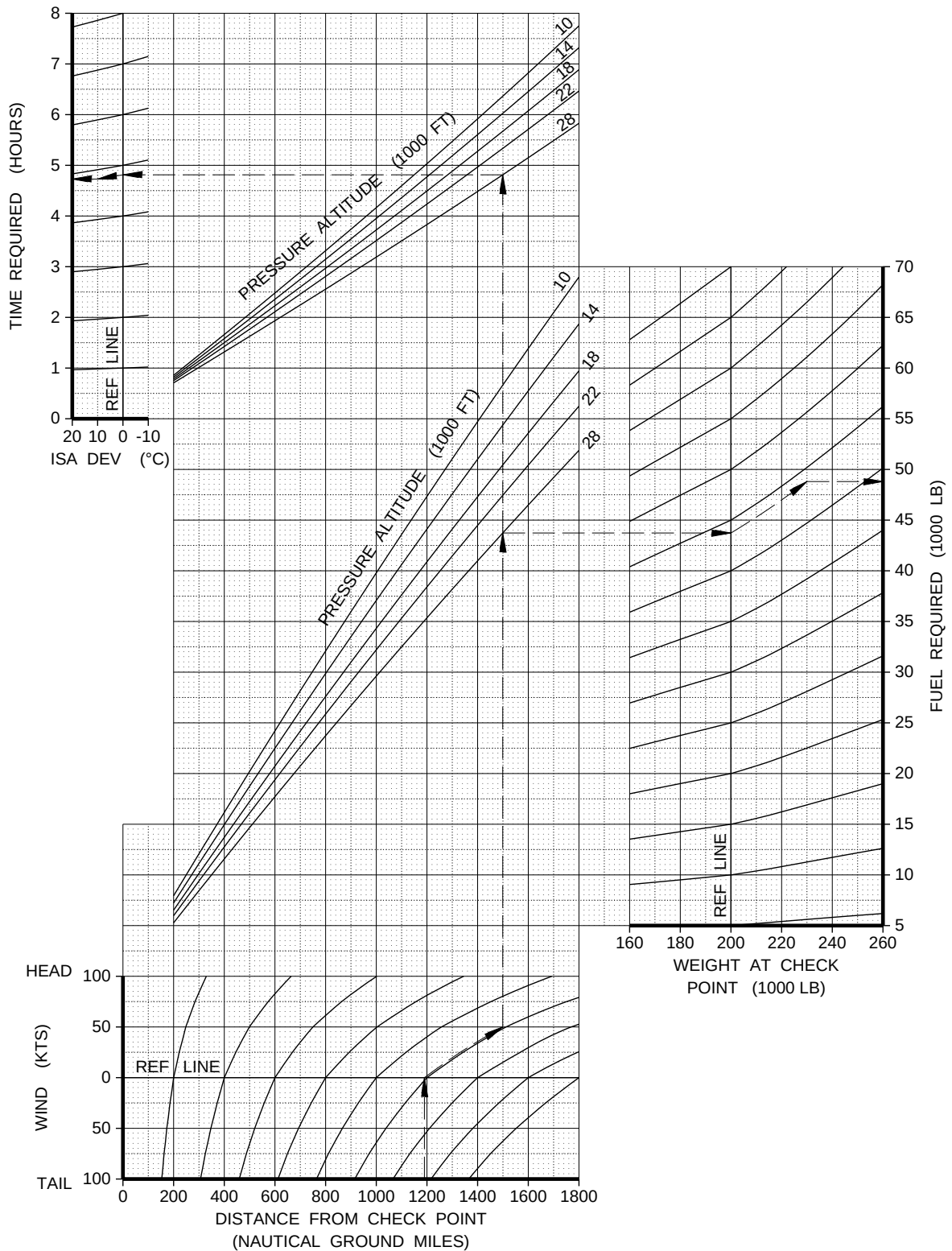
With engine anti-ice on, decrease limit EPR by 0.03.

With engine and wing anti-ice on, decrease limit EPR by 0.06.

GEAR DOWN

Long Range Cruise Enroute Fuel and Time

Based on VREF30 + 80 descent





GEAR DOWN

Descent

VREF30 + 80

PRESSURE ALTITUDE (FT)	TIME (MIN)	FUEL (LB)	DISTANCE (NM)
35000	20	730	70
33000	19	710	66
31000	18	690	62
29000	18	660	58
27000	17	640	54
25000	16	620	50
23000	15	600	46
21000	14	580	42
19000	14	550	39
17000	13	530	35
15000	12	510	31
10000	9	450	22
5000	7	370	12
1500	5	320	6

Allowances for a straight-in approach are included.

Holding

Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
30000	EPR								1.46	1.42	1.38	1.35	1.32	1.29	1.27	1.24
	KIAS								209	205	201	197	193	188	184	179
	FF/ENG								5260	4940	4640	4370	4130	3900	3700	3460
25000	EPR						1.36	1.33	1.31	1.29	1.27	1.25	1.23	1.21	1.19	1.17
	KIAS						217	213	209	205	201	197	193	188	184	179
	FF/ENG						5630	5360	5100	4850	4600	4350	4110	3880	3680	3450
20000	EPR			1.31	1.29	1.27	1.25	1.24	1.22	1.21	1.19	1.18	1.16	1.15	1.14	1.12
	KIAS			228	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG			6370	6100	5830	5560	5300	5050	4810	4570	4340	4110	3880	3650	3460
15000	EPR	1.25	1.24	1.22	1.21	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	KIAS	235	232	228	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG	6850	6580	6320	6060	5800	5550	5310	5070	4830	4600	4370	4140	3930	3710	3500
10000	EPR	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.08	1.08	1.07
	KIAS	235	232	228	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG	6900	6640	6380	6130	5880	5630	5390	5150	4930	4710	4490	4270	4060	3840	3630
5000	EPR	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.07	1.07	1.06	1.06	1.05
	KIAS	235	232	228	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG	6940	6680	6430	6210	5990	5780	5570	5340	5110	4890	4670	4440	4220	3990	3770
1500	EPR	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.04
	KIAS	235	232	228	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG	7030	6810	6590	6370	6130	5890	5660	5430	5210	4970	4740	4510	4290	4070	3850

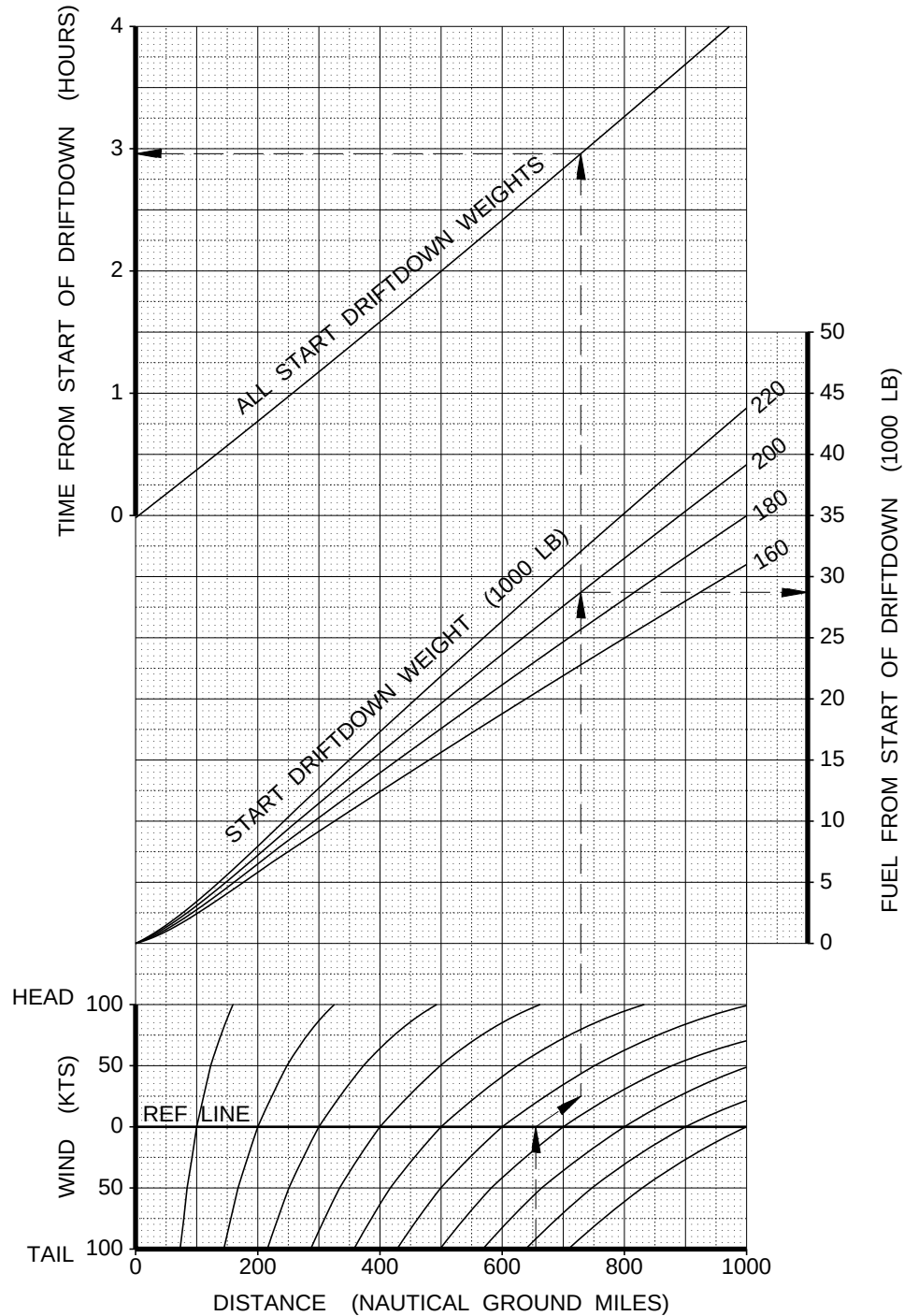
This table includes 5% additional fuel for holding in a racetrack pattern.

GEAR DOWN
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown/LRC Cruise Range Capability

Includes APU fuel burn



GEAR DOWN
ENGINE INOP
MAX CONTINUOUS THRUST

Long Range Cruise Altitude Capability

100 ft/min residual rate of climb

WEIGHT (1000 LB)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
200	6200		
190	9100	5700	
180	11800	9000	5800
170	14100	12000	8800
160	16000	14400	12200
150	17900	16400	14600
140	19800	18500	16800
130	21400	20500	19200
120	22900	22000	21000

With engine bleed for packs off, increase altitude capability by 100 ft.

With engine anti-ice on, decrease altitude capability by 5100 ft.

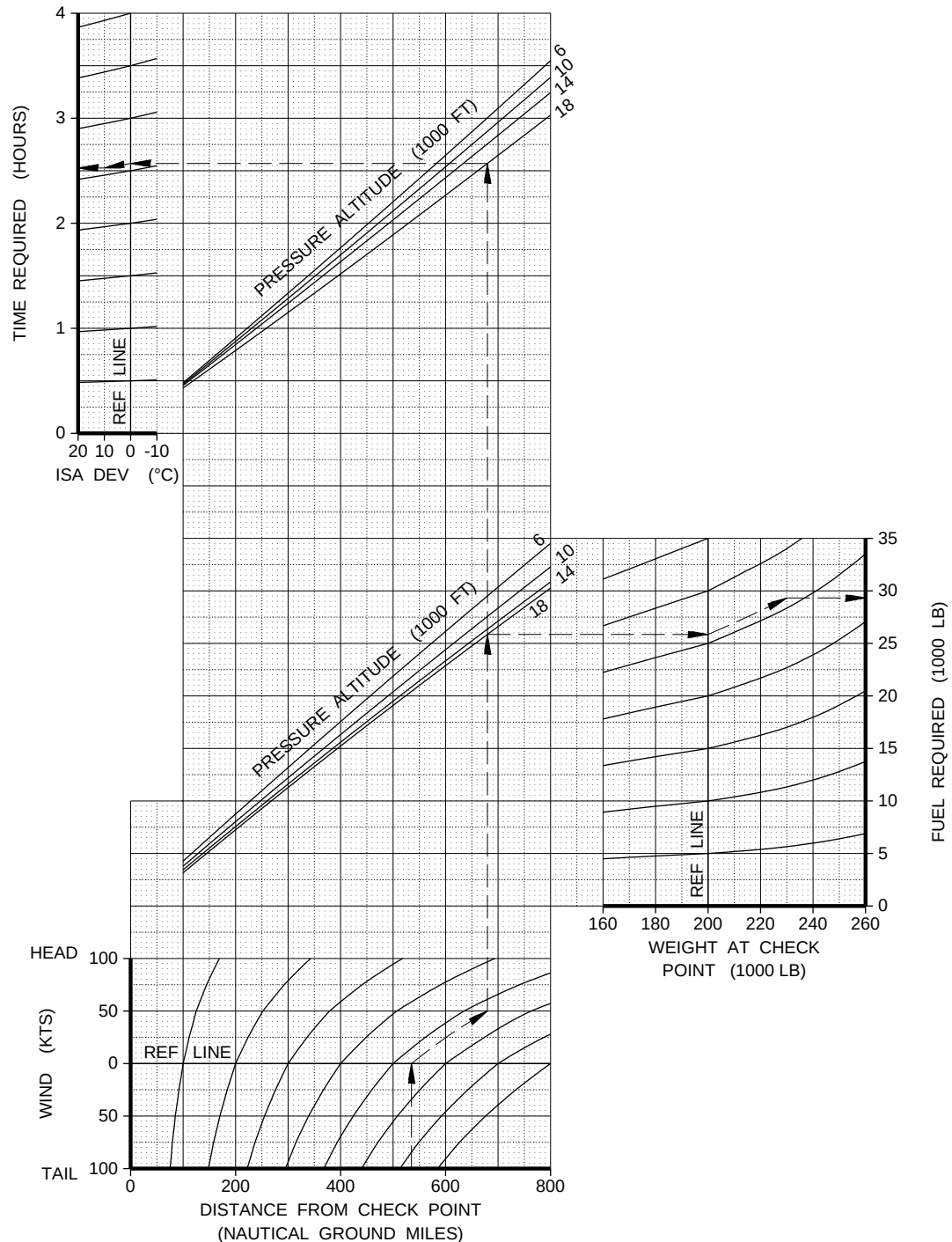
With engine and wing anti-ice on, decrease altitude capability by 8900 ft.

GEAR DOWN ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Diversion Fuel and Time

Based on VREF30 + 80 descent and includes APU fuel burn





GEAR DOWN
ENGINE INOP
MAX CONTINUOUS THRUST

Long Range Cruise Table
20000 FT to 15000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
20 (-17)	EPR													1.52	1.47	1.42
	MAX TAT													-2	5	12
	KIAS													188	184	179
	MACH													.412	.402	.392
	FF/ENG KTAS													7644 253	7029 247	6502 241
19 (-15)	EPR												1.54	1.48	1.44	1.40
	MAX TAT												-4	3	10	
	KIAS												193	188	184	179
	MACH												.413	.404	.394	.384
	FF/ENG KTAS												8148 254	7527 249	6967 243	6477 237
18 (-13)	EPR												1.50	1.45	1.41	1.37
	MAX TAT												2	8	14	
	KIAS												193	188	184	179
	MACH												.404	.396	.386	.377
	FF/ENG KTAS												8028 250	7448 245	6931 239	6465 233
17 (-11)	EPR											1.51	1.46	1.42	1.39	1.35
	MAX TAT											0	7	13		
	KIAS											197	193	188	184	179
	MACH											.405	.397	.388	.379	.369
	FF/ENG KTAS											8534 252	7929 247	7401 241	6914 235	6456 230
16 (-9)	EPR											1.47	1.43	1.40	1.36	1.33
	MAX TAT											6	11	17		
	KIAS											197	193	188	184	179
	MACH											.397	.389	.380	.371	.362
	FF/ENG KTAS											8418 248	7871 243	7375 237	6903 232	6457 226
15 (-7)	EPR										1.48	1.44	1.41	1.37	1.34	1.31
	MAX TAT										5	10	16	21		
	KIAS										201	197	193	188	184	179
	MACH										.398	.390	.381	.373	.364	.355
	FF/ENG KTAS										8909 249	8344 244	7833 239	7360 234	6897 228	6468 223

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Continuous EPR

PRESS ALT (1000 FT)	15	16	17	18	19	20
LIMIT EPR	1.49	1.51	1.52	1.53	1.55	1.56
MAX TAT (°C)	4	2	0	-2	-4	-6

Decrease limit EPR by 0.08 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.03.
With engine and wing anti-ice on, decrease limit EPR by 0.06.

GEAR DOWN
ENGINE INOP
MAX CONTINUOUS THRUST

Long Range Cruise Table
14000 FT to 9000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
14 (-6)	EPR										1.45	1.41	1.38	1.35	1.32	1.30
	MAX TAT										10	15	20			
	KIAS										201	197	193	188	184	179
	MACH										.390	.382	.374	.366	.357	.349
	FF/ENG KTAS										8903 245	8379 240	7893 235	7423 230	6971 225	6536 219
13 (-4)	EPR								1.46	1.42	1.39	1.36	1.33	1.30	1.28	
	MAX TAT								9	14	19	24				
	KIAS								205	201	197	193	188	184	179	
	MACH								.391	.383	.375	.367	.359	.351	.342	
	FF/ENG KTAS								9399 247	8857 242	8348 237	7871 232	7414 227	6974 221	6522 216	
12 (-2)	EPR								1.43	1.40	1.37	1.34	1.31	1.29	1.26	
	MAX TAT								12	17	23					
	KIAS								206	202	197	193	188	184	179	
	MACH								.385	.377	.369	.360	.352	.344	.335	
	FF/ENG KTAS								9407 244	8867 239	8352 234	7870 228	7423 223	6971 218	6520 213	
11 (0)	EPR								1.44	1.41	1.38	1.35	1.32	1.30	1.27	1.25
	MAX TAT								11	16	21	26				
	KIAS								211	207	203	198	193	188	184	179
	MACH								.388	.380	.371	.364	.354	.346	.337	.329
	FF/ENG KTAS								9966 246	9423 242	8892 236	8410 231	7896 225	7433 220	6969 215	6537 209
10 (2)	EPR								1.42	1.39	1.36	1.33	1.30	1.28	1.26	1.24
	MAX TAT								15	20	24	30				
	KIAS								212	208	204	199	193	188	184	179
	MACH								.382	.374	.366	.358	.348	.339	.331	.323
	FF/ENG KTAS								9984 244	9443 239	8944 234	8450 229	7913 222	7432 217	6980 211	6559 206
9 (4)	EPR								1.39	1.37	1.34	1.31	1.29	1.27	1.25	1.23
	MAX TAT								19	23	28	34				
	KIAS								213	209	205	199	193	188	184	179
	MACH								.376	.369	.362	.352	.342	.333	.325	.317
	FF/ENG KTAS								10003 241	9484 236	9004 232	8475 226	7924 219	7433 213	6998 208	6575 203

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Continuous EPR

PRESS ALT (1000 FT)	9	10	11	12	13	14
LIMIT EPR	1.42	1.43	1.44	1.46	1.47	1.49
MAX TAT (°C)	15	13	12	9	8	5

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.03.
With engine and wing anti-ice on, decrease limit EPR by 0.06.

GEAR DOWN ENGINE INOP MAX CONTINUOUS THRUST

Long Range Cruise Table 8000 FT to 5000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 LB)														
		260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
8 (6)	EPR							1.40	1.37	1.35	1.32	1.30	1.27	1.25	1.23	1.21
	MAX TAT							18	22	26	32					
	KIAS							218	214	210	205	199	193	188	184	179
	MACH							.378	.371	.364	.356	.346	.336	.327	.319	.311
	FF/ENG KTAS							10565 243	10032 238	9548 234	9034 229	8488 222	7926 216	7445 210	7015 205	6590 200
7 (7)	EPR							1.38	1.36	1.33	1.31	1.28	1.26	1.24	1.22	1.20
	MAX TAT							21	25	30	36					
	KIAS							219	215	211	205	199	193	188	184	179
	MACH							.373	.366	.359	.349	.340	.329	.321	.313	.305
	FF/ENG KTAS							10586 240	10090 236	9593 232	9051 225	8494 219	7933 213	7464 207	7030 202	6603 197
6 (9)	EPR						1.38	1.36	1.34	1.32	1.29	1.27	1.25	1.23	1.21	1.19
	MAX TAT						20	24	29	34						
	KIAS						224	220	216	211	205	200	193	188	184	179
	MACH						.374	.368	.361	.353	.343	.334	.323	.315	.307	.300
	FF/ENG KTAS						11151 242	10640 238	10155 234	9622 228	9065 222	8498 216	7947 209	7481 204	7046 199	6612 194
5 (11)	EPR						1.37	1.34	1.32	1.30	1.28	1.26	1.23	1.22	1.20	1.18
	MAX TAT						23	27	32	38						
	KIAS						225	221	217	211	206	200	193	188	184	179
	MACH						.369	.363	.355	.346	.337	.328	.317	.309	.302	.294
	FF/ENG KTAS						11197 240	10716 236	10189 231	9636 225	9068 219	8509 213	7958 206	7497 201	7058 196	6620 191

Max TAT not shown where EPR can be set in ISA + 30°C conditions.
Increase/decrease fuel flow 3% per 10°C above/below standard TAT.
Increase/decrease KTAS by 1 knot per 1°C above/below standard TAT.

Max Continuous EPR

PRESS ALT (1000 FT)	5	6	7	8
LIMIT EPR	1.37	1.38	1.40	1.41
MAX TAT (°C)	23	21	19	17

Decrease limit EPR by 0.06 per 10°C TAT hotter than table value.
With engine anti-ice on, decrease limit EPR by 0.03.
With engine and wing anti-ice on, decrease limit EPR by 0.05.

Holding Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 LB)											
		230	220	210	200	190	180	170	160	150	140	130	120
15000	EPR							1.48	1.44	1.41	1.37	1.34	1.31
	KIAS							201	197	193	188	184	179
	FF/ENG							9350	8760	8220	7730	7240	6790
10000	EPR					1.41	1.38	1.35	1.33	1.30	1.28	1.26	1.24
	KIAS					209	205	201	197	193	188	184	179
	FF/ENG					10250	9730	9230	8750	8290	7800	7330	6890
5000	EPR		1.37	1.35	1.33	1.31	1.29	1.27	1.25	1.23	1.22	1.20	1.18
	KIAS		220	217	213	209	205	201	197	193	188	184	179
	FF/ENG		11740	11210	10720	10240	9740	9250	8780	8330	7870	7410	6950
1500	EPR	1.32	1.31	1.29	1.27	1.26	1.24	1.23	1.21	1.20	1.18	1.17	1.15
	KIAS	224	220	217	213	209	205	201	197	193	188	184	179
	FF/ENG	12270	11760	11250	10730	10240	9780	9310	8850	8380	7910	7440	6970

This table includes 5% additional fuel for holding in a racetrack pattern.

ALTERNATE THRUST SETTING

Takeoff Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 LB)			
	FLAPS 1	FLAPS 5	FLAPS 15	FLAPS 20
FIELD	-10.3	-10.3	-10.4	-11.0
TIRE SPEED	-1.4	-1.4	-1.4	-1.4
CLIMB	-18.5	-17.5	-16.9	-15.7
OBSTACLE	-19.1	-18.2	-17.4	-16.4

Takeoff Speeds

TAKEOFF SPEEDS	TAKEOFF SPEED ADJUSTMENT (KTS)
V1	+2
VR	+1
V2	0

Enroute Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 LB)
ENROUTE CLIMB	-13.8

Landing Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 LB)	
	FLAPS 15/25	FLAPS 20/30
APPROACH/LANDING CLIMB	-19.1	-17.5

Takeoff %N1

Based on engine bleed for packs on, engine anti-ice on or off and wing anti-ice off

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)									
°F	°C	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
131	55	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6
122	50	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0
113	45	87.3	87.4	87.4	87.4	87.4	87.4	87.4	87.4	87.4	87.4
104	40	87.9	88.0	88.4	88.8	89.1	89.1	89.1	89.1	89.1	89.1
95	35	88.4	88.5	89.0	89.4	89.9	90.2	90.4	90.4	90.4	90.4
86	30	88.4	88.9	89.5	90.0	90.5	90.8	91.1	91.1	91.1	91.1
77	25	87.7	88.1	89.1	90.1	91.1	91.4	91.7	91.7	91.7	91.7
68	20	87.0	87.3	88.4	89.4	90.3	91.3	92.2	92.4	92.4	92.4
59	15	86.2	86.5	87.6	88.6	89.5	90.4	91.3	91.9	92.5	92.7
50	10	85.4	85.7	86.8	87.8	88.7	89.6	90.5	91.1	91.6	92.2
41	5	84.5	84.9	85.9	86.9	87.8	88.8	89.6	90.2	90.8	91.4
32	0	83.7	84.1	85.1	86.1	87.0	87.9	88.8	89.4	89.9	90.5
23	-5	82.9	83.2	84.3	85.3	86.1	87.1	87.9	88.5	89.1	89.6
14	-10	82.0	82.4	83.5	84.4	85.3	86.2	87.0	87.7	88.2	88.7
5	-15	81.2	81.6	82.6	83.6	84.4	85.4	86.2	86.8	87.3	87.8
-4	-20	80.4	80.8	81.8	82.8	83.6	84.5	85.3	85.9	86.4	87.0
-13	-25	79.5	80.0	81.0	81.9	82.7	83.7	84.5	85.1	85.6	86.1
-22	-30	78.7	79.1	80.2	81.1	81.9	82.8	83.6	84.2	84.7	85.2
-31	-35	77.9	78.3	79.4	80.3	81.0	82.0	82.7	83.3	83.8	84.3
-40	-40	77.0	77.5	78.5	79.4	80.2	81.1	81.9	82.5	82.9	83.4
-49	-45	76.2	76.6	77.7	78.6	79.4	80.3	81.0	81.6	82.1	82.6
-58	-50	75.4	75.8	76.9	77.8	78.5	79.4	80.2	80.7	81.2	81.7

%N1 Adjustments for Engine Bleed

BLEED CONFIGURATION	AIRPORT PRESSURE ALTITUDE (FT)									
	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
PACKS OFF	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
WING ANTI-ICE ON	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

ALTERNATE THRUST SETTING

Go-around %N1

Based on engine bleed for packs on, engine anti-ice on or off and wing anti-ice off

AIRPORT OAT		TAT	AIRPORT PRESSURE ALTITUDE (FT)									
°F	°C	(°C)	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
131	55	58	85.0	84.9	84.9	84.8	84.8	84.8	84.8	84.7	84.7	84.7
122	50	53	86.1	86.1	86.1	86.1	86.0	86.0	86.0	86.0	86.0	85.9
113	45	48	87.2	87.3	87.3	87.3	87.3	87.3	87.3	87.3	87.3	87.2
104	40	43	87.8	87.9	88.2	88.5	88.9	88.9	88.9	88.9	88.9	88.8
95	35	37	88.4	88.5	88.9	89.2	89.7	90.0	90.1	90.1	90.1	90.1
86	30	32	88.3	88.9	89.5	89.9	90.4	90.7	91.1	91.1	91.1	91.1
77	25	27	87.5	88.1	89.0	90.0	91.0	91.4	91.8	91.8	91.8	91.8
68	20	22	86.8	87.3	88.3	89.3	90.2	91.1	92.1	92.4	92.4	92.5
59	15	17	86.0	86.5	87.5	88.5	89.4	90.3	91.2	91.9	92.3	92.7
50	10	12	85.1	85.7	86.7	87.7	88.6	89.5	90.4	91.0	91.5	92.1
41	5	7	84.3	84.9	85.8	86.9	87.8	88.7	89.5	90.2	90.7	91.3
32	0	2	83.5	84.0	85.0	86.0	86.9	87.9	88.7	89.3	89.8	90.4
23	-5	-3	82.7	83.2	84.2	85.2	86.1	87.0	87.8	88.4	89.0	89.5
14	-10	-8	81.9	82.4	83.4	84.4	85.2	86.2	87.0	87.6	88.1	88.6
5	-15	-13	81.0	81.6	82.6	83.5	84.4	85.3	86.1	86.7	87.2	87.8
-4	-20	-18	80.2	80.7	81.7	82.7	83.5	84.5	85.2	85.9	86.4	86.9
-13	-25	-23	79.4	79.9	80.9	81.9	82.7	83.6	84.4	85.0	85.5	86.0
-22	-30	-28	78.6	79.1	80.1	81.0	81.8	82.8	83.5	84.1	84.6	85.1
-31	-35	-33	77.8	78.3	79.3	80.2	81.0	81.9	82.7	83.3	83.7	84.2
-40	-40	-38	76.9	77.4	78.5	79.4	80.2	81.1	81.8	82.4	82.9	83.4
-49	-45	-43	76.1	76.6	77.6	78.5	79.3	80.2	81.0	81.5	82.0	82.5
-58	-50	-48	75.3	75.8	76.8	77.7	78.4	79.4	80.1	80.7	81.1	81.6

%N1 Adjustments for Engine Bleed

BLEED CONFIGURATION	AIRPORT PRESSURE ALTITUDE (FT)									
	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
PACKS OFF	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
WING ANTI-ICE ON	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

Max Climb %N1

Based on engine bleed for packs on and anti-ice off

TAT (°C)	PRESSURE ALTITUDE (1000 FT)/SPEED (KIAS OR MACH)								
	0	5	10	15	20	25	30	35	40
	250	250	250	290	290	290	290	.78	.78
60	83.4	85.4	85.4	85.8	84.9	82.7	80.4	80.2	80.1
50	84.6	86.6	86.8	87.1	86.3	84.1	81.7	81.5	81.3
40	85.9	87.8	88.0	88.4	87.6	85.5	83.0	82.8	82.6
30	86.2	89.0	89.2	89.5	88.8	86.8	84.2	83.9	83.7
20	84.8	88.9	90.3	90.5	89.7	87.8	85.3	85.0	84.7
10	83.3	87.4	89.5	90.8	90.9	89.1	86.6	86.4	86.2
0	81.9	85.8	87.9	89.2	90.5	90.6	88.2	88.0	87.7
-10	80.3	84.2	86.3	87.5	88.8	89.1	86.5	86.3	86.1
-20	78.8	82.6	84.6	85.9	87.1	87.3	84.8	84.6	84.4
-30	77.2	81.0	82.9	84.1	85.4	85.6	83.1	82.9	82.7
-40	75.6	79.3	81.2	82.4	83.6	83.8	81.3	81.1	80.9
-50	74.0	77.6	79.5	80.6	81.8	82.0	79.5	79.3	79.1

%N1 Adjustments for Engine Bleeds

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)								
	0	5	10	15	20	25	30	35	40
PACKS OFF	0.5	0.4	0.4	0.5	0.7	0.8	1.0	1.2	1.4
ENGINE ANTI-ICE ON	0.0	0.0	-1.2	-1.2	-1.2	-1.3	-1.4	-1.7	-2.1
ENGINE & WING ANTI-ICE ON	-0.9	-1.0	-2.2	-2.3	-2.3	-2.4	-2.7	-3.2	-4.0

ALTERNATE THRUST SETTING

Max Cruise %N1

Based on engine bleed for packs on and anti-ice off

TAT (°C)	PRESSURE ALTITUDE (1000 FT)								
	25	27	29	31	33	35	37	39	41
55	80.7	80.4	80.2	80.0	79.7	79.5	79.2	79.0	78.8
50	81.8	81.6	81.4	81.2	81.0	80.8	80.6	80.3	80.2
45	82.5	82.4	82.2	82.0	81.9	81.7	81.5	81.4	81.2
40	83.1	82.9	82.8	82.6	82.5	82.3	82.2	82.1	81.9
35	83.7	83.5	83.4	83.2	83.1	82.9	82.8	82.6	82.5
30	84.2	84.0	83.9	83.8	83.6	83.5	83.3	83.2	83.1
25	84.7	84.5	84.4	84.3	84.2	84.0	83.9	83.8	83.7
20	85.2	85.0	84.9	84.8	84.6	84.5	84.4	84.3	84.2
15	85.6	85.5	85.4	85.3	85.1	85.0	84.9	84.3	84.7
10	85.9	85.8	85.7	85.6	85.5	85.4	85.3	85.2	85.1
5	85.7	86.1	86.1	86.0	85.9	85.8	85.7	85.6	85.5
0	85.0	85.8	86.4	86.3	86.2	86.1	86.0	85.9	85.9
-5	84.2	85.1	86.0	86.8	86.7	86.6	86.5	86.4	86.3
-10	83.4	84.3	85.2	86.2	87.2	87.1	87.0	86.9	86.9
-15	82.6	83.5	84.4	85.4	86.5	87.8	87.7	87.6	87.6
-20	81.8	82.6	83.6	84.6	85.7	86.9	87.6	87.5	87.5
-25	81.0	81.8	82.7	83.7	84.8	86.1	86.8	86.7	86.6
-30	80.2	81.0	81.9	82.9	84.0	85.2	85.9	85.8	85.7
-35	79.3	80.2	81.1	82.0	83.1	84.3	85.0	84.9	84.9
-40	78.5	79.3	80.2	81.2	82.2	83.4	84.1	84.0	84.0

%N1 Adjustments for Engine Bleeds

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)								
	25	27	29	31	33	35	37	39	41
ENGINE ANTI-ICE ON	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4
ENGINE & WING ANTI-ICE ON	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6

Intentionally
Blank

ALTERNATE THRUST SETTING

ENGINE INOP

Initial Max Continuous %N1

Based on .80M, engine bleed for one pack on and anti-ice off

TAT (°C)	PRESSURE ALTITUDE (1000 FT)								
	27	29	31	33	35	37	39	41	43
20	86.8	85.8	85.2	85.1	85.0	84.9	84.8	84.7	84.5
15	87.4	86.4	85.9	85.8	85.7	85.6	85.5	85.3	85.2
10	88.1	87.1	86.6	86.5	86.4	86.3	86.2	86.1	86.0
5	88.9	87.9	87.4	87.3	87.2	87.1	87.0	86.9	86.8
0	88.7	88.7	88.1	88.1	88.0	87.9	87.8	87.7	87.6
-5	87.9	88.4	88.9	88.8	88.7	88.6	88.5	88.5	88.4
-10	87.1	87.5	88.4	89.6	89.5	89.4	89.3	89.2	89.1
-15	86.3	86.7	87.6	88.9	90.3	90.2	90.1	90.0	89.9
-20	85.4	85.9	86.7	88.0	89.4	90.1	90.0	89.9	89.8
-25	84.6	85.0	85.9	87.2	88.5	89.2	89.1	89.0	88.9
-30	83.7	84.1	85.0	86.3	87.6	88.3	88.2	88.1	88.0
-35	82.9	83.3	84.1	85.4	86.7	87.4	87.3	87.2	87.1
-40	82.0	82.4	83.2	84.5	85.8	86.5	86.4	86.3	86.2

%N1 Adjustments for Engine Bleed

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)								
	27	29	31	33	35	37	39	41	43
PACKS OFF	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5
ENGINE ANTI-ICE ON	-1.3	-1.4	-1.5	-1.6	-1.7	-1.9	-2.0	-2.3	-2.8
ENGINE & WING ANTI-ICE ON	-2.5	-2.6	-2.8	-3.0	-3.2	-3.6	-3.8	-4.4	-5.3

ALTERNATE THRUST SETTING ENGINE INOP

Max Continuous %N1

Based on engine bleed for one pack on and anti-ice off
37000 FT to 16000 FT Pressure Altitudes

37000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.63	92.1	93.0	94.0	93.2	91.7	90.5	89.4	88.6	87.8	87.1	86.3	85.6
220	.69	89.9	90.8	91.8	92.7	91.3	90.2	89.3	88.6	87.9	87.1	86.3	85.6
240	.75	87.9	88.9	89.8	90.7	91.1	90.2	89.3	88.6	87.9	87.1	86.3	85.6
260	.80	86.4	87.4	88.3	89.2	90.1	90.2	89.4	88.6	87.9	87.1	86.3	85.6
33000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.58	90.4	91.4	92.3	93.3	91.9	90.6	89.6	88.7	87.9	87.2	86.4	85.7
220	.63	89.0	89.9	90.9	91.8	91.9	90.6	89.6	88.8	88.0	87.3	86.5	85.8
240	.68	87.2	88.2	89.1	90.0	90.9	90.4	89.5	88.8	88.0	87.3	86.5	85.8
260	.74	85.9	86.8	87.7	88.6	89.5	90.3	89.5	88.8	88.1	87.3	86.5	85.8
29000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.53	87.9	88.8	89.7	90.6	91.5	90.9	89.9	89.0	88.3	87.6	87.0	86.3
220	.58	87.2	88.1	89.0	90.0	90.9	91.2	90.2	89.3	88.5	87.8	87.1	86.4
240	.63	86.1	87.0	87.9	88.8	89.7	90.6	90.2	89.4	88.6	87.9	87.1	86.4
260	.68	84.9	85.8	86.7	87.5	88.4	89.3	90.1	89.4	88.7	87.9	87.1	86.4
25000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.49	87.1	88.0	89.0	89.9	90.8	91.7	91.6	90.8	90.1	89.5	88.9	88.3
220	.53	86.5	87.4	88.3	89.2	90.1	91.0	91.8	91.0	90.2	89.6	88.9	88.3
240	.58	85.9	86.8	87.7	88.6	89.5	90.4	91.3	91.2	90.4	89.7	89.1	88.4
260	.63	85.1	86.0	86.9	87.8	88.7	89.6	90.4	91.3	90.5	89.8	89.1	88.4
22000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.46	91.1	91.9	91.9	91.2	90.6	90.0	89.4	88.9	88.3	87.7	87.0	
240	.55	89.8	90.7	91.6	91.4	90.7	90.1	89.5	88.9	88.4	87.8	87.2	
280	.63	88.5	89.3	90.2	91.0	90.9	90.2	89.6	89.0	88.5	88.0	87.4	
20000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.44	90.7	91.6	92.4	91.9	91.3	90.7	90.2	89.6	89.1	88.4	87.8	
240	.53	89.5	90.4	91.2	92.0	91.4	90.8	90.2	89.7	89.2	88.6	88.0	
280	.61	88.4	89.2	90.1	90.9	91.6	90.9	90.3	89.7	89.3	88.8	88.2	
18000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.42	90.0	90.9	91.7	92.2	91.6	91.0	90.5	89.9	89.4	88.8	88.1	
240	.51	88.9	89.7	90.6	91.4	91.6	91.0	90.5	90.0	89.4	88.9	88.3	
280	.59	87.8	88.7	89.5	90.3	91.2	91.2	90.6	90.1	89.6	89.1	88.5	
16000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.41	89.3	90.2	91.0	91.9	91.9	91.3	90.8	90.2	89.7	89.1	88.5	
240	.49	88.3	89.2	90.0	90.8	91.7	91.3	90.8	90.3	89.7	89.2	88.6	
280	.57	87.3	88.1	89.0	89.8	90.6	91.4	90.9	90.3	89.9	89.4	88.8	

%N1 Adjustments for Engine Bleeds

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)							
	16	18	20	22	25	29	33	37
PACKS OFF	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.3
ENGINE ANTI-ICE ON	-1.2	-1.2	-1.2	-1.2	-1.2	-1.3	-1.5	-1.8
ENGINE & WING ANTI-ICE ON	-2.3	-2.3	-2.3	-2.3	-2.3	-2.5	-2.9	-3.4

ALTERNATE THRUST SETTING

ENGINE INOP

Max Continuous %N1

Based on engine bleed for one pack on and anti-ice off
14000 FT to Sea Level Pressure Altitudes

14000 FT PRESS ALT		TAT (°C)										
KLAS	M	-15	-10	-5	0	5	10	15	20	25	30	35
200	.39	88.5	89.3	90.2	91.0	91.8	91.4	90.9	90.3	89.7	89.1	88.5
240	.47	87.6	88.4	89.3	90.1	90.9	91.5	90.9	90.4	89.9	89.3	88.7
280	.54	86.6	87.4	88.2	89.1	89.9	90.7	91.0	90.5	90.0	89.4	88.9
12000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.38	88.2	89.1	89.9	90.7	91.3	90.7	90.2	89.6	89.0	88.4	87.7
240	.45	87.5	88.4	89.2	90.0	90.8	90.9	90.4	89.8	89.2	88.6	88.0
10000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.36	87.2	88.0	88.9	89.7	90.5	90.6	90.1	89.4	88.8	88.2	87.5
240	.43	86.6	87.5	88.3	89.1	89.9	90.7	90.3	89.8	89.2	88.6	88.0
8000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.35	86.2	87.0	87.8	88.6	89.4	90.2	89.9	89.3	88.7	88.0	87.3
240	.42	85.8	86.6	87.4	88.2	89.0	89.7	90.3	89.7	89.1	88.5	87.9
6000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.34	85.2	86.0	86.8	87.6	88.4	89.1	89.8	89.2	88.5	87.9	87.2
240	.40	84.9	85.7	86.5	87.2	88.0	88.8	89.6	89.6	89.1	88.5	87.8
4000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.32	83.8	84.6	85.4	86.2	87.0	87.7	88.5	88.7	88.1	87.4	86.7
240	.39	83.6	84.4	85.2	85.9	86.7	87.5	88.2	89.0	88.6	88.0	87.4
2000 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.31	82.2	83.0	83.8	84.5	85.3	86.0	86.8	87.5	87.3	86.6	85.9
240	.38	82.0	82.8	83.6	84.3	85.1	85.8	86.6	87.3	87.8	87.2	86.6
0 FT PRESS ALT		TAT (°C)										
KLAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.30	80.5	81.3	82.1	82.8	83.6	84.3	85.0	85.7	86.5	85.9	85.1
240	.36	80.4	81.2	81.9	82.7	83.4	84.1	84.9	85.6	86.3	86.4	85.8

%N1 Adjustments for Engine Bleeds

BLEED CONFIGURATION	PRESSURE ALTITUDE (1000 FT)							
	0	2	4	6	8	10	12	14
PACKS OFF	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
ENGINE ANTI-ICE ON	0.0	0.0	0.0	0.0	-1.2	-1.2	-1.2	-1.2
ENGINE & WING ANTI-ICE ON	-0.9	-0.9	-1.0	-1.0	-2.2	-2.2	-2.2	-2.2

Intentionally
Blank