



FLIGHT PLANNING AND PERFORMANCE MANUAL



757-200W PW2040 FAA KG/°C/FT CATEGORY A & B BRAKES

OPTIONS

Slush EI

This document has EAR data with Export Control Classification Numbers (ECCN) of: 9E991.

Export of this technology is controlled under the United States Export Administration Regulations (EAR) (15 CFR 730-774). An export license may be required before it is used for development, production or use by foreign persons from specific countries. The controller of this data has the individual responsibility to abide by all export laws.

BOEING PROPRIETARY

Copyright © 2000-2010 The Boeing Company. All rights reserved.

Boeing claims copyright in each page of this document only to the extent that the page contains copyrightable subject matter. Boeing also claims copyright in this document as a compilation and/or collective work. This document includes proprietary information owned by The Boeing Company and/or one or more third parties. Treatment of the document and the information it contains is governed by contract with Boeing. For more information, contact The Boeing Company, P.O. Box 3707, Seattle Washington 98124.

**PUBLISHED BY
FLIGHT OPERATIONS ENGINEERING
BOEING COMMERCIAL AIRPLANE GROUP
SEATTLE, WASHINGTON U.S.A**

BOEING DOCUMENT NUMBER: D632N002-NZ080

Revision Number: 0

Revision Date: May 17th, 2011

Intentionally
Blank

Preface Table of Contents

Chapter 0

Preface	0
Introduction	0.1
Revision Record	0.2
List of Effective Pages	0.3
Bulletin Record	0.4
TAKEOFF AND LANDING	1
FLIGHT PLANNING	2
ENROUTE	3
NON-STANDARD CONFIGURATION	4

Intentionally
Blank

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

Intentionally
Blank

Revision Transmittal Letter

To: All holders of Flight Planning and Performance Manual, Boeing Document Number D632N002-NZ080.

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
0	May 17, 2011	

No.	Revision Date	Date Filed

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.

Intentionally
Blank

Preface

List of Effective Pages

Chapter 0

Section 3

Page	Date
FPPM	
* Title Page	May 17, 2011
* Copyright	May 17, 2011
Preface (tab)	
* 0.TOC.0.1-2	May 17, 2011
* 0.1.1-2	May 17, 2011
* 0.2.1-2	May 17, 2011
List of Effective Pages	
* 0.3.1-2	May 17, 2011
Bulletins (tab)	
* 0.4.1-2	May 17, 2011
* 1.3.1-4	May 17, 2011
TAKEOFF AND LANDING (tab)	
* 1.TOC.0.1-2	May 17, 2011
* 1.1.1-6	May 17, 2011
* 1.2.1-20	May 17, 2011
* 1.3.1-6	May 17, 2011
FLIGHT PLANNING (tab)	
* 2.TOC.0.1-2	May 17, 2011
* 2.1.1-4	May 17, 2011
* 2.2.1-10	May 17, 2011
* 2.3.1-6	May 17, 2011
* 2.4.1-22	May 17, 2011
ENROUTE (tab)	
* 3.TOC.0.1-2	May 17, 2011
* 3.1.1-2	May 17, 2011
* 3.2.1-18	May 17, 2011
* 3.3.1-20	May 17, 2011

Page	Date
NON-STANDARD CONFIGURATION (tab)	
* 4.TOC.0.1-2	May 17, 2011
* 4.1.1-4	May 17, 2011
* 4.2.1-4	May 17, 2011
* 4.3.1-12	May 17, 2011
* 4.4.1-6	May 17, 2011
* 4.5.1-4	May 17, 2011
* 4.6.1-4	May 17, 2011
(blank tab)	

Intentionally
Blank

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



Number: NZ080-1

IssueDate: July 15, 2009

Airplane Effectivity: D632N002-NZ080

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/LANDIN G 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/LANDIN G 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/LANDIN G 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



Flight Planning and Performance Manual

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 NZ080-1 "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:

Mailing Address:	Manager, Performance Flight Operations Engineering Boeing Commercial Airplane Group P.O. Box 3707 M/C 20-88 Seattle, WA 98124-2207 USA
Fax:	(206) 662-3200
Phone:	(206) 662-4722
E-MAIL	flightops.engineering@boeing.com

TAKEOFF AND LANDING

Table of Contents

Chapter 1

Text.....	1.1.1
Introduction	1.1.1
Takeoff.....	1.1.1
Landing	1.1.4
Takeoff.....	1.2.1
Altimeter Setting to Station Pressure	1.2.1
Wind Component	1.2.2
Takeoff Field Limit	1.2.3
Takeoff Climb Limit	1.2.4
Obstacle Limit.....	1.2.8
Tire Speed Limit	1.2.12
Brake Energy Limits VMBE	1.2.13
Improved Climb.....	1.2.14
Slush/Standing Water Takeoff	1.2.15
Slippery Runway Takeoff	1.2.17
Takeoff Speeds	1.2.19
Maximum Allowable Clearway	1.2.19
Clearway and Stopway V1 Adjustments	1.2.19
V1(MCG)	1.2.20
Takeoff EPR	1.2.20
Stab Trim Setting.....	1.2.20
Landing	1.3.1
Landing Field Length Limit	1.3.1
Landing Climb Limit Weight	1.3.2
Quick Turnaround Limit	1.3.3
Recommended Brake Cooling Schedule	1.3.4
Normal Configuration Landing Distance	1.3.5

Intentionally
Blank

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 climb 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 13mm (0.5 inches) 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 12700 kg 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	-47	-42	-40	-37
8000	-37	-33	-31	-26
10000	-30	-27	-25	-23
12000	-24	-22		
14000	-20	-19		

*Reduce V1 adjustment by 1 knot per 4500 kg below 118000 kg.

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 7350 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 2300 kg 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	-4
8000	-3
10000	-2
12000	-2
14000	-2

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 4000 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 8°C.

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.

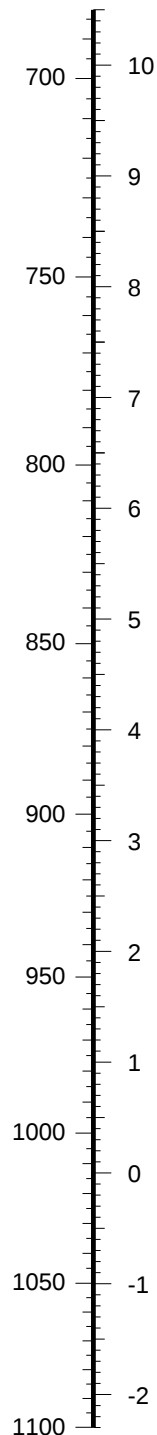
Use of the autobrake system commands the airplane to a constant deceleration rate. In some conditions, such as a runway with "poor" braking action, the airplane may not be able to achieve these deceleration rates. In these cases, runway slope and inoperative reversers influence the stopping distance. 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

MBS 1000 FT

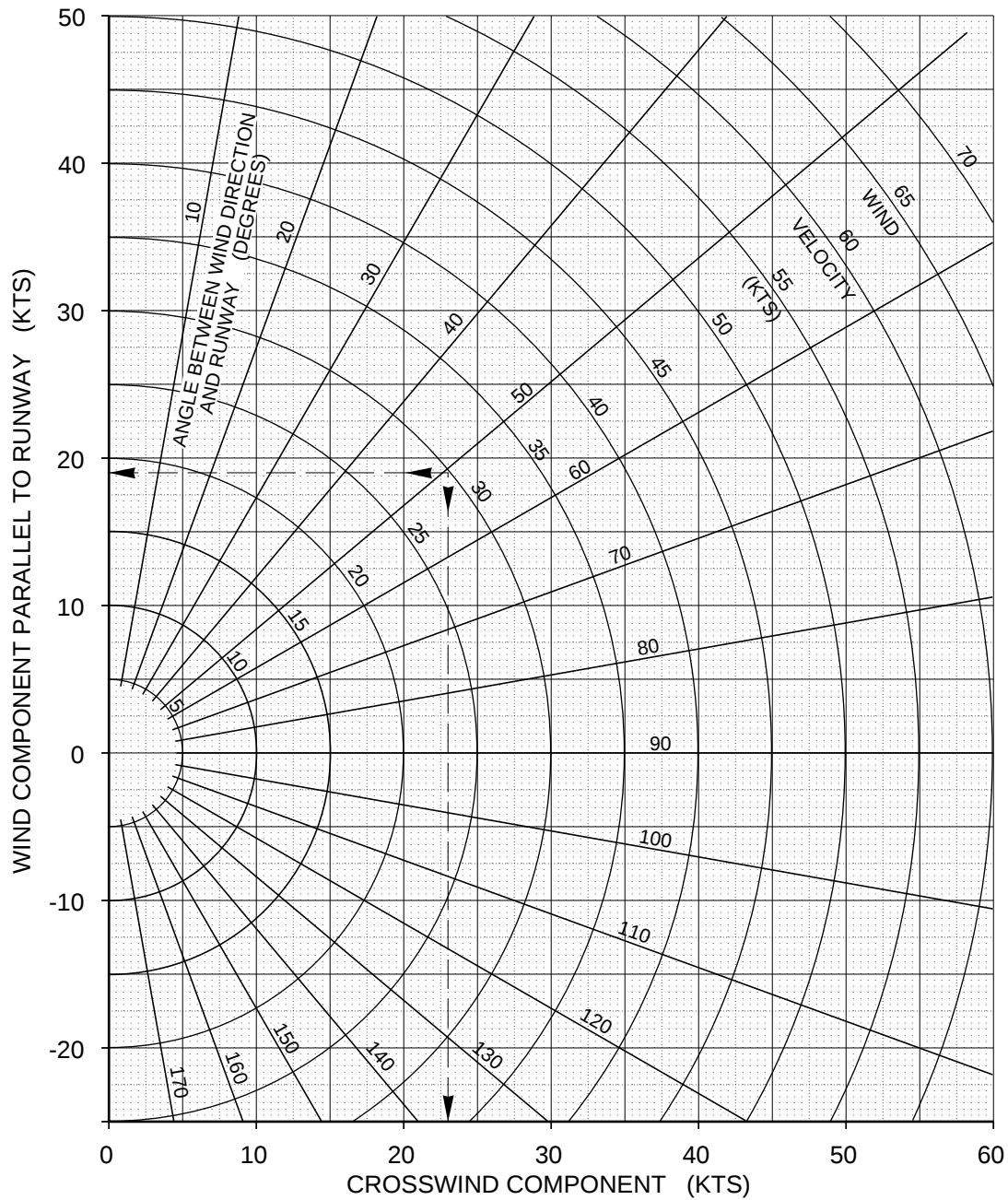


QNH to Pressure Altitude

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

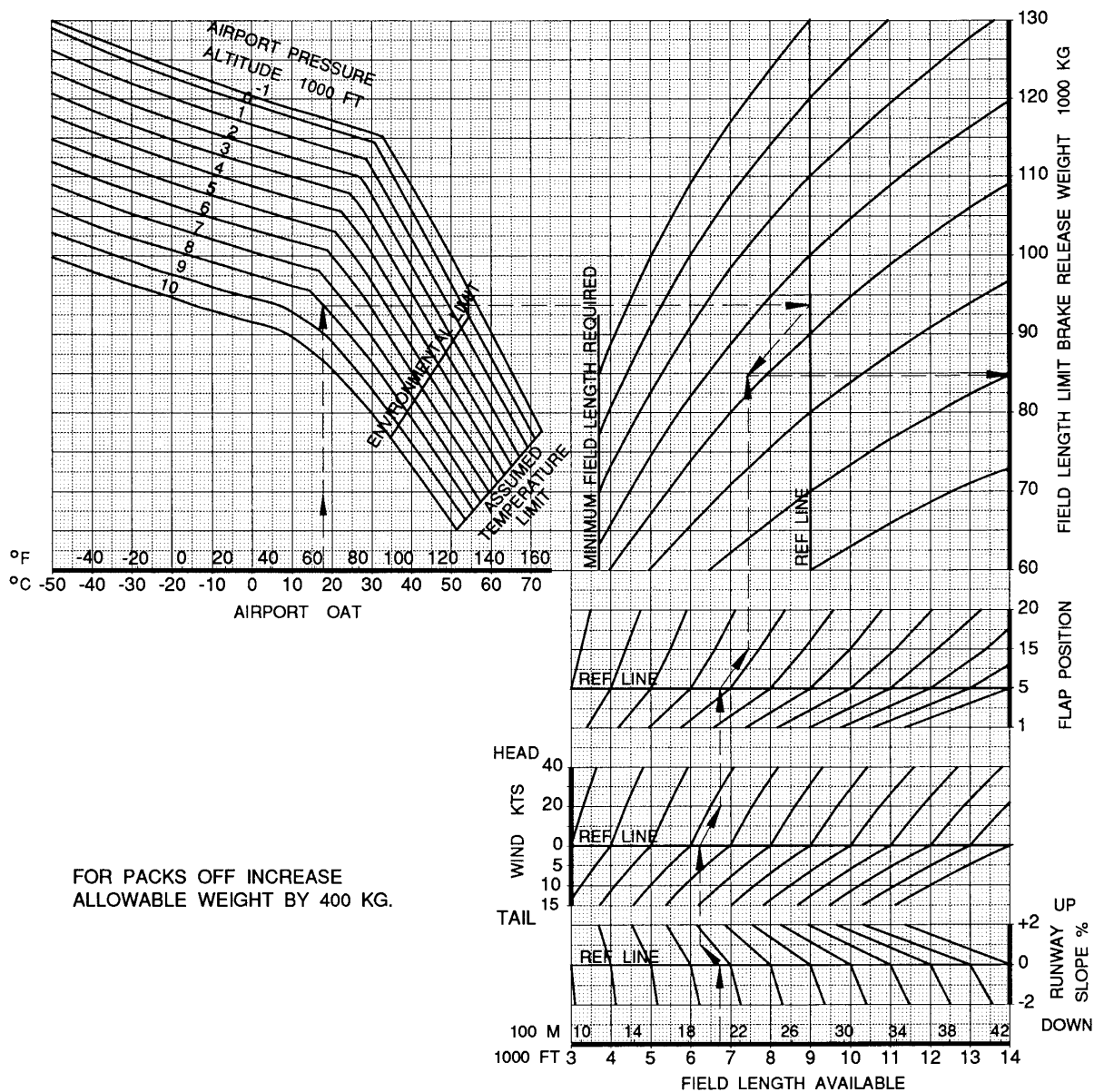
Example: Elevation = 2500 FT
 QNH = 29.48 IN. HG.
 Correction = 400 FT
 Press Alt = 2900 FT

Wind Component



Takeoff Field Limit

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

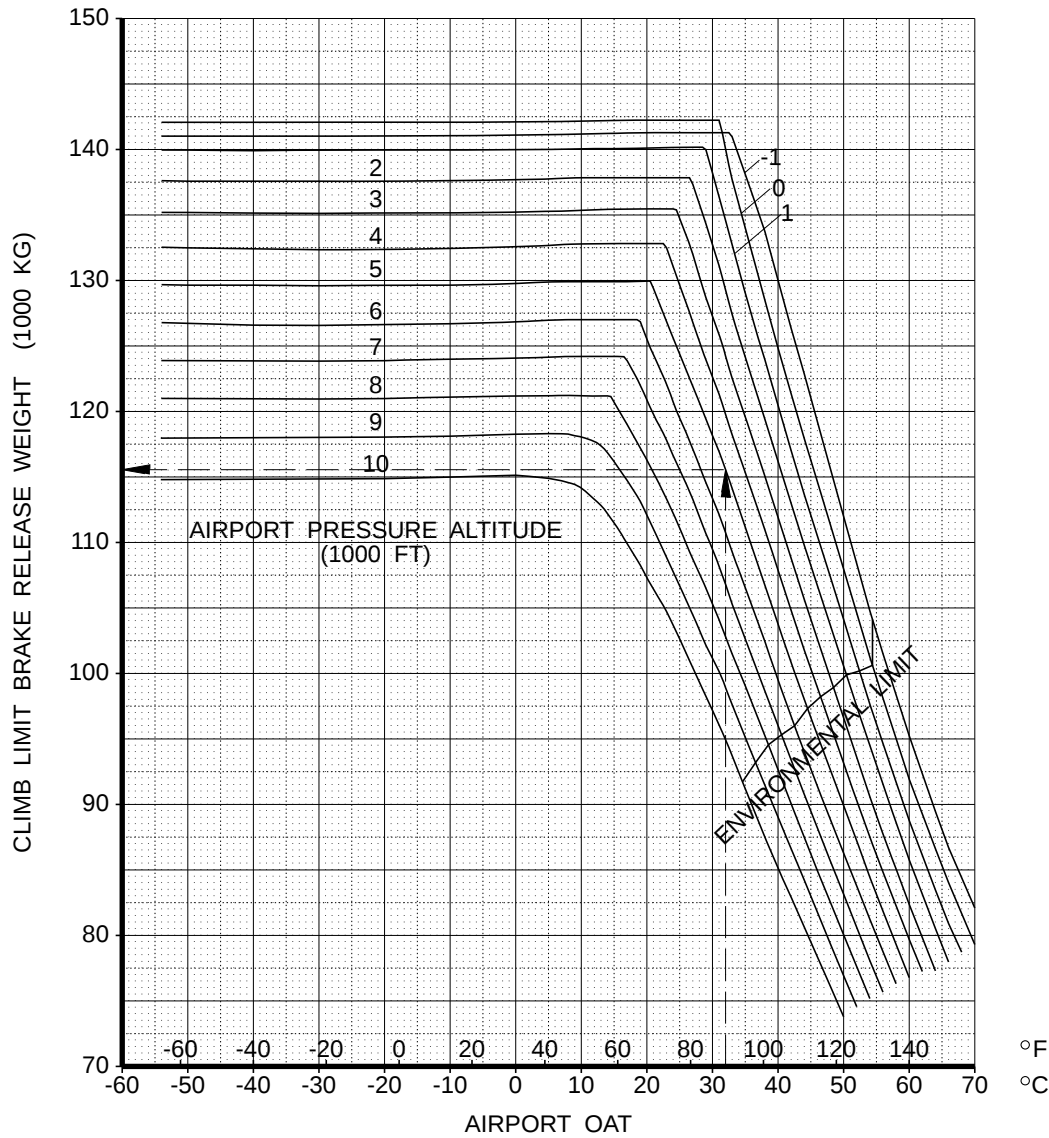


ANTI-ICE OPERATION DECREMENT KG				
FLAPS	AT OR BELOW 8000 FT		ABOVE 8000 FT	
	ENGINE	ENGINE & WING	ENGINE	ENGINE & WING
ALL	300	1850	1900	3600

Takeoff Climb Limit

Flaps 1

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



With engine bleed for packs off, increase weight by 600 kg.

With APU on, decrease weight by 230 kg.

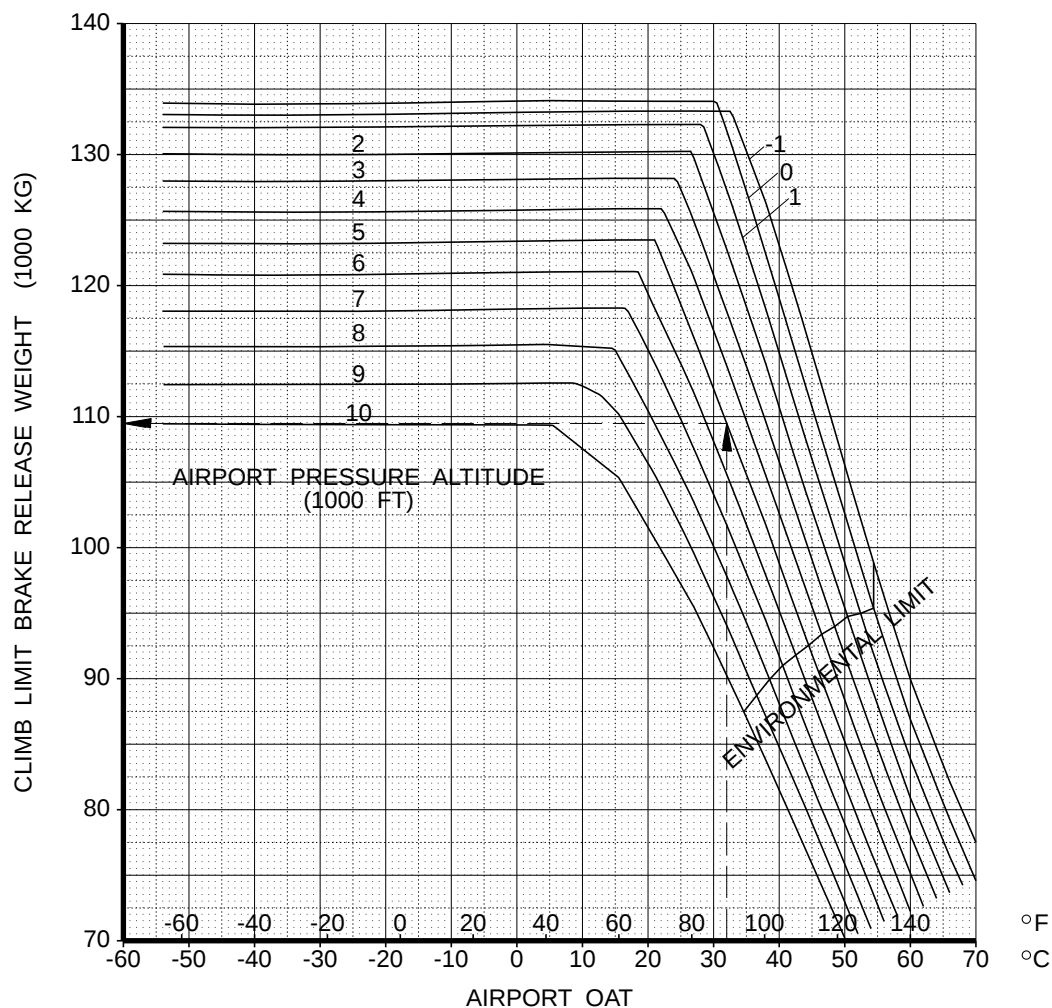
With engine anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 500 kg. For altitudes greater than 7850 ft, decrease weight by 3350 kg.

With engine and wing anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 3400 kg. For altitudes greater than 7850 ft, decrease weight by 6000 kg.

Takeoff Climb Limit

Flaps 5

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



With engine bleed for packs off, increase weight by 600 kg.

With APU on, decrease weight by 230 kg.

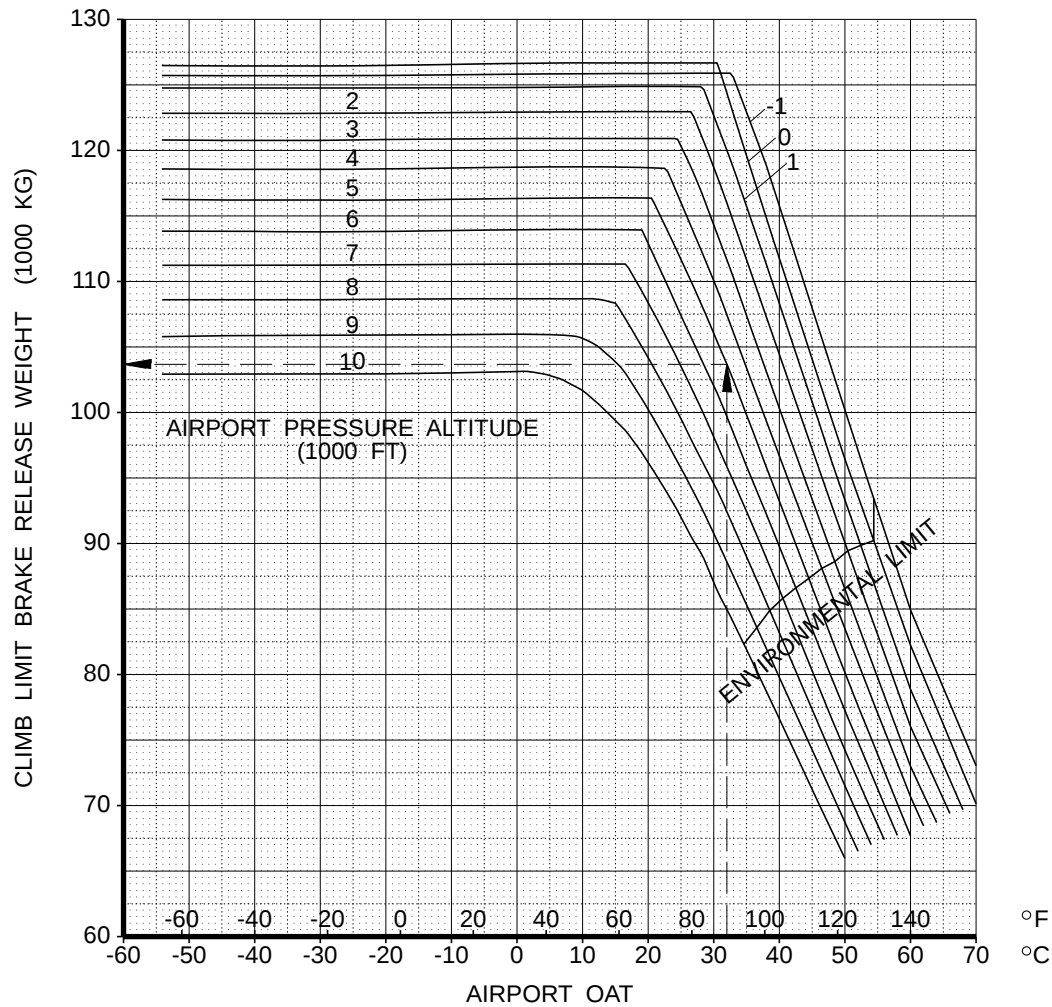
With engine anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 450 kg. For altitudes greater than 7850 ft, decrease weight by 3050 kg.

With engine and wing anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 3200 kg. For altitudes greater than 7850 ft, decrease weight by 5550 kg.

Takeoff Climb Limit

Flaps 15

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



With engine bleed for packs off, increase weight by 600 kg.

With APU on, decrease weight by 230 kg.

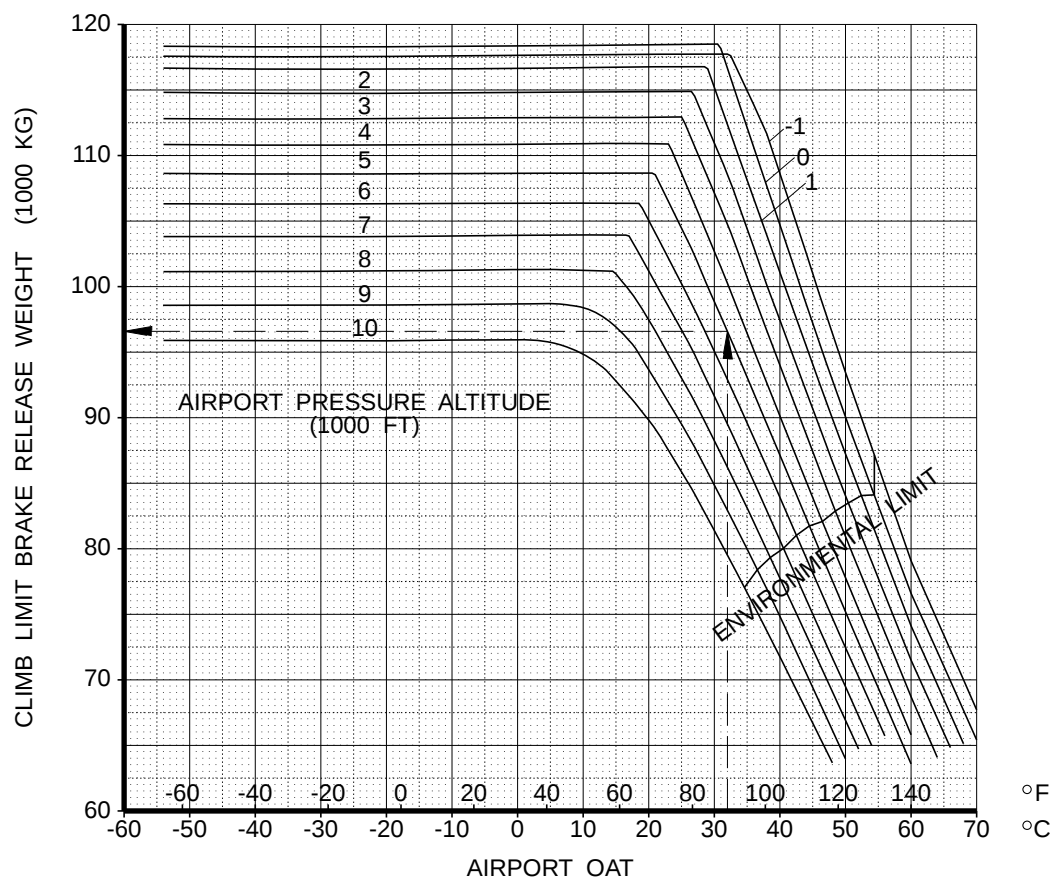
With engine anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 400 kg. For altitudes greater than 7850 ft, decrease weight by 2850 kg.

With engine and wing anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 3000 kg. For altitudes greater than 7850 ft, decrease weight by 5200 kg.

Takeoff Climb Limit

Flaps 20

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



With engine bleed for packs off, increase weight by 600 kg.

With APU on, decrease weight by 230 kg.

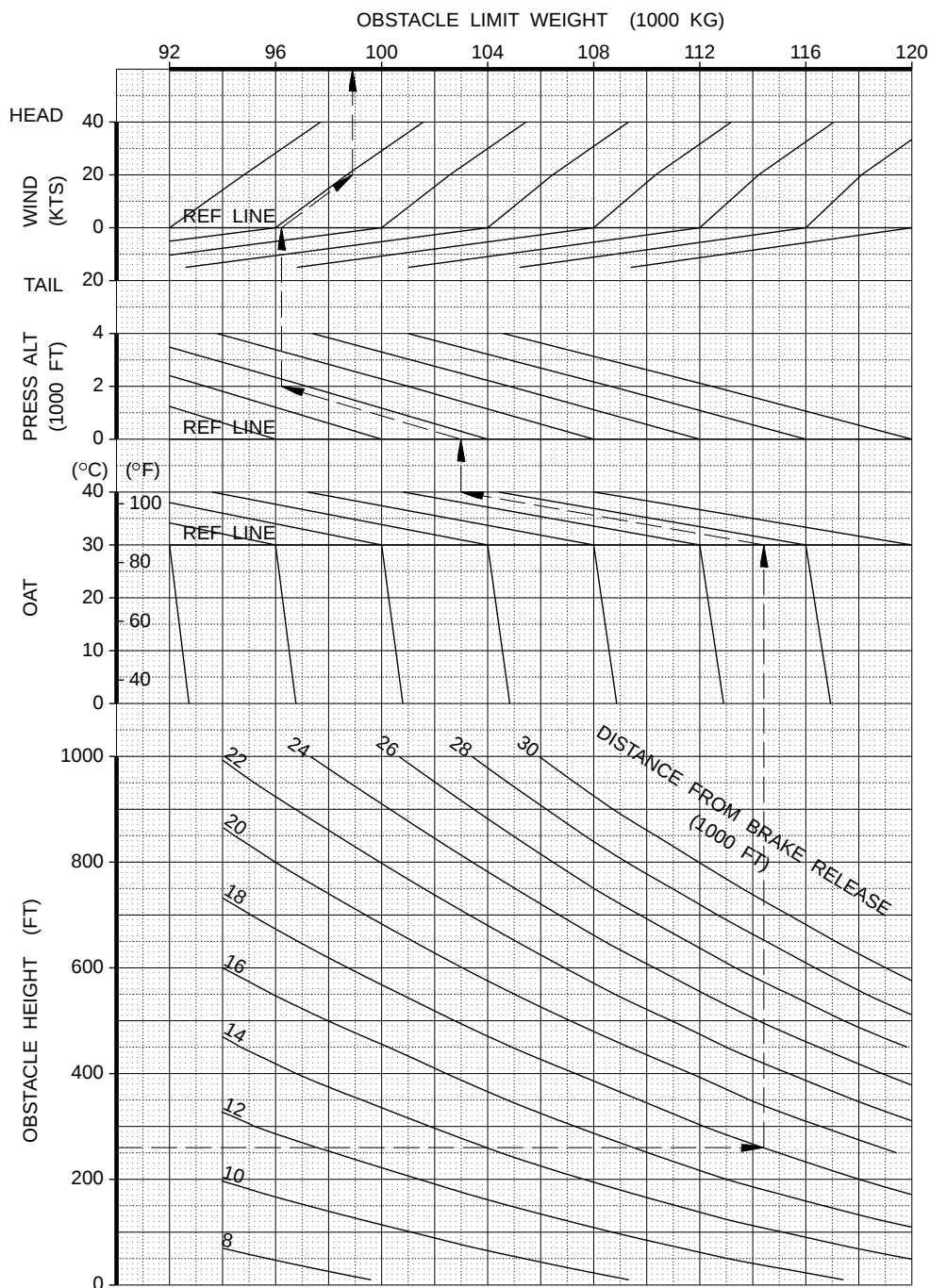
With engine anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 350 kg. For altitudes greater than 7850 ft, decrease weight by 2600 kg.

With engine and wing anti-ice on and altitude less than or equal to 7850 ft, decrease weight by 2800 kg. For altitudes greater than 7850 ft, decrease weight by 4750 kg.

Obstacle Limit

Flaps 1

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



Obstacle height must be calculated from the lowest point of the runway to conservatively account for runway slope.

With engine bleed for packs off, increase weight by 350 kg.

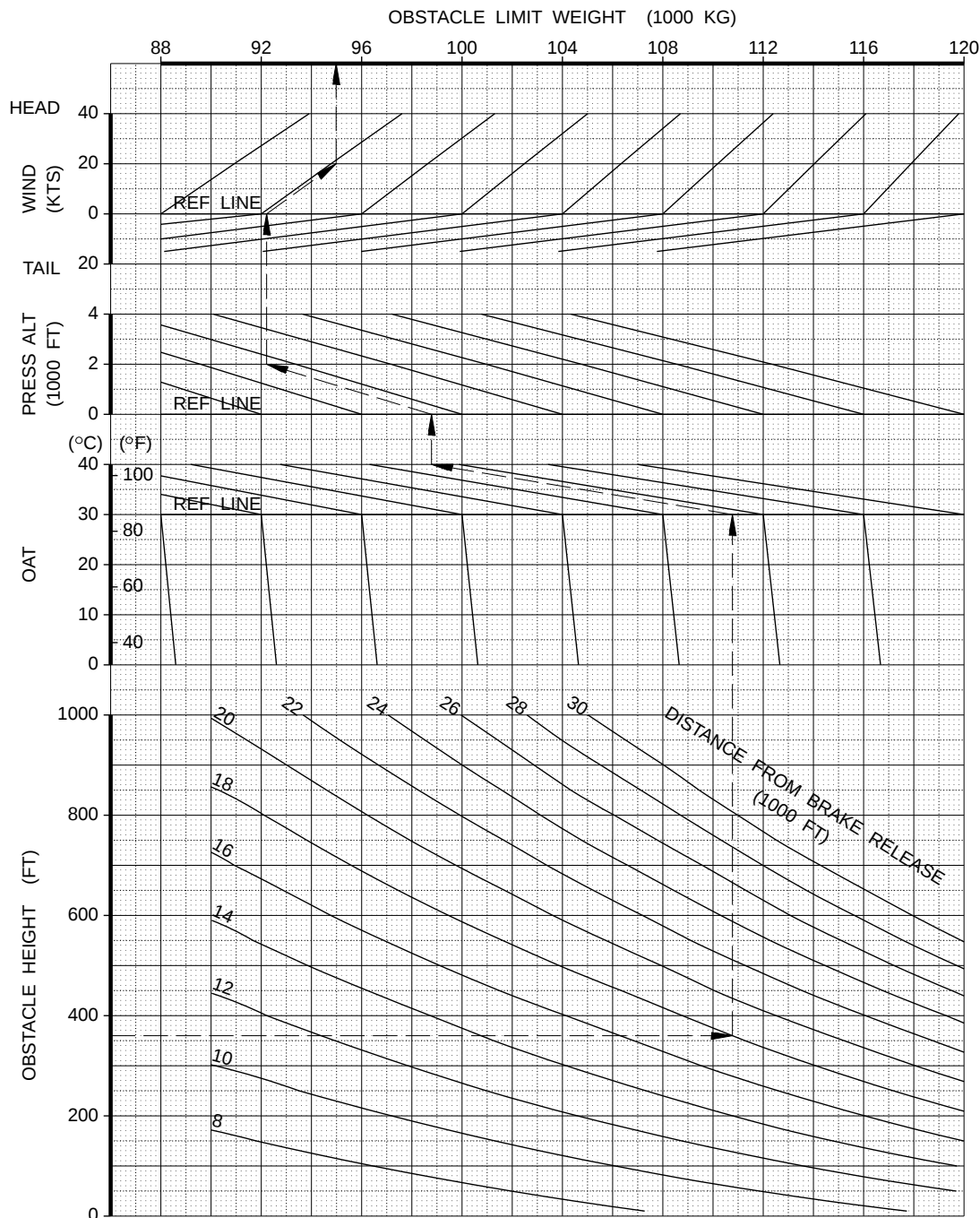
With engine anti-ice on, decrease weight by 650 kg.

With engine and wing anti-ice on, decrease weight by 2850 kg.

Obstacle Limit

Flaps 5

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



Obstacle height must be calculated from the lowest point of the runway to conservatively account for runway slope.

With engine bleed for packs off, increase weight by 350 kg.

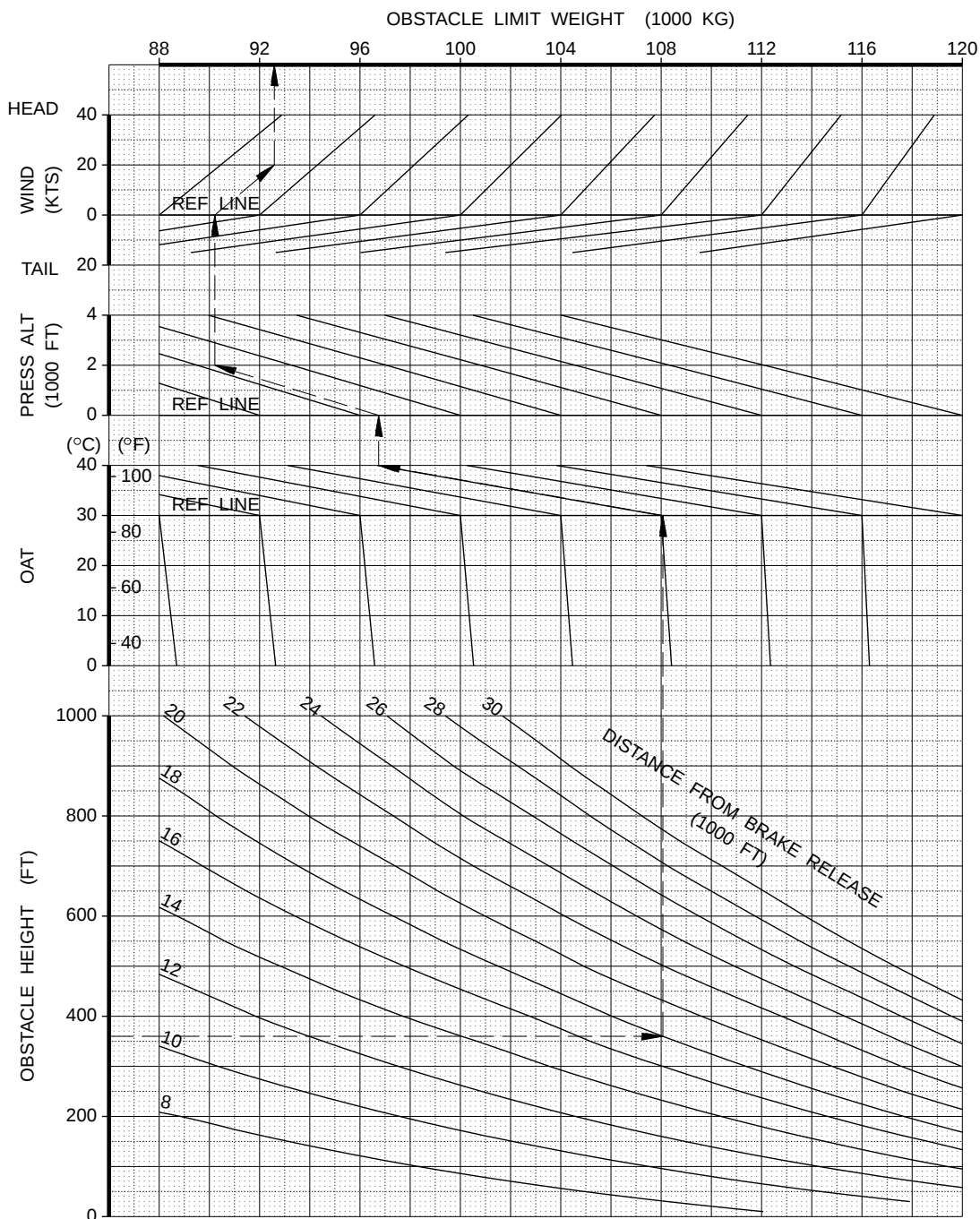
With engine anti-ice on, decrease weight by 650 kg.

With engine and wing anti-ice on, decrease weight by 2850 kg.

Obstacle Limit

Flaps 15

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



Obstacle height must be calculated from the lowest point of the runway to conservatively account for runway slope.

With engine bleed for packs off, increase weight by 350 kg.

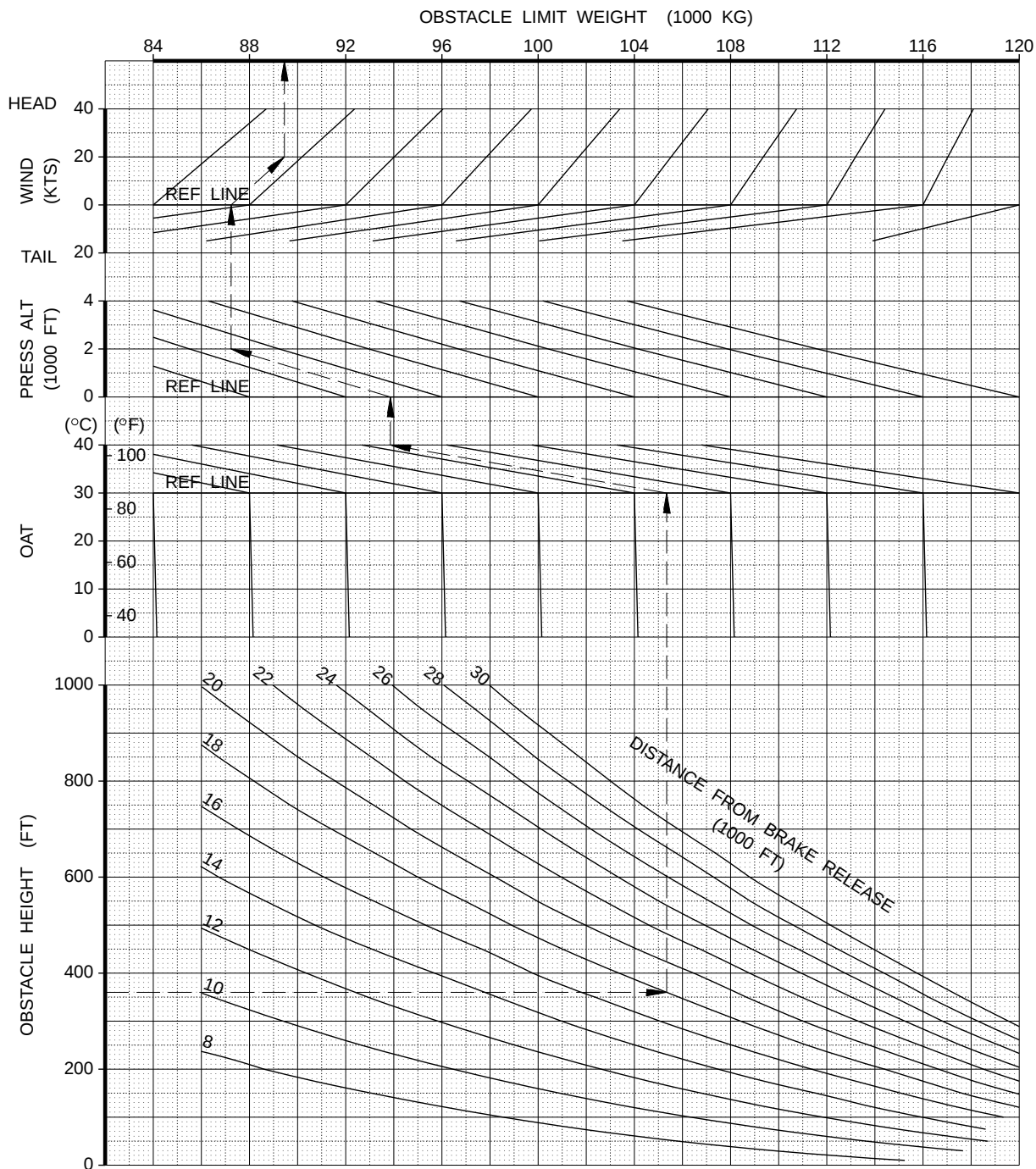
With engine anti-ice on, decrease weight by 650 kg.

With engine and wing anti-ice on, decrease weight by 2850 kg.

Obstacle Limit

Flaps 20

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



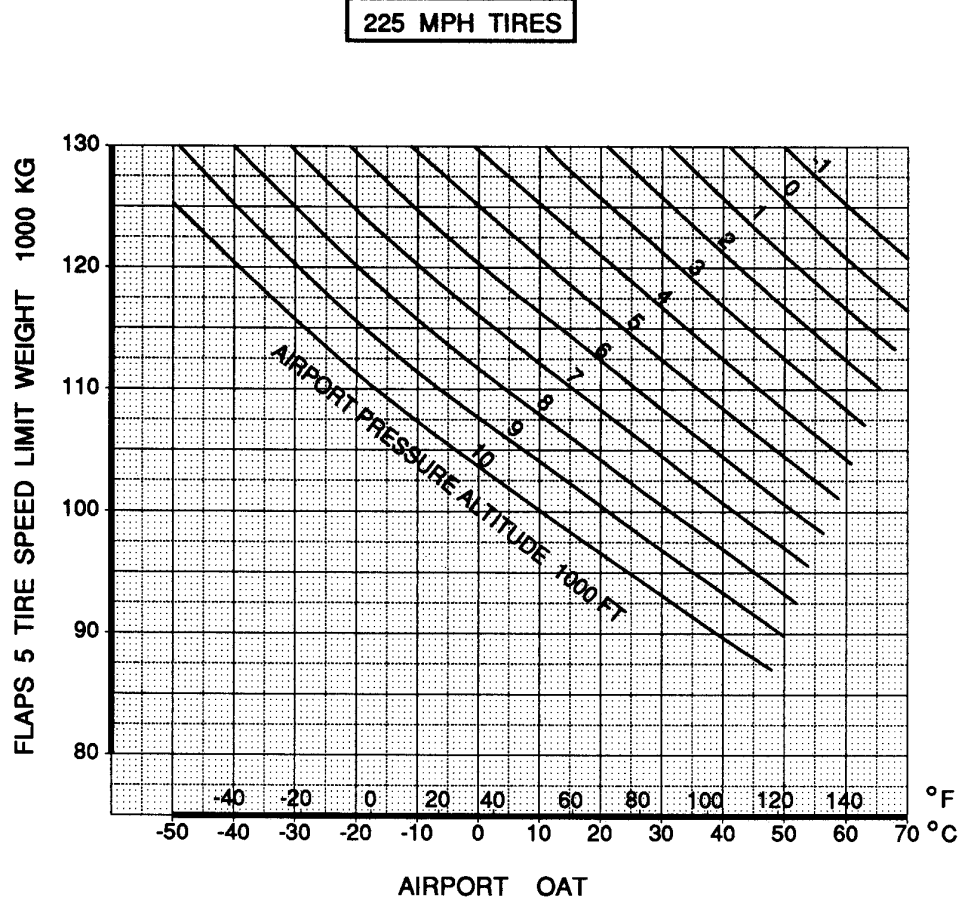
Obstacle height must be calculated from the lowest point of the runway to conservatively account for runway slope.

With engine bleed for packs off, increase weight by 350 kg.

With engine anti-ice on, decrease weight by 650 kg.

With engine and wing anti-ice on, decrease weight by 2850 kg.

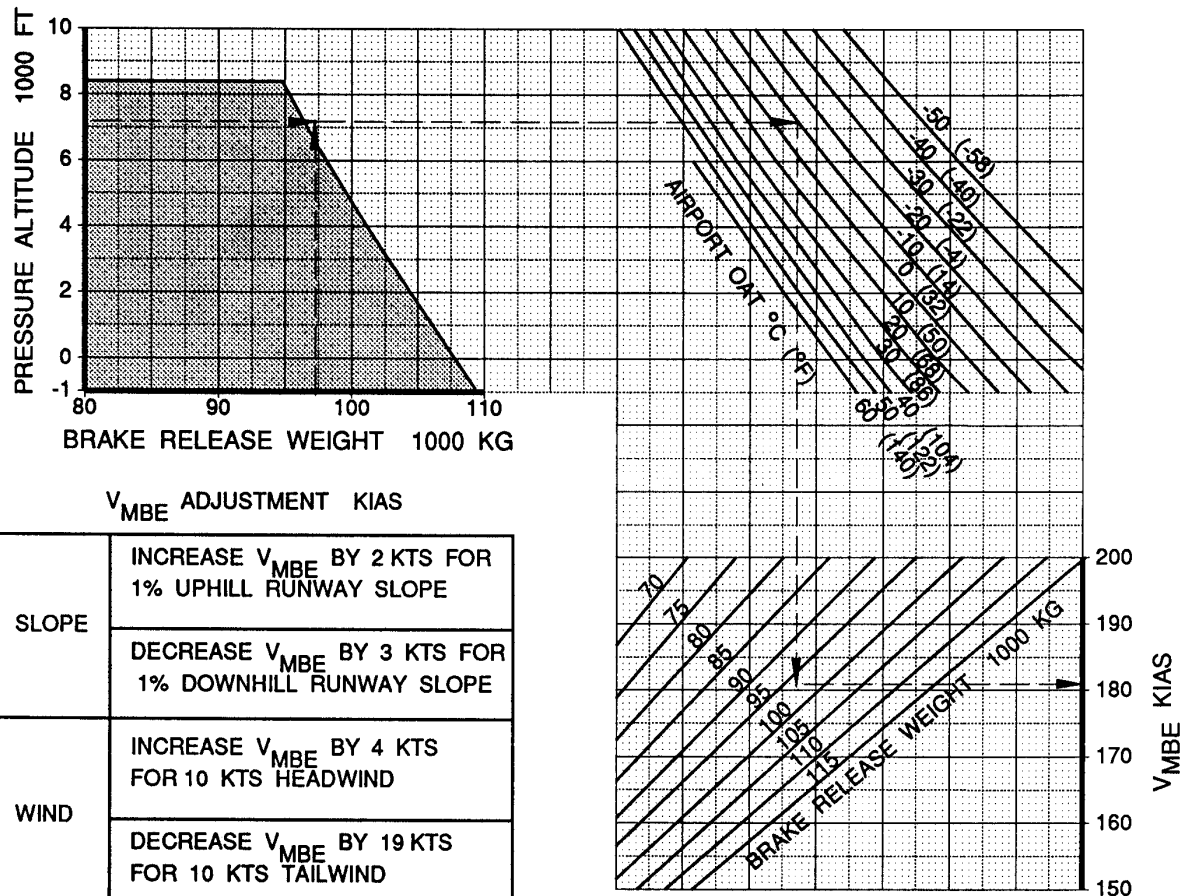
Tire Speed Limit



FOR FLAPS 1 DECREASE TIRE SPEED LIMIT WEIGHT BY 20200 KG.
 FOR FLAPS 15 INCREASE TIRE SPEED LIMIT WEIGHT BY 9350 KG.
 FOR FLAPS 20 INCREASE TIRE SPEED LIMIT WEIGHT BY 18700 KG.
 INCREASE TIRE SPEED LIMIT WEIGHT BY 550 KG PER KNOT HEADWIND.
 DECREASE TIRE SPEED LIMIT WEIGHT BY 1300 KG PER KNOT TAILWIND.
 FOR 210 MPH TIRES DECREASE TIRE SPEED LIMIT WEIGHT BY 16750 KG.

Brake Energy Limits V_{MBE}

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



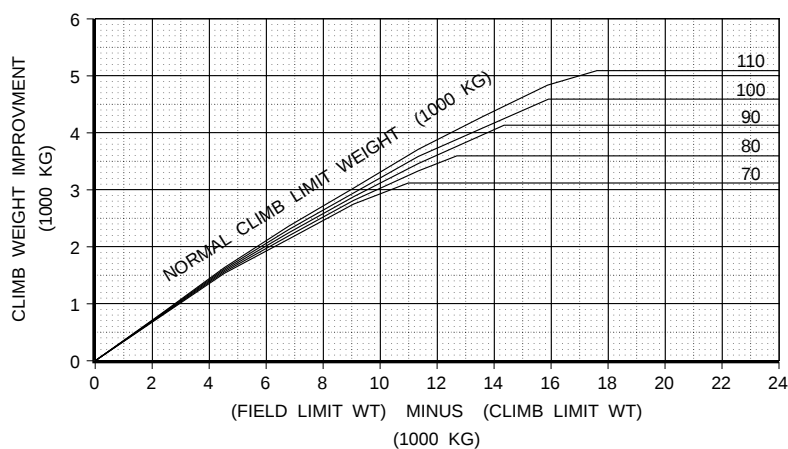
ADJUST V_{MBE} FOR SLOPE, WIND AND BRAKE CONFIGURATION.

NORMAL TAKEOFF: DECREASE BRAKE RELEASE WEIGHT BY 600 KG FOR EACH KNOT V₁ EXCEEDS V_{MBE}. DETERMINE NORMAL V₁, V_R, V₂ SPEEDS FOR LOWER BRAKE RELEASE WEIGHT.

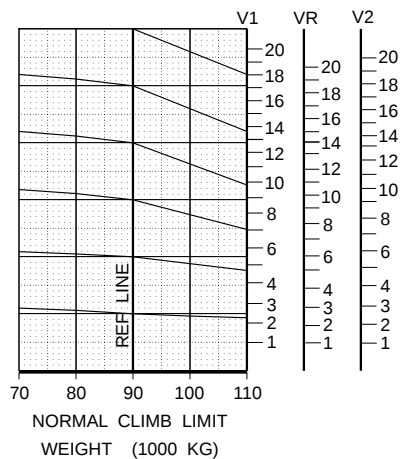
IMPROVED CLIMB TAKEOFF: DECREASE CLIMB WEIGHT IMPROVEMENT BY 250 KG FOR EACH KNOT V₁ EXCEEDS V_{MBE}. DETERMINE V₁, V_R, V₂ SPEED INCREMENTS FOR THE LOWER CLIMB WEIGHT IMPROVEMENT.

Improved Climb

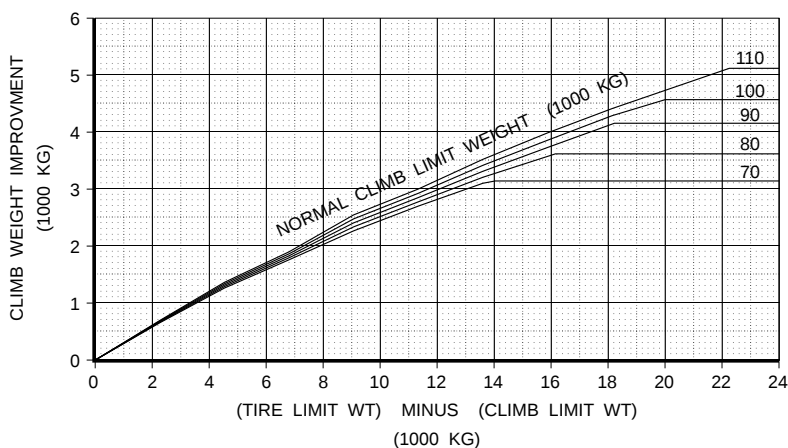
FIELD LENGTH LIMIT



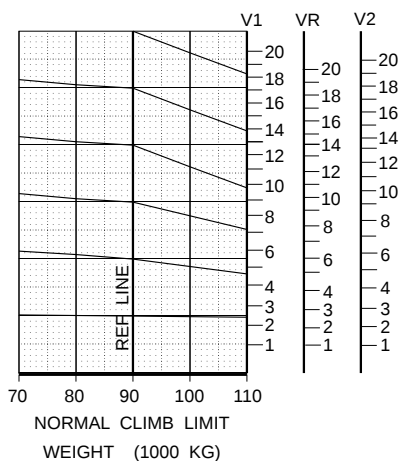
NORMAL TAKEOFF SPEED
INCREMENT (KIAS)



TIRE SPEED LIMIT



NORMAL TAKEOFF SPEED
INCREMENT (KIAS)



- 1 Use smaller of Improved Climb weight. (Field Length Limits) or (Tire Speed Limits).
- 2 Apply speed increments to normal V1, VR, V2 for actual Takeoff weight.
- 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 KG)

FIELD/OBSTACLE LIMIT WEIGHT (1000 KG)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
130	-12.2	-12.4	-12.5	-14.3	-14.1	-13.4	-19.3	-18.1	-16.0
120	-11.6	-12.2	-12.5	-13.7	-14.0	-13.9	-18.4	-18.5	-17.5
110	-10.4	-11.3	-12.0	-12.3	-13.2	-13.7	-16.6	-17.8	-17.8
100	-8.9	-9.9	-10.9	-10.5	-11.7	-12.8	-14.2	-16.0	-17.2
90	-7.2	-8.2	-9.4	-8.4	-9.7	-11.2	-11.3	-13.4	-15.4
80	-5.3	-6.2	-7.4	-6.2	-7.4	-8.9	-8.2	-10.1	-12.5
70	-3.5	-4.2	-5.1	-4.0	-4.9	-6.1	-5.1	-6.2	-8.5

V1(MCG) Limit Weight (1000 KG)

ADJUSTED FIELD LENGTH (FT)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
3800				53.9			61.3		
4200	66.6	50.1		70.8	54.8		78.0	62.3	50.5
4600	84.3	64.7	50.2	88.6	69.2	55.1	95.6	76.5	62.6
5000	103.2	79.7	62.8	107.4	84.2	67.6	114.1	91.3	74.7
5400	123.2	95.5	75.6	127.2	99.9	80.3	133.2	106.7	87.3
5800	143.7	112.1	89.0	147.3	116.4	93.6		122.6	100.3
6200		129.3	103.0		133.3	107.5		138.9	113.7
6600		146.8	117.6			121.8			127.3
7000			132.5			136.3			141.1
7400			147.5						

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 -90 ft /+90 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 KG)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
120	-15	-14	-13	-11	-11	-11	-4	-7	-9
110	-16	-16	-15	-12	-12	-12	-4	-5	-7
100	-17	-17	-16	-13	-12	-12	-4	-4	-6
90	-18	-17	-16	-14	-13	-12	-6	-4	-4
80	-18	-17	-16	-15	-13	-12	-8	-5	-3
70	-18	-17	-16	-16	-15	-13	-11	-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

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

FIELD/OBSTACLE LIMIT WEIGHT (1000 KG)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
130	-17.6	-18.4	-18.8	-20.3	-20.6	-19.9	-26.3	-25.6	-22.7
120	-16.0	-17.0	-17.8	-18.4	-19.4	-19.6	-24.0	-24.9	-23.9
110	-14.4	-15.4	-16.6	-16.4	-17.8	-18.9	-21.3	-23.4	-24.1
100	-12.3	-13.5	-14.9	-14.0	-15.6	-17.2	-18.0	-20.5	-22.6
90	-10.1	-11.2	-12.5	-11.4	-12.8	-14.5	-14.2	-16.5	-19.4
80	-7.7	-8.6	-9.8	-8.6	-9.7	-11.2	-10.2	-11.8	-15.1
70	-4.9	-5.5	-6.3	-5.3	-5.9	-7.1	-5.6	-6.5	-10.2

V1(MCG) Limit Weight (1000 KG)

ADJUSTED FIELD LENGTH (FT)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
5000							56.4		
5400							76.1	56.6	
5800				71.4			96.6	73.1	58.2
6200	76.4			95.1	64.8		118.3	89.7	72.0
6600	103.9	64.2		120.3	83.9	62.2	140.2	107.2	85.9
7000	132.2	86.2	58.4	145.7	104.0	78.3		125.2	100.3
7400		109.0	76.8		124.8	94.8		143.2	115.3
7800		132.3	95.6		145.7	112.0			130.3
8200			114.9			129.4			145.3
8600			134.3			146.7			

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 -140 ft/+140 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 KG)	SLUSH/STANDING WATER DEPTH								
	3 mm (0.12 INCHES)			6 mm (0.25 INCHES)			13 mm (0.50 INCHES)		
	PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)			PRESSURE ALTITUDE (FT)		
	S.L.	4000	8000	S.L.	4000	8000	S.L.	4000	8000
120	-28	-28	-26	-21	-21	-21	-6	-10	-10
110	-30	-29	-27	-24	-23	-22	-10	-11	-11
100	-32	-31	-29	-27	-25	-23	-14	-12	-12
90	-34	-32	-30	-30	-27	-24	-18	-13	-11
80	-35	-34	-31	-32	-29	-26	-23	-17	-12
70	-36	-35	-33	-34	-32	-28	-29	-24	-15

- 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 KG)

FIELD/OBSTACLE LIMIT WEIGHT (1000 KG)	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
130	0.0	0.0	-0.4	-5.6	-6.0	-6.5	-10.3	-10.9	-11.5
120	-0.8	-1.2	-1.6	-6.1	-6.6	-7.0	-10.2	-10.7	-11.3
110	-1.3	-1.7	-2.1	-6.1	-6.5	-6.9	-9.5	-10.1	-10.7
100	-1.2	-1.7	-2.1	-5.5	-5.9	-6.3	-8.5	-9.1	-9.7
90	-0.9	-1.3	-1.7	-4.6	-5.0	-5.4	-7.2	-7.8	-8.4
80	-0.4	-0.8	-1.2	-3.6	-4.0	-4.4	-5.7	-6.3	-6.9
70	0.0	-0.4	-0.8	-2.6	-3.0	-3.4	-4.2	-4.8	-5.4

V1(MCG) Limit Weight (1000 KG)

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	80.6								
3800	110.8	65.3							
4200	140.2	95.8		68.8					
4600		125.5	80.6	89.8	58.6				
5000			110.8	112.2	79.1		59.5		
5400			140.2	135.5	100.9	68.8	72.7		
5800					123.8	89.8	86.2	59.5	
6200					147.3	112.2	100.7	72.7	
6600						135.5	116.2	86.2	59.5
7000							132.4	100.7	72.7
7400							148.7	116.2	86.2
7800								132.4	100.7
8200								148.7	116.2
8600									132.4
9000									148.7

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 -72 ft/+72 ft for every 5°C above/below 4°C.
Adjust "Medium" field length available by -72 ft/+72 ft for every 5°C above/below 4°C.
Adjust "Poor" field length available by -90 ft/+90 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 slippery runway limited weight is lesser of weights from 1 and 3.

V1 Adjustment (KIAS)

WEIGHT (1000 KG)	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
120	-5	-4	-3	-14	-13	-12	-25	-23	-21
110	-7	-6	-5	-17	-16	-15	-28	-26	-24
100	-8	-7	-6	-18	-17	-16	-30	-28	-26
90	-9	-8	-7	-19	-18	-17	-31	-29	-27
80	-9	-8	-7	-20	-19	-18	-32	-30	-28
70	-10	-9	-8	-21	-20	-19	-33	-31	-29

- 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 KG)

FIELD/OBSTACLE LIMIT WEIGHT (1000 KG)	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
130	-1.8	-2.2	-2.6	-9.4	-9.8	-10.2	-14.8	-15.6	-16.4
120	-2.6	-3.0	-3.5	-9.4	-9.8	-10.2	-13.9	-14.7	-15.5
110	-3.2	-3.6	-4.0	-9.1	-9.5	-9.9	-12.9	-13.7	-14.5
100	-3.0	-3.4	-3.8	-8.2	-8.6	-9.0	-11.4	-12.2	-13.0
90	-2.5	-2.9	-3.3	-7.0	-7.4	-7.8	-9.6	-10.4	-11.2
80	-1.9	-2.4	-2.8	-5.7	-6.1	-6.5	-7.4	-8.2	-9.0
70	-1.3	-1.7	-2.1	-4.1	-4.5	-5.0	-5.4	-6.2	-7.0

V1(MCG) Limit Weight (1000 KG)

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
3600	53.4								
4000	97.1	53.4							
4400	133.5	97.1	53.4						
4800		133.5	97.1						
5200			133.5						
5600				63.9					
6000				103.6	63.9				
6400				138.6	103.6	63.9			
6800					138.6	103.6			
7200						138.6			
7600									
8000									
8400									
8800							70.0		
9200							95.2		
9600							121.9	70.0	
10000							149.0	95.2	
10400								121.9	70.0
10800								149.0	95.2
11200									121.9
11600									149.0

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 -90 ft/+90 ft for every 5°C above/below 4°C.
Adjust "Medium" field length available by -90 ft/+90 ft for every 5°C above/below 4°C.
Adjust "Poor" field length available by -170 ft/+170 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 slippery runway limited weight is lesser of weights from 1 and 3.

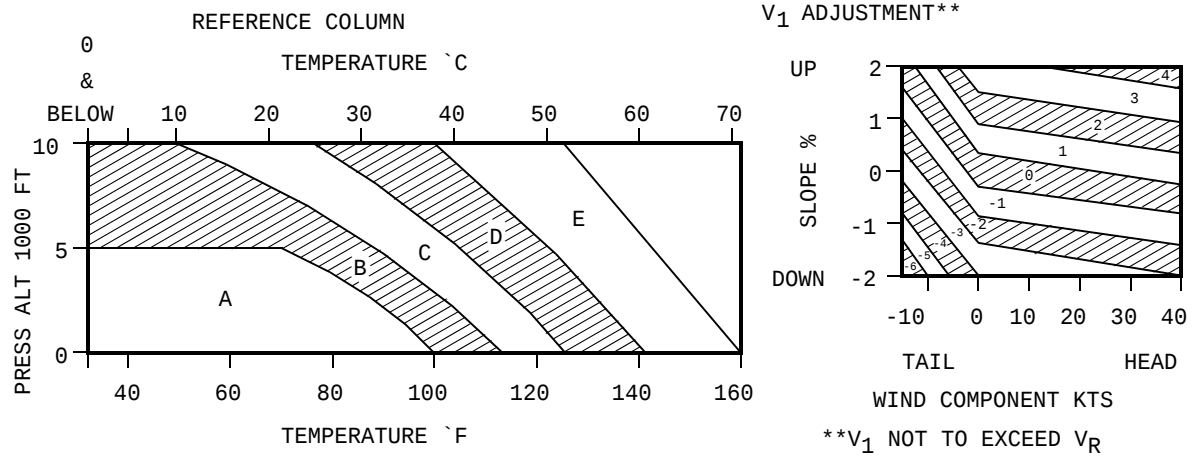
V1 Adjustment (KIAS)

WEIGHT (1000 KG)	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
120	-12	-9	-6	-26	-23	-20	-48	-43	-38
110	-14	-11	-8	-30	-27	-24	-52	-47	-42
100	-16	-13	-10	-33	-30	-27	-56	-51	-46
90	-18	-15	-12	-36	-33	-30	-58	-53	-48
80	-20	-17	-14	-38	-35	-32	-61	-56	-51
70	-22	-19	-16	-41	-38	-35	-63	-58	-53

- 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 KG)	A			B			C			D			E		
		V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2	V1	VR	V2
1	120	177	182	185	180	184	186									
	110	168	173	177	171	175	177	174	177	178						
	100	158	163	169	161	165	169	164	167	169						
	90	147	153	160	150	155	160	153	157	160	157	159	161			
	80	135	142	151	138	144	151	142	146	151	146	148	151			
5	120	164	168	171	166	170	171									
	110	155	159	163	157	161	163									
	100	145	150	155	148	152	155	151	154	156						
	90	135	141	147	138	142	147	141	144	147	145	146	148			
	80	124	131	139	127	132	139	130	134	139	134	136	139			
15	120	155	159	162	149	153	155									
	110	147	151	154	140	144	147	143	146	148						
	100	137	142	147	130	135	140	133	137	140	128	129	132			
	90	128	133	139	120	125	132	123	127	132	117	120	123	121	122	123
	80	117	124	132	109	116	123	112	117	123	110	113	117			
20	120	146	150	154	141	144	147									
	110	138	143	147	132	136	140									
	100	130	134	140	123	127	133	127	129	133	120	123	125			
	90	120	126	133	114	119	125	117	121	125	110	113	117			
	80	110	117	125	103	109	117	106	111	117	100	103	107			

Check Minimum V1 (MCG) in shaded area.

Maximum Allowable Clearway

FIELD LENGTH (FT)	4000	6000	8000	10000	12000	14000
MAX ALLOWABLE CLEARWAY (FT)	400	500	600	650	750	800

Clearway and Stopway V1 Adjustments

NORMAL V1 (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)					
°C	°F	0	2000	4000	6000	8000	10000
55	131	88					
50	122	92	88				
45	113	95	92	88	85		
40	104	98	95	91	88	85	
35	95	102	98	94	91	87	84
30	86	105	101	97	93	90	86
25	77	105	103	100	96	92	88
20	68	105	103	101	98	94	90
15	59	105	103	101	98	95	91
10 & BELOW	50 & BELOW	105	103	101	98	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)							
°C	°F	0	1000	2000	3000	4000	5000	6000	8000
70	158	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
65	149	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
60	140	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
55	131	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
50	122	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32
45	113	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
40	104	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
35	95	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
30	86	1.47	1.48	1.48	1.48	1.48	1.48	1.48	1.48
25	77	1.47	1.49	1.50	1.51	1.51	1.51	1.51	1.51
20	68	1.47	1.49	1.50	1.52	1.53	1.55	1.55	1.55
15	59	1.47	1.49	1.50	1.52	1.53	1.55	1.56	1.59
10 & BELOW	50 & BELOW	1.47	1.49	1.50	1.52	1.53	1.55	1.56	1.59

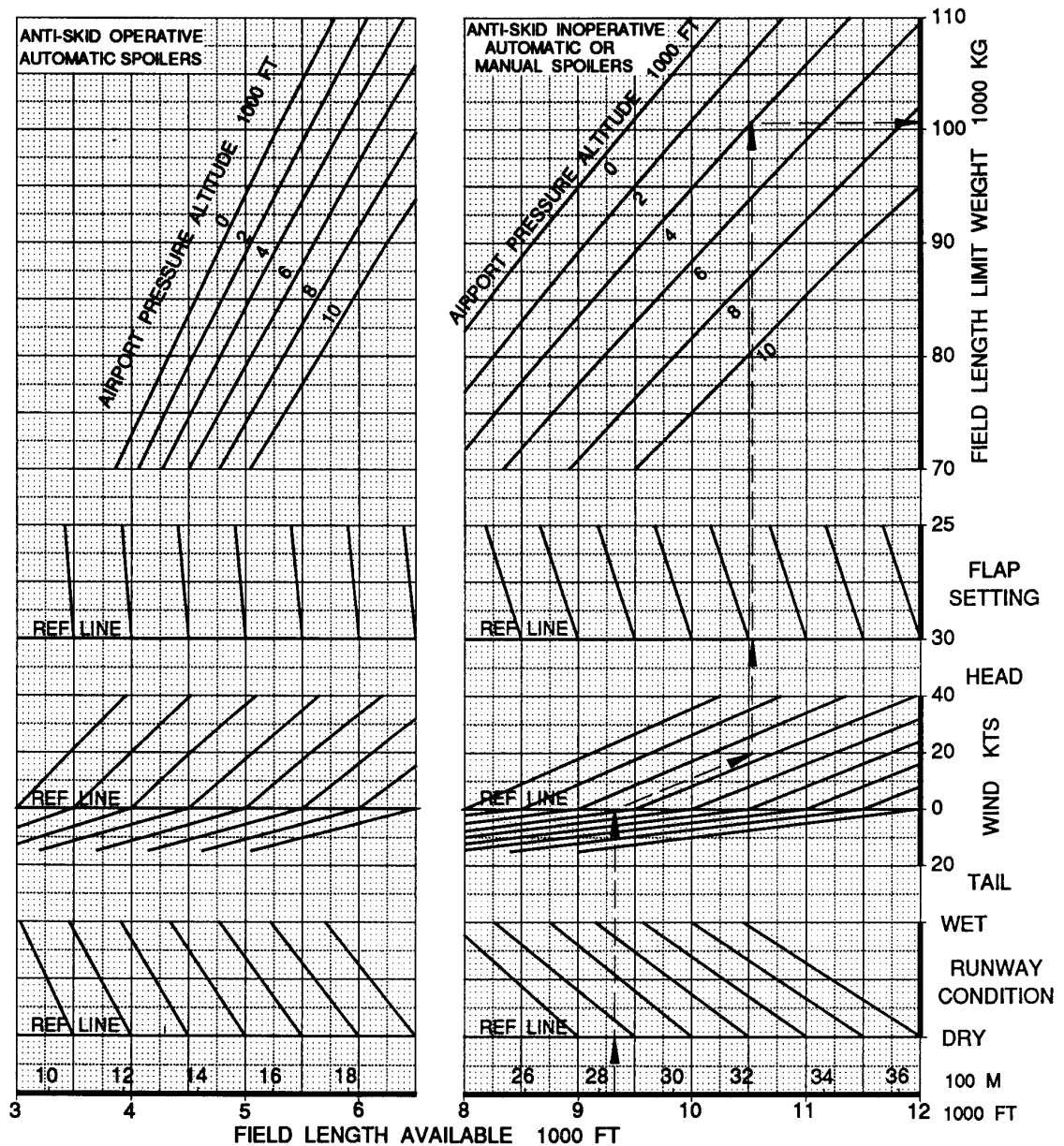
EPR Adjustments for Engine Bleeds

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 KG)	C.G. %MAC						
	9	14	19	24	29	34	39
120	7	7	6	5	4 1/4	3 1/4	2 1/2
110	7	6 3/4	5 3/4	4 3/4	4	3 1/4	2 1/2
100	7	6 1/4	5 1/4	4 1/2	3 3/4	3 1/4	2 1/2
90	7	6	5	4 1/4	3 1/2	2 3/4	2 1/4
80	6 1/2	5 1/2	4 1/2	3 3/4	3 1/4	2 1/2	2 1/4
70	6 1/4	5	4 1/4	3 1/2	3	2 1/4	2

Landing Field Length Limit

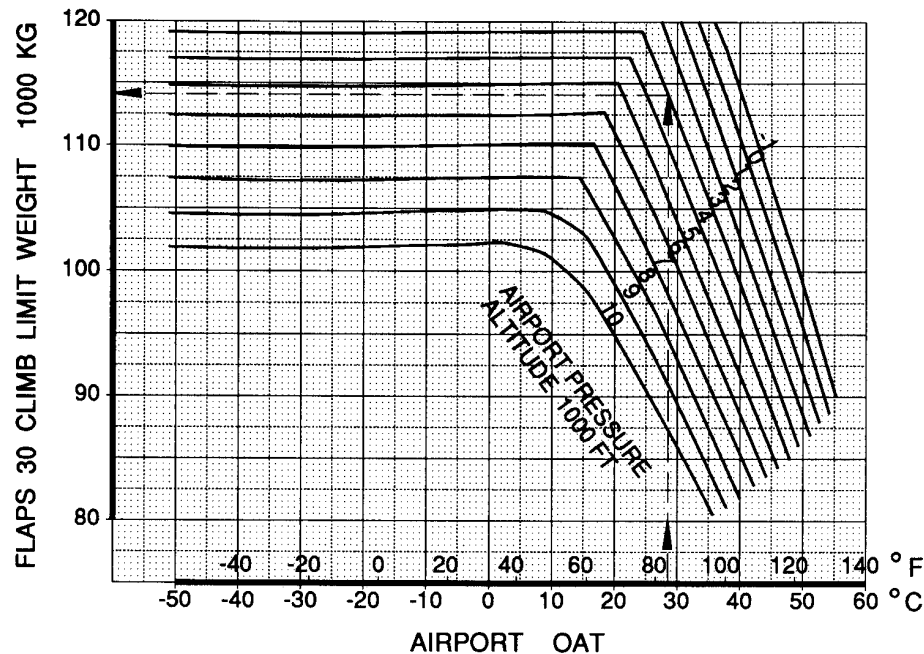


FOR MANUAL SPOILERS, ANTI-SKID OPERATIVE, DECREASE FIELD LENGTH AVAILABLE BY 700 FEET.

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 PACKS OFF INCREASE ALLOWABLE WEIGHT BY 740 KG.
FOR APU ON DECREASE ALLOWABLE WEIGHT BY 320 KG.
FOR FLAPS 25 INCREASE FLAPS 30 CLIMB LIMIT WEIGHT BY 7250 KG.
IF OPERATING IN ICING CONDITIONS DURING ANY PART OF THE FLIGHT
WHEN THE FORECAST LANDING TEMPERATURE IS BELOW 8°C (46°F) REDUCE
THE FLAPS 30 CLIMB LIMIT WEIGHT BY 4960 KG OR THE FLAPS 25 CLIMB
LIMIT WEIGHT BY 5250 KG.

ANTI-ICE OPERATION DECREMENT KG			
ENGINE RATING	ALTITUDE 1000 FT	ENGINE	ENGINE & WING
FULL	8000 AND BELOW	560	5850
	ABOVE 8000	3460	9090



Flight Planning and Performance Manual

Quick Turnaround Limit

Flaps 30 Limit Weight (1000 KG)

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)											
°C	°F	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
50	122	102	100	98	96	95							
40	104	103	101	100	98	96	94	93	91	89	87		
30	86	105	103	101	99	98	96	94	92	90	89	87	85
20	68	106	105	103	101	99	97	96	94	92	90	88	87
10	50	108	106	104	103	101	99	97	95	93	92	90	88
0	32	110	108	106	104	103	101	99	97	95	93	91	90
-10	14	112	110	108	106	104	102	101	99	97	95	93	91
-20	-4		112	110	108	106	104	103	101	99	97	95	93
-30	-22			112	110	108	106	105	103	101	99	97	95
-40	-40				112	111	109	107	105	103	101	98	97
-50	-58					113	111	109	107	105	103	100	99

Flaps 25 Limit Weight (1000 KG)

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE (FT)											
°C	°F	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
50	122	99	98	96	94	92							
40	104	101	99	97	96	94	92	90	89	87	85		
30	86	103	101	99	97	95	94	92	90	88	86	85	83
20	68	104	102	101	99	97	95	93	92	90	88	86	84
10	50	106	104	102	100	99	97	95	93	91	89	87	86
0	32	108	106	104	102	100	98	97	95	93	91	89	87
-10	14	110	108	106	104	102	100	98	96	95	93	91	89
-20	-4	112	110	108	106	104	102	100	98	96	94	92	91
-30	-22		112	110	108	106	104	102	100	98	96	94	92
-40	-40			112	110	108	106	104	102	100	98	96	94
-50	-58				113	111	109	107	105	103	101	98	96

Increase weight by 1000 kg per 1% uphill slope. Decrease weight by 1300 kg per 1% downhill slope.

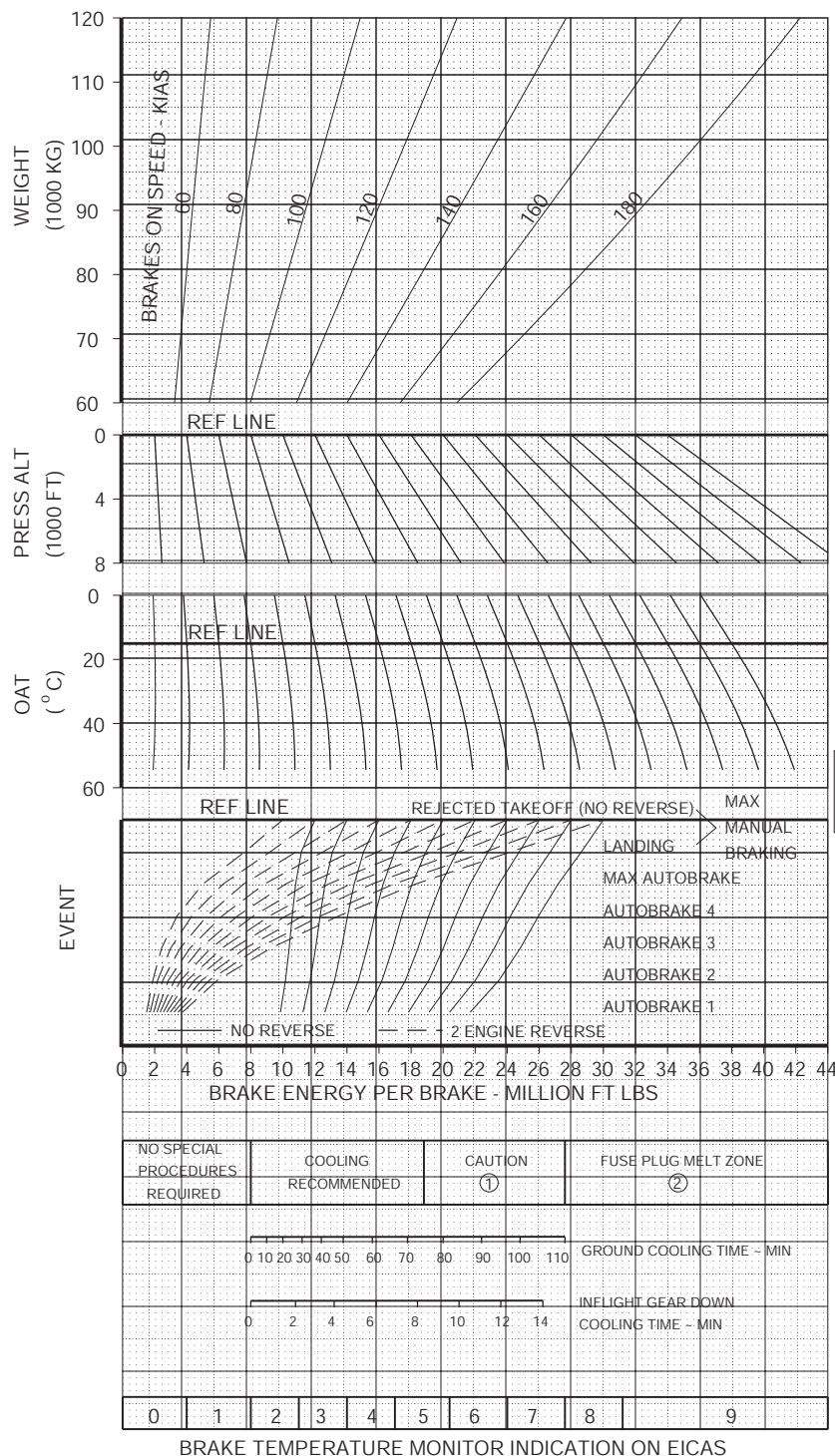
Increase weight by 2300 kg per 10 knots headwind. Decrease weight by 10000 kg per 10 knots tailwind.

When one brake is deactivated, decrease weight by 6580 kg.

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.



Flight Planning and Performance Manual

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	86000 KG LANDING WEIGHT	PER 5000 KG ABOVE/ BELOW 86000 KG	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	+110/-100	60/70	-110	380	40	-30	50	-50	210	60	130
MAX AUTO	4040	+180/-180	90/120	-180	570	50	-50	90	-90	310	180	360
AUTOBRAKE 4	4360	+210/-200	110/140	-210	680	60	-60	110	-100	360	190	390
AUTOBRAKE 3	4940	+260/-260	140/180	-250	850	90	-90	140	-130	410	240	470
AUTOBRAKE 2	5280	+320/-310	170/220	-290	980	150	-150	160	-140	410	540	800
AUTOBRAKE 1	5530	+360/-320	190/270	-320	1110	190	-170	170	-150	410	960	1450

Good Reported Braking Action

MAX MANUAL	3520	+160/-150	90/120	-170	610	80	-70	80	-80	280	220	540
MAX AUTO	4200	+200/-190	100/140	-200	690	90	-80	100	-90	310	360	910
AUTOBRAKE 4	4410	+210/-210	110/140	-220	730	80	-70	110	-110	360	240	670
AUTOBRAKE 3	4940	+260/-260	140/180	-250	850	90	-90	140	-130	410	240	480

Medium Reported Braking Action

MAX MANUAL	4560	+240/-210	130/180	-260	970	180	-140	120	-110	340	590	1640
MAX AUTO	4810	+260/-240	140/190	-280	1000	190	-160	130	-110	340	740	2050
AUTOBRAKE 4	4840	+260/-240	140/190	-280	1000	180	-150	130	-110	360	720	2020
AUTOBRAKE 3	5180	+280/-280	150/190	-300	1060	160	-150	140	-130	410	460	1660

Poor Reported Braking Action

MAX MANUAL	5620	+320/-280	170/250	-370	1470	390	-260	150	-130	380	1200	3850
MAX AUTO	5620	+330/-310	180/250	-400	1480	390	-280	160	-130	370	1320	4200
AUTOBRAKE 4	5620	+330/-310	180/250	-400	1480	390	-280	160	-130	380	1320	4200
AUTOBRAKE 3	5730	+330/-310	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

BRAKING CONFIGURATION	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	
	86000 KG LANDING WEIGHT	PER 5000 KG ABOVE/ BELOW 86000 KG	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	+100/-100	60/80	-110	390	40	-30	60	-50	210	60	140
MAX AUTO	4170	+180/-180	100/130	-180	580	50	-50	100	-90	320	190	400
AUTOBRAKE 4	4510	+210/-210	110/150	-210	690	60	-60	120	-110	380	210	430
AUTOBRAKE 3	5120	+260/-260	140/190	-260	860	90	-100	150	-130	430	270	530
AUTOBRAKE 2	5460	+320/-320	180/240	-300	1000	160	-160	180	-150	430	610	900
AUTOBRAKE 1	5710	+360/-330	200/280	-330	1120	200	-180	190	-150	430	1070	1600

Good Reported Braking Action

MAX MANUAL	3580	+160/-150	90/120	-170	610	80	-70	80	-80	280	230	580
MAX AUTO	4310	+200/-190	100/140	-210	690	90	-80	100	-100	320	380	990
AUTOBRAKE 4	4560	+210/-210	110/150	-220	740	80	-80	120	-110	380	250	720
AUTOBRAKE 3	5120	+260/-260	140/190	-260	860	90	-100	150	-130	430	270	530

Medium Reported Braking Action

MAX MANUAL	4660	+240/-210	130/190	-260	980	180	-150	120	-110	350	640	1810
MAX AUTO	4940	+260/-240	140/200	-290	1010	190	-160	140	-120	350	810	2270
AUTOBRAKE 4	4970	+250/-240	140/200	-290	1010	180	-150	130	-120	380	770	2230
AUTOBRAKE 3	5350	+280/-280	150/200	-310	1080	170	-150	150	-140	430	500	1840

Poor Reported Braking Action

MAX MANUAL	5770	+320/-290	170/250	-370	1490	400	-270	160	-140	390	1300	4320
MAX AUTO	5770	+330/-310	180/260	-400	1490	400	-290	170	-140	390	1440	4730
AUTOBRAKE 4	5770	+330/-310	180/260	-400	1490	400	-290	170	-140	390	1430	4720
AUTOBRAKE 3	5910	+330/-310	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

Table of Contents

Chapter 2

Text.....	2.1.1
Introduction	2.1.1
Simplified Flight Planning.....	2.1.1
Oxygen Requirements	2.1.2
Driftdown.....	2.1.3
ETOPS.....	2.1.3
Simplified Flight Planning.....	2.2.1
Optimum Altitude	2.2.1
Short Trip Cruise Altitude	2.2.1
Long Range Cruise Trip Fuel and Time	2.2.2
.80M Trip Fuel and Time	2.2.4
Long Range Cruise Step Climb Trip Fuel and Time	2.2.6
Long Range Cruise Short Trip Fuel and Time.....	2.2.7
Holding Planning.....	2.2.8
Oxygen Requirements	2.2.9
Driftdown.....	2.3.1
Net Level Off Weight	2.3.1
Driftdown Profiles Net Flight Path.....	2.3.2
Driftdown/LRC Cruise Range Capability	2.3.6
ETOPS.....	2.4.1
Area of Operation	2.4.1
Decompression Critical Fuel Reserves - LRC Cruise	2.4.2
Driftdown Critical Fuel Reserves - LRC Driftdown/Cruise	2.4.4
Decompression Critical Fuel Reserves -290 KIAS Cruise	2.4.5
Driftdown Critical Fuel Reserves - .78M/290 KIAS Driftdown/Cruise	2.4.6
Decompression Critical Fuel Reserves -310 KIAS Cruise	2.4.7
Driftdown Critical Fuel Reserves - .80M/310 KIAS Driftdown/Cruise	2.4.8
Decompression Critical Fuel Reserves -330 KIAS Cruise	2.4.9
Driftdown Critical Fuel Reserves - .80M/330 KIAS Driftdown/Cruise	2.4.10
Decompression Critical Fuel Reserves -340 KIAS Cruise	2.4.11
Driftdown Critical Fuel Reserves - .80M/340 KIAS Driftdown/Cruise	2.4.12
Long Range Cruise Net Level Off Weight	2.4.13
290 KIAS Cruise Net Level Off Weight	2.4.14
310 KIAS Cruise Net Level Off Weight	2.4.15
330 KIAS Cruise Net Level Off Weight	2.4.16



340 KIAS Cruise Net Level Off Weight	2.4.17
Long Range Cruise Driftdown/Cruise Range Capability	2.4.18
.78M/290 KIAS Driftdown/Cruise Range Capability	2.4.19
.80M/310 KIAS Driftdown/Cruise Range Capability	2.4.20
.80M/330 KIAS Driftdown/Cruise Range Capability	2.4.21

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 105 kg per hour on the ground.

Taxi fuel allowance is approximately 16 kg 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 (KG/HR)
39	70
35	75
31	85
25	95
20	105
15	110
10	125
5	135

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 40 kg 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 90 kg/hr for engine anti-ice on or 140 kg/hr for engine and wing anti-ice on.

Every 450 kg 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 80 kg of additional fuel.

Missed Approach

Approximately 230 kg 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	1.015
400	1.027
600	1.038
800	1.050
1000	1.062
2000	1.125
3000	1.196
4000	1.275

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%.

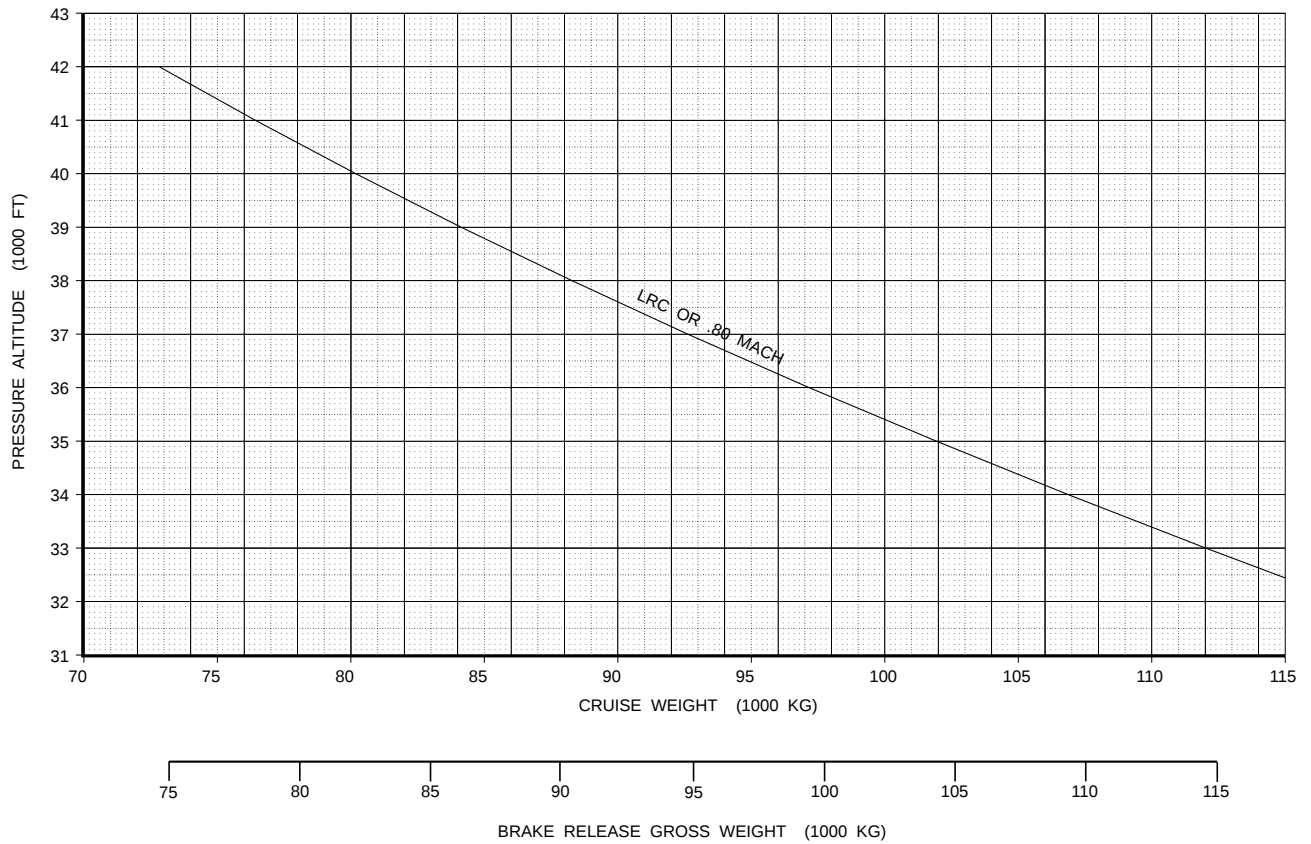
Net level off weight is determined by entering the appropriate chart at the left with the desired level off pressure altitude, adjusting for anti-ice as shown, proceeding across to the correct ISA deviation line and reading the allowable weight at the bottom. The net level off altitude may be obtained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

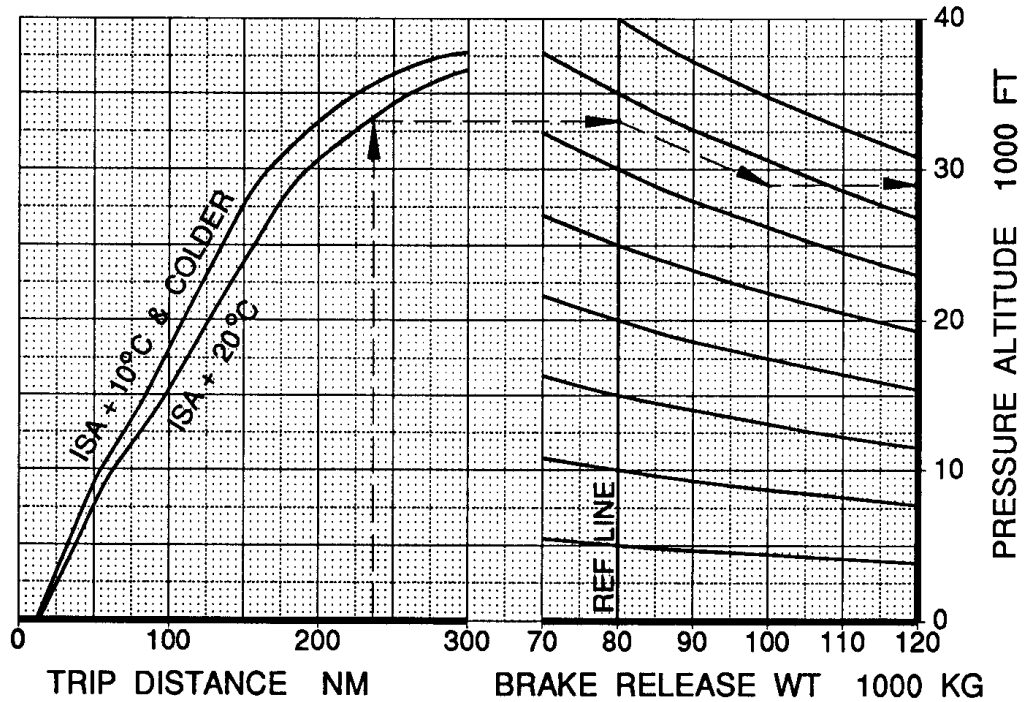
These charts show range capability from the start of driftdown/cruise when the driftdown/cruise procedure outlined in this section is followed. Charts are shown for each of the speed schedules discussed previously.

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



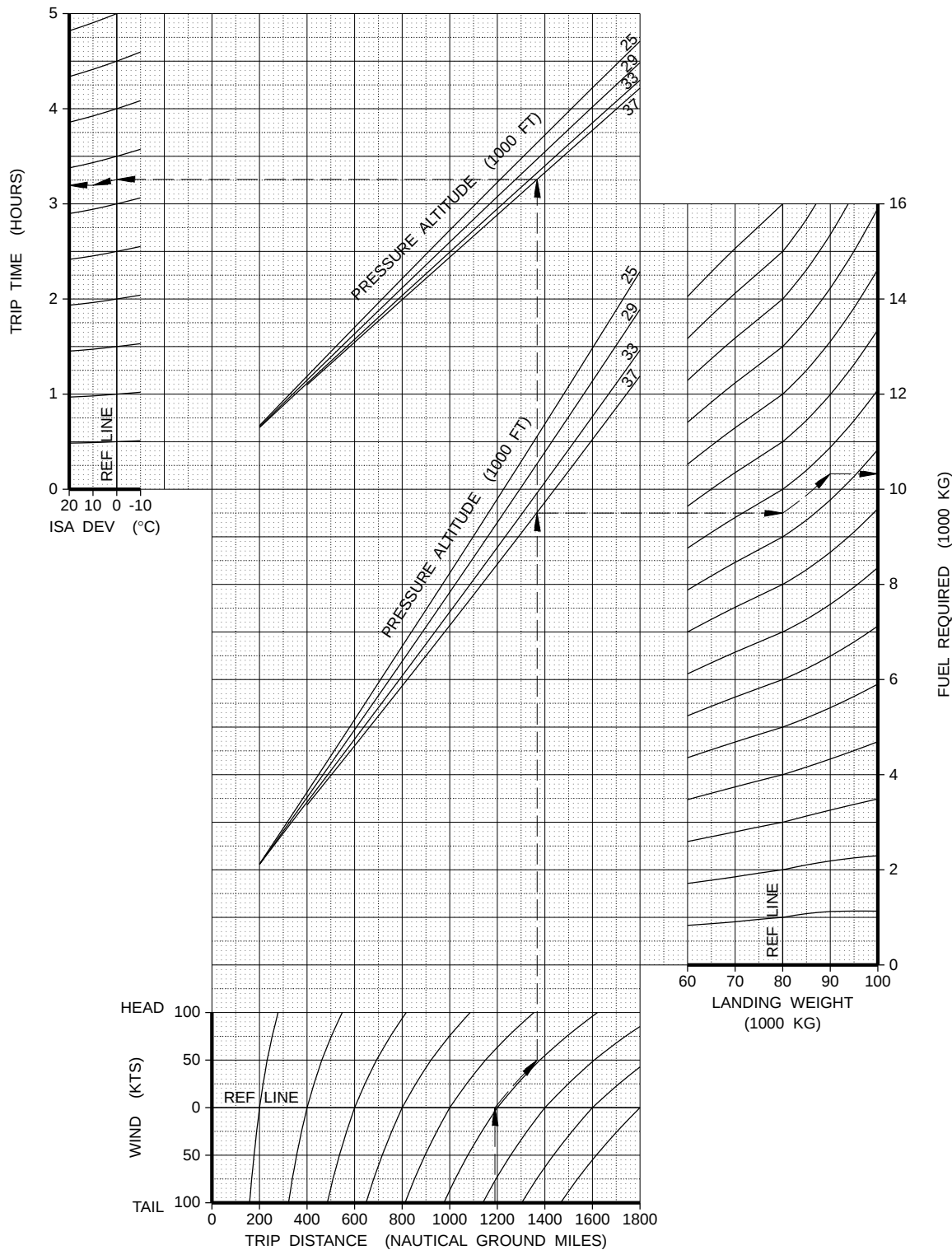
Short Trip Cruise Altitude



Long Range Cruise Trip Fuel and Time

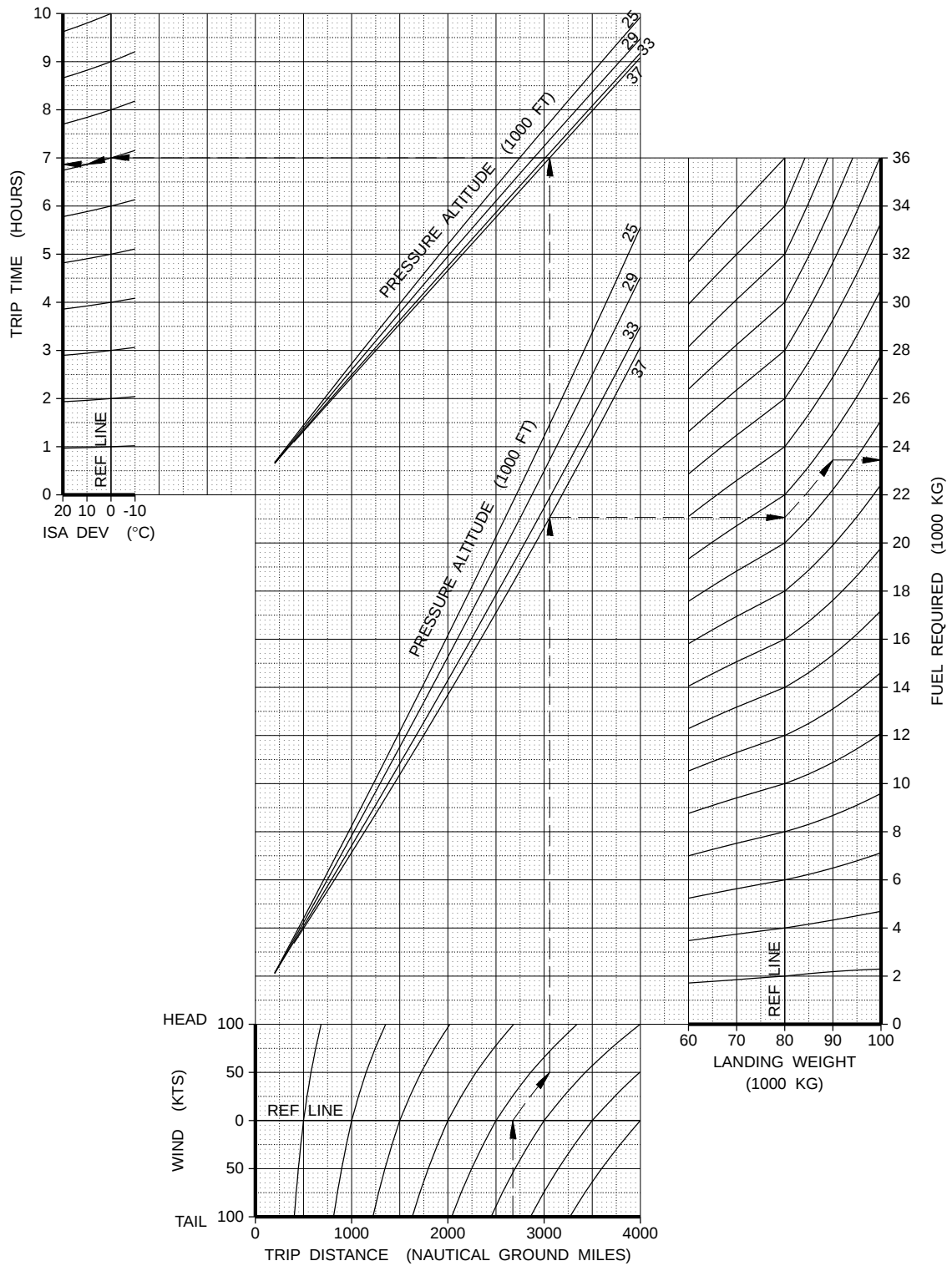
0 to 1800 NM Distance

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



Long Range Cruise Trip Fuel and Time

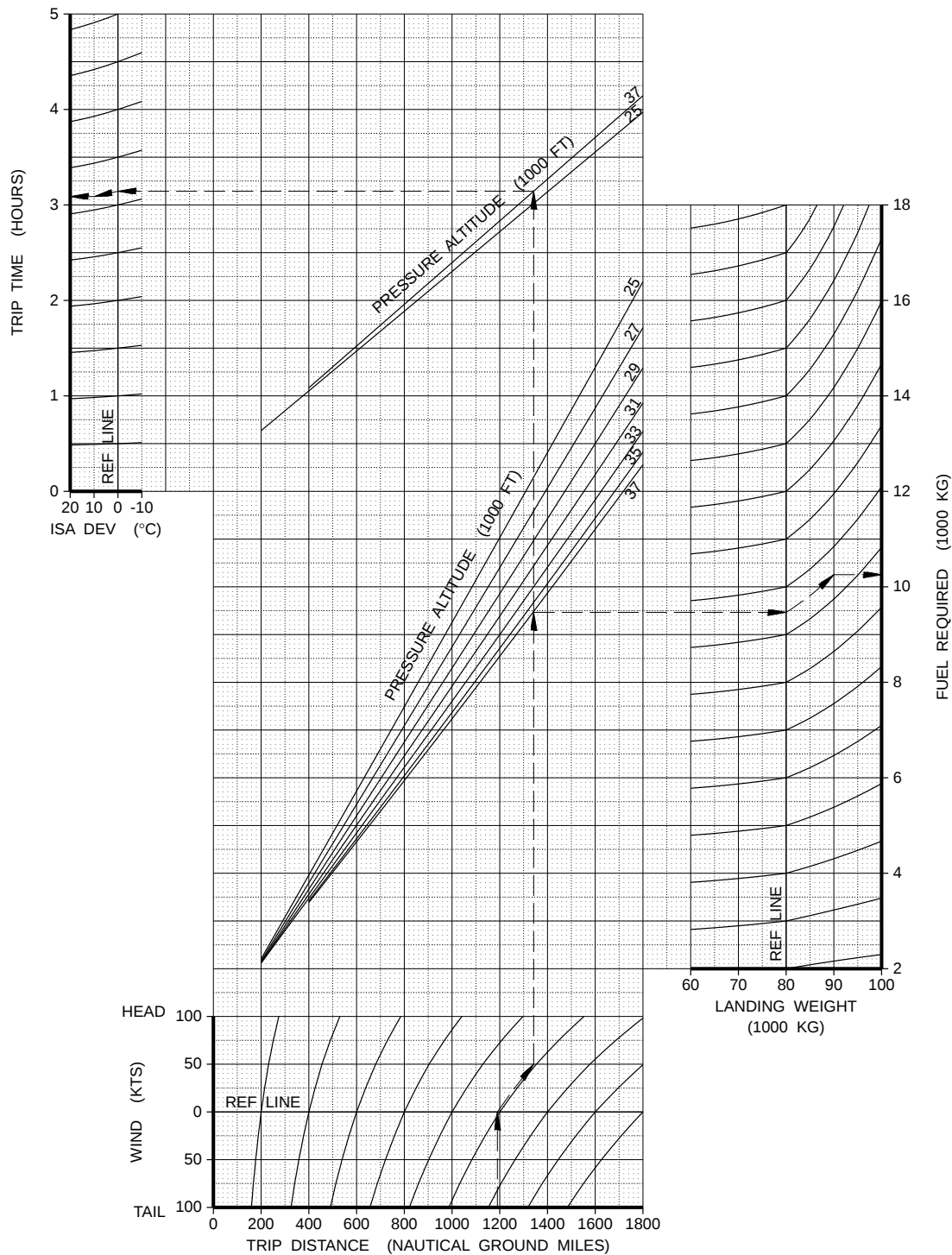
0 to 4000 NM Distance
Based on 290/.78 climb and .78/290/250 descent



.80M Trip Fuel and Time

0 to 1800 NM Distance

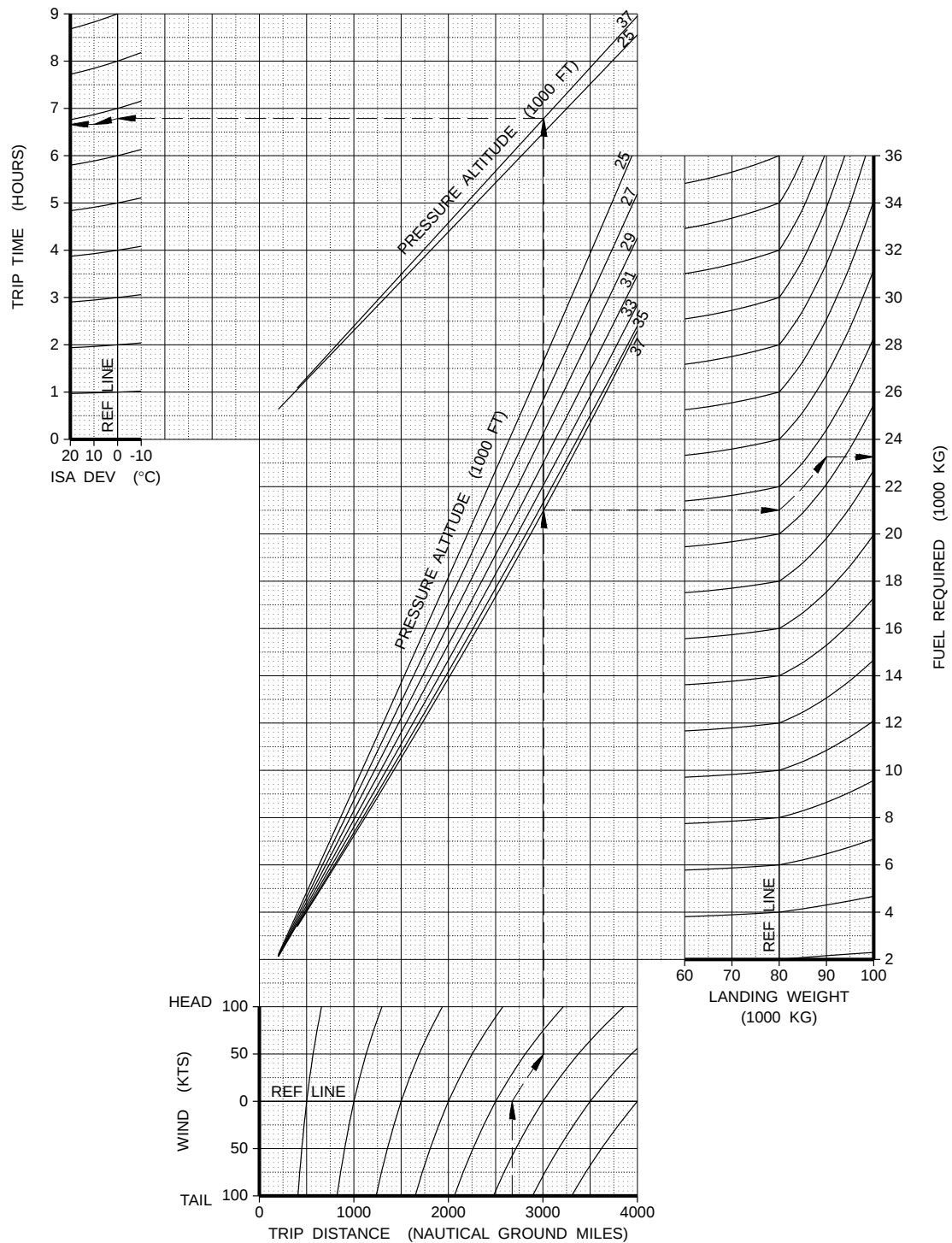
Based on 290/.78 climb and .78/290/250 descent



.80M Trip Fuel and Time

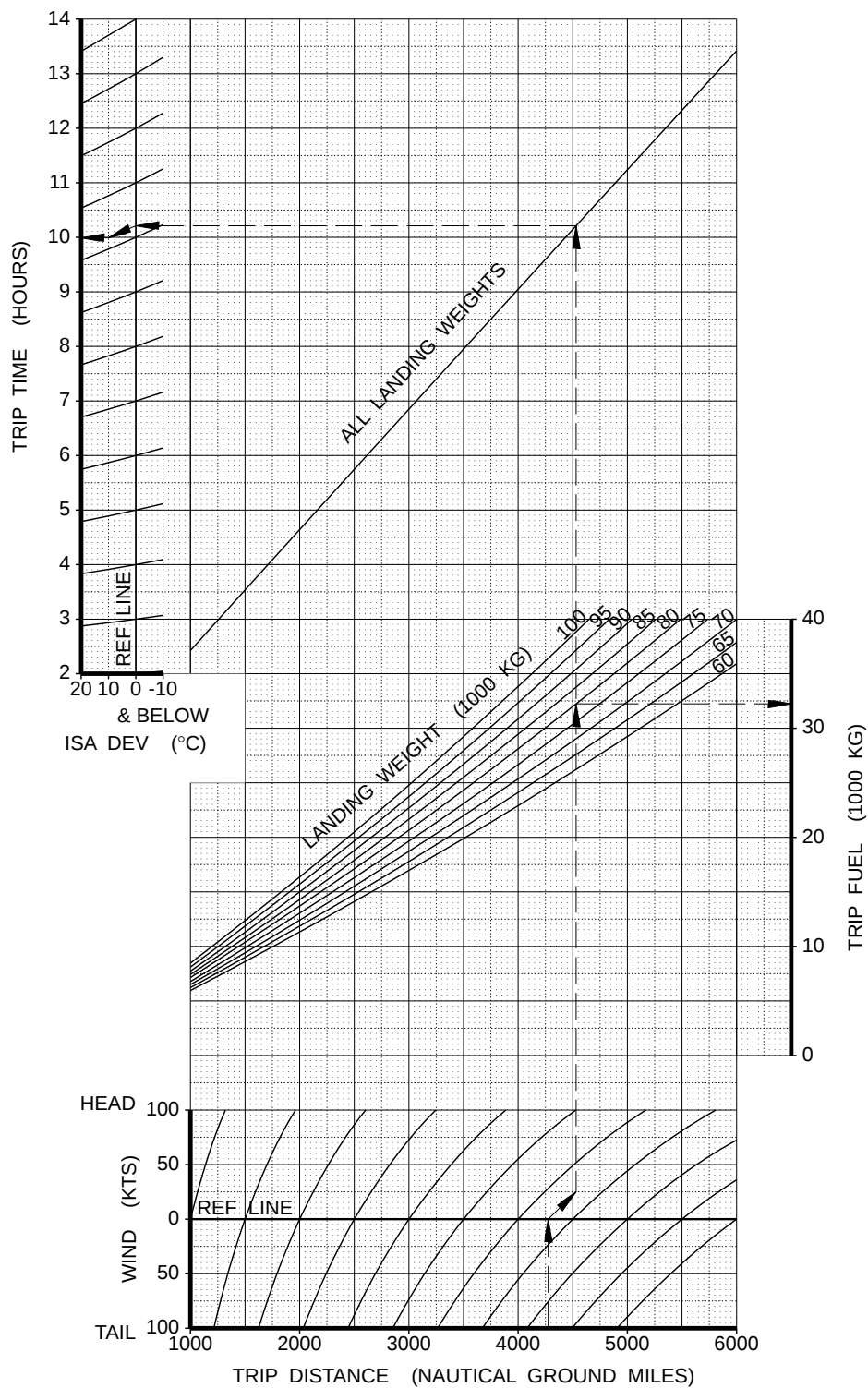
0 to 4000 NM Distance

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



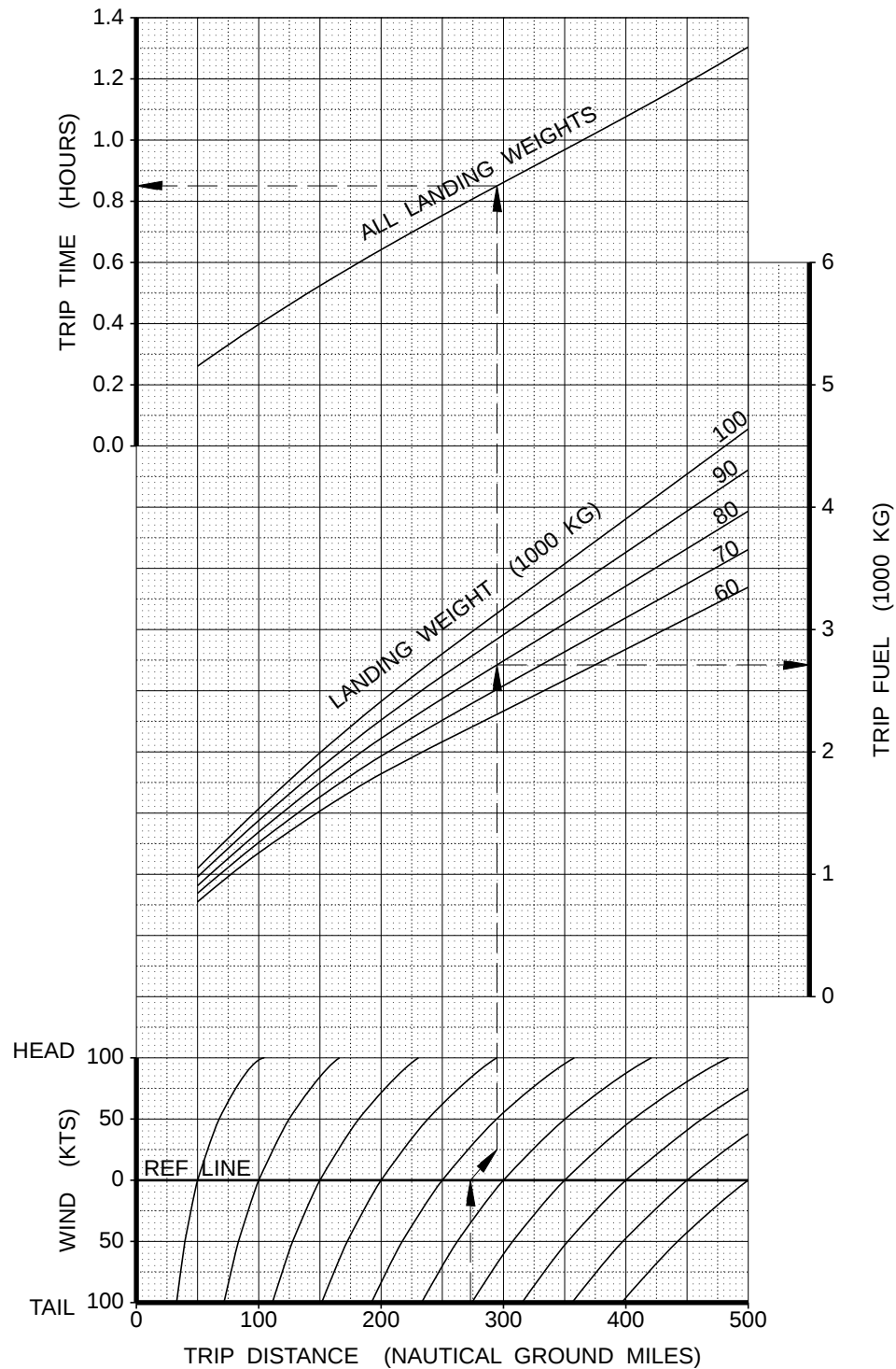
Long Range Cruise Step Climb Trip Fuel and Time

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 (KG/HR)												
	WEIGHT (1000 KG)												
	120	115	110	105	100	95	90	85	80	75	70	65	60
40000								2840	2670	2460	2310	2150	2200
35000			3550	3380	3170	2970	2810	2660	2510	2400	2220	2040	2090
30000	3760	3600	3450	3300	3190	3030	2860	2680	2520	2360	2200	2050	2110
25000	3810	3640	3470	3290	3130	3000	2840	2690	2540	2380	2220	2060	1910
20000	3770	3610	3450	3300	3150	3030	2870	2710	2550	2390	2240	2090	1940
15000	3820	3660	3500	3340	3180	3020	2890	2740	2590	2440	2300	2150	2010
10000	3880	3720	3560	3410	3260	3110	2960	2840	2690	2550	2400	2260	2120
5000	4010	3860	3710	3560	3400	3250	3110	2960	2850	2700	2550	2390	2250
1500	4090	3940	3790	3640	3490	3350	3200	3050	2930	2770	2620	2460	2320

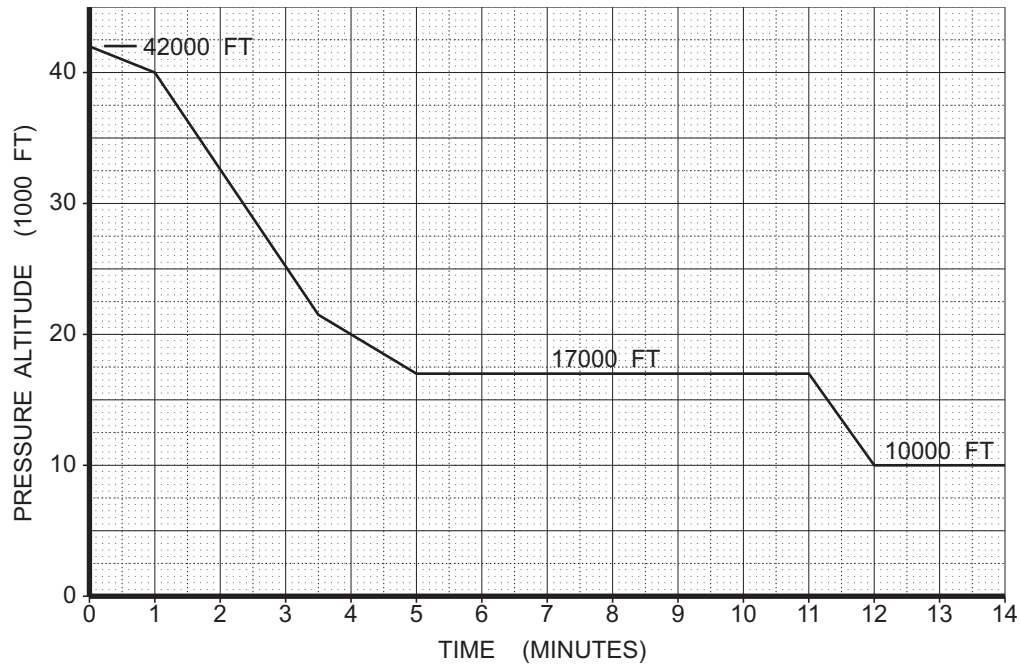
This table includes 5% additional fuel for holding in a racetrack pattern.

Oxygen Requirements

Passenger Oxygen Requirements - Chemical

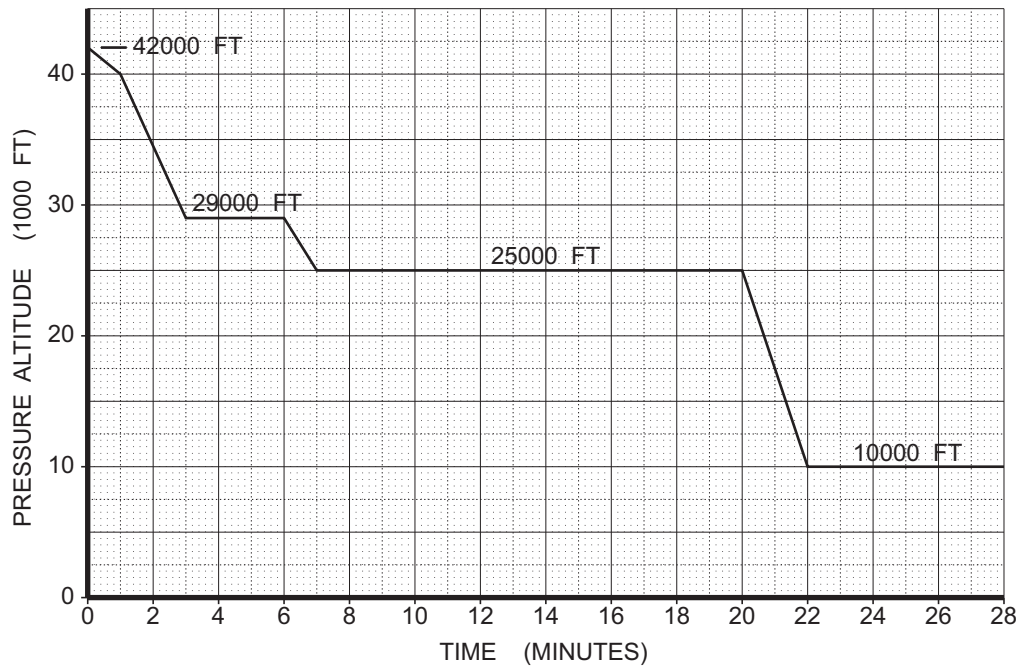
Maximum Altitude Envelope

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

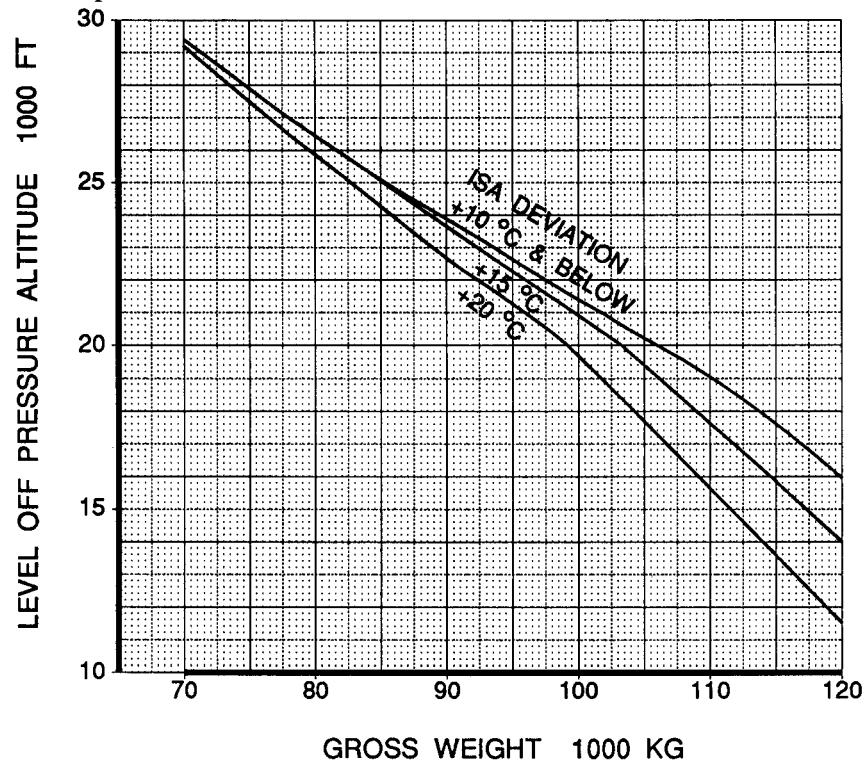
BOTTLE TEMPERATURE		NUMBER OF CREW USING OXYGEN				
°C	°F	2	3	4	5	6
50	122	530	735	945	1155	1365
45	113	520	725	930	1135	1340
40	104	510	715	915	1120	1325
35	95	505	700	900	1100	1300
30	86	495	690	885	1080	1275
25	77	485	680	870	1065	1260
20	68	480	670	860	1050	1240
15	59	470	655	840	1030	1220
10	50	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



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 300 FT.

ALTITUDE CORRECTION FOR ENGINE BLEED	
PACK OFF	+400 FT
ENG A/I ON	-2600 FT
ENG AND WING A/I ON	-6900 FT

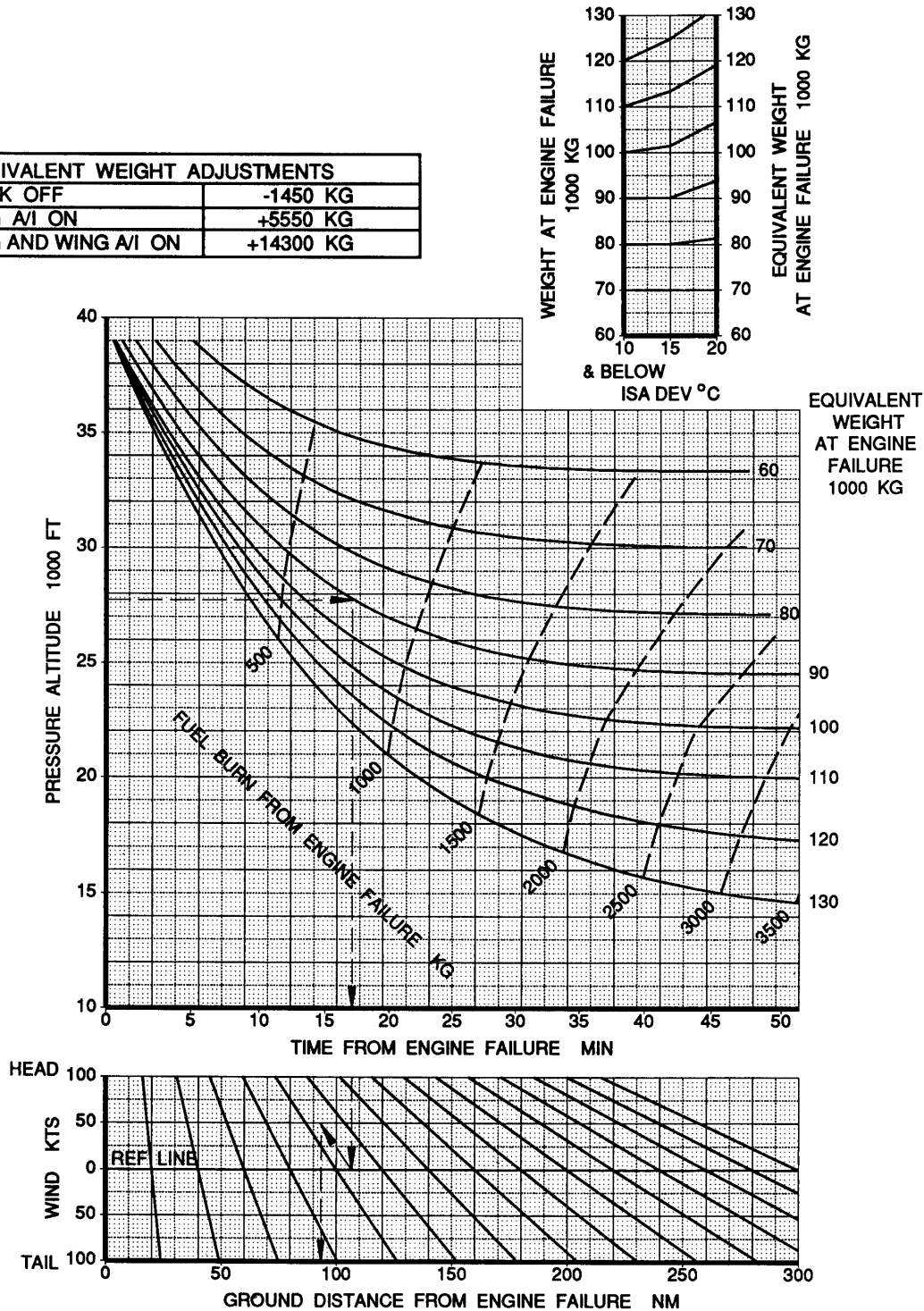
ENGINE INOP

MAX CONTINUOUS THRUST

Driftdown Profiles Net Flight Path

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

EQUIVALENT WEIGHT ADJUSTMENTS	
PACK OFF	-1450 KG
ENG A/I ON	+5550 KG
ENG AND WING A/I ON	+14300 KG



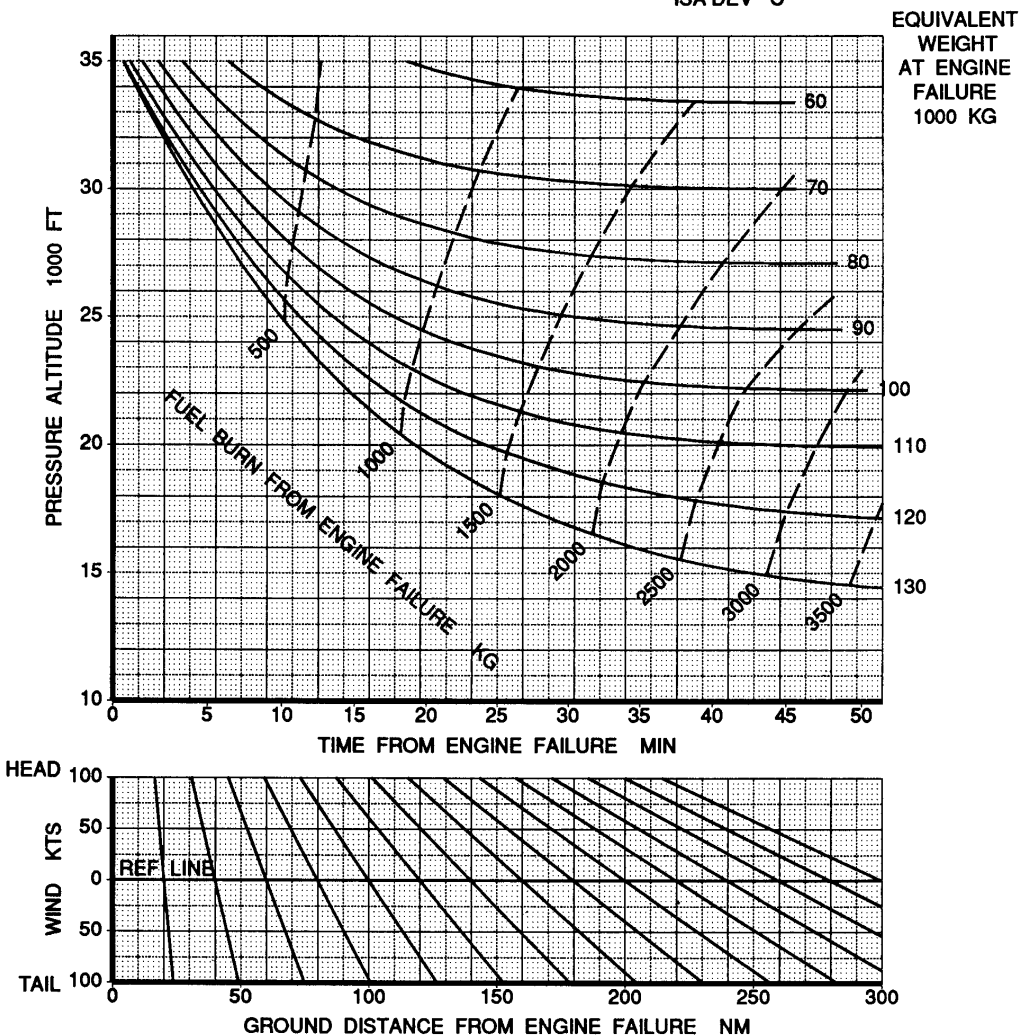
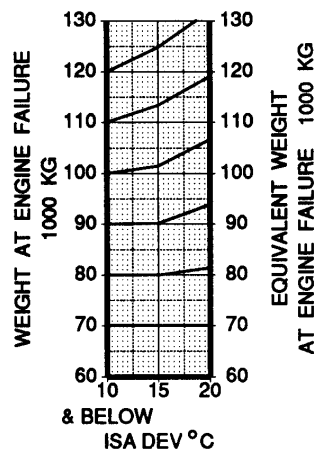
ENGINE INOP

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 WEIGHT ADJUSTMENTS	
PACK OFF	-1450 KG
ENG A/I ON	+5550 KG
ENG AND WING A/I ON	+14300 KG



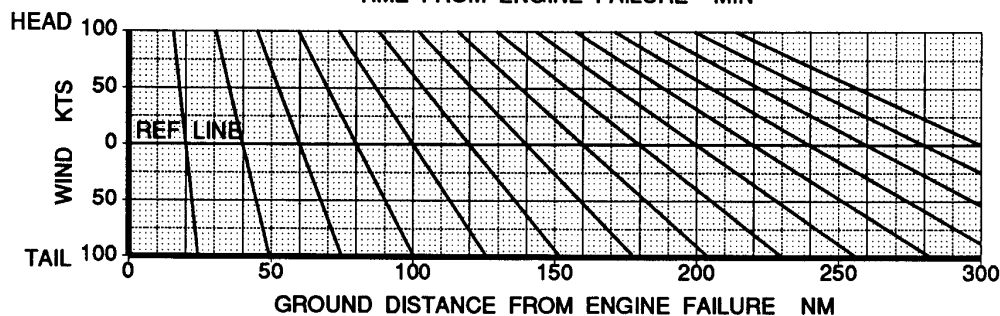
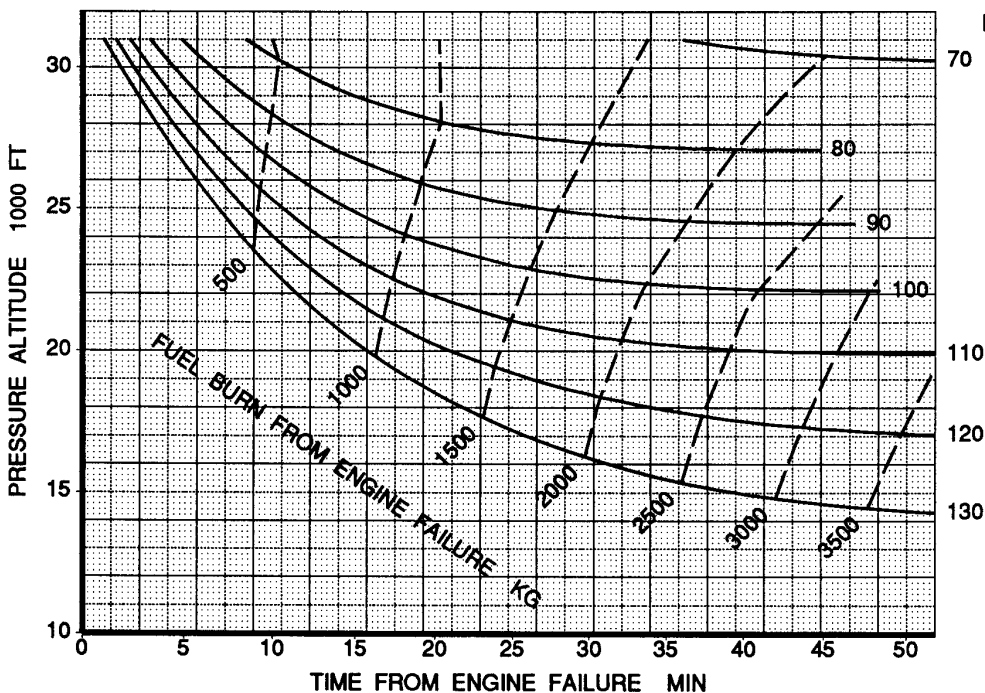
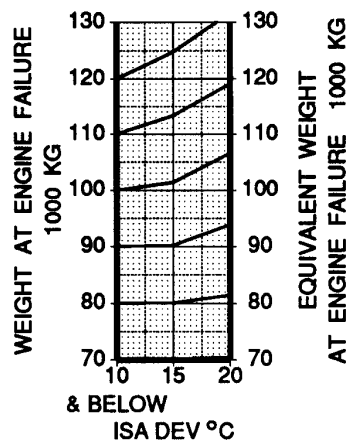
ENGINE INOP

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 WEIGHT ADJUSTMENTS	
PACK OFF	-1450 KG
ENG A/I ON	+5550 KG
ENG AND WING A/I ON	+14300 KG



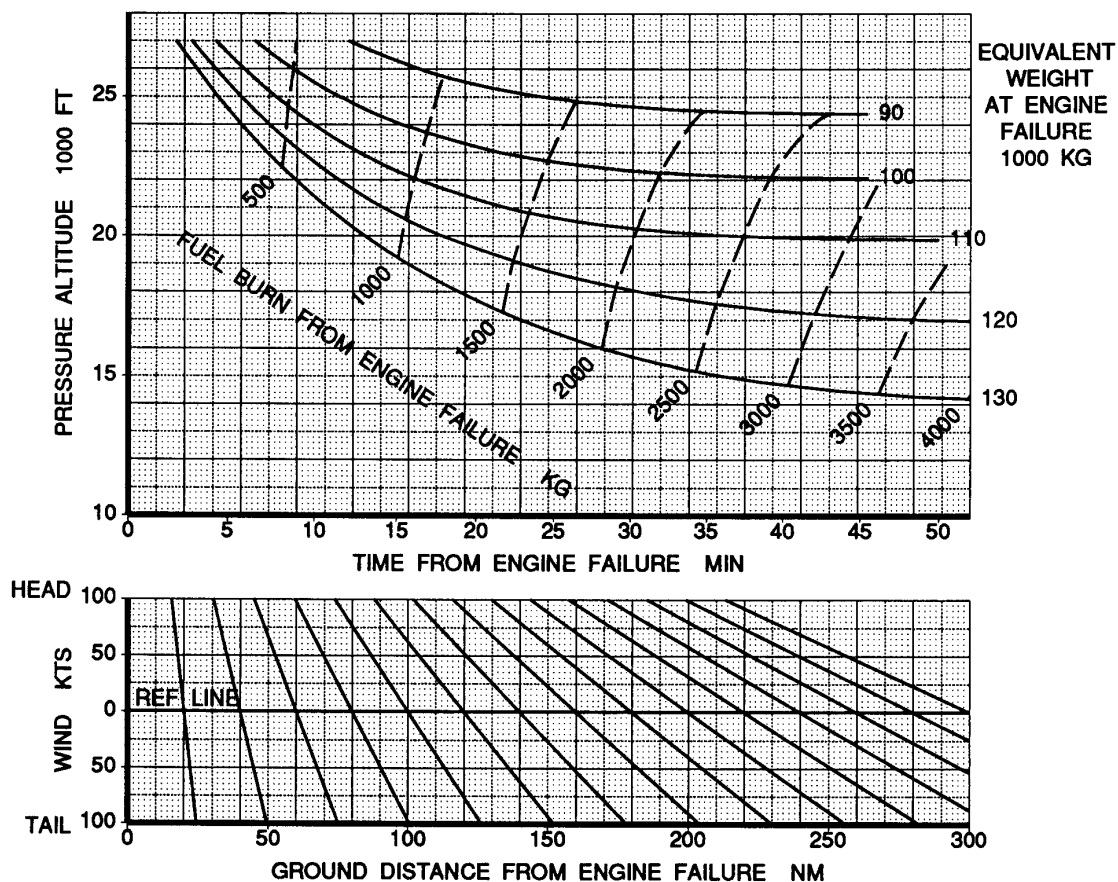
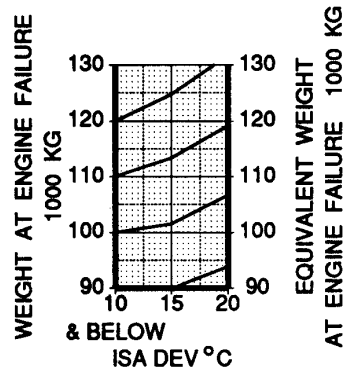
ENGINE INOP

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 WEIGHT ADJUSTMENTS	
PACK OFF	-1450 KG
ENG A/I ON	+5550 KG
ENG AND WING A/I ON	+14300 KG



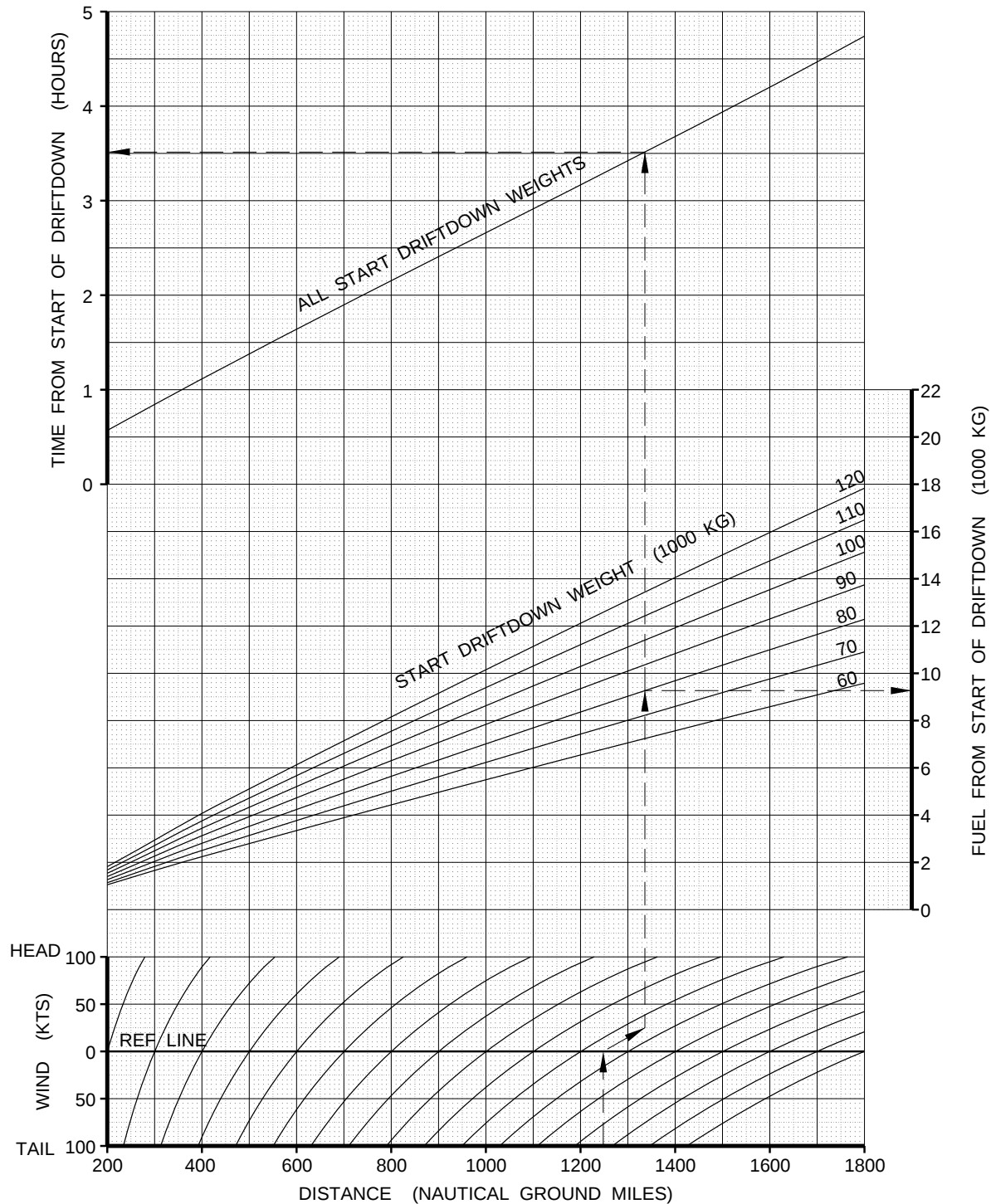
ENGINE INOP

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

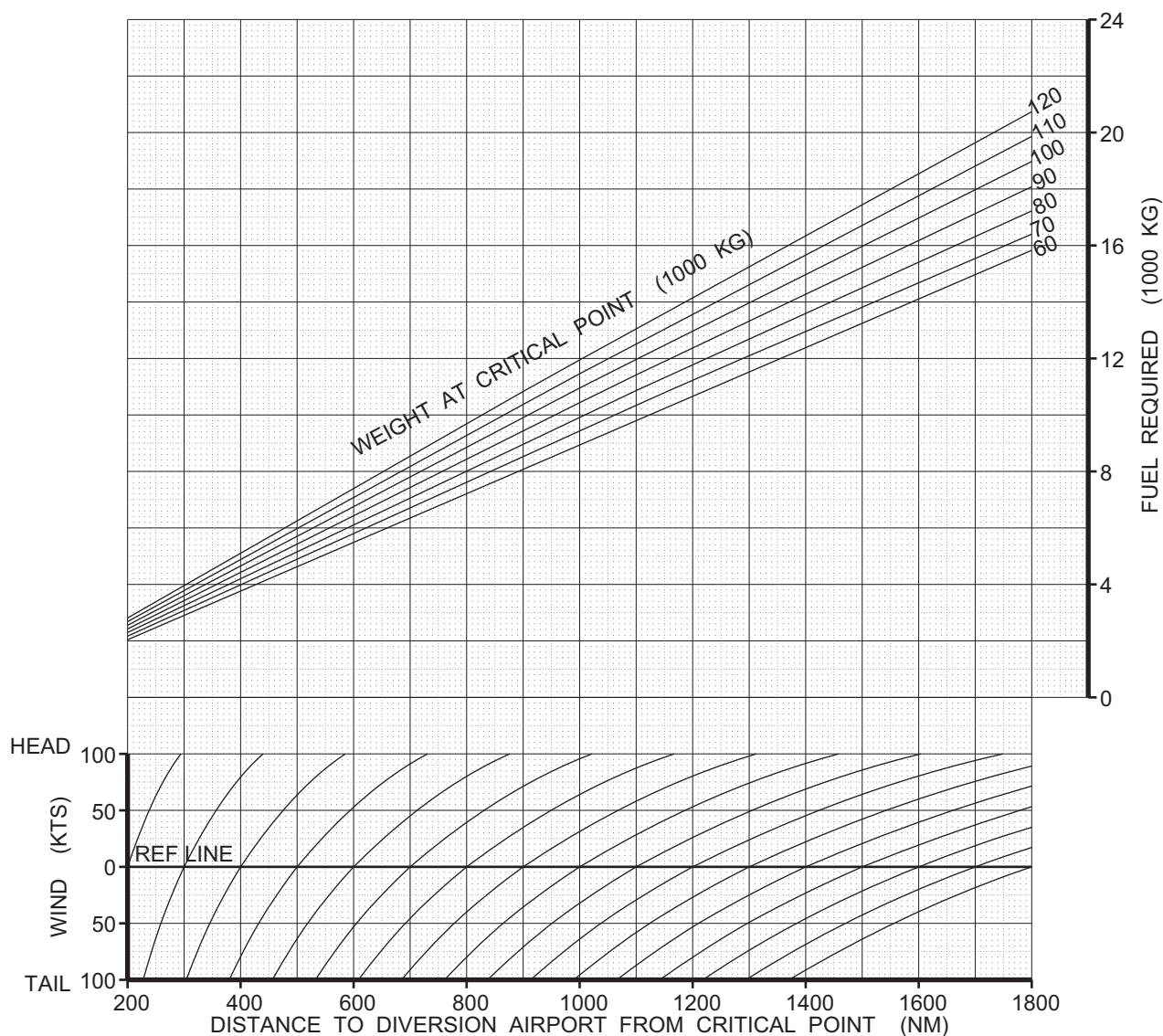
Area of Operation

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

SPEED (M/KIAS)	WEIGHT AT DIVERSION (1000 KG)	DIVERSION DISTANCE (NM)												
		TIME (MINUTES)												
		60	75	90	100	110	120	130	138	140	150	160	170	180
.78/290	120	412	512	612	678	745	811	878	931	944	1011	1078	1144	1211
	110	419	521	622	690	758	826	894	948	961	1029	1097	1165	1233
	100	425	528	632	701	770	839	908	963	977	1046	1115	1184	1253
	90	431	536	641	712	782	852	922	978	992	1063	1133	1203	1273
	80	436	543	650	721	793	864	935	992	1007	1078	1149	1220	1292
	70	441	549	658	730	802	874	947	1004	1019	1091	1163	1236	1308
	60	443	552	661	734	807	880	953	1011	1025	1098	1171	1244	1316
.80/310	120	427	530	633	702	771	840	909	965	978	1047	1116	1185	1254
	110	433	538	643	713	783	852	923	979	993	1062	1132	1202	1272
	100	437	544	651	722	793	864	935	992	1006	1077	1148	1219	1290
	90	442	550	658	730	802	874	946	1004	1018	1090	1162	1234	1306
	80	446	556	665	738	811	883	956	1014	1029	1102	1175	1248	1320
	70	449	559	669	743	816	890	963	1022	1037	1110	1184	1257	1331
	60	450	561	671	745	819	893	966	1025	1040	1114	1188	1262	1335
.80/330	120	438	544	649	720	790	861	931	988	1002	1072	1143	1213	1284
	110	443	551	659	730	802	874	945	1003	1017	1089	1161	1232	1304
	100	447	557	666	739	811	884	957	1015	1030	1102	1175	1248	1321
	90	451	561	671	745	819	892	966	1024	1039	1113	1186	1260	1333
	80	453	564	675	750	824	898	972	1031	1046	1120	1195	1269	1343
	70	455	566	678	753	827	902	976	1036	1051	1125	1200	1274	1349
	60	455	567	679	754	828	903	978	1037	1052	1127	1202	1277	1351
.80/340	120	442	549	656	727	798	869	940	997	1011	1082	1153	1224	1295
	110	447	555	663	735	807	880	952	1010	1024	1096	1168	1240	1313
	100	451	560	670	743	816	890	963	1021	1036	1109	1182	1255	1328
	90	454	565	676	750	823	897	971	1030	1045	1119	1193	1267	1341
	80	456	568	680	755	829	904	979	1038	1053	1128	1202	1277	1352
	70	457	569	682	757	832	907	982	1042	1057	1132	1207	1282	1357
	60	457	570	683	758	833	908	983	1043	1058	1134	1209	1284	1359
LRC	120	420	521	622	689	756	823	889	943	956	1022	1088	1154	1220
	110	417	518	619	686	752	819	885	938	951	1017	1082	1148	1213
	100	415	516	616	682	749	815	880	933	946	1012	1077	1142	1207
	90	412	512	612	678	744	809	875	927	940	1005	1070	1135	1199
	80	409	509	607	673	738	804	869	920	933	998	1063	1127	1191
	70	403	501	598	662	727	791	855	906	918	982	1045	1109	1172
	60	394	489	585	648	711	774	837	887	899	962	1024	1086	1148

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.

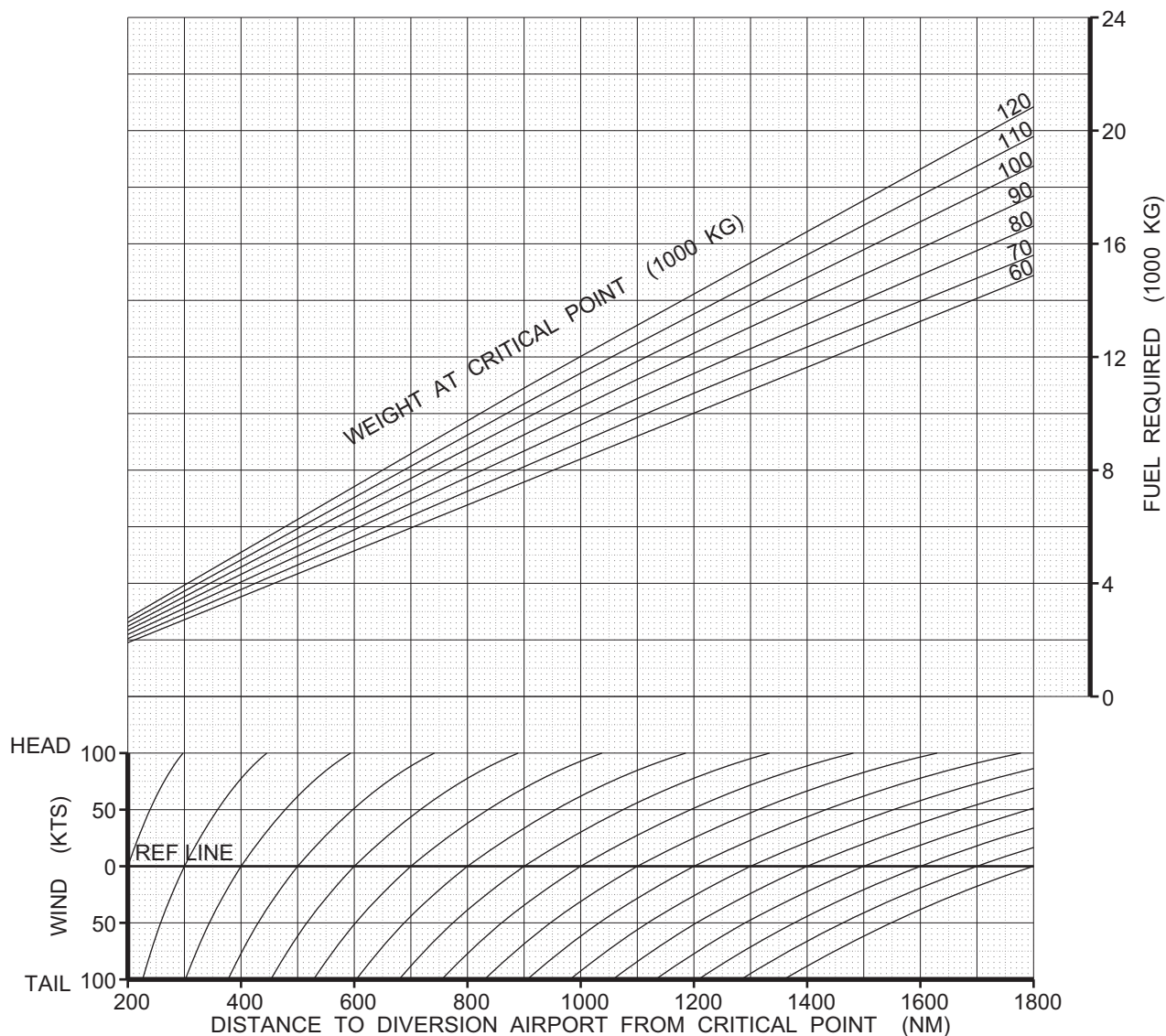
Adjustments:

- 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 0.8% 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.

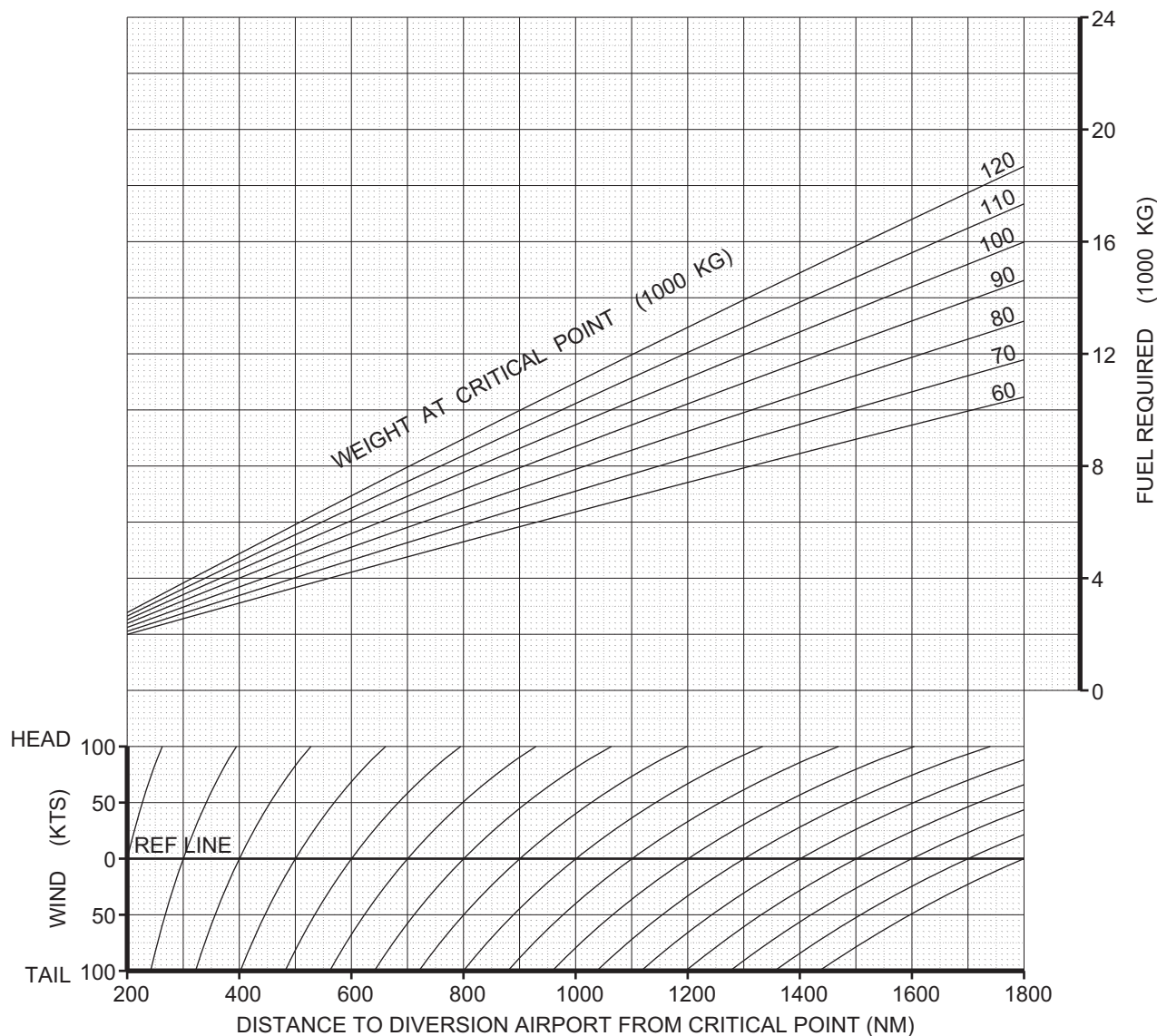
Adjustments:

- 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 0.8% 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.

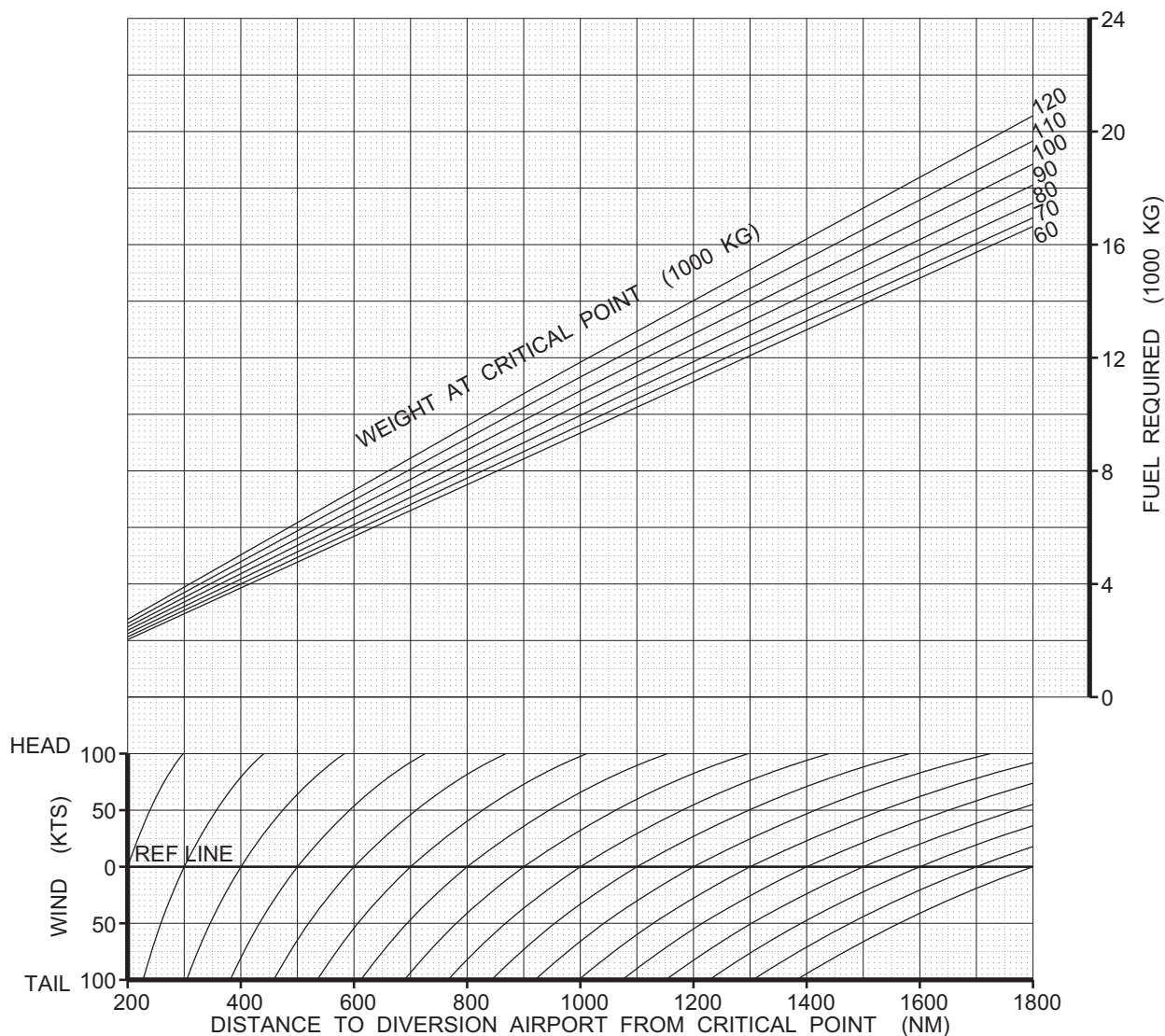
Adjustments:

- 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 0.8% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (2%) 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

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.

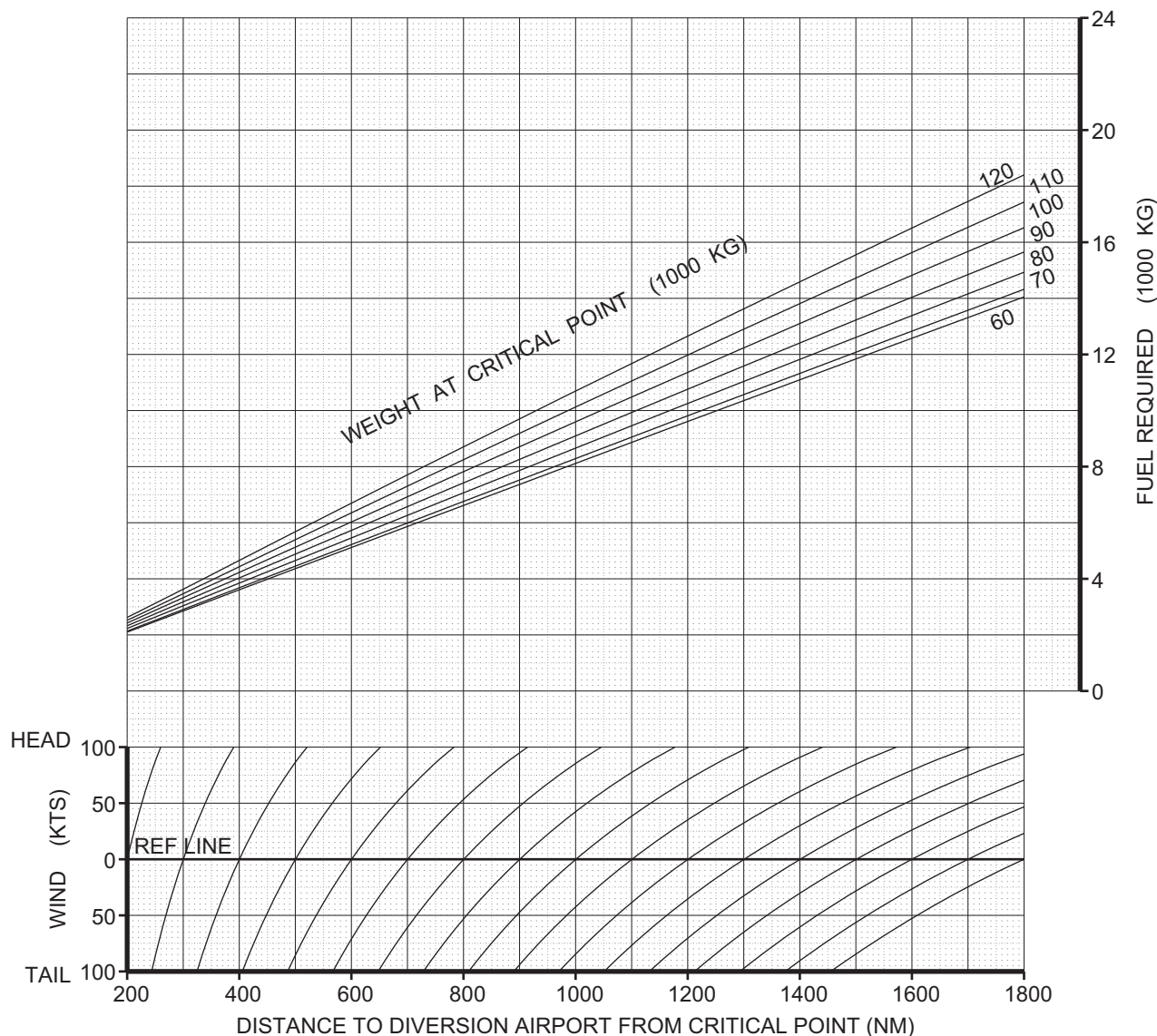
Adjustments:

- 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 0.8% 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.

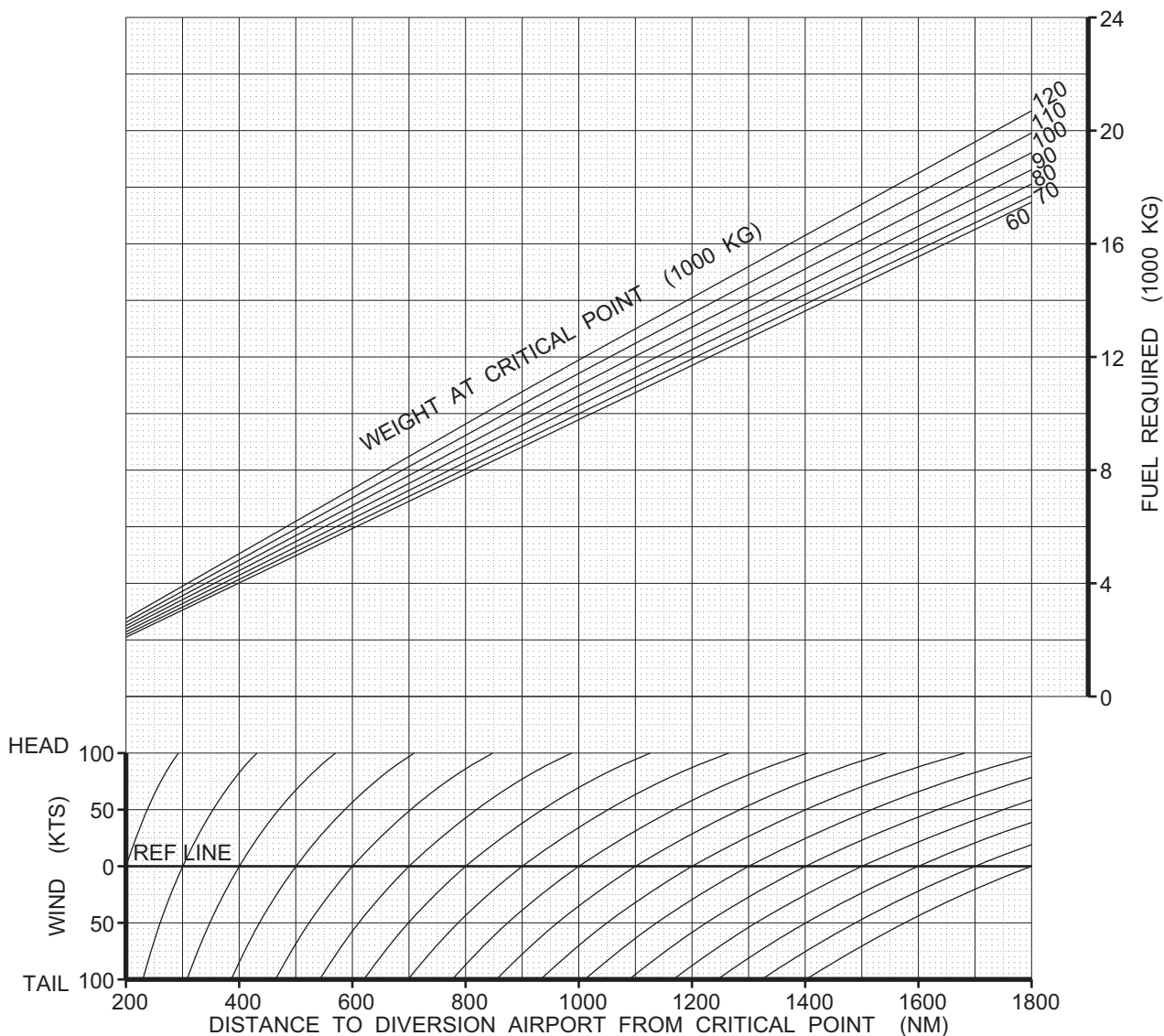
Adjustments:

- 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 0.8% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (2%) for the total forecast time or engine and wing anti-ice on and ice drag (13%) 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.

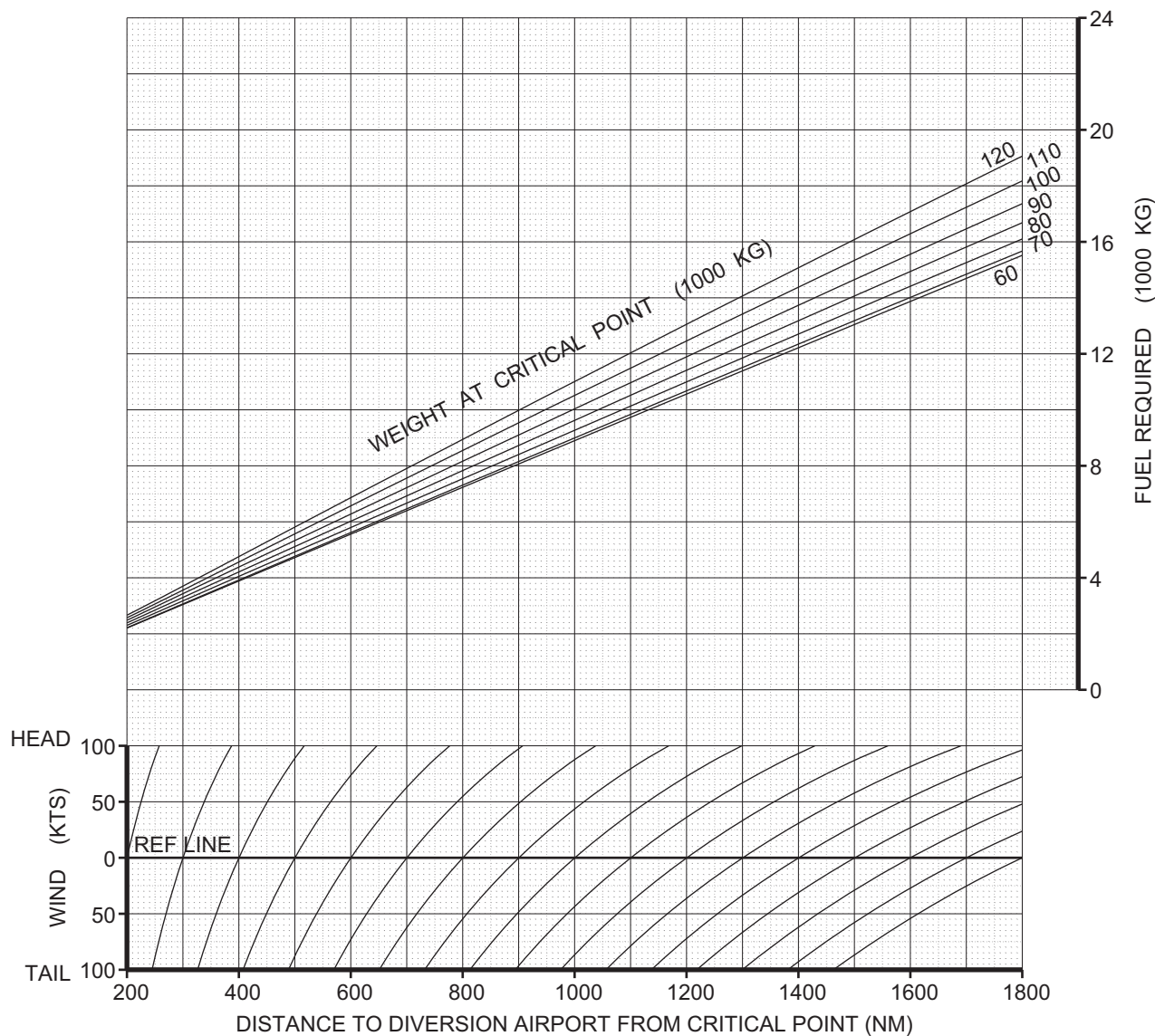
Adjustments:

- 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 0.8% 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.

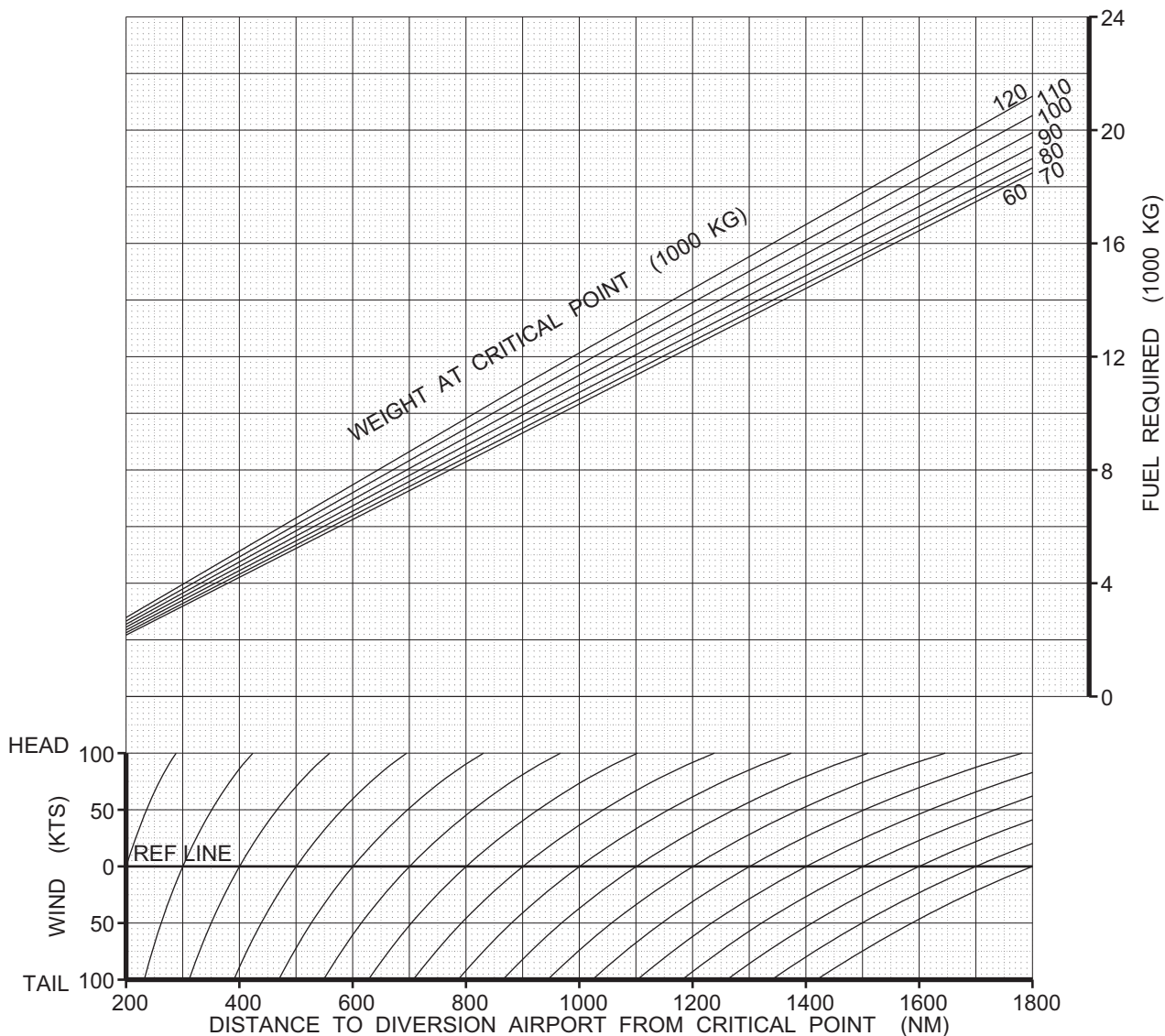
Adjustments:

- 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 0.8% per 10°C above ISA.
- When icing conditions are forecast, use the greater of engine and wing anti-ice on (3%) for the total forecast time or engine and wing anti-ice on and ice drag (14%) 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.

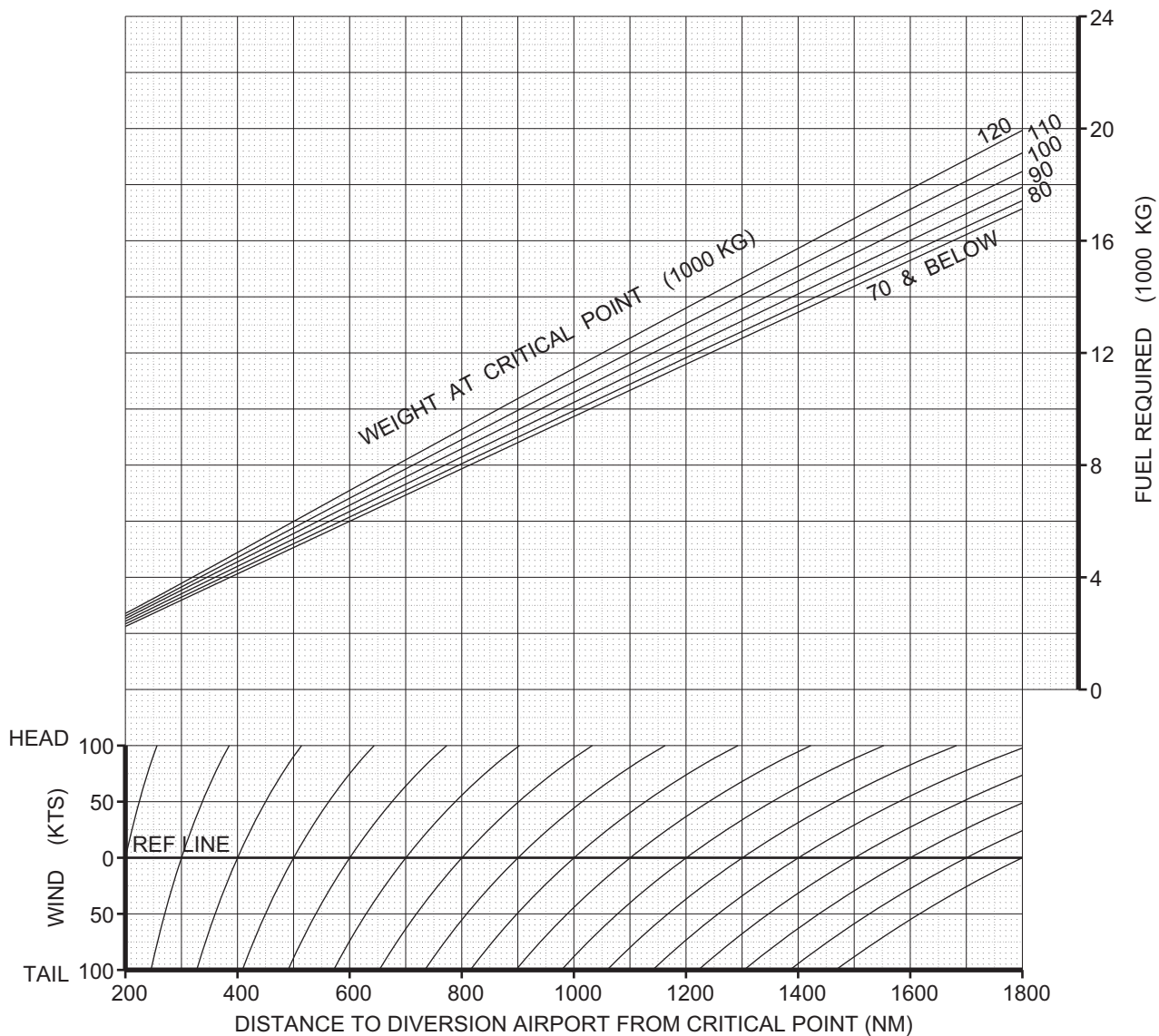
Adjustments:

- 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 0.8% 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.

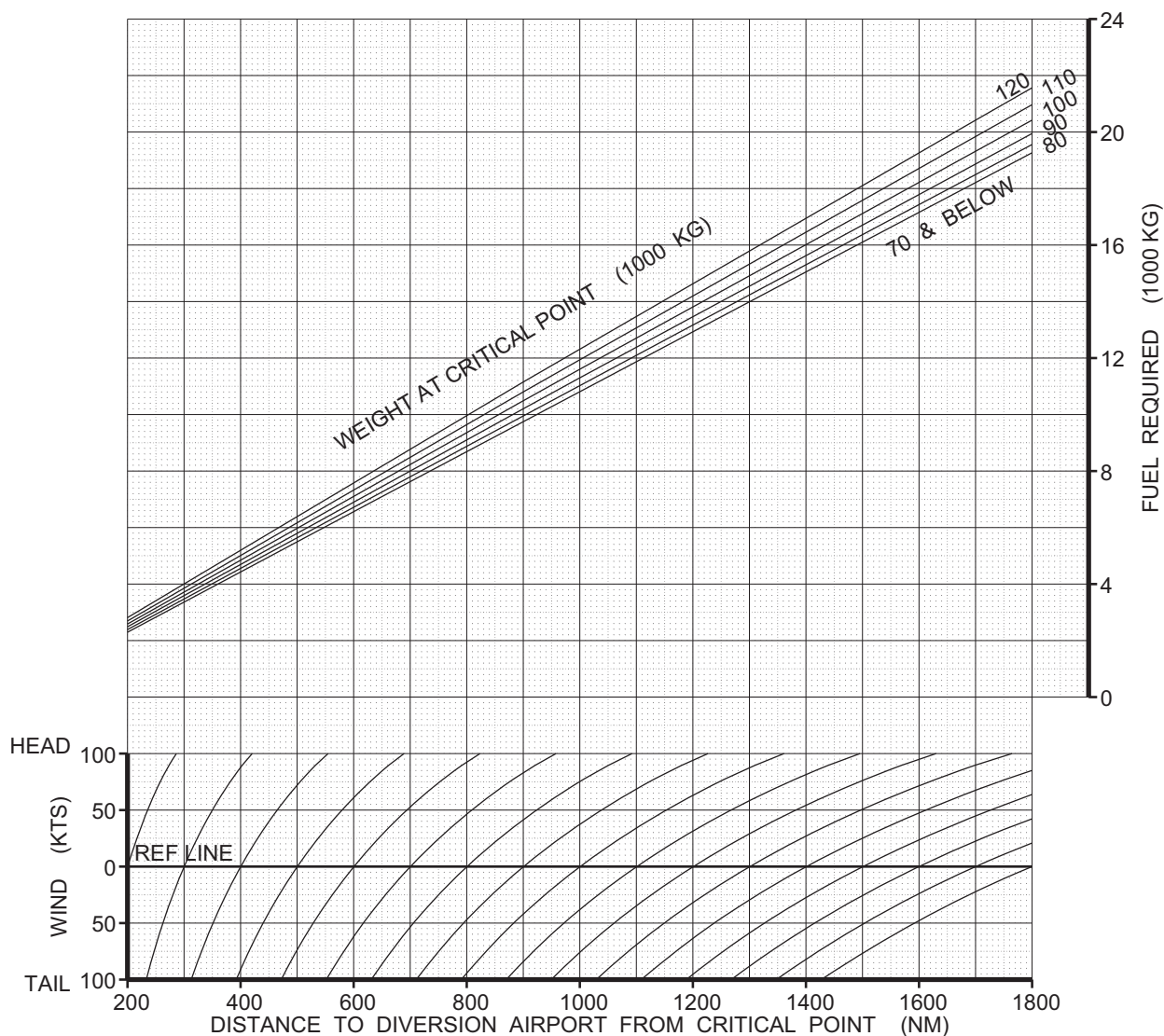
Adjustments:

- 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 0.8% 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 -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.

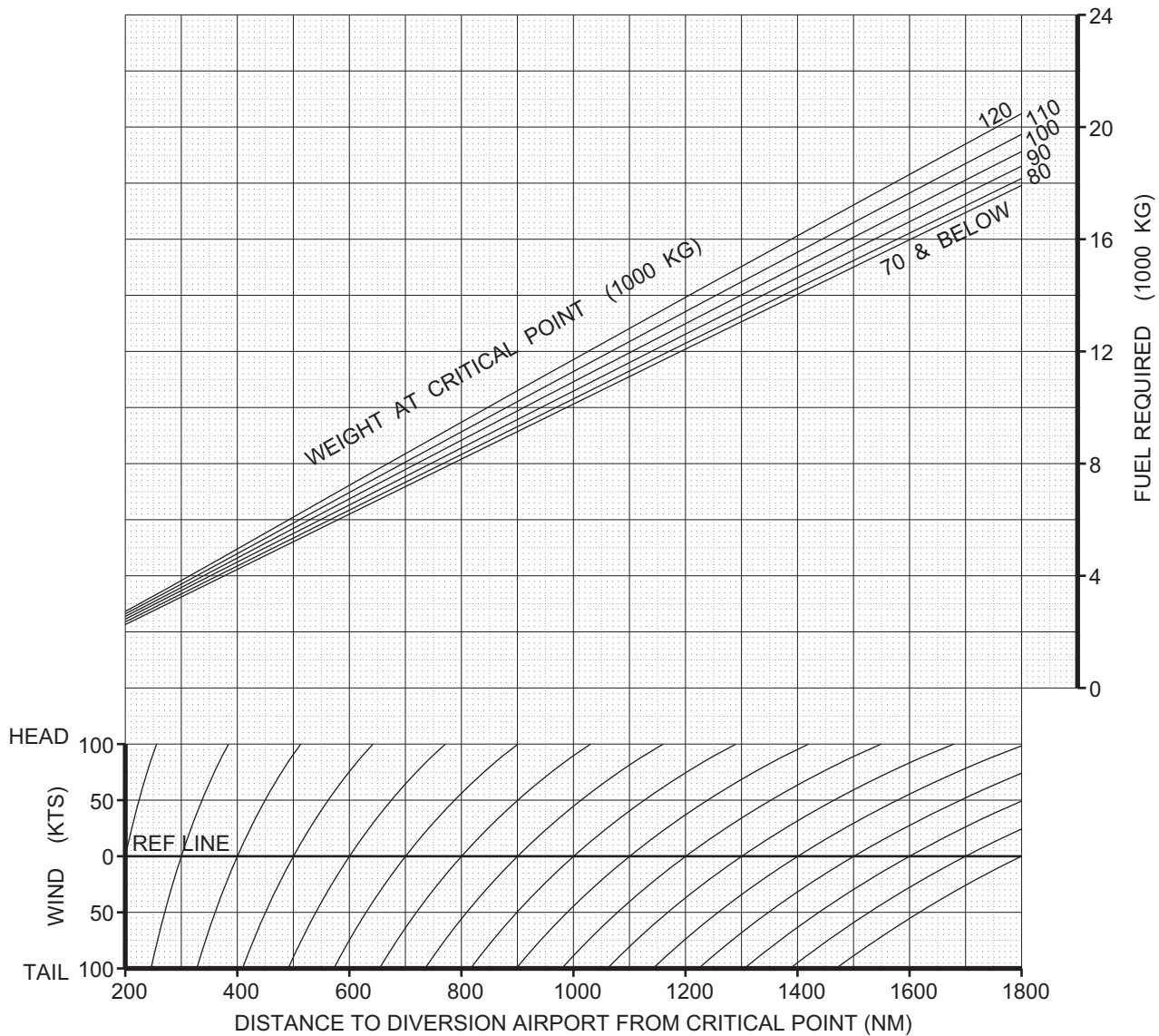
Adjustments:

- 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 (6%) for the total forecast time or engine and wing anti-ice on and ice drag (20%) for 10% of the forecast time.

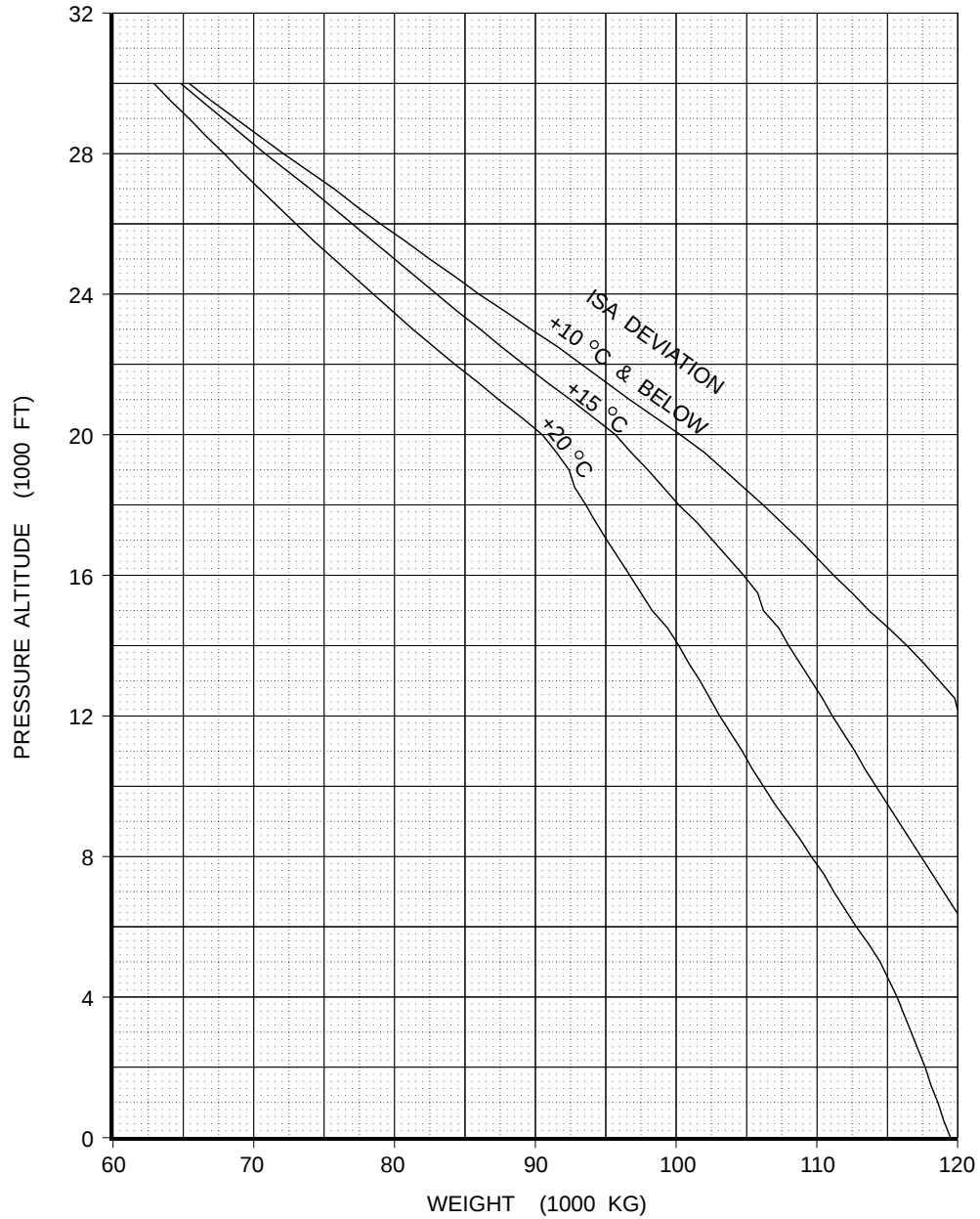
Compare the critical fuel reserves required for all engines cruise, engine inoperative cruise, and engine inoperative driftdown and use the higher of the three.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Net Level Off Weight

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

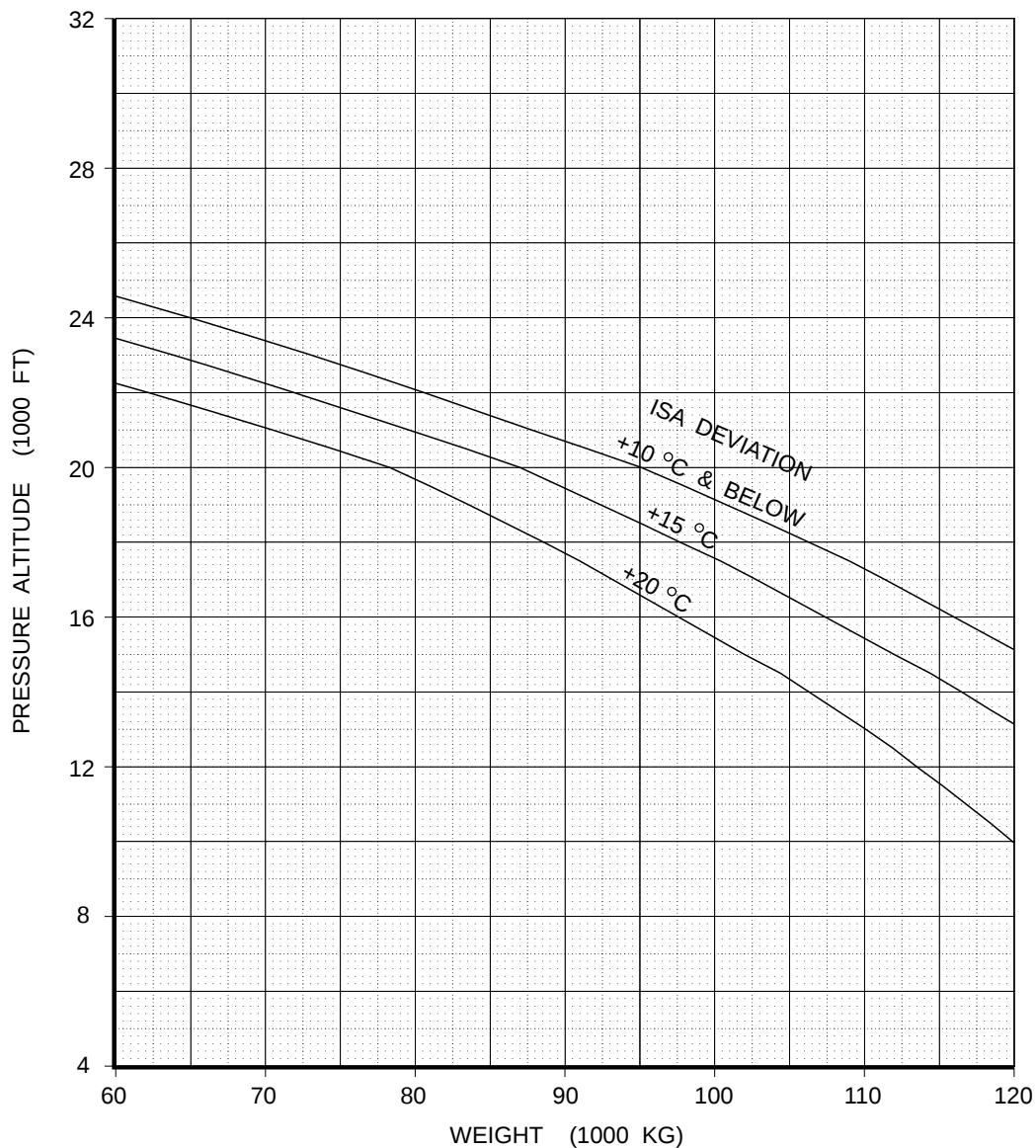


Anti-Ice Adjustments

ANTI-ICE CONFIGURATION	LEVEL OFF WEIGHT ADJUSTMENT (1000 KG)								
	PRESSURE ALTITUDE (1000 FT)								
	14	16	18	20	22	24	26	28	30
ENGINE ONLY	-5.9	-4.9	-5.2	-4.8	-4.4	-3.8	-3.3	-3.2	-3.0
ENGINE AND WING	-15.6	-14.0	-12.9	-12.1	-12.3	-11.5	-10.7	-10.1	-9.0

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

**Anti-Ice Adjustments**

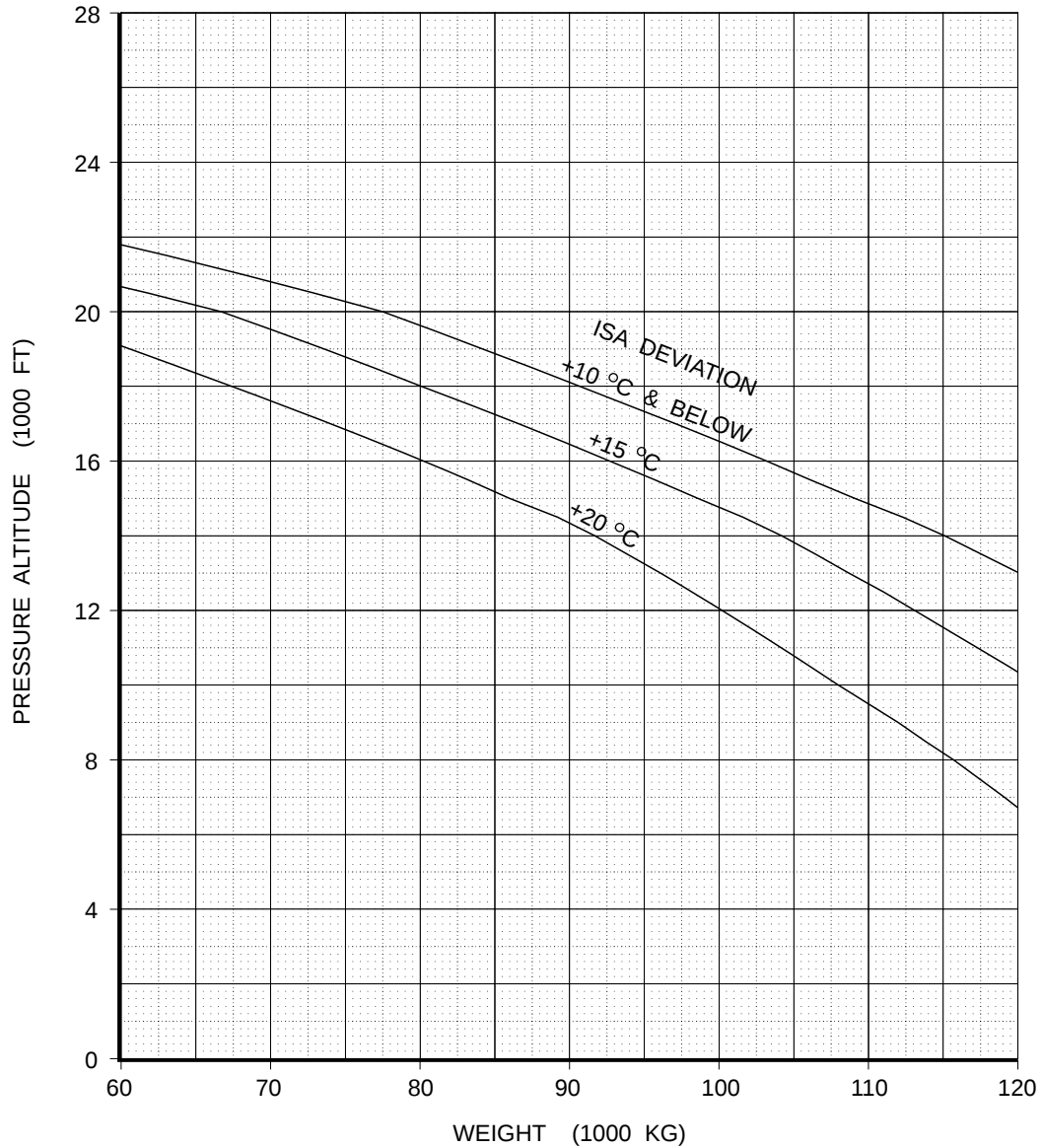
ANTI-ICE CONFIGURATION	LEVEL OFF WEIGHT ADJUSTMENT (1000 KG)			
	PRESSURE ALTITUDE (1000 FT)			
	16	18	20	22
ENGINE ONLY	-6.9	-7.5	-7.9	-9.2
ENGINE AND WING	-17.9	-18.3	-20.1	-28.0

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



Anti-Ice Adjustments

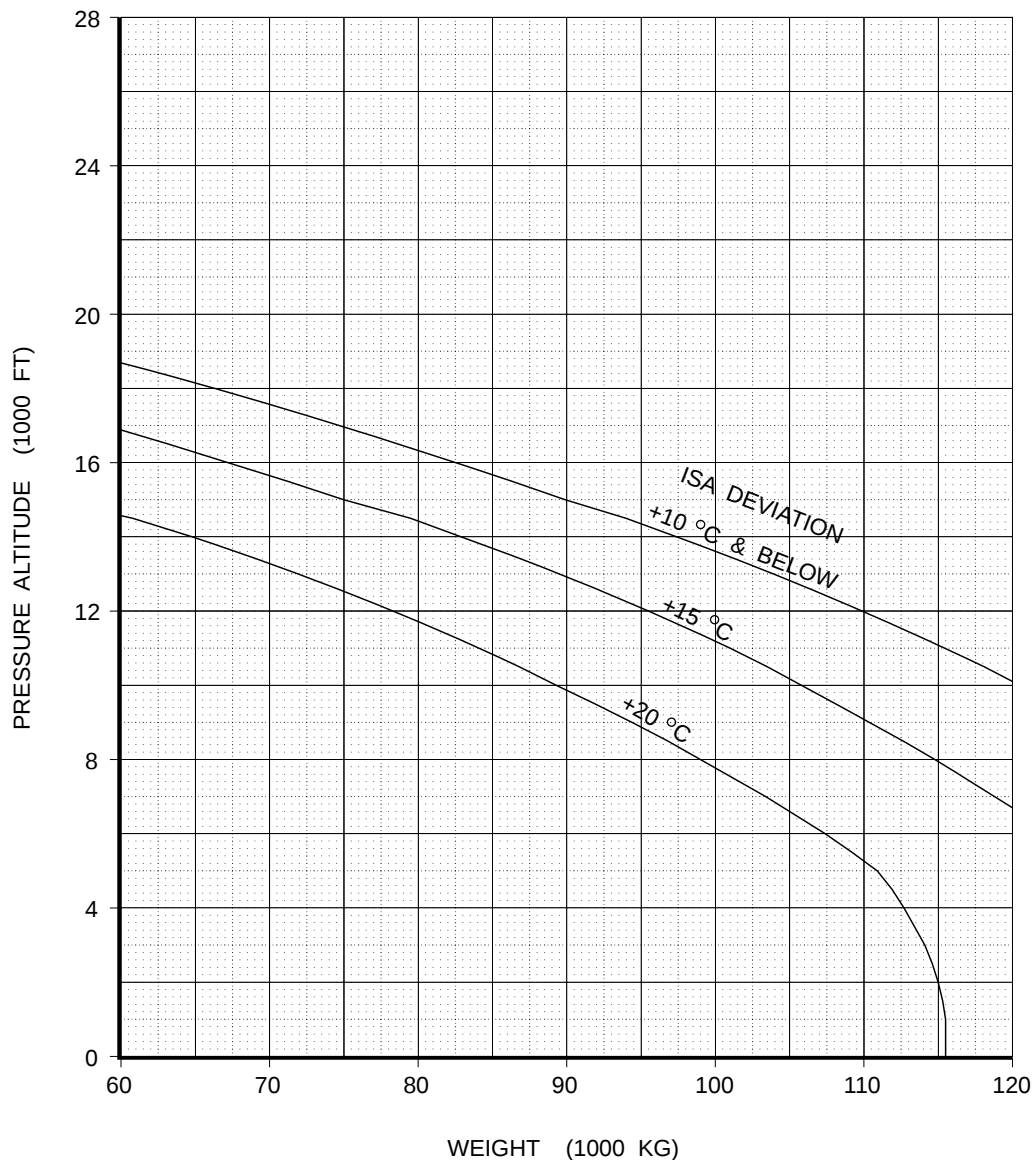
ANTI-ICE CONFIGURATION	LEVEL OFF WEIGHT ADJUSTMENT (1000 KG)			
	PRESSURE ALTITUDE (1000 FT)			
	14	16	18	20
ENGINE ONLY	-7.7	-8.0	-9.1	-10.7
ENGINE AND WING	-22.4	-22.9	-24.7	-28.7

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



Anti-Ice Adjustments

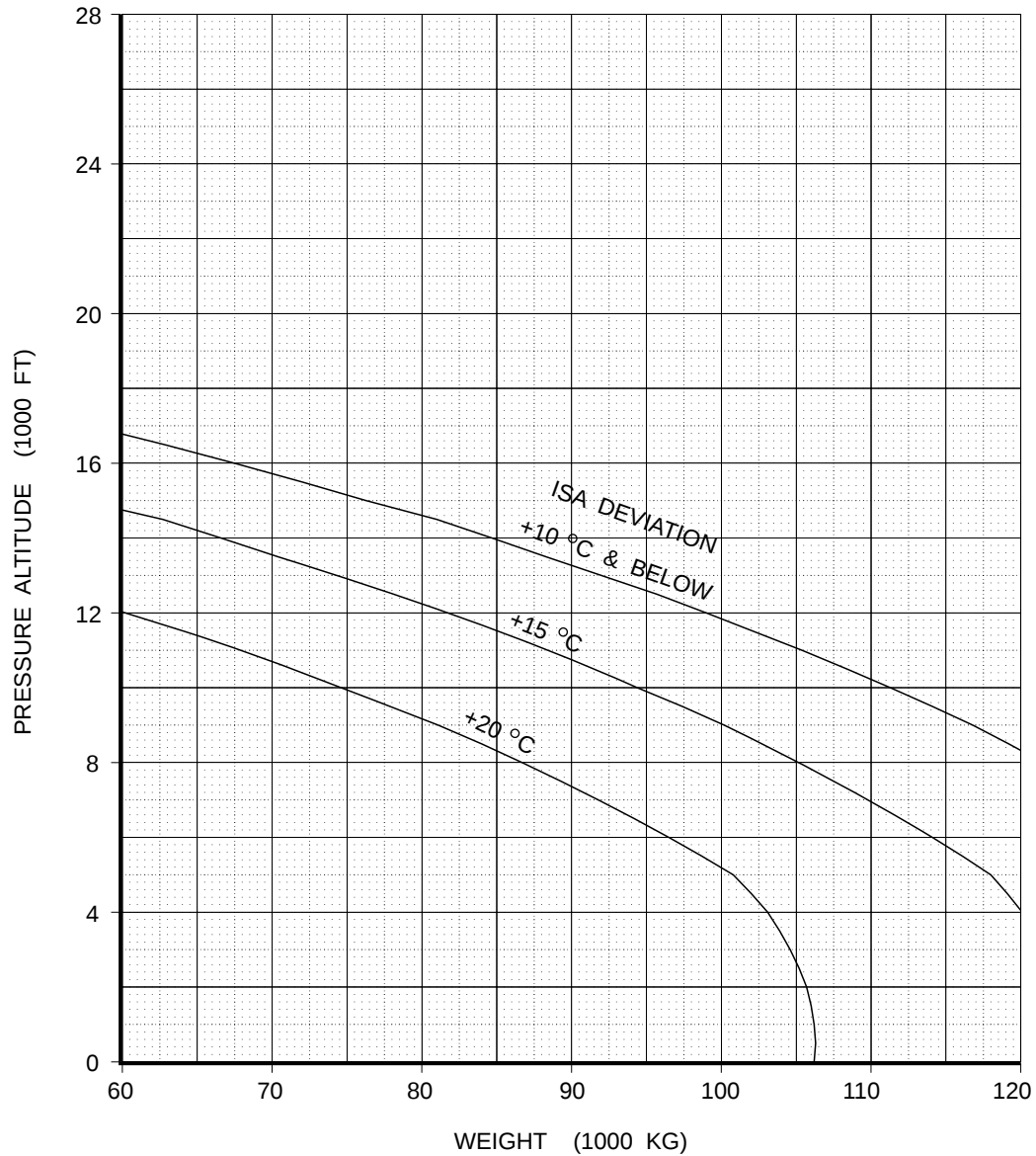
ANTI-ICE CONFIGURATION	LEVEL OFF WEIGHT ADJUSTMENT (1000 KG)			
	PRESSURE ALTITUDE (1000 FT)			
	12	14	16	18
ENGINE ONLY	-9.2	-9.6	-11.4	-13.8
ENGINE AND WING	-30.8	-32.9	-38.3	-53.8

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

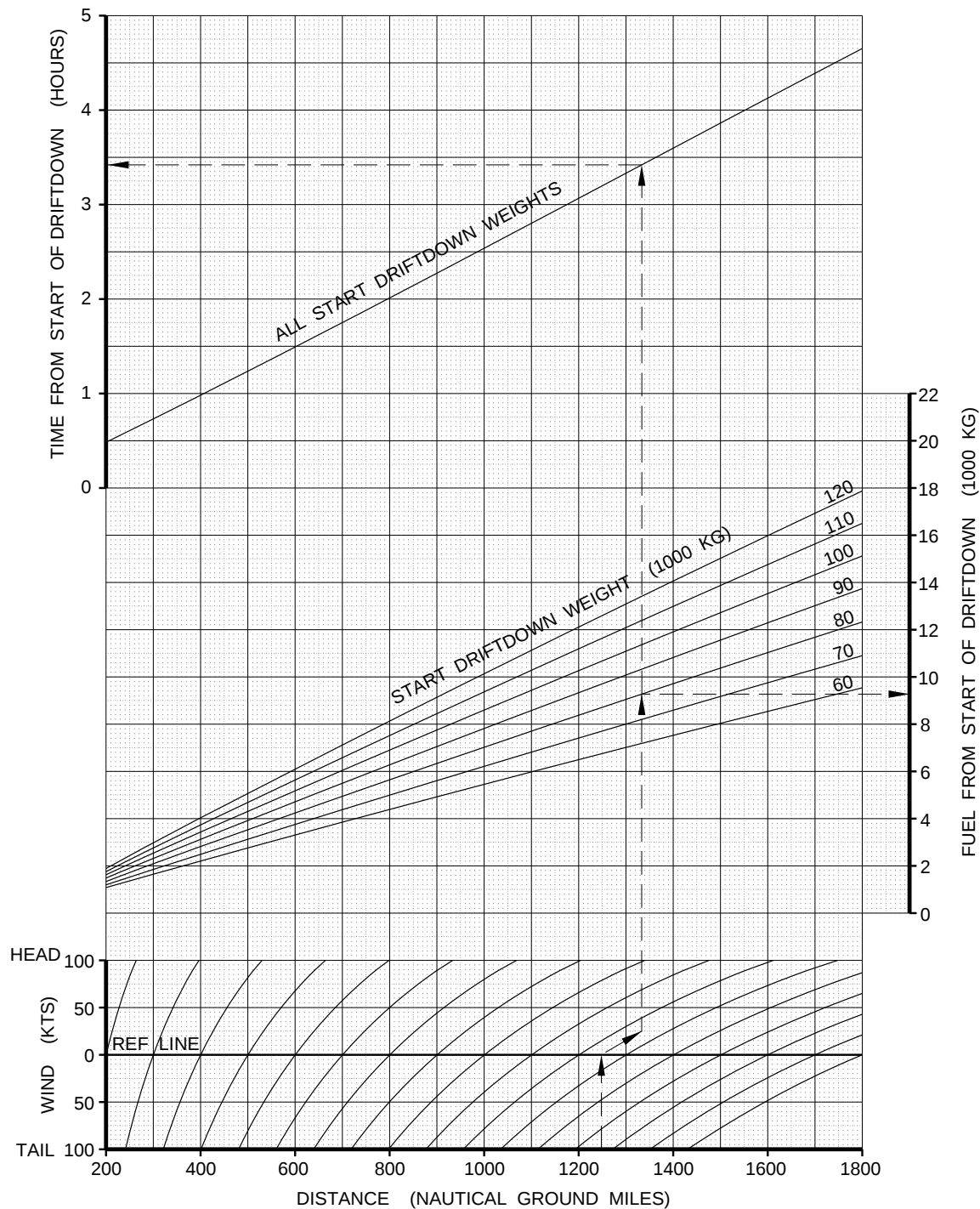


Anti-Ice Adjustments

ANTI-ICE CONFIGURATION	LEVEL OFF WEIGHT ADJUSTMENT (1000 KG)			
	PRESSURE ALTITUDE (1000 FT)			
	10	12	14	16
ENGINE ONLY	-10.8	-11.2	-11.9	-14.9
ENGINE AND WING	-35.2	-38.5	-45.8	

ENGINE INOP MAX CONTINUOUS THRUST

Long Range Cruise Driftdown/Cruise Range Capability Includes APU fuel burn

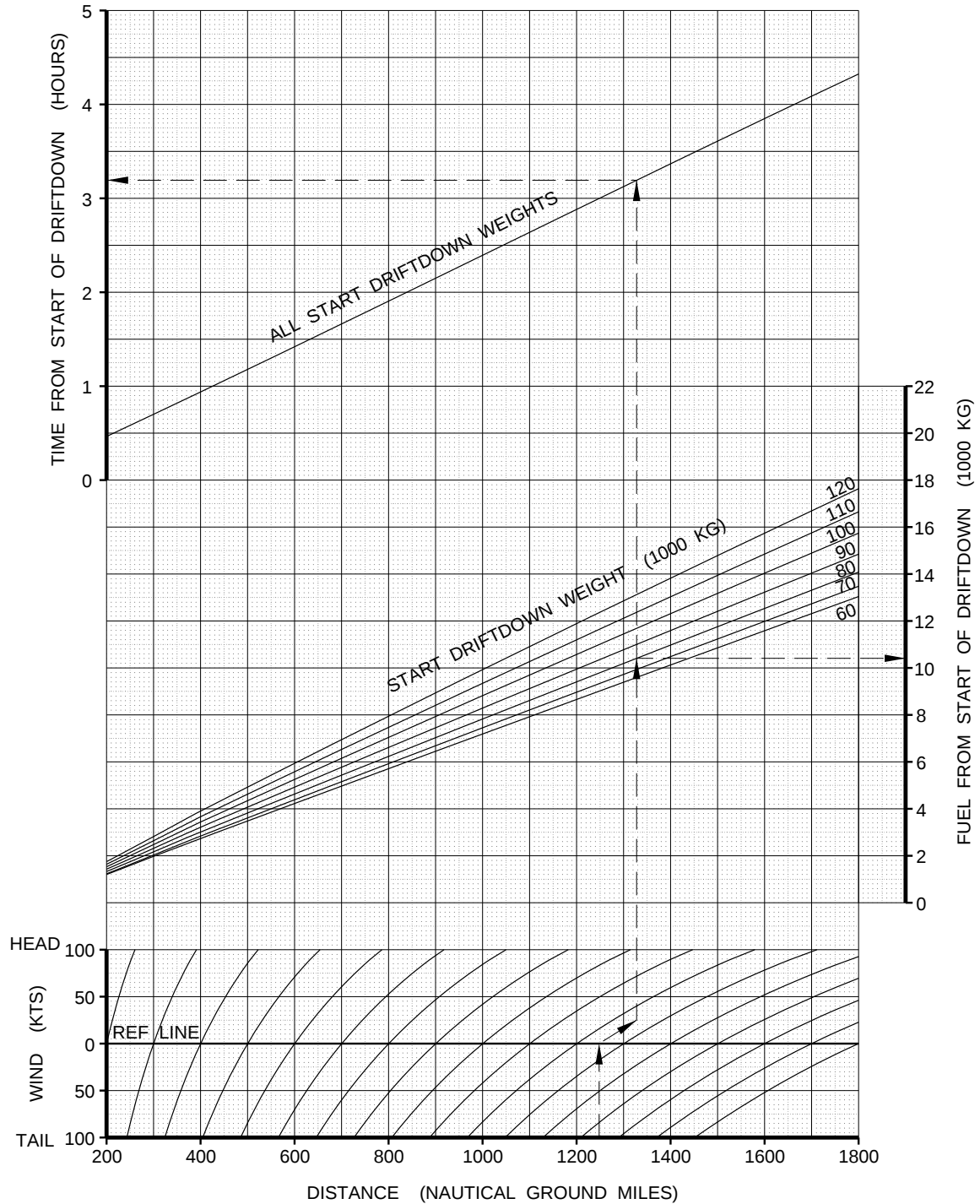


ENGINE INOP

MAX CONTINUOUS THRUST

.78M/290 KIAS Driftdown/Cruise Range Capability

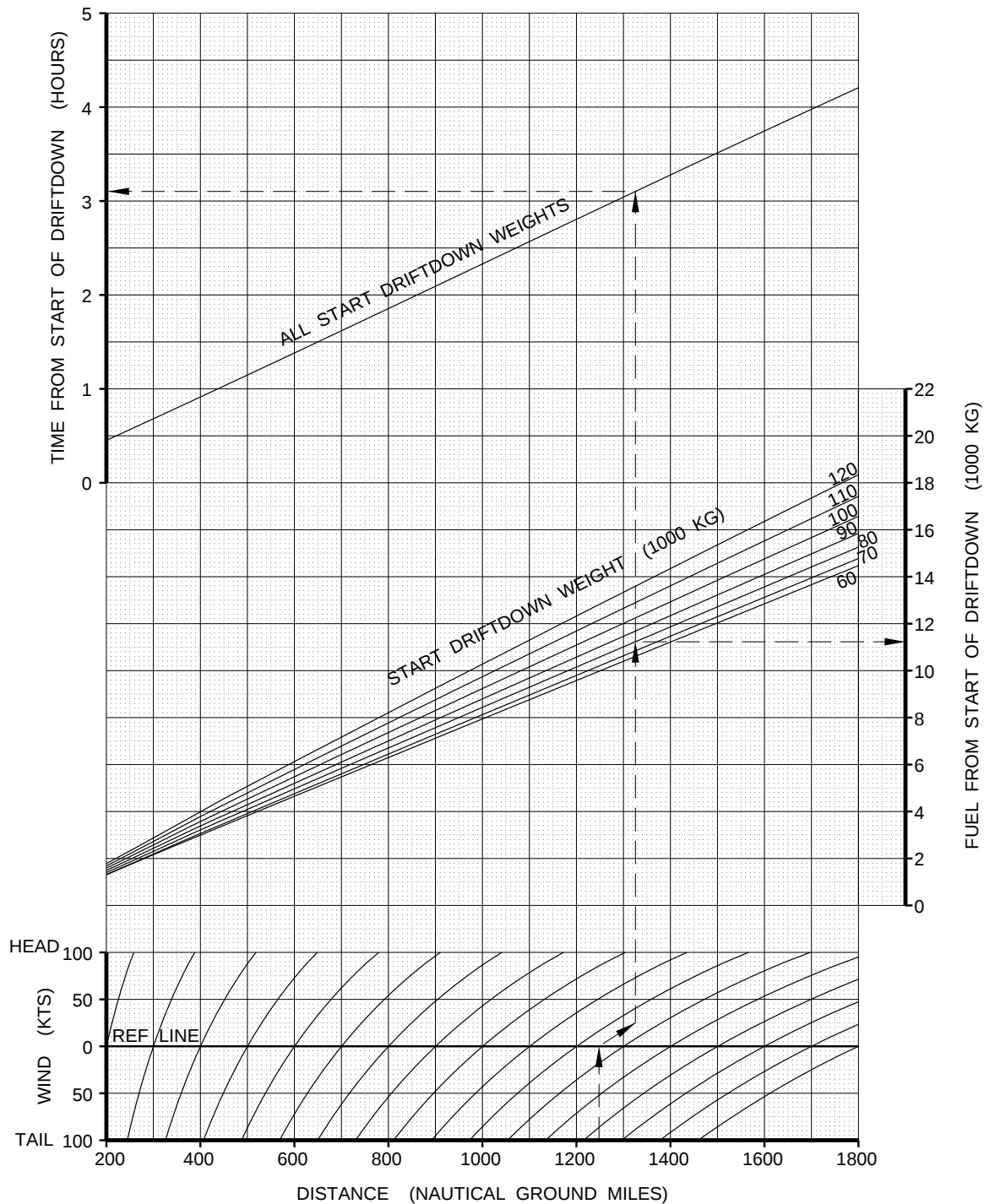
Includes APU fuel burn



ENGINE INOP MAX CONTINUOUS THRUST

.80M/310 KIAS Driftdown/Cruise Range Capability

Includes APU fuel burn

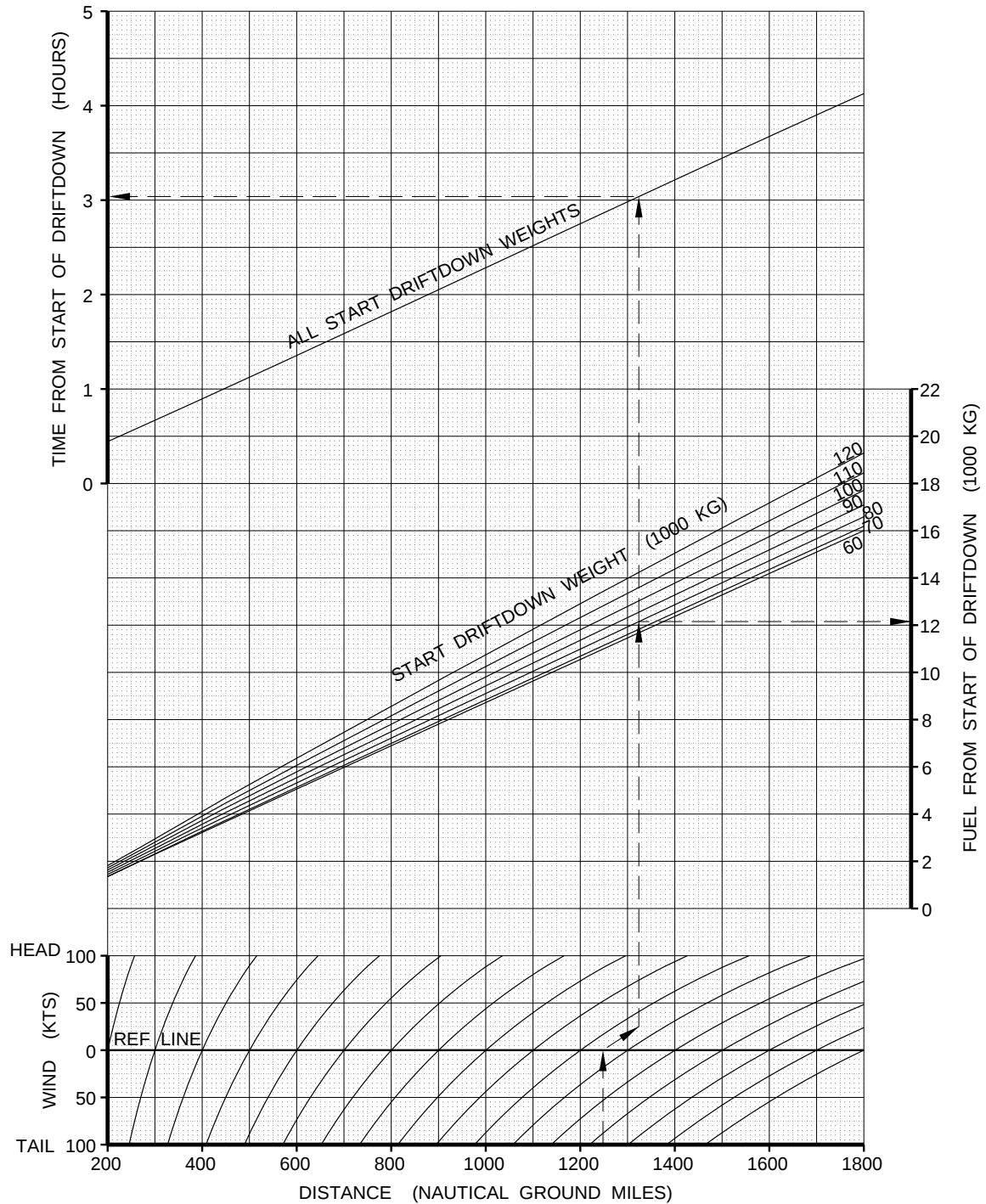


ENGINE INOP

MAX CONTINUOUS THRUST

.80M/330 KIAS Driftdown/Cruise Range Capability

Includes APU fuel burn



Intentionally
Blank

ENROUTE Table of Contents

Chapter 3

Text.....	3.1.1
Introduction	3.1.1
All Engines	3.1.1
Engine Inoperative.....	3.1.1
All Engine	3.2.1
Long Range Cruise Maximum Operating Altitude.....	3.2.1
290/.78 Enroute Climb.....	3.2.2
Long Range Cruise Enroute Fuel and Time.....	3.2.6
Long Range Cruise Table.....	3.2.8
.80M Cruise Table	3.2.14
Wind-Altitude Trade	3.2.16
Descent	3.2.17
Holding	3.2.17
Engine Inoperative	3.3.1
Long Range Cruise Altitude Capability	3.3.1
290 KIAS Altitude Capability	3.3.2
310 KIAS Altitude Capability	3.3.3
330 KIAS Altitude Capability	3.3.4
Long Range Cruise Table.....	3.3.5
290 KIAS Cruise Table	3.3.9
310 KIAS Cruise Table	3.3.11
330 KIAS Cruise Table	3.3.13
Long Range Cruise Diversion Fuel and Time	3.3.15
290 KIAS Diversion Fuel and Time	3.3.16
310 KIAS Diversion Fuel and Time	3.3.17
330 KIAS Diversion Fuel and Time	3.3.18
Holding	3.3.19

Intentionally
Blank

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.



Flight Planning and Performance Manual

Long Range Cruise Maximum Operating Altitude

ISA + 10°C and Below

WEIGHT (1000 KG)	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°)
120	31500	-8	35300*	35100	34300	32700	31200
115	32400	-10	36300*	36000	35200	33600	32100
110	33400	-12	37200*	36900	36100	34600	33100
105	34400	-14	38100*	37900	37100	35500	34100
100	35400	-17	39100*	38900	38100	36600	35100
95	36500	-18	40100*	40000	39200	37600	36200
90	37600	-18	41200*	41100	40300	38700	37300
85	38800	-18	42000	42000	41500	39900	38500
80	40000	-18	42000	42000	42000	41200	39800
75	41400	-18	42000	42000	42000	42000	41100
70	42000	-18	42000	42000	42000	42000	42000
65	42000	-18	42000	42000	42000	42000	42000
60	42000	-18	42000	42000	42000	42000	42000

ISA + 15°C

WEIGHT (1000 KG)	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°)
120	31500	-2	34300*	34300*	34300	32700	31200
115	32400	-4	35500*	35500*	35200	33600	32100
110	33400	-7	36500*	36500*	36100	34600	33100
105	34400	-9	37400*	37400*	37100	35500	34100
100	35400	-11	38400*	38400*	38100	36600	35100
95	36500	-13	39400*	39400*	39200	37600	36200
90	37600	-13	40400*	40400*	40300	38700	37300
85	38800	-13	41500*	41500*	41500	39900	38500
80	40000	-13	42000	42000	42000	41200	39800
75	41400	-13	42000	42000	42000	42000	41100
70	42000	-13	42000	42000	42000	42000	42000
65	42000	-13	42000	42000	42000	42000	42000
60	42000	-13	42000	42000	42000	42000	42000

ISA + 20°C

WEIGHT (1000 KG)	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°)
120	31500	3	32600*	32600*	32600*	32600*	31200
115	32400	1	34100*	34100*	34100*	33600	32100
110	33400	-1	35500*	35500*	35500*	34600	33100
105	34400	-3	36600*	36600*	36600*	35500	34100
100	35400	-5	37500*	37500*	37500*	36600	35100
95	36500	-7	38500*	38500*	38500*	37600	36200
90	37600	-7	39500*	39500*	39500*	38700	37300
85	38800	-7	40600*	40600*	40600*	39900	38500
80	40000	-7	41800*	41800*	41800*	41200	39800
75	41400	-7	42000	42000	42000	42000	41100
70	42000	-7	42000	42000	42000	42000	42000
65	42000	-7	42000	42000	42000	42000	42000
60	42000	-7	42000	42000	42000	42000	42000

*Denotes altitude thrust limited in level flight.

**290/.78 Enroute Climb
ISA & Below**

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
42000	TIME/FUEL							27/2600	23/2250	20/2050	18/1850	16/1700
	DIST/SPD							173/416	144/412	126/410	113/409	102/408
41000	TIME/FUEL						28/2750	24/2400	21/2150	19/1950	17/1800	15/1650
	DIST/SPD						178/415	148/411	130/409	117/408	105/407	95/406
40000	TIME/FUEL					29/2850	24/2500	22/2300	20/2100	18/1900	16/1750	14/1600
	DIST/SPD					181/413	152/409	134/408	121/406	109/405	99/404	90/403
39000	TIME/FUEL				29/3000	25/2650	22/2400	20/2200	19/2000	17/1850	15/1700	14/1550
	DIST/SPD				183/411	155/408	138/406	124/405	112/404	102/403	93/402	85/401
38000	TIME/FUEL			29/3100	26/2750	23/2500	21/2300	19/2150	18/1950	16/1800	15/1650	13/1500
	DIST/SPD			184/409	158/406	141/404	127/403	116/402	106/401	96/400	88/400	80/399
37000	TIME/FUEL		30/3200	26/2850	24/2650	22/2400	20/2250	18/2050	17/1900	16/1750	14/1600	13/1500
	DIST/SPD		187/408	161/404	144/402	130/401	119/400	109/399	100/399	91/398	83/397	76/397
36000	TIME/FUEL	30/3300	27/3000	24/2750	22/2550	21/2350	19/2150	18/2000	16/1850	15/1700	13/1550	12/1450
	DIST/SPD	188/405	164/402	147/401	134/399	122/398	112/398	103/397	94/396	87/396	79/395	72/394
35000	TIME/FUEL	28/3100	25/2850	23/2650	21/2450	20/2300	18/2100	17/1950	16/1800	14/1650	13/1550	12/1400
	DIST/SPD	169/401	152/399	138/398	126/397	116/396	106/395	98/394	90/394	82/393	76/393	69/392
34000	TIME/FUEL	26/3000	24/2750	22/2550	20/2400	19/2200	18/2050	16/1900	15/1750	14/1650	12/1500	11/1400
	DIST/SPD	156/397	141/396	130/395	119/394	110/393	101/393	93/392	86/391	79/391	72/390	66/390
33000	TIME/FUEL	25/2850	23/2650	21/2500	20/2300	18/2150	17/2000	16/1850	15/1700	13/1600	12/1450	11/1350
	DIST/SPD	145/394	133/393	122/392	113/391	104/390	96/390	88/389	81/389	75/388	69/388	63/387
32000	TIME/FUEL	23/2800	22/2600	20/2400	19/2250	18/2100	16/1950	15/1800	14/1700	13/1550	12/1450	10/1300
	DIST/SPD	136/390	125/389	115/389	107/388	99/387	91/387	84/386	77/386	71/385	65/385	60/384
31000	TIME/FUEL	22/2700	21/2500	19/2350	18/2200	17/2050	16/1900	15/1750	13/1650	12/1500	11/1400	10/1300
	DIST/SPD	128/387	118/386	109/385	101/385	93/384	86/384	80/383	74/383	68/382	62/382	57/381
30000	TIME/FUEL	21/2550	20/2400	18/2250	17/2100	16/1950	15/1850	14/1700	13/1600	12/1450	11/1350	10/1250
	DIST/SPD	118/382	109/381	101/381	94/380	87/380	80/379	74/379	69/378	63/378	58/377	53/377
29000	TIME/FUEL	20/2450	19/2300	17/2150	16/2000	15/1900	14/1750	13/1650	12/1500	11/1400	10/1300	9/1200
	DIST/SPD	109/377	101/377	94/376	87/376	81/375	75/375	69/375	64/374	59/374	54/373	50/373
28000	TIME/FUEL	19/2350	18/2200	16/2050	15/1950	14/1800	13/1700	12/1600	12/1450	11/1350	10/1250	9/1150
	DIST/SPD	101/373	94/372	87/372	81/372	75/371	69/371	64/370	59/370	55/369	50/369	46/369
27000	TIME/FUEL	18/2250	17/2150	16/2000	15/1850	14/1750	13/1650	12/1500	11/1400	10/1300	9/1200	8/1100
	DIST/SPD	93/369	87/368	80/368	75/367	70/367	65/367	60/366	55/366	51/365	47/365	43/365
26000	TIME/FUEL	17/2150	16/2050	15/1900	14/1800	13/1700	12/1550	11/1450	10/1350	10/1250	9/1150	8/1100
	DIST/SPD	86/364	80/364	75/364	69/363	65/363	60/363	56/362	51/362	48/362	44/361	40/361
25000	TIME/FUEL	16/2100	15/1950	14/1850	13/1750	12/1600	11/1500	11/1400	10/1300	9/1200	8/1150	7/1050
	DIST/SPD	80/361	74/360	69/360	64/360	60/359	56/359	52/359	48/358	44/358	41/357	38/357
24000	TIME/FUEL	15/2000	14/1900	13/1750	12/1650	12/1550	11/1450	10/1350	9/1250	9/1150	8/1100	7/1000
	DIST/SPD	74/357	69/356	64/356	60/356	56/356	52/355	48/355	44/355	41/354	38/354	35/353
23000	TIME/FUEL	14/1900	13/1800	12/1700	12/1600	11/1500	10/1400	10/1300	9/1200	8/1150	7/1050	7/950
	DIST/SPD	68/353	63/353	59/352	55/352	52/352	48/352	45/351	41/351	38/351	35/350	33/350
22000	TIME/FUEL	13/1850	13/1750	12/1650	11/1550	10/1450	10/1350	9/1250	9/1150	8/1100	7/1000	6/950
	DIST/SPD	63/350	59/349	55/349	51/349	48/349	44/348	41/348	38/348	36/347	33/347	30/347
21000	TIME/FUEL	13/1750	12/1650	11/1550	11/1450	10/1400	9/1300	9/1200	8/1100	7/1050	7/950	6/900
	DIST/SPD	58/346	54/346	51/346	47/345	44/345	41/345	38/345	36/344	33/344	30/344	28/343
20000	TIME/FUEL	12/1700	11/1600	11/1500	10/1400	9/1350	9/1250	8/1150	8/1100	7/1000	6/950	6/850
	DIST/SPD	53/343	50/343	47/342	44/342	41/342	38/342	35/341	33/341	30/341	28/340	26/340
18000	TIME/FUEL	11/1550	10/1450	9/1350	9/1300	8/1200	8/1150	7/1050	7/1000	6/900	6/850	5/800
	DIST/SPD	45/336	42/336	39/336	37/336	35/336	32/335	30/335	28/335	26/335	24/334	22/334
16000	TIME/FUEL	9/1400	9/1300	8/1250	8/1200	8/1100	7/1050	7/950	6/900	6/850	5/800	4/750
	DIST/SPD	38/330	35/330	33/330	31/330	29/330	27/330	25/329	23/329	22/329	20/328	19/328
14000	TIME/FUEL	8/1250	8/1200	7/1100	7/1050	7/1000	6/950	6/900	6/800	5/750	4/700	4/650
	DIST/SPD	31/325	29/325	27/325	25/324	24/324	22/324	21/324	19/323	18/323	17/323	15/322
10000	TIME/FUEL	6/1000	6/950	6/900	5/850	5/800	5/750	5/700	4/650	4/600	3/550	3/550
	DIST/SPD	19/314	18/314	17/314	16/314	15/314	14/314	13/313	12/313	11/313	10/312	10/312
1500	TIME/FUEL	3/450	2/450	2/400	2/400	2/400	2/350	2/350	2/300	2/300	1/250	1/250

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-100	-200	-300	-350	-450	-550

Shaded area approximates optimum altitude at LRC.



Flight Planning and Performance Manual

290/.78 Enroute Climb
ISA + 10°C

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
42000	TIME/FUEL DIST/SPD							28/2700 181/425	23/2350 151/421	21/2150 133/419	18/1950 119/418	16/1750 107/417
41000	TIME/FUEL DIST/SPD						29/2850 187/424	24/2500 156/420	22/2250 137/418	19/2050 123/417	17/1900 111/415	16/1700 100/414
40000	TIME/FUEL DIST/SPD					29/3000 190/422	25/2650 160/418	22/2400 141/416	20/2200 127/415	18/2000 114/414	16/1850 104/413	15/1650 94/412
39000	TIME/FUEL DIST/SPD				30/3100 192/420	26/2750 163/417	23/2500 144/415	21/2300 130/413	19/2100 118/412	17/1950 107/411	16/1800 98/410	14/1650 89/410
38000	TIME/FUEL DIST/SPD			30/3250 194/418	26/2900 166/415	24/2650 148/413	22/2400 134/411	20/2200 121/410	18/2050 111/410	17/1900 101/409	15/1750 92/408	13/1600 84/407
37000	TIME/FUEL DIST/SPD		31/3350 197/416	27/3000 169/413	24/2750 151/411	22/2550 137/410	20/2350 125/409	19/2150 114/408	17/2000 104/407	16/1850 96/406	14/1700 87/406	13/1550 80/405
36000	TIME/FUEL DIST/SPD	31/3450 198/414	28/3100 172/411	25/2850 155/409	23/2650 140/408	21/2450 128/407	20/2250 118/406	18/2100 108/405	17/1950 99/404	15/1800 91/404	14/1650 83/403	12/1500 76/403
35000	TIME/FUEL DIST/SPD	29/3250 177/409	26/3000 159/407	24/2750 145/406	22/2550 132/405	20/2400 121/404	19/2200 112/403	17/2050 103/403	16/1900 94/402	15/1750 86/401	13/1600 79/401	12/1450 73/400
34000	TIME/FUEL DIST/SPD	27/3100 163/406	25/2900 148/404	23/2650 136/403	21/2500 125/402	19/2300 115/401	18/2150 106/401	17/2000 97/400	15/1850 90/400	14/1700 82/399	13/1550 76/398	11/1450 69/398
33000	TIME/FUEL DIST/SPD	25/3000 152/402	23/2800 139/401	22/2600 128/400	20/2400 118/399	19/2250 109/399	17/2100 100/398	16/1950 93/397	15/1800 85/397	14/1650 78/396	12/1550 72/396	11/1400 66/395
32000	TIME/FUEL DIST/SPD	24/2900 143/398	22/2700 131/397	21/2500 121/397	19/2350 112/396	18/2200 103/395	17/2050 95/395	15/1900 88/394	14/1750 81/394	13/1600 75/393	12/1500 69/393	11/1350 63/392
31000	TIME/FUEL DIST/SPD	23/2800 134/395	21/2600 124/394	20/2450 114/393	18/2250 106/393	17/2100 98/392	16/2000 90/392	15/1850 84/391	14/1700 77/391	13/1550 71/390	11/1450 65/390	10/1350 60/389
30000	TIME/FUEL DIST/SPD	22/2700 124/390	20/2500 114/389	19/2350 106/389	18/2200 98/388	16/2050 91/388	15/1900 84/387	14/1750 78/387	13/1650 72/386	12/1500 66/386	11/1400 61/385	10/1300 56/385
29000	TIME/FUEL DIST/SPD	20/2550 114/385	19/2400 106/384	18/2250 98/384	17/2100 91/383	15/1950 84/383	14/1850 78/383	13/1700 72/382	12/1600 67/382	11/1450 62/381	10/1350 57/381	9/1250 52/380
28000	TIME/FUEL DIST/SPD	19/2450 105/380	18/2300 98/380	17/2150 91/379	16/2000 84/379	15/1900 78/379	14/1750 73/378	13/1650 67/378	12/1500 62/377	11/1400 57/377	10/1300 53/376	9/1200 48/376
27000	TIME/FUEL DIST/SPD	18/2350 97/376	17/2200 90/375	16/2050 84/375	15/1950 78/375	14/1800 73/374	13/1700 67/374	12/1600 62/374	11/1450 58/373	10/1350 53/373	9/1250 49/372	8/1150 45/372
26000	TIME/FUEL DIST/SPD	17/2250 90/372	16/2100 84/371	15/2000 78/371	14/1850 72/371	13/1750 67/370	12/1650 63/370	11/1500 58/370	10/1400 54/369	9/1200 50/369	8/1100 46/368	7/1050 42/368
25000	TIME/FUEL DIST/SPD	16/2150 83/368	15/2050 77/367	14/1900 72/367	13/1800 67/367	12/1700 63/366	11/1550 58/366	10/1450 54/366	9/1350 50/365	8/1250 46/365	7/1100 43/364	6/1000 39/364
24000	TIME/FUEL DIST/SPD	15/2050 77/364	14/1950 72/363	13/1850 67/363	12/1750 62/363	11/1650 58/362	10/1500 54/362	9/1350 50/362	8/1200 46/361	7/1050 43/361	6/950 40/361	5/800 37/360
23000	TIME/FUEL DIST/SPD	14/2000 71/360	14/1850 66/360	13/1750 62/359	12/1650 58/359	11/1550 54/359	10/1450 50/358	9/1300 46/358	8/1150 43/358	7/1000 40/357	6/900 37/357	5/750 34/357
22000	TIME/FUEL DIST/SPD	14/1900 66/356	13/1800 61/356	12/1700 57/356	11/1600 53/355	10/1500 50/355	9/1350 46/355	8/1200 43/355	7/1050 40/354	6/900 37/354	5/750 34/354	4/600 32/353
21000	TIME/FUEL DIST/SPD	13/1800 60/353	12/1700 56/352	11/1600 53/352	10/1500 49/352	9/1350 46/352	8/1200 43/351	7/1050 40/351	6/900 37/351	5/750 34/351	4/600 32/350	3/550 29/350
20000	TIME/FUEL DIST/SPD	12/1750 56/349	11/1650 52/349	10/1550 49/349	9/1450 45/349	8/1300 42/348	7/1150 40/348	6/1000 37/348	5/850 34/348	4/700 32/347	3/550 29/347	2/500 27/346
18000	TIME/FUEL DIST/SPD	11/1600 47/343	10/1500 44/343	9/1400 41/342	8/1300 38/342	7/1150 36/342	6/1000 34/342	5/850 31/341	4/700 29/341	3/550 27/341	2/500 25/341	1/450 23/340
16000	TIME/FUEL DIST/SPD	10/1450 39/337	9/1350 37/336	8/1200 34/336	7/1100 32/336	6/1000 30/336	5/850 28/336	4/700 26/335	3/550 24/335	2/500 23/335	1/450 21/334	0/400 19/334
14000	TIME/FUEL DIST/SPD	8/1300 32/331	7/1200 30/331	6/1100 28/330	5/950 26/330	4/800 25/330	3/650 23/330	2/500 22/330	1/450 20/329	0/400 19/329	0/350 17/329	0/300 16/328
10000	TIME/FUEL DIST/SPD	6/1000 20/320	5/950 19/320	4/800 18/320	3/650 17/320	2/500 15/319	1/450 14/319	0/400 13/319	0/350 12/319	0/300 11/318	0/250 10/318	0/200 10/317
1500	TIME/FUEL	3/450	2/450	2/400	2/400	2/400	2/350	2/350	2/300	2/300	1/250	1/250

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-100	-200	-300	-400	-500	-600

Shaded area approximates optimum altitude at LRC.

290/.78 Enroute Climb
ISA + 15°C

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
42000	TIME/FUEL								27/2600	24/2300	21/2100	19/1900
	DIST/SPD								182/428	156/425	138/424	124/423
41000	TIME/FUEL							28/2750	25/2450	22/2250	20/2000	18/1850
	DIST/SPD							188/427	162/424	143/422	128/421	115/420
40000	TIME/FUEL						29/2900	26/2600	23/2350	21/2150	19/1950	17/1800
	DIST/SPD						193/425	167/422	148/421	133/419	120/418	108/418
39000	TIME/FUEL					30/3050	27/2750	24/2500	22/2250	20/2100	18/1900	16/1750
	DIST/SPD					197/423	171/421	153/419	137/418	124/417	113/416	102/415
38000	TIME/FUEL				31/3200	27/2850	25/2600	23/2400	21/2200	19/2000	17/1850	15/1700
	DIST/SPD				201/421	176/419	157/417	142/416	129/415	117/414	106/413	97/413
37000	TIME/FUEL		38/3850	32/3350	28/3000	26/2750	23/2500	21/2300	20/2150	18/1950	16/1800	14/1650
	DIST/SPD		252/425	205/420	180/417	162/416	146/414	133/413	121/412	110/411	101/411	92/410
36000	TIME/FUEL	38/4000	33/3500	29/3150	26/2900	24/2650	22/2450	20/2250	19/2050	17/1900	15/1750	14/1600
	DIST/SPD	253/423	210/418	185/415	166/414	151/413	137/412	125/411	115/410	105/409	96/408	87/408
35000	TIME/FUEL	34/3650	30/3300	27/3000	25/2800	23/2550	21/2350	20/2200	18/2000	16/1850	15/1700	13/1550
	DIST/SPD	183/408	166/407	151/406	139/405	127/404	117/403	107/403	98/402	90/401	83/401	75/400
34000	TIME/FUEL	31/3450	28/3150	26/2900	24/2700	22/2500	20/2300	19/2150	17/1950	16/1800	14/1650	13/1550
	DIST/SPD	198/412	178/410	161/409	147/408	134/407	123/406	113/405	104/405	95/404	87/404	79/403
33000	TIME/FUEL	29/3300	27/3050	25/2800	23/2600	21/2400	20/2250	18/2050	17/1900	15/1750	14/1600	12/1500
	DIST/SPD	183/408	166/407	151/406	139/405	127/404	117/403	107/403	98/402	90/401	83/401	75/400
32000	TIME/FUEL	28/3200	26/2950	24/2750	22/2550	20/2350	19/2200	17/2000	16/1850	15/1700	13/1600	12/1450
	DIST/SPD	171/404	156/403	142/402	131/402	120/401	111/400	102/400	93/399	86/398	79/398	72/397
31000	TIME/FUEL	26/3050	24/2850	23/2650	21/2450	19/2300	18/2100	17/1950	15/1800	14/1650	13/1550	11/1400
	DIST/SPD	160/400	146/399	134/399	123/398	114/397	105/397	96/396	89/396	81/395	75/395	68/394
30000	TIME/FUEL	25/2900	23/2700	21/2550	20/2350	18/2200	17/2050	16/1900	15/1750	13/1600	12/1500	11/1350
	DIST/SPD	146/395	134/394	124/394	114/393	105/393	97/392	90/392	82/391	76/390	69/390	64/389
29000	TIME/FUEL	23/2800	22/2600	20/2400	19/2250	17/2100	16/1950	15/1800	14/1700	13/1550	11/1450	10/1300
	DIST/SPD	134/390	124/389	114/389	105/388	97/388	90/387	83/387	76/386	70/386	65/385	59/385
28000	TIME/FUEL	22/2650	20/2500	19/2300	18/2150	16/2000	15/1900	14/1750	13/1600	12/1500	11/1400	10/1250
	DIST/SPD	123/385	114/385	105/384	97/384	90/383	83/383	77/382	71/382	65/381	60/381	55/380
27000	TIME/FUEL	20/2550	19/2350	18/2200	17/2050	15/1950	14/1800	13/1650	12/1550	11/1450	10/1300	9/1200
	DIST/SPD	114/381	105/380	97/380	90/379	83/379	77/378	71/378	66/378	61/377	56/377	51/376
26000	TIME/FUEL	19/2450	18/2250	17/2100	16/2000	15/1850	14/1750	13/1600	12/1500	11/1400	10/1300	9/1200
	DIST/SPD	105/376	97/376	90/375	83/375	77/375	72/374	66/374	61/373	56/373	52/373	48/372
25000	TIME/FUEL	18/2300	17/2150	16/2050	15/1900	14/1800	13/1650	12/1550	11/1450	10/1350	9/1250	8/1150
	DIST/SPD	96/372	89/372	83/371	77/371	71/370	66/370	61/370	57/369	52/369	48/369	44/368
24000	TIME/FUEL	17/2200	16/2100	15/1950	14/1800	13/1700	12/1600	11/1500	11/1400	10/1300	9/1200	8/1100
	DIST/SPD	89/368	82/367	77/367	71/367	66/366	61/366	57/366	53/365	49/365	45/365	41/364
23000	TIME/FUEL	16/2100	15/2000	14/1850	13/1750	12/1650	12/1550	11/1400	10/1300	9/1250	8/1150	7/1050
	DIST/SPD	82/364	76/364	71/363	66/363	61/363	57/362	53/362	49/362	45/361	42/361	38/361
22000	TIME/FUEL	15/2000	14/1900	13/1800	12/1650	12/1550	11/1450	10/1350	9/1250	9/1200	8/1100	7/1000
	DIST/SPD	75/360	70/360	65/360	61/359	56/359	52/359	49/358	45/358	42/358	38/357	35/357
21000	TIME/FUEL	14/1950	13/1800	13/1700	12/1600	11/1500	10/1400	10/1300	9/1200	8/1150	7/1050	7/950
	DIST/SPD	69/356	65/356	60/356	56/356	52/355	48/355	45/355	42/355	39/354	36/354	33/354
20000	TIME/FUEL	13/1850	13/1750	12/1650	11/1550	10/1450	10/1350	9/1250	9/1150	8/1100	7/1000	6/950
	DIST/SPD	64/353	59/353	55/352	52/352	48/352	45/352	42/352	39/351	36/351	33/351	30/350
18000	TIME/FUEL	12/1650	11/1550	10/1500	10/1400	9/1300	9/1250	8/1150	8/1050	7/1000	6/900	6/850
	DIST/SPD	53/346	50/346	47/346	44/346	41/345	38/345	35/345	33/345	30/344	28/344	26/344
16000	TIME/FUEL	10/1500	10/1400	9/1350	9/1250	8/1200	8/1100	7/1050	7/950	6/900	6/850	5/800
	DIST/SPD	44/340	41/340	39/340	36/339	34/339	32/339	29/339	27/339	25/338	23/338	22/338
14000	TIME/FUEL	9/1350	9/1300	8/1200	8/1150	7/1100	7/1000	6/950	6/900	6/800	5/750	4/700
	DIST/SPD	36/334	34/334	32/334	30/334	28/333	26/333	24/333	22/333	21/332	19/332	18/332
10000	TIME/FUEL	7/1050	6/1000	6/950	6/900	5/850	5/800	5/750	5/700	4/650	4/600	3/550
	DIST/SPD	22/323	21/323	20/323	18/323	17/322	16/322	15/322	14/322	13/322	12/321	11/321
1500	TIME/FUEL	3/450	2/450	2/400	2/400	2/400	2/350	2/350	2/300	2/300	1/250	1/250

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-100	-200	-300	-400	-500	-600

Shaded area approximates optimum altitude at LRC.



Flight Planning and Performance Manual

290/.78 Enroute Climb
ISA + 20°C

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
42000	TIME/FUEL DIST/SPD								33/2950 228/436	28/2550 189/432	24/2300 164/430	21/2050 145/428
41000	TIME/FUEL DIST/SPD							35/3150 239/435	29/2700 196/431	26/2450 171/429	23/2200 151/427	20/2000 135/426
40000	TIME/FUEL DIST/SPD						36/3350 246/433	30/2900 202/429	27/2600 177/427	24/2350 157/426	21/2100 141/424	19/1950 127/423
39000	TIME/FUEL DIST/SPD					37/3500 252/432	31/3050 208/428	28/2750 183/425	25/2500 163/424	23/2250 146/423	20/2050 132/422	18/1850 119/421
38000	TIME/FUEL DIST/SPD				38/3650 256/430	32/3200 214/426	29/2900 189/424	26/2600 169/422	24/2400 152/421	21/2200 137/420	19/2000 124/419	17/1800 112/418
37000	TIME/FUEL DIST/SPD			39/3800 260/428	34/3350 221/424	30/3050 195/422	27/2750 175/421	25/2550 157/419	22/2300 142/418	20/2100 129/417	18/1950 117/417	16/1750 106/416
36000	TIME/FUEL DIST/SPD		40/4000 268/426	35/3550 229/423	31/3200 202/421	28/2900 181/419	26/2650 163/418	23/2450 148/417	21/2250 134/416	19/2050 122/415	18/1900 111/414	16/1700 101/413
35000	TIME/FUEL DIST/SPD	42/4250 282/425	36/3750 239/422	33/3400 210/419	29/3100 188/417	27/2850 170/416	24/2600 154/415	22/2400 140/414	20/2200 128/413	19/2000 116/412	17/1850 106/412	15/1700 97/411
34000	TIME/FUEL DIST/SPD	38/3950 249/420	34/3550 219/418	31/3250 196/416	28/2950 177/414	26/2750 160/413	23/2500 146/412	21/2300 133/411	20/2100 121/410	18/1950 110/410	16/1800 101/409	15/1650 92/408
33000	TIME/FUEL DIST/SPD	35/3750 227/416	32/3400 203/414	29/3100 183/412	27/2850 166/411	24/2650 151/410	22/2450 138/409	21/2250 126/408	19/2050 115/408	17/1900 105/407	16/1750 96/406	14/1600 87/406
32000	TIME/FUEL DIST/SPD	33/3550 209/411	30/3250 189/410	28/3000 171/409	25/2750 156/408	23/2550 142/407	21/2350 130/406	20/2200 119/405	18/2000 109/404	17/1850 99/404	15/1700 91/403	13/1550 83/403
31000	TIME/FUEL DIST/SPD	31/3400 194/407	29/3150 176/406	26/2900 160/405	24/2700 146/404	22/2500 134/403	20/2300 123/402	19/2100 112/402	17/1950 103/401	16/1800 94/400	14/1650 86/400	13/1500 79/399
30000	TIME/FUEL DIST/SPD	29/3250 176/401	27/3000 161/400	24/2750 147/399	23/2550 135/399	21/2350 124/398	19/2200 113/397	18/2050 104/397	16/1850 95/396	15/1700 87/395	14/1600 80/395	12/1450 73/394
29000	TIME/FUEL DIST/SPD	27/3050 161/396	25/2850 147/395	23/2650 135/394	21/2450 124/393	20/2250 114/393	18/2100 105/392	17/1950 96/392	15/1800 88/391	14/1650 81/391	13/1500 74/390	11/1400 68/390
28000	TIME/FUEL DIST/SPD	25/2900 147/390	23/2700 135/390	21/2500 124/389	20/2350 114/389	18/2150 105/388	17/2000 96/387	16/1850 89/387	15/1700 81/386	13/1600 75/386	12/1450 68/385	11/1350 63/385
27000	TIME/FUEL DIST/SPD	23/2750 134/386	22/2600 123/385	20/2400 114/384	19/2250 105/384	17/2100 97/383	16/1950 89/383	15/1800 82/382	14/1650 75/382	13/1500 69/382	11/1400 64/381	10/1300 58/381
26000	TIME/FUEL DIST/SPD	22/2650 123/381	20/2450 113/380	19/2300 104/380	18/2150 96/379	16/2000 89/379	15/1850 82/379	14/1700 76/378	13/1600 70/378	12/1450 64/377	11/1350 59/377	10/1250 54/376
25000	TIME/FUEL DIST/SPD	21/2500 113/376	19/2350 104/376	18/2200 96/375	17/2050 89/375	15/1900 82/375	14/1750 76/374	13/1650 70/374	12/1500 65/374	11/1400 59/373	10/1300 55/373	9/1200 50/372
24000	TIME/FUEL DIST/SPD	19/2400 104/372	18/2250 96/372	17/2100 88/371	16/1950 82/371	15/1800 76/371	14/1700 70/370	13/1550 65/370	12/1450 60/370	11/1350 55/369	10/1250 51/369	9/1150 47/368
23000	TIME/FUEL DIST/SPD	18/2300 95/368	17/2150 88/368	16/2000 81/367	15/1850 75/367	14/1750 70/367	13/1600 65/366	12/1500 60/366	11/1400 55/366	10/1300 51/365	9/1200 47/365	8/1100 43/365
22000	TIME/FUEL DIST/SPD	17/2150 87/364	16/2050 81/364	15/1900 75/363	14/1800 70/363	13/1650 64/363	12/1550 60/363	11/1450 55/362	10/1350 51/362	10/1250 47/362	9/1150 43/361	8/1050 40/361
21000	TIME/FUEL DIST/SPD	16/2050 80/360	15/1950 74/360	14/1800 69/360	13/1700 64/359	12/1600 59/359	11/1500 55/359	10/1400 51/359	9/1200 47/358	8/1100 44/358	7/1000 40/358	6/900 37/357
20000	TIME/FUEL DIST/SPD	15/1950 73/357	14/1850 68/356	13/1750 63/356	12/1600 59/356	11/1500 55/356	10/1400 51/355	9/1200 47/355	8/1100 44/355	7/950 40/355	6/850 37/354	5/750 34/354
18000	TIME/FUEL DIST/SPD	13/1750 61/350	12/1650 57/350	12/1550 53/349	11/1450 49/349	10/1400 46/349	9/1200 43/349	8/1100 40/348	7/950 37/348	6/850 34/348	5/750 31/348	4/600 29/347
16000	TIME/FUEL DIST/SPD	11/1600 51/343	11/1500 47/343	10/1400 44/343	10/1350 41/343	9/1250 38/343	8/1150 36/342	7/1000 33/342	6/900 31/342	5/800 28/342	4/650 26/341	3/600 24/341
14000	TIME/FUEL DIST/SPD	10/1400 41/337	9/1350 39/337	9/1250 36/337	8/1200 34/337	7/1100 31/337	6/1000 29/336	5/750 27/336	4/600 25/336	3/500 23/336	2/350 22/335	1/250 20/335
10000	TIME/FUEL DIST/SPD	7/1100 25/326	7/1050 24/326	7/1000 22/326	6/950 21/326	6/900 19/325	5/800 18/325	4/650 17/325	3/500 16/325	2/350 15/325	1/250 13/324	1/250 12/324
1500	TIME/FUEL	3/450	2/450	2/400	2/400	2/400	2/350	2/350	2/300	2/300	1/250	1/250

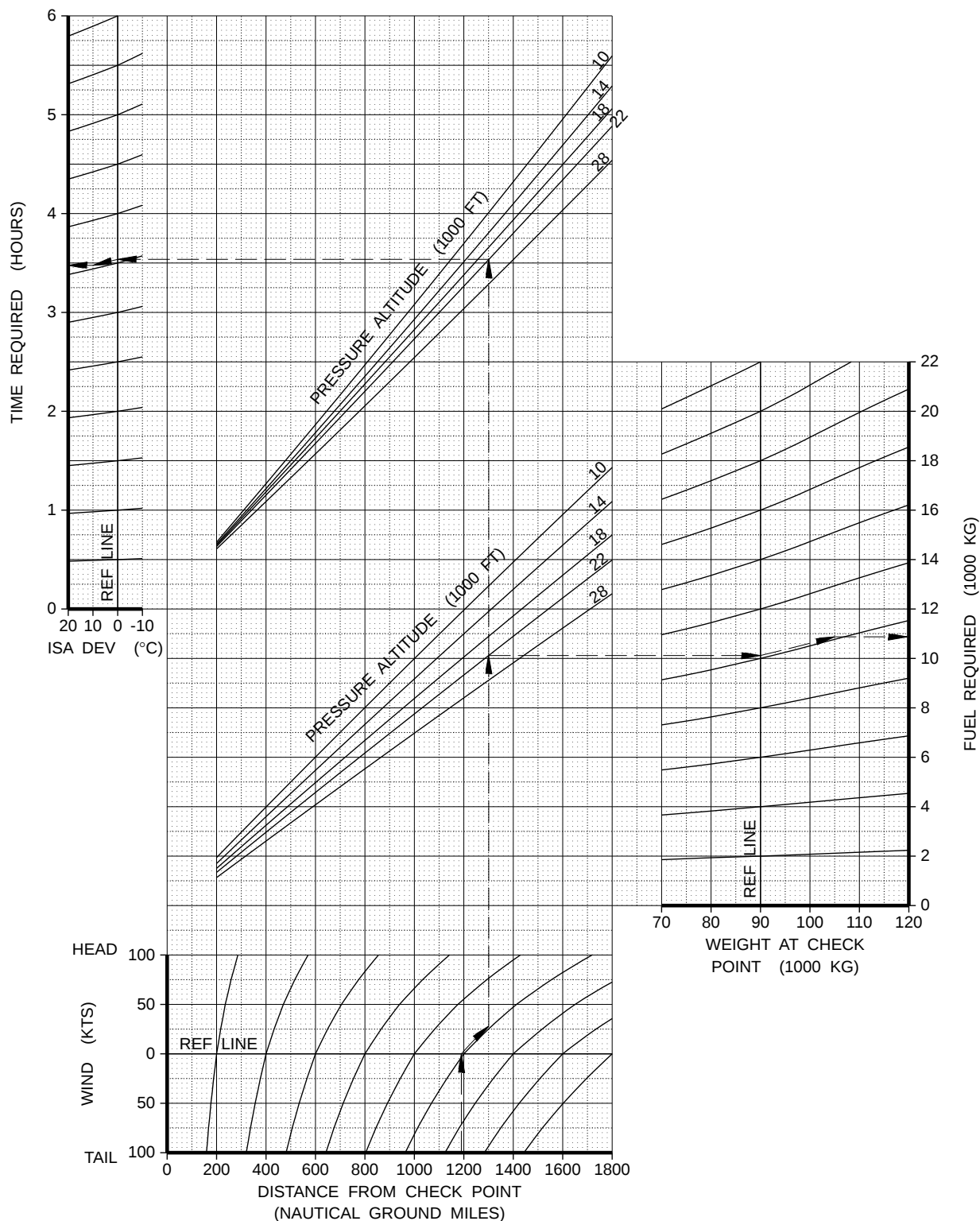
FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-100	-200	-350	-450	-550	-650

Shaded area approximates optimum altitude at LRC.

Long Range Cruise Enroute Fuel and Time

0 to 1800 NM Distance

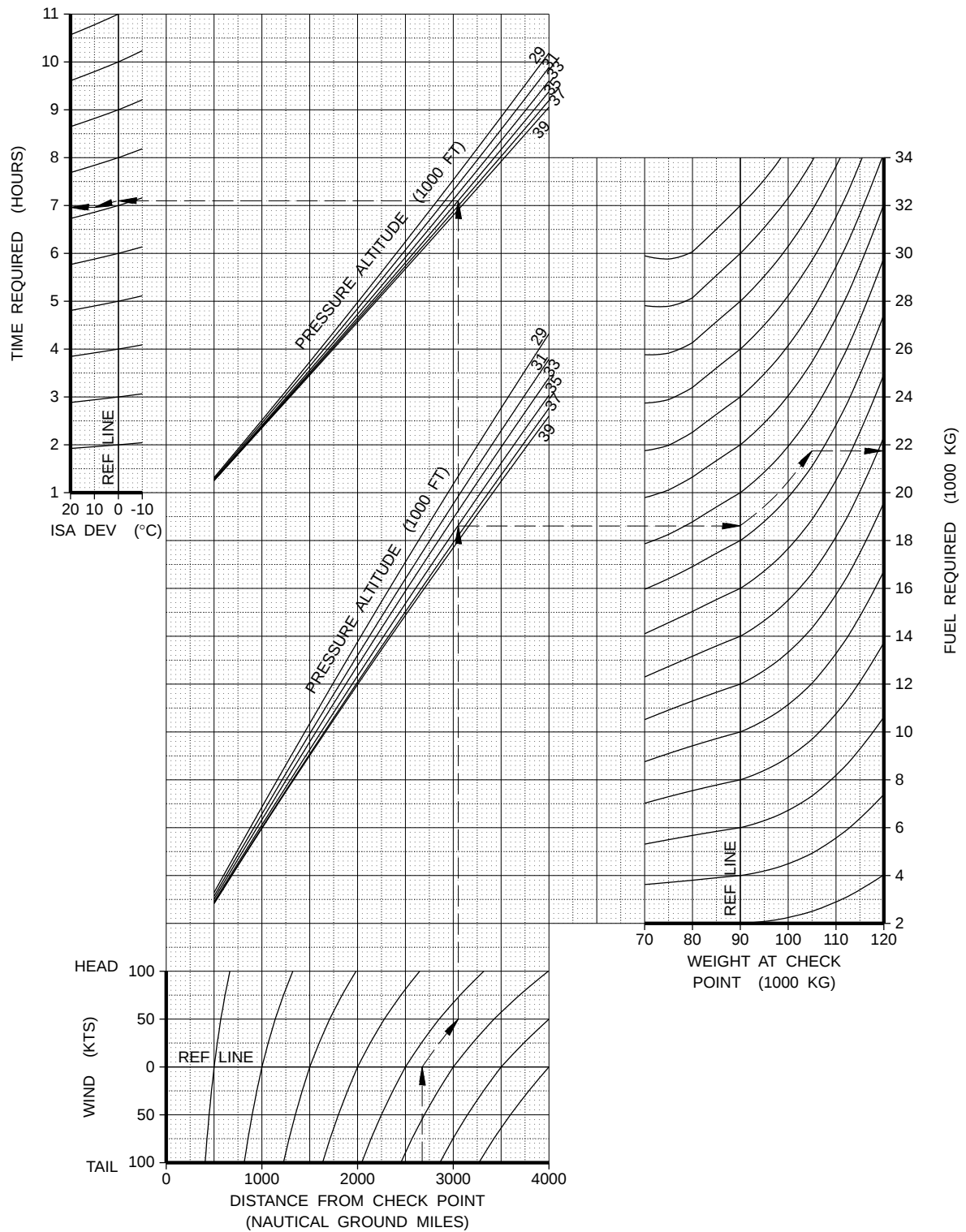
Based on .78/290/250 descent



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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
42 (-30)	EPR								1.37	1.29	1.25	1.20	1.17	1.14
	MAX TAT								-17	-9	-2			
	KIAS								227	228	228	227	225	221
	MACH								.787	.791	.791	.787	.780	.770
	FF/ENG								1490	1369	1289	1214	1148	1081
	KTAS								452	454	454	452	447	441
41 (-30)	EPR							1.38	1.30	1.25	1.21	1.18	1.15	1.13
	MAX TAT							-18	-9	-3	3			
	KIAS							232	233	234	233	231	228	224
	MACH							.787	.790	.791	.789	.783	.774	.761
	FF/ENG							1571	1444	1348	1282	1215	1148	1082
	KTAS							451	453	454	452	449	444	437
40 (-30)	EPR						1.39	1.31	1.26	1.22	1.19	1.16	1.13	1.11
	MAX TAT						-18	-10	-4	2				
	KIAS						238	239	239	237	237	235	231	225
	MACH						.787	.790	.791	.790	.785	.777	.767	.750
	FF/ENG						1655	1518	1420	1336	1268	1214	1150	1081
	KTAS						451	453	454	453	450	446	440	430
39 (-30)	EPR					1.39	1.31	1.26	1.22	1.19	1.16	1.14	1.12	1.10
	MAX TAT					-18	-10	-4	1					
	KIAS					243	244	245	245	243	241	238	233	226
	MACH					.787	.789	.791	.790	.786	.780	.771	.758	.736
	FF/ENG					1733	1591	1491	1406	1335	1268	1216	1152	1076
	KTAS					451	453	454	453	451	447	442	435	422
38 (-31)	EPR				1.39	1.31	1.26	1.22	1.19	1.17	1.14	1.12	1.10	1.09
	MAX TAT				-18	-10	-4	1						
	KIAS				249	250	251	250	249	247	245	241	235	227
	MACH				.787	.789	.791	.791	.787	.782	.774	.763	.745	.723
	FF/ENG				1807	1660	1561	1475	1402	1336	1268	1207	1149	1068
	KTAS				451	453	454	453	452	448	444	438	427	415
37 (-31)	EPR			1.38	1.31	1.26	1.23	1.19	1.17	1.14	1.12	1.11	1.09	1.07
	MAX TAT			-17	-10	-4	1							
	KIAS			255	256	257	256	255	254	251	248	243	235	228
	MACH			.787	.789	.791	.791	.788	.783	.776	.767	.752	.732	.710
	FF/ENG			1876	1728	1630	1543	1470	1403	1335	1273	1208	1144	1060
	KTAS			451	453	454	454	452	449	445	440	432	420	407

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
36 (-31)	EPR		1.37	1.31	1.26	1.23	1.20	1.17	1.15	1.13	1.11	1.09	1.08	1.06
	MAX TAT		-16	-9	-4	1								
	KIAS		261	262	263	262	262	260	257	255	250	244	236	228
	MACH		.787	.789	.791	.791	.788	.784	.777	.769	.758	.739	.719	.697
	FF/ENG KTAS		1941 452	1796 453	1696 454	1611 454	1538 452	1471 450	1403 446	1340 442	1276 435	1203 424	1136 412	1052 400
35 (-29)	EPR	1.36	1.30	1.26	1.22	1.19	1.17	1.15	1.13	1.11	1.10	1.08	1.07	1.05
	MAX TAT	-15	-8	-3	1	6								
	KIAS	267	268	269	269	268	266	264	261	257	251	244	237	229
	MACH	.787	.789	.791	.791	.789	.785	.779	.771	.761	.745	.726	.706	.683
	FF/ENG KTAS	2012 454	1873 455	1772 456	1688 456	1614 455	1548 452	1479 449	1415 445	1352 439	1280 429	1205 418	1134 407	1050 393
34 (-27)	EPR	1.29	1.25	1.22	1.19	1.17	1.15	1.13	1.11	1.10	1.08	1.07	1.06	1.05
	MAX TAT	-7	-2	2	6									
	KIAS	274	275	275	274	272	270	268	264	259	252	245	237	229
	MACH	.790	.791	.791	.789	.785	.779	.773	.764	.750	.732	.713	.692	.669
	FF/ENG KTAS	1952 457	1852 458	1768 458	1694 457	1627 454	1558 451	1494 447	1431 442	1362 434	1287 424	1205 413	1134 401	1050 387
33 (-25)	EPR	1.25	1.22	1.19	1.17	1.15	1.13	1.11	1.10	1.09	1.07	1.06	1.05	1.04
	MAX TAT	-1	3	7										
	KIAS	281	281	280	279	277	274	271	266	260	253	246	238	229
	MACH	.791	.791	.789	.785	.780	.774	.765	.753	.737	.719	.700	.678	.656
	FF/ENG KTAS	1934 460	1848 460	1775 459	1709 457	1639 454	1574 450	1511 445	1444 438	1369 429	1288 418	1206 407	1135 395	1051 381
32 (-24)	EPR	1.21	1.19	1.16	1.15	1.13	1.11	1.10	1.09	1.07	1.06	1.05	1.04	1.03
	MAX TAT	4	7	11										
	KIAS	287	286	285	283	281	278	273	267	261	254	246	238	230
	MACH	.791	.789	.785	.780	.774	.767	.756	.741	.724	.706	.687	.665	.644
	FF/ENG KTAS	1931 462	1856 461	1789 459	1720 456	1655 452	1592 448	1526 442	1451 433	1372 423	1290 413	1207 401	1125 388	1053 376
31 (-22)	EPR	1.18	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.06	1.05	1.04	1.03	1.02
	MAX TAT	8	12											
	KIAS	293	291	289	287	284	280	275	268	262	254	246	238	231
	MACH	.788	.785	.780	.775	.768	.758	.744	.728	.711	.693	.673	.652	.633
	FF/ENG KTAS	1940 463	1873 461	1803 458	1738 455	1675 450	1610 445	1535 436	1458 427	1375 417	1292 407	1210 395	1127 383	1061 372

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	1.31	1.32	1.34	1.36	1.38	1.40
MAX TAT (°C)	-7	-9	-11	-13	-16	-18

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

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

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
30 (-21)	EPR	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.06	1.05	1.04	1.04	1.03	1.02
	MAX TAT	12	15											
	KIAS	298	296	293	291	287	282	275	269	262	255	247	239	232
	MACH	.785	.780	.775	.768	.759	.746	.731	.715	.699	.680	.660	.641	.624
	FF/ENG	1958	1888	1822	1759	1695	1621	1545	1476	1392	1309	1225	1143	1071
29 (-19)	KTAS	462	460	457	453	447	440	431	421	412	401	389	378	368
	EPR	1.14	1.12	1.11	1.10	1.09	1.08	1.07	1.05	1.05	1.04	1.03	1.02	1.01
	MAX TAT	16												
	KIAS	302	300	297	294	288	283	276	270	263	255	247	240	234
	MACH	.780	.775	.768	.760	.748	.734	.718	.703	.686	.667	.648	.631	.615
28 (-18)	FF/ENG	1973	1908	1845	1781	1707	1631	1548	1480	1396	1313	1228	1153	1082
	KTAS	461	458	455	450	443	434	425	416	406	395	383	373	364
	EPR	1.12	1.11	1.10	1.08	1.08	1.07	1.05	1.05	1.04	1.03	1.02	1.02	1.01
	MAX TAT	20												
	KIAS	306	303	300	295	289	283	277	270	263	255	248	242	235
27 (-16)	MACH	.774	.768	.760	.749	.735	.721	.706	.690	.672	.654	.637	.622	.606
	FF/ENG	1994	1931	1867	1793	1717	1635	1552	1483	1400	1316	1236	1164	1092
	KTAS	460	457	452	445	437	429	420	410	400	389	379	370	360
	EPR	1.11	1.09	1.08	1.07	1.07	1.06	1.05	1.04	1.03	1.02	1.02	1.01	1.01
	MAX TAT													
26 (-15)	KIAS	310	306	302	296	290	284	278	271	263	256	250	243	237
	MACH	.768	.760	.749	.737	.723	.709	.694	.677	.660	.643	.628	.613	.598
	FF/ENG	2018	1953	1880	1803	1722	1638	1555	1488	1404	1321	1248	1175	1103
	KTAS	458	454	447	440	431	423	414	404	394	384	375	366	357
	EPR	1.09	1.08	1.07	1.06	1.05	1.05	1.04	1.03	1.03	1.02	1.01	1.01	1.00
25 (-13)	MAX TAT													
	KIAS	313	308	303	297	291	285	278	271	264	257	251	245	239
	MACH	.760	.749	.737	.724	.711	.697	.681	.664	.648	.633	.619	.604	.590
	FF/ENG	2040	1967	1890	1809	1725	1641	1560	1492	1407	1331	1259	1186	1115
	KTAS	456	449	442	434	426	418	408	398	388	379	371	362	354
25 (-13)	EPR	1.08	1.07	1.06	1.05	1.05	1.04	1.03	1.03	1.02	1.01	1.01	1.00	1.00
	MAX TAT													
	KIAS	314	309	304	298	292	285	278	271	265	259	253	247	241
	MACH	.749	.737	.725	.712	.699	.684	.668	.652	.637	.624	.610	.596	.583
	FF/ENG	2054	1977	1896	1813	1728	1646	1564	1494	1416	1343	1270	1198	1129
25 (-13)	KTAS	451	444	436	429	421	412	402	392	384	376	367	359	351

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	1.24	1.25	1.26	1.27	1.29
MAX TAT (°C)	3	2	0	-1	-3	-5

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.



Flight Planning and Performance Manual

Long Range Cruise Table
24000 FT to 19000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
24 (-12)	EPR	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.01	1.01	1.00	1.00	0.99
	MAX TAT													
	KIAS	316	310	304	299	292	285	279	272	266	260	254	249	243
	MACH	.737	.725	.713	.700	.686	.671	.656	.641	.628	.615	.602	.589	.575
	FF/ENG KTAS	2064 446	1984 438	1900 431	1816 423	1733 415	1651 406	1567 396	1487 388	1428 380	1355 372	1281 364	1211 356	1141 347
23 (-10)	EPR	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.01	1.01	1.00	1.00	1.00	0.99
	MAX TAT													
	KIAS	316	311	305	299	292	286	279	273	268	262	256	251	244
	MACH	.725	.713	.701	.688	.673	.659	.645	.632	.619	.607	.594	.582	.566
	FF/ENG KTAS	2072 440	1988 433	1904 426	1821 417	1739 409	1655 400	1573 391	1498 383	1441 376	1367 368	1295 361	1226 353	1150 343
22 (-9)	EPR	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.01	1.01	1.00	1.00	0.99	0.99
	MAX TAT													
	KIAS	317	312	306	299	293	286	280	275	269	264	258	252	244
	MACH	.713	.702	.689	.675	.661	.647	.635	.623	.611	.599	.587	.574	.556
	FF/ENG KTAS	2076 435	1991 428	1908 420	1827 411	1743 403	1659 394	1583 387	1511 380	1452 372	1379 365	1309 358	1237 350	1158 339
21 (-7)	EPR	1.04	1.03	1.03	1.02	1.02	1.02	1.01	1.01	1.00	1.00	0.99	0.99	0.99
	MAX TAT													
	KIAS	318	312	306	300	293	287	282	277	271	266	260	253	245
	MACH	.702	.690	.676	.663	.649	.637	.626	.614	.603	.591	.580	.565	.546
	FF/ENG KTAS	2078 429	1995 422	1914 414	1830 406	1745 397	1669 390	1596 383	1523 376	1449 369	1392 362	1324 355	1246 345	1164 334
20 (-6)	EPR	1.03	1.03	1.02	1.02	1.01	1.01	1.01	1.00	1.00	0.99	0.99	0.99	0.98
	MAX TAT													
	KIAS	319	312	306	300	294	289	284	278	273	268	262	254	245
	MACH	.690	.677	.664	.651	.639	.628	.617	.606	.595	.584	.572	.555	.536
	FF/ENG KTAS	2084 424	2002 416	1919 408	1833 400	1755 393	1682 386	1609 379	1534 372	1463 366	1408 359	1335 351	1254 341	1171 330
19 (-4)	EPR	1.03	1.02	1.02	1.01	1.01	1.01	1.00	1.00	0.99	0.99	0.99	0.99	0.98
	MAX TAT													
	KIAS	319	313	307	301	296	291	285	280	275	270	263	254	245
	MACH	.677	.665	.653	.641	.630	.620	.609	.599	.588	.577	.562	.545	.527
	FF/ENG KTAS	2093 418	2009 410	1923 403	1844 395	1770 389	1697 382	1622 376	1549 369	1479 363	1424 356	1345 347	1263 336	1179 325

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	1.21	1.21	1.21	1.22	1.22	1.23
MAX TAT (°C)	11	10	9	7	6	5

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

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

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
18 (-3)	EPR	1.02	1.02	1.01	1.01	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98
	MAX TAT													
	KIAS	319	313	308	302	297	292	287	282	277	271	263	255	246
	MACH	.665	.654	.642	.632	.622	.612	.601	.591	.581	.568	.553	.536	.517
	FF/ENG	2100	2014	1934	1860	1787	1712	1638	1567	1498	1423	1356	1272	1187
17 (-1)	KTAS	412	405	398	391	385	379	372	366	360	352	342	332	320
	EPR	1.02	1.01	1.01	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98
	MAX TAT													
	KIAS	320	314	309	304	299	294	289	284	279	272	264	255	246
	MACH	.654	.643	.633	.624	.614	.604	.594	.585	.573	.559	.543	.526	.507
16 (1)	FF/ENG	2106	2025	1950	1877	1802	1727	1655	1586	1514	1434	1366	1281	1194
	KTAS	406	400	394	388	381	375	369	363	356	348	338	327	315
	EPR	1.01	1.01	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	320	315	311	306	301	296	291	286	280	272	264	255	246
15 (2)	MACH	.643	.634	.625	.615	.606	.596	.587	.578	.565	.550	.534	.516	.498
	FF/ENG	2117	2041	1968	1893	1817	1744	1674	1605	1526	1445	1375	1289	1203
	KTAS	402	396	390	384	378	372	366	360	352	343	333	322	310
	EPR	1.01	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
14 (4)	KIAS	322	317	312	308	303	298	294	288	281	273	264	255	246
	MACH	.634	.626	.616	.607	.598	.590	.581	.569	.556	.541	.524	.507	.488
	FF/ENG	2133	2059	1984	1908	1834	1764	1695	1618	1538	1455	1384	1297	1211
	KTAS	397	392	386	381	375	369	364	357	348	339	328	318	306
	EPR	1.01	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98
13 (6)	MAX TAT													
	KIAS	323	319	314	310	305	300	295	288	281	273	264	255	245
	MACH	.626	.617	.609	.600	.591	.583	.573	.560	.546	.531	.515	.497	.479
	FF/ENG	2169	2093	2016	1941	1869	1799	1724	1643	1560	1476	1403	1316	1228
	KTAS	394	388	383	377	372	367	360	352	343	334	324	313	301
13 (6)	EPR	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	325	321	316	312	307	302	296	289	281	273	265	255	246
	MACH	.618	.610	.601	.593	.585	.576	.564	.551	.537	.522	.505	.488	.470
	FF/ENG	2184	2107	2031	1959	1888	1816	1736	1653	1569	1483	1411	1323	1238
13 (6)	KTAS	390	385	379	374	369	363	356	348	339	329	319	308	297

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)	20	18	17	15	14	13

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.



Flight Planning and Performance Manual

Long Range Cruise Table

12000 FT to 7000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
12 (7)	EPR	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	327	323	318	314	309	303	297	289	282	273	265	255	246
	MACH	.610	.602	.594	.586	.578	.567	.555	.542	.528	.512	.496	.479	.462
	FF/ENG	2200	2124	2050	1979	1909	1829	1748	1663	1579	1492	1405	1332	1249
11 (9)	KTAS	387	381	376	371	366	359	352	343	334	325	314	303	293
	EPR	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	329	325	320	316	311	304	297	290	282	273	264	255	247
	MACH	.603	.595	.587	.580	.570	.559	.546	.533	.518	.503	.487	.471	.455
10 (10)	FF/ENG	2218	2144	2073	2003	1925	1843	1759	1675	1589	1502	1415	1344	1261
	KTAS	383	378	374	369	362	355	347	339	330	320	310	299	289
	EPR	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	331	327	323	318	311	305	298	290	282	273	264	256	247
9 (12)	MACH	.596	.588	.581	.572	.561	.550	.537	.524	.509	.494	.478	.463	.447
	FF/ENG	2239	2167	2097	2021	1939	1856	1772	1686	1599	1512	1426	1357	1275
	KTAS	380	376	371	365	358	351	343	334	325	315	305	295	285
	EPR	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
8 (14)	KIAS	333	329	324	319	312	305	298	290	282	273	265	256	248
	MACH	.589	.582	.574	.564	.553	.541	.528	.514	.500	.485	.470	.455	.440
	FF/ENG	2301	2230	2153	2072	1987	1902	1815	1726	1638	1549	1463	1393	1310
	KTAS	377	373	368	361	354	346	338	330	320	311	301	292	282
	EPR	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
7 (15)	MAX TAT													
	KIAS	336	331	325	319	313	306	298	290	282	273	265	257	248
	MACH	.583	.575	.565	.555	.544	.532	.519	.505	.491	.476	.462	.448	.433
	FF/ENG	2328	2252	2171	2087	2001	1915	1827	1738	1650	1561	1477	1394	1325
	KTAS	375	370	364	357	350	342	334	325	316	306	297	288	278
7 (15)	EPR	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	MAX TAT													
	KIAS	338	332	326	320	313	306	298	290	282	274	266	257	249
	MACH	.576	.567	.557	.546	.535	.523	.510	.496	.482	.468	.455	.440	.426
	FF/ENG	2352	2271	2187	2101	2015	1927	1839	1750	1661	1575	1491	1409	1341
7 (15)	KTAS	372	366	359	352	345	337	329	320	311	302	293	284	275

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)	30	28	27	25	23	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 34000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
42	231	EPR									1.31	1.25	1.21	1.19	1.16
	-29	MAX TAT									-10	-3	3		
	459	FF/ENG									1407	1308	1249	1200	1152
41	237	EPR								1.32	1.26	1.22	1.19	1.16	1.14
	-29	MAX TAT								-11	-4	2			
	459	FF/ENG								1488	1381	1302	1262	1213	1168
40	242	EPR							1.33	1.27	1.23	1.20	1.17	1.15	1.13
	-29	MAX TAT							-12	-5	0				
	459	FF/ENG							1565	1456	1372	1312	1262	1229	1190
39	248	EPR						1.33	1.27	1.23	1.20	1.17	1.15	1.13	1.11
	-29	MAX TAT						-12	-6	0	4				
	459	FF/ENG						1640	1529	1442	1377	1326	1279	1237	1216
38	254	EPR					1.33	1.27	1.23	1.20	1.18	1.15	1.13	1.12	1.10
	-29	MAX TAT					-12	-6	-1	4					
	459	FF/ENG					1715	1601	1512	1444	1392	1343	1297	1261	1232
37	260	EPR				1.33	1.27	1.24	1.20	1.18	1.16	1.14	1.12	1.11	1.09
	-29	MAX TAT				-12	-6	-1	4						
	459	FF/ENG				1788	1671	1582	1511	1458	1408	1361	1321	1290	1265
36	266	EPR			1.32	1.27	1.23	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09
	-29	MAX TAT			-11	-5	0	4							
	459	FF/ENG			1857	1739	1651	1580	1526	1476	1427	1385	1351	1324	1300
35	272	EPR		1.32	1.27	1.23	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09	1.08
	-26	MAX TAT		-10	-5	0	4								
	461	FF/ENG		1935	1818	1729	1658	1603	1553	1503	1459	1423	1393	1367	1345
34	278	EPR	1.31	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.07
	-24	MAX TAT	-9	-4	1	5	8								
	463	FF/ENG	2015	1901	1810	1740	1684	1633	1583	1538	1500	1468	1441	1417	1399

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)	34	35	36	37	38	39	40	41	42
LIMIT EPR	1.35	1.37	1.40	1.40	1.40	1.39	1.39	1.39	1.39
MAX TAT (°C)	-13	-15	-17	-17	-17	-17	-17	-17	-17

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

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

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



Flight Planning and Performance Manual

.80M Cruise Table
33000 FT to 25000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
33	284	EPR	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.07
	-22	MAX TAT	-3	2	5	8									
	465	FF/ENG	1984	1895	1822	1767	1717	1666	1619	1580	1547	1518	1494	1473	1457
32	291	EPR	1.22	1.20	1.18	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.07	1.06
	-20	MAX TAT	2	6	9	12									
	467	FF/ENG	1980	1908	1851	1800	1749	1702	1662	1627	1598	1572	1549	1532	1519
31	297	EPR	1.19	1.17	1.15	1.14	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06
	-17	MAX TAT	7	10	13	15									
	469	FF/ENG	1994	1939	1887	1836	1788	1747	1711	1681	1654	1630	1611	1596	1585
30	304	EPR	1.17	1.15	1.14	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06	1.06
	-15	MAX TAT	11	13	16										
	471	FF/ENG	2028	1976	1925	1877	1835	1798	1767	1739	1715	1694	1677	1665	1655
29	311	EPR	1.15	1.13	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06	1.06	1.05
	-13	MAX TAT	14	16	19										
	473	FF/ENG	2067	2015	1967	1925	1888	1856	1827	1802	1780	1762	1748	1737	1730
28	317	EPR	1.13	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06	1.06	1.05	1.05
	-11	MAX TAT	17	19	22										
	476	FF/ENG	2107	2059	2017	1979	1946	1918	1892	1868	1849	1834	1822	1814	1808
27	324	EPR	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.05
	-8	MAX TAT	20	22	24										
	478	FF/ENG	2152	2110	2073	2039	2010	1984	1960	1939	1923	1910	1900	1894	1890
26	331	EPR	1.10	1.09	1.09	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.05	1.05
	-6	MAX TAT	23	25	26										
	480	FF/ENG	2206	2168	2135	2105	2078	2054	2032	2015	2001	1990	1982	1977	1975
25	338	EPR	1.09	1.08	1.08	1.07	1.06	1.06	1.06	1.05	1.05	1.05	1.05	1.05	1.04
	-4	MAX TAT	25	27	28										
	482	FF/ENG	2266	2232	2203	2175	2150	2128	2110	2096	2084	2075	2069	2065	2063

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)	25	26	27	28	29	30	31	32	33
LIMIT EPR	1.20	1.22	1.23	1.25	1.26	1.28	1.30	1.32	1.33
MAX TAT (°C)	7	5	3	1	-2	-4	-6	-8	-11

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.

Wind-Altitude Trade**LRC**

PRESSURE ALTITUDE (1000 FT)	CRUISE WEIGHT (1000 KG)											
	115	110	105	100	95	90	85	80	75	70	65	60
41						29	12	2	0	4	13	25
39				33	15	5	0	1	7	16	28	42
37		33	16	6	1	0	4	11	20	32	45	59
35	15	6	1	0	2	8	16	25	37	49	62	75
33	1	0	2	6	13	21	31	42	53	65	77	88
31	2	6	12	19	28	37	48	58	69	80	90	100
29	12	19	26	35	44	54	63	73	83	92	101	109
27	26	34	42	51	60	69	78	86	95	103	110	116
25	42	49	58	66	74	82	90	98	105	111	117	122
23	57	64	72	80	87	94	101	107	113	118	122	125

.80M

PRESSURE ALTITUDE (1000 FT)	CRUISE WEIGHT (1000 KG)											
	115	110	105	100	95	90	85	80	75	70	65	60
41							7	2	0	4	14	31
39					9	3	0	1	7	18	35	60
37			10	4	1	0	4	11	24	42	65	95
35	9	4	1	0	2	8	18	31	49	73	102	136
33	1	0	2	7	14	26	40	59	82	110	143	181
31	2	6	13	23	35	51	70	93	120	151	187	
29	13	22	33	47	63	83	106	132	162	195		
27	32	45	60	77	97	119	145	174				
25	59	74	92	112	134	160	187					
23	90	108	128	151	175							

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, 10000 kg, 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 100000 kg are 19 (31000 ft) and 0 (35000 ft). Difference is -19 so break even wind is -20 plus (-19), i.e. -39 knots (headwind).

B) Similarly, wind factors are 19 (31000 ft) and 51 (27000 ft). Difference is +32 so break even wind is -20 plus (+32), i.e. +12 knots (tailwind).



Flight Planning and Performance Manual

Descent

.78/290/250

PRESSURE ALTITUDE (FT)	TIME (MIN)	FUEL (KG)	DISTANCE (NM)		
			LANDING WEIGHT (1000 KG)		
			60	80	100
41000	29	480	117	137	147
39000	28	470	110	130	141
37000	27	460	105	124	135
35000	26	450	99	118	128
33000	25	440	95	112	123
31000	25	430	91	107	117
29000	24	420	86	101	110
27000	23	410	81	94	102
25000	22	400	75	88	95
23000	21	390	70	82	88
21000	20	380	65	76	81
19000	18	370	60	69	74
17000	17	360	55	63	67
15000	16	340	50	57	61
10000	12	280	34	38	39
5000	8	210	18	19	20
1500	5	150	6	6	6

Allowances for a straight-in approach are included.

Holding

Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
40000	EPR								1.25	1.21	1.18	1.16	1.15	1.13
	KIAS								229	225	217	209	200	192
	FF/ENG								1420	1330	1230	1160	1070	1100
35000	EPR			1.25	1.22	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.09	1.08
	KIAS			257	257	250	243	236	229	221	214	206	198	190
	FF/ENG			1780	1690	1580	1480	1410	1330	1260	1200	1110	1020	1040
30000	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	272	266	260	253	247	240	233	226	219	212	204	196	188
	FF/ENG	1880	1800	1730	1650	1590	1510	1430	1340	1260	1180	1100	1030	1050
25000	EPR	1.11	1.10	1.09	1.08	1.08	1.07	1.06	1.05	1.05	1.04	1.03	1.03	1.02
	KIAS	269	263	257	250	244	237	231	224	217	210	203	195	187
	FF/ENG	1910	1820	1730	1650	1560	1500	1420	1350	1270	1190	1110	1030	950
20000	EPR	1.07	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.01
	KIAS	266	260	254	248	242	236	229	223	216	208	201	194	186
	FF/ENG	1880	1800	1730	1650	1570	1510	1430	1350	1270	1200	1120	1040	970
15000	EPR	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01
	KIAS	264	258	252	247	241	234	228	221	215	208	200	192	185
	FF/ENG	1910	1830	1750	1670	1590	1510	1450	1370	1300	1220	1150	1080	1010
10000	EPR	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00
	KIAS	262	257	251	245	239	233	227	220	213	206	199	192	185
	FF/ENG	1940	1860	1780	1700	1630	1550	1480	1420	1350	1270	1200	1130	1060
5000	EPR	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00
	KIAS	261	256	250	244	238	231	225	219	213	206	198	190	185
	FF/ENG	2010	1930	1850	1780	1700	1630	1550	1480	1420	1350	1270	1200	1130
1500	EPR	1.01	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	KIAS	260	254	249	243	237	231	225	219	212	204	197	190	185
	FF/ENG	2050	1970	1890	1820	1750	1670	1600	1530	1470	1390	1310	1230	1160

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 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	18300	16400	11600
115	19800	18100	15100
110	21100	19800	17600
105	22300	21100	19600
100	23600	22400	21100
95	25000	23800	22500
90	26300	25200	24000
85	27700	26700	25500
80	29000	28300	27000
75	30400	29900	28700
70	31900	31600	30500
65	33300	33200	32400
60	34800	34800	34400

With engine anti-ice on, decrease altitude capability by 1800 ft.

With engine and wing anti-ice on, decrease altitude capability by 8800 ft.

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
115	500		
110	2800		
105	5100	2600	
100	7500	5000	1400
95	9900	7500	4900
90	12400	9900	7700
85	15000	12400	10200
80	17700	15000	12800
75	20900	17700	15200
70	24400	20700	18100
65	28500	24100	21100
60	31900	28000	24400

With engine anti-ice on, decrease altitude capability by 3200 ft.

With engine and wing anti-ice on, decrease altitude capability by 5700 ft.

ENGINE INOP

290 KIAS Altitude Capability

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	20100	18600	16500
115	20800	19500	17700
110	21500	20300	18700
105	22100	21000	19600
100	22800	21600	20400
95	23300	22200	21000
90	24000	22800	21600
85	24600	23400	22200
80	25200	24000	22800
75	25700	24600	23400
70	26200	25100	23900
65	26700	25500	24400
60	27100	26000	24800

With engine anti-ice on, decrease altitude capability by 1700 ft.

With engine and wing anti-ice on, decrease altitude capability by 4900 ft.

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	4200	400	
115	5700	2100	
110	7200	3700	
105	8600	5300	1400
100	9900	6800	3100
95	11200	8100	4600
90	12400	9400	6100
85	13500	10600	7400
80	14600	11800	8700
75	15200	12900	9800
70	16200	13800	10800
65	17000	14600	11800
60	17800	15000	12600

With engine anti-ice on, decrease altitude capability by 3400 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 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	18000	16200	13900
115	18700	17000	14900
110	19400	17700	15600
105	20100	18500	16500
100	20700	19300	17300
95	21200	20000	18100
90	21700	20600	18900
85	22200	21100	19700
80	22600	21500	20200
75	23100	22000	20700
70	23400	22300	21100
65	23800	22700	21500
60	24100	23000	21800

With engine anti-ice on, decrease altitude capability by 1500 ft.

With engine and wing anti-ice on, decrease altitude capability by 4000 ft.

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	500		
115	2000		
110	3400		
105	4700	800	
100	5900	2200	
95	7100	3500	
90	8200	4700	600
85	9200	5700	1900
80	10000	6700	3000
75	10800	7700	4000
70	11500	8500	4900
65	12200	9300	5700
60	12800	9900	6500

With engine anti-ice on, decrease altitude capability by 3100 ft.

With engine and wing anti-ice on, decrease altitude capability by 5200 ft.

ENGINE INOP

330 KIAS Altitude Capability

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	15300	13200	10100
115	16000	14000	11100
110	16700	14800	12100
105	17400	15400	12900
100	18000	16100	13700
95	18600	16700	14400
90	19100	17300	15000
85	19600	17900	15500
80	20000	18400	16100
75	20300	18900	16700
70	20600	19300	17200
65	20900	19700	17700
60	21100	20000	18100

With engine anti-ice on, decrease altitude capability by 1600 ft.

With engine and wing anti-ice on, decrease altitude capability by 5000 ft.

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

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
100	800		
95	1900		
90	2800		
85	3700		
80	4500	400	
75	5300	1300	
70	5900	2100	
65	6500	2700	
60	7000	3300	

With engine anti-ice on, decrease altitude capability by 800 ft.

With engine and wing anti-ice on, decrease altitude capability by 3400 ft.

ENGINE INOP MAX CONTINUOUS THRUST

Long Range Cruise Table 30000 FT to 25000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
30 (-26)	EPR									1.60	1.53	1.45	1.40	1.35
	MAX TAT									-12	-4	3		
	KIAS									253	245	238	231	227
	MACH									.676	.656	.638	.622	.610
	FF/ENG									2905	2656	2429	2229	2071
	KTAS									399	387	376	366	359
29 (-24)	EPR									1.54	1.47	1.41	1.37	1.33
	MAX TAT									-4	2			
	KIAS									253	246	239	234	230
	MACH									.662	.644	.627	.615	.605
	FF/ENG									2865	2627	2416	2241	2097
	KTAS									392	381	371	364	358
28 (-22)	EPR								1.56	1.49	1.43	1.38	1.34	1.31
	MAX TAT								-5	2	8			
	KIAS								261	253	246	241	236	232
	MACH								.667	.649	.633	.619	.608	.599
	FF/ENG								3067	2820	2601	2410	2257	2120
	KTAS								396	386	376	368	362	356
27 (-20)	EPR							1.57	1.50	1.44	1.39	1.35	1.32	1.29
	MAX TAT							-5	2	7				
	KIAS							268	260	254	248	243	240	235
	MACH							.671	.653	.637	.623	.612	.604	.592
	FF/ENG							3265	3012	2787	2585	2422	2282	2137
	KTAS							400	390	381	372	366	360	353
26 (-18)	EPR						1.57	1.51	1.45	1.40	1.36	1.33	1.30	1.27
	MAX TAT						-4	2	7	12				
	KIAS						275	268	261	255	250	246	242	236
	MACH						.674	.657	.642	.627	.616	.607	.598	.583
	FF/ENG						3461	3206	2974	2766	2589	2441	2303	2154
	KTAS						404	394	385	376	369	364	358	350
25 (-16)	EPR						1.52	1.46	1.41	1.37	1.34	1.31	1.28	1.25
	MAX TAT						2	8	13					
	KIAS						275	268	262	257	253	249	244	237
	MACH						.660	.645	.631	.619	.610	.602	.590	.575
	FF/ENG						3399	3161	2948	2759	2606	2469	2323	2167
	KTAS						397	388	380	373	367	362	355	346

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	1.59	1.58	1.60	1.61	1.61	1.62
MAX TAT (°C)	-3	-4	-6	-9	-11	-13

Decrease limit EPR by 0.11 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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
24 (-14)	EPR					1.52	1.47	1.42	1.38	1.35	1.32	1.29	1.26	1.23
	MAX TAT					3	8	13	17					
	KIAS					282	275	269	263	259	256	252	246	238
	MACH					.662	.648	.634	.622	.613	.605	.595	.582	.565
	FF/ENG KTAS					3591 400	3349 392	3131 383	2934 376	2773 370	2631 366	2491 360	2341 352	2171 342
23 (-12)	EPR				1.52	1.47	1.42	1.38	1.35	1.32	1.30	1.27	1.24	1.22
	MAX TAT				4	9	14	18						
	KIAS				288	282	276	270	266	262	259	254	247	239
	MACH				.664	.650	.637	.625	.615	.607	.599	.588	.573	.555
	FF/ENG KTAS				3782 403	3536 394	3315 386	3112 379	2943 373	2795 368	2659 364	2512 357	2353 348	2169 337
22 (-10)	EPR			1.52	1.47	1.43	1.39	1.36	1.33	1.30	1.28	1.25	1.23	1.20
	MAX TAT			5	10	14	19							
	KIAS			295	288	282	277	272	269	266	261	255	248	238
	MACH			.665	.652	.639	.627	.617	.609	.602	.593	.580	.564	.543
	FF/ENG KTAS			3970 405	3721 397	3497 389	3291 382	3113 376	2962 371	2827 367	2682 361	2529 353	2355 344	2171 331
21 (-8)	EPR		1.52	1.47	1.43	1.39	1.36	1.33	1.31	1.28	1.26	1.24	1.21	1.18
	MAX TAT		6	11	15	19	23							
	KIAS		301	295	289	284	279	275	272	268	263	256	248	237
	MACH		.666	.653	.640	.629	.619	.611	.604	.596	.585	.571	.553	.530
	FF/ENG KTAS		4154 408	3903 399	3678 392	3470 385	3285 379	3131 374	2991 370	2851 365	2702 358	2537 349	2353 339	2165 325
20 (-7)	EPR	1.52	1.47	1.43	1.39	1.36	1.34	1.31	1.29	1.27	1.24	1.22	1.20	1.17
	MAX TAT	7	12	17	21	24								
	KIAS	307	301	295	290	285	282	278	275	270	264	257	248	236
	MACH	.666	.653	.642	.631	.620	.613	.606	.599	.589	.577	.561	.542	.517
	FF/ENG KTAS	4337 409	4086 401	3859 394	3649 387	3459 381	3302 377	3158 372	3021 368	2875 362	2718 354	2538 345	2352 333	2155 318
19 (-5)	EPR	1.47	1.43	1.39	1.36	1.34	1.31	1.29	1.27	1.25	1.23	1.21	1.18	1.16
	MAX TAT	12	17	20	24	27								
	KIAS	307	302	296	292	288	284	282	277	272	265	257	247	234
	MACH	.654	.642	.632	.622	.614	.607	.601	.592	.581	.568	.551	.529	.504
	FF/ENG KTAS	4270 403	4042 396	3831 390	3638 383	3477 379	3329 375	3195 371	3050 365	2897 358	2724 350	2538 340	2348 326	2143 311

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	1.51	1.52	1.53	1.54	1.56	1.57
MAX TAT (°C)	10	8	6	4	2	-1

Decrease limit EPR by 0.10 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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
18 (-3)	EPR	1.43	1.39	1.36	1.34	1.32	1.30	1.28	1.26	1.23	1.21	1.19	1.17	1.14
	MAX TAT	17	20	24	27									
	KIAS	308	303	298	294	291	288	284	279	273	266	256	245	233
	MACH	.643	.632	.623	.615	.609	.603	.595	.585	.573	.558	.539	.516	.490
	FF/ENG	4226	4014	3819	3654	3504	3370	3226	3076	2910	2727	2540	2341	2128
	KTAS	398	392	386	381	377	373	368	362	355	345	334	320	304
17 (-2)	EPR	1.39	1.36	1.34	1.32	1.30	1.28	1.26	1.24	1.22	1.20	1.18	1.15	1.13
	MAX TAT	21	24	27	29									
	KIAS	309	304	300	297	294	291	286	280	274	266	255	243	231
	MACH	.633	.623	.616	.610	.604	.597	.588	.577	.563	.547	.527	.503	.478
	FF/ENG	4196	4000	3832	3681	3544	3404	3256	3095	2915	2730	2536	2328	2119
	KTAS	393	388	383	379	375	371	365	359	350	340	327	313	297
16 (0)	EPR	1.36	1.34	1.32	1.30	1.28	1.26	1.24	1.22	1.20	1.18	1.16	1.14	1.13
	MAX TAT	24	27	29	32									
	KIAS	310	306	303	300	297	293	288	281	274	265	254	242	232
	MACH	.624	.617	.610	.605	.599	.590	.580	.568	.554	.535	.514	.490	.470
	FF/ENG	4182	4012	3860	3720	3582	3436	3279	3103	2918	2729	2526	2311	2122
	KTAS	389	385	381	377	374	368	362	354	345	334	321	306	293
15 (1)	EPR	1.34	1.32	1.30	1.28	1.27	1.25	1.23	1.21	1.19	1.17	1.15	1.13	1.12
	MAX TAT	27	29	32	34									
	KIAS	313	309	307	304	300	295	289	282	274	264	252	240	232
	MACH	.617	.611	.606	.600	.592	.583	.572	.559	.543	.523	.501	.478	.462
	FF/ENG	4192	4039	3898	3761	3616	3461	3290	3107	2920	2722	2512	2301	2135
	KTAS	386	383	379	376	371	365	358	350	340	328	314	300	290
14 (3)	EPR	1.32	1.30	1.28	1.27	1.25	1.23	1.21	1.20	1.18	1.16	1.14	1.12	1.11
	MAX TAT	30	32	35										
	KIAS	316	313	310	306	301	296	290	282	273	262	250	241	234
	MACH	.611	.606	.601	.594	.585	.575	.563	.548	.530	.510	.488	.470	.456
	FF/ENG	4265	4120	3982	3836	3681	3511	3327	3138	2943	2735	2516	2328	2172
	KTAS	384	381	378	373	368	361	354	345	334	321	307	295	287
13 (5)	EPR	1.30	1.28	1.27	1.25	1.24	1.22	1.20	1.18	1.16	1.15	1.13	1.12	1.11
	MAX TAT	32	35	37										
	KIAS	319	316	313	308	303	297	290	281	271	260	249	242	235
	MACH	.606	.602	.595	.587	.577	.566	.553	.537	.518	.497	.477	.462	.450
	FF/ENG	4299	4162	4017	3863	3695	3514	3326	3135	2931	2715	2506	2339	2190
	KTAS	383	380	375	370	364	357	349	339	327	314	301	292	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.

Heavy line approximates max cruise thrust limit.

Max Continuous EPR

PRESS ALT (1000 FT)	13	14	15	16	17	18
LIMIT EPR	1.43	1.44	1.46	1.47	1.49	1.50
MAX TAT (°C)	19	17	16	14	12	11

Decrease limit EPR by 0.09 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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
12 (6)	EPR	1.28	1.27	1.25	1.24	1.22	1.20	1.19	1.17	1.15	1.14	1.12	1.11	1.10
	MAX TAT	35	37	40										
	KIAS	322	319	315	310	304	297	290	280	269	258	250	243	236
	MACH	.602	.596	.588	.579	.569	.556	.542	.525	.505	.484	.469	.456	.443
	FF/ENG	4346	4201	4049	3882	3702	3516	3327	3126	2914	2693	2513	2357	2204
	KTAS	381	377	372	367	360	353	343	332	320	307	297	289	281
11 (8)	EPR	1.27	1.25	1.24	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.09
	MAX TAT	37	40											
	KIAS	325	321	316	311	305	297	288	278	267	258	250	244	236
	MACH	.596	.589	.580	.571	.559	.546	.530	.512	.492	.475	.462	.450	.436
	FF/ENG	4389	4238	4072	3894	3709	3519	3322	3114	2895	2692	2528	2378	2220
	KTAS	379	374	369	363	356	347	337	326	313	302	294	286	277
10 (10)	EPR	1.25	1.24	1.22	1.21	1.19	1.18	1.16	1.14	1.13	1.12	1.11	1.10	1.09
	MAX TAT	40	42											
	KIAS	327	323	318	312	305	297	287	277	266	258	252	245	237
	MACH	.589	.581	.572	.562	.550	.535	.518	.499	.481	.467	.455	.443	.429
	FF/ENG	4428	4263	4086	3902	3712	3519	3313	3096	2879	2704	2549	2395	2237
	KTAS	376	371	365	359	351	341	331	319	307	298	291	283	274
9 (11)	EPR	1.24	1.22	1.21	1.20	1.18	1.16	1.15	1.13	1.12	1.11	1.10	1.09	1.08
	MAX TAT	42	45											
	KIAS	329	324	319	312	304	295	285	274	266	259	253	246	237
	MACH	.582	.574	.564	.552	.539	.523	.505	.487	.472	.460	.449	.436	.422
	FF/ENG	4455	4278	4094	3906	3714	3510	3296	3075	2883	2721	2571	2421	2275
	KTAS	373	367	361	354	345	335	324	312	302	295	288	280	270
8 (13)	EPR	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	45												
	KIAS	331	325	319	312	303	293	283	274	267	261	254	246	238
	MACH	.574	.565	.554	.542	.527	.510	.493	.477	.465	.454	.443	.429	.415
	FF/ENG	4471	4288	4100	3909	3707	3496	3276	3067	2898	2745	2592	2446	2298
	KTAS	369	363	356	348	339	328	317	307	299	292	285	276	267
7 (14)	EPR	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08
	MAX TAT	48												
	KIAS	332	326	319	310	301	291	281	274	268	262	255	247	238
	MACH	.566	.556	.544	.530	.515	.498	.481	.469	.458	.448	.436	.422	.408
	FF/ENG	4482	4295	4104	3904	3695	3476	3257	3077	2918	2767	2619	2472	2316
	KTAS	365	359	351	342	332	321	311	303	296	289	281	273	263

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	1.34	1.35	1.37	1.38	1.40	1.41
MAX TAT (°C)	29	28	26	25	23	21

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

290 KIAS Cruise Table 29000 FT to 19000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
29															
28															
27	290 -14 431	EPR MAX TAT FF/ENG											1.53 -3 3333	1.51 -1 3262	1.48 1 3199
26	290 -13 425	EPR MAX TAT FF/ENG									1.53 -2 3449	1.50 1 3359	1.48 3 3278	1.45 5 3207	1.43 7 3146
25	290 -12 418	EPR MAX TAT FF/ENG							1.54 -1 3597	1.51 2 3491	1.48 5 3392	1.45 7 3306	1.43 9 3229	1.41 11 3161	1.39 13 3104
24	290 -10 412	EPR MAX TAT FF/ENG					1.55 0 3761	1.52 2 3656	1.49 5 3547	1.46 8 3442	1.43 11 3347	1.41 13 3265	1.39 15 3192	1.37 17 3130	1.36 18 3075
23	290 -9 405	EPR MAX TAT FF/ENG				1.53 3 3818	1.50 6 3703	1.47 9 3601	1.44 11 3497	1.41 14 3397	1.39 16 3307	1.37 18 3229	1.35 20 3160	1.34 21 3101	1.33 21 3050
22	290 -8 399	EPR MAX TAT FF/ENG		1.54 3 4005	1.51 6 3873	1.48 9 3754	1.45 12 3646	1.42 14 3546	1.40 17 3448	1.38 19 3354	1.36 21 3270	1.34 23 3196	1.33 23 3131	1.31 3075	1.30 3025
21	290 -6 393	EPR MAX TAT FF/ENG	1.53 6 4081	1.49 9 3938	1.46 12 3812	1.43 15 3699	1.41 18 3595	1.39 20 3497	1.36 22 3404	1.34 24 3317	1.33 24 3238	1.31 3168	1.30 3105	1.29 3051	1.28 3004
20	290 -5 387	EPR MAX TAT FF/ENG	1.48 12 4017	1.44 15 3881	1.42 18 3759	1.39 21 3649	1.37 23 3549	1.35 25 3457	1.33 25 3370	1.32 25 3287	1.30 3211	1.29 3143	1.27 3084	1.26 3033	1.26 2989
19	290 -3 382	EPR MAX TAT FF/ENG	1.43 17 3960	1.41 19 3830	1.38 22 3713	1.36 24 3610	1.34 26 3516	1.32 26 3427	1.31 26 3343	1.29 26 3263	1.28 3191	1.27 3128	1.25 3072	1.24 3023	1.24 2979

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	25	26	27
LIMIT EPR	1.54	1.55	1.55	1.55	1.55	1.55	1.55	1.54	1.54
MAX TAT (°C)	7	6	5	3	2	1	-1	-2	-3

Decrease limit EPR by 0.10 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

290 KIAS Cruise Table 18000 FT to 8000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
18	290	EPR	1.40	1.37	1.35	1.33	1.32	1.30	1.28	1.27	1.26	1.25	1.24	1.23	1.22
	-2	MAX TAT	21	23	26	28									
	376	FF/ENG	3907	3786	3679	3581	3490	3405	3324	3248	3181	3120	3063	3012	2967
17	290	EPR	1.37	1.34	1.33	1.31	1.29	1.28	1.26	1.25	1.24	1.23	1.22	1.21	1.20
	-1	MAX TAT	24	27	29										
	370	FF/ENG	3867	3757	3655	3561	3474	3392	3316	3243	3174	3110	3053	3002	2958
16	290	EPR	1.34	1.32	1.30	1.29	1.27	1.26	1.25	1.23	1.22	1.21	1.20	1.20	1.19
	1	MAX TAT	28	30	32										
	365	FF/ENG	3845	3739	3642	3552	3470	3392	3315	3239	3168	3104	3049	3001	2960
15	290	EPR	1.31	1.30	1.28	1.27	1.26	1.24	1.23	1.22	1.21	1.20	1.19	1.18	1.18
	2	MAX TAT	31	33											
	359	FF/ENG	3828	3728	3635	3550	3469	3388	3308	3231	3163	3103	3051	3005	2963
14	290	EPR	1.29	1.28	1.26	1.25	1.24	1.23	1.21	1.20	1.19	1.19	1.18	1.17	1.16
	4	MAX TAT	34												
	354	FF/ENG	3857	3761	3672	3583	3496	3412	3332	3258	3193	3134	3081	3034	2993
13	290	EPR	1.27	1.26	1.25	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.16	1.16	1.15
	5	MAX TAT													
	349	FF/ENG	3851	3756	3661	3568	3482	3402	3327	3256	3191	3133	3080	3034	2992
12	290	EPR	1.26	1.24	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14
	7	MAX TAT													
	344	FF/ENG	3852	3750	3654	3564	3483	3406	3332	3263	3198	3140	3087	3041	2999
11	290	EPR	1.24	1.23	1.22	1.21	1.19	1.18	1.17	1.16	1.16	1.15	1.14	1.14	1.13
	8	MAX TAT													
	339	FF/ENG	3850	3750	3658	3572	3493	3417	3344	3274	3210	3152	3099	3053	3010
10	290	EPR	1.23	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.12
	10	MAX TAT													
	334	FF/ENG	3851	3757	3669	3584	3505	3428	3355	3286	3223	3164	3111	3064	3022
9	290	EPR	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11
	11	MAX TAT													
	329	FF/ENG	3859	3768	3681	3595	3516	3439	3366	3297	3233	3174	3122	3075	3033
8	290	EPR	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.11	1.11
	13	MAX TAT													
	325	FF/ENG	3869	3778	3692	3606	3526	3449	3375	3306	3242	3184	3131	3085	3044

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)	8	9	10	11	12	13	14	15	16	17	18
LIMIT EPR	1.40	1.41	1.43	1.44	1.45	1.47	1.48	1.49	1.51	1.52	1.53
MAX TAT (°C)	24	22	20	19	17	16	14	13	12	10	9

Decrease limit EPR by 0.09 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

310 KIAS Cruise Table 29000 FT to 19000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
29															
28															
27															
26															
25															
24	310 -7 438	EPR MAX TAT FF/ENG											1.48 4 3701	1.46 6 3644	1.45 7 3594
23	310 -6 432	EPR MAX TAT FF/ENG								1.49 5 3858	1.47 7 3778	1.45 9 3707	1.43 11 3644	1.42 12 3587	1.40 14 3538
22	310 -5 425	EPR MAX TAT FF/ENG						1.49 7 3975	1.46 9 3882	1.44 12 3797	1.42 13 3720	1.40 15 3652	1.39 17 3592	1.38 18 3540	1.37 19 3495
21	310 -3 419	EPR MAX TAT FF/ENG				1.49 8 4130	1.47 11 4023	1.44 13 3920	1.42 15 3830	1.40 17 3750	1.38 19 3678	1.37 21 3615	1.36 22 3559	1.35 23 3510	1.34 24 3467
20	310 -2 413	EPR MAX TAT FF/ENG		1.50 9 4282	1.47 12 4178	1.45 14 4073	1.42 16 3970	1.40 19 3873	1.38 21 3788	1.37 22 3711	1.35 24 3643	1.34 26 3583	1.33 27 3530	1.32 28 3483	1.31 29 3442
19	310 -1 407	EPR MAX TAT FF/ENG	1.48 12 4331	1.45 14 4222	1.43 16 4121	1.41 18 4021	1.39 21 3923	1.37 23 3832	1.35 24 3751	1.34 26 3678	1.32 28 3614	1.31 29 3556	1.30 30 3505	1.29 3460	1.29 3421

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)	19	20	21	22	23	24
LIMIT EPR	1.50	1.51	1.51	1.51	1.50	1.50
MAX TAT (°C)	10	9	7	6	5	4

Decrease limit EPR by 0.10 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

310 KIAS Cruise Table 18000 FT to 8000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
18	310	EPR	1.43	1.41	1.39	1.37	1.35	1.34	1.32	1.31	1.30	1.29	1.28	1.27	1.27
	0	MAX TAT	16	18	20	22	24	26	28	30	31				
	401	FF/ENG	4274	4169	4070	3973	3882	3798	3721	3651	3588	3533	3484	3441	3405
17	310	EPR	1.40	1.38	1.36	1.34	1.33	1.31	1.30	1.29	1.28	1.27	1.26	1.25	1.25
	2	MAX TAT	20	22	24	26	28	30	31	33					
	395	FF/ENG	4222	4121	4026	3935	3849	3768	3694	3627	3567	3514	3468	3428	3393
16	310	EPR	1.36	1.35	1.33	1.32	1.30	1.29	1.28	1.27	1.26	1.25	1.24	1.23	1.23
	3	MAX TAT	24	26	28	30	31	33							
	389	FF/ENG	4178	4082	3992	3904	3821	3743	3673	3609	3553	3503	3458	3417	3381
15	310	EPR	1.34	1.32	1.31	1.29	1.28	1.27	1.26	1.25	1.24	1.23	1.22	1.22	1.21
	5	MAX TAT	28	29	31	33	35								
	383	FF/ENG	4143	4051	3963	3879	3798	3725	3659	3598	3542	3490	3444	3402	3365
14	310	EPR	1.31	1.30	1.28	1.27	1.26	1.25	1.24	1.23	1.22	1.21	1.21	1.20	1.20
	6	MAX TAT	31	33	35	36									
	378	FF/ENG	4157	4067	3982	3901	3825	3753	3684	3620	3560	3508	3461	3419	3383
13	310	EPR	1.29	1.28	1.27	1.25	1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.19	1.18
	8	MAX TAT	34	36	38										
	372	FF/ENG	4138	4053	3973	3894	3816	3740	3670	3605	3548	3498	3454	3415	3380
12	310	EPR	1.27	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.19	1.19	1.18	1.17	1.17
	9	MAX TAT	37	39											
	367	FF/ENG	4133	4051	3969	3886	3805	3729	3661	3600	3546	3499	3456	3416	3382
11	310	EPR	1.25	1.24	1.23	1.22	1.21	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.16
	10	MAX TAT	40												
	362	FF/ENG	4133	4046	3960	3876	3797	3726	3661	3603	3550	3503	3460	3421	3386
10	310	EPR	1.24	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.16	1.15	1.15
	12	MAX TAT													
	357	FF/ENG	4123	4035	3951	3872	3797	3728	3665	3607	3554	3507	3464	3425	3391
9	310	EPR	1.22	1.21	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14
	13	MAX TAT													
	352	FF/ENG	4112	4028	3949	3873	3800	3732	3669	3611	3558	3511	3468	3429	3395
8	310	EPR	1.21	1.20	1.19	1.18	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13
	15	MAX TAT													
	347	FF/ENG	4119	4038	3961	3886	3813	3745	3682	3624	3571	3524	3480	3441	3408

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)	8	9	10	11	12	13	14	15	16	17	18
LIMIT EPR	1.38	1.39	1.40	1.42	1.43	1.44	1.45	1.46	1.47	1.48	1.49
MAX TAT (°C)	26	24	23	21	20	18	17	15	14	13	11

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.

ENGINE INOP

MAX CONTINUOUS THRUST

330 KIAS Cruise Table 29000 FT to 19000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
29															
28															
27															
26															
25															
24															
23															
22															
21	330 -1 444	EPR MAX TAT FF/ENG										1.45 10 4171	1.44 12 4120	1.43 13 4075	1.42 14 4036
20	330 1 438	EPR MAX TAT FF/ENG							1.45 12 4300	1.44 14 4229	1.42 15 4166	1.41 17 4109	1.40 18 4059	1.39 19 4015	1.38 20 3978
19	330 2 432	EPR MAX TAT FF/ENG					1.45 13 4395	1.43 15 4313	1.41 17 4238	1.40 19 4171	1.38 20 4112	1.37 21 4059	1.36 22 4013	1.36 23 3972	1.35 24 3937

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)	19	20	21
LIMIT EPR	1.46	1.47	1.46
MAX TAT (°C)	13	12	10

Decrease limit EPR by 0.09 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

330 KIAS Cruise Table 18000 FT to 8000 FT

PRESS ALT (1000 FT)	KIAS STD TAT KTAS		WEIGHT (1000 KG)												
			120	115	110	105	100	95	90	85	80	75	70	65	60
18	330	EPR			1.44	1.42	1.41	1.39	1.38	1.36	1.35	1.34	1.33	1.33	1.32
	3	MAX TAT			14	16	18	20	21	23	24	25	26	27	28
	425	FF/ENG			4526	4431	4346	4269	4199	4137	4081	4030	3985	3946	3912
17	330	EPR		1.42	1.41	1.39	1.37	1.36	1.35	1.34	1.33	1.32	1.31	1.30	1.30
	4	MAX TAT		16	18	20	22	24	25	26	27	28	29	30	31
	419	FF/ENG		4578	4477	4387	4306	4232	4165	4106	4052	4004	3961	3923	3890
16	330	EPR	1.41	1.39	1.37	1.36	1.34	1.33	1.32	1.31	1.30	1.29	1.29	1.28	1.28
	6	MAX TAT	19	21	22	24	26	27	28	30	31	32	33	33	34
	413	FF/ENG	4626	4527	4432	4346	4269	4198	4135	4077	4026	3979	3938	3902	3872
15	330	EPR	1.37	1.36	1.34	1.33	1.32	1.31	1.30	1.29	1.28	1.27	1.27	1.26	1.26
	7	MAX TAT	23	24	26	28	29	30	32	33	34	35	36	36	37
	407	FF/ENG	4571	4478	4391	4310	4235	4167	4105	4050	4001	3956	3918	3885	3856
14	330	EPR	1.34	1.33	1.32	1.30	1.29	1.28	1.27	1.27	1.26	1.25	1.25	1.24	1.24
	8	MAX TAT	27	28	30	31	33	34	35	36	37	38	39	40	
	401	FF/ENG	4581	4492	4407	4328	4256	4189	4130	4076	4029	3987	3950	3917	3890
13	330	EPR	1.32	1.30	1.29	1.28	1.27	1.26	1.25	1.25	1.24	1.23	1.23	1.22	1.22
	10	MAX TAT	30	32	33	35	36	37	38	39	40				
	396	FF/ENG	4537	4451	4369	4294	4225	4162	4107	4056	4009	3967	3929	3895	3866
12	330	EPR	1.29	1.28	1.27	1.26	1.25	1.24	1.24	1.23	1.22	1.22	1.21	1.21	1.20
	11	MAX TAT	33	35	36	38	39	40	41	42					
	390	FF/ENG	4503	4420	4342	4272	4206	4146	4089	4037	3989	3944	3905	3871	3842
11	330	EPR	1.27	1.26	1.25	1.24	1.24	1.23	1.22	1.21	1.21	1.20	1.20	1.19	1.19
	13	MAX TAT	36	38	39	41	42	43							
	385	FF/ENG	4480	4402	4328	4258	4191	4127	4069	4016	3969	3926	3888	3855	3828
10	330	EPR	1.26	1.25	1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.18
	14	MAX TAT	39	41	42	44	45								
	379	FF/ENG	4474	4395	4317	4244	4175	4113	4056	4006	3961	3920	3884	3852	3826
9	330	EPR	1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.17	1.17	1.17
	16	MAX TAT	42	44	45	47									
	374	FF/ENG	4468	4385	4306	4234	4168	4109	4055	4008	3964	3924	3888	3856	3831
8	330	EPR	1.22	1.22	1.21	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.15
	17	MAX TAT	45	47											
	369	FF/ENG	4457	4375	4300	4232	4169	4111	4059	4012	3969	3929	3893	3862	3837

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)	8	9	10	11	12	13	14	15	16	17	18
LIMIT EPR	1.36	1.37	1.38	1.39	1.40	1.41	1.42	1.43	1.44	1.44	1.45
MAX TAT (°C)	28	26	25	23	22	21	19	18	17	15	14

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.

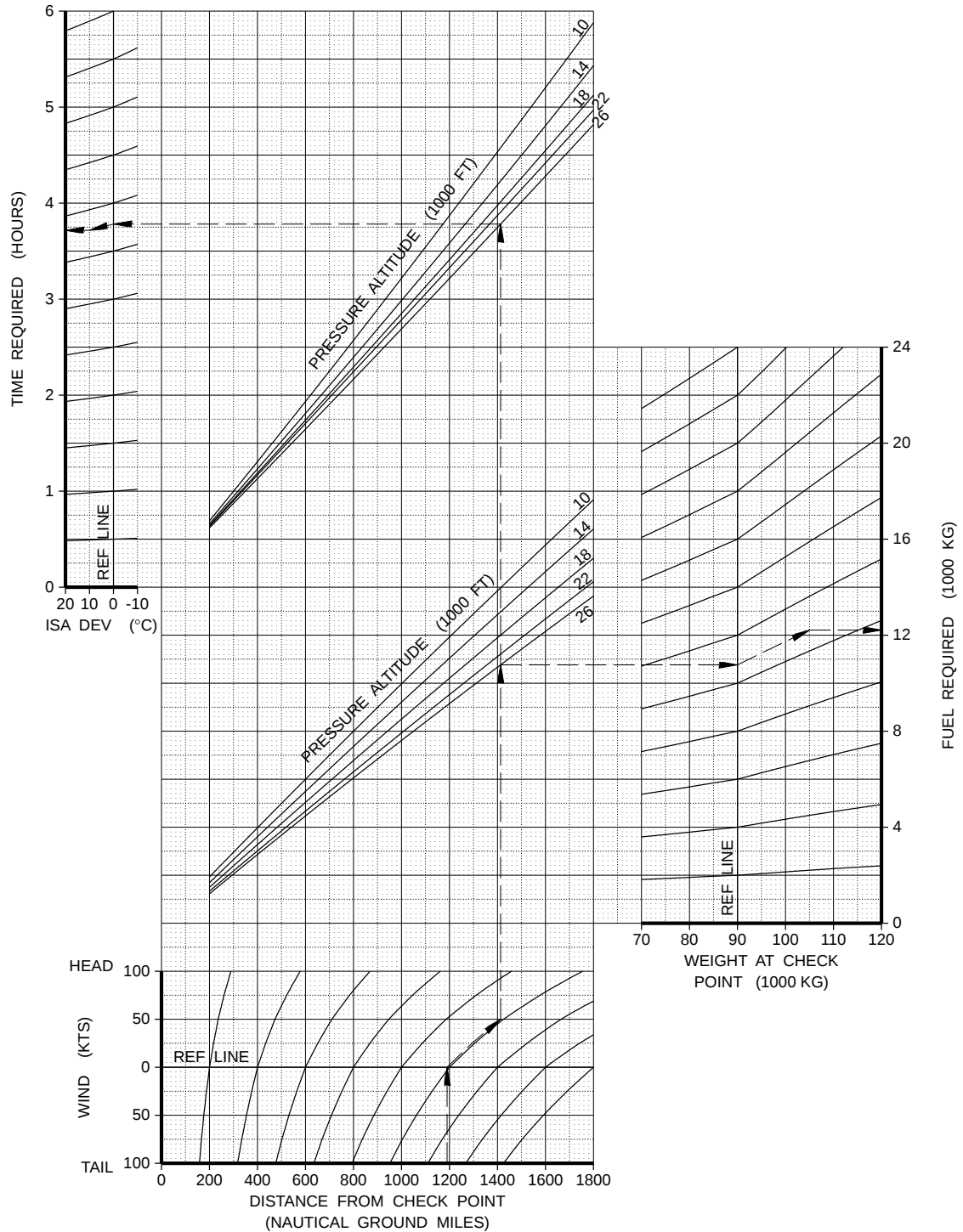
With engine and wing anti-ice on, decrease limit EPR by 0.06.

ENGINE INOP

MAX CONTINUOUS THRUST

Long Range Cruise Diversion Fuel and Time

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

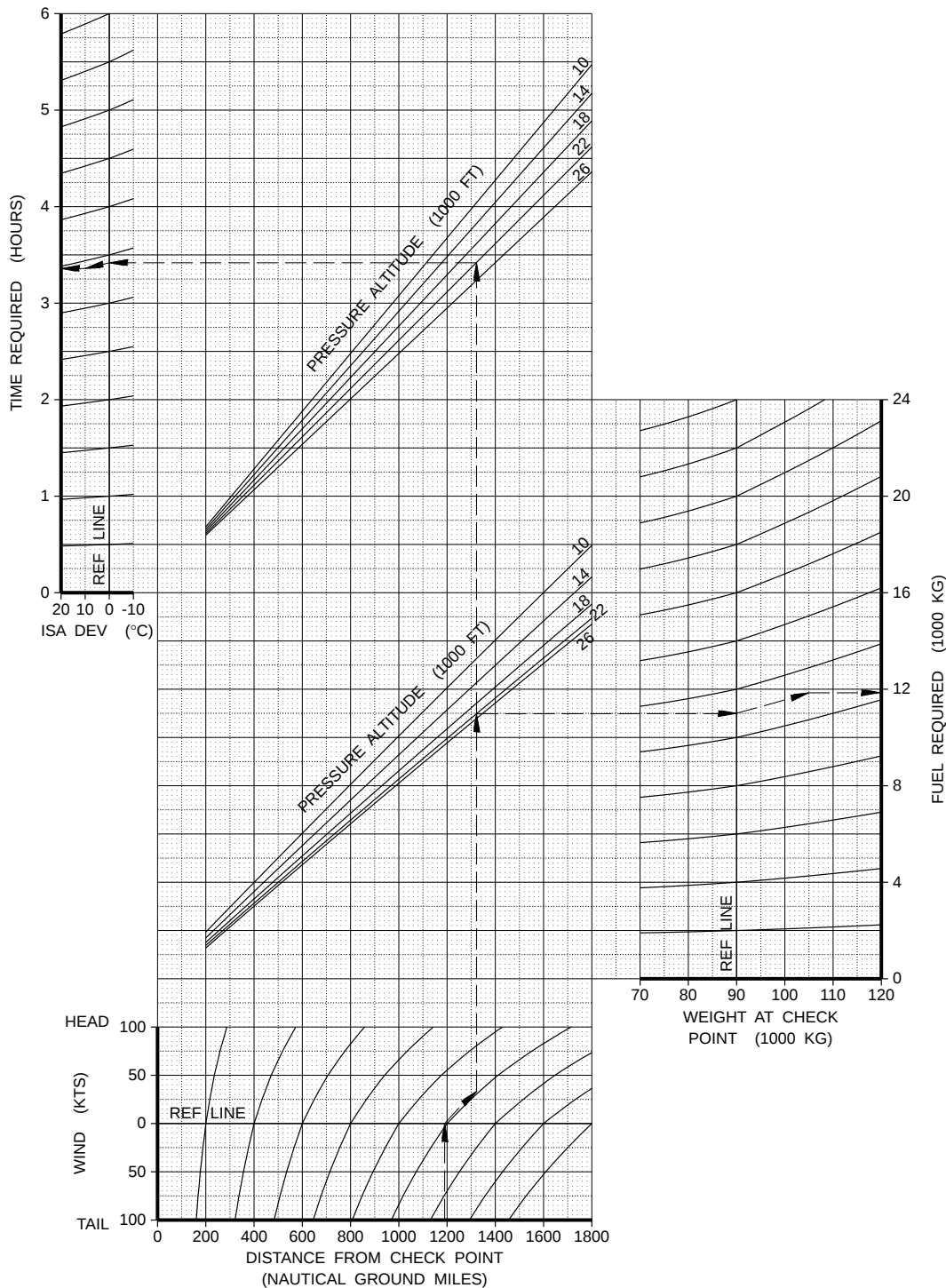


ENGINE INOP

MAX CONTINUOUS THRUST

290 KIAS Diversion Fuel and Time

Based on 290/250 descent and includes APU fuel burn

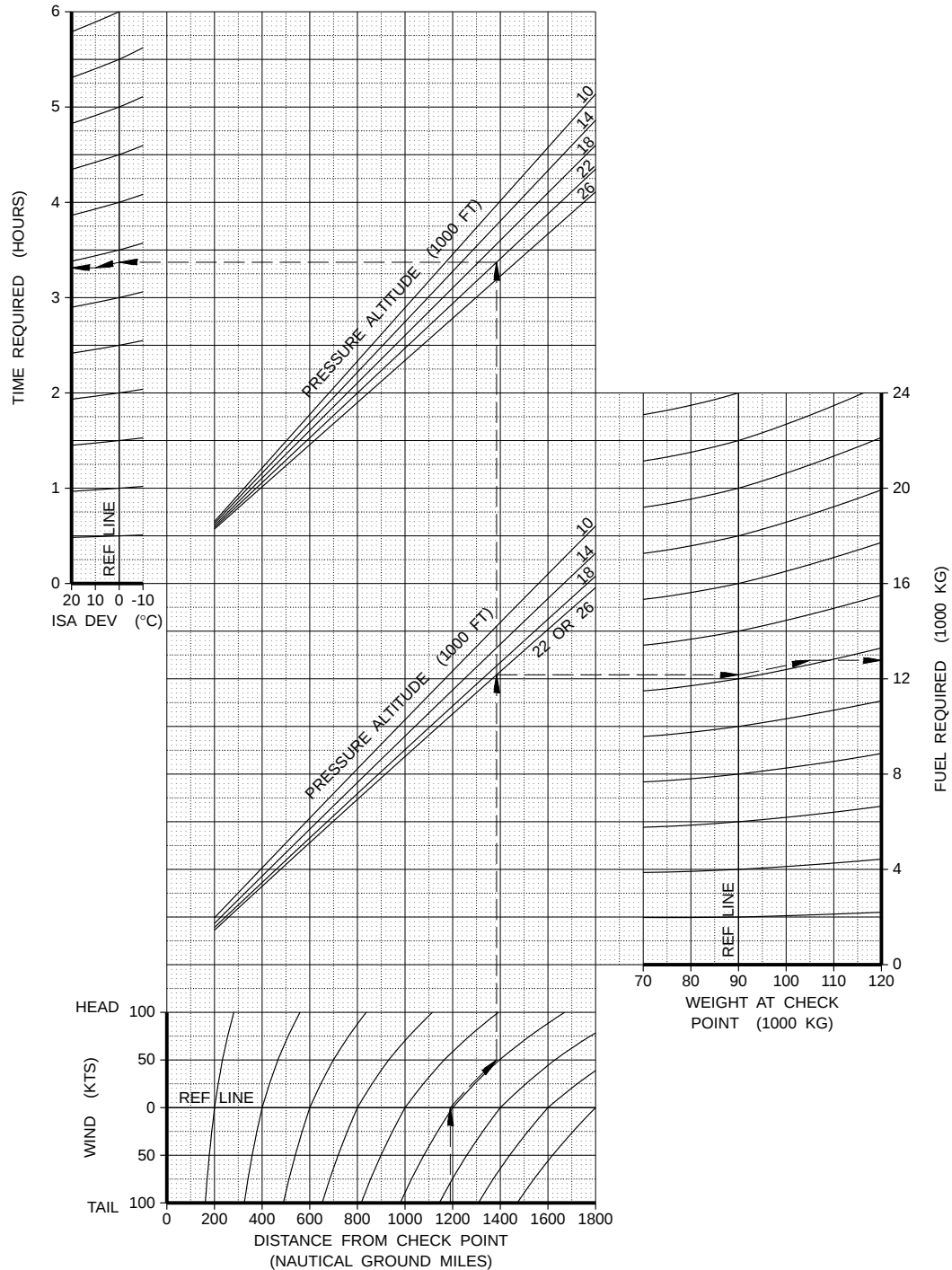


ENGINE INOP

MAX CONTINUOUS THRUST

310 KIAS Diversion Fuel and Time

Based on 310/250 descent and includes APU fuel burn

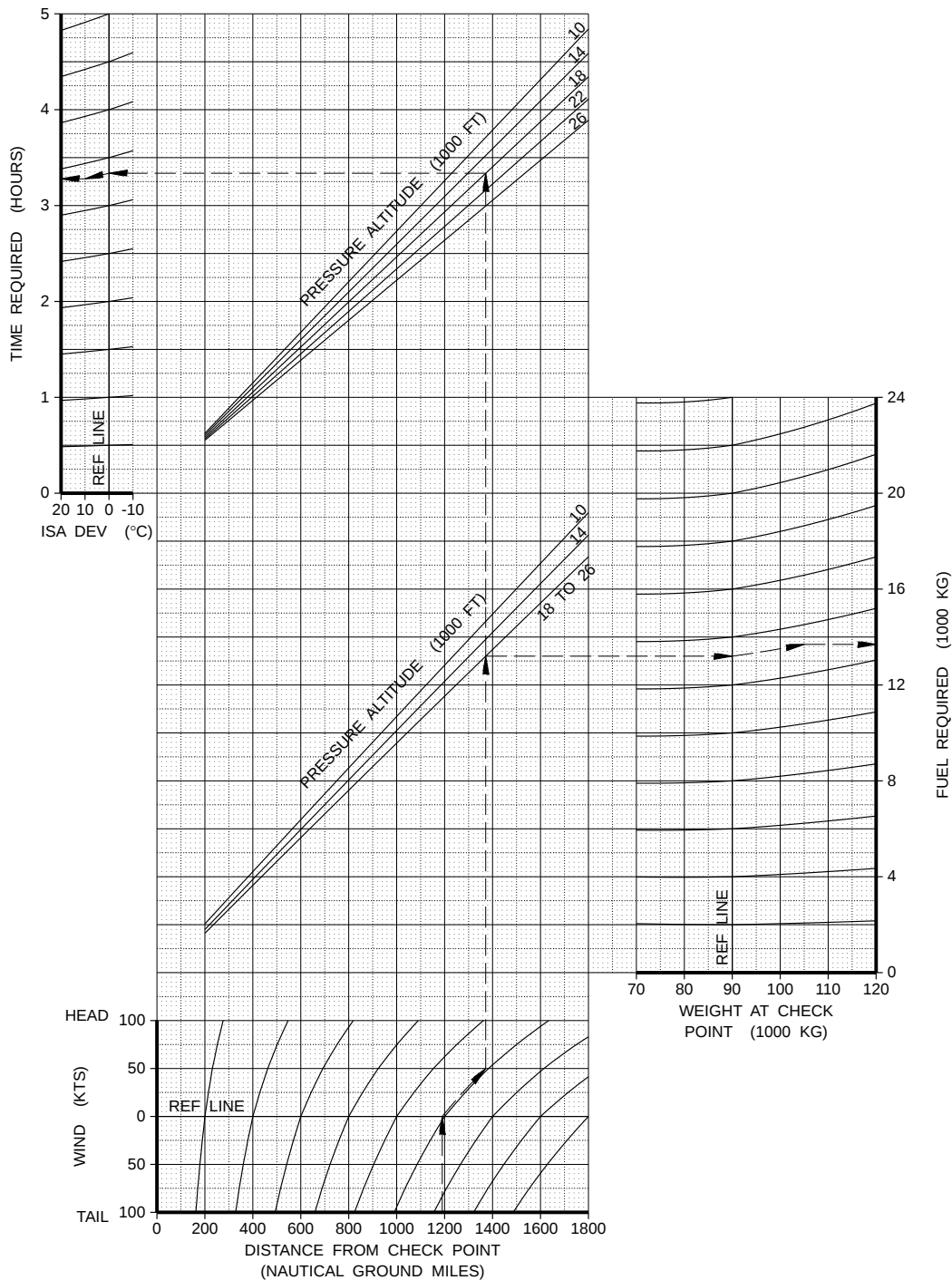


ENGINE INOP

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
35000	EPR												1.57	1.48
	KIAS												198	190
	FF/ENG												2140	1900
30000	EPR								1.60	1.52	1.46	1.40	1.35	1.31
	KIAS								226	219	212	204	196	188
	FF/ENG								2850	2610	2370	2170	1980	1820
25000	EPR				1.56	1.50	1.45	1.41	1.37	1.33	1.30	1.27	1.24	1.22
	KIAS				250	244	237	231	224	217	210	203	195	187
	FF/ENG				3530	3290	3050	2830	2640	2460	2300	2140	1970	1810
20000	EPR	1.45	1.42	1.38	1.35	1.33	1.30	1.28	1.26	1.23	1.21	1.19	1.17	1.15
	KIAS	266	260	254	248	242	236	229	223	216	208	201	194	186
	FF/ENG	3900	3680	3470	3280	3100	2930	2770	2610	2440	2280	2120	1960	1810
15000	EPR	1.31	1.29	1.27	1.25	1.23	1.22	1.20	1.18	1.17	1.15	1.14	1.13	1.12
	KIAS	264	258	252	247	241	234	228	221	215	208	200	192	185
	FF/ENG	3760	3590	3430	3260	3090	2920	2760	2600	2440	2290	2130	1970	1820
10000	EPR	1.23	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	262	257	251	245	239	233	227	220	213	206	199	192	185
	FF/ENG	3780	3610	3440	3280	3120	2960	2800	2630	2480	2320	2180	2030	1890
5000	EPR	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.08	1.07	1.07
	KIAS	261	256	250	244	238	231	225	219	213	206	198	190	185
	FF/ENG	3780	3620	3460	3290	3130	2970	2830	2690	2560	2420	2260	2110	1970
1500	EPR	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.09	1.08	1.07	1.07	1.06	1.06
	KIAS	260	254	249	243	237	231	225	219	212	204	197	190	185
	FF/ENG	3790	3630	3470	3320	3180	3040	2910	2760	2600	2450	2290	2140	2000

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

Intentionally
Blank

NON-STANDARD CONFIGURATION Table of Contents

Chapter 4

Text.....	4.1.1
Gear Down.....	4.1.1
Alternate Thrust Setting.....	4.1.2
Gear Down, Planning.....	4.2.1
Takeoff/Landing Climb Limit	4.2.1
Net Level Off Weight	4.2.2
Long Range Cruise Trip Fuel and Time	4.2.3
Gear Down, All Engine.....	4.3.1
Long Range Cruise Altitude Capability	4.3.1
210 KIAS Max Climb EPR	4.3.1
VREF + 80 Enroute Climb.....	4.3.2
Long Range Cruise Table.....	4.3.6
Long Range Cruise Enroute Fuel and Time.....	4.3.11
Descent	4.3.12
Holding	4.3.12
Gear Down, Engine Inoperative	4.4.1
Driftdown/LRC Cruise Range Capability	4.4.1
Long Range Cruise Altitude Capability	4.4.2
Long Range Cruise Diversion Fuel and Time	4.4.3
Long Range Cruise Table.....	4.4.4
Holding	4.4.6
Alternate Thrust Setting	4.5.1
Takeoff Performance	4.5.1
Takeoff Speeds	4.5.1
Enroute Performance	4.5.1
Landing Performance.....	4.5.1
Takeoff %N1	4.5.1
Go-around %N1	4.5.2
Max Climb %N1	4.5.2
Max Cruise %N1	4.5.3
Alternate Thrust Setting, Engine Inoperative	4.6.1
Initial Max Continuous %N1	4.6.1
Max Continuous %N1	4.6.2

Intentionally
Blank

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 8°C.

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 KG)											
		AIRPORT PRESSURE ALTITUDE (FT)											
°C	°F	- 1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
55	131	73	71										
50	122	79	77	75	72								
45	113	84	82	80	77	75	72						
40	104	90	87	85	83	80	77	74	71	68			
35	95	95	93	90	88	85	82	79	76	73	70	67	
30	86	100	98	95	93	90	87	84	80	77	74	71	68
25	77	104	103	101	98	95	92	88	85	81	78	75	72
20	68	104	103	103	102	100	96	93	89	86	82	79	75
15	59	104	103	103	102	101	99	97	93	90	86	83	79
10 & BELOW	50 & BELOW	104	103	103	102	101	99	97	95	93	90	86	83
ICING CONDITIONS*		99	101	99	98	96	94	92	90	88	86	83	81

For APU on, decrease allowable weight by 320 kg.

For packs off, increase allowable weight by 720 kg.

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

Anti-Ice Adjustments

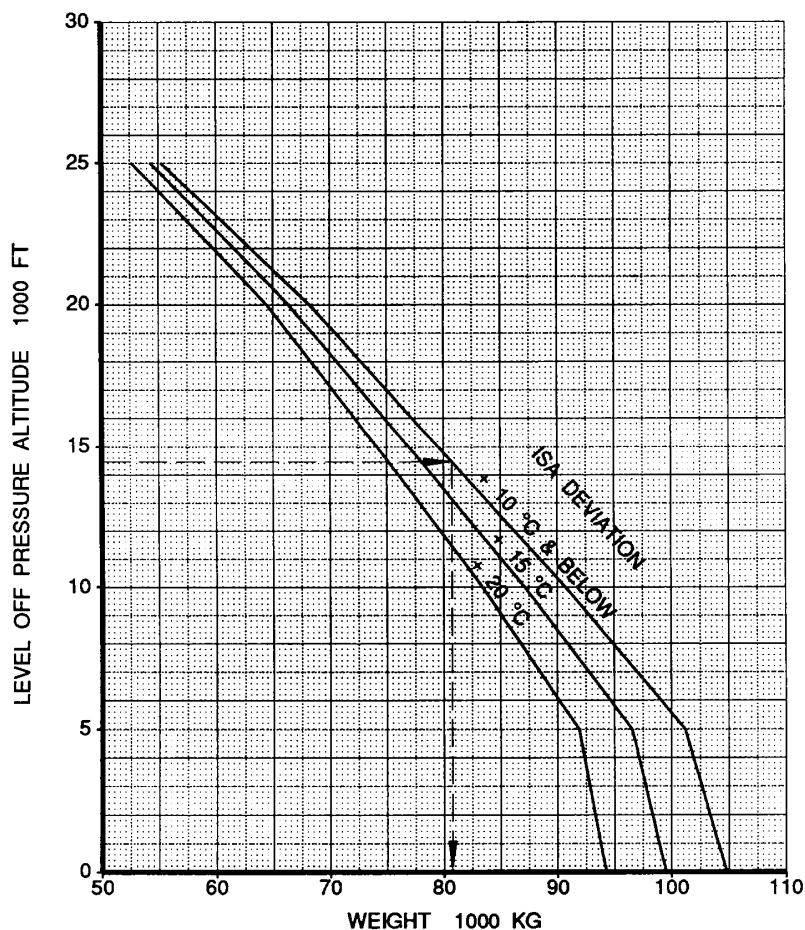
ENGINE BLEED CONFIGURATION	ANTI-ICE ADJUSTMENTS (KG)	
	PRESSURE ALTITUDE AT OR BELOW 6500 FT	PRESSURE ALTITUDE ABOVE 6500 FT
ENGINE ANTI-ICE ON	- 910	- 3860
ENGINE & WING ANTI-ICE ON	- 5440	- 7480

* 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



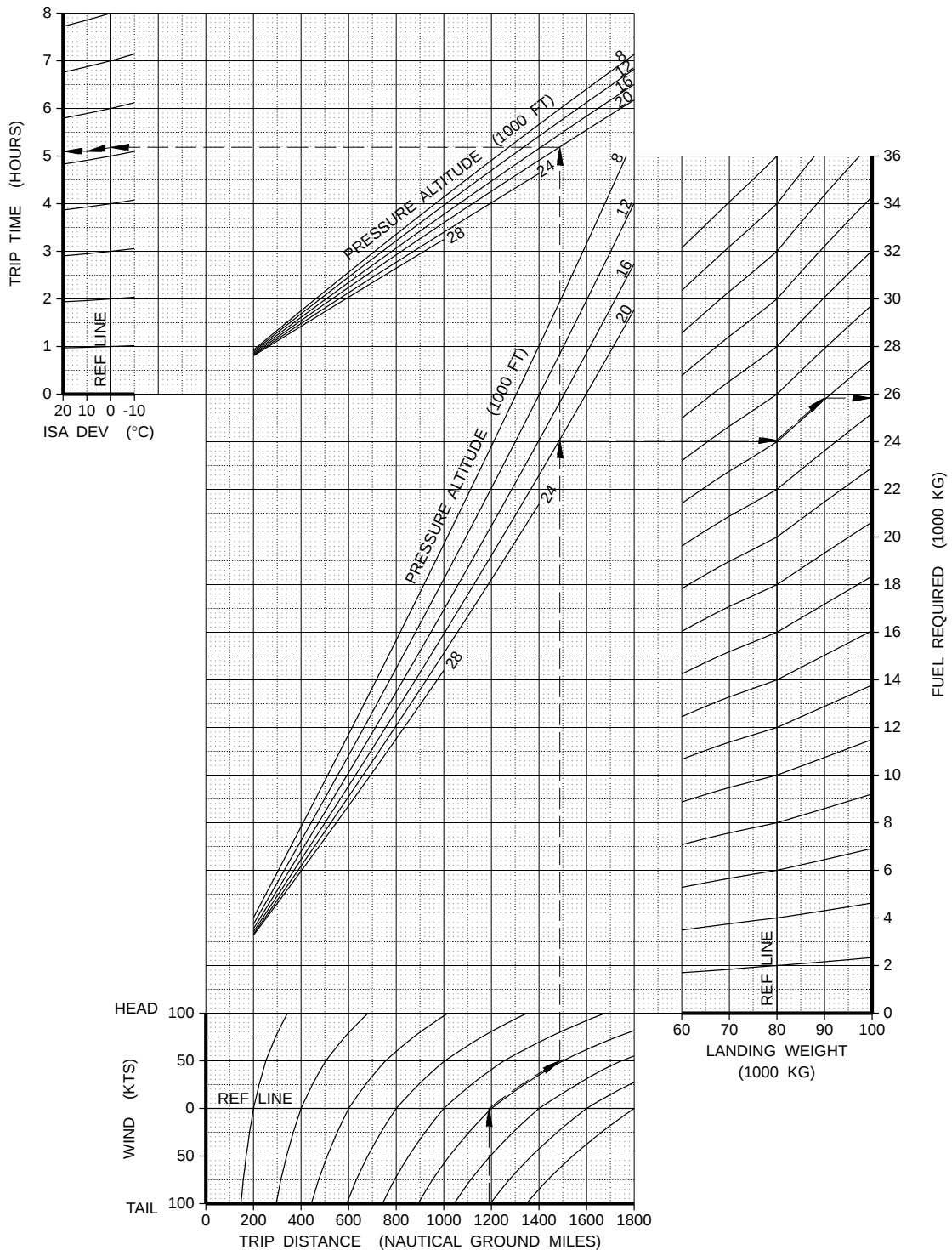
FOR APU ON DECREASE WEIGHT BY 680 KG.

ANTI-ICE	A/C PACKS	WEIGHT ADJUSTMENT KG
OFF	OFF	+1000
	ON	0
ENGINE ONLY	OFF	-2200
	ON	-3700
ENGINE & WING	OFF	-8700
	ON	-10200

GEAR DOWN

Long Range Cruise Trip Fuel and Time

Based on VREF30 + 80 climb/descent



Intentionally
Blank



Flight Planning and Performance Manual

GEAR DOWN

Long Range Cruise Altitude Capability

WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
120	15800	14000	11300
115	17600	15600	13500
110	19500	17400	15300
105	21600	19300	17300
100	23900	21200	19300
95	26400	23300	21200
90	28800	25700	23200
85	31100	28300	25400
80	33100	31100	27900
75	34500	33600	31000
70	35900	35700	33700
65	37100	37100	35900
60	38500	38300	37200

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 (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
36000	TIME/FUEL DIST/SPD											29/2550 131/292
35000	TIME/FUEL DIST/SPD										31/2850 143/296	24/2250 105/283
34000	TIME/FUEL DIST/SPD									33/3150 157/299	26/2500 114/286	21/2050 89/276
33000	TIME/FUEL DIST/SPD								36/3550 176/302	27/2750 125/289	22/2250 97/279	19/1950 78/270
32000	TIME/FUEL DIST/SPD								30/3050 138/293	24/2500 106/282	20/2100 85/274	18/1800 70/265
31000	TIME/FUEL DIST/SPD							33/3400 156/297	26/2750 116/286	21/2300 92/277	19/2000 76/269	17/1700 63/261
30000	TIME/FUEL DIST/SPD						37/3900 178/301	28/3000 128/289	23/2500 100/280	20/2150 82/272	17/1850 68/264	15/1650 58/257
29000	TIME/FUEL DIST/SPD						30/3300 141/292	25/2750 109/283	21/2300 89/275	18/2000 74/268	16/1750 62/260	15/1550 53/253
28000	TIME/FUEL DIST/SPD					34/3700 158/296	27/3000 120/286	22/2500 96/278	19/2200 80/271	17/1900 67/264	15/1650 57/257	14/1500 48/250
27000	TIME/FUEL DIST/SPD				38/4200 181/299	29/3300 132/289	24/2750 104/281	20/2350 86/274	17/2050 72/267	15/1800 61/260	14/1600 52/253	13/1400 45/247
26000	TIME/FUEL DIST/SPD				32/3650 146/293	26/3000 113/284	22/2550 92/277	19/2200 77/270	16/1950 65/263	14/1700 56/257	13/1500 48/250	12/1350 41/244
25000	TIME/FUEL DIST/SPD			35/4050 164/296	28/3250 124/287	23/2750 99/279	20/2350 82/272	17/2050 69/266	15/1800 59/260	13/1600 51/253	12/1450 44/247	11/1300 38/241
24000	TIME/FUEL DIST/SPD		39/4550 185/299	30/3550 136/290	25/2950 107/282	21/2550 88/275	18/2200 74/269	16/1950 63/262	14/1700 54/256	13/1550 47/250	12/1350 40/244	11/1250 35/238
23000	TIME/FUEL DIST/SPD		33/3900 149/292	26/3200 116/285	22/2700 94/278	19/2350 78/271	17/2050 66/265	15/1850 57/259	13/1650 49/253	12/1450 43/247	11/1300 37/241	10/1150 32/235
22000	TIME/FUEL DIST/SPD	36/4350 166/295	28/3450 126/287	23/2900 101/280	20/2500 83/274	17/2200 70/268	15/1950 60/262	14/1750 52/256	12/1550 45/250	11/1400 39/245	10/1250 34/239	10/1100 30/233
21000	TIME/FUEL DIST/SPD	30/3800 137/290	25/3150 108/283	21/2700 89/277	18/2350 74/271	16/2050 63/265	14/1850 54/259	13/1650 47/253	11/1450 41/248	10/1300 36/242	10/1200 31/236	9/1050 27/230
20000	TIME/FUEL DIST/SPD	26/3400 116/285	22/2850 94/279	19/2500 79/273	17/2200 67/267	15/1950 57/262	13/1700 49/256	12/1550 43/250	11/1400 38/245	10/1250 33/239	9/1100 29/234	9/1000 25/228
18000	TIME/FUEL DIST/SPD	21/2800 87/277	18/2400 73/272	16/2150 62/267	14/1900 54/261	13/1700 47/256	11/1550 41/251	10/1400 36/245	9/1250 31/240	8/1100 28/235	8/1000 24/229	8/900 21/223
16000	TIME/FUEL DIST/SPD	17/2350 67/271	15/2050 58/266	13/1850 50/261	12/1650 43/256	11/1500 38/251	10/1350 33/246	9/1200 29/241	8/1100 26/235	7/1000 23/230	7/900 20/225	7/800 18/219
14000	TIME/FUEL DIST/SPD	14/1950 52/265	12/1750 45/261	11/1600 39/256	10/1450 35/251	9/1300 30/246	8/1200 27/241	8/1050 24/236	7/950 21/231	6/900 19/226	6/800 17/221	6/750 15/215
10000	TIME/FUEL DIST/SPD	9/1350 30/256	8/1250 26/251	7/1150 23/247	7/1050 21/242	6/950 18/238	6/850 16/233	5/800 15/228	5/750 13/223	5/650 12/218	5/600 10/213	5/550 9/208
1500	TIME/FUEL	2/350	2/350	2/300	2/300	2/300	2/250	1/250	1/250	1/200	2/200	2/200

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-150	-300	-400	-550	-700	-850



Flight Planning and Performance Manual

GEAR DOWN

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

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
36000	TIME/FUEL DIST/SPD											30/2700 137/299
35000	TIME/FUEL DIST/SPD										32/3000 151/302	25/2350 110/289
34000	TIME/FUEL DIST/SPD									34/3300 165/305	26/2600 119/292	22/2150 93/282
33000	TIME/FUEL DIST/SPD								37/3700 185/309	28/2850 130/295	23/2350 101/285	20/2000 82/276
32000	TIME/FUEL DIST/SPD								30/3200 145/299	24/2600 110/288	21/2200 89/279	18/1900 73/271
31000	TIME/FUEL DIST/SPD							34/3600 163/303	26/2850 122/292	22/2400 97/283	19/2050 79/274	17/1800 66/266
30000	TIME/FUEL DIST/SPD						38/4050 186/307	29/3150 133/295	23/2600 105/286	20/2250 86/277	18/1950 71/270	16/1700 60/262
29000	TIME/FUEL DIST/SPD						31/3450 147/298	25/2850 114/289	21/2400 93/281	18/2100 77/273	16/1850 65/266	15/1600 55/258
28000	TIME/FUEL DIST/SPD					35/3900 166/302	27/3150 125/292	23/2650 100/284	19/2250 83/276	17/2000 70/269	15/1750 59/262	14/1550 50/255
27000	TIME/FUEL DIST/SPD				39/4400 189/306	30/3450 138/295	24/2850 109/287	21/2450 89/279	18/2150 75/272	16/1850 63/265	14/1650 54/258	13/1450 46/251
26000	TIME/FUEL DIST/SPD				32/3800 153/298	26/3100 118/290	22/2650 96/282	19/2300 80/275	17/2000 68/268	15/1750 58/262	13/1550 50/255	12/1400 43/248
25000	TIME/FUEL DIST/SPD			36/4250 171/302	28/3400 129/293	23/2850 103/285	20/2450 86/278	17/2150 72/271	15/1900 62/265	14/1700 53/258	13/1500 46/252	12/1350 39/245
24000	TIME/FUEL DIST/SPD		40/4750 194/305	31/3700 142/295	25/3100 112/288	21/2650 91/281	18/2300 77/274	16/2000 65/268	14/1800 56/261	13/1600 48/255	12/1400 42/249	11/1250 36/242
23000	TIME/FUEL DIST/SPD		33/4100 156/298	27/3350 121/290	22/2850 98/283	19/2450 82/277	17/2150 69/270	15/1900 59/264	13/1700 51/258	12/1500 44/252	11/1350 39/246	10/1200 34/240
22000	TIME/FUEL DIST/SPD	37/4550 174/301	29/3600 131/293	24/3050 105/286	20/2600 87/279	18/2300 73/273	16/2000 63/267	14/1800 54/261	12/1600 47/255	11/1450 41/249	10/1300 36/243	10/1150 31/237
21000	TIME/FUEL DIST/SPD	31/3950 143/295	25/3250 113/288	21/2800 92/282	19/2450 77/276	16/2150 66/270	14/1900 57/264	13/1700 49/258	12/1500 43/252	10/1350 37/247	10/1250 33/241	9/1100 29/235
20000	TIME/FUEL DIST/SPD	27/3500 121/290	23/3000 98/284	19/2600 82/278	17/2250 69/272	15/2000 59/266	13/1800 51/261	12/1600 45/255	11/1450 39/250	10/1300 34/244	9/1150 30/238	9/1050 26/232
18000	TIME/FUEL DIST/SPD	21/2900 91/283	18/2500 76/277	16/2200 65/272	14/1950 56/266	13/1750 48/261	11/1600 42/255	10/1450 37/250	9/1300 33/244	8/1150 29/239	8/1050 25/233	8/950 22/227
16000	TIME/FUEL DIST/SPD	17/2400 70/276	15/2150 60/271	13/1900 52/266	12/1700 45/261	11/1550 39/255	10/1400 35/250	9/1250 31/245	8/1150 27/240	7/1000 24/234	6/900 21/229	7/850 19/223
14000	TIME/FUEL DIST/SPD	14/2050 54/270	12/1800 47/265	11/1650 41/261	10/1500 36/256	9/1350 32/251	8/1200 28/246	7/1100 25/240	6/1000 22/235	5/900 20/230	4/800 17/225	6/750 15/219
10000	TIME/FUEL DIST/SPD	9/1400 31/260	8/1300 28/256	8/1150 24/251	7/1050 22/247	6/1000 19/242	5/900 17/237	4/800 15/232	3/700 14/227	2/600 12/222	1/500 11/217	5/550 10/212
1500	TIME/FUEL	2/350	2/350	2/300	2/300	2/300	2/250	1/250	1/250	1/200	2/200	2/200

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-150	-300	-450	-600	-750	-900



GEAR DOWN

VREF + 80 Enroute Climb ISA + 15°C

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
36000	TIME/FUEL DIST/SPD											34/2950 159/302
35000	TIME/FUEL DIST/SPD										39/3500 192/308	29/2600 130/293
34000	TIME/FUEL DIST/SPD										32/3000 151/298	25/2400 111/286
33000	TIME/FUEL DIST/SPD									37/3500 178/304	28/2700 126/291	23/2200 97/280
32000	TIME/FUEL DIST/SPD									31/3050 143/295	25/2450 108/284	21/2050 86/275
31000	TIME/FUEL DIST/SPD								34/3450 165/300	27/2750 121/288	22/2300 95/279	19/1950 78/270
30000	TIME/FUEL DIST/SPD								29/3050 134/292	24/2500 105/282	20/2150 85/274	18/1850 70/266
29000	TIME/FUEL DIST/SPD							32/3400 150/295	26/2750 115/286	21/2300 92/277	19/2000 76/269	17/1750 64/262
28000	TIME/FUEL DIST/SPD						36/3850 171/299	28/3050 127/289	23/2550 101/281	20/2150 83/273	17/1900 69/265	16/1650 58/258
27000	TIME/FUEL DIST/SPD					41/4450 200/303	31/3400 142/293	25/2800 111/284	21/2350 90/276	18/2050 75/269	16/1800 63/262	15/1550 53/255
26000	TIME/FUEL DIST/SPD					34/3800 161/296	27/3050 122/287	22/2600 98/279	19/2200 81/272	17/1950 68/265	15/1700 57/258	14/1500 49/251
25000	TIME/FUEL DIST/SPD				39/4350 185/300	30/3400 135/290	24/2800 107/282	20/2400 87/275	18/2100 73/268	16/1800 62/262	14/1600 53/255	13/1400 45/248
24000	TIME/FUEL DIST/SPD				33/3750 151/294	26/3100 117/285	22/2600 94/278	19/2250 78/271	16/1950 66/265	14/1700 56/258	13/1550 48/252	12/1350 41/245
23000	TIME/FUEL DIST/SPD			36/4250 172/297	28/3350 128/288	23/2800 102/281	20/2400 84/274	17/2100 71/268	15/1850 60/261	13/1650 51/255	12/1450 44/249	11/1300 38/242
22000	TIME/FUEL DIST/SPD		41/4850 197/300	31/3700 142/291	25/3050 111/284	21/2600 90/277	18/2250 75/270	16/1950 64/264	14/1750 55/258	13/1550 47/252	12/1400 41/246	11/1250 35/240
21000	TIME/FUEL DIST/SPD		34/4150 159/294	27/3350 121/287	23/2800 97/280	19/2400 80/273	17/2100 68/267	15/1850 58/261	13/1650 50/255	12/1450 43/249	11/1300 37/243	10/1150 32/237
20000	TIME/FUEL DIST/SPD	38/4650 179/297	29/3650 133/289	24/3050 105/282	20/2600 86/276	18/2250 72/270	15/1950 61/264	14/1750 52/258	12/1550 45/252	11/1400 39/247	10/1250 34/241	10/1100 30/235
18000	TIME/FUEL DIST/SPD	28/3550 123/287	23/2950 98/281	19/2550 81/275	17/2200 68/269	15/1950 58/264	13/1750 50/258	12/1550 43/253	10/1400 38/247	10/1250 33/242	9/1100 29/236	9/1000 25/230
16000	TIME/FUEL DIST/SPD	21/2850 90/280	18/2450 75/274	16/2150 63/269	14/1900 54/264	12/1700 47/258	11/1500 40/253	10/1350 35/248	9/1200 31/242	8/1100 27/237	8/1000 24/231	8/900 21/226
14000	TIME/FUEL DIST/SPD	17/2350 68/273	15/2050 58/268	13/1800 49/263	12/1650 43/258	10/1450 37/253	9/1300 33/248	9/1200 29/243	8/1050 25/238	7/950 22/233	7/900 20/227	7/800 17/221
10000	TIME/FUEL DIST/SPD	11/1550 38/263	10/1400 33/258	9/1250 29/254	8/1150 25/249	7/1050 22/244	6/950 20/239	6/850 17/235	5/800 15/230	5/700 14/225	5/650 12/219	5/600 11/214
1500	TIME/FUEL	2/350	2/350	2/300	2/300	2/300	2/250	1/250	1/250	1/200	2/200	2/200

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-150	-300	-500	-650	-800	-1000



Flight Planning and Performance Manual

GEAR DOWN

**VREF + 80 Enroute Climb
ISA + 20°C**

PRESSURE ALTITUDE (FT)	UNITS MIN/KG NM/KTAS	BRAKE RELEASE WEIGHT (1000 KG)										
		120	115	110	105	100	95	90	85	80	75	70
36000	TIME/FUEL DIST/SPD											38/3250 184/304
35000	TIME/FUEL DIST/SPD											32/2800 147/294
34000	TIME/FUEL DIST/SPD										37/3300 177/300	28/2550 123/287
33000	TIME/FUEL DIST/SPD										31/2900 142/292	25/2300 106/280
32000	TIME/FUEL DIST/SPD									35/3350 167/297	27/2600 120/285	22/2150 94/275
31000	TIME/FUEL DIST/SPD									29/2900 135/289	24/2400 104/279	21/2000 83/270
30000	TIME/FUEL DIST/SPD								33/3300 153/292	26/2650 116/282	22/2200 92/274	19/1900 75/265
29000	TIME/FUEL DIST/SPD							38/3800 179/297	29/2950 130/286	23/2450 102/277	20/2100 82/269	18/1800 68/262
28000	TIME/FUEL DIST/SPD							32/3350 148/290	26/2700 113/281	21/2300 91/273	19/1950 75/265	16/1700 62/258
27000	TIME/FUEL DIST/SPD						36/3850 171/294	28/3050 126/285	23/2500 100/276	20/2150 81/269	17/1850 68/262	15/1600 57/255
26000	TIME/FUEL DIST/SPD					42/4500 203/298	31/3400 142/288	25/2750 110/280	21/2350 89/272	18/2000 74/265	16/1750 62/258	14/1550 52/251
25000	TIME/FUEL DIST/SPD					35/3850 163/292	27/3050 122/283	23/2550 97/275	19/2200 80/268	17/1900 67/262	15/1650 56/255	14/1450 48/248
24000	TIME/FUEL DIST/SPD				40/4450 190/296	30/3400 137/286	25/2800 107/279	21/2350 86/271	18/2050 72/265	15/1800 61/258	14/1550 51/252	13/1400 44/245
23000	TIME/FUEL DIST/SPD				34/3850 155/290	27/3100 117/282	22/2600 94/274	19/2200 77/268	16/1900 65/261	14/1700 55/255	13/1500 47/249	12/1300 40/243
22000	TIME/FUEL DIST/SPD			38/4350 177/293	29/3400 130/285	24/2800 102/277	20/2400 83/271	17/2050 70/264	15/1800 59/258	13/1600 50/252	12/1400 43/246	11/1250 37/240
21000	TIME/FUEL DIST/SPD		44/5100 208/296	32/3800 145/288	26/3050 112/280	21/2600 90/274	18/2200 74/267	16/1950 63/261	14/1700 53/255	12/1500 46/249	11/1350 39/243	11/1200 34/237
20000	TIME/FUEL DIST/SPD	40/4850 188/293	30/3700 135/286	24/3000 105/279	20/2550 85/273	18/2200 71/267	15/1900 60/261	13/1700 51/255	12/1500 44/250	11/1350 38/244	10/1200 33/238	9/1050 29/233
18000	TIME/FUEL DIST/SPD	28/3550 124/284	23/2950 98/278	19/2500 79/272	17/2150 66/267	15/1900 56/261	13/1650 48/256	11/1500 41/250	10/1300 36/245	9/1200 31/239	8/1050 27/234	8/950 24/228
16000	TIME/FUEL DIST/SPD	21/2800 89/277	18/2400 73/271	15/2050 61/266	14/1800 52/261	12/1600 44/256	11/1450 38/251	10/1300 33/245	9/1150 29/240	8/1050 25/235	7/950 22/229	7/850 19/224
14000	TIME/FUEL DIST/SPD	13/1800 47/265	11/1600 40/261	10/1400 35/256	9/1250 30/251	8/1150 26/247	7/1000 23/242	6/900 20/237	5/850 18/232	4/750 16/227	3/700 14/222	2/600 12/216
10000	TIME/FUEL	2/350	2/350	2/300	2/300	2/300	2/250	1/250	1/250	1/200	2/200	2/200

FUEL ADJUSTMENT FOR HIGH ELEVATION AIRPORTS EFFECT ON TIME AND DISTANCE IS NEGLIGIBLE	AIRPORT ELEVATION (FT)	2000	4000	6000	8000	10000	12000
	FUEL ADJUSTMENT (KG)	-150	-350	-500	-700	-900	-1100

GEAR DOWN

Long Range Cruise Table 35000 FT to 30000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
35 (-40)	EPR										1.56	1.48	1.42	1.37
	MAX TAT										-28	-22	-17	-13
	KIAS										202	194	190	185
	MACH										.602	.580	.567	.553
	FF/ENG										2021	1819	1677	1550
	KTAS										347	335	327	319
34 (-38)	EPR										1.49	1.43	1.39	1.34
	MAX TAT										-23	-18	-14	-9
	KIAS										200	194	190	185
	MACH										.584	.568	.555	.541
	FF/ENG										1956	1790	1661	1542
	KTAS										338	329	321	314
33 (-36)	EPR									1.51	1.45	1.40	1.36	1.32
	MAX TAT									-25	-19	-14	-10	
	KIAS									207	200	194	190	185
	MACH									.590	.570	.556	.543	.530
	FF/ENG									2115	1917	1772	1651	1538
	KTAS									343	332	323	316	308
32 (-35)	EPR									1.46	1.41	1.37	1.33	1.30
	MAX TAT									-20	-16	-11	-6	
	KIAS									206	201	196	190	185
	MACH									.574	.561	.547	.532	.519
	FF/ENG									2059	1908	1775	1645	1539
	KTAS									336	328	320	311	303
31 (-33)	EPR								1.47	1.42	1.38	1.34	1.30	1.27
	MAX TAT								-21	-16	-12	-8		
	KIAS								212	207	202	196	190	185
	MACH								.579	.565	.551	.538	.520	.507
	FF/ENG								2209	2047	1906	1777	1644	1542
	KTAS								340	331	324	315	305	298
30 (-31)	EPR								1.43	1.39	1.35	1.32	1.28	1.25
	MAX TAT								-18	-13	-9	-4		
	KIAS								213	208	203	197	190	185
	MACH								.568	.555	.543	.527	.509	.497
	FF/ENG								2188	2044	1915	1783	1668	1562
	KTAS								334	327	320	311	300	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)	30	31	32	33	34	35
LIMIT EPR	1.46	1.48	1.51	1.52	1.55	1.57
MAX TAT (°C)	-19	-21	-23	-24	-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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
29 (-30)	EPR								1.40	1.36	1.33	1.29	1.26	1.24
	MAX TAT								-14	-10	-6	0		
	KIAS								214	209	203	196	190	185
	MACH								.558	.546	.533	.515	.499	.486
	FF/ENG KTAS								2186 330	2054 323	1923 315	1782 305	1654 295	1562 288
28 (-28)	EPR							1.40	1.37	1.34	1.30	1.27	1.24	1.22
	MAX TAT							-15	-11	-7	-2			
	KIAS							219	215	210	203	195	190	185
	MACH							.561	.549	.537	.522	.502	.488	.476
	FF/ENG KTAS							2326 333	2189 327	2058 319	1922 310	1771 298	1653 290	1562 283
27 (-26)	EPR							1.37	1.34	1.31	1.28	1.25	1.22	1.20
	MAX TAT							-11	-7	-3	2			
	KIAS							220	216	210	203	194	190	185
	MACH							.552	.541	.527	.509	.490	.478	.466
	FF/ENG KTAS							2322 329	2192 323	2059 315	1913 304	1759 292	1652 286	1563 278
26 (-24)	EPR						1.38	1.35	1.32	1.29	1.26	1.23	1.21	1.19
	MAX TAT						-12	-8	-4	1				
	KIAS						226	222	216	209	202	194	190	185
	MACH						.554	.543	.531	.515	.496	.480	.468	.457
	FF/ENG KTAS						2457 332	2328 326	2196 318	2053 309	1899 298	1758 287	1652 281	1563 274
25 (-23)	EPR						1.35	1.32	1.30	1.27	1.24	1.21	1.19	1.18
	MAX TAT						-8	-5	0	5				
	KIAS						227	222	216	208	201	194	190	185
	MACH						.545	.534	.520	.502	.485	.470	.459	.447
	FF/ENG KTAS						2464 328	2332 321	2192 313	2040 302	1887 292	1757 283	1652 276	1563 269
24 (-21)	EPR					1.36	1.33	1.30	1.27	1.25	1.22	1.20	1.18	1.16
	MAX TAT					-9	-5	-1	4					
	KIAS					233	228	222	215	208	201	195	190	185
	MACH					.547	.536	.524	.507	.490	.475	.461	.450	.438
	FF/ENG KTAS					2600 331	2468 324	2331 316	2182 307	2026 296	1886 287	1761 279	1652 272	1564 265

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	1.37	1.39	1.41	1.42	1.44
MAX TAT (°C)	-8	-10	-11	-14	-15	-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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
23 (-19)	EPR					1.33	1.31	1.28	1.25	1.23	1.21	1.19	1.17	1.15
	MAX TAT					-5	-1	3	8					
	KIAS					234	228	222	214	207	201	195	190	185
	MACH					.538	.526	.511	.495	.479	.466	.452	.441	.429
	FF/ENG KTAS					2605 327	2470 320	2323 310	2166 300	2019 291	1891 283	1765 275	1653 267	1564 261
22 (-18)	EPR					1.31	1.28	1.26	1.23	1.21	1.19	1.17	1.16	1.14
	MAX TAT					-2	3	7	13					
	KIAS					234	228	220	213	207	202	195	190	185
	MACH					.529	.515	.499	.484	.470	.458	.444	.432	.421
	FF/ENG KTAS					2609 322	2463 314	2306 304	2154 295	2021 287	1896 279	1767 270	1653 263	1565 256
21 (-16)	EPR				1.31	1.29	1.26	1.24	1.22	1.20	1.18	1.16	1.15	1.13
	MAX TAT				-2	2	7	12						
	KIAS				240	234	227	220	213	208	202	195	190	185
	MACH				.530	.517	.502	.487	.474	.462	.449	.435	.423	.412
	FF/ENG KTAS				2746 324	2601 316	2445 307	2290 298	2152 290	2026 283	1898 275	1768 266	1653 259	1550 252
20 (-14)	EPR				1.29	1.27	1.24	1.22	1.20	1.19	1.17	1.15	1.14	1.13
	MAX TAT				2	6	11	16						
	KIAS				239	233	226	219	214	208	202	195	190	185
	MACH				.519	.505	.490	.477	.466	.454	.441	.427	.415	.404
	FF/ENG KTAS				2741 319	2586 310	2429 301	2285 293	2157 286	2030 279	1900 271	1770 262	1654 255	1551 248
19 (-12)	EPR			1.29	1.27	1.25	1.23	1.21	1.19	1.17	1.16	1.14	1.13	1.12
	MAX TAT			2	6	11	15							
	KIAS			245	238	232	225	220	214	208	202	196	190	185
	MACH			.520	.507	.493	.480	.469	.457	.445	.432	.419	.407	.396
	FF/ENG KTAS			2883 321	2729 313	2568 304	2421 296	2290 289	2164 282	2034 275	1903 267	1773 258	1656 251	1554 244
18 (-10)	EPR			1.27	1.25	1.23	1.21	1.20	1.18	1.16	1.15	1.14	1.12	1.11
	MAX TAT			6	10	15	19							
	KIAS			244	237	231	225	220	215	208	202	196	190	185
	MACH			.509	.495	.482	.471	.461	.449	.437	.424	.411	.399	.388
	FF/ENG KTAS			2872 315	2709 307	2558 299	2426 292	2299 285	2169 278	2038 270	1907 263	1777 254	1660 247	1559 241

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	1.29	1.30	1.31	1.32	1.34	1.34
MAX TAT (°C)	3	1	-1	-2	-4	-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.

GEAR DOWN

Long Range Cruise Table 17000 FT to 12000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
17 (-9)	EPR		1.27	1.25	1.23	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12	1.10
	MAX TAT		6	10	14	18								
	KIAS		249	243	237	231	226	220	215	209	202	196	190	185
	MACH		.510	.497	.484	.473	.463	.452	.441	.429	.416	.403	.391	.381
	FF/ENG KTAS		3015 317	2851 309	2696 301	2563 294	2435 288	2305 281	2174 274	2041 266	1911 259	1782 251	1664 243	1566 237
16 (-7)	EPR		1.25	1.23	1.22	1.20	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.10
	MAX TAT		10	14	18	22								
	KIAS		248	242	237	231	226	221	215	209	202	196	190	185
	MACH		.498	.486	.475	.465	.455	.444	.433	.421	.408	.396	.384	.374
	FF/ENG KTAS		2993 311	2833 303	2694 296	2565 290	2438 284	2308 277	2176 270	2044 262	1914 255	1790 247	1675 240	1572 233
15 (-5)	EPR	1.25	1.23	1.22	1.20	1.19	1.18	1.16	1.15	1.14	1.12	1.11	1.10	1.09
	MAX TAT	10	14	18	22	26								
	KIAS	253	247	242	237	232	227	221	215	209	203	197	191	185
	MACH	.498	.487	.476	.467	.457	.447	.436	.425	.413	.401	.389	.378	.366
	FF/ENG KTAS	3134 312	2973 305	2832 298	2701 292	2574 286	2444 280	2311 273	2179 266	2049 259	1921 251	1801 244	1690 237	1580 229
14 (-3)	EPR	1.23	1.22	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	MAX TAT	15	18	22	26									
	KIAS	252	247	242	237	232	227	221	215	209	203	197	192	185
	MACH	.487	.477	.468	.459	.449	.439	.428	.417	.405	.394	.383	.372	.360
	FF/ENG KTAS	3145 306	3000 300	2867 294	2738 289	2606 282	2473 276	2339 269	2206 262	2074 255	1951 248	1835 241	1723 234	1609 226
13 (-1)	EPR	1.22	1.21	1.19	1.18	1.17	1.16	1.14	1.13	1.12	1.11	1.10	1.09	1.08
	MAX TAT	18	22	25	29									
	KIAS	252	247	243	238	232	227	221	215	209	204	198	192	185
	MACH	.478	.469	.460	.451	.441	.431	.420	.409	.398	.388	.377	.366	.354
	FF/ENG KTAS	3137 302	3003 296	2874 291	2742 285	2609 278	2474 272	2341 265	2209 258	2081 251	1962 245	1850 238	1736 231	1619 223
12 (0)	EPR	1.21	1.19	1.18	1.17	1.16	1.15	1.14	1.12	1.12	1.11	1.10	1.09	1.08
	MAX TAT	22	25	29										
	KIAS	253	248	243	238	232	227	221	215	210	204	199	193	186
	MACH	.470	.461	.452	.443	.433	.423	.412	.402	.392	.382	.371	.360	.347
	FF/ENG KTAS	3142 298	3012 292	2880 287	2747 281	2612 274	2478 268	2345 261	2215 255	2092 248	1977 242	1865 235	1750 228	1628 220

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	1.25	1.26	1.26	1.26	1.28	1.28
MAX TAT (°C)	13	12	10	9	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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
11 (2)	EPR	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.07
	MAX TAT	25	29	32										
	KIAS	253	248	243	238	233	227	221	216	210	205	199	193	186
	MACH	.462	.453	.444	.435	.425	.415	.405	.395	.386	.376	.365	.354	.341
	FF/ENG	3154	3021	2888	2752	2617	2484	2351	2226	2108	1996	1881	1762	1638
10 (4)	KTAS	294	288	283	277	270	264	258	251	245	239	232	225	217
	EPR	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
	MAX TAT	29	32											
	KIAS	253	249	243	238	233	227	222	216	211	206	200	193	186
	MACH	.454	.446	.437	.427	.418	.408	.398	.389	.380	.370	.360	.348	.335
9 (5)	FF/ENG	3163	3029	2893	2758	2623	2489	2362	2241	2126	2013	1897	1774	1648
	KTAS	290	284	279	273	267	260	254	248	242	236	230	222	214
	EPR	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.08	1.07	1.07
	MAX TAT	32	36											
	KIAS	254	249	243	238	233	227	222	217	212	206	200	193	186
8 (7)	MACH	.446	.438	.429	.420	.410	.401	.392	.383	.374	.364	.353	.341	.329
	FF/ENG	3171	3035	2899	2764	2629	2499	2375	2269	2166	2058	1936	1809	1680
	KTAS	286	280	275	269	263	257	251	245	240	233	226	219	210
	EPR	1.16	1.15	1.14	1.13	1.13	1.12	1.11	1.10	1.09	1.09	1.08	1.07	1.06
	MAX TAT	35	39											
7 (9)	KIAS	254	249	244	238	233	228	223	218	212	207	200	193	186
	MACH	.439	.430	.421	.412	.403	.394	.386	.377	.368	.358	.347	.335	.322
	FF/ENG	3177	3041	2905	2770	2637	2512	2400	2297	2190	2074	1948	1820	1689
	KTAS	282	277	271	265	259	254	248	243	237	230	223	216	207
	EPR	1.15	1.14	1.14	1.13	1.12	1.11	1.10	1.10	1.09	1.08	1.07	1.07	1.06
6 (11)	MAX TAT	39												
	KIAS	254	249	244	238	233	228	224	218	213	207	200	193	186
	MACH	.431	.423	.414	.405	.397	.388	.380	.372	.362	.352	.341	.329	.316
	FF/ENG	3183	3047	2911	2777	2650	2533	2428	2323	2212	2088	1960	1830	1697
	KTAS	278	273	267	261	256	251	245	240	234	227	220	212	204
	EPR	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.08	1.08	1.07	1.06	1.06
	MAX TAT	42												
	KIAS	254	249	244	239	234	229	224	219	213	207	200	193	186
	MACH	.423	.415	.407	.398	.390	.382	.375	.366	.357	.346	.335	.323	.311
	FF/ENG	3190	3054	2918	2789	2668	2562	2457	2349	2228	2101	1972	1840	1705
	KTAS	274	269	263	258	253	248	243	237	231	224	217	209	201

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	1.22	1.23	1.23	1.24	1.24	1.25
MAX TAT (°C)	23	22	20	18	17	15

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

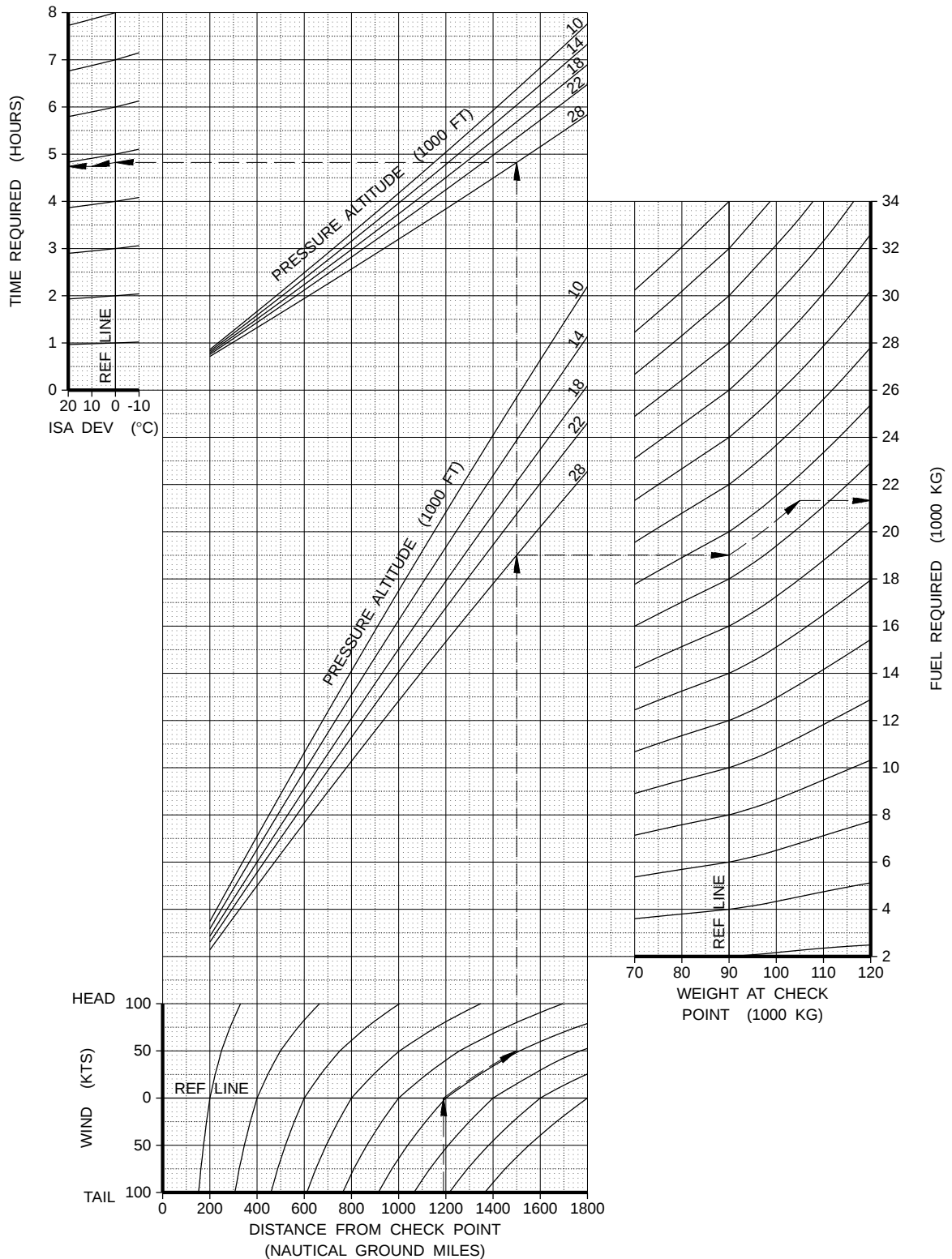
With engine anti-ice on, decrease limit EPR by 0.03.

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

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 (KG)	DISTANCE (NM)
35000	20	350	74
33000	19	350	70
31000	18	340	65
29000	17	330	61
27000	17	320	57
25000	16	310	53
23000	15	300	49
21000	14	290	45
19000	13	280	41
17000	13	270	37
15000	12	260	33
10000	9	230	23
5000	7	180	13
1500	5	150	6

Allowances for a straight-in approach are included.

Holding

Flaps Up

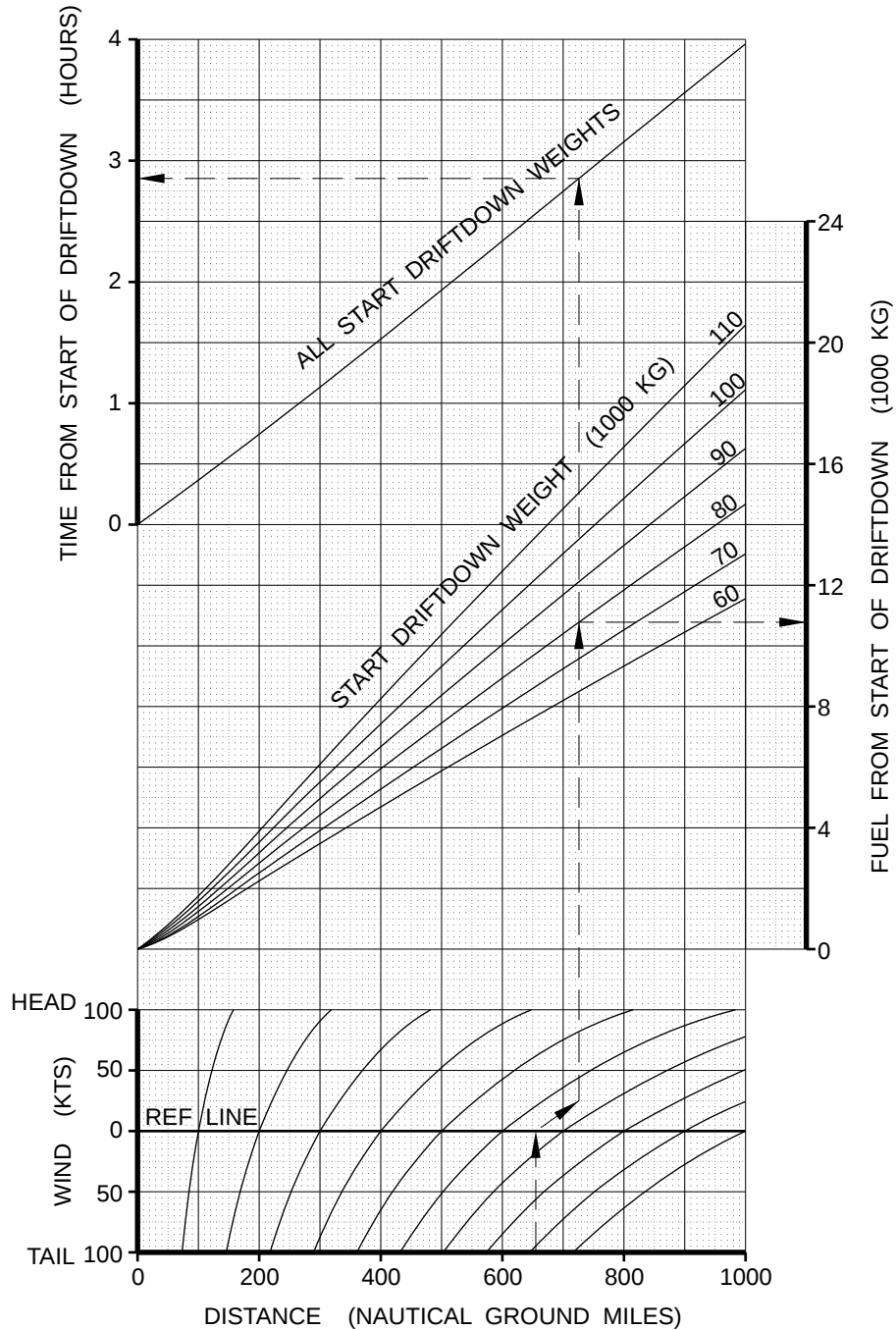
PRESSURE ALTITUDE (FT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
35000	EPR										1.54	1.48	1.42	1.37
	KIAS										199	194	190	185
	FF/ENG										2080	1910	1760	1630
30000	EPR								1.42	1.38	1.34	1.31	1.28	1.25
	KIAS								208	203	199	194	190	185
	FF/ENG								2230	2090	1960	1840	1750	1640
25000	EPR					1.36	1.33	1.30	1.28	1.26	1.23	1.21	1.19	1.18
	KIAS					221	216	212	208	203	199	194	190	185
	FF/ENG					2570	2430	2310	2190	2070	1960	1840	1730	1640
20000	EPR		1.31	1.29	1.27	1.25	1.23	1.21	1.20	1.18	1.17	1.15	1.14	1.13
	KIAS		233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG		2920	2800	2670	2540	2420	2300	2180	2070	1960	1840	1740	1630
15000	EPR	1.23	1.22	1.20	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09
	KIAS	237	233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG	3030	2900	2780	2660	2540	2420	2300	2190	2080	1970	1860	1760	1660
10000	EPR	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.09	1.08	1.08	1.07
	KIAS	237	233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG	3060	2940	2820	2690	2570	2460	2340	2240	2130	2030	1920	1820	1720
5000	EPR	1.13	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.06	1.06	1.05
	KIAS	237	233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG	3080	2960	2850	2740	2640	2540	2430	2320	2220	2110	2000	1900	1790
1500	EPR	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	237	233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG	3130	3030	2920	2810	2700	2580	2470	2360	2250	2140	2040	1930	1820

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

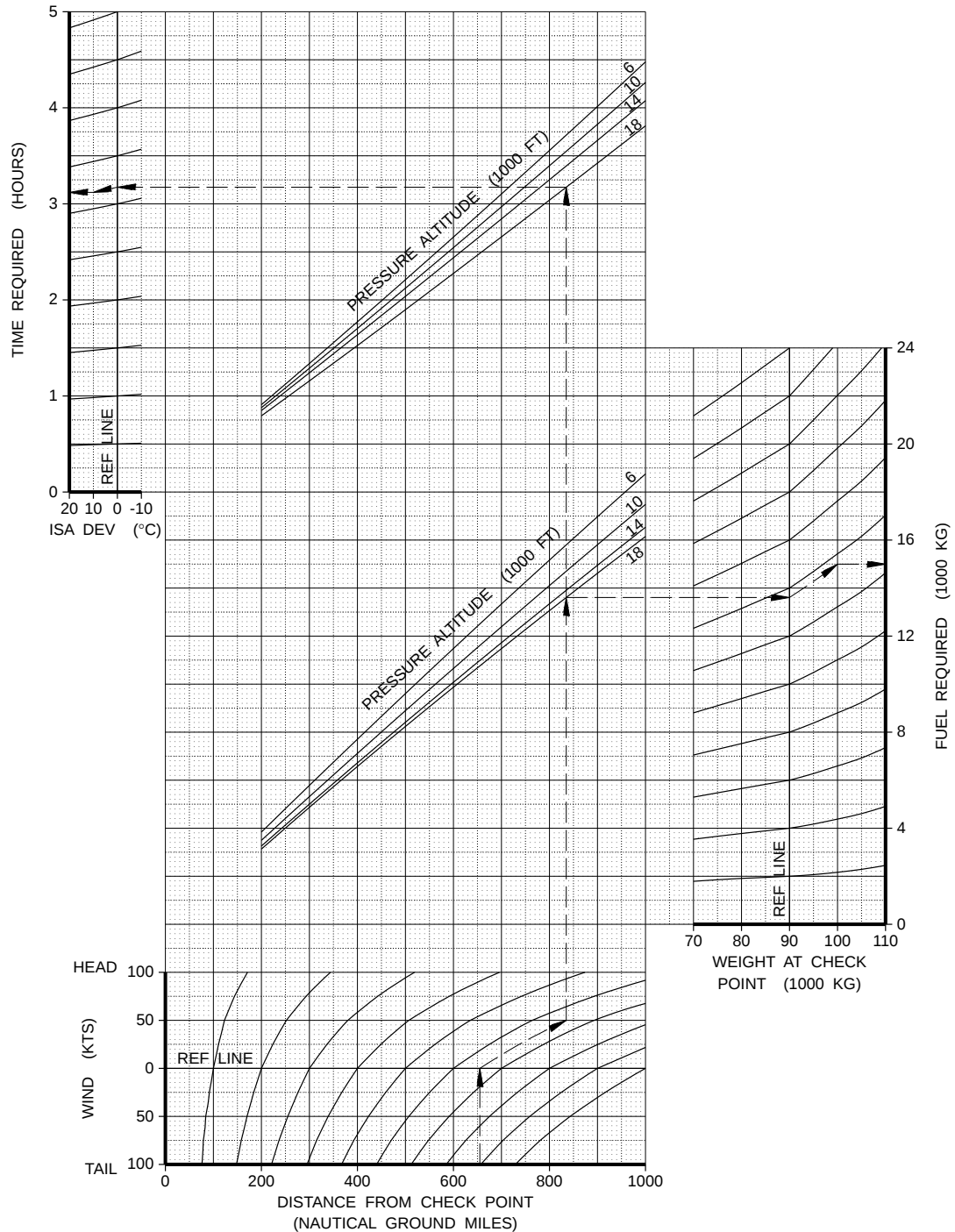
WEIGHT (1000 KG)	PRESSURE ALTITUDE (FT)		
	ISA + 10°C & BELOW	ISA + 15°C	ISA + 20°C
100	6300		
95	8900	6000	
90	11700	9000	5400
85	13600	11800	9100
80	15400	14100	12200
75	17300	16000	14600
70	19200	18000	16600
65	20900	20100	18800
60	22300	21700	20700

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
20 (-16)	EPR											1.58	1.51	1.46
	MAX TAT											-3	5	13
	KIAS											194	190	185
	MACH											.425	.415	.404
	FF/ENG KTAS											3702	3406	3121
19 (-14)	EPR											261	255	248
	MAX TAT											1.53	1.48	1.43
	KIAS											3	11	
	MACH											194	190	185
	FF/ENG KTAS											.416	.407	.396
18 (-12)	EPR											3649	3356	3097
	MAX TAT											257	251	244
	KIAS										1.55	1.49	1.44	1.40
	MACH										1	8	15	
	FF/ENG KTAS										199	194	190	185
17 (-11)	EPR											.418	.399	.388
	MAX TAT											3893	3596	3085
	KIAS											259	253	241
	MACH											1.51	1.46	1.41
	FF/ENG KTAS											7	14	13.7
16 (-9)	EPR											199	194	185
	MAX TAT											.409	.400	.381
	KIAS											3838	3554	3079
	MACH											255	249	237
	FF/ENG KTAS											1.52	1.47	1.43
15 (-7)	EPR											5	12	18
	MAX TAT											203	199	194
	KIAS											.410	.402	.393
	MACH											4082	3788	3530
	FF/ENG KTAS											256	251	245
15 (-7)	EPR											245	239	233
	MAX TAT											1.44	1.40	1.36
	KIAS											17	194	190
	MACH											1.48	1.44	1.40
	FF/ENG KTAS											4	11	10.3
15 (-7)	EPR											208	203	199
	MAX TAT											.411	.402	.394
	KIAS											4325	4024	3756
	MACH											257	252	247
	FF/ENG KTAS											1.53	1.48	1.44

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	1.53	1.54	1.56	1.57	1.59	1.60
MAX TAT (°C)	4	2	0	-2	-4	-5

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 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
14 (-5)	EPR								1.49	1.45	1.41	1.37	1.34	1.31
	MAX TAT								10	16	22			
	KIAS								208	203	199	194	190	185
	MACH								.403	.395	.386	.378	.369	.359
	FF/ENG KTAS								4298 253	4022 248	3774 243	3544 238	3322 232	3112 226
13 (-3)	EPR							1.50	1.46	1.42	1.38	1.35	1.32	1.29
	MAX TAT							9	15	20	26			
	KIAS							212	208	204	199	194	190	185
	MACH							.403	.395	.388	.379	.371	.362	.353
	FF/ENG KTAS							4538 255	4250 250	4007 245	3761 239	3536 234	3321 228	3114 223
12 (-1)	EPR							1.46	1.43	1.40	1.36	1.33	1.30	1.28
	MAX TAT							14	19	24				
	KIAS							212	209	205	200	195	190	185
	MACH							.396	.391	.383	.373	.364	.355	.346
	FF/ENG KTAS							4494 251	4266 248	4020 242	3769 236	3543 231	3327 225	3112 219
11 (1)	EPR						1.47	1.44	1.41	1.37	1.34	1.32	1.29	1.26
	MAX TAT						12	17	22	27				
	KIAS						218	215	210	206	201	196	190	185
	MACH						.398	.393	.386	.377	.368	.359	.348	.339
	FF/ENG KTAS						4765 253	4530 250	4284 245	4035 240	3793 234	3567 228	3330 221	3112 216
10 (2)	EPR						1.45	1.42	1.38	1.35	1.33	1.30	1.27	1.25
	MAX TAT						16	21	26	31				
	KIAS						219	216	211	206	202	196	190	185
	MACH						.394	.388	.380	.371	.363	.352	.342	.333
	FF/ENG KTAS						4782 252	4549 248	4301 243	4050 237	3828 232	3580 225	3329 218	3117 213
9 (4)	EPR					1.45	1.42	1.39	1.36	1.34	1.31	1.28	1.26	1.24
	MAX TAT					15	20	24	29	33				
	KIAS					224	221	217	212	207	202	196	190	185
	MACH					.395	.390	.383	.374	.366	.357	.346	.335	.327
	FF/ENG KTAS					5043 253	4816 250	4567 245	4314 240	4079 235	3849 229	3583 222	3331 215	3126 209

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	1.46	1.47	1.48	1.49	1.51	1.52
MAX TAT (°C)	16	14	12	10	8	6

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.



GEAR DOWN ENGINE INOP MAX CONTINUOUS THRUST

Long Range Cruise Table 8000 FT to 5000 FT

PRESS ALT (1000 FT) (STD TAT)		WEIGHT (1000 KG)												
		120	115	110	105	100	95	90	85	80	75	70	65	60
8 (6)	EPR					1.43	1.40	1.37	1.35	1.32	1.29	1.27	1.24	1.22
	MAX TAT					18	23	28	32					
	KIAS					226	222	218	213	209	202	196	190	185
	MACH					.392	.385	.377	.369	.361	.351	.340	.329	.321
	FF/ENG					5084	4835	4584	4337	4114	3858	3586	3338	3135
	KTAS					252	248	243	237	232	226	219	212	206
7 (8)	EPR					1.41	1.38	1.35	1.33	1.30	1.28	1.25	1.23	1.21
	MAX TAT					22	26	31	35					
	KIAS					228	223	218	214	209	203	196	190	185
	MACH					.387	.380	.372	.364	.355	.345	.334	.323	.315
	FF/ENG					5105	4854	4600	4373	4133	3861	3593	3348	3143
	KTAS					250	245	240	235	229	223	216	209	203
6 (10)	EPR				1.41	1.39	1.36	1.34	1.31	1.29	1.26	1.24	1.22	1.20
	MAX TAT				21	25	30	34	38					
	KIAS				233	229	224	220	215	209	203	196	190	185
	MACH				.388	.381	.374	.367	.359	.349	.339	.328	.317	.309
	FF/ENG				5376	5125	4868	4632	4403	4138	3865	3601	3356	3151
	KTAS				251	247	242	237	233	226	219	212	206	200
5 (12)	EPR				1.39	1.37	1.34	1.32	1.30	1.27	1.25	1.23	1.21	1.19
	MAX TAT				25	29	33	36	41					
	KIAS				234	229	225	221	215	209	203	196	190	185
	MACH				.383	.376	.369	.362	.353	.343	.333	.322	.312	.304
	FF/ENG				5398	5142	4896	4672	4418	4142	3873	3609	3364	3157
	KTAS				249	244	240	235	229	223	216	209	203	197

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	1.41	1.42	1.43	1.44
MAX TAT (°C)	24	22	20	18

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 0.05.

Holding

Flaps Up

PRESSURE ALTITUDE (FT)		WEIGHT (1000 KG)											
		115	110	105	100	95	90	85	80	75	70	65	60
15000	EPR							1.53	1.48	1.44	1.40	1.36	1.33
	KIAS							208	203	199	194	190	185
	FF/ENG							4540	4230	3940	3690	3460	3230
10000	EPR					1.44	1.40	1.37	1.35	1.32	1.30	1.27	1.25
	KIAS					216	212	208	203	199	194	190	185
	FF/ENG					4930	4660	4410	4170	3940	3720	3500	3270
5000	EPR		1.40	1.37	1.35	1.32	1.30	1.28	1.26	1.24	1.23	1.21	1.19
	KIAS		229	225	221	216	212	208	203	199	194	190	185
	FF/ENG		5650	5390	5130	4890	4660	4420	4190	3960	3750	3530	3310
1500	EPR	1.34	1.32	1.30	1.29	1.27	1.25	1.24	1.22	1.20	1.19	1.18	1.16
	KIAS	233	229	225	221	216	212	208	203	199	194	190	185
	FF/ENG	5880	5630	5390	5150	4900	4660	4440	4220	4000	3770	3550	3330

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

ALTERNATE THRUST SETTING

Takeoff Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 KG)			
	FLAPS 1	FLAPS 5	FLAPS 15	FLAPS 20
FIELD	-1.0	-1.0	-1.1	-1.1
TIRE SPEED	-0.2	-0.2	-0.2	-0.2
CLIMB	-2.6	-2.6	-2.4	-2.4
OBSTACLE	-2.9	-2.8	-2.5	-2.4

Takeoff Speeds

TAKEOFF SPEEDS	TAKEOFF SPEED ADJUSTMENT (KTS)
V1	0
VR	0
V2	0

Enroute Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 KG)
ENROUTE CLIMB	-3.9

Landing Performance

PERFORMANCE LIMIT	WEIGHT ADJUSTMENT (1000 KG)	
	FLAPS 15/25	FLAPS 20/30
APPROACH/LANDING CLIMB	-2.8	-2.5

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)									
°C	°F	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
55	131	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
50	122	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9
45	113	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7
40	104	91.0	91.0	91.0	91.0	91.0	91.0	91.0	91.0	91.0	91.0
35	95	91.9	92.3	92.3	92.3	92.3	92.3	92.3	92.3	92.3	92.3
30	86	91.8	93.3	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6
25	77	91.1	92.6	93.3	94.0	94.6	94.6	94.6	94.6	94.6	94.6
20	68	90.3	91.8	92.5	93.3	94.0	94.6	95.3	95.5	95.5	95.5
15	59	89.6	91.0	91.7	92.5	93.2	93.8	94.5	95.1	95.6	96.2
10	50	88.8	90.2	90.9	91.7	92.4	93.0	93.6	94.2	94.8	95.4
5	41	88.0	89.4	90.1	90.8	91.5	92.2	92.8	93.4	94.0	94.6
0	32	87.2	88.6	89.3	90.0	90.7	91.4	92.0	92.6	93.1	93.7
-5	23	86.4	87.8	88.5	89.2	89.9	90.5	91.1	91.7	92.3	92.8
-10	14	85.6	87.0	87.7	88.3	89.0	89.7	90.3	90.8	91.4	92.0
-15	5	84.8	86.1	86.8	87.5	88.2	88.8	89.4	90.0	90.5	91.1
-20	-4	83.9	85.3	86.0	86.7	87.3	87.9	88.5	89.1	89.7	90.2
-25	-13	83.1	84.4	85.1	85.8	86.5	87.1	87.7	88.2	88.8	89.3
-30	-22	82.3	83.6	84.3	84.9	85.6	86.2	86.8	87.3	87.9	88.4
-35	-31	81.4	82.7	83.4	84.1	84.7	85.3	85.9	86.4	87.0	87.5
-40	-40	80.6	81.9	82.5	83.2	83.8	84.4	85.0	85.5	86.0	86.6
-45	-49	79.7	81.0	81.6	82.3	82.9	83.5	84.1	84.6	85.1	85.6
-50	-58	78.8	80.1	80.7	81.4	82.0	82.6	83.1	83.7	84.2	84.7

%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)									
°C	°F	(°C)	-1000	0	1000	2000	3000	4000	5000	6000	7000	8000
55	131	58	85.6	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5
50	122	53	87.4	87.4	87.5	87.6	87.6	87.5	87.5	87.5	87.5	87.5
45	113	48	89.2	89.3	89.3	89.3	89.4	89.3	89.5	89.4	89.4	89.4
40	104	43	90.6	90.6	90.6	90.7	90.7	90.7	90.8	90.8	90.9	90.9
35	95	38	91.5	92.0	92.0	92.0	92.0	92.1	92.1	92.1	92.2	92.2
30	86	33	91.8	93.3	93.4	93.4	93.4	93.4	93.4	93.5	93.5	93.5
25	77	28	91.0	92.5	93.3	94.1	94.6	94.6	94.6	94.7	94.7	94.8
20	68	23	90.3	91.8	92.6	93.3	94.1	94.8	95.4	95.7	95.7	95.7
15	59	18	89.5	91.0	91.8	92.5	93.3	94.0	94.6	95.3	95.9	96.5
10	50	13	88.7	90.2	91.0	91.7	92.5	93.1	93.8	94.4	95.0	95.7
5	41	8	87.9	89.4	90.2	90.9	91.7	92.3	93.0	93.6	94.2	94.8
0	32	3	87.1	88.6	89.3	90.1	90.8	91.5	92.1	92.8	93.4	94.0
-5	23	-2	86.3	87.8	88.5	89.3	90.0	90.6	91.3	91.9	92.5	93.1
-10	14	-7	85.5	86.9	87.7	88.4	89.2	89.8	90.4	91.0	91.6	92.3
-15	5	-13	84.6	86.1	86.8	87.5	88.3	88.9	89.6	90.2	90.8	91.4
-20	-4	-18	83.8	85.2	85.9	86.6	87.4	88.0	88.7	89.3	89.9	90.5
-25	-13	-23	82.9	84.3	85.1	85.8	86.5	87.1	87.8	88.4	88.9	89.6
-30	-22	-28	82.1	83.5	84.2	84.9	85.6	86.2	86.8	87.4	88.0	88.6
-35	-31	-33	81.2	82.6	83.3	84.0	84.7	85.3	85.9	86.5	87.1	87.7
-40	-40	-38	80.4	81.7	82.4	83.1	83.8	84.4	85.0	85.6	86.2	86.8
-45	-49	-43	79.5	80.9	81.6	82.2	82.9	83.5	84.1	84.7	85.3	85.8
-50	-58	-48	78.7	80.0	80.7	81.4	82.0	82.6	83.2	83.8	84.3	84.9

%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	82.2	85.2	85.3	86.7	86.7	83.8	79.7	75.6	70.4
50	85.0	87.4	87.5	88.3	88.3	86.0	82.9	80.2	75.2
40	87.2	89.2	89.3	89.9	89.8	87.8	85.3	83.1	79.3
30	87.9	90.8	91.0	91.8	91.7	89.8	87.7	86.0	83.2
20	86.5	90.8	92.9	93.8	93.6	91.6	89.4	87.6	85.4
10	85.0	89.3	92.4	94.8	95.7	93.4	91.0	89.1	87.2
0	83.5	87.7	90.8	93.1	95.5	95.3	92.6	90.8	88.8
-10	81.9	86.1	89.1	91.4	93.7	93.7	93.2	92.8	90.9
-20	80.4	84.4	87.4	89.7	91.9	91.9	91.4	94.0	93.3
-30	78.7	82.7	85.6	87.9	90.1	90.1	89.6	92.1	91.4
-40	77.1	81.0	83.9	86.1	88.2	88.2	87.7	90.2	89.5
-50	75.4	79.3	82.0	84.2	86.3	86.3	85.8	88.2	87.6

%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
PACKS OFF	1.4	1.2	1.0	0.8	0.7	0.5	0.4	0.4	0.5
ENGINE ANTI-ICE ON	-2.1	-1.7	-1.4	-1.3	-1.2	-1.2	-1.2	0.0	0.0
ENGINE & WING ANTI-ICE ON	-4.0	-3.2	-2.7	-2.4	-2.3	-2.3	-2.2	-1.0	-0.9

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	90.6	89.8	89.0	88.3	87.6	86.7	85.8	84.9	84.1
15	91.3	90.5	89.8	89.0	88.3	87.5	86.7	85.9	85.0
10	92.0	91.2	90.4	89.7	89.0	88.2	87.4	86.6	85.8
5	92.7	91.9	91.1	90.4	89.7	89.0	88.2	87.4	86.5
0	92.5	92.7	91.9	91.2	90.6	89.8	89.0	88.2	87.4
-5	91.7	92.4	92.8	92.1	91.5	90.7	89.9	89.1	88.3
-10	90.8	91.5	92.4	93.3	92.6	91.9	91.1	90.3	89.5
-15	89.9	90.6	91.5	92.7	94.0	93.2	92.5	91.7	90.9
-20	89.1	89.8	90.6	91.8	93.1	93.5	92.8	92.0	91.2
-25	88.2	88.9	89.7	90.8	92.2	92.6	91.9	91.1	90.3
-30	87.3	88.0	88.8	89.9	91.2	91.7	90.9	90.2	89.4
-35	86.4	87.1	87.9	89.0	90.3	90.7	90.0	89.2	88.5
-40	85.5	86.1	87.0	88.1	89.3	89.8	89.0	88.3	87.5

%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	90.3	91.3	92.2	93.2	94.1	94.9	93.8	92.6	91.4	90.3	89.1	88.1
220	.69	90.5	91.4	92.4	93.3	94.3	94.3	93.1	92.0	90.9	89.9	88.9	87.9
240	.75	90.6	91.6	92.5	93.5	94.4	93.8	92.5	91.3	90.3	89.4	88.6	87.7
260	.80	89.7	90.7	91.6	92.6	93.5	93.2	91.9	90.7	89.8	89.0	88.2	87.5
33000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.58	90.1	91.1	92.0	93.0	93.9	94.8	95.5	94.3	93.1	91.9	90.7	89.5
220	.63	90.3	91.3	92.2	93.2	94.1	95.0	95.2	94.1	92.9	91.8	90.6	89.6
240	.68	90.4	91.4	92.4	93.3	94.2	95.2	94.6	93.5	92.4	91.4	90.4	89.5
260	.74	90.6	91.5	92.5	93.4	94.4	95.3	94.0	92.9	91.9	91.0	90.1	89.3
29000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.53	89.9	90.9	91.8	92.8	93.7	94.6	95.5	95.5	94.3	93.1	91.9	90.8
220	.58	90.1	91.1	92.1	93.0	93.9	94.8	95.8	95.7	94.5	93.3	92.1	91.0
240	.63	90.3	91.3	92.2	93.2	94.1	95.0	95.9	95.5	94.3	93.2	92.1	91.0
260	.68	90.4	91.4	92.3	93.3	94.2	95.2	96.1	95.0	93.9	92.9	91.9	90.9
25000 FT PRESS ALT		TAT (°C)											
KIAS	M	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15
200	.49	89.7	90.7	91.7	92.6	93.5	94.4	95.3	96.2	95.3	94.2	93.1	92.0
220	.53	89.9	90.9	91.9	92.8	93.7	94.6	95.6	96.5	95.9	94.7	93.5	92.4
240	.58	90.1	91.1	92.1	93.0	93.9	94.9	95.8	96.7	96.1	94.9	93.7	92.6
260	.63	90.3	91.3	92.2	93.2	94.1	95.0	95.9	96.8	95.9	94.8	93.7	92.6
22000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.46	94.3	95.2	96.1	95.5	94.6	93.7	92.8	91.8	90.9	89.9	88.9	
240	.55	94.7	95.6	96.5	97.1	95.9	94.8	93.7	92.6	91.5	90.4	89.4	
280	.63	93.6	94.5	95.4	96.3	95.9	94.8	93.8	92.8	91.8	90.9	89.8	
20000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.44	94.3	95.3	96.2	95.7	94.9	94.1	93.3	92.4	91.5	90.6	89.8	
240	.53	94.6	95.5	96.4	97.3	96.7	95.5	94.4	93.3	92.2	91.2	90.2	
280	.61	93.5	94.4	95.3	96.2	96.9	95.8	94.7	93.7	92.6	91.6	90.6	
18000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.42	93.0	93.9	94.7	95.2	94.6	93.9	93.1	92.3	91.5	90.7	89.9	
240	.51	94.0	94.9	95.8	96.7	96.7	95.5	94.4	93.3	92.2	91.2	90.2	
280	.59	92.5	93.4	94.3	95.2	96.0	95.9	94.8	93.7	92.7	91.6	90.7	
16000 FT PRESS ALT		TAT (°C)											
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35	
200	.41	91.6	92.5	93.3	94.2	94.3	93.7	93.0	92.2	91.5	90.7	89.9	
240	.49	92.5	93.4	94.3	95.2	96.1	95.3	94.3	93.2	92.2	91.2	90.3	
280	.57	91.4	92.3	93.2	94.1	94.9	95.8	94.8	93.7	92.7	91.6	90.7	

%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)										
KIAS	M	-15	-10	-5	0	5	10	15	20	25	30	35
200	.39	90.4	91.3	92.2	93.0	93.9	93.5	92.8	92.1	91.4	90.6	89.9
240	.47	91.0	91.9	92.8	93.6	94.5	95.0	94.1	93.1	92.1	91.1	90.3
280	.54	90.3	91.2	92.0	92.9	93.7	94.6	94.8	93.7	92.6	91.6	90.6
12000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.38	90.2	91.1	91.9	92.8	93.3	92.7	91.9	91.2	90.4	89.7	88.9
240	.45	90.5	91.3	92.2	93.0	93.8	93.8	92.8	91.9	91.0	90.2	89.3
10000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.36	89.1	90.0	90.8	91.6	92.4	92.5	91.8	91.0	90.3	89.5	88.7
240	.43	89.1	90.0	90.8	91.6	92.4	93.3	92.6	91.8	90.9	90.1	89.3
8000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.35	88.0	88.8	89.6	90.4	91.2	92.0	91.6	90.9	90.1	89.4	88.5
240	.42	87.9	88.7	89.5	90.3	91.1	91.9	92.4	91.6	90.8	90.0	89.2
6000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.34	86.8	87.6	88.4	89.2	90.0	90.8	91.5	90.7	89.9	89.2	88.4
240	.40	86.7	87.5	88.3	89.1	89.9	90.7	91.5	91.5	90.7	90.0	89.2
4000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.32	85.3	86.1	86.9	87.7	88.5	89.3	90.1	90.3	89.5	88.8	87.9
240	.39	85.3	86.1	86.9	87.7	88.5	89.3	90.1	90.8	90.3	89.5	88.7
2000 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.31	83.6	84.4	85.2	86.0	86.7	87.5	88.3	89.0	88.8	88.0	87.1
240	.38	83.6	84.4	85.2	86.0	86.8	87.5	88.3	89.0	89.6	88.8	87.9
0 FT PRESS ALT		TAT (°C)										
KIAS	M	-10	-5	0	5	10	15	20	25	30	35	40
200	.30	81.9	82.7	83.4	84.2	84.9	85.7	86.4	87.2	87.9	87.2	86.2
240	.36	81.9	82.7	83.5	84.2	85.0	85.7	86.5	87.2	87.9	88.0	87.0

%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