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B-717-200

Operational Data

Manual

Revision Number: 13
Revision Date: Septmeber 23, 2016

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FUNCTION

The Aircraft Operational Data Manual (ODM) serves to provide trained Delta Flight Operations and Operations Control personnel with some of the information and instructions necessary for safe and economical operation of the aircraft.

AUTHORITY

This manual is published by the General Manager – Performance Engineering, Dept. 088, ATL under the authority of the Vice President – Operations Reliability and Control.

The procedures and data contained in this manual include those in the FAA Approved Airplane Flight Manual and aircraft manufacturer's data.

RESPONSIBILITY

The General Manager – Performance Engineering has been designated the responsibility for the quality of this manual.

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All manual holders and users are encouraged to contribute their suggestions and criticisms regarding the manual so that its function is well served. Inputs concerning data and technical content should be addressed to Performance Engineering, Dept. 088, ATL.

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 DELTA
Revision Notification

Publication: B-717-200 OPERATIONAL DATA MANUAL

Date: 23 Sep 16

Revision Number: 13

Page: 1 of 1

REMOVE	INSERT	REMARKS
COVER PAGE	COVER PAGE	Cover page updated to reflect revision.
LIST OF EFFECTIVE PAGES Page <i>i</i>	LIST OF EFFECTIVE PAGES Page <i>i</i>	List of Effective Pages updated to reflect revision.
QUICK REFERENCE Pages: All	QUICK REFERENCE Pages: All	Changed the table title and eliminated fair nomenclature to make it consistent with new FAA policy

**Pages not displaying a revision date of 23 Sep 16 were unchanged and included only for filing purposes.*

This list is effective with ODM Revision #13

ODM REVISION LOG

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	NO DATE

TOC / COVER PAGE

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END

717-200 QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES

RUNWAY CONDITION ASSESSMENT MATRIX

For additional guidance regarding the classification of the braking action based on existing contaminant types and the ICAO/Runway Condition Code values, please refer to Airway Manual, Supplemental, 4 – Weather, Braking Action.

Reported Braking Action		Reported Runway Surface Conditions			
PIREP	Definition	Runway Contaminant	ICAO/Runway Condition Code	Mu ⁽²⁾	RCR
--	--	• Dry	6		--
Good	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal	- Frost - Wet or Damp 1/8" or less depth of: - Water - Slush - Dry Snow - Wet Snow	5	40 or higher	19 & above
Good to Medium	Braking deceleration OR directional control is between Good and Medium.	-15°C and colder OAT: Compacted Snow	4	39 to 30	
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	- Wet ("slippery when wet" runway) - Dry Snow or Wet Snow (any depth) over Compacted Snow Greater than 1/8" depth of: - Dry Snow - Wet Snow Warmer than -15°C OAT: - Compacted Snow	3	29 to 21	13 – 18
Medium to Poor	Braking deceleration OR directional control is between Medium and Poor.	Greater than 1/8" depth of: - Water - Slush	2	20 or lower	
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	• Ice	1		6 – 12
Nil ⁽¹⁾	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	- Wet Ice - Water on top of Compacted Snow - Dry Snow or Wet Snow over Ice	0		5 & below
--	--	• Unreliable	9 (ICAO only)	N/A	N/A

⁽¹⁾ Operations on any runway with a PIREP or runway contaminant of nil are prohibited.

⁽²⁾ The overlapping Mu scales reflect the inherent inaccuracies of ground based Mu devices. Do not base the calculation of a landing distance solely on runway friction meter readings.

Braking actions "GOOD TO MEDIUM (4)" and "MEDIUM TO POOR (2)" are not displayed on the following pages. It is acceptable to interpolate between the provided data to calculate the desired landing performance when these conditions are present.

CROSSWIND

On slippery runways, crosswind guidelines are a function of runway surface condition, airplane loading and assume proper pilot technique. The following crosswind guidelines are applicable to all Delta aircraft for takeoff and landing.

	DRY	GOOD	MEDIUM	POOR
Crosswind Limit	Aircraft Limits	Aircraft Limits	20KTS	10KTS
Tailwind Limit	10KTS	10KTS	5KTS	0KTS

717-200 QUICK REFERENCE CHART

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717-200 QUICK REFERENCE CHART

OPERATIONAL LANDING DISTANCES FEET

FLAPS 40

NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).				
Weight (lb)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
120,000	4,400	5,900	7,200	10,300
115,000	4,300	5,700	7,000	10,000
110,000	4,300	5,500	6,800	9,700
105,000	4,200	5,400	6,600	9,400
100,000	4,100	5,200	6,300	9,100
95,000	4,000	5,000	6,100	8,900
90,000	3,900	4,800	5,900	8,600
85,000	3,800	4,700	5,700	8,300
80,000	3,700	4,500	5,400	8,100
75,000	3,700	4,300	5,200	7,800
70,000	3,600	4,200	5,100	7,700

BASIS: Zero wind and slope • 2 Engines at Max Reverse to 80 kts, Idle Reverse by 60 kts, and Idle Forward by 40 kts. • Touchdown Speed = VREF40 - 5 • Max Manual Braking

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
0	-100	-300	-400	-600
2,000	0	0	0	0
4,000	100	300	400	600
6,000	200	600	900	1,300
8,000	300	900	1,400	2,000

CORRECTIONS

	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
PER 1 KT HEADWIND	0	0	-50	-50
PER 1 KT TAILWIND	50	100	150	300
PER 5 KTS ADD'L SPD	100	400	450	500
PER 1% UP SLOPE	-50	-150	-300	-700
PER 1% DOWN SLOPE	50	150	400	1,200
1 REVERSER INOP	0	300	600	1,000
2 REVERSERS INOP	0	600	1,400	2,800

Note: Do not operate when Braking Action is Nil.

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DEFINITIONS AND ASSUMPTIONS

ISA - International Standard Atmosphere temperature, in °C, for a given pressure altitude. ISA temperature for Sea Level is 15°C (59°F).

ISA DEVIATION - The difference between the standard ISA temperature and the ambient temperature in °C.

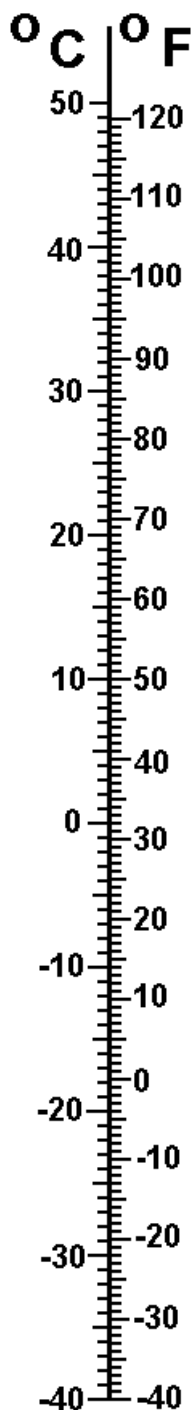
STATIC AIR TEMPERATURE (SAT) - The ambient still air temperature outside of the aircraft. Sometimes known as the Outside Air Temperature (OAT).

TOTAL AIR TEMPERATURE (TAT) - The total of the ambient air temperature (SAT) plus the increase in temperature due to compression heating.

V_{mo}/M_{mo} - Maximum allowable operating indicated airspeed or Mach number.

TEMPERATURE CONVERSION AND STATIC AIR TEMPERATURE

°C



ALTITUDE - FEET	ISA DEVIATION					
	ISA-20°C	ISA-10°C	ISA	ISA+10°C	ISA+20°C	ISA+30°C
36,000 & Higher	-76.5	-66.5	-56.5	-46.5	-36.5	-26.5
35,000	-74.2	-64.2	-54.2	-44.2	-34.2	-24.2
34,000	-72.3	-62.3	-52.3	-42.3	-32.3	-22.3
33,000	-70.3	-60.3	-50.3	-40.3	-30.3	-20.3
32,000	-68.3	-58.3	-48.3	-38.3	-28.3	-18.3
31,000	-66.3	-56.3	-46.3	-36.3	-26.3	-16.3
30,000	-64.3	-54.3	-44.3	-34.3	-24.3	-14.3
29,000	-62.4	-52.4	-42.4	-32.4	-22.4	-12.4
28,000	-60.4	-50.4	-40.4	-30.4	-20.4	-10.4
27,000	-58.4	-48.4	-38.4	-28.4	-18.4	-8.4
26,000	-56.5	-46.5	-36.5	-26.5	-16.5	-6.5
25,000	-54.5	-44.5	-34.5	-24.5	-14.5	-4.5
24,000	-52.5	-42.5	-32.5	-22.5	-12.5	-2.5
23,000	-50.5	-40.5	-30.5	-20.5	-10.5	-0.5
22,000	-48.5	-38.5	-28.5	-18.5	-8.5	+1.5
21,000	-46.6	-36.6	-26.6	-16.6	-6.6	+3.4
20,000	-44.6	-34.6	-24.6	-14.6	-4.6	+5.4
19,000	-42.6	-32.6	-22.6	-12.6	-2.6	+7.4
18,000	-40.6	-30.6	-20.6	-10.6	-0.6	+9.4
17,000	-38.7	-28.7	-18.7	-8.7	+1.3	+11.3
16,000	-36.7	-26.7	-16.7	-6.7	+3.3	+13.3
15,000	-34.7	-24.7	-14.7	-4.7	+5.3	+15.3
14,000	-32.7	-22.7	-12.7	-2.7	+7.3	+17.3
13,000	-30.7	-20.7	-10.7	-0.7	+9.3	+19.3
12,000	-28.8	-18.8	-8.8	+1.2	+11.2	+21.2
11,000	-26.8	-16.8	-6.8	+3.2	+13.2	+23.2
10,000	-24.8	-14.8	-4.8	+5.2	+15.2	+25.2
5000	-14.9	-4.9	+5.1	+15.1	+25.1	+35.1
0	-5.0	+5.0	+15.0	+25.0	+35.0	+45.0

RULE OF THUMB: For standard temperature (ISA) at or below 36,000 feet:

Double altitude (in thousands of feet), subtract 15, change sign.

EXAMPLES:	<u>ALT</u>	<u>DOUBLE ALT</u>	<u>SUBTRACT 15</u>	<u>CHANGE SIGN</u>
	0	0	-15	+15
	33	66	51	-51

TOTAL AIR TEMPERATURE vs STATIC AIR TEMPERATURE

°C

IND TAT °C	INDICATED MACH NUMBER													
	.40	.50	.60	.70	.74	.75	.76	.77	.78	.80	.82	.84	.86	.88
75	64	58	52	44	41	40	39	38	37	35	34	32	30	28
70	59	54	47	39	36	35	34	33	33	31	29	28	26	24
65	55	49	42	35	32	31	30	29	28	27	25	23	21	20
60	50	44	38	30	27	26	25	24	24	22	21	19	17	15
55	45	39	33	26	23	22	21	20	19	18	16	14	13	11
50	40	35	28	21	18	17	16	15	14	13	12	10	8	7
45	35	30	24	17	14	13	12	11	10	9	7	6	4	2
40	30	25	19	12	9	8	7	6	6	4	3	1	0	-2
35	25	20	14	7	5	4	3	2	1	0	-1	-3	-5	-6
30	21	16	10	3	0	-1	-2	-3	-3	-4	-6	-7	-9	-11
25	16	11	5	-2	-4	-5	-6	-7	-7	-9	-10	-12	-13	-15
20	11	6	0	-6	-9	-10	-11	-12	-12	-13	-15	-16	-18	-19
15	6	1	-4	-11	-13	-14	-15	-16	-16	-18	-19	-21	-22	-24
10	1	-3	-9	-15	-18	-19	-20	-21	-21	-22	-23	-25	-27	-28
5	-4	-8	-14	-20	-22	-23	-24	-25	-25	-27	-28	-29	-31	-32
0	-8	-13	-18	-24	-27	-28	-29	-30	-30	-31	-32	-34	-35	-37
-5	-13	-18	-23	-29	-31	-32	-33	-34	-34	-35	-37	-38	-40	-41
-10	-18	-23	-28	-33	-36	-37	-38	-39	-39	-40	-41	-43	-44	-45
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-30	-38	-42	-46	-52	-54	-54	-55	-55	-56	-58	-59	-60	-61	-63
-35	-42	-46	-51	-56	-58	-59	-60	-61	-61	-62	-63	-64	-66	-67
-40	-47	-51	-56	-61	-63	-63	-64	-64	-65	-66	-68	-69	-70	-71
-45	-52	-56	-60	-65	-67	-68	-69	-70	-70	-71	-72	-73	-74	-76
-50	-57	-61	-65	-70	-72	-72	-73	-73	-74	-75	-76	-78	-79	-80
-55	-62	-65	-70	-74	-76	-77	-78	-79	-79	-80	-81	-82	-83	-84

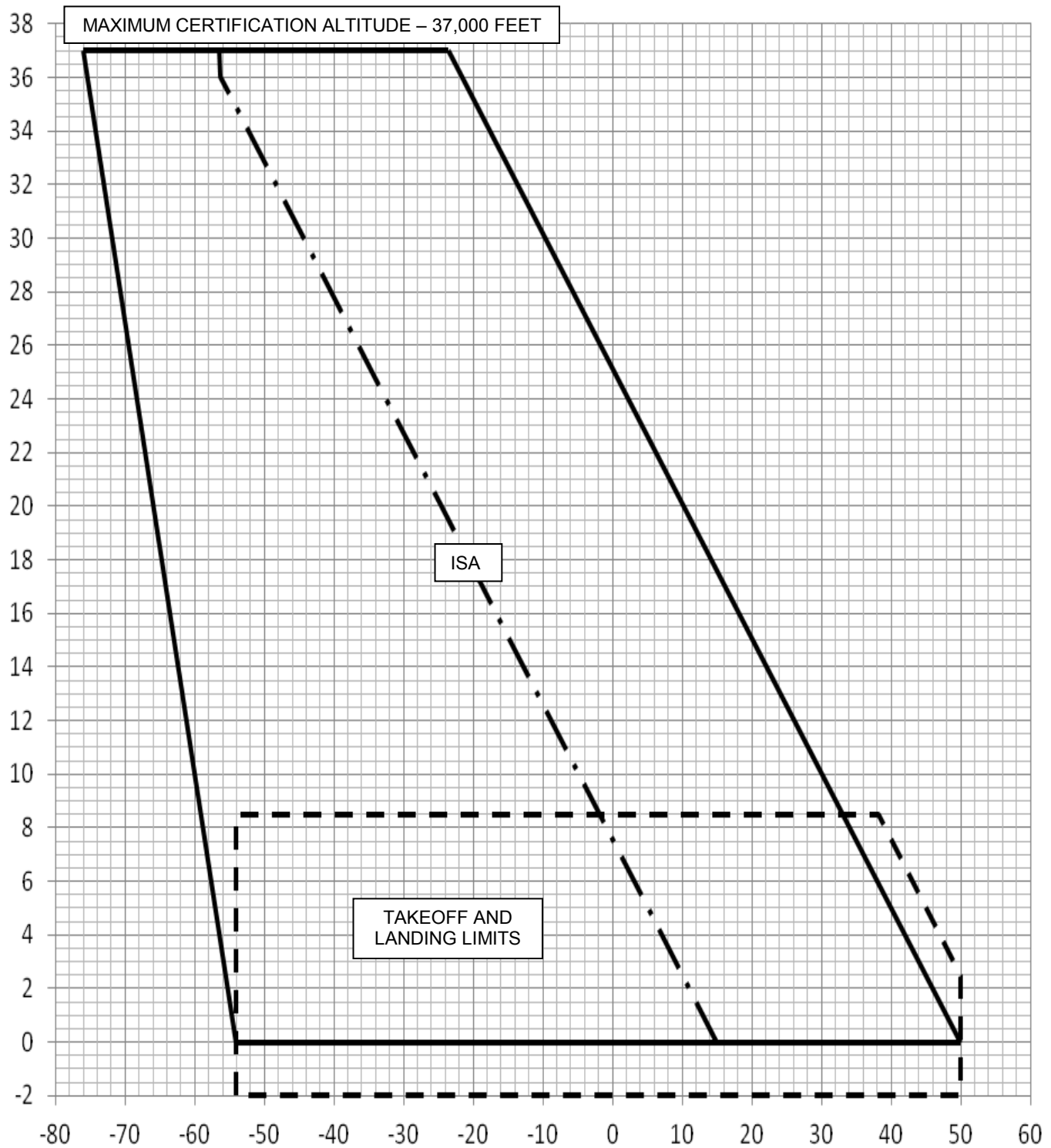
NORMAL OPERATING SPEED LIMIT

Vmo / Mmo

PRESSURE ALTITUDE	INDICATED Vmo (KIAS)	MACH Mmo
0	340	0.51
5,000	340	0.56
10,000	340	0.61
15,000	340	0.67
17,000	340	0.69
19,000	340	0.72
21,000	340	0.75
23,000	340	0.78
25,000	340	0.81
27,000	333	0.82
29,000	319	0.82
31,000	306	0.82
33,000	292	0.82
35,000	279	0.82
37,000	267	0.82

NOTE: If the Mach Trim Compensator malfunctions or becomes inoperative during flight, DO NOT EXCEED 0.78 Mach.

ENVIRONMENT ENVELOPE

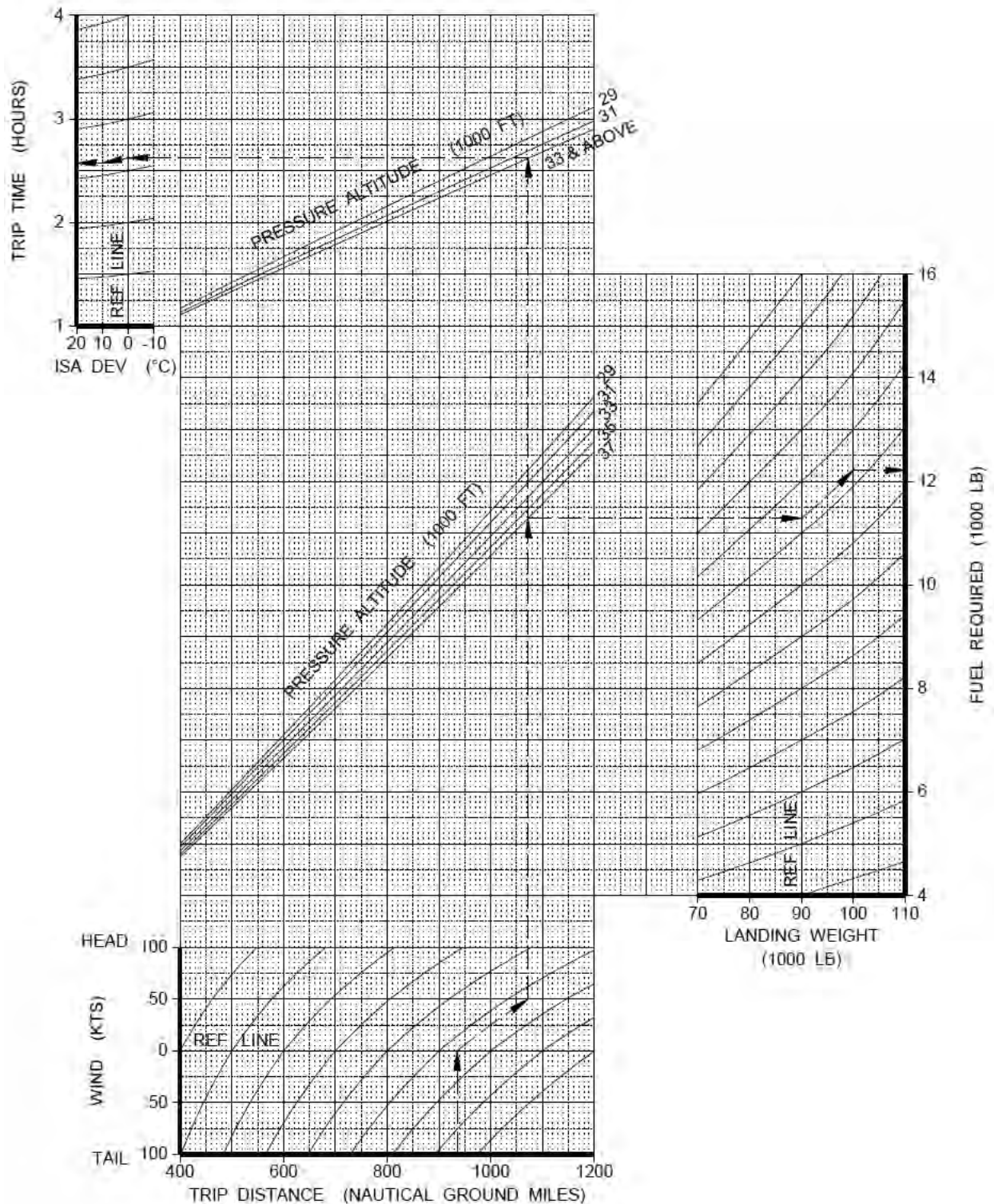


TRIP FUEL AND TIME ESTIMATE

400 TO 1,200 NM TRIP DISTANCE

STANDARD DAY, ZERO WIND

- Climb @ 250/290/.72 Mach
- Long Range Cruise
- Descent @ 250

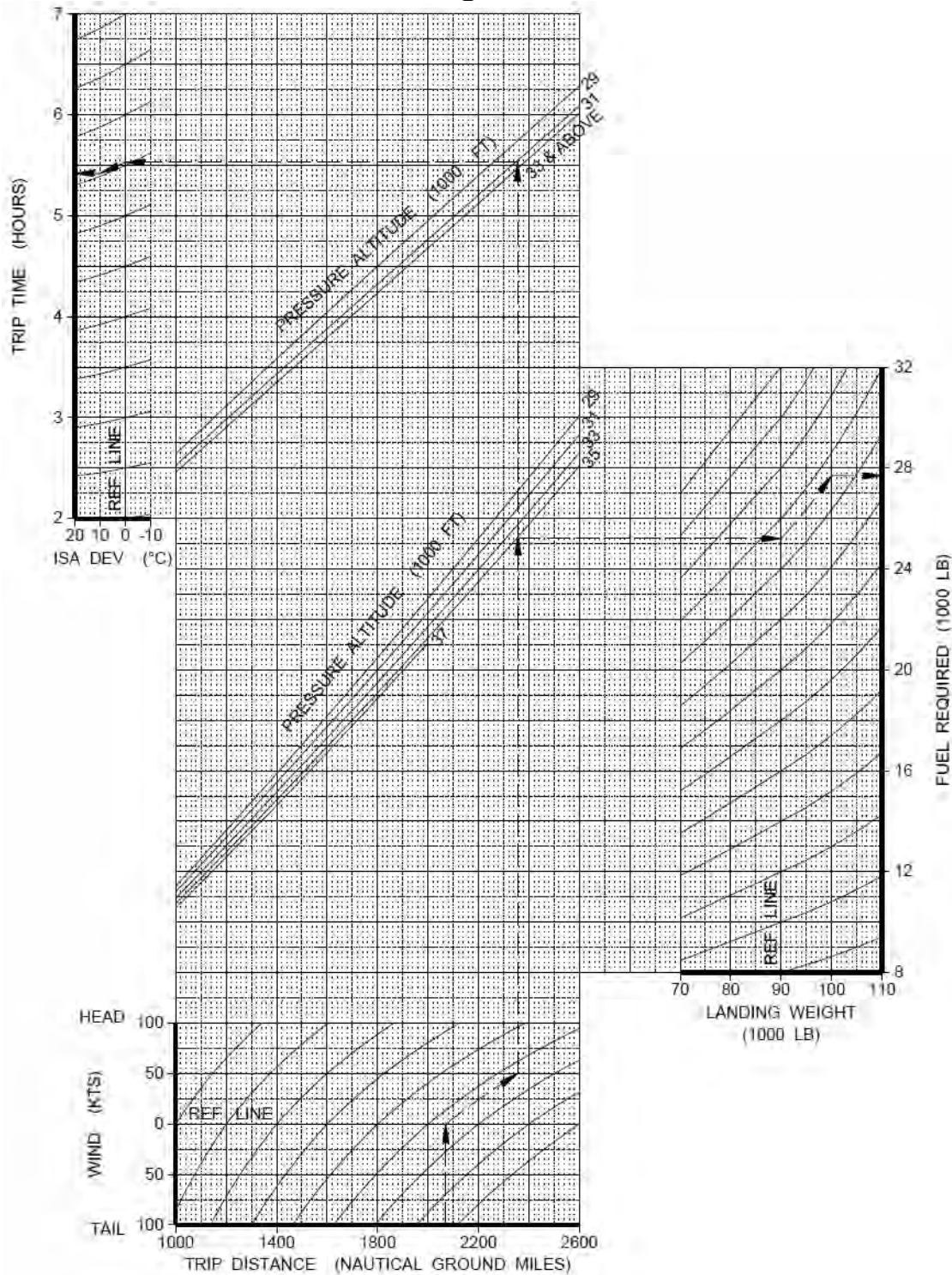


TRIP FUEL AND TIME ESTIMATE

1,000 TO 2,600 NM TRIP DISTANCE

STANDARD DAY, ZERO WIND

- Climb @ 250/290/.72 Mach
- Long Range Cruise
- Descent @ 250



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DRIFTDOWN PERFORMANCE

(ONE ENGINE INOPERATIVE)

Net driftdown performance is provided for one engine inoperative. The data on Page 1-11 defines net level-off altitudes following driftdown. The data on Pages 1-12 – 1-13 defines the driftdown net flight path from normal operational altitudes.

This net driftdown performance data may be used to assess terrain clearance for operation over mountainous areas. In addition, the driftdown profiles on Pages 1-12 – 1-13 may be used to determine altitude capability during driftdown. For overwater operation without life rafts, the driftdown profiles may be used to assure that the aircraft has sufficient driftdown performance to the coastline so that the 162 nm limitation is not exceeded.

Instructions for determining ground distance during driftdown for a given weight and intercept altitude (charts on Pages 1-12 – 1-13):

- A) Determine equivalent gross weight from chart at top of Page 1-12 or 1-13 by entering chart at actual gross weight and exiting with equivalent gross weight.
- B) Select chart on Page 1-12 or 1-13 applicable to cruise altitude at engine failure.
- C) As shown by example trace lines on FL 330 chart, for a given intercept altitude, proceed over to equivalent gross weight, then down to wind reference line. Correct for wind, then proceed down to distance traveled.

APPLICABILITY:

The driftdown level-off altitude data presented in this manual are used for obstacle clearance analysis for ice protection ON and OFF, with various temperatures and airplane weights at a set initial cruise altitude. The net driftdown performance represents the gross (actual) driftdown gradient minus 1.1%. This is in accordance with FAR 25.123 for two-engine aircraft.

The net data (also stored in FPS 2.0) provide an additional margin to account for a number of possible navigational and procedural errors that could take place. It is used for pre-flight analysis of enroute obstacles to ensure clearance. Per FAR 121.191(a), the *net* level-off altitude must clear all enroute terrain by at least 1,000 feet.

The gross data represents the actual aircraft performance in the event of an in-flight engine failure and are directly available in the FMS, as well as the Abnormal section of this manual. These numbers cannot be used for dispatch/pre-flight analysis purposes.

DRIFTDOWN NET LEVEL OFF ALTITUDE

(FOR FLIGHT PLANNING PURPOSES)

MAXIMUM CONTINUOUS THRUST

BR700-715C1-30 Engines

ENGINE ANTI-ICE OFF

GROSS WEIGHT – POUNDS		APPROXIMATE NET LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C	ISA + 0°C	ISA + 10°C	ISA + 20°C
120,000	115,600	14,500	14,500	14,500	10,900
110,000	106,300	17,300	17,300	17,300	14,400
100,000	96,900	20,000	20,000	19,900	17,800
90,000	87,300	22,400	22,400	22,400	20,800
80,000	77,500	25,300	25,300	25,300	23,500
70,000	68,000	28,800	28,800	28,800	27,100

ENGINE ANTI-ICE ON

GROSS WEIGHT – POUNDS		APPROXIMATE NET LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C	ISA + 0°C	ISA + 10°C	ISA + 20°C
120,000	115,200	13,300	13,200	13,200	9,300
110,000	106,100	16,300	16,300	16,300	13,000
100,000	96,700	19,000	19,000	19,000	16,500
90,000	87,200	21,600	21,600	21,600	19,900
80,000	77,500	24,400	24,400	24,400	22,600
70,000	68,000	27,700	27,700	27,700	25,900

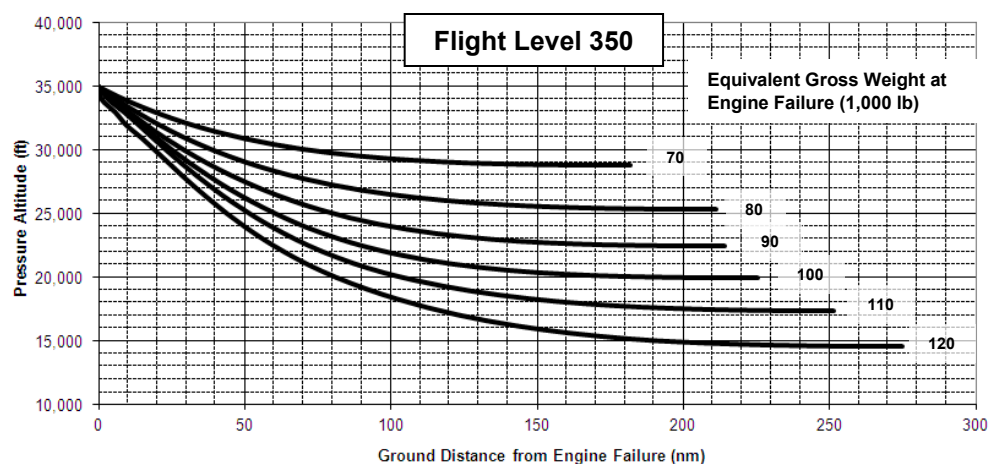
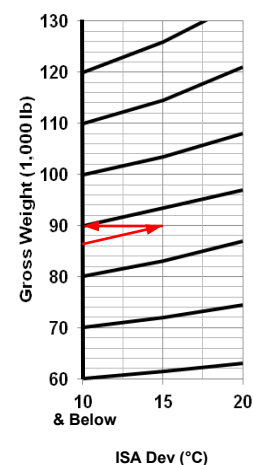
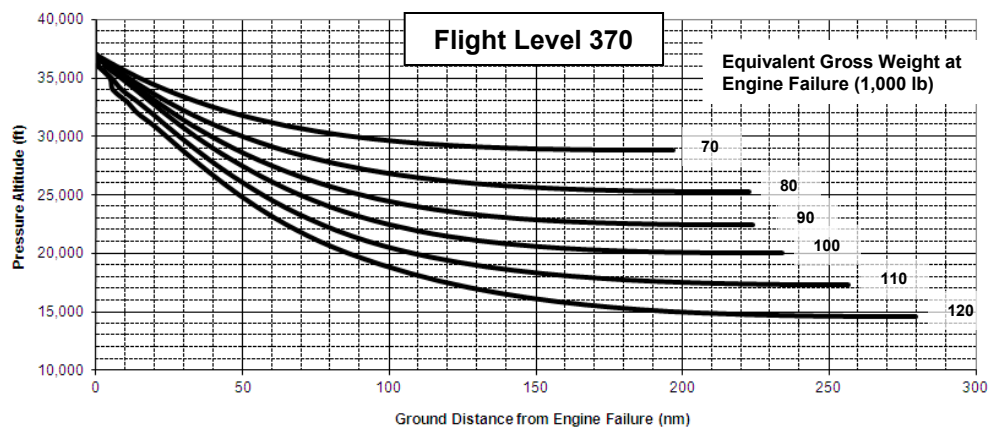
ENGINE & WING ANTI-ICE ON

GROSS WEIGHT – POUNDS		APPROXIMATE NET LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C	ISA + 0°C	ISA + 10°C	ISA + 20°C
120,000	115,000	11,700	11,700	11,700	6,900
110,000	105,900	15,000	15,000	15,000	11,000
100,000	96,500	18,000	18,000	17,900	14,900
90,000	87,100	20,700	20,700	20,700	18,500
80,000	77,500	23,300	23,300	23,300	21,500
70,000	67,900	26,600	26,600	26,600	24,600

BASIS:

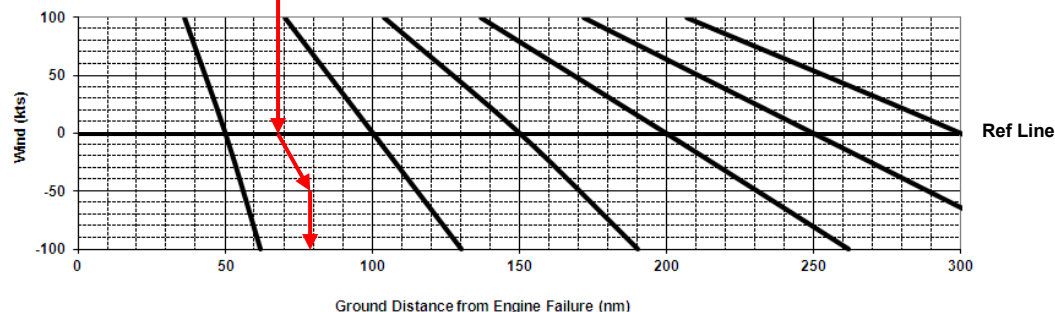
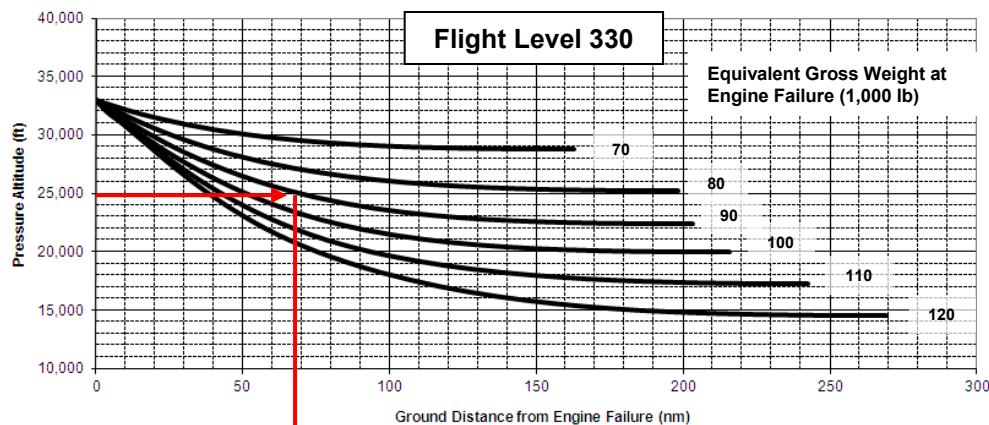
- APU Operating
- Maximum Continuous Thrust Limits
- 100 ft./min. residual rate of climb
- 35,000 ft. initial altitude
- 1.1% gradient decrement (net driftdown)

DRIFTDOWN NET FLIGHT PATH (ONE ENGINE OPERATING)

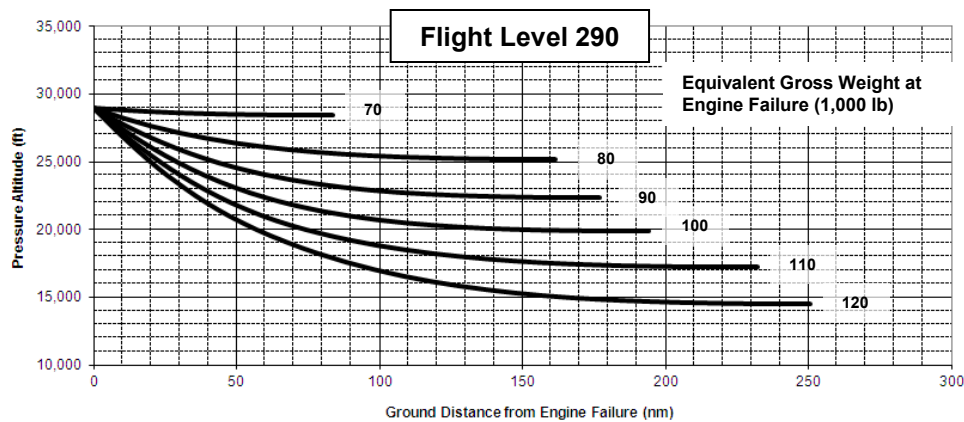
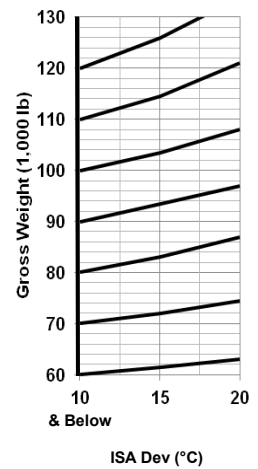
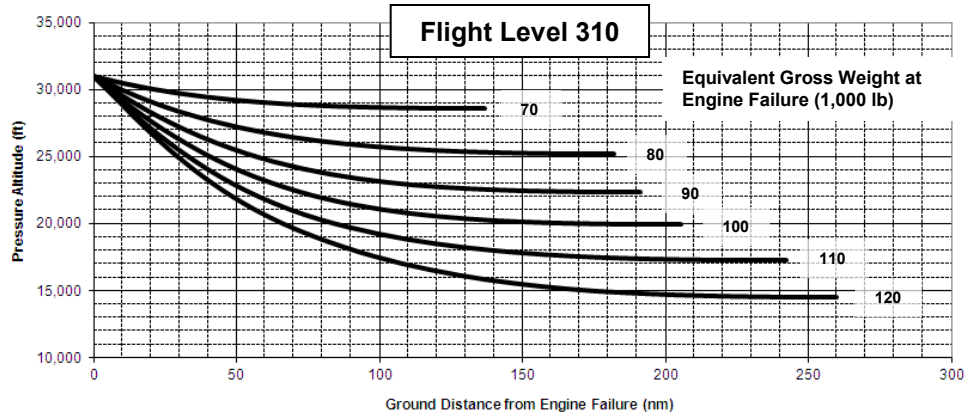


Note: Each line represents 10,000 lb. weight interval.

Instructions on Page 1-10.

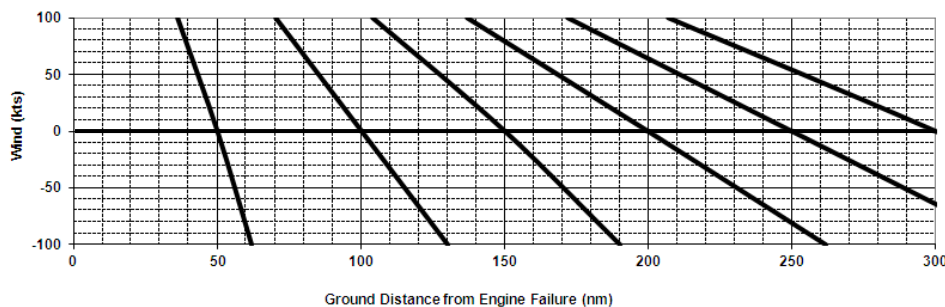
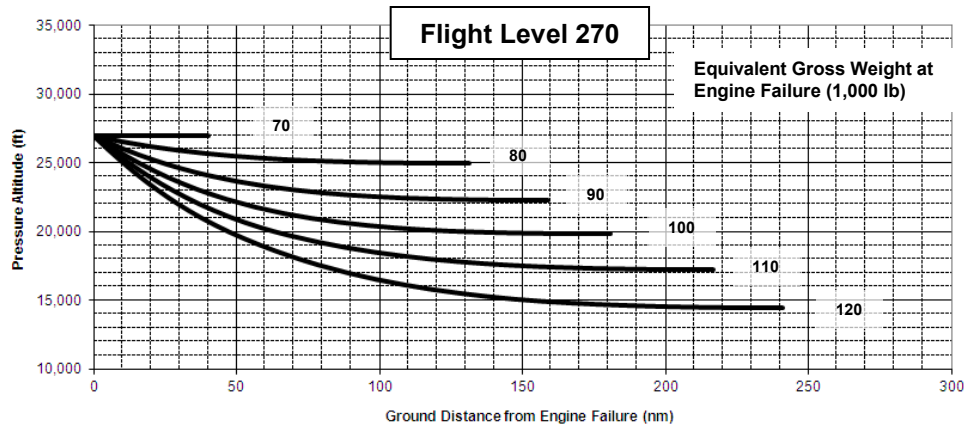


DRIFTDOWN NET FLIGHT PATH (ONE ENGINE OPERATING)



Note: Each line represents 10,000 lb. weight interval.

Instructions on Page 1-10.



Ref Line

End of Section

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CROSS REFERENCES

BUFFET ONSET BOUNDARY SPEEDS	CRUISE
MAXIMUM INITIAL CRUISE ALTITUDE	CRUISE
PATTERN AND APPROACH SPEED	APPROACH/LANDING
STALL SPEED	APPROACH/LANDING

DEFINITIONS AND ASSUMPTIONS

AWABS	Automated Weight and Balance System. The computerized system for determining the weight & balance and airport performance.
AIRPORT PRESSURE ALTITUDE	The altitude read from the altimeter while sitting on the airport and adjusting the altimeter setting to 29.92 inches of mercury.
EPR	Engine pressure ratio. Used as the primary thrust setting parameter for the BR700-715C1-30 engine.
FMS	Flight Management System.
FMC	Flight Management Computer.
GWT	Gross Weight for Takeoff. The aircraft weight at the start of the takeoff roll.
V₁	Takeoff Decision Speed. V ₁ is the speed that determines a go or no-go decision in the event of an engine failure. No time is allowed after V ₁ for reaction or decision; action must be initiated at or before V ₁ . FAR, Part 25 defines V ₁ as “the speed at which an engine failure has been recognized and action initiated to either continue or stop the takeoff”.
V_R	Rotation Speed. V _R is the speed at which the pilot begins to rotate the aircraft to the takeoff pitch attitude. V _R is selected so that, with a normal rate of rotation, the aircraft will lift off and attain a height of 35 feet at a speed of V ₂ .
V₂	Takeoff Safety Speed. V ₂ is the speed used to achieve the required gradient during second climb segment.

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TAKEOFF THRUST

EPR

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO

NORMAL BLEED – PACKS ON, ANTI-ICE OFF

BR700-715C1-30

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE - FEET									
°F	°C	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
140	60	1.378	1.378	1.378	1.377	1.376	1.375				
131	55	1.401	1.398	1.398	1.397	1.397	1.397	1.395	1.394		
122	50	1.425	1.422	1.421	1.419	1.418	1.418	1.417	1.416	1.415	1.414
113	45	1.453	1.449	1.448	1.446	1.444	1.442	1.440	1.439	1.438	1.438
104	40	1.474	1.480	1.477	1.475	1.473	1.471	1.468	1.466	1.463	1.462
95	35	1.474	1.509	1.506	1.504	1.502	1.500	1.499	1.496	1.494	1.492
86	30	1.474	1.533	1.532	1.531	1.529	1.527	1.526	1.524	1.523	1.521
77	25	1.474	1.533	1.541	1.550	1.554	1.553	1.551	1.550	1.549	1.547
68	20	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.575	1.574	1.573
59	15	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.600
50	10	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
41	5	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
32	0	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
23	-5	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
14	-10	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
5	-15	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-4	-20	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-13	-25	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-22	-30	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-31	-35	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-40	-40	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-49	-45	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604
-58	-50	1.474	1.533	1.541	1.550	1.559	1.567	1.576	1.585	1.595	1.604

CORRECTIONS:

BLEED CONFIG	AIRPORT PRESSURE ALTITUDE - FEET									
	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
PACKS OFF	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.018	0.018	0.018
ENGINE ANTI-ICE ON	-0.019	-0.02	-0.021	-0.021	-0.021	-0.022	-0.022	-0.023	-0.024	-0.025

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 05

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
125,000	8,000	144 / 157 / 158	141 / 157 / 158	138 / 157 / 158	158 / 158 / 158	158 / 158 / 158
	6,000	149 / 156 / 159	146 / 156 / 159	143 / 156 / 158	141 / 157 / 158	158 / 158 / 158
	4,000	150 / 155 / 159	150 / 155 / 159	149 / 155 / 159	147 / 156 / 158	144 / 157 / 158
	2,000	149 / 154 / 159	149 / 154 / 159	149 / 154 / 159	152 / 155 / 159	150 / 156 / 158
	0	147 / 153 / 159	147 / 153 / 159	147 / 153 / 159	149 / 154 / 159	152 / 155 / 158
120,000	8,000	146 / 153 / 155	144 / 153 / 155	141 / 153 / 155	138 / 154 / 155	154 / 154 / 155
	6,000	147 / 152 / 156	147 / 152 / 156	146 / 152 / 155	143 / 153 / 155	141 / 154 / 155
	4,000	145 / 151 / 156	145 / 151 / 156	147 / 151 / 156	149 / 152 / 155	147 / 153 / 155
	2,000	144 / 150 / 156	144 / 150 / 156	144 / 150 / 156	147 / 151 / 156	149 / 152 / 155
	0	142 / 149 / 156	142 / 149 / 156	142 / 149 / 156	144 / 150 / 156	147 / 151 / 155
115,000	8,000	145 / 149 / 152	145 / 149 / 152	144 / 149 / 152	141 / 150 / 152	150 / 150 / 152
	6,000	143 / 148 / 153	143 / 148 / 153	145 / 148 / 152	147 / 149 / 152	145 / 150 / 152
	4,000	141 / 147 / 153	141 / 147 / 153	143 / 147 / 153	145 / 148 / 152	147 / 149 / 152
	2,000	140 / 146 / 153	140 / 146 / 153	140 / 146 / 153	143 / 147 / 153	145 / 148 / 152
	0	138 / 145 / 153	138 / 145 / 153	138 / 145 / 153	140 / 146 / 153	143 / 147 / 152
110,000	8,000	140 / 145 / 148	140 / 145 / 148	142 / 145 / 148	144 / 146 / 148	146 / 146 / 148
	6,000	138 / 144 / 149	138 / 144 / 149	140 / 144 / 148	142 / 145 / 148	145 / 146 / 148
	4,000	136 / 143 / 149	136 / 143 / 149	138 / 143 / 149	140 / 144 / 148	142 / 145 / 148
	2,000	135 / 142 / 149	135 / 142 / 149	135 / 142 / 149	138 / 143 / 149	140 / 144 / 148
	0	133 / 141 / 149	133 / 141 / 149	133 / 141 / 149	135 / 142 / 149	138 / 143 / 148
105,000	8,000	136 / 141 / 145	136 / 141 / 145	138 / 141 / 145	141 / 142 / 145	142 / 142 / 145
	6,000	134 / 140 / 146	134 / 140 / 146	136 / 140 / 145	138 / 141 / 145	141 / 142 / 145
	4,000	132 / 139 / 146	132 / 139 / 146	134 / 139 / 146	136 / 140 / 145	138 / 141 / 145
	2,000	131 / 138 / 146	131 / 138 / 146	131 / 138 / 146	134 / 139 / 146	136 / 140 / 145
	0	129 / 137 / 146	129 / 137 / 146	129 / 137 / 146	131 / 138 / 146	134 / 139 / 145
100,000	8,000	131 / 137 / 142	131 / 137 / 142	133 / 137 / 142	136 / 138 / 142	138 / 138 / 142
	6,000	129 / 136 / 143	129 / 136 / 143	131 / 136 / 142	133 / 137 / 142	136 / 138 / 142
	4,000	127 / 135 / 143	127 / 135 / 143	129 / 135 / 143	131 / 136 / 142	133 / 137 / 142
	2,000	126 / 134 / 143	126 / 134 / 143	126 / 134 / 143	129 / 135 / 143	131 / 136 / 142
	0	124 / 133 / 143	124 / 133 / 143	124 / 133 / 143	126 / 134 / 143	129 / 135 / 142

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

 Limited by Max Brake Energy.

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 05

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
95,000	8,000	126 / 133 / 139	126 / 133 / 139	128 / 133 / 139	131 / 134 / 139	133 / 134 / 139
	6,000	124 / 132 / 140	124 / 132 / 140	126 / 132 / 139	128 / 133 / 139	131 / 134 / 139
	4,000	122 / 131 / 140	122 / 131 / 140	124 / 131 / 140	126 / 132 / 139	128 / 133 / 139
	2,000	121 / 130 / 140	121 / 130 / 140	121 / 130 / 140	124 / 131 / 140	126 / 132 / 139
	0	120* / 129 / 140	120* / 129 / 140	120* / 129 / 140	121 / 130 / 140	124 / 131 / 139
90,000	8,000	121 / 128 / 135	121 / 128 / 135	123 / 128 / 135	126 / 129 / 135	128 / 129 / 135
	6,000	119 / 127 / 136	119 / 127 / 136	121 / 127 / 135	123 / 128 / 135	126 / 129 / 135
	4,000	117 / 126 / 136	117 / 126 / 136	119 / 126 / 136	121 / 127 / 135	123 / 128 / 135
	2,000	116 / 125 / 136	116 / 125 / 136	116 / 125 / 136	119 / 126 / 136	121 / 127 / 135
	0	120* / 125 / 137	120* / 125 / 137	120* / 125 / 137	116 / 125 / 136	119 / 126 / 135
85,000	8,000	116 / 123 / 132	116 / 123 / 132	118 / 123 / 132	121 / 124 / 132	123 / 124 / 132
	6,000	114 / 122 / 133	114 / 122 / 133	116 / 122 / 132	118 / 123 / 132	121 / 124 / 132
	4,000	113* / 121 / 133	112 / 121 / 133	114 / 121 / 133	116 / 122 / 132	118 / 123 / 132
	2,000	116* / 122 / 135	116* / 122 / 135	114* / 120 / 133	114 / 121 / 133	116 / 122 / 132
	0	120* / 125 / 139	120* / 125 / 139	120* / 125 / 139	115* / 121 / 134	114 / 121 / 132
80,000	8,000	110 / 118 / 128	110 / 118 / 128	112 / 118 / 128	115 / 119 / 128	117 / 119 / 128
	6,000	109* / 117 / 129	108 / 117 / 129	110 / 117 / 128	112 / 118 / 128	115 / 119 / 128
	4,000	113* / 119 / 132	112* / 119 / 132	109* / 116 / 129	110 / 117 / 128	112 / 118 / 128
	2,000	116* / 122 / 136	116* / 122 / 136	114* / 120 / 134	109* / 116 / 129	110 / 117 / 128
	0	120* / 125 / 140	120* / 125 / 140	120* / 125 / 140	115* / 121 / 135	109* / 116 / 128
75,000	8,000	105* / 113 / 124	104 / 113 / 124	106 / 113 / 124	109 / 114 / 124	111 / 114 / 124
	6,000	109* / 115 / 128	108* / 115 / 128	104 / 112 / 124	106 / 113 / 124	109 / 114 / 124
	4,000	113* / 119 / 133	112* / 119 / 133	109* / 116 / 130	104 / 112 / 124	106 / 113 / 124
	2,000	116* / 122 / 137	116* / 122 / 137	114* / 120 / 135	109* / 116 / 130	104 / 112 / 124
	0	120* / 125 / 141	120* / 125 / 141	120* / 125 / 141	115* / 121 / 136	109* / 116 / 129
70,000	8,000	105* / 112 / 125	103* / 110 / 123	100 / 107 / 120	103 / 108 / 120	105 / 108 / 120
	6,000	109* / 115 / 130	108* / 115 / 130	104* / 111 / 125	100 / 107 / 120	103 / 108 / 120
	4,000	113* / 119 / 135	112* / 119 / 135	109* / 116 / 132	104* / 111 / 125	100 / 107 / 120
	2,000	116* / 122 / 139	116* / 122 / 139	114* / 120 / 137	109* / 116 / 132	104* / 111 / 125
	0	120* / 125 / 143	120* / 125 / 143	120* / 125 / 143	115* / 121 / 138	109* / 116 / 131

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 13

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
125,000	8,000	144 / 148 / 151	141 / 148 / 151	138 / 149 / 151	149 / 149 / 150	150 / 150 / 150
	6,000	145 / 148 / 151	145 / 148 / 151	143 / 148 / 151	141 / 149 / 150	149 / 149 / 150
	4,000	143 / 147 / 151	143 / 147 / 151	144 / 147 / 151	146 / 148 / 151	144 / 149 / 150
	2,000	142 / 146 / 151	142 / 146 / 151	142 / 146 / 151	144 / 147 / 151	147 / 148 / 151
	0	140 / 145 / 151	140 / 145 / 151	140 / 145 / 151	142 / 145 / 151	145 / 146 / 151
120,000	8,000	143 / 144 / 148	143 / 144 / 148	141 / 145 / 148	145 / 145 / 147	146 / 146 / 147
	6,000	141 / 144 / 148	141 / 144 / 148	142 / 144 / 148	143 / 145 / 147	145 / 145 / 147
	4,000	139 / 143 / 148	139 / 143 / 148	140 / 143 / 148	142 / 144 / 148	144 / 145 / 147
	2,000	138 / 142 / 148	138 / 142 / 148	138 / 142 / 148	140 / 143 / 148	143 / 144 / 148
	0	136 / 141 / 148	136 / 141 / 148	136 / 141 / 148	138 / 141 / 148	141 / 142 / 148
115,000	8,000	139 / 141 / 145	139 / 141 / 145	140 / 142 / 145	141 / 142 / 144	143 / 143 / 144
	6,000	137 / 141 / 145	137 / 141 / 145	138 / 141 / 145	140 / 142 / 144	142 / 142 / 144
	4,000	135 / 140 / 145	135 / 140 / 145	136 / 140 / 145	138 / 141 / 145	140 / 142 / 144
	2,000	134 / 139 / 145	134 / 139 / 145	134 / 139 / 145	136 / 140 / 145	139 / 141 / 145
	0	132 / 138 / 145	132 / 138 / 145	132 / 138 / 145	134 / 138 / 145	137 / 139 / 145
110,000	8,000	134 / 137 / 142	134 / 137 / 142	135 / 138 / 142	137 / 138 / 141	139 / 139 / 141
	6,000	132 / 137 / 142	132 / 137 / 142	133 / 137 / 142	135 / 138 / 141	137 / 138 / 141
	4,000	130 / 136 / 142	130 / 136 / 142	131 / 136 / 142	133 / 137 / 142	135 / 138 / 141
	2,000	129 / 135 / 142	129 / 135 / 142	129 / 135 / 142	131 / 136 / 142	134 / 137 / 142
	0	127 / 134 / 142	127 / 134 / 142	127 / 134 / 142	129 / 134 / 142	132 / 135 / 142
105,000	8,000	130 / 133 / 139	130 / 133 / 139	131 / 134 / 139	133 / 134 / 138	135 / 135 / 138
	6,000	128 / 133 / 139	128 / 133 / 139	129 / 133 / 139	131 / 134 / 138	133 / 134 / 138
	4,000	126 / 132 / 139	126 / 132 / 139	127 / 132 / 139	129 / 133 / 139	131 / 134 / 138
	2,000	125 / 131 / 139	125 / 131 / 139	125 / 131 / 139	127 / 132 / 139	130 / 133 / 139
	0	123 / 130 / 139	123 / 130 / 139	123 / 130 / 139	125 / 130 / 139	128 / 131 / 139
100,000	8,000	125 / 129 / 136	125 / 129 / 136	126 / 130 / 136	128 / 130 / 135	130 / 131 / 135
	6,000	123 / 129 / 136	123 / 129 / 136	124 / 129 / 136	126 / 130 / 135	128 / 130 / 135
	4,000	121 / 128 / 136	121 / 128 / 136	122 / 128 / 136	124 / 129 / 136	126 / 130 / 135
	2,000	120 / 127 / 136	120 / 127 / 136	120 / 127 / 136	122 / 128 / 136	125 / 129 / 136
	0	120* / 126 / 136	120* / 126 / 136	120* / 126 / 136	120 / 126 / 136	123 / 127 / 136

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

 Limited by Max Brake Energy.

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 13

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
95,000	8,000	120 / 125 / 133	120 / 125 / 133	121 / 126 / 133	123 / 126 / 132	125 / 127 / 132
	6,000	118 / 125 / 133	118 / 125 / 133	119 / 125 / 133	121 / 126 / 132	123 / 126 / 132
	4,000	116 / 124 / 133	116 / 124 / 133	117 / 124 / 133	119 / 125 / 133	121 / 126 / 132
	2,000	116* / 123 / 133	116* / 123 / 133	115 / 123 / 133	117 / 124 / 133	120 / 125 / 133
	0	120* / 125 / 136	120* / 125 / 136	120* / 125 / 136	115 / 122 / 133	118 / 123 / 133
90,000	8,000	115 / 121 / 130	115 / 121 / 130	116 / 122 / 130	118 / 122 / 129	120 / 123 / 129
	6,000	113 / 121 / 130	113 / 121 / 130	114 / 121 / 130	116 / 122 / 129	118 / 122 / 129
	4,000	113* / 120 / 130	112* / 120 / 130	112 / 120 / 130	114 / 121 / 130	116 / 122 / 129
	2,000	116* / 122 / 133	116* / 122 / 133	114* / 120 / 131	112 / 120 / 130	115 / 121 / 130
	0	120* / 125 / 137	120* / 125 / 137	120* / 125 / 137	115* / 121 / 133	113 / 119 / 130
85,000	8,000	110 / 117 / 127	110 / 117 / 127	111 / 118 / 127	113 / 118 / 126	115 / 119 / 126
	6,000	109* / 117 / 127	108 / 117 / 127	109 / 117 / 127	111 / 118 / 126	113 / 118 / 126
	4,000	113* / 119 / 130	112* / 119 / 130	109* / 116 / 127	109 / 117 / 127	111 / 118 / 126
	2,000	116* / 122 / 134	116* / 122 / 134	114* / 120 / 132	109* / 116 / 127	110 / 117 / 127
	0	120* / 125 / 138	120* / 125 / 138	120* / 125 / 138	115* / 121 / 134	109* / 116 / 128
80,000	8,000	105 / 112 / 123	105 / 112 / 123	106 / 113 / 123	108 / 113 / 122	110 / 114 / 122
	6,000	109* / 115 / 126	108* / 115 / 126	104 / 112 / 123	106 / 113 / 122	108 / 113 / 122
	4,000	113* / 119 / 131	112* / 119 / 131	109* / 116 / 128	104 / 112 / 123	106 / 113 / 122
	2,000	116* / 122 / 135	116* / 122 / 135	114* / 120 / 133	109* / 116 / 128	105 / 112 / 123
	0	120* / 125 / 139	120* / 125 / 139	120* / 125 / 139	115* / 121 / 135	109* / 116 / 129
75,000	8,000	105* / 112 / 125	103* / 110 / 123	100 / 108 / 120	102 / 108 / 119	104 / 109 / 119
	6,000	109* / 115 / 128	108* / 115 / 128	104* / 111 / 124	100 / 108 / 119	102 / 108 / 119
	4,000	113* / 119 / 133	112* / 119 / 133	109* / 116 / 130	104* / 111 / 124	100 / 108 / 119
	2,000	116* / 122 / 137	116* / 122 / 137	114* / 120 / 135	109* / 116 / 130	104* / 111 / 124
	0	120* / 125 / 141	120* / 125 / 141	120* / 125 / 141	115* / 121 / 137	109* / 116 / 131
70,000	8,000	105* / 112 / 127	103* / 110 / 125	99* / 107 / 121	96 / 103 / 116	98 / 104 / 116
	6,000	109* / 115 / 130	108* / 115 / 130	104* / 111 / 126	100* / 107 / 120	96 / 103 / 116
	4,000	113* / 119 / 135	112* / 119 / 135	109* / 116 / 132	104* / 111 / 126	100* / 107 / 120
	2,000	116* / 122 / 139	116* / 122 / 139	114* / 120 / 137	109* / 116 / 132	104* / 111 / 126
	0	120* / 125 / 143	120* / 125 / 143	120* / 125 / 143	115* / 121 / 139	109* / 116 / 133

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 18

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
125,000	8,000	143 / 144 / 147	141 / 144 / 147	138 / 145 / 147	145 / 145 / 146	146 / 146 / 146
	6,000	141 / 144 / 147	141 / 144 / 147	142 / 144 / 147	141 / 145 / 146	145 / 145 / 146
	4,000	139 / 143 / 147	139 / 143 / 147	140 / 143 / 147	142 / 144 / 147	144 / 145 / 146
	2,000	138 / 142 / 147	138 / 142 / 147	138 / 142 / 147	140 / 143 / 147	143 / 144 / 147
	0	136 / 141 / 147	136 / 141 / 147	136 / 141 / 147	138 / 141 / 147	141 / 142 / 147
120,000	8,000	139 / 140 / 144	139 / 140 / 144	140 / 141 / 144	141 / 141 / 143	142 / 142 / 143
	6,000	137 / 140 / 144	137 / 140 / 144	138 / 140 / 144	140 / 141 / 143	141 / 141 / 143
	4,000	135 / 139 / 144	135 / 139 / 144	136 / 139 / 144	138 / 140 / 144	140 / 141 / 143
	2,000	134 / 138 / 144	134 / 138 / 144	134 / 138 / 144	136 / 139 / 144	139 / 140 / 144
	0	132 / 137 / 144	132 / 137 / 144	132 / 137 / 144	134 / 137 / 144	137 / 138 / 144
115,000	8,000	135 / 137 / 141	135 / 137 / 141	136 / 138 / 141	138 / 138 / 140	139 / 139 / 140
	6,000	133 / 137 / 141	133 / 137 / 141	134 / 137 / 141	136 / 138 / 140	138 / 138 / 140
	4,000	131 / 136 / 141	131 / 136 / 141	132 / 136 / 141	134 / 137 / 141	136 / 138 / 140
	2,000	130 / 135 / 141	130 / 135 / 141	130 / 135 / 141	132 / 136 / 141	135 / 137 / 141
	0	128 / 134 / 141	128 / 134 / 141	128 / 134 / 141	130 / 134 / 141	133 / 135 / 141
110,000	8,000	131 / 133 / 138	131 / 133 / 138	132 / 134 / 138	134 / 134 / 137	135 / 135 / 137
	6,000	129 / 133 / 138	129 / 133 / 138	130 / 133 / 138	132 / 134 / 137	134 / 134 / 137
	4,000	127 / 132 / 138	127 / 132 / 138	128 / 132 / 138	130 / 133 / 138	132 / 134 / 137
	2,000	126 / 131 / 138	126 / 131 / 138	126 / 131 / 138	128 / 132 / 138	131 / 133 / 138
	0	124 / 130 / 138	124 / 130 / 138	124 / 130 / 138	126 / 130 / 138	129 / 131 / 138
105,000	8,000	127 / 130 / 135	127 / 130 / 135	128 / 131 / 135	130 / 131 / 134	132 / 132 / 134
	6,000	125 / 130 / 135	125 / 130 / 135	126 / 130 / 135	128 / 131 / 134	130 / 131 / 134
	4,000	123 / 129 / 135	123 / 129 / 135	124 / 129 / 135	126 / 130 / 135	128 / 131 / 134
	2,000	122 / 128 / 135	122 / 128 / 135	122 / 128 / 135	124 / 129 / 135	127 / 130 / 135
	0	120 / 127 / 135	120 / 127 / 135	120 / 127 / 135	122 / 127 / 135	125 / 128 / 135
100,000	8,000	122 / 126 / 132	122 / 126 / 132	123 / 127 / 132	125 / 127 / 131	127 / 128 / 131
	6,000	120 / 126 / 132	120 / 126 / 132	121 / 126 / 132	123 / 127 / 131	125 / 127 / 131
	4,000	118 / 125 / 132	118 / 125 / 132	119 / 125 / 132	121 / 126 / 132	123 / 127 / 131
	2,000	117 / 124 / 132	117 / 124 / 132	117 / 124 / 132	119 / 125 / 132	122 / 126 / 132
	0	120* / 125 / 134	120* / 125 / 134	120* / 125 / 134	117 / 123 / 132	120 / 124 / 132

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

Limited by Max Brake Energy.

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

DRY RUNWAY TAKEOFF SPEEDS – V₁ / V_R / V₂

KIAS

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

TO / 18

TAKEOFF WEIGHT LBS	AIRPORT PRESSURE ALTITUDE FT	AMBIENT TEMPERATURE - °C				
		10 & below	20	30	40	50
95,000	8,000	117 / 122 / 129	117 / 122 / 129	118 / 123 / 129	120 / 123 / 128	122 / 124 / 128
	6,000	115 / 122 / 129	115 / 122 / 129	116 / 122 / 129	118 / 123 / 128	120 / 123 / 128
	4,000	113 / 121 / 129	113 / 121 / 129	114 / 121 / 129	116 / 122 / 129	118 / 123 / 128
	2,000	116* / 122 / 131	116* / 122 / 131	114* / 120 / 129	114 / 121 / 129	117 / 122 / 129
	0	120* / 125 / 135	120* / 125 / 135	120* / 125 / 135	115* / 121 / 131	115 / 120 / 129
90,000	8,000	112 / 118 / 126	112 / 118 / 126	113 / 119 / 126	115 / 119 / 125	117 / 120 / 125
	6,000	110 / 118 / 126	110 / 118 / 126	111 / 118 / 126	113 / 119 / 125	115 / 119 / 125
	4,000	113* / 119 / 128	112* / 119 / 128	109 / 117 / 126	111 / 118 / 126	113 / 119 / 125
	2,000	116* / 122 / 132	116* / 122 / 132	114* / 120 / 130	109 / 117 / 126	112 / 118 / 126
	0	120* / 125 / 136	120* / 125 / 136	120* / 125 / 136	115* / 121 / 132	110 / 116 / 126
85,000	8,000	107 / 114 / 123	107 / 114 / 123	108 / 115 / 123	110 / 115 / 122	112 / 116 / 122
	6,000	109* / 115 / 124	108* / 115 / 124	106 / 114 / 123	108 / 115 / 122	110 / 115 / 122
	4,000	113* / 119 / 129	112* / 119 / 129	109* / 116 / 126	106 / 114 / 123	108 / 115 / 122
	2,000	116* / 122 / 133	116* / 122 / 133	114* / 120 / 131	109* / 116 / 126	107 / 114 / 123
	0	120* / 125 / 137	120* / 125 / 137	120* / 125 / 137	115* / 121 / 133	109* / 116 / 127
80,000	8,000	105* / 112 / 123	103* / 110 / 121	103 / 110 / 120	105 / 110 / 119	107 / 111 / 119
	6,000	109* / 115 / 126	108* / 115 / 126	104* / 111 / 122	103 / 110 / 119	105 / 110 / 119
	4,000	113* / 119 / 131	112* / 119 / 131	109* / 116 / 128	104* / 111 / 122	103 / 110 / 119
	2,000	116* / 122 / 135	116* / 122 / 135	114* / 120 / 133	109* / 116 / 128	104* / 111 / 122
	0	120* / 125 / 139	120* / 125 / 139	120* / 125 / 139	115* / 121 / 135	109* / 116 / 129
75,000	8,000	105* / 112 / 125	103* / 110 / 123	99* / 107 / 119	100 / 105 / 116	102 / 106 / 116
	6,000	109* / 115 / 128	108* / 115 / 128	104* / 111 / 124	100* / 107 / 118	100 / 105 / 116
	4,000	113* / 119 / 133	112* / 119 / 133	109* / 116 / 130	104* / 111 / 124	100* / 107 / 118
	2,000	116* / 122 / 137	116* / 122 / 137	114* / 120 / 135	109* / 116 / 130	104* / 111 / 124
	0	120* / 125 / 141	120* / 125 / 141	120* / 125 / 141	115* / 121 / 137	109* / 116 / 131
70,000	8,000	105* / 112 / 127	103* / 110 / 125	99* / 107 / 121	95* / 103 / 116	96 / 101 / 113
	6,000	109* / 115 / 130	108* / 115 / 130	104* / 111 / 126	100* / 107 / 120	96* / 103 / 116
	4,000	113* / 119 / 135	112* / 119 / 135	109* / 116 / 132	104* / 111 / 126	100* / 107 / 120
	2,000	116* / 122 / 139	116* / 122 / 139	114* / 120 / 137	109* / 116 / 132	104* / 111 / 126
	0	120* / 125 / 143	120* / 125 / 143	120* / 125 / 143	115* / 121 / 139	109* / 116 / 133

CORRECTIONS:

CONDITION		V ₁ CORRECTION - KNOTS
Runway slope	Per ½% uphill slope	+1
	Per ½% downhill slope	-1
Wind	Per 20 knots headwind	+1
	Tailwind	none

NOTE: Speeds denoted by an asterisk (*) are V_{MCG} limited. DO NOT APPLY NEGATIVE CORRECTIONS.

TAKEOFF STABILIZER SETTINGS

DEGREES AIRPLANE NOSE UP

CAUTION: Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

CENTER OF GRAVITY (%MAC)	STABILIZER SETTINGS - DEGREES ANU					
	FLAPS 5°	FLAPS 10°	FLAPS 13°	FLAPS 15°	FLAPS 18°	FLAPS 20°
5.9	7.0	8.0	8.6	9.0	9.3	9.5
6	7.0	8.0	8.6	9.0	9.3	9.5
7	6.7	7.7	8.3	8.7	8.9	9.1
8	6.5	7.4	8.0	8.3	8.6	8.8
9	6.2	7.2	7.7	8.0	8.3	8.4
10	6.0	6.9	7.4	7.7	7.9	8.1
11	5.8	6.6	7.1	7.4	7.6	7.8
12	5.5	6.4	6.8	7.1	7.3	7.5
13	5.3	6.1	6.5	6.8	7.0	7.1
14	5.0	5.8	6.2	6.5	6.7	6.8
15	4.8	5.5	5.9	6.2	6.4	6.5
16	4.6	5.2	5.6	5.9	6.0	6.2
17	4.3	4.9	5.3	5.5	5.7	5.8
18	4.1	4.6	5.0	5.2	5.4	5.5
19	3.9	4.3	4.7	4.9	5.1	5.2
20	3.6	4.1	4.4	4.6	4.8	4.9
21	3.4	3.8	4.1	4.3	4.4	4.5
22	3.1	3.5	3.8	4.0	4.1	4.2
23	2.9	3.2	3.5	3.7	3.8	3.9
24	2.6	3.0	3.2	3.4	3.5	3.6
25	2.4	2.7	2.9	3.0	3.1	3.2
26	2.1	2.4	2.6	2.7	2.8	2.9
27	1.9	2.1	2.3	2.4	2.5	2.6
28	1.6	1.9	2.0	2.1	2.2	2.3
29	1.4	1.6	1.7	1.8	1.9	1.9
30	1.1	1.3	1.4	1.5	1.6	1.6
31	0.9	1.0	1.1	1.2	1.2	1.3
32	0.6	0.7	0.8	0.9	0.9	0.9
33	0.4	0.5	0.5	0.5	0.6	0.6
34	0.2	0.2	0.2	0.2	0.2	0.2
34.7	0.0	0.0	0.0	0.0	0.0	0.0

End of Section

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CLIMB EPR SETTINGS

CL

NORMAL BLEED - PACKS ON / ENGINE AND WING ANTI-ICE OFF

BR700-715C1-30

TAT - °C	PRESSURE ALTITUDE - FEET SPEED - KIAS OR MACH								
	0	5,000	10,000	15,000	20,000	25,000	30,000	35,000	37,000
	250	250	290	290	290	290	0.72	0.72	0.72
60	1.187								
55	1.207	1.209							
50	1.230	1.228	1.215						
45	1.254	1.252	1.238	1.244					
40	1.279	1.277	1.266	1.268	1.261				
35	1.305	1.304	1.294	1.297	1.288	1.276			
30	1.313	1.331	1.323	1.328	1.318	1.306			
25	1.313	1.359	1.353	1.360	1.351	1.338	1.321		
20	1.313	1.360	1.383	1.396	1.386	1.373	1.353		
15	1.313	1.360	1.383	1.433	1.424	1.412	1.389		
10	1.313	1.360	1.383	1.449	1.462	1.451	1.428	1.404	1.395
5	1.313	1.360	1.383	1.449	1.493	1.491	1.468	1.441	1.431
0	1.313	1.360	1.383	1.449	1.493	1.534	1.510	1.483	1.471
-5	1.313	1.360	1.383	1.449	1.493	1.539	1.555	1.527	1.516
-10	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.572	1.561
-15	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.610	1.601
-20	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.640	1.633
-25	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.643	1.650
-30	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.643	1.650
-35	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.643	1.650
-40	1.313	1.360	1.383	1.449	1.493	1.539	1.596	1.643	1.650

NOTE: For the following engine bleed conditions adjust EPR by the indicated amount

BLEED CONFIGURATION	PRESSURE ALTITUDE - FEET								
	0	5,000	10,000	15,000	20,000	25,000	30,000	35,000	37,000
A/C HIGH FLOW	-0.013	-0.017	-0.019	-0.022	-0.023	-0.025	-0.027	-0.03	-0.032
ENGINE ANTI-ICE ON	-0.017	-0.021	-0.025	-0.029	-0.032	-0.037	-0.046	-0.048	-0.049
WING AND ENGINE ANTI-ICE ON	-0.039	-0.048	-0.056	-0.064	-0.070	-0.078	-0.093	-0.103	-0.110

CLIMB TIME, DISTANCE, AND FUEL

SPEED SCHEDULE 250 KIAS / 290 KIAS / 0.72 MACH

TOGW 125,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370									
350	27	163	3,900	28	170	4,000			
330	23	129	3,400	23	135	3,500			
310	20	111	3,100	20	115	3,200	30	182	4,100
290	18	97	2,900	18	101	3,000	26	153	3,700
270	16	85	2,700	17	89	2,800	23	130	3,400
250	14	72	2,400	15	75	2,500	20	107	3,000
230	13	61	2,200	13	63	2,300	17	88	2,700
200	11	47	1,900	11	49	2,000	14	67	2,300
150	8	30	1,500	8	32	1,600	10	42	1,700
100	5	15	1,000	5	15	1,100	6	20	1,200

TOGW 120,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370									
350	24	139	3,400	24	146	3,600			
330	20	116	3,100	21	121	3,200	31	191	4,100
310	18	101	2,900	19	105	3,000	27	160	3,700
290	17	89	2,700	17	93	2,800	23	137	3,400
270	15	79	2,500	15	82	2,600	21	118	3,100
250	13	67	2,300	14	70	2,400	18	98	2,800
230	12	57	2,100	12	59	2,200	16	81	2,500
200	10	44	1,800	10	46	1,900	13	62	2,100
150	8	29	1,400	8	30	1,500	9	39	1,600
100	5	14	1,000	5	14	1,000	6	19	1,100

TOGW 115,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	26	158	3,600	27	165	3,700			
350	21	123	3,100	22	129	3,200			
330	19	106	2,800	19	110	3,000	27	167	3,700
310	17	93	2,700	17	97	2,800	24	143	3,400
290	15	82	2,500	16	86	2,600	21	124	3,100
270	14	73	2,300	14	76	2,400	19	108	2,900
250	13	62	2,100	13	65	2,200	17	90	2,600
230	11	53	1,900	11	55	2,000	15	75	2,300
200	10	42	1,700	10	43	1,800	12	58	2,000
150	7	27	1,300	7	28	1,400	9	36	1,500
100	5	13	900	5	14	1,000	6	18	1,000

CLIMB TIME, DISTANCE, AND FUEL

SPEED SCHEDULE 250 KIAS / 290 KIAS / 0.72 MACH

TOGW 110,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	23	133	3,100	23	139	3,300			
350	19	111	2,800	20	115	2,900	28	174	3,700
330	17	96	2,600	18	101	2,700	24	148	3,300
310	16	85	2,500	16	89	2,600	22	129	3,100
290	14	76	2,300	15	79	2,400	20	113	2,900
270	13	68	2,200	13	71	2,200	18	99	2,600
250	12	58	2,000	12	60	2,100	15	83	2,400
230	11	49	1,800	11	52	1,900	14	70	2,200
200	9	39	1,600	9	40	1,600	11	54	1,900
150	7	25	1,300	7	26	1,300	8	34	1,400
100	4	12	900	4	13	900	5	16	1,000

TOGW 105,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	20	117	2,800	20	123	2,900			
350	18	100	2,600	18	105	2,700	25	153	3,300
330	16	88	2,400	16	92	2,500	22	133	3,100
310	14	79	2,300	15	82	2,400	20	117	2,800
290	13	70	2,100	14	73	2,200	18	104	2,600
270	12	63	2,000	12	65	2,100	16	91	2,400
250	11	54	1,900	11	56	1,900	14	77	2,200
230	10	46	1,700	10	48	1,800	13	65	2,000
200	8	36	1,500	8	38	1,500	10	50	1,700
150	6	24	1,200	6	24	1,200	8	32	1,300
100	4	11	800	4	12	800	5	15	900

TOGW 100,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	18	105	2,600	18	110	2,700	25	158	3,300
350	16	91	2,400	16	95	2,500	22	136	3,000
330	15	81	2,300	15	85	2,300	20	121	2,800
310	13	73	2,100	14	76	2,200	18	107	2,600
290	12	65	2,000	13	68	2,100	17	95	2,400
270	11	58	1,900	12	61	2,000	15	84	2,300
250	10	50	1,700	10	52	1,800	13	71	2,100
230	9	43	1,600	9	45	1,600	12	60	1,900
200	8	34	1,400	8	35	1,400	10	47	1,600
150	6	22	1,100	6	23	1,100	7	30	1,200
100	4	11	800	4	11	800	5	14	800

CLIMB TIME, DISTANCE, AND FUEL

SPEED SCHEDULE 250 KIAS / 290 KIAS / 0.72 MACH

TOGW 95,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	16	95	2,400	17	99	2,500	22	140	2,900
350	15	84	2,200	15	87	2,300	20	123	2,700
330	14	75	2,100	14	78	2,200	18	110	2,600
310	12	67	2,000	13	70	2,000	17	98	2,400
290	11	61	1,900	12	63	1,900	15	87	2,200
270	11	54	1,800	11	57	1,800	14	77	2,100
250	10	47	1,600	10	49	1,700	12	66	1,900
230	9	40	1,500	9	42	1,500	11	56	1,700
200	7	32	1,300	7	33	1,300	9	43	1,500
150	6	21	1,000	6	21	1,100	7	28	1,200
100	4	10	700	4	10	700	4	13	800

TOGW 90,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	15	86	2,200	15	90	2,300	20	125	2,700
350	14	77	2,000	14	80	2,100	18	111	2,500
330	12	69	1,900	13	72	2,000	17	100	2,400
310	12	62	1,800	12	65	1,900	15	90	2,200
290	11	56	1,700	11	59	1,800	14	80	2,100
270	10	50	1,600	10	53	1,700	13	71	1,900
250	9	43	1,500	9	45	1,600	11	61	1,800
230	8	37	1,400	8	39	1,400	10	51	1,600
200	7	30	1,200	7	31	1,300	8	40	1,400
150	5	19	1,000	5	20	1,000	6	26	1,100
100	3	9	700	3	10	700	4	12	700

TOGW 85,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	14	79	2,000	14	82	2,100	18	113	2,400
350	13	70	1,900	13	73	2,000	17	101	2,300
330	12	64	1,800	12	66	1,900	15	91	2,200
310	11	58	1,700	11	60	1,800	14	82	2,000
290	10	52	1,600	10	54	1,700	13	74	1,900
270	9	47	1,500	9	49	1,600	12	66	1,800
250	8	40	1,400	8	42	1,500	11	56	1,600
230	7	35	1,300	8	36	1,300	9	48	1,500
200	6	28	1,100	6	29	1,200	8	37	1,300
150	5	18	900	5	19	900	6	24	1,000
100	3	9	600	3	9	600	4	12	700

CLIMB TIME, DISTANCE, AND FUEL

SPEED SCHEDULE 250 KIAS / 290 KIAS / 0.72 MACH

TOGW 80,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	13	72	1,800	13	75	1,900	17	102	2,200
350	12	65	1,700	12	67	1,800	15	92	2,100
330	11	59	1,700	11	61	1,700	14	84	2,000
310	10	53	1,600	10	55	1,600	13	76	1,900
290	9	48	1,500	9	50	1,600	12	68	1,800
270	9	43	1,400	9	45	1,500	11	61	1,700
250	8	37	1,300	8	39	1,400	10	52	1,500
230	7	32	1,200	7	34	1,200	9	44	1,400
200	6	26	1,100	6	27	1,100	7	34	1,200
150	4	17	800	5	17	900	5	22	900
100	3	8	600	3	8	600	3	11	600

TOGW 75,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	12	66	1,700	12	69	1,800	15	93	2,000
350	11	59	1,600	11	62	1,700	14	84	1,900
330	10	54	1,500	10	56	1,600	13	77	1,800
310	9	49	1,500	9	51	1,500	12	69	1,700
290	9	44	1,400	9	46	1,400	11	62	1,600
270	8	40	1,300	8	42	1,400	10	56	1,500
250	7	35	1,200	7	36	1,300	9	48	1,400
230	6	30	1,100	7	31	1,200	8	41	1,300
200	5	24	1,000	6	25	1,000	7	32	1,100
150	4	15	800	4	16	800	5	20	900
100	3	8	500	3	8	600	3	10	600

TOGW 70,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	11	60	1,600	11	63	1,600	14	84	1,900
350	10	54	1,500	10	57	1,500	13	77	1,800
330	9	50	1,400	9	52	1,500	12	70	1,700
310	8	45	1,300	9	47	1,400	11	64	1,600
290	8	41	1,300	8	43	1,300	10	57	1,500
270	7	37	1,200	7	38	1,300	9	51	1,400
250	7	32	1,100	7	33	1,200	8	44	1,300
230	6	28	1,000	6	29	1,100	7	37	1,200
200	5	22	900	5	23	900	6	29	1,000
150	4	14	700	4	15	700	5	19	800
100	3	7	500	3	7	500	3	9	600

CLIMB TIME, DISTANCE, AND FUEL

SPEED SCHEDULE 250 KIAS / 290 KIAS / 0.72 MACH

TOGW 65,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	10	55	1,400	10	57	1,500	13	76	1,700
350	9	50	1,400	9	52	1,400	12	70	1,600
330	8	45	1,300	9	47	1,400	11	64	1,500
310	8	41	1,200	8	43	1,300	10	58	1,500
290	7	37	1,200	7	39	1,200	9	52	1,400
270	7	34	1,100	7	35	1,200	9	47	1,300
250	6	29	1,000	6	31	1,100	8	40	1,200
230	5	25	1,000	6	26	1,000	7	34	1,100
200	5	20	800	5	21	900	6	27	1,000
150	4	13	700	4	14	700	4	17	700
100	2	6	500	2	7	500	3	8	500

TOGW 60,000 LB

FL	ISA and lower			ISA+10°C			ISA+20°C		
	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)	Time (min)	Distance (nm)	Fuel (lb)
370	9	50	1,300	9	52	1,400	11	69	1,600
350	8	45	1,200	8	47	1,300	11	63	1,500
330	8	41	1,200	8	43	1,200	10	58	1,400
310	7	38	1,100	7	39	1,200	9	53	1,300
290	7	34	1,100	7	36	1,100	9	48	1,300
270	6	31	1,000	6	32	1,100	8	43	1,200
250	6	27	900	6	28	1,000	7	37	1,100
230	5	23	900	5	24	900	6	31	1,000
200	4	18	800	4	19	800	5	25	900
150	3	12	600	3	12	600	4	16	700
100	2	6	400	2	6	400	3	8	500

End of Section

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DEFINITIONS AND ASSUMPTIONS

Long Range Cruise: Speed which gives 99% maximum fuel mileage.

EPR: Engine Pressure Ratio. Power setting required to maintain level flight speed.

FF/ENG: Fuel flow per operating engine in lb/hr.

ISA: Standard day temperature at given altitude in °C.

KIAS: Indicated airspeed in knots.

KTAS: True Airspeed in knots.

TAT: Total air temperature in °C. (RAT + 1°C)

MCR Thrust Limit lines (Max Rec. Initial Cruise Alt. chart): Altitude vs. weight limit based on maximum cruise thrust.

Buffet Onset Ceiling lines (Max Rec. Initial Cruise Alt. chart): Altitude vs. weight limit for light turbulence (1.3g) and moderate turbulence (1.5g) due to Mach buffet.

MAXIMUM CRUISE EPR SETTINGS

ENGINE AND WING ANTI-ICE OFF

BR700-715C1-30

TAT		PRESSURE ALTITUDE (1,000 FT)										
°C	°F	10	15	20	23	25	27	29	31	33	35	37
40	104	1.16	1.18	1.14	1.14	1.13	1.09	1.07	1.07	1.04	1.04	1.01
35	95	1.20	1.21	1.18	1.18	1.17	1.14	1.12	1.11	1.09	1.08	1.06
30	86	1.23	1.25	1.22	1.22	1.21	1.18	1.16	1.16	1.13	1.13	1.10
25	77	1.27	1.28	1.26	1.26	1.25	1.23	1.21	1.20	1.18	1.17	1.15
20	68	1.29	1.32	1.30	1.30	1.29	1.27	1.25	1.25	1.22	1.22	1.19
15	59	1.29	1.35	1.34	1.34	1.33	1.32	1.30	1.29	1.27	1.26	1.24
10	50	1.29	1.36	1.38	1.38	1.37	1.36	1.34	1.34	1.31	1.31	1.28
5	41	1.29	1.36	1.40	1.42	1.41	1.41	1.39	1.38	1.36	1.35	1.33
0	32	1.29	1.36	1.40	1.42	1.43	1.45	1.43	1.43	1.40	1.40	1.37
-5	23	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.47	1.45	1.44	1.42
-10	14	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.49	1.49	1.46
-12	10	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.51	1.51	1.48
-14	7	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.52	1.50
-16	3	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.54	1.51
-18	0	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.53
-20	-4	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-22	-8	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-24	-11	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-26	-15	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-28	-18	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-30	-22	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-32	-26	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-34	-29	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-36	-33	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-38	-36	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-40	-40	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-42	-44	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-44	-47	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-46	-51	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-48	-54	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55
-50	-58	1.29	1.36	1.40	1.42	1.43	1.45	1.47	1.50	1.52	1.55	1.55

NOTE: For the following engine bleed conditions adjust EPR by the indicated amount

Bleed Configuration	PRESSURE ALTITUDE (1,000 FT)										
	10	15	20	23	25	27	29	31	33	35	37
Engine Anti-Ice ON	+0.05	+0.05	+0.04	+0.04	+0.04	+0.03	+0.03	+0.03	+0.03	+0.03	+0.03
Engine & Wing Anti-Ice ON	+0.02	+0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03

BUFFET ONSET BOUNDARY SPEEDS

KIAS

Flight Level	Cruise Weight (1,000 lbs)	Vb	G / Bank Angle (deg)					
			1.0 / 0°		1.15 / 30°		1.5 / 48°	
			Low	High	Low	High	Low	High
370	120	0.75M	237	264	N/A	N/A	N/A	N/A
	110		224	269	N/A	N/A	N/A	N/A
	100		213	273	231	267	N/A	N/A
	90		200	274	218	271	N/A	N/A
	80		185	274	204	274	237	264
350	130	0.75M	245	277	N/A	N/A	N/A	N/A
	120		234	282	262	267	N/A	N/A
	110		223	285	241	279	N/A	N/A
	100		211	287	229	283	N/A	N/A
	90		197	287	216	287	252	273
330	130	0.75M	242	295	267	285	N/A	N/A
	120		232	298	251	292	N/A	N/A
	110		221	299	239	297	N/A	N/A
	100		207	299	227	299	267	284
	90		193	299	212	299	247	294
310	130	275 KIAS	250	312	260	306	N/A	N/A
	120		229	313	249	309	N/A	N/A
	110		217	313	237	313	279	295
	100		202	313	224	313	260	306
	90		188	313	209	313	246	311
290	130	275 KIAS	237	326	258	324	N/A	N/A
	120		225	326	247	326	290	309
	110		213	326	234	326	271	318
	100		199	326	220	326	258	324
	90		184	326	203	326	243	326
270	130	275 KIAS	233	340	255	340	299	324
	120		221	340	244	340	282	332
	110		207	340	230	340	270	337
	100		195	340	215	340	256	340
	90		180	340	199	340	240	340
250	130	275 KIAS	228	354	252	354	293	346
	120		215	354	239	354	281	351
	110		202	354	225	354	267	354
	100		189	354	208	354	252	354
	90		177	354	194	354	234	354
	80		164	354	180	354	215	354

Vb – Severe Turbulence target speed.

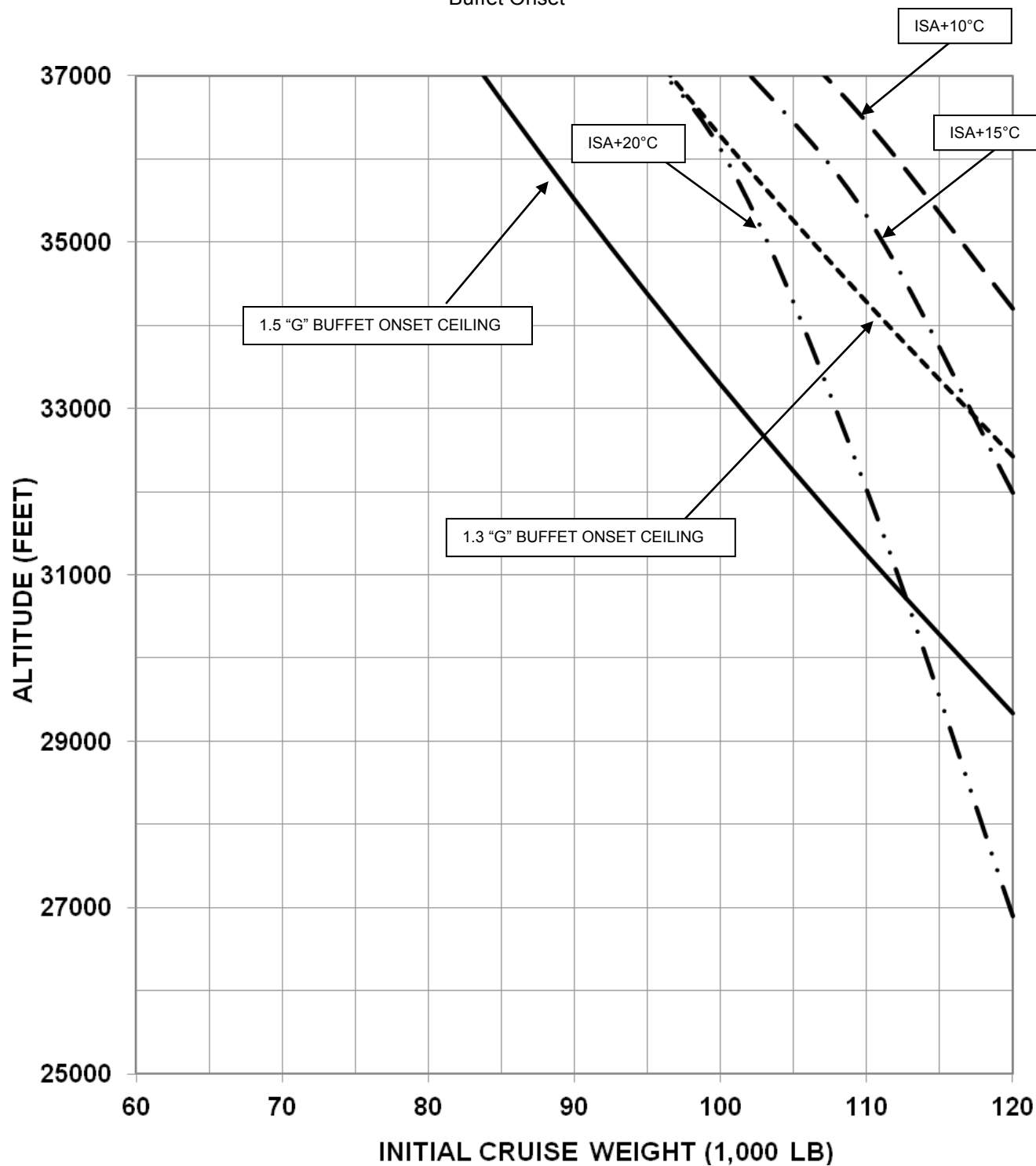
Data based upon CG = 19.4% MAC

N/A - Denotes "Not Applicable"; Aircraft is above buffet onset ceiling at this weight and altitude.

MAXIMUM RECOMMENDED INITIAL CRUISE ALTITUDE

BASED ON LONG RANGE CRUISE

Limited by Maximum Cruise Thrust
and
Buffet Onset



LONG RANGE CRUISE DATA

ALL ENGINES OPERATING

FL STD TAT (°C)		GROSS WEIGHT (1,000 LB)							
		130	120	110	100	90	80	70	60
370 -34	EPR					1.42	1.36	1.30	1.23
	MAX TAT					-3			
	KIAS					248	247	229	208
	MACH					0.768	0.765	0.713	0.654
	FF/ENG KTAS					1992 441	1827 439	1550 409	1283 375
350 -32	EPR				1.42	1.37	1.32	1.25	1.19
	MAX TAT				-3	3			
	KIAS				260	259	246	226	207
	MACH				0.768	0.766	0.731	0.675	0.623
	FF/ENG KTAS				2216 443	2048 442	1799 421	1510 389	1260 359
330 -28	EPR			1.42	1.38	1.33	1.27	1.22	1.16
	MAX TAT			-2	4				
	KIAS			272	271	263	242	224	207
	MACH			0.768	0.766	0.746	0.690	0.642	0.596
	FF/ENG KTAS			2456 447	2284 446	2069 434	1760 401	1485 373	1257 347
310 -25	EPR		1.42	1.38	1.34	1.28	1.23	1.18	1.14
	MAX TAT		0	5	10				
	KIAS		284	284	278	257	240	223	208
	MACH		0.768	0.766	0.753	0.700	0.656	0.613	0.573
	FF/ENG KTAS		2703 451	2528 449	2328 442	2011 411	1727 385	1472 360	1263 336
300 -22	EPR	1.44	1.40	1.36	1.31	1.26	1.21	1.17	1.13
	MAX TAT	-2	3	8					
	KIAS	291	290	289	273	256	239	223	209
	MACH	0.768	0.767	0.764	0.726	0.682	0.640	0.600	0.563
	FF/ENG KTAS	2925 453	2736 452	2572 450	2283 428	1990 402	1716 377	1471 354	1269 332
290 -21	EPR	1.41	1.38	1.34	1.29	1.24	1.20	1.16	1.12
	MAX TAT	2	6	11					
	KIAS	297	296	291	271	254	238	223	210
	MACH	0.768	0.766	0.755	0.706	0.665	0.626	0.588	0.554
	FF/ENG KTAS	2956 455	2783 453	2582 447	2260 418	1972 394	1706 370	1473 348	1278 328

Definitions:

KIAS: Indicated airspeed in knots
 STD TAT: Standard Day TAT in °C
 KTAS: True airspeed in knots

MAX TAT: Max TAT in °C
 EPR: EPR required for flight
 FF/ENG: Fuel Flow per Engine (lb / hr)

Temperature Trade Factors:

- KTAS increases 1 knot per °C above ISA and decreases 1 knot per °C below standard TAT.
- FF increases 3% for +10°C and decreases 3% for -10°C difference from standard TAT.

Notes:

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

LONG RANGE CRUISE DATA

ALL ENGINES OPERATING

FL STD TAT (°C)		GROSS WEIGHT (1,000 LB)							
		130	120	110	100	90	80	70	60
280 -20	EPR	1.39	1.36	1.32	1.27	1.23	1.18	1.14	1.11
	MAX TAT	5	9	14					
	KIAS	303	302	287	269	253	238	224	211
	MACH	0.766	0.764	0.729	0.688	0.649	0.612	0.577	0.546
	FF/ENG	2992	2828	2534	2238	1957	1700	1477	1287
	KTAS	456	454	433	409	386	364	343	324
270 -18	EPR	1.37	1.34	1.30	1.25	1.21	1.17	1.13	1.10
	MAX TAT	8	12						
	KIAS	309	304	284	268	253	238	224	212
	MACH	0.766	0.753	0.708	0.671	0.635	0.600	0.567	0.538
	FF/ENG	3046	2833	2508	2217	1945	1700	1483	1299
	KTAS	457	450	423	400	379	358	339	321
260 -17	EPR	1.35	1.32	1.27	1.23	1.19	1.16	1.12	1.10
	MAX TAT	11	16						
	KIAS	314	299	282	267	252	238	225	214
	MACH	0.763	0.728	0.690	0.655	0.621	0.588	0.558	0.531
	FF/ENG	3089	2781	2483	2199	1935	1703	1491	1313
	KTAS	457	436	414	393	372	353	335	318
250 -15	EPR	1.33	1.30	1.26	1.22	1.18	1.14	1.12	1.09
	MAX TAT	14	19						
	KIAS	315	296	281	266	252	239	227	216
	MACH	0.750	0.708	0.673	0.640	0.608	0.577	0.550	0.524
	FF/ENG	3081	2754	2461	2184	1931	1706	1501	1328
	KTAS	451	426	405	385	366	348	331	315
240 -14	EPR	1.31	1.28	1.24	1.20	1.16	1.13	1.11	1.09
	MAX TAT	17	22						
	KIAS	310	294	279	265	252	239	228	217
	MACH	0.724	0.690	0.658	0.626	0.596	0.568	0.542	0.518
	FF/ENG	3025	2728	2440	2172	1932	1713	1513	1345
	KTAS	438	417	398	379	360	343	327	313
230 -13	EPR	1.29	1.26	1.22	1.18	1.15	1.13	1.10	1.08
	MAX TAT	20							
	KIAS	307	293	279	265	252	240	230	219
	MACH	0.705	0.674	0.643	0.613	0.585	0.559	0.534	0.512
	FF/ENG	2998	2703	2424	2165	1935	1722	1527	1364
	KTAS	428	409	390	372	355	339	324	311

Definitions:

KIAS: Indicated airspeed in knots
 STD TAT: Standard Day TAT in °C
 KTAS: True airspeed in knots

MAX TAT: Max TAT in °C
 EPR: EPR required for flight
 FF/ENG: Fuel Flow per Engine (lb / hr)

Temperature Trade Factors:

- KTAS increases 1 knot per °C above ISA and decreases 1 knot per °C below standard TAT.
- FF increases 3% for +10°C and decreases 3% for -10°C difference from standard TAT.

Notes:

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

LONG RANGE CRUISE DATA

ALL ENGINES OPERATING

FL STD TAT (°C)		GROSS WEIGHT (1,000 LB)							
		130	120	110	100	90	80	70	60
210 -10	EPR	1.25	1.22	1.19	1.16	1.13	1.11	1.09	1.07
	MAX TAT	26							
	KIAS	304	290	277	265	254	243	233	223
	MACH	0.672	0.644	0.616	0.590	0.565	0.543	0.522	0.500
	FF/ENG	2946	2665	2401	2166	1949	1747	1562	1391
	KTAS	411	394	377	361	346	332	319	306
190 -7	EPR	1.22	1.19	1.16	1.14	1.12	1.10	1.08	1.06
	MAX TAT								
	KIAS	302	289	277	266	256	246	237	228
	MACH	0.642	0.617	0.593	0.570	0.549	0.529	0.510	0.490
	FF/ENG	2906	2639	2401	2178	1972	1780	1603	1438
	KTAS	396	381	366	352	338	326	314	302
170 -3	EPR	1.19	1.16	1.14	1.12	1.10	1.09	1.07	1.06
	MAX TAT								
	KIAS	301	289	279	269	259	250	242	232
	MACH	0.617	0.594	0.573	0.553	0.534	0.517	0.499	0.479
	FF/ENG	2877	2638	2412	2201	2005	1823	1653	1486
	KTAS	383	369	356	344	332	321	310	298
150 0	EPR	1.16	1.14	1.12	1.11	1.09	1.08	1.06	1.05
	MAX TAT								
	KIAS	301	290	281	272	263	255	246	236
	MACH	0.594	0.574	0.556	0.538	0.522	0.506	0.489	0.469
	FF/ENG	2876	2647	2433	2234	2049	1873	1706	1538
	KTAS	372	360	348	337	327	317	306	294
130 3	EPR	1.14	1.13	1.11	1.09	1.08	1.07	1.06	1.05
	MAX TAT								
	KIAS	302	292	284	275	267	259	250	239
	MACH	0.574	0.557	0.541	0.526	0.511	0.496	0.478	0.458
	FF/ENG	2887	2672	2469	2279	2100	1931	1761	1598
	KTAS	363	352	342	332	322	313	302	289
110 7	EPR	1.13	1.11	1.10	1.08	1.07	1.06	1.05	1.04
	MAX TAT								
	KIAS	304	295	287	280	272	264	254	243
	MACH	0.557	0.542	0.528	0.514	0.500	0.485	0.468	0.447
	FF/ENG	2914	2708	2515	2332	2160	1991	1822	1659
	KTAS	355	345	336	327	318	309	298	284

Definitions:

KIAS: Indicated airspeed in knots
 STD TAT: Standard Day TAT in °C
 KTAS: True airspeed in knots

MAX TAT: Max TAT in °C
 EPR: EPR required for flight
 FF/ENG: Fuel Flow per Engine (lb / hr)

Temperature Trade Factors:

- KTAS increases 1 knot per °C above ISA and decreases 1 knot per °C below standard TAT.
- FF increases 3% for +10°C and decreases 3% for -10°C difference from standard TAT.

Notes:

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

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MACH 0.76 CRUISE DATA

ALL ENGINES OPERATING

FLT LVL	KIAS STD TAT KTAS		GROSS WEIGHT (1,000 LB)							
			130	120	110	100	90	80	70	60
370	245	EPR					1.41	1.36	1.32	1.28
	-31	MAX TAT					-3			
	436	FF/ENG					1954	1805	1690	1605
360	251	EPR				1.44	1.39	1.34	1.31	1.28
	-31	MAX TAT				-6	0			
	436	FF/ENG				2149	1977	1843	1739	1661
350	257	EPR				1.41	1.37	1.33	1.30	1.27
	-29	MAX TAT				-2	3			
	438	FF/ENG				2173	2018	1896	1802	1730
340	263	EPR			1.44	1.39	1.35	1.31	1.29	1.27
	-27	MAX TAT			-5	1				
	440	FF/ENG			2383	2207	2067	1956	1869	1804
330	269	EPR			1.42	1.37	1.33	1.30	1.28	1.26
	-25	MAX TAT			-1	4				
	442	FF/ENG			2409	2250	2122	2021	1942	1882
320	275	EPR		1.44	1.39	1.35	1.32	1.30	1.27	1.26
	-22	MAX TAT		-3	2	7				
	444	FF/ENG		2622	2445	2301	2185	2092	2019	1965
310	281	EPR		1.41	1.37	1.34	1.31	1.29	1.27	1.26
	-20	MAX TAT		0	5	10				
	446	FF/ENG		2650	2491	2360	2254	2169	2102	2052
300	287	EPR	1.43	1.39	1.36	1.33	1.30	1.28	1.27	1.25
	-18	MAX TAT	-1	4	8	12				
	448	FF/ENG	2866	2690	2546	2426	2329	2251	2190	2142

Definitions:

KIAS: Indicated airspeed in knots
 STD TAT: Standard Day TAT in °C
 KTAS: True airspeed in knots

MAX TAT: Max TAT in °C
 EPR: EPR required for flight
 FF/ENG: Fuel Flow per Engine (lb / hr)

Temperature Trade Factors:

- KTAS increases 1 knot per °C above ISA and decreases 1 knot per °C below standard TAT.
- FF increases 3% for +10°C and decreases 3% for -10°C difference from standard TAT.

Notes:

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

MACH 0.76 CRUISE DATA

ALL ENGINES OPERATING

FLT LVL	KIAS STD TAT KTAS		GROSS WEIGHT (1,000 LB)							
			130	120	110	100	90	80	70	60
290	294	EPR	1.41	1.37	1.34	1.31	1.29	1.28	1.26	1.25
	-16	MAX TAT	2	7	11	14				
	450	FF/ENG	2899	2741	2609	2500	2410	2338	2283	2237
280	300	EPR	1.39	1.36	1.33	1.30	1.29	1.27	1.26	1.25
	-14	MAX TAT	6	10	13	16	18			
	452	FF/ENG	2945	2800	2679	2580	2498	2431	2380	2337
270	306	EPR	1.37	1.34	1.32	1.30	1.28	1.27	1.26	1.25
	-11	MAX TAT	8	12	15	18	20			
	454	FF/ENG	3000	2868	2758	2667	2591	2530	2482	2441
260	313	EPR	1.35	1.33	1.31	1.29	1.27	1.26	1.25	1.24
	-9	MAX TAT	11	14	17	19	21	23		
	456	FF/ENG	3066	2945	2844	2760	2690	2635	2588	2550
250	319	EPR	1.34	1.32	1.30	1.28	1.27	1.26	1.25	1.24
	-7	MAX TAT	13	16	19	21	23	24	25	
	457	FF/ENG	3141	3030	2937	2859	2795	273	2699	2664
240	326	EPR	1.33	1.31	1.29	1.28	1.27	1.26	1.25	1.24
	-5	MAX TAT	15	18	20	22	24	25	26	27
	459	FF/ENG	3224	3123	3037	2965	2906	2857	2816	2782
230	333	EPR	1.32	1.30	1.28	1.27	1.26	1.25	1.25	1.24
	-3	MAX TAT	17	19	21	23	24	26	27	27
	461	FF/ENG	3316	3223	3144	3077	3023	2976	2937	2906

Definitions:

KIAS: Indicated airspeed in knots
 STD TAT: Standard Day TAT in °C
 KTAS: True airspeed in knots

MAX TAT: Max TAT in °C
 EPR: EPR required for flight
 FF/ENG: Fuel Flow per Engine (lb / hr)

Temperature Trade Factors:

- KTAS increases 1 knot per °C above ISA and decreases 1 knot per °C below standard TAT.
- FF increases 3% for +10°C and decreases 3% for -10°C difference from standard TAT.

Notes:

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

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HOLDING SPEED / EPR / FUEL FLOW

STANDARD DAY - FLAPS UP

PRESSURE ALTITUDE - FEET		GROSS WEIGHT - 1000 LB							
		130	120	110	100	90	80	70	60
37,000	EPR				1.47	1.41	1.34	1.28	1.21
	KIAS				248	230	212	196	176
	FF/ENG (lb/hr)				2280	1960	1670	1420	1150
35,000	EPR			1.48	1.42	1.36	1.30	1.23	1.18
	KIAS			262	243	225	210	193	173
	FF/ENG (lb/hr)			2550	2190	1900	1630	1370	1120
30,000	EPR	1.43	1.39	1.34	1.29	1.24	1.20	1.16	1.12
	KIAS	278	262	247	234	219	201	186	172
	FF/ENG (lb/hr)	2930	2630	2350	2070	1800	1540	1320	1120
25,000	EPR	1.31	1.27	1.23	1.20	1.17	1.14	1.11	1.09
	KIAS	267	255	240	224	211	198	185	171
	FF/ENG (lb/hr)	2780	2500	2220	1960	1730	1520	1330	1140
20,000	EPR	1.22	1.19	1.16	1.14	1.12	1.10	1.08	1.06
	KIAS	257	244	232	221	209	197	184	170
	FF/ENG (lb/hr)	2630	2380	2150	1930	1730	1540	1360	1180
15,000	EPR	1.15	1.13	1.12	1.10	1.09	1.07	1.06	1.05
	KIAS	251	241	231	220	208	196	183	170
	FF/ENG (lb/hr)	2570	2360	2150	1960	1760	1570	1410	1240
10,000	EPR	1.11	1.10	1.09	1.08	1.06	1.05	1.04	1.03
	KIAS	250	240	230	219	208	196	183	169
	FF/ENG (lb/hr)	2590	2390	2190	1990	1810	1640	1470	1330
5,000	EPR	1.09	1.08	1.07	1.06	1.05	1.04	1.03	1.03
	KIAS	249	239	229	218	207	195	182	169
	FF/ENG (lb/hr)	2630	2430	2240	2070	1900	1730	1560	1420
1,500	EPR	1.07	1.06	1.05	1.05	1.04	1.03	1.03	1.02
	KIAS	248	239	228	218	207	195	182	169
	FF/ENG (lb/hr)	2670	2490	2310	2140	1970	1810	1640	1500

- NOTE: 1) This table includes 5% additional fuel for holding in a racetrack pattern.
 2) FF/ENG denotes fuel flow per operating engine in pounds per hour.

DESCENT REFERENCE GUIDE

START DESCENT		FOLLOW 3:1 LINE		
1000 FPM Entry Cruise Mach / 300 KIAS		Cruise Mach / 300 KIAS		
Cruise Altitude (1000 Ft)	Top of Descent Distance (NM)	Intercept Altitude (1000 Ft)	Distance (NM)	Rate of Descent Zero wind (FPM)
37	126	33	99	2600
35	120	31	93	2600
33	114	29	87	2600
31	108	27	81	2500
29	102	25	75	2400
28	99	24	72	2400
27	96	23	69	2300
26	93	22	66	2300
25	90	21	63	2300
24	87	20	60	2200
23	84	19	57	2200
22	81	18	54	2200
21	78	17	51	2100
20	75	16	48	2100
19	72	15	45	2100
18	69	14	42	2000
17	66	13	39	2000
16	63	12	36	2000
15	60	11	33	1900
14	57	10	30	1900
13	52	10	30	1900
12	47	10	30	1900
11	42	10	30	1900
10	36	10	30	1900

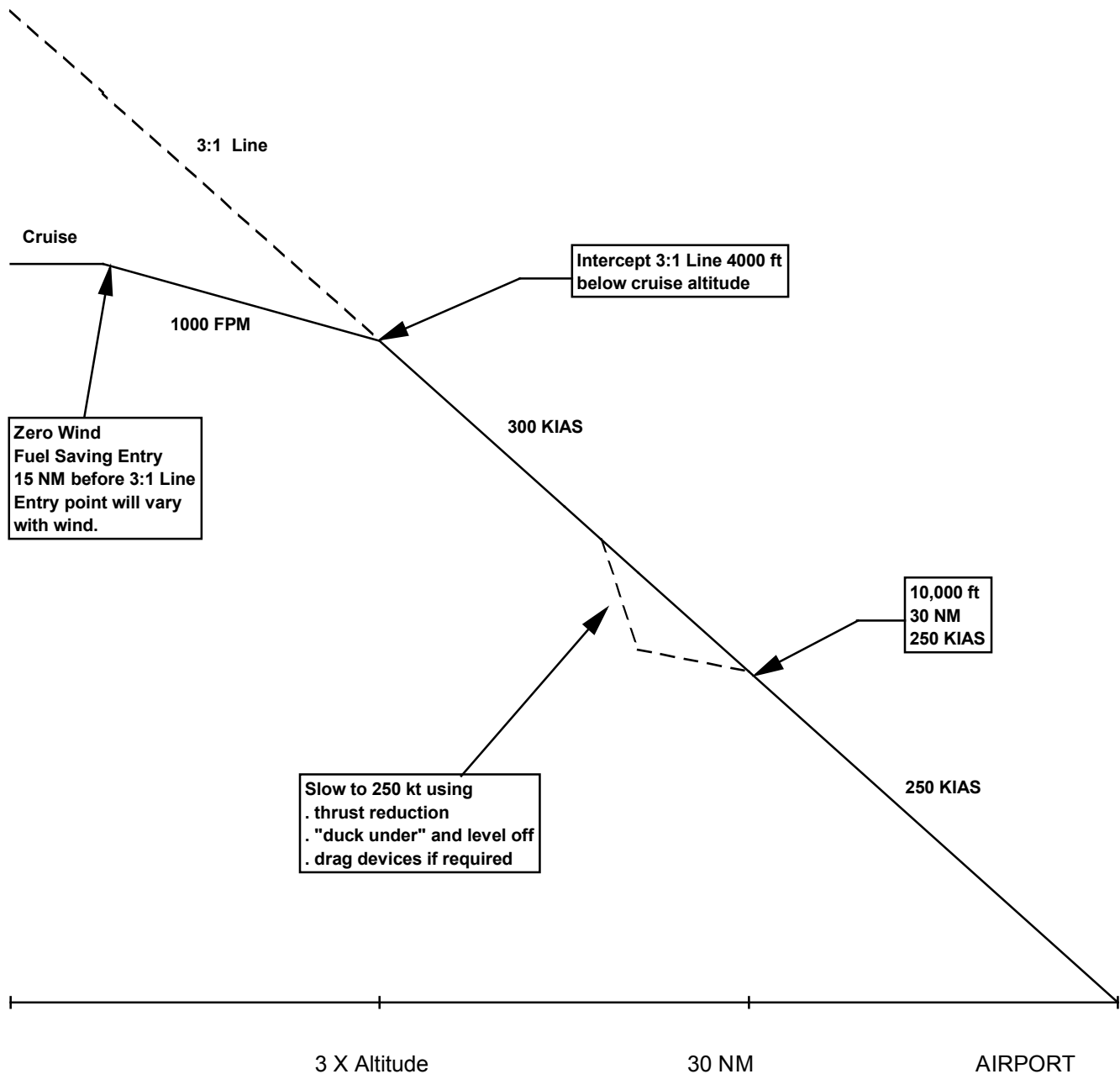
Descent entry point distance will increase/decrease with tailwind/headwind.

Example

1. From FL 350 start descent 120 NM out with a 1000 fpm rate of descent.
2. You will intercept 3:1 line at FL 310, 93 NM out.
3. A target 2600 fpm rate of descent will put you on the 3:1 line initially.
4. Read down to check 3:1 distance and rate of descent at lower altitudes.

DESCENT PROFILE

- SPEED - Cruise Mach/300 KIAS
- THRUST - as required



DESCENT PLANNING

PRESSURE ALTITUDE - FEET	TIME - MINUTES	FUEL - POUNDS	DISTANCE - NAUTICAL MILES		
			LANDING WEIGHT - POUNDS		
			70,000	90,000	110,000
37,000	24	590	114	121	124
35,000	23	570	103	114	117
33,000	22	550	97	107	110
31,000	21	530	91	100	104
29,000	20	510	85	94	97
27,000	19	500	79	87	90
25,000	18	480	73	80	84
23,000	16	460	67	74	77
21,000	15	430	61	67	70
19,000	14	410	55	61	64
17,000	13	390	50	55	58
15,000	12	370	45	49	52
10,000	9	310	32	35	37
5,000	6	240	20	21	22
1,500	4	200	12	12	12

NOTE: 1) Allowances for a straight-in approach are included
 2) Based on 250 KIAS descent speed schedule.

ALTITUDE FOR ALTERNATE DESTINATION

Based on Missed Approach

Distance (NM)	Cruise Altitude/ Flight Level	Cruise Speed Schedule
25	5,000 Ft	Min Cost V
50	7 - 9,000 Ft.	
100	11 - 15,000 Ft.	
125	14,000 Ft. - FL 180	
150	17,000 Ft. - FL 210	
200	FL 230 - 270	
250	FL 350/370	
300	FL 350/370	
400	FL 350/370	

B-717-200 DIVERSION CHARTS

(MIN FUEL = 4,000 lb)

**DIVERSION FROM MISSED APPROACH
FUEL (1,000 LB) & TIME REQUIRED**

DIST (NM)	CRUISE ALTITUDE – 1,000 FT						
	5	10	15	20	25	29	35
400			11.9 1:01	10.9 1:03	10.1 1:04	9.8 1:05	9.5 1:06
300			10.0 0:49	9.3 0:50	8.8 0:51	8.6 0:51	8.5 0:52
200			8.1 0:36	7.7 0:37	7.4 0:38	7.4 0:38	
180		8.3 0:32	7.7 0:33	7.4 0:35	7.1 0:35	7.1 0:35	
160		7.9 0:30	7.4 0:31	7.0 0:32	6.9 0:33		
140		7.4 0:27	7.0 0:28	6.7 0:29	6.6 0:30		
120		7.0 0:25	6.6 0:26	6.4 0:27			
100	7.0 0:20	6.5 0:22	6.2 0:23	6.1 0:25			
80	6.5 0:17	6.1 0:20	5.9 0:21				
70	6.3 0:16	5.9 0:18	5.7 0:20				
60	6.0 0:15	5.7 0:17					
50	5.7 0:13	5.4 0:16					
40 OR LESS	5.5 0:12						

**DIVERSION FROM HOLDING
FUEL (1,000 LB) & TIME REQUIRED**

DIST (NM)	CRUISE ALTITUDE – 1,000 FT				
	15	20	25	29	35
400	11.0 0:58	10.0 0:59	9.2 1:01	8.8 1:01	8.5 1:02
300	9.2 0:45	8.4 0:47	7.8 0:48	7.6 0:48	7.3 0:49
200	7.3 0:32	6.8 0:34	6.5 0:34	6.4 0:35	
180	6.9 0:30	6.5 0:31	6.2 0:32	6.1 0:32	
160	6.6 0:27	6.2 0:28	5.9 0:29		
140	6.2 0:25	5.9 0:26	5.7 0:26		
120	5.8 0:22	5.5 0:23	5.4 0:24		
100	5.4 0:20	5.2 0:21			
80	5.1 0:17	4.9 0:18			
70 OR LESS	4.9 0:16				

End of Section

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DEFINITIONS AND ASSUMPTIONS

ACTUAL LANDING DISTANCE	The actual distance required to land starting at 50 feet above the runway (usually at the threshold) to a complete stop on the runway. This distance is based on a 1.3 V_S speed at 50 feet and assumes maximum braking and NO reverse thrust.
APPROACH CLIMB LIMIT WEIGHT	Approach Climb Limit Weight is defined in FAR 25.121 as the maximum weight at which a missed approach climb meets the FAR prescribed climb gradient (2.1% for a two engine aircraft). This gradient is determined with the critical engine inoperative, remaining engine at takeoff thrust, landing gear retracted, and approach flap setting (as defined in the FAA Approved Flight Manual). This weight takes into account an air conditioning pack ON and operated from engine bleed air.
F.A.R. LANDING FIELD LENGTH	This is the landing field length as defined in the Federal Air Regulations Part 121, and is the actual landing distance plus an additional safety margin of 67%. Dispatch is based on F.A.R. Landing Field Length at the destination airport.
GO-AROUND THRUST	Maximum thrust setting available for use during a missed approach.
LANDING CLIMB LIMIT WEIGHT	Landing Climb Limit Weight is defined in FAR 25.119 as the maximum weight at which the aircraft meets the FAR prescribed climb gradient (3.2%). This gradient is determined with all engines operating, landing gear extended, and landing flap setting.
V_{REF}	Reference speed for the aircraft weight and configuration. This value typically represents 1.3 V_S for the configuration (unless otherwise noted). These speeds assume minimum maneuvering is required after being established on final approach.
V_S	Indicated stall speed for the aircraft weight and configuration. 1.3 V_S is 1.3 times the stall speed, or an increase of 30% above stall speed.

GO-AROUND EPR SETTINGS

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

BR700-715C1-30

REPORTED OAT		TAT	AIRPORT PRESSURE ALTITUDE - FEET									
°F	°C	°C	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
134	57	60	1.374	1.372	1.372	1.372	1.371					
125	52	55	1.398	1.395	1.394	1.392	1.392	1.392				
116	47	50	1.424	1.421	1.419	1.417	1.416	1.414	1.413	1.413	1.413	1.413
108	42	45	1.454	1.451	1.449	1.447	1.445	1.443	1.441	1.438	1.437	1.437
99	37	40	1.458	1.484	1.481	1.479	1.476	1.474	1.472	1.469	1.467	1.464
90	32	35	1.458	1.511	1.510	1.508	1.505	1.504	1.502	1.500	1.498	1.495
81	27	30	1.458	1.521	1.529	1.532	1.531	1.530	1.528	1.527	1.525	1.523
72	22	25	1.458	1.521	1.529	1.537	1.546	1.555	1.553	1.552	1.551	1.549
63	17	20	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.577	1.576
54	12	15	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
45	7	10	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
36	2	5	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
27	-3	0	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
18	-8	-5	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
9	-13	-10	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
1	-17	-15	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-8	-22	-20	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-17	-27	-25	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-26	-32	-30	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-35	-37	-35	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-44	-42	-40	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-53	-47	-45	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591
-62	-52	-50	1.458	1.521	1.529	1.537	1.546	1.555	1.564	1.573	1.582	1.591

CORRECTIONS:

BLEED CONFIGURATION	AIRPORT PRESSURE ALTITUDE - FEET									
	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
PACKS OFF	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.018	0.018	0.018
A/C HIGH	-0.013	-0.013	-0.013	-0.014	-0.014	-0.014	-0.015	-0.015	-0.015	-0.016
WING ANTI-ICE ON	-0.025	-0.027	-0.027	-0.027	-0.028	-0.029	-0.029	-0.030	-0.031	-0.032
ENGINE ANTI-ICE ON	-0.019	-0.020	-0.021	-0.021	-0.021	-0.022	-0.022	-0.023	-0.024	-0.025

LANDING REFERENCE SPEEDS, VREF**KIAS**

LANDING WEIGHT - POUNDS	SLATS RET.	SLATS EXTENDED				
	FLAPS 0	FLAPS 0	FLAPS 13	FLAPS 18	FLAPS 25	FLAPS 40
120,000	208	162	152	151	149	144
116,000	204	159	150	148	146	142
112,000	201	157	147	146	144	140
108,000	197	154	145	143	141	137
104,000	193	151	142	140	138	134
100,000	190	148	139	138	136	132
96,000	186	145	136	135	133	129
92,000	182	142	133	132	130	126
88,000	178	139	130	129	127	124
84,000	174	136	127	126	124	121
80,000	170	132	124	123	121	118
76,000	165	129	121	120	118	115
72,000	161	126	118	117	115	112
68,000	156	122	115	113	112	111
64,000	152	118	111	111	111	111

Shaded areas denote speeds in excess of tire rating speed.

STALL SPEEDS - V_s**KIAS**

GROSS WEIGHT - POUNDS	FLAPS 0 SLATS RET*	FLAPS 0 SLATS EXT	FLAPS 5 SLATS EXT	FLAPS 10 SLATS EXT	FLAPS 13 SLATS EXT	FLAPS 18 SLATS EXT	FLAPS 20 SLATS EXT	FLAPS 25 SLATS EXT	FLAPS 40 SLATS EXT
125,000	180	135	132	129	128	125	125	123	120
120,000	174	132	129	126	125	123	122	121	118
115,000	169	129	126	124	122	120	119	118	115
110,000	163	126	123	121	120	118	117	115	113
105,000	158	123	121	118	117	115	114	113	110
100,000	154	121	118	115	114	112	111	110	108
95,000	151	118	115	112	111	109	109	107	105
90,000	146	114	112	109	108	107	106	104	102
85,000	142	111	108	106	105	103	103	101	99
80,000	138	108	105	103	102	100	100	98	96
75,000	134	104	102	100	99	97	96	95	93
70,000	129	101	99	97	96	94	93	92	90

*Flaps 0, Slats Retracted stall speeds valid up to 10,000 feet pressure altitude. Stall speeds may be greater at higher pressure altitudes.

F.A.R. DRY LANDING FIELD LENGTH**FEET****BR700-715C1-30****FLAPS 40**

AIRCRAFT WEIGHT - POUNDS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
125,000	5,530	5,650	5,780	5,910	6,040	6,180	6,330	6,480	6,630
120,000	5,360	5,480	5,600	5,720	5,850	5,990	6,130	6,270	6,420
115,000	5,190	5,300	5,420	5,540	5,660	5,790	5,930	6,070	6,220
110,000	5,020	5,130	5,240	5,360	5,480	5,600	5,730	5,860	6,010
105,000	4,840	4,950	5,060	5,170	5,290	5,400	5,520	5,650	5,790
100,000	4,670	4,770	4,880	4,990	5,100	5,210	5,320	5,440	5,570
95,000	4,490	4,590	4,690	4,800	4,910	5,010	5,120	5,240	5,360
90,000	4,320	4,410	4,500	4,610	4,710	4,820	4,920	5,030	5,140
85,000	4,160	4,240	4,330	4,420	4,520	4,620	4,720	4,830	4,930
80,000	3,990	4,070	4,160	4,240	4,330	4,420	4,520	4,620	4,720
75,000	3,810	3,890	3,970	4,050	4,130	4,220	4,320	4,410	4,500
72,000 and below	3,700	3,780	3,860	3,930	4,010	4,100	4,190	4,280	4,370

NOTE:

Actual Landing Distance is:

- 60 percent of the F.A.R. Landing Field Lengths above.
- The distance to a complete stop from 50 feet above the runway threshold at V_{Ref40} .
- Based on Maximum Braking, Speed Brakes Extended and No Thrust Reverse.

CORRECTIONS:

CONDITION	CORRECTIONS
Headwind	- 20 ft. per knot
Tailwind	+ 90 ft. per knot
Auto Ground Spoilers Inoperative	+ 350 ft.
Wet runway and/or Low Minima	increase distance by 15%

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APPROACH AND LANDING CLIMB LIMITS

POUNDS

BR700-715C1-30
**APPROACH FLAPS 13
LANDING FLAPS 40**

ONE PACK ON, ANTI-ICE OFF

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
50	117,900	113,600	109,000						
45	123,300	119,000	114,200						
40	129,800	125,000	120,000	115,300	110,700	106,300	102,000	97,800	
35	130,000	130,000	125,900	121,000	116,200	111,600	107,000	102,500	98,200
32	130,000	130,000	129,000	124,000	119,300	114,500	110,000	105,600	101,100
30	130,000	130,000	130,000	126,200	121,200	116,600	111,800	107,400	103,000
28	130,000	130,000	130,000	127,800	123,000	118,200	113,500	108,800	104,500
26	130,000	130,000	130,000	129,700	124,700	119,700	115,100	110,500	106,100
24	130,000	130,000	130,000	130,000	125,500	121,400	116,600	112,000	107,500
22	130,000	130,000	130,000	130,000	125,500	122,900	118,200	113,600	109,200
20	130,000	130,000	130,000	130,000	125,500	124,400	119,700	115,200	110,600
18	130,000	130,000	130,000	130,000	125,500	124,500	121,100	116,600	112,000
16	130,000	130,000	130,000	130,000	125,500	124,500	121,200	117,900	114,500
10 & below	130,000	130,000	130,000	130,000	125,600	124,600	121,300	118,000	114,500

NOTES:

1. Shaded region represents conditions outside environmental envelope.
2. Reduce Gross Weight by 1,200 lbs. when operating in icing conditions during any part of the flight when the forecast landing temperature is below 20°C.
3. Apply the following Gross Weight Corrections (pounds) for applicable bleed configuration:

CONFIGURATION	CORRECTIONS – POUNDS
Packs OFF	+ 3,900
Engine Ice Protection only	- 3,300
Engine and Airplane Ice Protection	- 10,300

BASIS:

In accordance with FAR 25.119 and FAR 25.121(d), the limit weights shown are the more restrictive of the following two scenarios:

Approach Climb

- One engine inoperative.
- Flaps at approach setting. (Flaps 13)
- Landing gear retracted.

Landing Climb

- All engines operating.
- Flaps at landing setting. (Flaps 40)
- Landing gear extended.

APPROACH AND LANDING CLIMB LIMITS

POUNDS

BR700-715C1-30
**APPROACH FLAPS 18
LANDING FLAPS 40**

ONE PACK ON, ANTI-ICE OFF

OAT - °C	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
50	112,000	108,000	103,600						
45	117,300	113,000	108,400						
40	123,400	118,500	114,100						
35	129,500	124,300	119,600	114,800	110,300	105,800	102,200	97,400	93,300
32	130,000	122,400	122,500	117,600	113,100	108,600	104,500	100,000	95,900
30	130,000	129,000	124,300	119,400	114,800	110,400	106,000	101,700	97,700
28	130,000	130,000	125,900	121,200	116,500	111,900	107,600	103,300	99,200
26	130,000	130,000	127,500	122,700	118,100	113,400	109,100	104,800	100,500
24	130,000	130,000	127,500	124,400	119,700	115,000	110,500	106,200	102,000
22	130,000	130,000	127,600	124,400	121,100	116,500	112,100	107,600	103,300
20	130,000	130,000	127,600	124,500	121,100	117,900	113,400	109,100	104,800
18	130,000	130,000	127,700	124,500	121,200	118,000	114,800	110,400	106,000
16	130,000	130,000	127,800	124,500	121,300	118,000	114,800	111,700	107,400
10 & below	130,000	130,000	128,000	124,600	121,400	118,100	114,900	111,800	108,800

NOTES:

1. Shaded region represents conditions outside environmental envelope.
2. Reduce Gross Weight by 1,500 lbs. when operating in icing conditions during any part of the flight when the forecast landing temperature is below 20°C.
3. Apply the following Gross Weight Corrections (pounds) for applicable bleed configuration:

CONFIGURATION	CORRECTIONS – POUNDS
Packs OFF	+ 3,700
Engine Ice Protection only	- 3,500
Engine and Wing Ice Protection	- 11,100

BASIS:

In accordance with FAR 25.119 and FAR 25.121(d), the limit weights shown are the more restrictive of the following two scenarios:

Approach Climb

- One engine inoperative.
- Flaps at approach setting. (Flaps 18)
- Landing gear retracted.

Landing Climb

- All engines operating.
- Flaps at landing setting. (Flaps 40)
- Landing gear extended.

OPERATIONAL LANDING DISTANCES

FEET

FLAPS 40

NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).				
Weight (lb)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
120,000	4,400	5,900	7,200	10,300
115,000	4,300	5,700	7,000	10,000
110,000	4,300	5,500	6,800	9,700
105,000	4,200	5,400	6,600	9,400
100,000	4,100	5,200	6,300	9,100
95,000	4,000	5,000	6,100	8,900
90,000	3,900	4,800	5,900	8,600
85,000	3,800	4,700	5,700	8,300
80,000	3,700	4,500	5,400	8,100
75,000	3,700	4,300	5,200	7,800
70,000	3,600	4,200	5,100	7,700

BASIS: Zero wind and slope • 2 Engines at Max Reverse to 80 kts, Idle Reverse by 60 kts, and Idle Forward by 40 kts. • Touchdown Speed = VREF40 - 5 • Max Manual Braking

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
0	-100	-300	-400	-600
2,000	0	0	0	0
4,000	100	300	400	600
6,000	200	600	900	1,300
8,000	300	900	1,400	2,000

CORRECTIONS	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
PER 1 KT HEADWIND	0	0	-50	-50
PER 1 KT TAILWIND	50	100	150	300
PER 5 KTS ADD'L SPD	100	400	450	500
PER 1% UP SLOPE	-50	-150	-300	-700
PER 1% DOWN SLOPE	50	150	400	1,200
1 REVERSER INOP	0	300	600	1,000
2 REVERSERS INOP	0	600	1,400	2,800

Note: Do not operate when Braking Action is Nil.

End of Section

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CROSS REFERENCES

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ESTIMATED CONTAMINATED RUNWAY LANDING DISTANCES	QUICK REFERENCE & APPROACH / LANDING

DEFINITIONS AND ASSUMPTIONS

GROSS LEVEL OFF ALTITUDE	Altitude at which the aircraft is expected to level off after the loss of one engine. No conservatism is built into this value. For use during flight, not for flight planning.
LONG RANGE CRUISE	The speed of the aircraft that will result in 99% of the maximum range of the aircraft in no wind conditions for a given weight and altitude.
MAXIMUM CONTINUOUS THRUST (MCT)	The maximum thrust level for which the engine is rated with no time constraint.
STATIC AIR TEMPERATURE (SAT)	The static air temperature outside of the aircraft. Also referred to as the Outside Air Temperature or OAT.
TOTAL AIR TEMPERATURE (TAT)	The sum of both the ambient air temperature plus the total increase in temperature due to compression heating.
V_{REF}	Reference speed for the aircraft weight and configuration. This value typically represents $1.3 V_S$ for the configuration (unless otherwise noted). These speeds assume minimum maneuvering is required after being established on final approach.

MEL RELATED PERFORMANCE ABBREVIATIONS DISPLAYED ON WDR

ASI	AWABS has automatically corrected the allowable weights and V1 speeds due to a completely inoperative anti-skid braking system.
EEC	AWABS has automatically corrected the allowable weights and V1 speeds due to EEC Normal (EPR) Mode Inoperative.
PTU	AWABS has automatically corrected the allowable weights and V1 speeds due to an inoperative hydraulic power transfer unit.
TRI	AWABS has automatically corrected the allowable weights and V1 speeds due to one inoperative thrust reverser.

ONE ENGINE INOPERATIVE
MAXIMUM CONTINUOUS THRUST EPR
PERCENT

BR700-715C1-30

MCT

0.76 MACH
 BASED ON PACK ON HIGH, ANTI-ICE OFF

TAT - °C	PRESSURE ALTITUDE – FEET								
	21,000	23,000	25,000	27,000	29,000	31,000	33,000	35,000	37,000
20	1.431	1.392	1.351	1.342	1.332	1.322			
15	1.469	1.430	1.389	1.380	1.369	1.358	1.347		
10	1.485	1.470	1.428	1.419	1.409	1.397	1.385	1.373	1.363
5	1.485	1.481	1.468	1.460	1.449	1.438	1.426	1.413	1.401
0	1.485	1.481	1.474	1.501	1.491	1.480	1.468	1.455	1.442
-5	1.485	1.481	1.474	1.503	1.532	1.522	1.511	1.499	1.486
-10	1.485	1.481	1.474	1.503	1.532	1.557	1.552	1.542	1.530
-15	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.580	1.571
-20	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.599	1.602
-25	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.599	1.604
-30	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.599	1.604
-35	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.599	1.604
-40	1.485	1.481	1.474	1.503	1.532	1.557	1.578	1.599	1.604

CORRECTIONS:

Engine Anti-Ice ON	-0.035	-0.036	-0.037	-0.041	-0.044	-0.046	-0.047	-0.048	-0.049
Engine & Wing Anti-Ice ON	-0.076	-0.076	-0.078	-0.084	-0.090	-0.095	-0.099	-0.103	-0.110

ONE ENGINE INOPERATIVE DRIFTDOWN PROCEDURES

IN THE EVENT OF AN ENGINE FAILURE OR SHUTDOWN DURING CRUISE:

1. Immediately set Maximum Continuous Thrust (MCT) from previous page.
2. Allow aircraft to decelerate in level flight to driftdown speed prior to initiating descent.
 - Aircraft will level off at or above altitudes shown in DRIFTDOWN GROSS LEVEL-OFF ALTITUDE chart.
 - Cross-check FMS engine-out level-off altitude.
3. If driftdown terrain clearance is critical, consult Flight Plan Remarks to determine:
 - Recommended en route alternate airports, if required.
 - ISA temperature deviation at 18,000 feet.
4. If terrain clearance is a factor, select a suitable alternate airport as follows:
 - Terrain clearance is assured for flight to any flight plan alternate airport listed.
 - Comply with Unrestricted/Restricted Critical Terrain Procedures as described in Airway Manual – Section 6.
 - Use flight plan recommended en route alternate airport, or:
 - Determine aircraft position on appropriate Jeppesen Low Level or High/Low Level enroute chart and locations of other suitable alternates.
 - Check terrain clearance for flight via MEA / MOCA on airway or Grid MORA for a non-flight-plan suitable enroute alternate.
 - Maintain MCT / driftdown speed after level-off and allow aircraft to climb until at/above MEA / MOCA on airway or Grid MORA.
 - Maintain airway MEA / MOCA until established on the arrival to selected alternate airport.
5. Proceed to selected nearest suitable alternate.
6. Except as specified in Step 4, maintain Maximum Continuous Thrust (MCT) and allow aircraft to accelerate to engine-out Long Range Cruise speed at level-off altitude.

DRIFTDOWN SPEED SCHEDULE KIAS

GROSS WEIGHT - POUNDS	Optimum Driftdown Speed (KIAS)
120,000	241
115,000	237
110,000	232
105,000	227
100,000	222
95,000	217
90,000	211
85,000	205
80,000	199
75,000	193
70,000	186
65,000	180
60,000	173

ONE ENGINE INOPERATIVE

DRIFTDOWN SPEED AND GROSS LEVEL OFF ALTITUDE FEET

ENGINE ANTI-ICE OFF

GROSS WEIGHT – POUNDS		GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C & COLDER	ISA	ISA + 10°C	ISA + 20°C
120,000	116,300	18,700	18,700	18,700	15,900
110,000	106,900	20,900	20,900	20,900	18,900
100,000	97,100	23,100	23,100	23,100	21,400
90,000	87,400	25,800	25,800	25,800	23,800
80,000	77,800	28,900	28,900	28,900	27,100
70,000	68,400	32,200	32,200	32,200	30,900

ENGINE ANTI-ICE ON

GROSS WEIGHT – POUNDS		GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C & COLDER	ISA	ISA + 10°C	ISA + 20°C
120,000	116,100	17,700	17,700	17,700	14,600
110,000	106,700	20,100	20,100	20,100	17,700
100,000	97,100	22,300	22,300	22,300	20,500
90,000	87,300	24,800	24,800	24,800	22,900
80,000	77,800	27,800	27,800	27,800	25,800
70,000	68,300	31,200	31,200	31,100	29,700

ENGINE & WING ANTI-ICE ON

GROSS WEIGHT – POUNDS		GROSS LEVEL OFF ALTITUDE – FEET			
AT ENGINE FAILURE	AT LEVEL OFF (APPROX)	ISA - 10°C & COLDER	ISA	ISA + 10°C	ISA + 20°C
120,000	115,900	16,500	16,400	16,400	12,700
110,000	106,400	19,100	19,000	19,000	16,100
100,000	97,000	21,300	21,300	21,300	19,300
90,000	87,300	23,800	23,800	23,800	21,800
80,000	77,700	26,700	26,700	26,700	24,500
70,000	68,200	30,000	30,000	29,900	28,200

BASIS:

- APU Operating
- Maximum Continuous Thrust Limits
- 100 ft./min. residual rate of climb
- 35,000 ft. initial altitude

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL STD TAT		GROSS WEIGHT – 1,000 POUNDS							
		130	120	110	100	90	80	70	60
300 - 31	EPR MAX TAT KIAS MACH FF/ENG KTAS							1.57 -12 209 0.565 2,897 333	1.45 194 0.525 2,335 309
290 - 29	EPR MAX TAT KIAS MACH FF/ENG KTAS							1.53 -7 208 0.551 2,840 326	1.42 195 0.517 2,326 306
280 - 28	EPR MAX TAT KIAS MACH FF/ENG KTAS							1.49 -2 208 0.539 2,798 320	1.40 196 0.509 2,325 302
270 - 25	EPR MAX TAT KIAS MACH FF/ENG KTAS						1.57 -11 223 0.565 3,356 337	1.46 2 209 0.529 2,775 316	1.37 198 0.502 2,333 300
260 - 24	EPR MAX TAT KIAS MACH FF/ENG KTAS						1.53 -5 222 0.551 3,292 330	1.44 6 210 0.520 2,762 312	1.35 200 0.497 2,350 298
250 - 22	EPR MAX TAT KIAS MACH FF/ENG KTAS						1.50 -1 222 0.539 3,245 325	1.41 211 0.512 2,755 308	1.34 202 0.492 2,374 296

NOTE: Heavy line approximates max cruise thrust limit.

DEFINITIONS:

FL: Flight level.	FF/ENG: Fuel Flow per Engine. (lb per hr).
STD TAT: Standard Day total air temperature in °C.	MACH: Mach number.
EPR: Target EPR.	KIAS: Indicated airspeed in knots.
MAX TAT: Maximum total air temperature in °C.	KTAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- Max TAT not shown where EPR can be set in ISA + 30°C conditions.
- FF increases 3% for every +10°C and decreases 3% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE

FL STD TAT		GROSS WEIGHT – 1,000 POUNDS							
		130	120	110	100	90	80	70	60
240 - 19	EPR					1.56	1.47	1.39	1.32
	MAX TAT					-6	5		
	KIAS					236	223	212	204
	MACH					0.560	0.529	0.505	0.486
	FF/ENG					3,799	3,218	2,759	2,399
230 - 18	KTAS					339	320	305	294
	EPR					1.52	1.44	1.37	1.31
	MAX TAT					1	11		
	KIAS					235	224	214	206
	MACH					0.547	0.521	0.499	0.481
220 - 16	FF/ENG					3,732	3,202	2,773	2,423
	KTAS					332	316	303	292
	EPR					1.49	1.41	1.35	1.29
	MAX TAT					7			
	KIAS					235	225	216	207
210 - 14	MACH					0.536	0.513	0.494	0.475
	FF/ENG					3,686	3,194	2,796	2,451
	KTAS					327	313	301	289
	EPR				1.54	1.46	1.39	1.33	1.28
	MAX TAT				3	13			
200 - 12	KIAS				248	236	226	219	209
	MACH				0.553	0.527	0.506	0.490	0.469
	FF/ENG				4,230	3,663	3,199	2,828	2,479
	KTAS				338	323	310	300	287
	EPR				1.51	1.43	1.37	1.32	1.27
190 - 10	MAX TAT				10	19			
	KIAS				247	237	228	221	210
	MACH				0.541	0.519	0.500	0.484	0.462
	FF/ENG				4,172	3,650	3,216	2,858	2,507
	KTAS				333	319	307	298	284
180 - 8	EPR			1.55	1.48	1.41	1.35	1.30	1.26
	MAX TAT			5	14				
	KIAS			260	248	238	230	222	211
	MACH			0.557	0.532	0.512	0.495	0.479	0.455
	FF/ENG			4,734	4,135	3,645	3,242	2,887	2,531
170 - 6	KTAS			343	328	316	305	295	280

DEFINITIONS:

FL: Flight level.
STD TAT: Standard Day total air temperature in °C.
EPR: Target EPR.
MAX TAT: Maximum total air temperature in °C.

FF/ENG: Fuel Flow per Engine. (lb per hr).
MACH: Mach number.
KIAS: Indicated airspeed in knots.
KTAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- Max TAT not shown where EPR can be set in ISA + 30°C conditions.
- FF increases 3% for every +10°C and decreases 3% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE LONG RANGE CRUISE

FL STD TAT		GROSS WEIGHT – 1,000 POUNDS							
		130	120	110	100	90	80	70	60
180 - 8	EPR			1.52	1.45	1.39	1.34	1.29	1.24
	MAX TAT			10	19				
	KIAS			259	249	240	233	224	212
	MACH			0.545	0.523	0.505	0.491	0.473	0.447
	FF/ENG KTAS			4,657 337	4,113 324	3,650 313	3,276 304	2,920 293	2,553 277
170 - 6	EPR			1.49	1.42	1.37	1.32	1.28	1.23
	MAX TAT			14	22				
	KIAS			259	250	242	235	226	212
	MACH			0.534	0.516	0.499	0.486	0.467	0.440
	FF/ENG KTAS			4,605 332	4,097 321	3,667 310	3,305 302	2,950 290	2,572 273
160 - 4	EPR		1.52	1.46	1.40	1.35	1.31	1.27	1.22
	MAX TAT		10	18	26				
	KIAS		270	260	251	244	237	227	212
	MACH		0.546	0.526	0.509	0.495	0.480	0.460	0.432
	FF/ENG KTAS		5,138 341	4,576 328	4,096 317	3,696 309	3,336 300	2,979 287	2,591 269
150 - 2	EPR		1.49	1.43	1.38	1.34	1.29	1.25	1.21
	MAX TAT		15	22					
	KIAS		270	261	253	247	239	228	212
	MACH		0.536	0.518	0.503	0.490	0.475	0.453	0.424
	FF/ENG KTAS		5,078 336	4,557 325	4,107 315	3,734 307	3,372 297	3,005 284	2,607 265
140 - 1	EPR		1.46	1.41	1.36	1.32	1.28	1.24	1.20
	MAX TAT		18	26					
	KIAS		271	263	255	249	240	228	212
	MACH		0.527	0.511	0.497	0.485	0.469	0.446	0.415
	FF/ENG KTAS		5,043 332	4,550 321	4,131 313	3,766 305	3,407 295	3,030 280	2,620 261
130 1	EPR	1.49	1.44	1.39	1.35	1.31	1.27	1.23	1.19
	MAX TAT	15	22	29					
	KIAS	281	272	264	258	251	241	229	212
	MACH	0.536	0.520	0.505	0.493	0.480	0.462	0.438	0.407
	FF/ENG KTAS	5,549 338	5,021 328	4,556 319	4,167 311	3,801 303	3,440 292	3,053 277	2,632 257

DEFINITIONS:

FL:	Flight level.	FF/ENG:	Fuel Flow per Engine. (lb per hr).
STD TAT:	Standard Day total air temperature in °C.	MACH:	Mach number.
EPR:	Target EPR.	KIAS:	Indicated airspeed in knots.
MAX TAT:	Maximum total air temperature in °C.	KTAS:	True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- Max TAT not shown where EPR can be set in ISA + 30°C conditions.
- FF increases 3% for every +10°C and decreases 3% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ONE ENGINE INOPERATIVE

LONG RANGE CRUISE

FL STD TAT		GROSS WEIGHT – 1,000 POUNDS							
		130	120	110	100	90	80	70	60
120 3	EPR	1.47	1.42	1.37	1.33	1.29	1.26	1.22	1.18
	MAX TAT	19	25	32					
	KIAS	282	273	266	260	253	242	229	212
	MACH	0.527	0.513	0.499	0.488	0.474	0.456	0.430	0.399
	FF/ENG	5,511	5,010	4,578	4,207	3,841	3,471	3,074	2,641
	KTAS	334	325	316	309	301	289	273	253
110 5	EPR	1.44	1.39	1.35	1.32	1.28	1.25	1.21	1.17
	MAX TAT	22	29	35					
	KIAS	283	275	269	262	254	243	229	212
	MACH	0.520	0.506	0.495	0.483	0.469	0.449	0.423	0.391
	FF/ENG	5,487	5,014	4,612	4,243	3,879	3,500	3,092	2,651
	KTAS	331	322	315	307	298	285	269	248
100 7	EPR	1.42	1.38	1.34	1.30	1.27	1.24	1.20	1.16
	MAX TAT	25	32	37					
	KIAS	284	277	272	265	256	244	229	211
	MACH	0.513	0.501	0.491	0.478	0.462	0.441	0.415	0.383
	FF/ENG	5,475	5,034	4,658	4,282	3,917	3,526	3,106	2,660
	KTAS	327	320	313	305	295	282	265	244
90 8	EPR	1.40	1.36	1.32	1.29	1.26	1.23	1.19	1.15
	MAX TAT	29	34	40					
	KIAS	286	280	274	266	257	244	229	211
	MACH	0.506	0.496	0.486	0.473	0.456	0.434	0.407	0.375
	FF/ENG	5,478	5,067	4,696	4,327	3,951	3,551	3,119	2,669
	KTAS	324	318	311	303	292	278	260	240
80 10	EPR	1.38	1.34	1.31	1.28	1.25	1.22	1.18	1.14
	MAX TAT	32	37						
	KIAS	288	282	276	268	258	244	228	210
	MACH	0.501	0.492	0.481	0.467	0.449	0.426	0.399	0.367
	FF/ENG	5,498	5,114	4,737	4,368	3,984	3,573	3,128	2,676
	KTAS	322	316	309	300	289	274	256	236
70 12	EPR	1.36	1.33	1.30	1.27	1.24	1.21	1.17	1.13
	MAX TAT	35	40						
	KIAS	290	285	278	269	258	244	228	209
	MACH	0.496	0.487	0.475	0.461	0.442	0.418	0.391	0.359
	FF/ENG	5,533	5,159	4,782	4,410	4,014	3,591	3,140	2,685
	KTAS	320	314	307	297	285	270	252	232

DEFINITIONS:

FL: Flight level.
STD TAT: Standard Day total air temperature in °C.
EPR: Target EPR.
MAX TAT: Maximum total air temperature in °C.

FF/ENG: Fuel Flow per Engine. (lb per hr).
MACH: Mach number.
KIAS: Indicated airspeed in knots.
KTAS: True airspeed in knots.

TEMPERATURE TRADE FACTORS:

- Max TAT not shown where EPR can be set in ISA + 30°C conditions.
- FF increases 3% for every +10°C and decreases 3% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

ABNORMAL FLIGHT MODE ANNUNCIATIONS AFTER LANDING GEAR EXTENSION

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	3,890	3,810	3,730	3,650	3,570	3,490	3,410	3,340	3,260	3,180
GOOD	5,360	5,240	5,120	5,000	4,870	4,740	4,610	4,480	4,340	4,240
MEDIUM	7,420	7,210	6,990	6,780	6,570	6,360	6,150	5,960	5,760	5,570
POOR	10,030	9,730	9,420	9,120	8,810	8,510	8,210	7,930	7,640	7,360
V_{REF}	144	141	138	135	132	129	125	122	118	115

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+120	+173	+219	+283
Wind	Per 1 kt headwind	-10	-20	-36	-58
	Per 1 kt tailwind	+30	+68	+118	+216
Slope	Per 1% downhill	+32	+118	+336	+1,074
	Per 1% uphill	-32	-110	-276	-690
Approach Speed	Per 10 kt above table	+200	+300	+420	+580

NOTE: Use the below chart for “ANTISKID FAIL” when referred by QRH, Anti-skid Inoperative Non-normal procedure ONLY. These values are NOT to be used for dispatch purposes. For dispatch landing distances, refer to MEL Support at the end of the Abnormal section of this manual.

ANTISKID FAIL

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	6,360	6,130	5,890	5,700	5,500	5,330	5,150	4,990	4,830	4,680
GOOD	7,820	7,560	7,300	7,070	6,830	6,620	6,400	6,200	5,990	5,790
MEDIUM	10,660	10,290	9,910	9,570	9,230	8,920	8,600	8,310	8,010	7,720
POOR	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	11,740	11,310	10,880	10,470
V_{REF}	144	141	138	135	132	129	125	122	118	115

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+235	+272	+314	+300
Wind	Per 1 kt headwind	-16	-28	-52	-86
	Per 1 kt tailwind	+50	+98	+170	+316
Slope	Per 1% downhill	+50	+170	+482	+1,566
	Per 1% uphill	-50	-158	-396	-1,008
Approach Speed	Per 10 kt above table	+360	+440	+620	+860

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

FLAP DISAG (FINAL FLAP SETTING LESS THAN 25°)

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	**	**	5,780	5,580	5,380	5,200	5,010	4,820	4,630	4,440
GOOD	**	**	8,210	7,860	7,500	7,150	6,790	6,450	6,110	5,780
MEDIUM	**	**	11,230	10,720	10,200	9,690	9,170	8,680	8,180	7,710
POOR	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	11,130	10,440
V_{REF}	208	204	199	195	190	185	180	175	170	164

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+140	+260	+345	+345
Wind	Per 1 kt headwind	-16	-32	-58	-96
	Per 1 kt tailwind	+50	+108	+188	+352
Slope	Per 1% downhill	+50	+50	+536	+1,748
	Per 1% uphill	-50	-176	-440	-1,124
Approach Speed	Per 10 kt above table	+340	+500	+680	+960

**Denotes Maximum Brake Energy Limit

FLAPS 13

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	4,210	4,120	4,030	3,940	3,850	3,760	3,670	3,580	3,490	3,400
GOOD	6,130	5,965	5,800	5,635	5,470	5,305	5,140	4,990	4,840	4,690
MEDIUM	8,200	7,965	7,730	7,495	7,260	7,025	6,790	6,580	6,370	6,160
POOR	10,970	10,665	10,360	10,055	9,750	9,445	9,140	8,875	8,610	8,345
V_{REF13}	152	150	146	143	139	136	132	128	124	121

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+60	+120	+180	+300
Wind	Per 1 kt headwind	-11	-22	-36	-63
	Per 1 kt tailwind	+35	+72	+122	+219
Slope	Per 1% downhill	+40	+140	+370	+1190
	Per 1% uphill	-40	-120	-270	-710
Approach Speed	Per 10 kt above table	+230	+330	+400	+440

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

FLAPS 18

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	4,210	4,120	4,030	3,940	3,850	3,760	3,670	3,580	3,490	3,400
GOOD	6,080	5,920	5,760	5,600	5,440	5,280	5,120	4,970	4,820	4,670
MEDIUM	8,130	7,900	7,670	7,440	7,210	6,980	6,750	6,535	6,320	6,105
POOR	10,820	10,525	10,230	9,935	9,640	9,345	9,050	8,785	8,520	8,255
V_{REF18}	151	148	145	141	138	135	131	127	123	120

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+60	+110	+180	+300
Wind	Per 1 kt headwind	-11	-22	-36	-62
	Per 1 kt tailwind	+35	+72	+122	+218
Slope	Per 1% downhill	+40	+140	+370	+1180
	Per 1% uphill	-40	-130	-290	-700
Approach Speed	Per 10 kt above table	+230	+330	+390	+440

FLAPS 25

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	4,070	3,985	3,900	3,815	3,730	3,645	3,560	3,475	3,390	3,305
GOOD	5,930	5,775	5,620	5,465	5,310	5,155	5,000	4,855	4,710	4,565
MEDIUM	7,870	7,650	7,430	7,210	6,990	6,770	6,550	6,350	6,150	5,950
POOR	10,450	10,170	9,890	9,610	9,330	9,050	8,770	8,520	8,270	8,020
V_{REF25}	149	146	143	139	136	133	129	125	121	118

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+60	+110	+170	+280
Wind	Per 1 kt headwind	-11	-21	-35	-61
	Per 1 kt tailwind	+34	+70	+119	+214
Slope	Per 1% downhill	+40	+140	+350	+1130
	Per 1% uphill	-40	-120	-280	-670
Approach Speed	Per 10 kt above table	+220	+320	+380	+420

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

GEN ALL OFF OR TOTAL LOSS OF AC POWER

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	7,360	7,190	7,020	6,850	6,680	6,430	6,180	6,160	6,140	6,080
GOOD	11,340	10,980	10,620	10,270	9,920	9,610	9,290	9,030	8,760	8,560
MEDIUM	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	11,430
POOR	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000
V_{REF}	164	161	158	155	152	149	145	142	138	135

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+245	+370	+320	N/A
Wind	Per 1 kt headwind	-18	-42	-80	N/A
	Per 1 kt tailwind	+62	+144	+256	N/A
Slope	Per 1% downhill	+64	+254	+730	N/A
	Per 1% uphill	-64	-236	-600	N/A
Approach Speed	Per 10 kt above table	+440	+660	+920	N/A

GRND SPLR INOP

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	4,290	4,195	4,100	4,005	3,910	3,815	3,720	3,635	3,550	3,465
GOOD	6,340	6,170	6,000	5,830	5,660	5,490	5,320	5,170	5,020	4,870
MEDIUM	8,260	8,030	7,800	7,570	7,340	7,110	6,880	6,675	6,470	6,265
POOR	10,840	10,560	10,280	10,000	9,720	9,440	9,160	8,915	8,670	8,425
V_{REF40}	144	142	139	135	132	129	125	122	118	115

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+60	+130	+190	+300
Wind	Per 1 kt headwind	-11	-23	-38	-65
	Per 1 kt tailwind	+35	+76	+127	+226
Slope	Per 1% downhill	+60	+180	+430	+1340
	Per 1% uphill	-50	-160	-340	-780
Approach Speed	Per 10 kt above table	+370	+440	+450	+460

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

HYD L & R FAIL

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	9,500	8,580	7,650	7,170	6,690	6,440	6,180	5,960	5,730	5,510
GOOD	**	**	**	**	**	**	8,290	7,890	7,480	7,090
MEDIUM	**	**	**	**	**	**	11,340	10,760	10,170	9,610
POOR	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000
V_{REF}	208	204	199	195	190	185	180	175	170	164

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+680	+270	+355	N/A
Wind	Per 1 kt headwind	-18	-40	-72	-120
	Per 1 kt tailwind	+62	+130	+234	+442
Slope	Per 1% downhill	+64	+232	+667	+2,186
	Per 1% uphill	-64	-216	-548	-1,408
Approach Speed	Per 10 kt above table	+440	+600	+840	+1,200

**Denotes Maximum Brake Energy Limit

NO FLAP/NO SLAT OR NO FLAPS/SLATS EXTENDED LANDING

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	**	**	5,780	5,580	5,380	5,200	5,010	4,820	4,630	4,440
GOOD	**	**	8,210	7,860	7,500	7,150	6,790	6,450	6,110	5,780
MEDIUM	**	**	11,230	10,720	10,200	9,690	9,170	8,680	8,180	7,710
POOR	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	> 12,000	11,130	10,440
V_{REF}	208	204	199	195	190	185	180	175	170	164

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+140	+260	+345	+345
Wind	Per 1 kt headwind	-16	-32	-58	-96
	Per 1 kt tailwind	+50	+108	+188	+352
Slope	Per 1% downhill	+50	+190	+536	+1,748
	Per 1% uphill	-50	-176	-440	-1,124
Approach Speed	Per 10 kt above table	+340	+500	+680	+960

**Denotes Maximum Brake Energy Limit

ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS FEET

BASIS:

- Sea level, standard day, no wind, no slope.
- Max manual braking.
- Max reverse to 80 kts, Idle reverse by 60 kts, and Idle forward by 40 kts. (if reverse thrust is available)
- Includes 1,500 foot air distance.

ONE ENGINE INOP

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	4,100	4,010	3,920	3,830	3,740	3,650	3,560	3,475	3,390	3,305
GOOD	6,200	6,020	5,840	5,660	5,480	5,300	5,120	4,950	4,780	4,610
MEDIUM	8,550	8,280	8,010	7,740	7,470	7,200	6,930	6,675	6,420	6,165
POOR	11,670	11,290	10,910	10,530	10,150	9,770	9,390	9,035	8,680	8,325
V_{REF25}	149	146	143	139	136	133	129	125	121	118

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+60	+120	+190	+290
Wind	Per 1 kt headwind	-11	-22	-36	-60
	Per 1 kt tailwind	+34	+71	+121	+207
Slope	Per 1% downhill	+40	+160	+410	+1130
	Per 1% uphill	-40	-140	-330	-740
Approach Speed	Per 10 kt above table	+230	+390	+500	+590

STABILIZER INOP

RWY COND VREF	LANDING WEIGHT (1,000 POUNDS)									
	120,000	115,000	110,000	105,000	100,000	95,000	90,000	85,000	80,000	75,000
DRY	5,080	4,950	4,810	4,670	4,530	4,390	4,250	4,110	3,960	3,820
GOOD	6,540	6,310	6,080	5,860	5,640	5,420	5,200	4,990	4,780	4,580
MEDIUM	8,810	8,480	8,140	7,820	7,500	7,180	6,850	6,560	6,260	5,960
POOR	> 12,000	11,550	11,070	10,610	10,150	9,690	9,230	8,790	8,350	7,930
V_{REF}	164	161	158	155	152	149	145	142	138	135

NOTE: Threshold speeds and landing distances in this table are based on a 20 knot increase in VREF.

CORRECTIONS - FEET		DRY	GOOD	MEDIUM	POOR
Altitude	Per 1,000 feet	+122	+220	+272	+295
Wind	Per 1 kt headwind	-12	-24	-42	-68
	Per 1 kt tailwind	+40	+80	+136	+250
Slope	Per 1% downhill	+40	+140	+386	+1,246
	Per 1% uphill	-40	-128	-318	-800
Approach Speed	Per 10 kt above table	+280	+360	+500	+680

EMERGENCY LANDING DISTANCES FEET

NOTE: TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

FLAPS 40

NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).				
Weight (lb)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
120,000	3,800	5,100	6,300	9,000
115,000	3,700	5,000	6,100	8,700
110,000	3,700	4,800	5,900	8,400
105,000	3,700	4,700	5,700	8,200
100,000	3,600	4,500	5,500	7,900
95,000	3,500	4,300	5,300	7,700
90,000	3,400	4,200	5,100	7,500
85,000	3,300	4,100	5,000	7,200
80,000	3,200	3,900	4,700	7,000
75,000	3,200	3,700	4,500	6,800
70,000	3,100	3,700	4,400	6,700

BASIS: Zero wind and slope • 2 Engines at Max Reverse to 80 kts, Idle Reverse by 60 kts, and Idle Forward by 40 kts. • Touchdown Speed = VREF40 - 5 • Max Manual Braking

Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

THIS DATA DOES NOT INCLUDE 15% SAFETY MARGIN.

REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.



Shaded region corresponds to Max Landing Weight (MLW)

ALTITUDE ADJUSTMENT

ALTITUDE (FEET)	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
0	-100	-300	-300	-500
2,000	0	0	0	0
4,000	100	300	300	500
6,000	200	500	800	1,100
8,000	300	800	1,200	1,700

CORRECTIONS	DRY (6)	GOOD (5)	MEDIUM (3)	POOR (1)
PER 1 KT HEADWIND	0	0	-50	-50
PER 1 KT TAILWIND	50	100	150	250
PER 5 KTS ADD'L SPD	100	350	400	450
PER 1% UP SLOPE	-50	-150	-250	-600
PER 1% DOWN SLOPE	50	150	350	1,050
1 REVERSER INOP	0	300	500	900
2 REVERSERS INOP	0	500	1,200	2,400

OPERATION WITHOUT AIRSPEED INDICATION

Use the following body attitude and EPR Setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

CLIMB					
SPEED: 275 KIAS		THRUST: Max Thrust (Throttles to Overboost bar) FLAPS: UP			
PRESSURE ALTITUDE – FEET		GROSS WEIGHT – POUNDS			
		130,000	110,000	90,000	70,000
20,000	AIRSPEED - KIAS	275	275	275	275
	PITCH	5.3	5.4	5.7	6.6
15,000	AIRSPEED - KIAS	275	275	275	275
	PITCH	6.4	6.6	7.2	8.4
10,000	AIRSPEED - KIAS	275	275	275	275
	PITCH	9.2	9.4	10.2	11.9
5,000	AIRSPEED - KIAS	275	275	275	275
	PITCH	9.8	10.2	11.1	13.1

CRUISE					
SPEED: see below		THRUST: %N ₁ FOR LEVEL FLIGHT FLAPS: UP			
PRESSURE ALTITUDE – FEET		GROSS WEIGHT – POUNDS			
		130,000	110,000	90,000	70,000
35,000	PITCH		2.7	1.9	1.0
	% N ₁		84.20	80.30	77.40
	AIRSPEED - KIAS		253	253	253
30,000	PITCH	2.7	2.0	1.3	0.5
	% N ₁	84.60	81.30	78.80	77.00
	AIRSPEED - KIAS	275	275	275	275
20,000	PITCH	3.1	2.3	1.5	0.7
	% N ₁	76.60	73.70	71.30	69.40
	AIRSPEED - KIAS	275	275	275	275
10,000	PITCH	3.5	2.6	1.8	1.0
	% N ₁	67.80	65.10	62.80	61.00
	AIRSPEED - KIAS	275	275	275	275

OPERATION WITHOUT AIRSPEED INDICATION

Use the following body attitude and N₁ Setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

DESCENT					
SPEED: 250 KIAS			THRUST: IDLE FLAPS: UP		
PRESSURE ALTITUDE – FEET		GROSS WEIGHT – POUNDS			
		130,000	110,000	90,000	70,000
35,000	PITCH V/S (FPM)		0.1 -2,100	-0.7 -2,000	-1.8 -2,200
30,000	PITCH V/S (FPM)	1.0 -2,100	0.2 -2,000	-0.8 -2,000	-2.0 -2,200
20,000	PITCH V/S (FPM)	1.6 -1,800	0.6 -1,700	-0.5 -1,800	-1.8 -1,900
10,000	PITCH V/S (FPM)	1.6 -1,600	0.5 -1,600	-0.7 -1,700	-2.1 -1,900

ARRIVAL						
SPEED: AS REQ'D			THRUST: SEE BELOW FLAPS: AS REQ'D GEAR: UP			
PRESSURE ALTITUDE – FEET	FLAPS/ SLATS		GROSS WEIGHT – POUNDS			
			130,000	110,000	90,000	70,000
5,000	UP/RET	PITCH	4.8	4.9	4.9	5.0
		% N ₁	62.40	58.20	54.10	49.10
		KIAS	249	229	207	182
3,000	0/EXT	PITCH	9.7	9.7	9.7	9.7
		% N ₁	64.17	59.76	54.60	49.50
		KIAS	195	179	162	143
1,500	0/EXT	PITCH	9.7	9.7	9.7	9.7
		% N ₁	63.19	58.55	53.64	48.52
		KIAS	195	179	162	143
	13/EXT	PITCH	9.5	9.5	9.5	9.5
		% N ₁	65.56	61.22	56.04	50.43
		KIAS	173	159	144	127
	18/EXT	PITCH	8.9	8.9	8.9	8.9
		% N ₁	66.64	62.08	57.02	51.17
		KIAS	170	156	141	125
	25/EXT	PITCH	8.2	8.2	8.2	8.2
% N ₁		72.02	67.13	61.60	55.39	
KIAS		167	153	139	122	
40/EXT	PITCH	6.6	6.6	6.6	6.6	
	% N ₁	76.71	72.29	66.43	59.83	
	KIAS	163	150	136	120	

OPERATION WITHOUT AIRSPEED INDICATION

Use the following body attitude and N₁ Setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

APPROACH						
SPEED: APPROX V _{REF} + 15			THRUST: %N1 TO MAINTAIN GLIDE PATH FLAPS: AS REQ'D GEAR: DOWN			
PRESSURE ALTITUDE – FEET	FLAPS/ SLATS		GROSS WEIGHT – POUNDS			
			130,000	110,000	90,000	70,000
DESCENT	25/EXT	PITCH	4.7	4.5	4.2	3.8
		% N ₁	60.42	56.18	51.96	47.16
		KIAS	169	157	143	128
	40/EXT	PITCH	3.0	2.8	2.5	2.1
		% N ₁	67.04	62.67	58.06	52.37
		KIAS	166	154	140	126

GO AROUND						
SPEED: V _{REF40} + 15 (see below)			THRUST: %N1 FOR PITCH ATTITUDE FLAPS: AS REQ'D GEAR: UP ON POSITIVE CLIMB			
PRESSURE ALTITUDE – FEET	FLAPS/ SLATS		GROSS WEIGHT – POUNDS			
			130,000	110,000	90,000	70,000
SEA LEVEL	13/EXT	PITCH	20.1	22.6	26.1	31.5
		KIAS	166	154	140	126
	18/EXT	PITCH	18.9	21.4	24.9	30.2
		KIAS	166	154	140	126
5,000	13/EXT	PITCH	18.3	20.5	23.7	28.5
		KIAS	166	154	140	126
	18/EXT	PITCH	17.0	19.2	22.4	27.2
		KIAS	166	154	140	126

BRAKE COOLING PROCEDURES

LANDING

Maximum Permissible Quick Turn-Around Landing Weight (QTLW)

General

Information presented in this section is to enable determination of whether or not a quick turn-around is possible. The criteria being that the wheel thermal fuse plugs do not release tire pressure during or after takeoff.

If landing weight exceeds the weight determined from the chart entitled Maximum Quick Turn-Around Landing Weight, the full 50 minute (ramp time) waiting period and a visual inspection of tire inflation are required, unless the requirement discussed under Brake Temperature Monitoring System shown below is met.

Brake Temperature Monitoring System (BTMS)

If there is no artificial cooling, the following procedure may be used to eliminate the waiting period and inspection requirements when landing weight exceeds that shown on the chart entitled Maximum Quick Turn-Around Landing Weight.

If ten minutes after parking the temperature of the warmest brake, as measured by the BTMS, is less than 260°C and decreasing and the “BRAKE OVERHEAT” alert is not displayed on the EIS; no waiting period or inspection is required. The full 50 minute (ramp time) waiting period and a visual inspection of tire inflation are required if the warmest brake temperature exceeds 260°C or if the “BRAKE OVERHEAT” alert is or has been displayed since landing.

REJECTED TAKEOFF

If another takeoff is planned after a rejected takeoff (RTO) event, allow an additional 15 minutes for brake temperatures to peak after brake use. Then, reference the chart entitled Maximum Recommended Takeoff Brake Temperature to ensure all brake temperatures are below the temperatures provided.

If the temperature of the hottest brake is higher than the Recommended Maximum Takeoff Brake Temperature, then a waiting time is needed until the brake temperature drops below the Recommended Maximum Takeoff Brake Temperature to ensure that the brakes have adequate RTO capacity for the subsequent takeoff. Refer to the chart entitled Brake Cooling Time Chart.

BRAKE COOLING

MAXIMUM QUICK TURN-AROUND LANDING WEIGHT

1,000 POUNDS

FLAPS 40

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE - FEET					
°C	°F	0	1,000	2,000	4,000	6,000	8,000
50	122	96.0	94.3	92.6			
45	113	96.8	95.1	93.3	90.0		
40	104	97.6	95.8	94.1	90.7	87.3	
35	95	98.4	96.6	94.8	91.4	88.0	84.8
30	86	99.2	97.4	95.6	92.2	88.8	85.5
25	77	100.0	98.2	96.4	92.9	89.5	86.2
20	68	100.8	99.0	97.2	93.7	90.3	86.9
15	59	101.7	99.9	98.1	94.5	91.1	87.7
0	32	104.5	102.6	100.7	97.1	93.5	90.0
-20	-4	108.5	106.6	104.6	100.9	97.1	93.5
-54	-65	116.6	114.5	112.5	108.4	104.4	100.5

CORRECTIONS:

CONDITION		CORRECTION – POUNDS
Wind	per 1 kt. of headwind	+230
	per 1 kt. of tailwind	-1,110
Runway slope	per 0.1% uphill slope	+100
	per 0.1% downhill slope	-160

NOTE: If actual landing weight exceeds Maximum Quick Turn-Around Landing Weight above, accomplish item #1 or #2 below:

1. If actual landing weight exceeds Maximum Permissible Quick Turn-Around Landing Weight, adjusted for slope and wind, wait at least 50 minutes, visually inspect tire inflation and check that wheel thermal plugs have not melted before executing a takeoff.
2. If BTMS is operative but there is not artificial cooling, the following procedure may be used to eliminate the waiting period and inspection requirements when landing weight exceeds that shown on the chart above:
 - o If 10 minutes after parking the temperature of the warmest brake, as measured by the BTMS, is less than 260°C and decreasing and the “BRAKE OVERHEAT” alert is not displayed on the EIS; no waiting period or inspection is required.
 - o The full 50-minute (ramp time) waiting period and a visual inspection of tire inflation and wheel thermal plugs are required if the warmest brake temperature exceeds 260°C or if the “BRAKE OVERHEAT” alert is or has been displayed since landing.

BRAKE COOLING

BRAKE COOLING TIME CHART

RECOMMENDED BRAKE TEMP - °C	BRAKE COOLING TIME - HOURS:MINUTES										
	TEMPERATURE OF HOTTEST BRAKE - °C*										
	60	80	100	120	140	160	180	200	220	240	260
60	0:00	0:27	0:48	1:06	1:20	1:33	1:44	1:54	2:03	2:11	2:19
80		0:00	0:21	0:38	0:53	1:06	1:17	1:27	1:36	1:44	1:52
100			0:00	0:17	0:32	0:45	0:56	1:06	1:15	1:23	1:31
120				0:00	0:15	0:27	0:38	0:48	0:57	1:06	1:13
140					0:00	0:13	0:24	0:34	0:43	0:51	0:59
160						0:00	0:11	0:21	0:30	0:38	0:46
180							0:00	0:10	0:19	0:27	0:35
200								0:00	0:09	0:17	0:25
220									0:00	0:08	0:16
240										0:00	0:08
260											0:00

NOTES:

1. Refer to Page 7-24 for maximum recommended takeoff brake temperature.
2. Allow an additional 15 minutes for brake temperatures to peak following brake use.
3. If the BTMS is inoperative (MEL 32-47-01) and a high-speed rejected takeoff is conducted (i.e. at or above 80 knots), enter table above assuming temperature of hottest brake to be 260°C. In addition, request maintenance to perform a check of the tire pressures (accomplished by entering a maintenance log item requiring a tire pressure check).

BRAKE COOLING**MAXIMUM RECOMMENDED TAKEOFF BRAKE TEMPERATURE****°C****UP TO 2,200 FT MSL**

TAKEOFF WEIGHT LBS	TAKEOFF DECISION SPEED, V ₁ – KIAS						
	90	100	110	120	130	140	150
125,000	253	227	199	169	138	109	79
120,000	258	232	205	177	147	117	90
115,000	260	238	212	184	156	127	100
110,000	260	243	218	192	165	136	110
105,000	260	249	225	200	174	147	120
100,000	260	254	232	209	183	157	131
95,000	260	260	239	216	192	167	142
90,000	260	260	245	224	201	178	154
85,000	260	260	252	232	210	188	166
80,000	260	260	259	240	220	199	178

2,201 - 3,000 FT MSL

TAKEOFF WEIGHT LBS	TAKEOFF DECISION SPEED, V ₁ – KIAS						
	90	100	110	120	130	140	150
125,000	249	222	193	163	132	102	71
120,000	254	228	200	171	140	110	82
115,000	258	233	206	178	149	120	92
110,000	260	239	213	186	158	130	103
105,000	260	245	221	195	168	140	113
100,000	260	250	228	203	177	151	124
95,000	260	256	234	211	186	161	136
90,000	260	260	241	219	196	172	148
85,000	260	260	248	227	205	183	160
80,000	260	260	255	236	215	194	172

3,001 - 4,500 FT MSL

TAKEOFF WEIGHT LBS	TAKEOFF DECISION SPEED, V ₁ – KIAS						
	90	100	110	120	130	140	150
125,000	242	213	182	152	120	88	55
120,000	247	219	189	159	128	97	66
115,000	251	225	196	167	137	107	78
110,000	256	231	204	175	147	118	89
105,000	260	237	211	184	156	128	100
100,000	260	243	219	193	166	139	112
95,000	260	249	226	201	175	149	124
90,000	260	255	233	209	185	160	136
85,000	260	260	240	218	195	172	148
80,000	260	260	248	228	206	183	161

CORRECTIONS: valid for all above tables

CONDITION		CORRECTION – °C
Temperature	per 2° above 90 °F	-2
	per 2° below 90 °F	+1
Wind	per 1 kt. of headwind	+1
	per 1 kt. of tailwind	-4

BRAKE COOLING

MAXIMUM RECOMMENDED TAKEOFF BRAKE TEMPERATURE

°C

4,501 - 5,500 FT MSL

TAKEOFF WEIGHT LBS	TAKEOFF DECISION SPEED, V ₁ – KIAS						
	90	100	110	120	130	140	150
125,000	236	206	175	143	112	78	45
120,000	241	212	182	151	120	88	56
115,000	246	219	190	159	129	99	68
110,000	251	225	197	168	138	109	80
105,000	256	231	205	177	148	120	92
100,000	260	237	213	186	158	130	103
95,000	260	244	220	194	168	141	115
90,000	260	250	227	203	178	152	127
85,000	260	256	235	212	188	164	140
80,000	260	260	243	222	199	176	153

5,501 - 6,500 FT MSL

TAKEOFF WEIGHT LBS	TAKEOFF DECISION SPEED, V ₁ – KIAS						
	90	100	110	120	130	140	150
125,000	230	200	168	135	103	68	34
120,000	235	206	175	143	111	79	45
115,000	240	212	182	151	120	90	57
110,000	245	219	190	160	130	100	70
105,000	250	225	198	169	140	111	82
100,000	255	231	206	179	150	122	94
95,000	260	238	213	187	160	133	106
90,000	260	244	221	196	170	144	119
85,000	260	251	229	205	181	156	131
80,000	260	257	237	215	192	168	144

CORRECTIONS: valid for both tables

CONDITION		CORRECTION – °C
Temperature	per 2° above 90 °F	-2
	per 2° below 90 °F	+1
Wind	per 1 kt. of headwind	+1
	per 1 kt. of tailwind	-4

MEL SUPPORT**30-22-01B: INLET COWL ANTI-ICE REGULATOR / SHUTOFF VALVES
INOPERATIVE OPEN****TAKEOFF THRUST
EPR**

NORMAL BLEED - PACKS ON, INLET COWL A/I VALVE SECURED OPEN
WING A/I OFF

BR700-715C1-30

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE – FEET									
°F	°C	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
131	55	1.354	1.336	1.336	1.335	1.335	1.335	1.333	1.332	1.331	1.330
122	50	1.378	1.360	1.359	1.357	1.356	1.356	1.355	1.354	1.354	1.353
113	45	1.406	1.387	1.386	1.384	1.382	1.380	1.378	1.377	1.377	1.377
104	40	1.427	1.418	1.415	1.413	1.411	1.409	1.406	1.404	1.402	1.401
95	35	1.427	1.447	1.444	1.442	1.440	1.438	1.437	1.434	1.432	1.431
86	30	1.427	1.471	1.470	1.469	1.467	1.465	1.464	1.462	1.461	1.460
77	25	1.427	1.471	1.479	1.488	1.492	1.491	1.489	1.488	1.487	1.486
68	20	1.427	1.471	1.479	1.488	1.497	1.505	1.514	1.513	1.513	1.512
59	15	1.427	1.471	1.479	1.488	1.497	1.505	1.514	1.523	1.533	1.539
50	10	1.427	1.471	1.479	1.488	1.497	1.505	1.514	1.523	1.533	1.543
41	5	1.446	1.501	1.510	1.519	1.528	1.537	1.546	1.556	1.566	1.575
≤ 32	≤ 0	1.446	1.501	1.510	1.519	1.528	1.537	1.546	1.556	1.566	1.575

BLEED CORRECTIONS (EPR):

	AIRPORT PRESSURE ALTITUDE									
CONFIGURATION	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Packs OFF	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018
Wing Anti-Ice ON	-0.025	-0.027	-0.027	-0.027	-0.028	-0.029	-0.029	-0.030	-0.031	-0.032

MEL SUPPORT**30-22-01B: INLET COWL ANTI-ICE REGULATOR / SHUTOFF VALVES
INOPERATIVE OPEN****GO-AROUND
EPR**

NORMAL BLEED - PACKS ON, INLET COWL A/I VALVE SECURED OPEN
WING A/I OFF

BR700-715C1-30

AIRPORT OAT		TAT	AIRPORT PRESSURE ALTITUDE – FEET									
°F	°C	°C	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
134	57	60	1.341	1.335	1.333	1.330	1.326					
125	52	55	1.365	1.358	1.354	1.350	1.347	1.343				
116	47	50	1.391	1.384	1.380	1.375	1.371	1.365	1.360	1.356	1.355	1.354
108	42	45	1.421	1.414	1.410	1.405	1.400	1.394	1.388	1.381	1.379	1.378
99	37	40	1.425	1.447	1.441	1.437	1.431	1.425	1.419	1.412	1.409	1.405
90	32	35	1.425	1.474	1.470	1.466	1.460	1.455	1.449	1.443	1.440	1.436
81	27	30	1.425	1.484	1.490	1.490	1.486	1.481	1.475	1.470	1.467	1.464
72	22	25	1.425	1.484	1.490	1.495	1.501	1.506	1.500	1.495	1.493	1.490
63	17	20	1.425	1.484	1.490	1.495	1.501	1.506	1.511	1.516	1.519	1.517
54	12	15	1.425	1.484	1.490	1.495	1.501	1.506	1.511	1.516	1.524	1.532
45	7	10	1.422	1.481	1.487	1.494	1.500	1.507	1.515	1.523	1.531	1.539
36	2	5	1.422	1.481	1.487	1.494	1.500	1.507	1.515	1.523	1.531	1.539
27	-3	≤ 0	1.422	1.481	1.487	1.494	1.500	1.507	1.515	1.523	1.531	1.539

BLEED CORRECTIONS (EPR):

	AIRPORT PRESSURE ALTITUDE									
CONFIGURATION	-2,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Packs OFF	0.015	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018
A/C HIGH	-0.013	-0.013	-0.013	-0.014	-0.014	-0.014	-0.015	-0.015	-0.015	-0.016
Wing Anti-Ice ON	-0.025	-0.027	-0.027	-0.027	-0.028	-0.029	-0.029	-0.030	-0.031	-0.032

MEL SUPPORT**30-22-01B: INLET COWL ANTI-ICE REGULATOR / SHUTOFF VALVES
INOPERATIVE OPEN****MAXIMUM CONTINUOUS
EPR**

NORMAL BLEED - PACKS ON, INLET COWL A/I VALVE SECURED OPEN
WING A/I ON FOR ALL TEMPERATURES BELOW 10°C

BR700-715C1-30

PRESS ALT - FEET	KIAS	MACH	TAT - °C									
			-35	-30	-20	-10	0	10	20	30	40	45
25,000	160	0.39	1.528	1.528	1.528	1.489	1.404	1.326				
	200	0.49	1.509	1.509	1.509	1.491	1.407	1.326				
	240	0.58	1.478	1.478	1.478	1.478	1.410	1.328	1.285			
	280	0.67	1.432	1.432	1.432	1.432	1.414	1.331	1.286			
	320	0.76	1.380	1.380	1.380	1.380	1.380	1.334	1.290			
24,000	160	0.38	1.529	1.529	1.529	1.501	1.424	1.343				
	200	0.48	1.508	1.508	1.508	1.501	1.427	1.344	1.309			
	240	0.57	1.479	1.479	1.479	1.479	1.429	1.347	1.303			
	280	0.66	1.439	1.439	1.439	1.439	1.433	1.351	1.306			
	320	0.75	1.392	1.392	1.392	1.392	1.392	1.355	1.311			
22,000	160	0.37		1.529	1.529	1.520	1.456	1.377				
	200	0.46		1.511	1.511	1.511	1.459	1.380	1.341			
	240	0.55		1.485	1.485	1.485	1.461	1.383	1.341			
	280	0.63		1.452	1.452	1.452	1.452	1.388	1.344			
	320	0.72		1.410	1.410	1.410	1.410	1.392	1.349			
20,000	160	0.35		1.529	1.529	1.529	1.486	1.406	1.372			
	200	0.44		1.516	1.516	1.516	1.491	1.412	1.373			
	240	0.53		1.497	1.497	1.497	1.495	1.418	1.378			
	280	0.61		1.469	1.469	1.469	1.469	1.423	1.382			
	320	0.69		1.425	1.425	1.425	1.425	1.425	1.386			
18,000	160	0.34			1.521	1.521	1.495	1.420	1.379			
	200	0.42			1.506	1.506	1.498	1.425	1.383			
	240	0.51			1.485	1.485	1.485	1.429	1.388	1.317		
	280	0.59			1.454	1.454	1.454	1.433	1.391	1.318		
	320	0.67			1.413	1.413	1.413	1.413	1.392	1.319		
16,000	160	0.33			1.513	1.513	1.506	1.431	1.389			
	200	0.41			1.498	1.498	1.498	1.436	1.393	1.326		
	240	0.49			1.473	1.473	1.473	1.439	1.396	1.324		
	280	0.57			1.439	1.439	1.439	1.439	1.398	1.326		
	320	0.64			1.400	1.400	1.400	1.400	1.399	1.326		

MEL SUPPORT**30-22-01B: INLET COWL ANTI-ICE REGULATOR / SHUTOFF VALVES
INOPERATIVE OPEN****MAXIMUM CONTINUOUS
EPR**

NORMAL BLEED - PACKS ON, INLET COWL A/I VALVE SECURED OPEN
WING A/I ON FOR ALL TEMPERATURES BELOW 10°C

BR700-715C1-30

PRESS ALT - FEET	KIAS	MACH	TAT - °C									
			-35	-30	-20	-10	0	10	20	30	40	45
14,000	160	0.31			1.496	1.496	1.496	1.442	1.398	1.333		
	200	0.39			1.479	1.479	1.479	1.445	1.399	1.331		
	240	0.47			1.453	1.453	1.453	1.446	1.400	1.330		
	280	0.54			1.422	1.422	1.422	1.422	1.402	1.331		
	320	0.62			1.385	1.385	1.385	1.385	1.403	1.331		
12,000	160	0.30				1.478	1.478	1.449	1.405	1.338		
	200	0.38				1.456	1.456	1.449	1.404	1.335		
	240	0.45				1.430	1.430	1.430	1.404	1.333	1.272	
	280	0.52				1.401	1.401	1.401	1.404	1.332	1.268	
	320	0.60				1.368	1.368	1.368	1.399	1.331	1.266	
10,000	160	0.29				1.459	1.459	1.459	1.409	1.342	1.288	
	200	0.36				1.435	1.435	1.435	1.407	1.339	1.281	
	240	0.43				1.408	1.408	1.408	1.405	1.336	1.274	
	280	0.51				1.380	1.380	1.380	1.404	1.334	1.269	
	320	0.58				1.348	1.348	1.348	1.377	1.332	1.265	
5,000	160	0.26				1.409	1.409	1.409	1.424	1.357	1.299	1.274
	200	0.33				1.391	1.391	1.391	1.412	1.354	1.294	1.267
	240	0.40				1.370	1.370	1.370	1.391	1.351	1.289	1.262
	280	0.46				1.343	1.343	1.343	1.365	1.346	1.282	1.255
	320	0.53				1.314	1.314	1.314	1.336	1.336	1.277	1.248
0	160	0.24				1.362	1.362	1.362	1.385	1.376	1.318	1.292
	200	0.30				1.346	1.346	1.346	1.370	1.370	1.313	1.287
	240	0.36				1.327	1.327	1.327	1.350	1.350	1.308	1.281
	280	0.42				1.306	1.306	1.306	1.329	1.329	1.303	1.276
	320	0.48				1.281	1.281	1.281	1.305	1.305	1.299	1.270

MEL SUPPORT

30-22-01B: INLET COWL ANTI-ICE REGULATOR / SHUTOFF VALVES INOPERATIVE OPEN

TAKEOFF V-SPEED CALCULATION EQUIVALENT WEIGHTS

Enter the following table using *actual* takeoff weight to find an *equivalent* takeoff weight for takeoff v-speed calculation. Then, use the *equivalent* weight with the “Dry Runway Takeoff Speeds” tables in the ODM – Takeoff section.

Actual Takeoff Weight (lb)	Equivalent Takeoff Weight for V-Speed Tables (lb)	
	OAT below 50°F	OAT at or above 50°F
125,000		
120,000		
115,000	122,245	
110,000	116,930	
105,000	111,615	
100,000	106,300	121,100
95,000	100,985	115,045
90,000	95,670	108,990
85,000	90,355	102,935
80,000	85,040	96,880
75,000	79,725	90,825
70,000	74,410	84,770



Above Takeoff Limit Weight

MEL SUPPORT

36-11-01: FAN AIR VALVE INOPERATIVE
36-13-03: PNEUMATIC SYSTEM CONTROLLER (PSC) CHANNELS
36-13-07: MANIFOLD TEMPERATURE SENSOR (TM)

TAKEOFF V-SPEED CALCULATION EQUIVALENT WEIGHTS

Enter the following table using *actual* takeoff weight to find an *equivalent* takeoff weight for takeoff v-speed calculation. Then, use the *equivalent* weight with the “Dry Runway Takeoff Speeds” tables in the ODM – Takeoff section.

Actual Takeoff Weight (lb)	Equivalent Takeoff Weight for V-Speed Tables (lb)
125,000	
120,000	125,760
115,000	120,520
110,000	115,280
105,000	110,040
100,000	104,800
95,000	99,560
90,000	94,320
85,000	89,080
80,000	83,840
75,000	78,600
70,000	73,360



Above Takeoff Limit Weight

MEL SUPPORT**73-21-02: EEC NORMAL (EPR) MODE INOPERATIVE****TAKEOFF THRUST****%N₁**

NORMAL BLEED - PACKS ON, ANTI-ICE OFF

BR700-715C1-30

AIRPORT OAT		AIRPORT PRESSURE ALTITUDE – FEET									
°F	°C	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
122	50	91.0	90.9	90.9	90.8	90.9	-	-	-	-	-
118	48	91.2	91.2	91.1	91.1	91.0	-	-	-	-	-
115	46	91.5	91.4	91.4	91.3	91.2	91.2	91.2	-	-	-
111	44	91.8	91.7	91.6	91.6	91.5	91.4	91.3	-	-	-
108	42	92.1	92.0	91.9	91.9	91.8	91.7	91.6	-	-	-
104	40	92.4	92.3	92.2	92.1	92.1	92.0	91.9	-	-	-
100	38	92.6	92.6	92.5	92.4	92.4	92.3	92.2	-	-	-
97	36	92.9	92.9	92.8	92.7	92.6	92.5	92.5	92.3	92.3	92.3
93	34	92.6	93.1	93.0	92.9	92.8	92.8	92.7	92.5	92.5	92.5
90	32	92.4	93.2	93.2	93.1	93.0	93.0	92.9	92.8	92.8	92.8
86	30	92.1	93.4	93.3	93.3	93.2	93.2	93.1	93.0	93.0	93.0
82	28	91.8	93.1	93.5	93.5	93.5	93.4	93.3	93.2	93.2	93.2
79	26	91.5	92.8	93.2	93.7	93.7	93.6	93.6	93.4	93.4	93.4
75	24	91.2	92.5	92.9	93.4	93.8	93.8	93.8	93.6	93.6	93.6
72	22	90.9	92.2	92.6	93.1	93.5	93.8	94.0	93.8	93.8	93.8
68	20	90.6	91.9	92.3	92.8	93.2	93.7	94.1	94.0	94.0	94.0
64	18	90.3	91.6	92.0	92.5	92.9	93.4	93.8	94.0	94.0	94.0
61	16	90.0	91.3	91.7	92.2	92.6	93.1	93.5	94.0	94.0	94.0
57	14	89.7	91.0	91.4	91.9	92.3	92.8	93.2	93.9	93.9	93.9
54	12	89.4	90.7	91.1	91.6	92.0	92.5	92.9	93.9	93.9	93.9
50	10	89.1	90.4	90.8	91.3	91.7	92.2	92.6	93.8	93.8	93.8
32	0	87.6	88.8	89.3	89.7	90.2	90.6	91.1	92.2	92.2	92.2
14	-10	86.1	87.3	87.7	88.1	88.6	89.0	89.5	90.6	90.6	90.6
-4	-20	84.5	85.7	86.1	86.5	87.0	87.4	87.8	89.0	89.0	89.0
-22	-30	82.9	84.0	84.5	84.9	85.3	85.7	86.2	87.3	87.3	87.3
-40	-40	81.2	82.4	82.8	83.2	83.6	84.0	84.4	85.6	85.6	85.6
-58	-50	79.5	80.6	81.0	81.4	81.9	82.3	82.7	83.8	83.8	83.8
-67	-55	78.6	79.8	80.2	80.6	81.0	81.4	81.8	82.9	82.9	82.9

CORRECTIONS:

CONFIGURATION	N ₁ CORRECTION – PCT.
Packs OFF	+0.8
Engine Anti-Ice ON	0.0*
Wing Anti-Ice ON	-1.4

*For altitudes at or above 7,500 feet with temperatures between 4°C and 10°C, bleed correction for Engine Anti-Ice ON is -1.5% N₁.

MEL SUPPORT**73-21-02: EEC NORMAL (EPR) MODE INOPERATIVE****GO-AROUND****%N₁**

NORMAL BLEED - PACKS ON, ANTI-ICE OFF

BR700-715C1-30

STATIC AIR TEMP		PRESSURE ALTITUDE – FEET									
°F	°C	-1,000	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
122	50	91.2	91.2	91.1	91.1	91.1	-	-	-	-	-
118	48	91.5	91.4	91.4	91.3	91.3	-	-	-	-	-
115	46	91.8	91.7	91.6	91.6	91.6	91.5	91.5	-	-	-
111	44	92.1	92.0	91.9	91.8	91.8	91.7	91.6	-	-	-
108	42	92.4	92.3	92.2	92.1	92.1	92.0	91.9	-	-	-
104	40	92.7	92.7	92.5	92.4	92.3	92.2	92.2	-	-	-
100	38	93.0	92.9	92.8	92.7	92.6	92.5	92.4	-	-	-
97	36	93.2	93.2	93.1	93.0	92.9	92.7	92.6	92.5	92.5	92.5
93	34	93.0	93.5	93.4	93.3	93.2	93.1	92.9	92.8	92.8	92.8
90	32	92.7	93.6	93.6	93.5	93.4	93.3	93.2	93.1	93.1	93.1
86	30	92.4	93.8	93.8	93.7	93.7	93.6	93.6	93.4	93.4	93.4
82	28	92.1	93.5	93.9	93.9	93.9	93.8	93.7	93.6	93.6	93.6
79	26	91.8	93.2	93.6	94.0	94.0	94.0	93.9	93.8	93.8	93.8
75	24	91.5	92.9	93.3	93.7	94.2	94.1	94.1	94.0	94.0	94.0
72	22	91.3	92.6	93.0	93.4	93.9	94.1	94.3	94.2	94.2	94.2
68	20	91.0	92.3	92.7	93.1	93.6	94.0	94.4	94.3	94.3	94.3
64	18	90.7	92.0	92.4	92.8	93.3	93.7	94.1	94.3	94.3	94.3
61	16	90.4	91.7	92.1	92.5	93.0	93.4	93.8	94.2	94.2	94.2
57	14	90.1	91.4	91.8	92.2	92.7	93.1	93.5	94.1	94.1	94.1
54	12	89.8	91.1	91.5	91.9	92.3	92.8	93.2	94.1	94.1	94.1
50	10	89.5	90.8	91.2	91.6	92.0	92.5	92.9	94.0	94.0	94.0
32	0	87.9	89.3	89.7	90.1	90.5	90.9	91.3	92.4	92.4	92.4
14	-10	86.4	87.7	88.1	88.5	88.9	89.3	89.7	90.8	90.8	90.8
-4	-20	84.8	86.1	86.5	86.9	87.3	87.7	88.1	89.1	89.1	89.1
-22	-30	83.1	84.5	84.8	85.2	85.6	86.0	86.4	87.4	87.4	87.4
-40	-40	81.5	82.8	83.1	83.5	83.9	84.3	84.7	85.7	85.7	85.7
-58	-50	79.8	81.0	81.4	81.7	82.1	82.5	82.9	83.9	83.9	83.9
-67	-55	78.9	80.1	80.5	80.9	81.2	81.6	82.0	83.0	83.0	83.0

CORRECTIONS:

CONFIGURATION	N ₁ CORRECTION – PCT.
Packs OFF	+0.7
Packs ON, High Flow	-1.3
Engine Anti-Ice ON	-1.0
Wing Anti-Ice ON	-1.3

MEL SUPPORT**73-21-02: EEC NORMAL (EPR) MODE INOPERATIVE****MAXIMUM CONTINUOUS
%N₁**

ENGINE BLEEDS FOR HIGH FLOW FROM THE OPERATIVE A/C PACK

BR700-715C1-30

PRESS ALT - FEET	KIAS	MACH	AMBIENT TEMPERATURE - °C												
			-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50
25,000	160	0.39	83.4	85.3	87.1	88.9	90.7	91.1	89.1	87.5					
	200	0.49	83.2	85.0	86.9	88.7	90.5	90.8	88.9	87.3					
	240	0.58	82.6	84.4	86.3	88.1	89.9	90.2	88.3	86.7					
	280	0.67	82.0	83.8	85.7	87.5	89.3	89.6	87.7	86.1					
	320	0.76	81.5	83.3	85.2	87.0	88.7	89.1	87.2	85.6					
24,000	160	0.38	83.8	85.2	87.1	88.9	90.7	91.7	89.9	88.2					
	200	0.48	83.6	85.0	86.9	88.7	90.5	91.5	89.7	88.0					
	240	0.57	83.1	84.5	86.4	88.2	90.0	90.9	89.2	87.5					
	280	0.66	82.5	83.9	85.8	87.6	89.4	90.4	88.6	86.9					
	320	0.75	82.0	83.4	85.3	87.1	88.9	89.8	88.1	86.4					
22,000	160	0.37	84.5	85.2	87.1	88.9	90.7	92.4	91.4	89.6					
	200	0.46	84.4	85.1	87.0	88.8	90.6	92.3	91.4	89.5					
	240	0.55	84.0	84.7	86.6	88.4	90.1	91.9	90.9	89.1					
	280	0.63	83.5	84.1	86.0	87.8	89.6	91.3	90.4	88.6					
	320	0.72	82.9	83.6	85.5	87.3	89.1	90.8	89.9	88.1					
20,000	160	0.35		85.2	87.0	88.9	90.6	92.4	92.9	91.1	89.4				
	200	0.44		85.1	87.0	88.8	90.6	92.4	92.8	91.1	89.4				
	240	0.53		84.8	86.7	88.5	90.3	92.1	92.5	90.8	89.1				
	280	0.61		84.3	86.2	88.0	89.8	91.5	92.0	90.2	88.6				
	320	0.69		83.8	85.7	87.5	89.3	91.0	91.5	89.7	88.1				
18,000	160	0.34		84.3	86.1	87.9	89.7	91.4	92.9	91.4	89.6				
	200	0.42		84.3	86.1	88.0	89.7	91.4	92.9	91.4	89.6				
	240	0.51		84.1	85.9	87.7	89.5	91.2	92.7	91.2	89.4				
	280	0.59		83.5	85.4	87.2	89.0	90.7	92.2	90.6	88.9				
	320	0.67		83.0	84.9	86.7	88.5	90.2	91.7	90.1	88.4				
16,000	160	0.33		83.4	85.3	87.1	88.8	90.5	92.2	91.7	89.9	88.5			
	200	0.41		83.4	85.3	87.1	88.8	90.6	92.2	91.7	89.9	88.5			
	240	0.49		83.2	85.1	86.9	88.7	90.4	92.0	91.5	89.7	88.4			
	280	0.57		82.8	84.6	86.5	88.2	89.9	91.6	91.0	89.2	87.9			
	320	0.64		82.2	84.1	85.9	87.7	89.4	91.1	90.5	88.7	87.4			

CORRECTIONS:

CONFIGURATION	N ₁ CORRECTION – PCT.	
	0 – 15,000 FT.	15,001 – 25,000 FT.
Packs OFF	+1.4	+1.9
Engine Anti-Ice ON	-1.0	-1.6
Engine & Wing Anti-Ice ON	-1.3	-1.8

MEL SUPPORT**73-21-02: EEC NORMAL (EPR) MODE INOPERATIVE****MAXIMUM CONTINUOUS
%N₁**

ENGINE BLEEDS FOR HIGH FLOW FROM THE OPERATIVE A/C PACK

BR700-715C1-30

PRESS ALT - FEET	KIAS	MACH	AMBIENT TEMPERATURE - °C												
			-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50
14,000	160	0.31		82.6	84.4	86.2	88.0	89.7	91.3	92.1	90.2	88.6			
	200	0.39		82.5	84.4	86.2	87.9	89.6	91.3	92.0	90.2	88.6			
	240	0.47		82.3	84.2	86.0	87.7	89.4	91.1	91.8	90.0	88.4			
	280	0.54		82.0	83.8	85.6	87.4	89.1	90.7	91.5	89.6	88.0			
	320	0.62		81.5	83.3	85.1	86.9	88.6	90.2	90.9	89.1	87.5			
12,000	160	0.30		82.0	83.6	85.4	87.2	88.8	90.5	92.1	90.7	89.1			
	200	0.38		81.9	83.5	85.3	87.1	88.8	90.4	92.0	90.6	89.1			
	240	0.45		81.7	83.3	85.1	86.8	88.5	90.2	91.8	90.4	88.8			
	280	0.52		81.3	82.9	84.7	86.5	88.2	89.8	91.4	90.0	88.5			
	320	0.60		80.9	82.5	84.3	86.0	87.7	89.4	91.0	89.6	88.0			
10,000	160	0.29		81.0	82.8	84.6	86.3	88.0	89.7	91.3	91.2	89.6	88.2		
	200	0.36		80.9	82.7	84.5	86.2	87.9	89.5	91.1	91.0	89.5	88.1		
	240	0.43		80.6	82.4	84.2	85.9	87.6	89.3	90.9	90.8	89.2	87.8		
	280	0.51		80.2	82.0	83.8	85.5	87.2	88.9	90.5	90.4	88.8	87.4		
	320	0.58		79.8	81.6	83.4	85.2	86.8	88.5	90.1	90.0	88.4	87.0		
5,000	160	0.26			80.1	81.8	83.5	85.2	86.8	88.4	89.9	89.9	89.2	87.8	
	200	0.33			80.0	81.7	83.4	85.1	86.7	88.3	89.8	89.8	89.1	87.7	
	240	0.40			79.8	81.5	83.2	84.9	86.5	88.0	89.6	89.6	88.9	87.4	
	280	0.46			79.4	81.2	82.9	84.5	86.1	87.7	89.3	89.3	88.6	87.1	
	320	0.53			79.0	80.8	82.5	84.1	85.7	87.3	88.9	88.9	88.1	86.7	
0	160	0.24			77.4	79.1	80.7	82.4	84.0	85.5	87.0	88.5	88.5	87.0	85.2
	200	0.30			77.4	79.0	80.7	82.4	84.0	85.5	87.0	88.5	88.5	87.0	85.1
	240	0.36			77.1	78.8	80.5	82.2	83.7	85.3	86.8	88.3	88.3	86.7	84.9
	280	0.42			76.8	78.5	80.2	81.8	83.4	84.9	86.5	87.9	87.9	86.4	84.6
	320	0.48			76.3	78.0	79.7	81.3	82.9	84.4	86.0	87.4	87.4	85.9	84.1

CORRECTIONS:

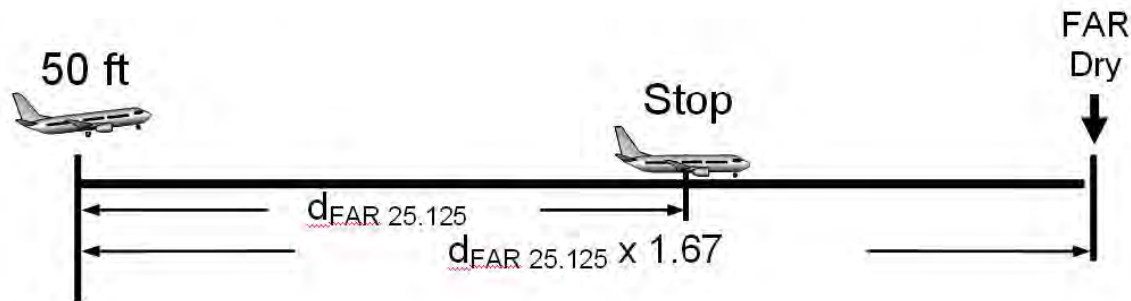
CONFIGURATION	N ₁ CORRECTION – PCT.	
	0 – 15,000 FT.	15,001 – 25,000 FT.
Packs OFF	+1.4	+1.9
Engine Anti-Ice ON	-1.0	-1.6
Engine & Wing Anti-Ice ON	-1.3	-1.8

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED)

DEFINITION

All given distances in this section are FAR (Factored) Landing Distances. These distances represent the actual (or demonstrated) landing distances – designated as d_{FAR} in the diagram below – multiplied by a factor of 1.67.



FAR Landing Distance Diagram

This is in accordance with FAR 121.195, requiring the aircraft to be able to come to a complete stop within 60% of the effective length of the runway.

APPLICABILITY

The tables on the following pages provide landing distances and approach speeds to be used for dispatch with the given conditions and the associated MEL applied. For landing distances in the event of an in-flight system failure or abnormality not detected at or prior to dispatch, please refer to the “Abnormal Configuration Actual Landing Distances and Approach Speeds” pages in this section of the ODM.

ASSUMPTIONS

The data within this section was generated based on a set of assumed conditions:

- Standard day conditions
- No wind
- No slope
- No reverse thrust credit factored in FAR Landing Distances
- Maximum manual braking
- Includes distance from 50 feet above threshold to stop (1,000 feet of air distance)

MEL SUPPORT

FAR LANDING DISTANCES (FACTORED) FEET

FLAPS 40

ANTI-SKID INOP – DRY RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
125,000	9,670	9,920	10,180	10,450	10,720	11,000	11,300	11,600	11,920
120,000	9,340	9,580	9,820	10,080	10,350	10,620	10,900	11,190	11,500
115,000	9,010	9,230	9,470	9,710	9,970	10,230	10,510	10,790	11,080
110,000	8,670	8,890	9,120	9,350	9,590	9,840	10,100	10,380	10,670
105,000	8,340	8,550	8,770	8,990	9,220	9,460	9,710	9,970	10,240
100,000	8,010	8,210	8,420	8,630	8,850	9,080	9,320	9,560	9,810
95,000	7,670	7,860	8,060	8,260	8,480	8,700	8,920	9,150	9,390
90,000	7,330	7,510	7,700	7,890	8,100	8,300	8,520	8,750	8,980
85,000	6,990	7,160	7,340	7,530	7,720	7,910	8,120	8,330	8,550
80,000	6,660	6,820	6,980	7,150	7,340	7,530	7,720	7,920	8,120
75,000	6,320	6,470	6,630	6,790	6,950	7,130	7,310	7,500	7,700
72,000 and below	6,110	6,260	6,420	6,570	6,730	6,890	7,060	7,250	7,440

ANTI-SKID INOP - WET RUNWAY

NOTE: Operation with Anti-Skid System Inoperative restricted to Dry Runways only.

CORRECTIONS:

Headwind per kt	-30
Tailwind per kt	+160

MEL SUPPORT **FAR LANDING DISTANCES (FACTORED)** **FEET**

FLAPS 40

TWO SYMMETRIC SPOILER PANELS INOPERATIVE – DRY RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
125,000	6,770	6,930	7,100	7,270	7,460	7,650	7,850	8,050	8,260
120,000	6,550	6,710	6,870	7,030	7,210	7,400	7,590	7,780	7,980
115,000	6,330	6,480	6,640	6,800	6,970	7,140	7,330	7,520	7,710
110,000	6,110	6,260	6,410	6,560	6,720	6,890	7,060	7,250	7,440
105,000	5,890	6,030	6,180	6,330	6,480	6,640	6,810	6,980	7,160
100,000	5,680	5,810	5,950	6,090	6,240	6,390	6,550	6,710	6,880
95,000	5,460	5,580	5,710	5,850	5,990	6,130	6,280	6,440	6,610
90,000	5,240	5,360	5,480	5,610	5,740	5,880	6,020	6,170	6,330
85,000	5,030	5,140	5,260	5,380	5,500	5,630	5,760	5,900	6,050
80,000 and below	4,810	4,920	5,030	5,140	5,260	5,380	5,510	5,640	5,780

TWO SYMMETRIC SPOILER PANELS INOPERATIVE – WET RUNWAY

AIRCRAFT WEIGHT LBS	AIRPORT PRESSURE ALTITUDE - FEET								
	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
125,000	7,780	7,970	8,160	8,360	8,580	8,800	9,020	9,260	9,500
120,000	7,530	7,710	7,900	8,090	8,290	8,500	8,720	8,950	9,180
115,000	7,280	7,460	7,630	7,820	8,010	8,210	8,420	8,640	8,870
110,000	7,020	7,190	7,370	7,550	7,730	7,920	8,120	8,330	8,550
105,000	6,770	6,930	7,100	7,280	7,450	7,640	7,830	8,020	8,230
100,000	6,530	6,680	6,840	7,000	7,170	7,350	7,530	7,720	7,910
95,000	6,280	6,420	6,570	6,730	6,890	7,050	7,230	7,410	7,600
90,000	6,030	6,160	6,310	6,450	6,610	6,760	6,920	7,100	7,280
85,000	5,780	5,910	6,040	6,180	6,320	6,470	6,630	6,790	6,960
80,000 and below	5,530	5,660	5,780	5,910	6,050	6,190	6,330	6,490	6,640

CORRECTIONS:

Headwind per kt	-20
Tailwind per kt	+130

End of Section

FERRY FLIGHT PLANNING AND OPERATION

AUTHORIZATION AND FLIGHT PLANNING	8-2
ANTI-SKID INOPERATIVE	8-3
LANDING GEAR EXTENDED	8-4

AUTHORIZATION AND FLIGHT PLANNING

Authorization, procedures, and applicability of data for ferry operations is described in the Flight Operations Manual (Chapters 9 and 35) and the Technical Operations Policies and Procedures Manual (TOPP 40-60-05). Procedures outlined in these manuals must be strictly adhered to.

Ferry operational data is available for the following configuration:

- Anti-Skid Inoperative
- Landing Gear Extended

The following method should be used for ferry flight planning and certain revenue flight planning (as noted) and operations:

1. Obtain a normal aircraft configuration (computerized or manual) unfiled flight plan using Long Range Cruise (LRC) at the proposed cruise altitude. (The following FERRY page contains recommended cruise altitude under the FLIGHT PLANNING heading.)
2. Calculate the trip time and fuel load using the provided data under the FLIGHT PLANNING heading. Enter this data either in the Dispatcher Remarks section of the Computerized Flight Plan or on the Standby Flight Plan form (NS80172).
3. Add remarks containing the ferry speed, speed limit, altitude limit, total time, leg times if appropriate, and engine-out altitude capability.
Note: Suggested cruise altitudes are for reference, and reasonable adjustments may be made to accommodate ATC and direction of flight.
4. Assure adequate terrain clearance by referring to the Engine Out Altitude Limit table, if available. (See FERRY, ENROUTE heading)
5. Adjust the Runway Allowable and Climb Limit Takeoff Weights, and the Landing Climb Limit Weight as follows:
Subtract the weight decrements indicated under headings for TAKEOFF and LANDING from the NORMAL Thrust takeoff weight and the Landing Climb weight, respectively, obtained from the ALM (Airport Sections).

The following limitations should be applied to all ferry flights:

1. All ferry flight takeoffs will be made using full (NORMAL) thrust (TO) and climb out will be made using Maximum Climb thrust (CL) unless otherwise specified on ferry configuration data page.
2. Observe additional limitations and restrictions as listed for each ferry configuration on the following data pages.

ANTI-SKID INOPERATIVE

Use the following conditions and factors for anti-skid inoperative ferry operations:

LIMITATIONS:

- Both thrust reversers must be operative.

Maximum Cruise Altitude:	Normal
Maximum Speed:	Normal
C. G. Limitations:	No additional restrictions
En Route Weather Restrictions:	No additional restrictions

FLIGHT PLANNING

Flight Plan as Normal.

TAKEOFF

RATOW & Takeoff climb limit weight:	Use ASI TPI in AWABS
Takeoff V Speeds:	Use ASI TPI in AWABS
Takeoff Thrust Settings:	Flex thrust <u>NOT</u> approved, but Derate Thrust (TO1, TO2) may be used.
Takeoff Flap Settings:	5, 13, or 18 degrees only.
Operation from Contaminated Runway:	<u>NOT</u> permitted. Operation allowed only on DRY runways.

NOTE: If performance data is not available in AWABS, contact Performance Engineering.

NOTE: Rejected takeoff performance data with anti-skid inoperative is based on the following: engine thrust to idle and immediate application of all available reverse thrust while verifying extension of ground spoilers. Manual braking technique (i.e. gradually increasing brake pedal force until a moderate deceleration is felt) will be used.

ENROUTE

Standard Flight Planning Data and Procedures.

LANDING

Landing Speed restrictions:	No additional restrictions
Flap Setting Restrictions:	No additional restrictions
Approach & Landing climb limit weights:	No adjustment necessary
Landing Distances:	Refer to ODM, Abnormal section.
Landing Procedure:	Follow normal landing procedures, except that the manual braking procedure is to be used in lieu of normal anti-skid braking. Upon initiation of brakes, gradually increase brake pedal force until a moderate deceleration is felt.

HOLDING

Standard FMS speeds and thrusts.

LANDING GEAR EXTENDED

Use the following conditions and factors for gear down ferry operations:

LIMITATIONS:

Maximum Speed:	250 KIAS
C. G. Limitations:	No additional restrictions
En Route Weather Restrictions:	Dispatch into known icing prohibited.

FLIGHT PLANNING

Trip Fuel and Time:

Use gear down FPS data, if available. Otherwise, use the following factors multiplied by the basic flight plan values:

Range (Nautical Miles)	Cruise Altitude (Feet)	Time Factor	Fuel Factor – MLG Doors Closed	Fuel Factor – MLG Doors Open or Removed
200	24,000	1.13	1.55	1.67
400	24,000	1.15	1.55	1.67
600	24,000	1.17	1.51	1.63
800	24,000	1.18	1.48	1.60
1,000	24,000	1.19	1.48	1.60

Long Range Cruise Altitude Capability (feet):

WEIGHT (1,000 LB)	Gear Down, MLG Doors Closed			Gear Down, MLG Doors Open or Removed		
	ISA + 10°C	ISA + 15°C	ISA + 20°C	ISA + 10°C	ISA + 15°C	ISA + 20°C
120	22,000	20,200	17,200	20,200	17,500	13,100
110	24,100	24,000	21,600	23,800	21,600	18,800
100	26,300	26,300	25,500	26,300	25,500	23,300
90	28,600	28,600	28,600	28,600	28,600	27,300
80	31,200	31,200	31,200	31,200	31,200	31,100
70	34,100	34,100	34,100	34,100	34,100	34,100
60	37,000	37,000	37,000	37,000	37,000	37,000

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

TAKEOFF

RATOW & Takeoff climb limit weight:	Use GRD TPI in AWABS
Takeoff V Speeds:	Use GRD TPI in AWABS
Takeoff Thrust Settings:	Flex or Derate thrust <u>NOT</u> approved.
Takeoff Flap Settings:	5 or 13 degrees only.
Operation from Contaminated Runway:	Permitted

NOTE: If performance data is not available in AWABS, contact Performance Engineering.

ENROUTE

NOTE: Because the FMS does not incorporate a gear down position input, the PROF mode should not be used during gear down ferry operations. There is no accountability for gear drag and no provisions for the FMS to generate climb, cruise, and descent speed schedules and fuel burn predictions appropriate for gear down flight.

Recommended Climb Speed Schedule:	220 KIAS / 0.55M
Recommended Descent Speed Schedule:	0.54M / 215 KIAS

LANDING GEAR EXTENDED (cont.)

ENROUTE (cont.)

Long Range Cruise Table

PRESS ALT (1,000 FT) (STD TAT)		WEIGHT (1,000 LB)							
		130	120	110	100	90	80	70	60
31 (-34)	EPR						1.44	1.35	1.28
	KIAS						198	186	174
	MACH						0.548	0.517	0.484
	FF/ENG (LB)						2,224	1,867	1,555
	KTAS						322	303	284
28 (-29)	EPR					1.43	1.35	1.29	1.23
	KIAS					210	199	188	175
	MACH					0.544	0.516	0.488	0.456
	FF/ENG (LB)					2,518	2,161	1,845	1,566
	KTAS					323	307	290	271
25 (-23)	EPR				1.41	1.35	1.29	1.24	1.19
	KIAS				221	211	200	189	176
	MACH				0.537	0.513	0.488	0.461	0.431
	FF/ENG (LB)				2,807	2,455	2,136	1,854	1,582
	KTAS				323	309	294	277	259
22 (-17)	EPR		1.45	1.39	1.34	1.29	1.24	1.20	1.16
	KIAS		241	232	222	212	201	190	177
	MACH		0.550	0.529	0.508	0.486	0.462	0.436	0.407
	FF/ENG (LB)		3,482	3,094	2,748	2,431	2,146	1,870	1,603
	KTAS		335	323	310	296	281	265	248
19 (-12)	EPR	1.42	1.37	1.32	1.28	1.24	1.20	1.17	1.13
	KIAS	251	242	233	224	213	202	191	178
	MACH	0.539	0.520	0.501	0.481	0.460	0.437	0.412	0.385
	FF/ENG (LB)	3,757	3,386	3,042	2,731	2,444	2,164	1,893	1,629
	KTAS	332	321	309	297	284	269	254	237
16 (-7)	EPR	1.34	1.30	1.27	1.24	1.20	1.17	1.14	1.11
	KIAS	252	244	234	225	214	204	192	179
	MACH	0.511	0.494	0.475	0.456	0.436	0.414	0.390	0.365
	FF/ENG (LB)	3,675	3,338	3,036	2,746	2,464	2,189	1,920	1,659
	KTAS	319	308	297	285	272	258	244	228
13 (-1)	EPR	1.29	1.26	1.23	1.20	1.17	1.14	1.12	1.09
	KIAS	254	245	236	226	216	204	193	180
	MACH	0.485	0.469	0.451	0.433	0.413	0.393	0.370	0.346
	FF/ENG (LB)	3,641	3,345	3,053	2,770	2,492	2,219	1,953	1,694
	KTAS	306	296	285	273	261	248	234	218
10 (+4)	EPR	1.25	1.22	1.19	1.17	1.14	1.12	1.10	1.08
	KIAS	255	246	237	227	217	206	194	181
	MACH	0.461	0.445	0.429	0.411	0.393	0.373	0.352	0.329
	FF/ENG (LB)	3,658	3,365	3,082	2,799	2,523	2,254	1,991	1,735
	KTAS	294	284	274	262	251	238	224	210

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.

NOTE: For operations with Main Gear Door Open or Removed, increase fuel flow by 8%.

LANDING GEAR EXTENDED (cont.)

HOLDING THRUST, SPEED, FUEL FLOW (EPR / KIAS / FF/ENG)

PRESSURE ALTITUDE FEET		WEIGHT (1,000 LB)							
		130	120	110	100	90	80	70	60
15,000	EPR	1.32	1.28	1.25	1.22	1.18	1.15	1.12	1.10
	KIAS	251	241	231	220	208	196	183	170
	FF/ENG (LB)	3,810	3,450	3,130	2,810	2,500	2,200	1,920	1,640
10,000	EPR	1.24	1.21	1.19	1.16	1.13	1.11	1.09	1.07
	KIAS	250	240	230	219	208	196	183	169
	FF/ENG (lb)	3,750	3,430	3,120	2,810	2,520	2,230	1,960	1,690
5,000	EPR	1.18	1.16	1.14	1.12	1.10	1.08	1.07	1.05
	KIAS	249	239	229	218	207	195	182	169
	FF/ENG (lb)	3,740	3,430	3,130	2,840	2,550	2,280	2,010	1,760
1,500	EPR	1.15	1.13	1.11	1.10	1.08	1.07	1.06	1.05
	KIAS	248	239	228	218	207	195	182	169
	FF/ENG (lb)	3,750	3,450	3,160	2,870	2,590	2,320	2,070	1,820

Based on Flaps Up, includes 5% additional fuel for holding in a racetrack pattern

NOTE: For operations with Main Gear Door Open or Removed, increase fuel flow by 8%.

LANDING

Landing Speed restrictions:

No additional restrictions

Flap Setting Restrictions:

No additional restrictions

Approach & Landing climb limit weights:

Reduce by 17,000 lb.

Landing Distances:

Refer to ODM, Abnormal section.

End of Section