

Boeing 747-100 Performance □ (JT9D-7A / 7AH)

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747-100 Takeoff Speeds

ALTITUDE 1000 FEET		OAT °F (°C)											
4 TO 6					-65 TO 70 (-54 TO 21)			70 TO 97 (21 TO 36)			97 TO 116 (36 TO 47)		
2 TO 4					-65 TO 94 (-54 TO 34)			94 TO 115 (34 TO 46)			115 TO 123 (46 TO 51)		
-1 TO 2		-65 TO 88 (-54 TO 31)			88 TO 112 (31 TO 44)			112 TO 130 (44 TO 55)					
F L A P S 10	TOGW	V ₁	V _R	V ₂	V ₁	V _R	V ₂	V ₁	V _R	V ₂	V ₁	V _R	V ₂
	760	161	171	177	162	172	177						
	740	158	167	174	159	169	174	160	170	174			
	720	155	164	171	157	166	171	158	167	171			
	700	152	161	168	153	162	168	155	164	168			
	680	148	157	165	150	159	165	152	161	165			
	660	145	154	162	146	155	162	148	157	162	150	159	163
	640	141	151	159	143	152	159	145	154	159	147	156	160
	620	139	147	157	141	149	157	141	150	157	143	152	157
	600	135	143	154	137	145	154	139	147	154	141	149	154
F L A P S 20	580	131	139	151	133	141	151	135	143	151	137	145	151
	560	126	135	148	130	138	148	132	140	148	134	142	148
	540	123	132	145	125	134	145	127	136	145	130	138	145
	520	120	129	143	121	130	142	124	133	142	126	135	142
	500	116	125	141	118	127	139	120	129	139	122	131	139
	480	114	122	138	115	124	137	116	125	136	119	128	136
	460	114	118	136	114	120	135	113	122	133	115	124	133
	440	114	115	135	114	116	134	109	118	130	111	120	130
	420	114	114	135	114	114	134	108	115	129	108	117	127
	400	114	114	135	114	114	134	108	111	129	103	113	125
F L A P S 20	760	155	164	169									
	740	152	161	167	153	162	167						
	720	149	157	164	150	159	164						
	700	146	154	161	148	156	161	149	157	161			
	680	143	151	158	144	152	158	146	154	158			
	660	139	147	155	141	149	155	143	151	156			
	640	136	144	153	138	146	153	139	147	153			
	620	133	141	150	134	142	150	136	144	150	138	146	150
	600	129	137	147	131	139	147	133	141	147	134	142	147
	580	125	133	144	127	135	144	129	137	144	131	139	144
F L A P S 20	560	121	130	141	124	132	141	126	134	141	128	136	141
	540	117	126	138	119	128	138	121	130	138	124	132	138
	520	114	123	136	115	124	136	118	127	136	120	129	136
	500	114	120	134	114	122	133	114	123	133	117	126	133
	480	114	117	132	114	118	131	111	120	130	113	122	130
	460	114	114	132	114	115	131	108	117	128	110	119	127
	440	114	114	132	114	114	131	108	113	126	105	115	125
	420	114	114	132	114	114	131	108	110	126	102	112	122
	400	114	114	132	114	114	131	108	108	126	102	108	120

V1 Adjustments

V1 = Vmcg red lettering. If adjusted V1 is less than Vmcg, use Vmcg as V1.

Wind - Add 1 knot for each 15 knots headwind. Subtract 2 knots for each 5 knots tailwind.

747-100 Takeoff N1%

N1 values are provided for use when an EPR gauge is inoperative.

PRESS ALT 1000 FEET	AIRPORT TEMPERATURE °F (°C)														
	-20 (-29)	-10 (-23)	0 (-18)	10 (-12)	20 (-7)	30 (-1)	40 (4)	50 (10)	60 (16)	70 (21)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)
8	88.2	89.1	90.1	91.2	92.2	93.2	93.9	94.5	94.8	94.8	94.5	94.0	93.3	92.5	91.7
6	87.6	88.6	89.5	90.5	91.4	92.4	93.3	94.1	94.6	94.7	94.5	94.0	93.3	92.5	91.7
4	86.8	87.9	88.8	89.7	90.6	91.6	92.6	93.5	94.2	94.5	94.5	94.0	93.3	92.5	91.7
2	86.1	87.2	88.1	89.0	89.9	90.9	91.9	92.9	93.6	94.1	94.2	94.0	93.3	92.5	91.7
SL	85.4	86.5	87.3	88.2	89.0	90.0	91.0	92.0	92.9	93.5	93.9	93.8	93.3	92.5	91.7

Values are valid for 3 packs OFF, nacelle anti-ice ON or OFF, and when set while speed is 40 to 80 knots.

747-100 Maximum Takeoff Thrust - EPR, Packs Off

PRESS ALT 1000 FEET	AIRPORT TEMPERATURE °F (°C)													
	Up To 50 1000 FEET (10)	55 (13)	60 (16)	65 (18)	70 (21)	75 (24)	80 (27)	85 (29)	90 (32)	95 (35)	100 (38)	105 (41)	110 (43)	120 (49)
8	1.53	1.52	1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.39	1.36
7	1.52	1.52	1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.39	1.36
6	1.51	1.51	1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.39	1.36
4	1.49	1.49	1.49	1.49	1.48	1.47	1.45	1.44	1.43	1.42	1.40	1.39	1.38	1.35
2	1.47	1.47	1.47	1.47	1.47	1.47	1.45	1.44	1.43	1.42	1.40	1.39	1.38	1.35
1	1.46	1.46	1.46	1.46	1.46	1.46	1.45	1.44	1.43	1.42	1.40	1.39	1.38	1.35
SL	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.44	1.43	1.42	1.40	1.39	1.38	1.35

Enter table with airport pressure altitude and airport temperature to find maximum EPR for takeoff.

Values valid for 3 packs OFF, nacelle anti-ice on or off and when set while airspeed is 40-80 knots.

For 3 packs ON, decrease EPR by .02.

For 1 pack ON, decrease EPR by .01.

747-100 Reduced Takeoff Thrust

Reduced EPR is the minimum thrust required under normal conditions and is recommended as it results in reduced engine wear and fuel consumption. Do not use reduced takeoff thrust for any of the following conditions:

- When ambient temp is below -47°F (-44°C).
- When takeoff runway is other than dry. A grooved runway is considered dry when there is no standing water or other clutter.
- When headwind adjustment has been used to increase allowable takeoff gross weight.
- When taking off with a tailwind.
- When any brake is deactivated.
- When a spare engine is carried.
- When an EPR indicator is inoperative.
- When available runway length is less than 7,000 feet.
- When MEL/CDL weight or performance penalties are applied.

To find assumed temperature - From gross weight page (not shown) for airport to be used, find:

1. Maximum temperature for which actual airplane weight is allowable considering runway limit for runway being used.
2. Maximum temperature for which actual airplane weight is allowable considering performance limit.

The lower of these two temperatures is the assumed temperature.

Enter the table below with maximum EPR and assumed temperature to find reduced takeoff EPR. Reduced EPR cannot be less than maximum climb EPR calculated on field elevation and airport OAT.

From the TAKEOFF SPEEDS table:

1. Determine V1 for the actual OAT, actual gross weight and airport altitude.
2. Determine V1, Vr, and V2 for the assumed temperature, actual gross weight and airport altitude.

Compare the assumed temp V1 and Vr with the actual OAT V1. If actual OAT V1 is greater than the assumed temp V1, use actual OAT V1. If actual V1 is greater than the assumed temperature Vr, use actual OAT V1 for Vr and add the difference to the assumed temperature V2.

	ASSUMED TEMPERATURE ° F														
MAX EPR	Up To 50	55	60	65	70	75	80	85	90	95	100	105	110	120	130
1.53	1.53	1.52	1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.39	1.39	1.39
1.52	1.52	1.52	1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.38	1.38
1.51	1.51		1.51	1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.37	1.37
1.50	1.50			1.50	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.36
1.49	1.49			1.49	1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.35
1.48	1.48				1.48	1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.47	1.47					1.47	1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.46	1.46						1.46	1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.45	1.45							1.45	1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.44	1.44							1.44	1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.43	1.43								1.43	1.42	1.41	1.40	1.38	1.36	1.34
1.42	1.42									1.42	1.41	1.40	1.38	1.36	1.34
1.41	1.41										1.41	1.40	1.38	1.36	1.34
1.40	1.40											1.40	1.38	1.36	1.34
1.39	1.39											1.39	1.38	1.36	1.34
1.38	1.38												1.38	1.36	1.34
1.37	1.37												1.37	1.36	1.34
1.36	1.36													1.36	1.34
1.35	1.35													1.35	1.34

747-100 Maximum Climb / Maximum Continuous Thrust 250/300/.82 Schedule

PRESSURE ALTITUDE 1000 FEET	SPEED IAS/M	TOTAL AIR TEMPERATURE °C															
		-20 OR COLDER	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55
45	.82	1.51	1.51	1.49	1.47	1.44	1.41	1.38	1.35	1.31							
43	.82	1.52	1.52	1.50	1.48	1.45	1.42	1.39	1.36	1.32							
41	.82	1.53	1.53	1.50	1.48	1.45	1.42	1.39	1.36	1.32							
39	.82	1.53	1.53	1.51	1.49	1.46	1.43	1.40	1.37	1.33							
37	.82	1.54	1.53	1.52	1.50	1.47	1.44	1.41	1.38	1.34							
35	.82	1.53	1.53	1.52	1.50	1.47	1.44	1.41	1.38	1.34	1.30	1.26					
33	.82	1.52	1.52	1.52	1.52	1.47	1.44	1.41	1.38	1.34	1.30	1.26					
31	300/.81	1.50	1.50	1.50	1.50	1.48	1.45	1.42	1.39	1.35	1.31	1.27	1.23				
29	300/.78	1.49	1.49	1.49	1.49	1.48	1.45	1.42	1.39	1.35	1.31	1.27	1.23				
27	300/.75	1.48	1.48	1.48	1.48	1.47	1.45	1.42	1.39	1.35	1.31	1.27	1.23	1.18			
25	300/.72	1.47	1.47	1.47	1.47	1.47	1.45	1.42	1.39	1.35	1.31	1.27	1.23	1.19	1.15	1.11	
20	300/.65	1.44	1.44	1.44	1.44	1.44	1.44	1.42	1.39	1.35	1.31	1.27	1.23	1.19	1.16	1.13	1.11
16	300/.60	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.39	1.35	1.31	1.27	1.23	1.20	1.17	1.15	1.12
14	300/.58	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.35	1.31	1.27	1.23	1.20	1.18	1.15	1.13
12	280/.52	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.35	1.31	1.28	1.25	1.22	1.19	1.16	1.14
10	250/.45	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.36	1.32	1.29	1.26	1.23	1.21	1.19	1.17
5	250/.41	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.30	1.27	1.24	1.22	1.20	1.18
0	250/.38	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.27	1.25	1.23	1.21	1.19

Bleed Corrections:

1. Nacelle A/I ON -.02
2. Wing A/I ON -.02
3. Nacelle and Wing A/I ON -.03

747-100 N1 Equivalents Chart

Enter with required EPR and Mach to determine N1 required to provide same thrust.

EPR	MACH NO.						
	.30	.40	.50	.60	.70	.80	.90
1.15	72.0	74.5	78.0	81.5	84.0	85.0	85.0
1.20	76.0	78.5	81.0	84.0	86.0	87.0	87.0
1.25	80.0	82.0	84.0	86.0	88.0	88.5	88.5
1.30	83.5	85.0	86.5	88.5	89.5	90.0	90.0
1.35	86.0	87.5	88.5	90.5	91.5	91.5	91.5
1.40	88.5	90.0	91.0	92.0	93.0	93.0	93.0
1.45	90.5	91.5	92.5	94.0	94.5	94.5	94.5
1.50	92.5	93.5	94.5	95.5	96.0	96.0	96.0
1.55	94.0	95.0	96.0	97.0	97.5	97.5	97.5
1.60	95.5	96.5	97.5	98.5	98.5	98.5	98.5

Above N1 values valid for a TAT of 0°C only. Increase or decrease N1 by 1.5% rpm for each 10°C above or below 0°C TAT respectively.

747-100 Flight Planning Table

CRUISE
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When the trip length line (corrected for wind intersects between the horizontal time-fuel lines, use the time and fuel shown in the blocks for the flight altitude.
Example: 3600 NM, 50K Headwind, Altitude 39,000. Time 8:30, Fuel 188.5.

When the trip length line (corrected for wind) intersects on a horizontal time-fuel line, interpolate.
Example: 3000 NM, 50K Tailwind, Altitude 41,000. Time 5:49, Fuel 122.9.

FLIGHT PLANNING TABLE

Based on following speed schedule:

CLIMB: 250 IAS to 10,000 ft - 300 IAS to 31,800 ft - Mach 0.82 above 31,800 ft.
CRUISE: SL to 10,000 ft - 250 IAS 10,000 ft to 27,000 ft - 340 IAS above 27,000 ft - Mach 0.84.
DESCENT: Mach 0.84 to 36,000 ft - 280 IAS between 36,000 ft and 10,000 ft - 250 IAS below 10,000 ft.

FLIGHT TIME AND FUEL BURNOUT																					
41,000 FT.		39,000 FT.		37,000 FT.		35,000 FT.		33,000 FT.		31,000 FT.		29,000 FT.		25,000 FT.		15,000 FT.		10,000 FT.			
481 TAS	TIME	481 TAS	TIME	481 TAS	TIME	481 TAS	TIME	488 TAS	TIME	488 TAS	TIME	492 TAS	TIME	497 TAS	TIME	484 TAS	TIME	419 TAS	TIME		
FUEL		FUEL		FUEL		FUEL		FUEL		FUEL		FUEL		FUEL		FUEL		FUEL			
12-12 293.5	12-12 293.0	12-12 294.3	12-11 297.5																		
11-47 281.0	11-47 280.7	11-47 281.8	11-46 285.2	11-42 292.3																	
11-23 268.7	11-23 268.6	11-23 269.4	11-21 273.0	11-18 279.7	11-13 289.6																
10-59 256.5	10-58 256.6	10-58 257.2	10-57 261.0	10-53 267.5	10-49 277.3	10-43 291.1															
10-34 244.8	10-33 244.9	10-34 245.4	10-32 249.1	10-29 255.4	10-24 265.3	10-19 278.5	10-33 296.7														
10-9 233.3	10-9 233.3	10-9 233.9	10-8 237.5	10-4 243.7	9-59 253.3	9-55 266.2	10-8 283.7														
9-44 222.0	9-44 221.8	9-44 222.7	9-43 226.0	9-39 232.2	9-35 241.7	9-30 254.0	9-43 270.8														
9-20 210.9	9-20 210.5	9-19 211.6	9-18 214.6	9-15 221.0	9-10 230.1	9-6 242.0	9-18 258.1														
8-55 200.0	8-55 199.4	8-55 200.6	8-54 203.4	8-50 209.9	8-46 218.7	8-41 230.0	8-53 245.4	10-10 291.3													
8-30 189.2	8-30 188.5	8-30 189.8	8-29 192.5	8-25 199.0	8-21 207.4	8-17 218.3	8-28 233.0	9-41 276.2													
8-5 178.5	8-6 177.9	8-5 179.1	8-4 181.7	8-0 188.2	7-57 196.3	7-53 206.6	8-3 220.6	9-13 261.5													
7-41 168.1	7-41 167.6	7-40 168.7	7-39 171.4	7-36 177.6	7-32 185.3	7-28 195.2	7-38 208.4	8-44 246.8													
7-16 157.7	7-16 157.3	7-16 158.3	7-15 161.1	7-11 167.1	7-8 174.4	7-4 183.8	7-13 196.3	8-15 232.3													
6-51 147.5	6-51 147.4	6-51 148.1	6-50 151.0	6-46 156.7	6-43 163.7	6-40 172.5	6-48 184.3	7-46 217.9													
6-26 137.4	6-26 137.4	6-26 138.0	6-25 141.1	6-22 146.6	6-19 153.0	6-15 161.3	6-24 172.4	7-18 203.7													
6-1 127.7	6-1 127.7	6-1 128.3	6-0 131.3	5-57 136.5	5-54 142.5	5-51 150.3	5-59 160.6	6-49 189.6	7-18 284.8												
5-36 118.2	5-36 118.1	5-36 118.8	5-35 121.7	5-32 126.5	5-30 132.0	5-27 139.3	5-34 148.9	6-20 175.7	6-47 263.6												
5-11 108.8	5-11 108.6	5-11 109.3	5-10 112.1	5-7 116.6	5-5 121.7	5-3 128.5	5-9 137.3	5-52 161.8	6-16 242.5												
4-46 99.6	4-46 99.3	4-46 100.1	4-45 102.8	4-43 106.8	4-41 111.5	4-38 117.7	4-44 125.8	5-23 148.1	5-45 221.5												
4-21 90.4	4-21 90.0	4-21 91.0	4-20 93.5	4-18 97.2	4-16 101.4	4-14 107.0	4-19 114.3	4-54 134.5	5-14 200.7												
3-56 81.6	3-56 81.1	3-56 82.0	3-55 84.3	3-53 87.5	3-52 91.4	3-50 96.5	3-54 103.0	4-25 120.9	4-43 180.2												
3-31 72.7	3-31 72.3	3-31 73.2	3-30 75.3	3-29 78.1	3-27 81.5	3-25 86.1	3-29 91.7	3-57 107.4	4-13 159.9												
3-6 64.0	3-6 63.5	3-6 64.4	3-5 66.3	3-4 69.7	3-3 71.7	3-1 75.7	3-4 80.5	3-28 94.1	3-42 139.7												
2-41 55.4	2-41 55.1	2-41 55.9	2-41 57.4	2-39 59.4	2-38 61.9	2-37 65.3	2-40 69.3	2-59 80.8	3-11 119.6												
2-16 46.9	2-16 46.7	2-16 47.4	2-16 48.6	2-15 50.2	2-14 52.3	2-13 55.0	2-15 58.2	2-31 67.6	2-40 99.6												
1-51 38.6	1-51 38.4	1-51 38.9	1-51 39.8	1-50 41.1	1-49 42.7	1-48 44.7	1-50 47.3	2-2 54.5	2-9 79.7												
1-26 30.5	1-26 30.4	1-26 30.7	1-26 31.2	1-26 32.1	1-25 33.2	1-24 34.5	1-25 36.3	1-33 41.4	1-38 59.8												
1-1 22.4	1-1 22.3	1-1 22.5	1-1 22.7	1-1 23.1	1-0 23.7	1-0 24.4	1-0 25.4	1-5 28.4	1-8 40.1												
				0-36 14.2	0-36 14.3	0-36 14.3	0-35 14.6	0-36 15.5	0-37 20.6												
450 LBS/HR										200 LBS/HR			150 LBS/HR								
400 LBS/HR										350 LBS/HR			300 LBS/HR			250 LBS/HR			200 LBS/HR		

TRIP LENGTH- NH

5800

5600

5400

5200

5000

4800

4600

4400

4200

4000

3800

3600

3400

3200

3000

2800

2600

2400

2200

2000

1800

1600

1400

1200

1000

800

600

400

200

0

100

200

300

400

500

600

700

800

900

1000

1100

1200

1300

1400

1500

1600

1700

1800

1900

2000

2100

2200

2300

2400

2500

2600

2700

2800

2900

3000

3100

3200

3300

3400

3500

3600

3700

3800

3900

4000

4100

4200

4300

4400

4500

4600

4700

4800

4900

5000

5100

5200

5300

5400

5500

5600

5700

5800

5900

6000

6100

6200

6300

6400

6500

6600

6700

6800

6900

7000

7100

7200

7300

7400

7500

7600

7700

7800

7900

8000

8100

8200

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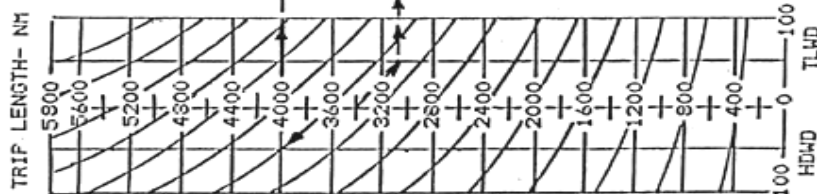
9800

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10000

TLHD

TABLE VALID ONLY FOR LANDING WEIGHT OF 450,000 LBS. FOR EACH 10,000 LBS. DEVIATION ABOVE (BELOW) 450,000 LBS., ADD (SUBTRACT) FUEL BURNOUT CORRECTION SHOWN ABOVE FOR EACH HOUR OF FLIGHT TIME



747-100 Mach .82 Cruise

4 ENGINE MACH .82 CRUISE

EPR, fuel flow and NAM/1000 pounds are for Mach .82. When operating in region left of heavy line, determine and set max cruise EPR if less than listed value.

Fuel flow and true airspeed values are for standard temperature. See adjustments at bottom of page.

Three air conditioning packs operating.

FLIGHT LEVEL STD TEMP	IAS TAS	GROSS WEIGHT (1000 LBS)																	
		740	720	700	680	660	640	620	600	580	560	540	520	500	480	460	440	420	400
440	226																	1.48	1.41
-56C	470																	4210	3980
																		27.8	28.6
430	232																	1.48	1.42
-56C	470																	4380	4180
																		28.8	29.7
420	237																	1.41	1.37
-56C	470														1.88	1.48	4380	4140	3980
															24.9	28.8	27.1	28.4	29.8
410	243														1.81	1.48	1.41	1.37	1.30
-56C	470														5020	4740	4330	4330	4010
															22.4	24.8	28.0	27.2	29.3
400	248														1.48	1.41	1.37	1.33	1.27
-56C	470														5180	4920	4510	4390	4050
															22.7	23.8	25.0	27.0	29.0
390	254														1.53	1.48	1.44	1.30	1.25
-56C	470														5830	5340	4890	4390	4100
															20.9	22.0	23.1	24.0	28.8
380	260														1.51	1.48	1.43	1.27	1.23
-56C	470														5780	5490	5070	4880	4160
															20.3	21.4	22.3	24.1	28.3
370	268														1.54	1.49	1.45	1.25	1.21
-56C	470														6220	5930	5660	5450	4240
															18.9	19.8	20.8	21.8	27.7
360	273														1.52	1.47	1.44	1.23	1.19
-56C	470														6350	6070	5800	5440	4330
															18.5	19.4	20.1	21.8	27.1
350	279														1.54	1.49	1.45	1.21	1.18
-54C	472														6820	6530	6260	5890	4480
															17.3	18.1	18.9	20.8	28.8
340	285														1.51	1.47	1.44	1.19	1.18
-52C	474														6990	6700	6480	6270	4590
															17.0	17.7	18.3	19.8	28.8
330	292														1.48	1.45	1.42	1.18	1.15
-50C	476														7160	6900	6680	6480	4760
															16.8	17.3	17.8	19.0	25.1
320	298														1.46	1.43	1.40	1.15	1.15
-48C	478														7330	7120	6910	6710	4930
															16.3	16.9	17.3	18.4	24.3
310	305														1.41	1.38	1.36	1.13	1.14
-46C	481														7330	7130	6930	6770	5120
															16.4	16.9	17.4	17.8	23.5
300	312														1.37	1.35	1.33	1.11	1.13
-44C	483														7350	7170	7010	6860	5320
															16.4	16.8	17.2	17.6	22.7
290	318														1.33	1.32	1.30	1.09	1.10
-42C	485														7440	7280	7120	6970	5450
															16.3	16.7	17.0	17.4	21.9
280	325														1.30	1.29	1.27	1.07	1.12
-40C	487														7550	7390	7240	7100	5580
															16.1	16.5	16.8	17.2	21.0
270	332														1.28	1.26	1.25	1.05	1.12
-38C	489														7670	7520	7380	7240	5690
															16.0	16.3	16.6	16.9	20.3
TEMP ADJ		23	22	22	21	21	20	20	19	19	19	18	18	18	17	17	16	16	15

Adjustments: TAS (knots) is for standard temperature. Add 1 knot/°C above standard. Subtract 1 knot/°C below standard.

Add/subtract temperature adjustment pounds/hour to fuel flow per 1°C above/below standard.

747-100 Mach .85 Cruise

4 ENGINE MACH .85 CRUISE

EPR, fuel flow and NAM/1000 pounds are for Mach .85. When operating in region left of heavy line, determine and set max cruise EPR if less than listed value.

Fuel flow and true airspeed values are for standard temperature. See adjustments at bottom of page.

Three air conditioning packs operating.

FLIGHT LEVEL STD TEMP	IAS TAS	GROSS WEIGHT (1000 LB)																	
		740	720	700	680	660	640	620	600	580	560	540	520	500	480	460	440	420	400
440	238																		1.44
-56C	487																		4250 28.6
430	241																		1.49
-56C	487																1.44	1.40	4240 28.7
420	247																1.49	1.44	1.40
-56C	487																4900 24.9	4640 26.2	4440 27.4
410	253																		1.38
-56C	487													1.53	1.48	1.44	1.40	1.36	4250 28.7
400	258													5350 22.8	5080 24.0	4830 25.2	4650 26.2	4450 27.0	4200 27.9
390	265													5510 22.1	5250 23.2	5030 24.2	4840 25.2	4650 26.2	4450 27.0
-56C	487													1.51	1.46	1.42	1.39	1.36	1.31
380	271													5700 21.4	5440 22.4	5200 23.3	5040 24.2	4850 25.1	4650 25.9
-56C	487													1.50	1.45	1.42	1.39	1.35	1.28
370	277													5880 20.7	5620 21.7	5400 22.4	5240 23.3	5050 24.1	4920 24.8
-56C	487													1.52	1.48	1.44	1.38	1.35	1.25
360	284													6060 20.1	5820 20.9	5600 21.6	5440 22.4	5260 23.1	5130 23.8
-56C	487													1.50	1.46	1.42	1.37	1.34	1.28
350	290													6230 19.6	6020 20.2	5840 20.9	5680 21.6	5500 22.2	5350 22.8
-54C	489													1.52	1.48	1.45	1.42	1.39	1.26
340	297													6490 18.8	6300 19.6	6130 20.2	5990 20.8	5860 21.4	5700 21.9
-52C	492													1.50	1.46	1.43	1.38	1.35	1.22
330	304													6710 17.2	6510 17.8	6330 18.4	6170 19.0	6030 19.5	5880 20.1
-80C	494													1.48	1.44	1.42	1.38	1.37	1.21
320	310													6990 16.7	6790 17.3	6610 17.8	6450 18.3	6310 18.8	6160 19.3
-48C	498													1.48	1.46	1.43	1.38	1.36	1.19
310	317													7280 15.8	7080 16.3	6900 16.8	6740 17.2	6590 17.7	6440 18.2
-48C	498													1.44	1.41	1.39	1.35	1.33	1.16
300	324													7580 15.3	7380 15.8	7200 16.3	7040 16.7	6890 17.2	6740 17.7
-44C	500													1.40	1.38	1.35	1.32	1.29	1.12
290	331													7880 14.8	7680 15.3	7500 15.8	7340 16.2	7190 16.7	7040 17.2
-42C	502													1.38	1.34	1.33	1.31	1.30	1.12
280	338													8120 14.3	7920 14.8	7740 15.3	7580 15.7	7430 16.2	7280 16.7
-40C	505													1.33	1.32	1.31	1.29	1.28	1.10
270	345													8420 13.3	8220 13.8	8040 14.3	7880 14.7	7730 15.2	7580 15.7
-38C	507													1.31	1.30	1.28	1.27	1.26	1.08
TEMP ADJ		24	24	23	23	22	22	21	21	21	20	20	19	19	19	18	18	17	17

Adjustments: TAS (knots) is for standard temperature. Add 1 knot/°C above standard. Subtract 1 knot/°C below standard.

Add/subtract temperature adjustment pounds/hour to fuel flow per 1°C above/below standard.

747-100 340 KIAS Cruise

4 ENGINE 340 KIAS CRUISE

EPR, fuel flow and NAM/1000 pounds are for 340 KIAS.

Fuel flow and true airspeed values are for standard temperature. See adjustments at bottom of page.

Three air conditioning packs operating.

FLIGHT LEVEL STD TEMP	IAS TAS	GROSS WEIGHT (1000 LB)																	
		740	720	700	680	660	640	620	600	580	560	540	520	500	480	460	440	420	400
270	340	1.29	1.28	1.26	1.25	1.24	1.23	1.22	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.14
-38C	499	7930	7800	7670	7540	7420	7310	7190	7080	6970	6910	6850	6780	6700	6630	6570	6520	6460	6410
		15.8	16.0	16.3	16.6	16.8	17.1	17.4	17.6	17.9	18.1	18.2	18.4	18.6	18.8	19.0	19.2	19.3	19.5
250	339	1.23	1.22	1.21	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.10
-34C	484	7800	7660	7520	7400	7290	7180	7070	6960	6870	6780	6710	6640	6570	6510	6470	6420	6380	6330
		15.5	15.8	16.1	16.4	16.6	16.9	17.1	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.7	18.9	19.0	19.1
230	340	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.09	1.09	1.08	1.08	1.08	1.07
-30C	470	7790	7650	7520	7410	7300	7200	7090	6980	6900	6830	6750	6680	6610	6560	6520	6470	6420	6380
		15.1	15.4	15.7	15.9	16.1	16.4	16.6	16.8	16.9	17.1	17.2	17.4	17.6	17.8	17.9	18.1	18.2	18.5
210	339	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.06	1.05	1.05
-26C	457	7780	7630	7510	7400	7300	7190	7090	6980	6910	6840	6770	6690	6620	6570	6530	6480	6440	6390
		14.7	15.0	15.2	15.4	15.7	15.9	16.1	16.4	16.5	16.7	16.9	17.1	17.3	17.4	17.5	17.6	17.8	17.9
200	339	1.13	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.05	1.04
-24C	450	7740	7620	7500	7390	7290	7180	7070	6970	6900	6830	6760	6680	6610	6570	6520	6480	6430	6390
		14.5	14.8	15.0	15.2	15.4	15.7	15.9	16.1	16.3	16.5	16.6	16.8	17.0	17.1	17.3	17.4	17.6	17.8
190	339	1.12	1.11	1.10	1.10	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.04	1.04
-22C	444	7750	7620	7510	7400	7290	7180	7080	6990	6920	6850	6780	6710	6640	6590	6550	6500	6460	6420
		14.3	14.6	14.8	15.0	15.2	15.5	15.7	15.9	16.0	16.2	16.4	16.6	16.7	16.8	17.0	17.1	17.2	17.3
180	340	1.11	1.10	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.04	1.03	1.03	1.03
-20C	437	7750	7630	7510	7410	7300	7200	7100	7020	6950	6880	6810	6740	6670	6630	6590	6540	6500	6460
		14.1	14.4	14.6	14.8	15.0	15.2	15.4	15.6	15.7	15.9	16.1	16.3	16.4	16.5	16.6	16.7	16.9	17.0
170	340	1.10	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03
-18C	431	7760	7640	7540	7430	7330	7230	7130	7060	6990	6920	6850	6780	6720	6670	6630	6580	6540	6500
		13.9	14.1	14.3	14.5	14.7	14.9	15.1	15.3	15.4	15.6	15.8	16.0	16.1	16.2	16.3	16.4	16.5	16.6
160	340	1.09	1.08	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.02	1.02
-16C	425	7780	7660	7560	7460	7350	7250	7150	7080	7010	6950	6880	6810	6750	6710	6660	6610	6570	6530
		13.7	13.9	14.1	14.3	14.5	14.7	14.9	15.0	15.2	15.3	15.5	15.6	15.7	15.9	16.0	16.1	16.2	16.3
150	339	1.08	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.02	1.02	1.02
-14C	418	7800	7680	7580	7470	7370	7270	7170	7100	7040	6970	6910	6840	6790	6740	6690	6640	6590	6560
		13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.7	14.9	15.0	15.2	15.3	15.4	15.5	15.7	15.8	15.9	16.0
140	339	1.07	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02
-12C	413	7830	7710	7610	7510	7410	7310	7210	7140	7080	7010	6960	6900	6840	6790	6740	6690	6640	6600
		13.2	13.4	13.6	13.8	13.9	14.1	14.3	14.5	14.6	14.7	14.9	15.0	15.1	15.2	15.3	15.4	15.6	15.6
130	339	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01
-10C	407	7860	7750	7650	7550	7450	7350	7260	7190	7120	7060	7000	6950	6900	6840	6790	6740	6690	6650
		13.0	13.1	13.2	13.4	13.7	13.9	14.0	14.2	14.3	14.4	14.6	14.7	14.8	14.9	15.0	15.1	15.2	15.3
120	339	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01
-8C	401	7900	7780	7680	7580	7480	7380	7300	7230	7160	7110	7060	7000	6950	6890	6840	6790	6750	6710
		12.7	12.9	13.1	13.2	13.4	13.6	13.7	13.9	14.0	14.1	14.2	14.3	14.4	14.6	14.7	14.8	14.9	15.0
110	339	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01
-6C	395	7940	7830	7730	7630	7530	7430	7340	7280	7210	7160	7110	7060	7000	6950	6890	6840	6790	6740
		12.5	12.6	12.8	13.0	13.1	13.3	13.5	13.6	13.7	13.8	13.9	14.0	14.1	14.2	14.3	14.5	14.6	14.7
TEMP ADJ		24	23	23	23	22	22	22	22	21	21	21	21	21	20	20	20	20	19

Adjustments: TAS (knots) is for standard temperature. Add 1 knot/°C above standard. Subtract 1 knot/°C below standard.

Add/subtract temperature adjustment pounds/hour to fuel flow per 1°C above/below standard.

747-100 Recommended Initial Cruise Weight Tables

747-100 Recommended Initial Cruise Weight Tables, Mach .84 Cruise Speed, 2000 Foot Step

The following tables provide a weight for a given step climb and wind shear difference at which fuel burn will be optimized. This weight will put the aircraft above the optimum initially. As fuel is consumed, the weight will approach optimum conditions and burn below the optimum weight until the weight reduces to the point for the next step climb. Maximum Cruise Weight should always be checked before climbing to the new altitude.

HEADWIND							
FL CHANGE	WIND STRONGER AT HIGHER ALTITUDE						
	30	25	20	15	10	5	0
410-430	-	-	-	-	-	403	423
400-420	-	-	-	-	403	428	447
390-410	-	-	-	403	428	454	470
380-400	-	-	-	422	447	470	493
370-390	-	-	-	439	468	502	516
360-380	-	-	400	463	496	522	548
350-370	-	-	427	486	519	535	572
340-360	-	407	460	520	539	581	600
330-350	405	428	467	551	572	606	629
320-340	428	451	480	567	603	642	659
310-330	421	471	491	593	631	668	699
300-320	480	490	512	606	659	690	720
TAILWIND							
FL CHANGE	WIND STRONGER AT LOWER ALTITUDE						
	30	25	20	15	10	5	0
410-430	-	-	-	-	-	407	423
400-420	-	-	-	-	411	433	447
390-410	-	-	-	416	440	456	470
380-400	-	-	416	436	455	474	493
370-390	-	-	422	459	476	502	516
360-380	-	398	435	481	507	526	548
350-370	-	435	483	507	527	560	572
340-360	412	461	520	532	560	588	600
330-350	434	473	550	560	586	612	629
320-340	457	504	565	594	618	646	659
310-330	474	510	589	620	657	677	699
300-320	494	520	601	640	669	702	720

747-100 Recommended Initial Cruise Weight Tables, Mach .84 Cruise Speed, 4000 Foot Step

HEADWIND								
FL CHANGE	WIND STRONGER AT HIGHER ALTITUDE							
	60	50	40	30	20	10	5	0
390-430	-	-	-	-	412	427	433	SEE NOTE
380-420	-	-	-	-	436	450	456	
370-410	-	-	-	416	458	472	478	
360-400	-	-	383	435	480	499	506	
350-390	-	-	411	455	505	520	529	
340-380	-	398	420	486	532	550	559	
330-370	-	420	451	511	562	578	588	
320-360	-	439	479	537	590	610	626	
310-350	413	461	494	562	615	638	656	
300-340	431	482	515	588	647	667	678	
NOTE: For 0 wind shear and winds stronger at lower altitude, a climb is recommended if gross weight is below the Maximum Cruise Weight.								
TAILWIND								
FL CHANGE	WIND STRONGER AT LOWER ALTITUDE							
	60	50	40	30	20	10	5	0
390-430	-	-	-	-	412	427	433	SEE NOTE
380-420	-	-	-	414	436	450	456	
370-410	-	-	407	432	458	472	478	
360-400	-	-	426	452	480	499	506	
350-390	-	409	449	479	505	520	529	
340-380	401	421	480	511	532	550	559	
330-370	425	451	508	538	562	578	588	
320-360	449	482	533	567	590	610	626	
310-350	467	499	558	590	615	638	656	
300-340	483	522	581	612	647	667	678	
NOTE: For 0 wind shear and winds stronger at higher altitude, a climb is recommended if gross weight is below the Maximum Cruise Weight.								

747-100 Maximum / Optimum Cruise Weight

MAXIMUM CRUISE WEIGHT				OPTIMUM CRUISE WEIGHT	
Maximum weight at which .84M can be maintained in level flight at max cruise thrust and which will provide at least 300 fpm rate-of-climb at .84M at max climb thrust. This is a performance limit and does not consider fuel efficiency.				Best nautical air miles per 1,000 lbs of fuel.	
FLIGHT LEVEL SAT (Ts) °C	STATIC AIR TEMPERATURE - °C			.84M	LRC
	Ts + 10 and Below	Ts + 15	Ts + 20		
440 -57	398,000	389,000	381,000	387,000	366,500
430 -57	420,000	410,000	402,000	407,000	387,000
420 -57	442,000	431,000	424,000	427,000	408,000
410 -57	467,000	455,000	445,000	449,000	430,000
400 -57	490,000	478,000	468,000	472,000	453,000
390 -57	514,000	501,000	490,000	496,000	477,000
380 -57	543,000	528,000	516,000	521,000	502,000
370 -57	570,000	557,000	542,000	548,000	527,000
360 -56	601,000	586,000	571,000	575,000	554,000
350 -54	630,000	615,000	600,000	604,000	587,000
340 -52	659,000	642,000	627,000	634,500	609,000
330 -50	685,000	668,000	650,000	666,000	638,000
320 -48	711,000	692,000	673,000	698,000	668,500
310 -46	736,000	716,000	696,000	732,000	698,000
300 -44	750,000	738,000	718,000	745,000	730,000

747-100 Descent Distance

.84/280 DESCENT SPEED												
FLIGHT LEVEL	GROSS WEIGHT 1000 LBS											DISTANCE CORRECTION PER 10 KNOTS WIND
	400	420	440	460	480	500	520	540	560	580	600	
430	95	98	101	103	105	107	108	109	110	111	111	2.6
410	90	93	95	97	99	101	103	104	105	106	106	2.5
390	85	87	90	92	94	96	97	98	99	100	101	2.4
370	80	82	84	86	88	90	92	93	94	95	95	2.3
350	74	76	78	80	82	84	85	86	87	88	89	2.1
330	67	70	72	73	75	77	78	79	80	81	81	2.0
310	61	63	65	67	68	70	71	72	73	74	74	1.8
290	55	57	59	60	62	63	64	65	66	66	67	1.7
270	49	51	52	54	55	56	57	58	59	59	60	1.5
250	43	45	46	47	48	49	50	51	52	52	53	1.4
200	29	30	31	32	32	33	34	34	35	35	36	1.0
180	24	24	25	26	26	27	27	28	28	29	29	0.8
150	15	16	16	17	17	18	18	18	19	19	19	0.5
.84/340 DESCENT SPEED												
FLIGHT LEVEL	GROSS WEIGHT 1000 LBS											DISTANCE CORRECTION PER 10 KNOTS WIND
	400	420	440	460	480	500	520	540	560	580	600	
430	79	82	85	88	91	93	95	97	99	100	101	2.1
410	74	77	80	82	85	87	89	92	93	95	97	1.9
390	69	71	74	77	79	82	84	86	88	90	91	1.8
370	63	66	69	71	74	76	78	80	82	84	86	1.7
350	59	62	64	67	69	71	73	75	77	79	80	1.6
330	55	57	60	62	64	66	68	70	72	74	75	1.5
310	51	53	56	58	60	62	63	66	67	69	70	1.4
290	48	50	52	54	56	58	60	61	63	64	66	1.4
270	44	46	48	50	52	54	55	57	58	60	61	1.3
250	39	41	43	45	46	48	49	51	52	53	55	1.2
200	28	29	31	32	33	34	35	36	37	38	39	0.9
180	24	25	26	27	28	29	29	30	31	32	32	0.6
150	17	18	19	19	20	21	21	22	22	23	23	0.6

747-100 Landing Reference Speeds, Flaps 30

GROSS WEIGHT 1000 LBS	380	400	420	440	460	480	500	520	540	560	580*	600*	620*	640*	660*	680*	700*
REF (KIAS)	115	118	121	124	127	130	133	135	138	141	144	147	150	153	156	159	162

* To be used in the event of an overweight landing.

747-100 Maneuver, Approach and Threshold Speeds

FLAP POSTION	MINIMUM MANEUVER	APPROACH & THRESHOLD
0	REF + 80	
1	REF + 60	
5	REF + 40	
10	REF + 20	
20	REF + 10	
25	REF + 5	REF + 5
30		REF

Wind Corrections:

Approach & Threshold Speeds - Add 1/2 the steady headwind component plus the full gust value to the speed for the flap configuration used for landing. The total addition should not exceed 20 knots.

Target Approach Speed - The announced APPROACH SPEED corrected for wind and airplane irregular configuration, if applicable.