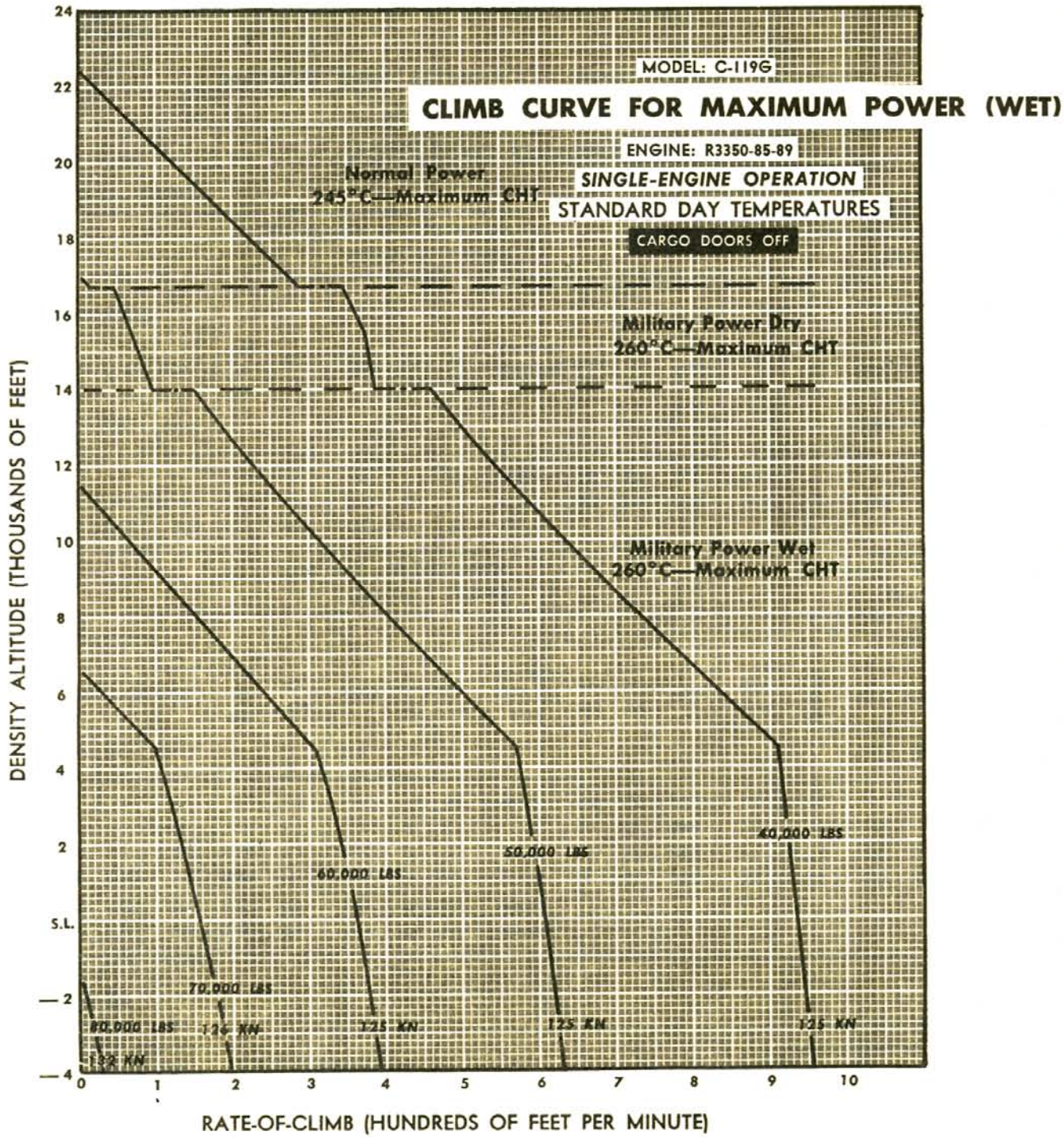


REMARKS:

(1) Climb speeds quoted are sea level CAS.

(2) 2900 RPM and NORMAL mixture.

(3) Each temperature variation of 5.6°C (10°F) from standard day temperature produces a 1.1% variation in the BHP of each engine. This 1.1% multiplied by the propeller efficiency at best climb speed (approximately 80%) gives a variation of .88% (.0088) in the thrust horsepower. The resulting change in the rate-of-climb values, then, may be obtained from the following formulae:

$$\Delta R/C = \Delta THP \times \frac{33000}{W}$$

$$\Delta THP = .0088\ BHP_{Std} \times N$$

BHP_{Std} = Brake horsepower per engine (standard day)
N = Number of engines operating
W = Gross weight of the airplane

DATA BASIS: Flight Test **DATA AS OF:** March 55

Figure A-76. Single-Engine Climb Curve For Maximum Wet Power

CARGO DOORS OFF

CLIMB CHART FOR MAXIMUM WET POWER

STANDARD TEMPERATURES

SINGLE-ENGINE OPERATION

MODEL: C-119G **ENGINE:** (1) R3350-85-89

CONFIGURATION: Cargo Doors Off
WEIGHT: 73,000 LBS.

APPROXIMATE				M.P. IN. HG	TOP PSI	RPM	CAS KN	TAS KN	DENSITY ALTITUDE FEET	TAS KN	CAS KN	RPM	TOP PSI	M.P. IN. HG	APPROXIMATE			
RATE OF CLIMB	FROM SEA LEVEL														FROM SEA LEVEL			RATE OF CLIMB
	DIST.	TIME	FUEL												FUEL	TIME	DIST.	
140	—	—	—	—	171	2900	128	121	−4,000	120	127	2900	171	—	—	—	—	310
100	0	0	585 (1)	57.5	171	2900	128	128	S.L.	125	125	2900	171	57.5	585 (1)	0	0	275
									5,000	131	122	2900	168	55.0	1875	20.6	44	195

CONFIGURATION: Cargo Doors Off
WEIGHT: 54,000 LBS.

CONFIGURATION: Cargo Doors Off
WEIGHT: 44,000 LBS.

APPROXIMATE				M.P. IN. HG	TOP PSI	RPM	CAS KN	TAS KN	DENSITY ALTITUDE FEET	TAS KN	CAS KN	RPM	TOP PSI	M.P. IN. HG	APPROXIMATE			
RATE OF CLIMB	FROM SEA LEVEL														FROM SEA LEVEL			RATE OF CLIMB
	DIST.	TIME	FUEL												FUEL	TIME	DIST.	
530	—	—	—	—	171	2900	127	120	−4,000	120	127	2900	171	—	—	—	—	805
505	0	0	585 (1)	57.5	171	2900	125	125	S.L.	125	125	2900	171	57.5	585 (1)	0	0	785
435	22	10.5	1240	55.0	168	2900	121	130	5,000	130	121	2900	168	55.0	995	6.5	14	730
205	56	26.1	2150	46.0	143	2900	111	129	10,000	129	111	2900	143	46.0	1470	14.8	32	485
									15,000	129	102	2600	139	50.0	2110	28.7	62	245
									20,000	145	106	2600	120	42.0	3405	72.3	165	10

REMARKS:

(1) Taxi and take-off allowance.
(2) 2900 RPM and NORMAL mixture.
(3) Each temperature variation of 5.6°C (10°F) from standard day temperature produces a 1.1% variation in the BHP of each engine. This 1.1% multiplied by the propeller efficiency at best climb speed (approximately 80%) gives a variation of .88% (.0088) in the thrust horsepower. The resulting change in the rate-of-climb values, then, may be obtained from the following formulae:

$$\Delta R/C = \Delta THP \times \frac{33000}{W}$$

$$\Delta THP = .0088\ BHP_{std} \times N$$

BHP_{std} = Brake horsepower per engine (standard day)
N = Number of engines operating
W = Gross weight of the airplane

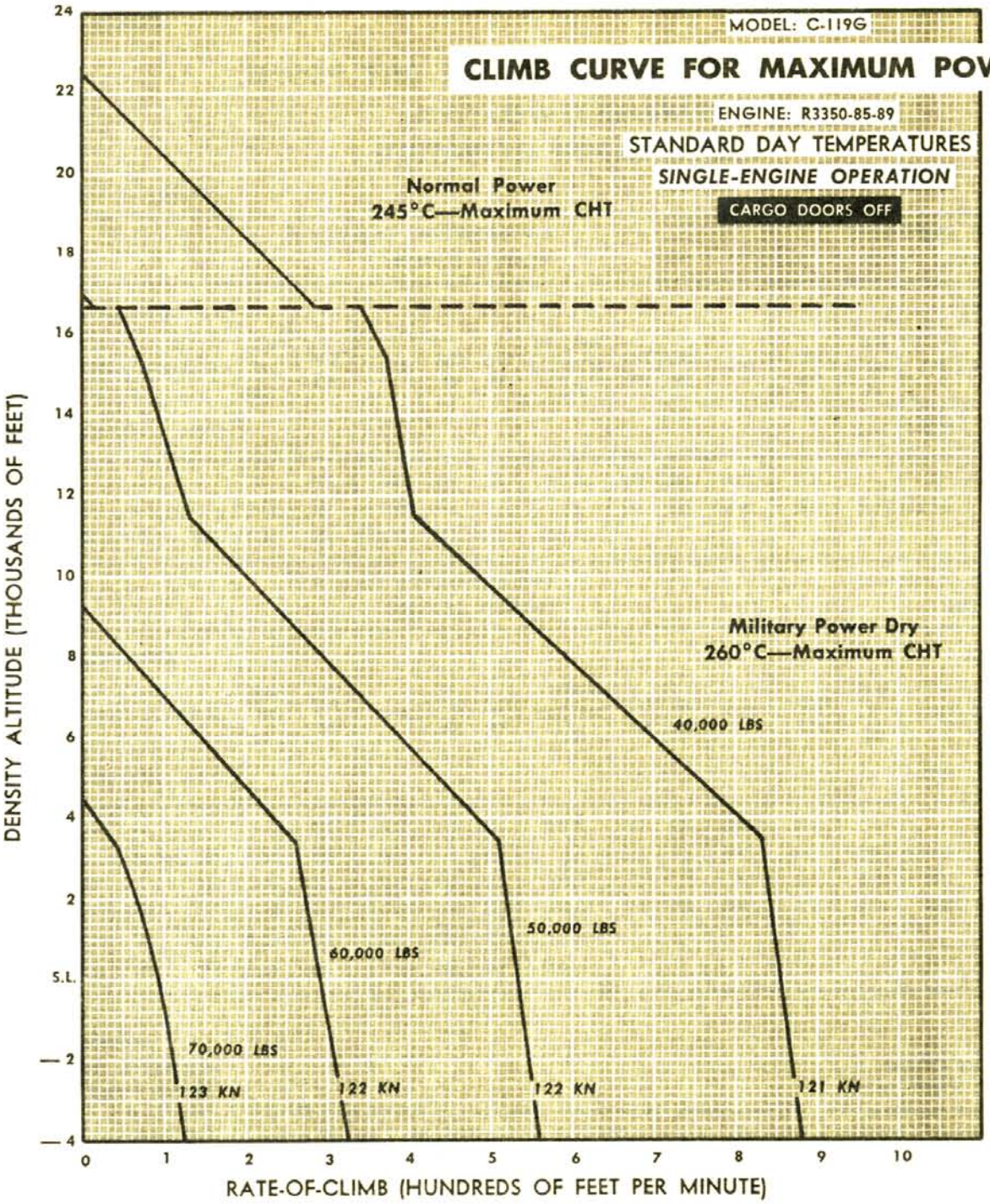
LEGEND

Rate of Climb: Feet Per Min
Distance: Nautical Miles
Time: Minutes
Fuel: Pounds
M.P.: Manifold Pressure
Top: Torque Pressure
RPM: Rev Per Min
CAS: Calibrated Airspeed
TAS: True Airspeed

DATA AS OF: March 1955
DATA BASIS: Flight Test

FUEL GRADE: 115/145
FUEL DENSITY: 6 Lbs/Gal

Figure A-77. Single-Engine Climb Chart For Maximum Wet Power



REMARKS:

(1) Climb speeds quoted are sea level CAS.

(2) 2900 RPM and NORMAL mixture.

(3) Each temperature variation of 5.6°C (10°F) from standard day temperature produces a 1.1% variation in the BHP of each engine. This 1.1% multiplied by the propeller efficiency at best climb speed (approximately 80%) gives a variation of .88% (.0088) in the thrust horsepower. The resulting change in the rate-of-climb values, then, may be obtained from the following formulae:

$$\Delta R/C = \Delta THP \times \frac{33000}{W}$$

$$\Delta THP = .0088\ BHP_{std} \times N$$

BHP_{std} = Brake horsepower per engine (standard day)
N = Number of engines operating
W = Gross weight of the airplane

DATA BASIS: Flight Test **DATA AS OF:** March 55

Figure A-78. Single-Engine Climb Curve For Maximum Dry Power

CARGO DOORS OFF

CLIMB CHART FOR MAXIMUM DRY POWER

STANDARD TEMPERATURES

SINGLE-ENGINE OPERATION

MODEL: C-119G **ENGINE:** (1) R3350-85-89

CONFIGURATION: Cargo Doors Off
WEIGHT: 69,700 LBS.

APPROXIMATE				M.P. IN. HG	TOP PSI	RPM	CAS KN	TAS KN	DENSITY ALTITUDE FEET	TAS KN	CAS KN	RPM	TOP PSI	M.P. IN. HG	APPROXIMATE			
RATE OF CLIMB	FROM SEA LEVEL														FROM SEA LEVEL			RATE OF CLIMB
	DIST.	TIME	FUEL												FUEL	TIME	DIST.	
135	—	—	—	—	159	2900	123	117	−4,000	115	122	2900	159	—	—	—	—	250
100	0	0	585 (1)	59.5	159	2900	123	123	S.L.	122	122	2900	159	59.5	585 (1)	0	0	210
									5,000	128	119	2900	152	54.5	1790	29.4	61	100

CONFIGURATION: Cargo Doors Off
WEIGHT: 54,000 LBS.

CONFIGURATION: Cargo Doors Off
WEIGHT: 44,000 LBS.

APPROXIMATE				M.P. IN. HG	TOP PSI	RPM	CAS KN	TAS KN	DENSITY ALTITUDE FEET	TAS KN	CAS KN	RPM	TOP PSI	M.P. IN. HG	APPROXIMATE			
RATE OF CLIMB	FROM SEA LEVEL														FROM SEA LEVEL			RATE OF CLIMB
	DIST.	TIME	FUEL												FUEL	TIME	DIST.	
465	—	—	—	—	159	2900	122	116	−4,000	116	122	2900	159	—	—	—	—	740
435	0	0	585 (1)	59.5	159	2900	122	122	S.L.	122	122	2900	159	59.5	585 (1)	0	0	710
335	25	12.3	1090	54.5	152	2900	117	126	5,000	126	117	2900	152	54.5	890	7.3	15	620
110	73	35	1850	45.5	130	2900	109	127	10,000	125	108	2900	130	45.5	1225	17.3	36	380
									15,000	129	102	2600	139	50.0	1790	35	73	245
									20,000	145	106	2600	120	42.0	3090	78.5	175	10

REMARKS:

(1) Taxi and take-off allowance.
(2) 2900 RPM and NORMAL mixture.
(3) Each temperature variation of 5.6°C (10°F) from standard day temperature produces a 1.1% variation in the BHP of each engine. This 1.1% multiplied by the propeller efficiency at best climb speed (approximately 80%) gives a variation of .88% (.0088) in the thrust horsepower. The resulting change in the rate-of-climb values, then, may be obtained from the following formulae:

$$\Delta R/C = \Delta THP \times \frac{33000}{W}$$

$$\Delta THP = .0088\ BHP_{Std} \times N$$

BHP_{Std} = Brake horsepower per engine (standard day)
N = Number of engines operating
W = Gross weight of the airplane

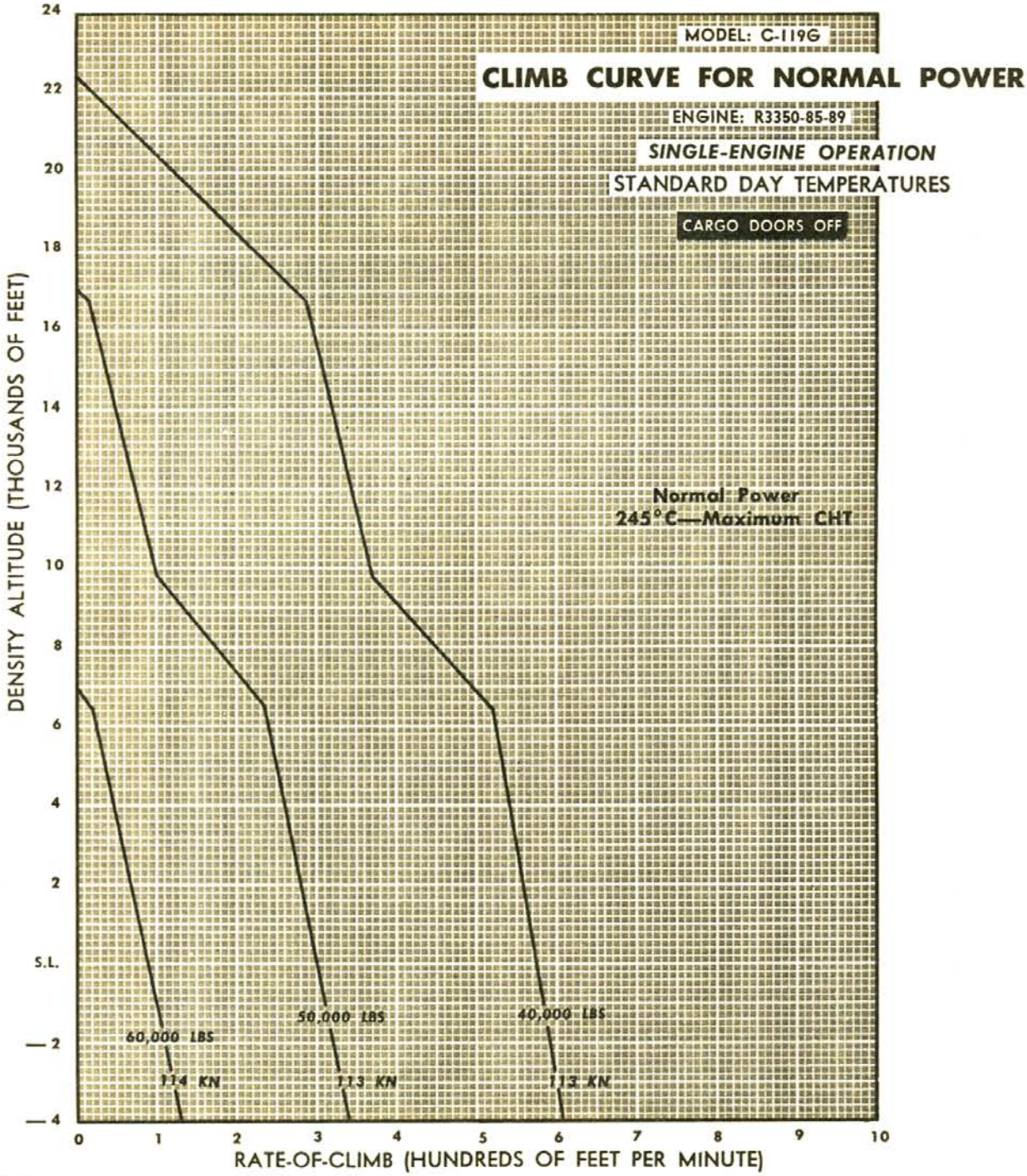
LEGEND

Rate of Climb: Feet Per Min
Distance: Nautical Miles
Time: Minutes
Fuel: Pounds
M.P.: Manifold Pressure
Top: Torque Pressure
RPM: Rev Per Min
CAS: Calibrated Airspeed
TAS: True Airspeed

DATA AS OF: March 1955
DATA BASIS: Flight Test

FUEL GRADE: 115/145
FUEL DENSITY: 6 Lbs/Gal

Figure A-79. Single-Engine Climb Chart For Maximum Dry Power



REMARKS:

(1) Climb speeds quoted are sea level CAS.

(2) 2600 RPM and NORMAL mixture.

(3) Each temperature variation of 5.6°C (10°F) from standard day temperature produces a 1.1% variation in the BHP of each engine. This 1.1% multiplied by the propeller efficiency at best climb speed (approximately 80%) gives a variation of .88% (.0088) in the thrust horsepower. The resulting change in the rate-of-climb values, then, may be obtained from the following formulae:

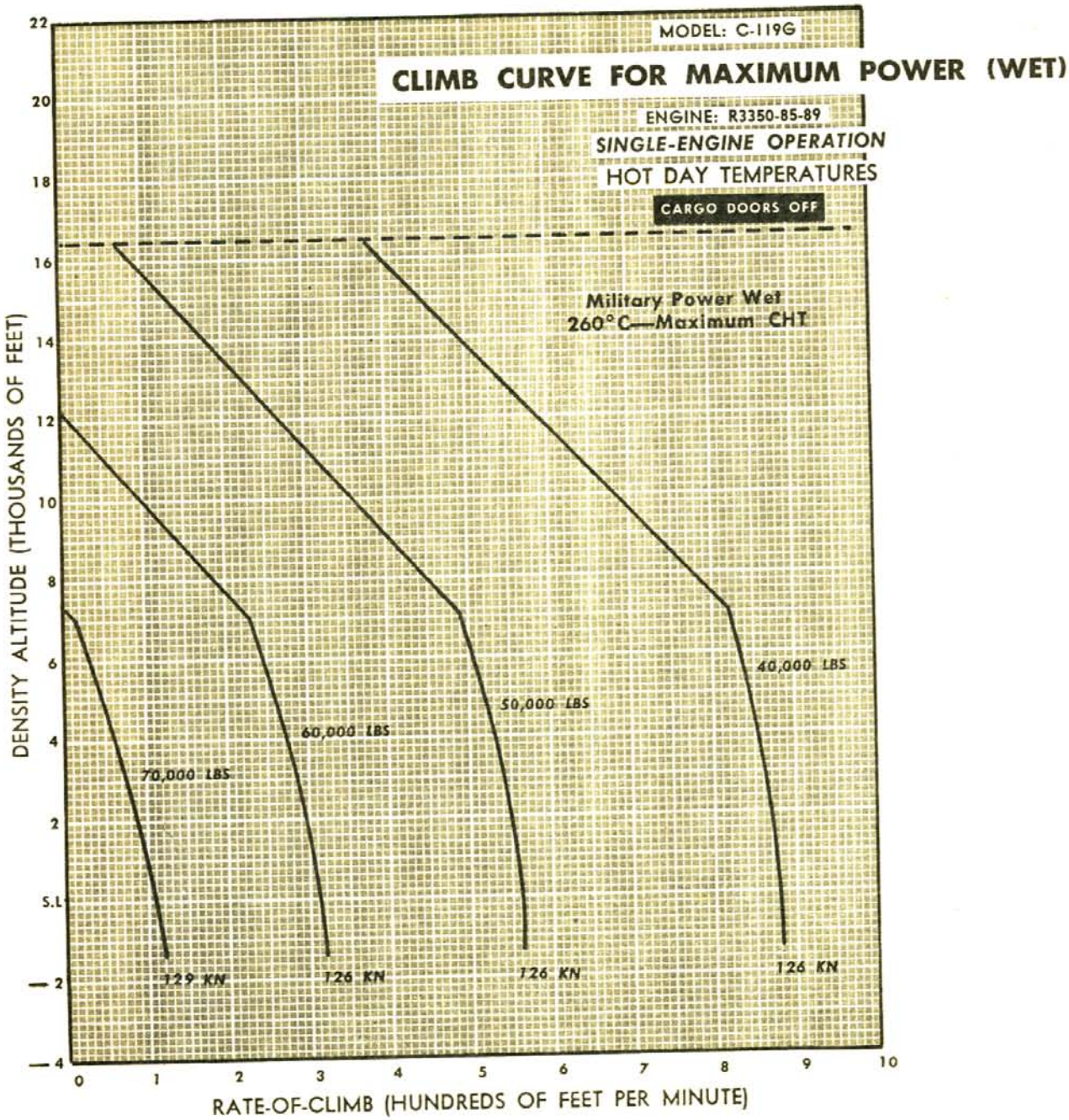
$$\Delta R/C = \Delta THP \times \frac{33000}{W}$$

$$\Delta THP = .0088\ BHP_{std} \times N$$

BHP_{std} = Brake horsepower per engine (standard day)
N = Number of engines operating
W = Gross weight of the airplane

DATA BASIS: Flight Test **DATA AS OF:** March 55

Figure A-80. Single-Engine Climb Curve For Normal Power



REMARKS:

1. 2900 RPM and NORMAL mixture.
2. Climb speeds quoted are sea level CAS.
3. At maximum wet power the airplane flies at speed for best climb; the limiting cylinder head temperature of 260°C can be maintained. Due to the increased cooling drag, operation at maximum dry power above 16,500 feet density altitude on a hot day is impractical.
4. Refer to Figure A-76 for standard temperature data.

DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-81. Single-Engine Climb Curve For Maximum Wet Power (Hot Day)

MODEL: C-119G

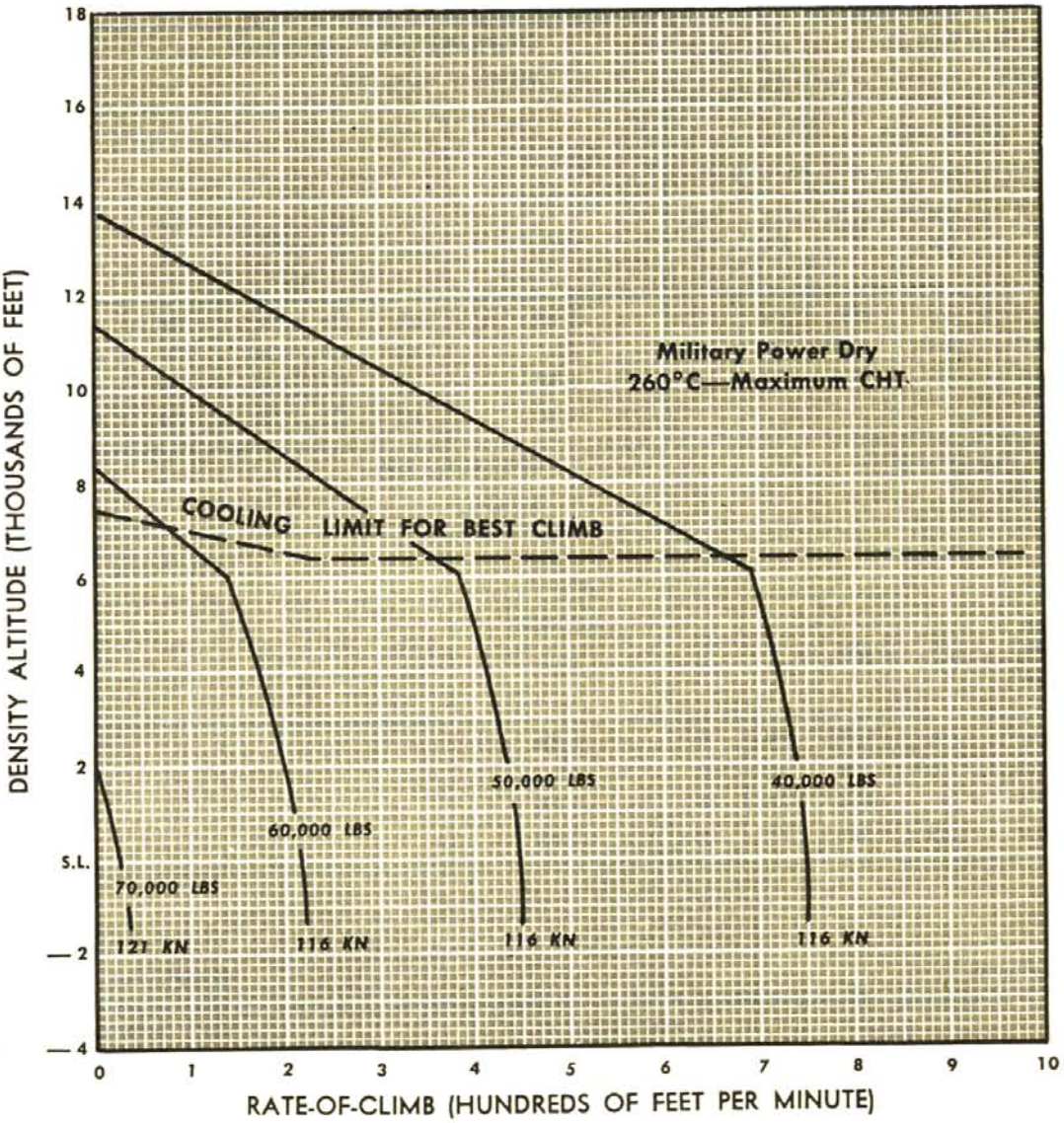
CLIMB CURVE FOR MAXIMUM POWER (DRY)

ENGINE: R3350-85-89

SINGLE-ENGINE OPERATION

HOT DAY TEMPERATURES

CARGO DOORS OFF



REMARKS:

1. 2900 RPM and NORMAL mixture.
2. Climb speeds quoted are sea level CAS.
3. Below the cooling limit line, the airplane flies at speed for best rate-of-climb; the limiting cylinder head temperature of 260°C can be maintained. Above the cooling limit line the airplane flies at speed higher than best climb speed or limit control speed in order to maintain cylinder-head temperature of 260°C with cowl flaps full OPEN.
4. Refer to Figure A-78 for standard temperature data.

DATA BASIS: Flight Test **DATA AS OF:** March 55

Figure A-82. Single-Engine Climb Curve For Maximum Dry Power (Hot Day)

CARGO DOORS OFF

MAXIMUM ENDURANCE

STANDARD TEMPERATURES

SINGLE-ENGINE OPERATION

MODEL: C-119G **ENGINE:** (1) R-3350-85-89

CONFIGURATION: Cargo Doors Off
WEIGHT: 69,700 LBS.

APPROXIMATE							DENSITY ALTITUDE FEET	APPROXIMATE						
LB/HR	RPM	M.P. IN. HG	TOP PSI	BHP	CAS KN	TAS KN		TAS KN	CAS KN	BHP	TOP PSI	M.P. IN. HG	RPM	LB/HR
1915	2680	——	147	2780	118	112	–4,000	106	112	2190	126	——	2470	1325
2070	2750	53.0	151	2920	121	121	S.L.	114	114	2340	132	44.0	2520	1490
2245	2830	54.5	157	3120	121	130	5,000	121	112	2520	139	44.5	2570	1660
							10,000	130	112	2770	141	47.5	2790	1910

CONFIGURATION: Cargo Doors Off
WEIGHT: 50,000 LBS.

APPROXIMATE							DENSITY ALTITUDE FEET	APPROXIMATE						
LB/HR	RPM	M.P. IN. HG	TOP PSI	BHP	CAS KN	TAS KN		TAS KN	CAS KN	BHP	TOP PSI	M.P. IN. HG	RPM	LB/HR
750	2280	——	105	1690	104	98	–4,000							
795	2320	37.5	108	1770	102	102	S.L.							
1000	2360	36.5	117	1940	105	113	5,000							
1190	2390	36.0	123	2070	102	119	10,000							

CONFIGURATION:
WEIGHT:

REMARKS:

(1) Use NORMAL mixtures.
(2) If BHP cannot be attained within limit manifold pressure, adjust power settings using Figures A-7 and A-8.

LEGEND

LB/HR: FUEL FLOW
RPM: REVOLUTIONS PER MINUTE
M.P.: MANIFOLD PRESSURE
TOP: TORQUE PRESSURE
BHP: BRAKE HORSEPOWER
CAS: CALIBRATED AIRSPEED
TAS: TRUE AIRSPEED

DATA AS OF: March 1955
DATA BASIS: Flight Test

FUEL GRADE: 115/145
FUEL DENSITY: 6 Lbs/Gal

Figure A-83. Single-Engine Maximum Endurance

AIRCRAFT MODEL: C-119G

ENGINE: R-3350-85-89

FLIGHT OPERATION INSTRUCTION CHART

STANDARD TEMPERATURES

CHART WEIGHT LIMITS: 69,700 TO 60,000 POUNDS

CARGO DOORS OFF

NUMBER OF ENGINES OPERATING: 1

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to right or left and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite values nearest desired cruising altitude (ALT) read RPM, manifold pressure (M.P.), torque pressure (TOP) and brake horsepower (BHP). Refer to corresponding column and altitude for new power settings when gross weight falls below limits of this chart.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Air miles per pound (MI/LB) (no wind), pounds per hour (LB/HR), calibrated airspeed (CAS) and true airspeed (TAS) are approximate values for reference. Range values are for an average airplane flying alone (no wind).

COLUMN I RANGE IN AIRMILES		FUEL (1) LB	COLUMN II RANGE IN AIRMILES		COLUMN III RANGE IN AIRMILES		COLUMN IV RANGE IN AIRMILES		FUEL (1) LB	COLUMN V RANGE IN AIRMILES	
STATUTE	NAUTICAL		STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL		STATUTE	NAUTICAL
1090	945	15000							15000	1130	980
995	865	13800							13800	1030	895
905	785	12600							12600	935	810
815	710	11400							11400	835	725
725	630	10200							10200	740	640
635	550	9000							9000	645	560
550	480	7800							7800	560	485
465	405	6600							6600	475	410
380	330	5400							5400	385	335
295	257	4200							4200	300	260
210	185	3000							3000	215	185
125	110	1800							1800	130	110
40	35	600							600	45	35

.070 MAXIMUM CONTINUOUS .061						DENSITY ALT. FEET	STAT. NAUT MI/LB						STAT. NAUT MI/LB						STAT. NAUT MI/LB						DENSITY ALT. FEET	STAT. .072 NAUT .062 MI/LB					
RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN
						10000																			10000						
						5000																			5000	2900	56.5	159	3250	132	142
2900	—	159	3250	150	142	S.L.																			S.L.	2900	59.5	159	3250	147	147
						−4000																			−4000	2850	—	157	3150	147	139

REMARKS:

1. Make allowance for warm-up, take-off and climb plus allowances for wind reserve and combat as required.

DATA AS OF: March 1955

BASED ON: Flight Test

EXAMPLE

It is required to fly 740 statute miles at a gross weight of 69,000 pounds and at 5000 feet altitude. The total fuel load is 12,200 pounds and the allowances required for warm-up, take-off, climb, winds, reserves and combat amount to 2000 pounds of fuel, leaving 10,200 pounds net for cruising. What are the engine settings?

With range and net cruise fuel, enter appropriate chart column (in this case column V). For 5000 feet altitude, maintain 2900 rpm, 159 psi torque pressure and 56.5 in. manifold pressure to obtain a brake horsepower of 3250 with NORMAL mixture setting. If engine settings listed do not result in a BHP of 3250, adjust engine settings using the brake horsepower chart of Figure A-7. When weight decreases below 60,000 pounds, refer to next weight chart 60,000 to 50,000 pounds under column V at 5000 feet for revision of engine settings.

LEGEND

RPM—Rev Per Min
M.P.—Manifold Pressure (in. Hg)
TOP—Torque Pressure
BHP—Brake Horsepower
CAS—Calibrated Airspeed
TAS—True Airspeed
ALT—Density Altitude

FUEL GRADE: 115/145
FUEL DENSITY: 6 Lbs/Gal

Figure A-84. Single-Engine Flight Operation Instruction Chart (69,700-60,000 Lbs.)

AIRCRAFT MODEL: C-119G

ENGINE: R-3350-85-89

FLIGHT OPERATION INSTRUCTION CHART

STANDARD TEMPERATURES

CHART WEIGHT LIMITS: 60,000 TO 50,000 POUNDS

CARGO DOORS OFF

NUMBER OF ENGINES OPERATING: 1

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to right or left and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite values nearest desired cruising altitude (ALT) read RPM, manifold pressure (M.P.), torque pressure (TOP) and brake horsepower (BHP). Refer to corresponding column and altitude for new power settings when gross weight falls below limits of this chart.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Air miles per pound (MI/LB) (no wind), pounds per hour (LB/HR), calibrated airspeed (CAS) and true airspeed (TAS) are approximate values for reference. Range values are for an average airplane flying alone (no wind).

COLUMN I RANGE IN AIRMILES		FUEL (1) LB	COLUMN II RANGE IN AIRMILES		COLUMN III RANGE IN AIRMILES		COLUMN IV RANGE IN AIRMILES		FUEL (1) LB	COLUMN V RANGE IN AIRMILES	
STATUTE	NAUTICAL		STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL		STATUTE	NAUTICAL
1155	1000	15000							15000	1405	1220
1060	920	13800							13800	1265	1095
965	835	12600							12600	1120	975
870	755	11400							11400	980	850
775	670	10200							10200	835	725
680	590	9000							9000	730	635
590	515	7800							7800	635	550
500	435	6600							6600	535	465
410	355	5400							5400	440	380
320	275	4200							4200	340	295
225	195	3000							3000	245	210
135	120	1800							1800	145	125
45	40	600							600	50	40

.076 MAXIMUM CONTINUOUS .066						DENSITY ALT. FEET	STAT. NAUT MI/LB						STAT. NAUT MI/LB						STAT. NAUT MI/LB						DENSITY ALT. FEET	STAT. .081 NAUT .070 MI/LB					
RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN
						10000																			10000	2900	49.5	142	2900	122	142
2900	56.5	159	3250	148	160	5000																			5000	2820	54.0	156	3100	145	156
2900	59.5	159	3250	157	157	S.L.																			S.L.	2800	55.5	154	3040	151	151
2900	—	159	3250	162	153	−4000																			−4000	2740	—	150	2900	151	143

REMARKS:

1. Make allowance for warm-up, take-off and climb plus allowances for wind reserve and combat as required.

DATA AS OF: March 1955

BASED ON: Flight Test

EXAMPLE

It is required to fly 870 statute miles at a gross weight of 59,000 pounds and at 5000 feet altitude. The total fuel load is 13,600 pounds and the allowances required for warm-up, take-off, climb, winds, reserves and combat amount to 2200 pounds of fuel leaving 11,400 pounds net for cruising. What are the engine settings?

With range and net cruise fuel, enter appropriate chart column (in this case column I). For 5000 feet altitude, maintain 2900 rpm, 159 psi torque pressure and 56.5 in. manifold pressure to obtain a brake horsepower of 3250 with NORMAL mixture setting. If engine settings listed do not result in a BHP of 3250, adjust engine settings using the brake horsepower chart of Figure A-7. When weight decreases below 50,000 pounds, refer to next weight chart 50,000 to 40,000 pounds under column I at 5000 feet for revision of engine settings.

LEGEND

RPM—Rev Per Min
M.P.—Manifold Pressure (in. Hg)
TOP—Torque Pressure
BHP—Brake Horsepower
CAS—Calibrated Airspeed
TAS—True Airspeed
ALT—Density Altitude

FUEL GRADE: 115/145

FUEL DENSITY: 6 Lbs/Gal

Figure A-85. Single-Engine Flight Operation Instruction Chart (60,000-50,000 Lbs.)

AIRCRAFT MODEL: C-119G

ENGINE: R-3350-85-89

FLIGHT OPERATION INSTRUCTION CHART

STANDARD TEMPERATURES

CHART WEIGHT LIMITS: 50,000 TO 40,000 POUNDS

CARGO DOORS OFF

NUMBER OF ENGINES OPERATING: 1

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to right or left and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite values nearest desired cruising altitude (ALT) read RPM, manifold pressure (M.P.), torque pressure (TOP) and brake horsepower (BHP). Refer to corresponding column and altitude for new power settings when gross weight falls below limits of this chart.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Air miles per pound (MI/LB) (no wind), pounds per hour (LB/HR), calibrated airspeed (CAS) and true airspeed (TAS) are approximate values for reference. Range values are for an average airplane flying alone (no wind).

COLUMN I RANGE IN AIRMILES		FUEL (1) LB	COLUMN II RANGE IN AIRMILES		COLUMN III RANGE IN AIRMILES		COLUMN IV RANGE IN AIRMILES		FUEL (1) LB	COLUMN V RANGE IN AIRMILES	
STATUTE	NAUTICAL		STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL		STATUTE	NAUTICAL
615	535	7800	690	600	770	670	845	735	7800	925	805
520	455	6600	585	510	650	565	715	620	6600	785	680
425	370	5400	480	415	535	465	585	510	5400	640	555
330	290	4200	370	325	415	360	455	395	4200	500	435
235	205	3000	265	230	295	255	325	285	3000	355	310
140	125	1800	160	140	180	155	195	170	1800	215	185
45	40	600	55	45	60	50	65	55	600	70	60

.079 MAXIMUM CONTINUOUS .069						DENSITY ALT. FEET	STAT. .089 NAUT .077 MI/LB						STAT. .099 NAUT .086 MI/LB						STAT. .108 NAUT .094 MI/LB						DENSITY ALT. FEET	STAT. .119 NAUT .103 MI/LB					
RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN	RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN		RPM	M.P.	TOP PSI	BHP	CAS KN	TAS KN
						10000	2900	49.5	142	2900	142	165	2770	47.0	141	2740	138	161	2520	41.0	135	2100	128	149	10000	2440	37.5	127	2180	115	134
2900	56.5	159	3250	158	170	5000	2790	52.5	154	3040	153	165	2600	46.0	145	2650	143	154	2520	42.0	133	2360	134	144	5000	2400	39.0	126	2170	124	134
2900	59.5	159	3250	165	165	S.L.	2740	52.5	150	2900	156	156	2590	47.0	140	2550	146	146	2510	43.5	130	2300	138	138	S.L.	2460	41.0	124	2150	132	132
2900	—	159	3250	169	160	−4000	2680	—	147	2760	156	148	2570	—	137	2480	148	140	2500	—	129	2280	140	133	−4000	2450	—	122	2110	135	128

REMARKS:

1. Make allowance for warm-up, take-off and climb plus allowances for wind reserve and combat as required.

DATA AS OF: March 1955

BASED ON: Flight Test

EXAMPLE

It is required to fly 265 statute miles at a gross weight of 49,000 pounds and at 10,000 feet altitude. The total fuel load is 4200 pounds and the allowances required for warm-up, take-off, climb, winds, reserves and combat amount to 1200 pounds of fuel leaving 3000 pounds net for cruising. What are the engine settings?

With range and net cruise fuel, enter appropriate chart column (in this case column II). For 10,000 feet altitude, maintain 2900 rpm, 142 psi torque pressure and 49.5 in. manifold pressure to obtain a brake horsepower of 2900 with NORMAL mixture setting. If engine settings listed do not result in a BHP of 2900, adjust engine settings using the brake horsepower chart of Figure A-7.

LEGEND

RPM—Rev Per Min
M.P.—Manifold Pressure (in. Hg)
TOP—Torque Pressure
BHP—Brake Horsepower
CAS—Calibrated Airspeed
TAS—True Airspeed
ALT—Density Altitude

FUEL GRADE: 115/145

FUEL DENSITY: 6 Lbs/Gal

Figure A-86. Single-Engine Flight Operation Instruction Chart (50,000-40,000 Lbs.)

CARGO DOORS OFF

LONG RANGE CRUISE CHART AT SEA LEVEL
LOW BLOWER, NORMAL MIXTURE
STANDARD TEMPERATURES

MODEL: C-119G

SINGLE-ENGINE OPERATION

ENGINE: (1) R-3350-85-89

BEST RANGE AT SEA LEVEL DENSITY ALTITUDE

FUEL LOAD (1)		RANGE IN NAUTICAL MILES				
GALLONS	POUNDS	68,000 LB TO START CRUISE	64,000 LB TO START CRUISE	60,000 LB TO START CRUISE	LB TO START CRUISE	LB TO START CRUISE
3,667	22,000	2150	——	——		
3,333	20,000	1855	2195	——		
3,000	18,000	1585	1885	——		
2,667	16,000	1330	1595	1905		
2,333	14,000	1105	1320	1595		
2,000	12,000	900	1065	1300		
1,667	10,000	720	840	1025		
1,333	8,000	555	640	775		
1,000	6,000	405	455	545		
667	4,000	265	295	345		
333	2,000	130	140	165		

CRUISE CONTROL AT SEA LEVEL DENSITY ALTITUDE

GROSS WEIGHT POUNDS	FUEL FLOW LB/HR	RPM	M. P. IN. HG	TORQUE PRESSURE PSI	BHP	CAS KNOTS	TAS KNOTS
68,000	2245	2850	57.5	157	3150	145	145
66,000	2065	2760	53.5	152	2940	141	141
64,000	1985	2720	52.0	146	2850	139	139
62,000	1800	2620	48.5	144	2650	134	134
60,000	1675	2580	47.0	139	2520	131	131
58,000	1495	2530	44.0	132	2340	127	127
56,000	1245	2450	41.0	123	2120	122	122
54,000	1070	2410	39.0	117	1990	118	118
52,000	965	2380	38.5	115	1920	116	116
50,000	855	2350	38.0	112	1860	115	115
48,000	800	2330	37.5	109	1790	115	115
46,000	770	2300	37.0	107	1730	114	114
44,000	708	2240	36.0	101	1600	113	113

REMARKS:

(1) Make allowance for warm-up, take-off, climb, wind, reserve, and combat before entering chart. Fly power settings from cruise control chart. Fuel flow is 5% conservative.

(2) Ranges quoted can be obtained only by adjusting power settings at the end of each 2000 pounds of fuel used.

(3) If BHP listed cannot be obtained within limit manifold pressure, adjust power settings using Figure A-7.

DATA AS OF: March 1955

DATA BASIS: Flight Test

FUEL GRADE: 115/145

FUEL DENSITY: 6 Lbs/Gal

Figure A-87. Single-Engine Long Range Cruise at Sea Level (Low Blower)

CARGO DOORS OFF

LONG RANGE CRUISE CHART AT 5,000 FEET
LOW BLOWER, NORMAL MIXTURE
STANDARD TEMPERATURES

MODEL: C-119G

SINGLE-ENGINE OPERATION

ENGINE: (1) R-3350-85-89

BEST RANGE AT 5,000 FEET DENSITY ALTITUDE

FUEL LOAD (1)		RANGE IN NAUTICAL MILES				
GALLONS	POUNDS	64,000 LB TO START CRUISE	60,000 LB TO START CRUISE	G.W. TO START CRUISE	G.W. TO START CRUISE	G.W. TO START CRUISE
3,333	20,000	1985	--			
3,000	18,000	1690	--			
2,667	16,000	1425	1700			
2,333	14,000	1185	1410			
2,000	12,000	970	1140			
1,667	10,000	780	900			
1,333	8,000	605	685			
1,000	6,000	440	495			
667	4,000	285	320			
333	2,000	140	155			

CRUISE CONTROL AT 5,000 FEET DENSITY ALTITUDE

GROSS WEIGHT POUNDS	FUEL FLOW LB/HR	RPM	M. P. IN. HG	TORQUE PRESSURE PSI	BHP	CAS KNOTS	TAS KNOTS
64,000	2330	2900	56.5	159	3250	141	152
62,000	2065	2740	51.0	152	2940	136	147
60,000	1905	2660	48.0	148	2760	134	144
58,000	1775	2600	46.0	143	2620	130	140
56,000	1580	2540	42.5	136	2430	125	135
54,000	1380	2480	40.0	128	2240	121	130
52,000	1215	2430	38.0	123	2100	116	125
50,000	1070	2380	37.0	118	1990	112	121
48,000	965	2360	36.0	116	1920	110	119
46,000	865	2340	35.5	113	1870	110	119
44,000	820	2320	35.0	111	1820	111	120

REMARKS:

(1) Make allowance for warm-up, take-off, climb, wind, reserve, and combat before entering chart. Fly power settings from cruise control chart. Fuel flow is 5% conservative.

(2) Ranges quoted can be obtained only by adjusting power settings at the end of each 2000 pounds of fuel used.

(3) If BHP listed cannot be obtained within limit manifold pressure, adjust power settings using Figure A-7.

DATA AS OF: March 1955

DATA BASIS: Flight Test

FUEL GRADE: 115/145

FUEL DENSITY: 6 Lbs/Gal

Figure A-88. Single-Engine Long Range Cruise at 5,000 Feet (Low Blower)

CARGO DOORS OFF

LONG RANGE CRUISE CHART AT 10,000 FEET
LOW BLOWER, NORMAL MIXTURE
STANDARD TEMPERATURES

MODEL: C-119G

SINGLE-ENGINE OPERATION

ENGINE: (1) R-3350-85-89

BEST RANGE AT 10,000 FEET DENSITY ALTITUDE

FUEL LOAD (1)		RANGE IN NAUTICAL MILES				
GALLONS	POUNDS	60,000 LB TO START CRUISE	LB TO START CRUISE	LB TO START CRUISE	LB TO START CRUISE	LB TO START CRUISE
2,667	16,000	1610				
2,333	14,000	1320				
2,000	12,000	1060				
1,667	10,000	835				
1,333	8,000	640				
1,000	6,000	460				
667	4,000	295				
333	2,000	145				

CRUISE CONTROL AT 10,000 FEET DENSITY ALTITUDE

GROSS WEIGHT POUNDS	FUEL FLOW LB/HR	RPM	M. P. IN. HG	TORQUE PRESSURE PSI	BHP	CAS KNOTS	TAS KNOTS
60,000	2030	2900	49.5	142	2900	122	142
58,000	1870	2750	47.0	140	2720	121	141
56,000	1705	2620	44.0	138	2550	119	139
54,000	1555	2520	41.0	135	2400	118	137
52,000	1405	2470	38.5	130	2260	116	135
50,000	1295	2430	37.0	126	2170	115	134
48,000	1145	2380	35.5	122	2040	113	132
46,000	1025	2350	34.5	118	1960	112	131
44,000	885	2320	34.0	115	1880	112	130

REMARKS:

(1) Make allowance for warm-up, take-off, climb, wind, reserve, and combat before entering chart. Fly power settings from cruise control chart. Fuel flow is 5% conservative.

(2) Ranges quoted can be obtained only by adjusting power settings at the end of each 2000 pounds of fuel used.

(3) If BHP listed cannot be obtained within limit manifold pressure, adjust power settings using Figure A-7.

DATA AS OF: March 1955

DATA BASIS: Flight Test

FUEL GRADE: 115/145

FUEL DENSITY: 6 Lbs/Gal

Figure A-89. Single-Engine Long Range Cruise at 10,000 Feet (Low Blower)

ALTERNATE FUEL GRADE PERFORMANCE DATA.

The performance data presented for alternate grade (100/130) fuel consists of the engine power schedule, the brake horsepower correction charts for maximum wet power and maximum dry power, and the limit take-off gross weight charts for the cargo-doors-on and cargo-doors-off configurations. Refer to ALTERNATE FUEL GRADE LIMITATIONS, Section V, for limitations involved when alternate fuel grade must be used.

ENGINE POWER SCHEDULE.

The Engine Power Schedule for alternate grade fuel presents a series of part throttle and full throttle-critical altitude points for maximum wet and maximum dry powers at standard day temperatures. Note that the sea level settings are part throttle limits for low blower operation as are the 8,000-foot settings for high blower; consequently, overboosting is quite possible if these settings are not made with caution. At the full throttle-critical altitude points, a brake horsepower equal to or greater than the sea level BHP is obtained; this becomes particularly significant when the Brake Horsepower Correction Chart for Maximum Dry Power is used to correct for altitude and atmospheric conditions.

Inasmuch as the schedule is based on engine performance with no ram, power settings at altitudes beyond those included in the schedule will be experienced in flight and may be employed if the limiting torque values listed in the schedule are not exceeded.

BRAKE HORSEPOWER CORRECTION CHARTS.

Brake Horsepower Correction Charts presented for Maximum Wet Power and Maximum Dry Power predict the brake horsepower, expected torque pressure, reject torque pressure, and percent deviation from standard sea level BHP for probable atmospheric conditions which may be encountered at take-off. These charts reflect engine performance only and are applicable to both cargo-doors-on and cargo-doors-off operation.

On the Brake Horsepower Correction Chart for Maximum Dry Power, the per cent deviation from the alternate fuel sea level standard BHP (2600 BHP) shows both positive and negative percent deviations because the engine output at the limiting full throttle-critical altitude points exceeds the brake horsepower obtained at the part throttle sea level limits. Since a power loss has been considered a positive deviation and the limit brake horsepower at the critical altitude is in excess of the sea level limit, a negative deviation is used to indicate a corrected brake horsepower higher than the sea level standard BHP (2600 BHP).

LIMIT TAKE-OFF GROSS WEIGHT CURVES.

The alternate fuel Limit Take-Off Gross Weight Curves show the highest gross weight at which a 100 fpm rate-of-climb can be maintained at various density altitudes with one engine inoperative, landing gear retracted, and the propeller of the inoperative engine feathered. These data are presented for 0° and 14° wing flaps settings, maximum wet and maximum dry powers, as well as the cargo-doors-on and cargo-doors-off configurations.

Note that the limit take-off gross weight is plotted versus percent deviations from the maximum brake horsepower obtained under standard sea level conditions (3420 BHP for maximum power wet and 2600 BHP for maximum dry power). In the event the take-off is made with maximum dry power at some altitude above sea level (assuming near standard atmospheric conditions prevail) a brake horsepower greater than the sea level standard BHP is obtained. The curve is entered with a minus percent deviation value and the limit take-off gross weight is read accordingly.

Before entering the limit take-off gross weight curves, consult the Density Altitude Correction Chart, Figure A-6, to obtain the corrected density altitude.

ENGINE POWER SCHEDULE

STANDARD DAY—NO RAM—RICH MIXTURE

ENGINE: R-3350-85-89 **FUEL GRADE:** 100/130

LOW BLOWER OPERATION

POWER RATING	RPM	THROTTLE	ALTITUDE (FEET)	BHP	M.P. (IN. HG)	TOP (PSI)
Maximum Wet (2)	2900	Part	S. L.	3420	57.4	167.5
	2900	Full	5,250	3420	54.3	167.5
Maximum Dry	2900	Part	S. L.	2600	49.9	127.0
	2900	Full	6,000	2750	48.0	134.7
Normal	2600	Part	S. L.	2555	47.8	139.5
Cruise	2300	Part	S. L.	1690	36.1	104.5
Cruise	2100	Part	S. L.	1425	33.8	96.5

HIGH BLOWER OPERATION

POWER RATING	RPM	THROTTLE	ALTITUDE (FEET)	BHP	M.P. (IN. HG)	TOP (PSI)
Normal	2600	Part	8,000	1710	39.5	93.4
	2600	Full	21,500	1780	35.5	97.2
Cruise	2300	Part	8,000	1520	35.5	93.8
	2300	Full	19,500	1580	34.7	97.5
Cruise	2100	Part	8,000	1430	35.4	96.7
	2100	Full	18,000	1470	34.0	99.4

REMARKS:

(1) Do not exceed the torque pressure or manifold pressure listed whichever comes first.

(2) Do not exceed 50 in. Hg at 2900 rpm (sea level) during take-off, if water injection light does not illuminate or if water pressure gages do not indicate water flow. Serious engine damage may result from detonation.

DATA BASIS: WADC **DATA AS OF:** February 1955

Figure A-90. Engine Power Schedule (100/130 Fuel)

MODEL: C-119G

BRAKE HORSEPOWER CORRECTION CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (WET) **MAXIMUM POWER (WET)**

3420 BHP at Standard Sea Level Conditions

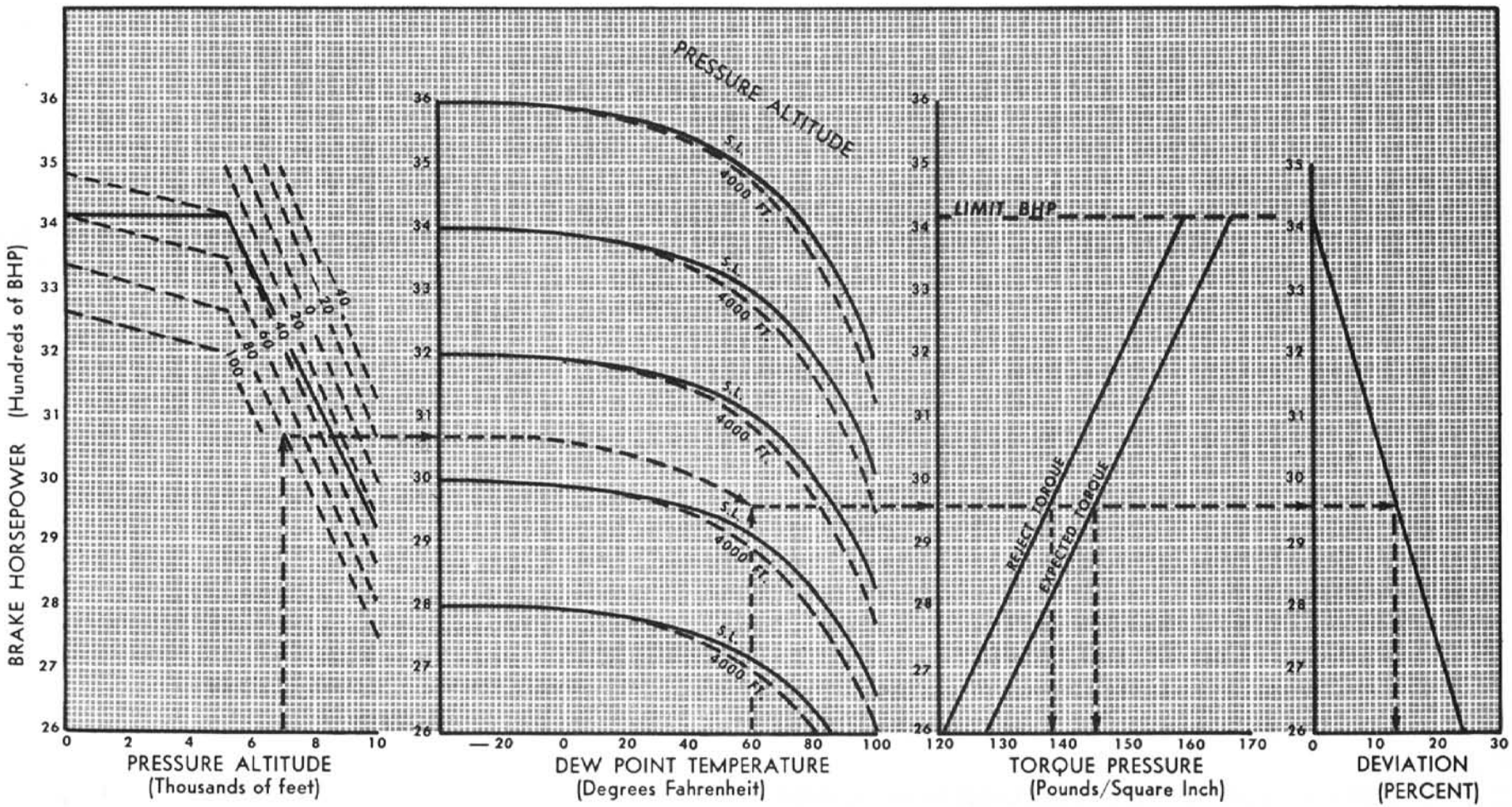
ALTERNATE FUEL 100/130

LOW BLOWER

EXAMPLE

KNOWN: 7,000 ft. = Pressure Altitude
80° F = FAT = CAT
60° F = Dew Point

READ: 145 psi = Expected Torque
138 psi = Reject Torque
13% = Deviation



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-91. Brake Horsepower Correction Chart (100/130 Fuel—Wet Power)

MODEL: C-119G

BRAKE HORSEPOWER CORRECTION CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (DRY) **MAXIMUM POWER (DRY)**

2600 BHP at Standard Sea Level Conditions

ALTERNATE FUEL 100/130

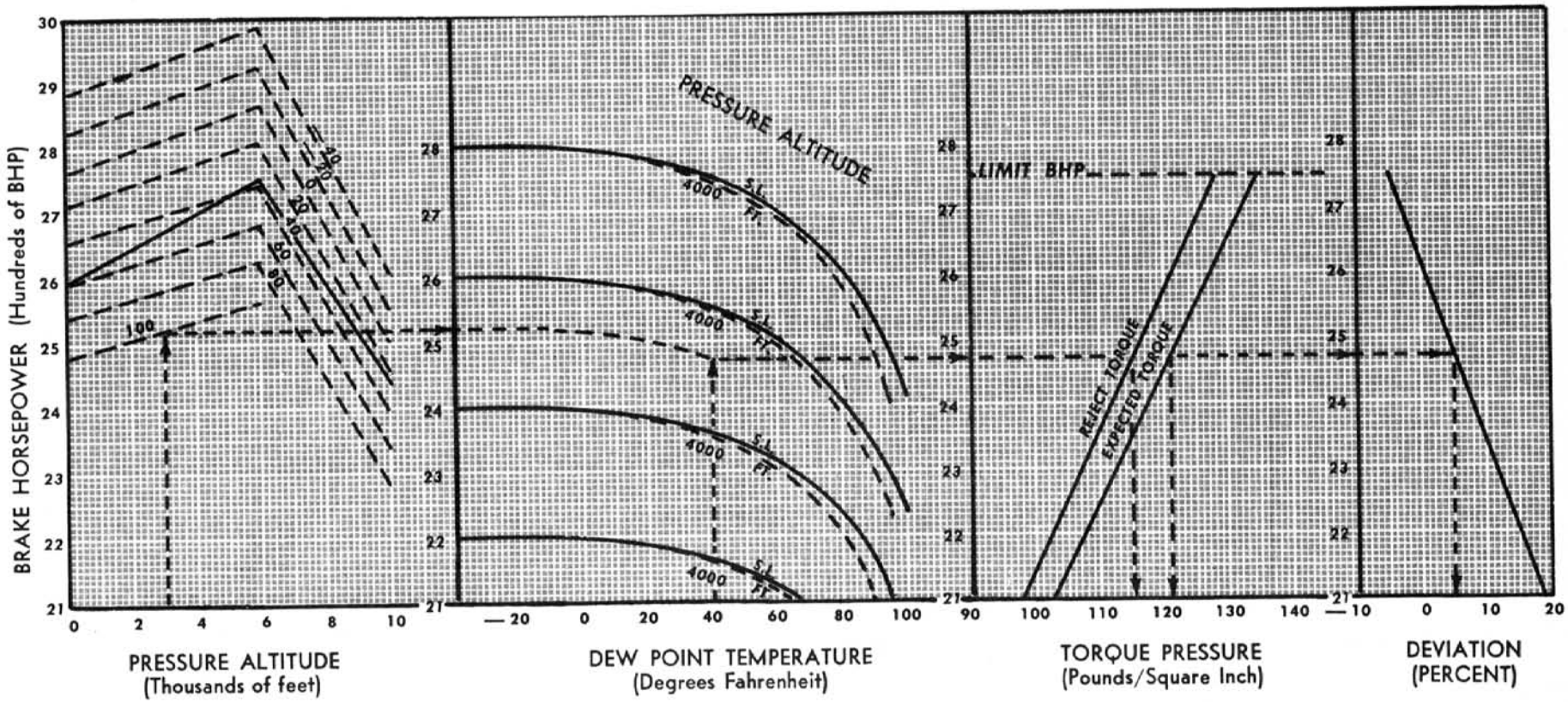
LOW BLOWER

EXAMPLE

KNOWN: 3,000 ft. = Pressure Altitude
100° F = FAT = CAT
40° F = Dew Point

READ: 121 psi = Expected Torque
115 psi = Reject Torque

5% = Deviation



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-92. Brake Horsepower Correction Chart (100/130 Fuel—Dry Power)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (WET) MAXIMUM POWER (WET)

3420 BHP at Standard Sea Level Conditions

WING FLAPS 0°

ALTERNATE FUEL 100/130

CARGO DOORS ON

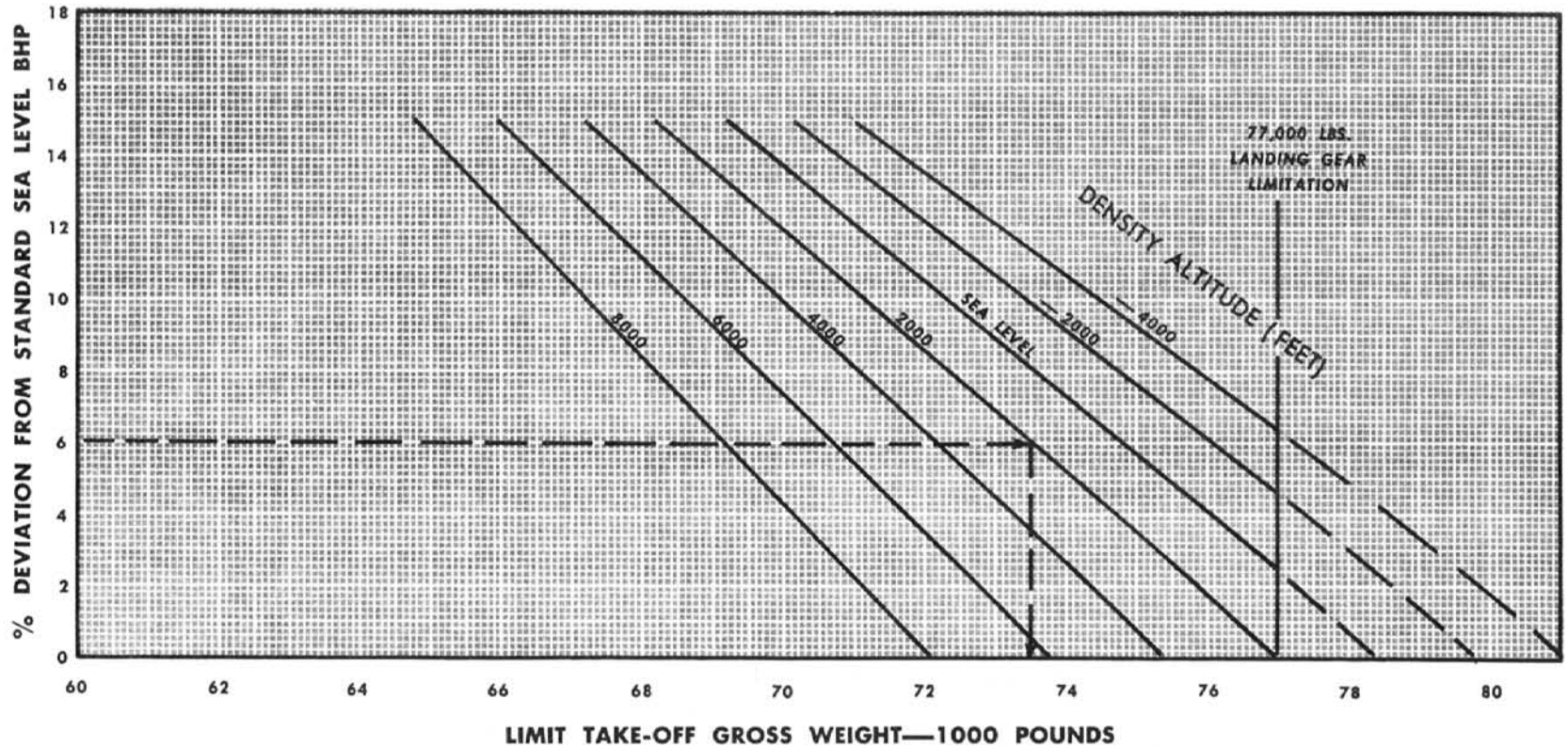
EXAMPLE

KNOWN: 2000 ft. = Density Altitude
6% = Deviation

FIND: Limit Take-off Gross Weight = 73,500 lbs.

NOTES

1. **This curve is based on a single-engine rate-of-climb of 100 fpm.**



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-93. Limit Take-off Weight Curve (100/130 Fuel—Take-off Wet Power—Flaps 0°)

Revised 1 November 1955

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (WET) MAXIMUM POWER (WET)

3420 BHP at Standard Sea Level Conditions

WING FLAPS 14°

ALTERNATE FUEL 100/130

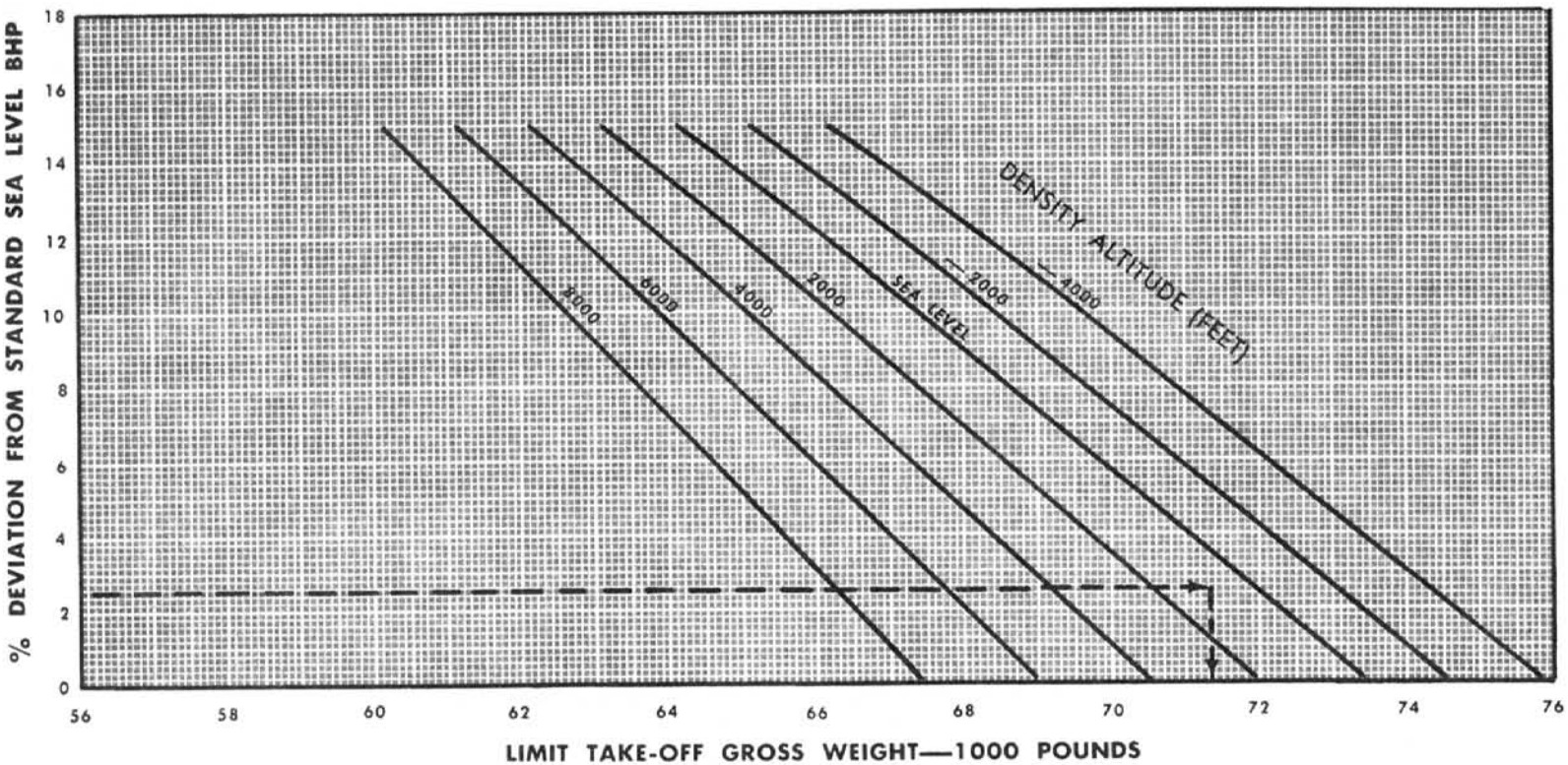
CARGO DOORS ON

EXAMPLE

KNOWN: 800 ft. = Density Altitude
2.5% = Deviation
FIND: Limit Take-off Gross Weight = 71,400 lbs.

NOTES

1. This curve is based on a single-engine rate-of-climb of 100 fpm.



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-94. Limit Take-off Weight Curve (100/130 Fuel—Take-off Wet Power—Flaps 14°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (DRY) MAXIMUM POWER (DRY)

2600 BHP at Standard Sea Level Conditions

WING FLAPS 0°

ALTERNATE FUEL 100/130

CARGO DOORS ON

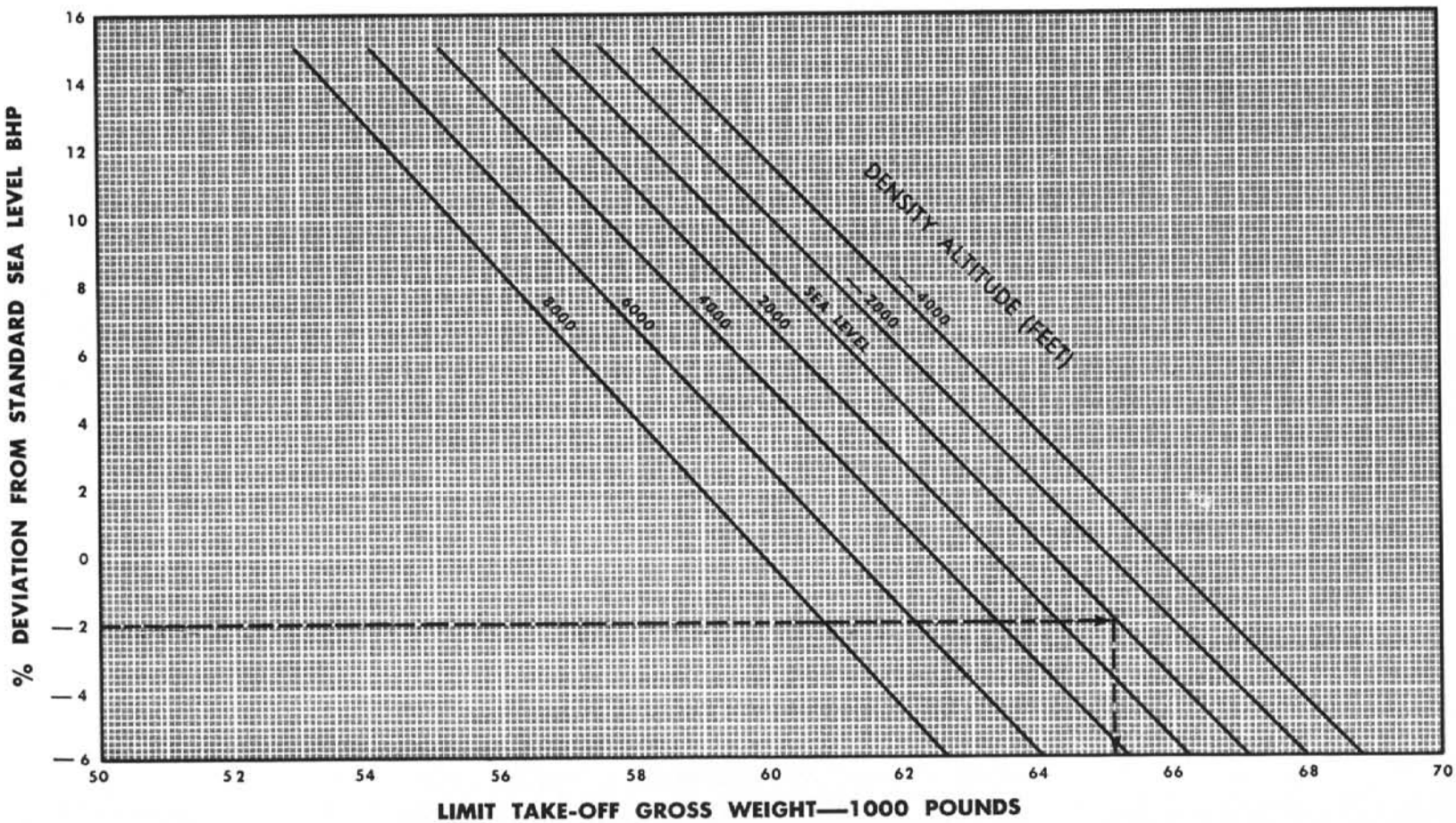
EXAMPLE

KNOWN: Sea Level = Density Altitude
—2% = Deviation

FIND: Limit Take-off Gross Weight = 65,100 lbs.

NOTES

1. **This curve is based on a single-engine rate-of-climb of 100 fpm.**
2. **Add 0.4% deviation for every 10° F increase in FAT above standard temperature to compensate for additional cooling drag.**



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-95. Limit Take-off Weight Curve (100/130 Fuel—Take-off Dry Power—Flaps 0°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (DRY) MAXIMUM POWER (DRY)
2600 BHP at Standard Sea Level Conditions

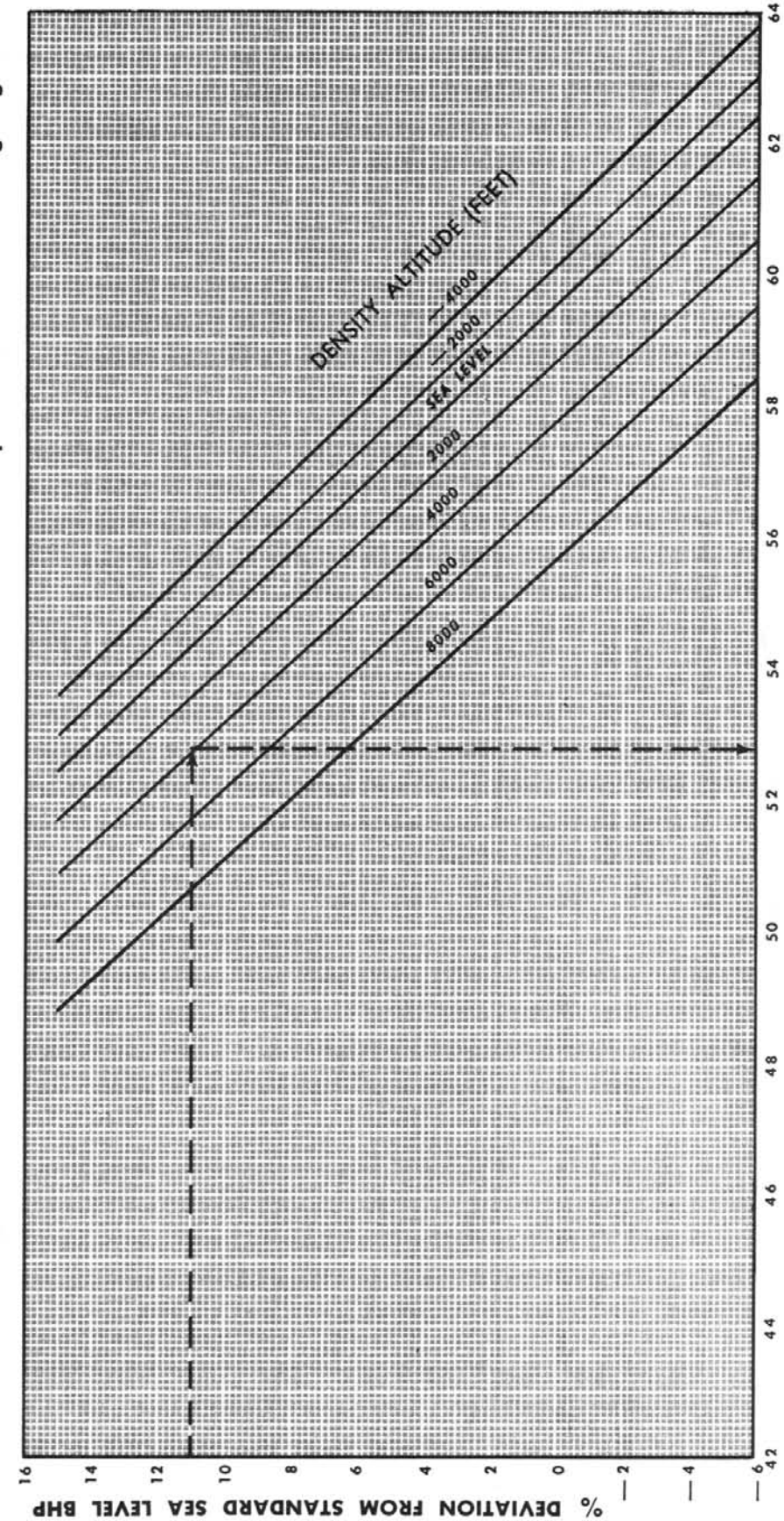
EXAMPLE

KNOWN: 4000 ft. = Density Altitude
11% = Deviation
WING FLAPS 14°
ALTERNATE FUEL 100/130
CARGO DOORS ON

FIND: Limit Take-off Gross Weight = 52,800 lbs.

NOTES

1. This curve is based on a single-engine rate-of-climb of 100 fpm.
2. Add 0.4% deviation for every 10° F increase in FAT above standard temperature to compensate for additional cooling drag.



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-96. Limit Take-off Weight Curve (100/130 Fuel—Take-off Dry Power—Flaps 14°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (WET) MAXIMUM POWER (WET)

3420 BHP at Standard Sea Level Conditions

WING FLAPS 0°

ALTERNATE FUEL 100/130

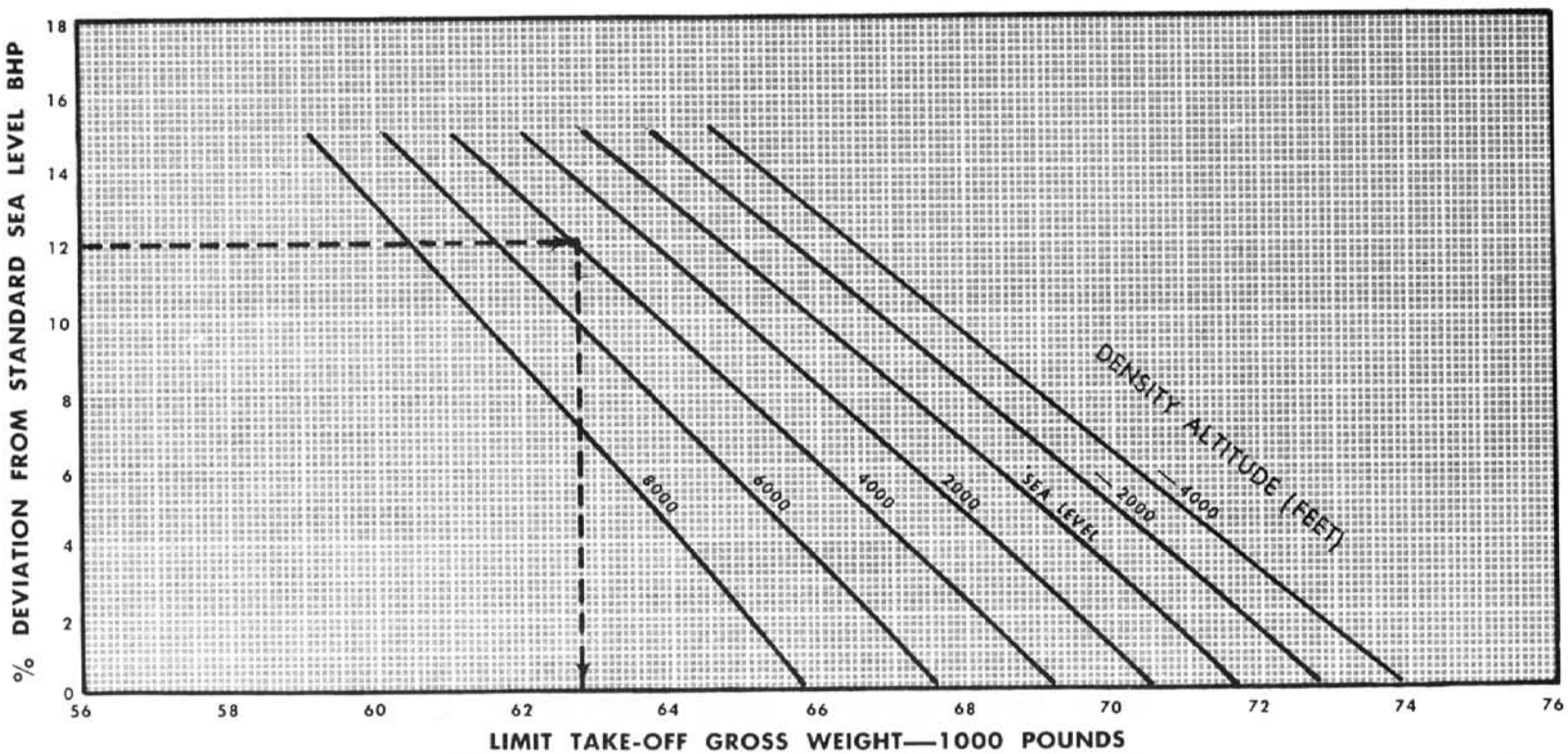
CARGO DOORS OFF

EXAMPLE

KNOWN: 6,000 ft. = Density Altitude
12% = Deviation
FIND: Limit Take-off Gross Weight = 62,700 lbs.

NOTES

1. **This curve is based on a single-engine rate-of-climb of 100 fpm.**



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-97. Limit Take-off Weight Curve (100/130 Fuel—Take-off Wet Power—Flaps 0°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (WET) MAXIMUM POWER (WET)

3420 BHP at Standard Sea Level Conditions

WING FLAPS 14°

ALTERNATE FUEL 100/130

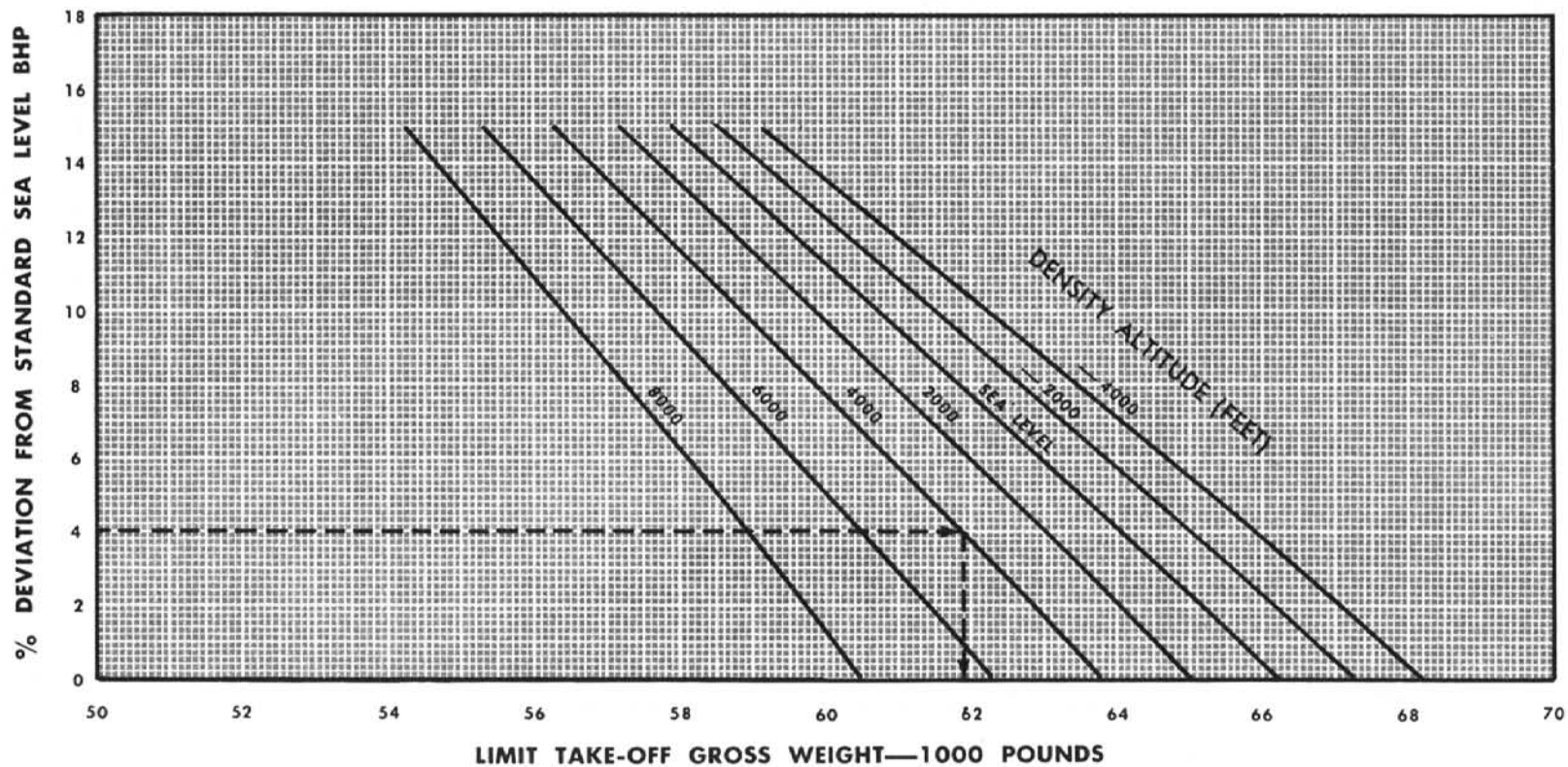
CARGO DOORS OFF

EXAMPLE

KNOWN: 4,000 ft. = Density Altitude
4% = Deviation
FIND: Limit Take-off Gross Weight = 61,900 lbs.

NOTES

1. **This curve is based on a single-engine rate-of-climb of 100 fpm.**



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-98. Limit Take-off Weight Curve (100/130 Fuel—Take-off Wet Power—Flaps 14°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (DRY) MAXIMUM POWER (DRY)

2600 BHP at Standard Sea Level Conditions

WING FLAPS 0°

ALTERNATE FUEL 100/130

CARGO DOORS OFF

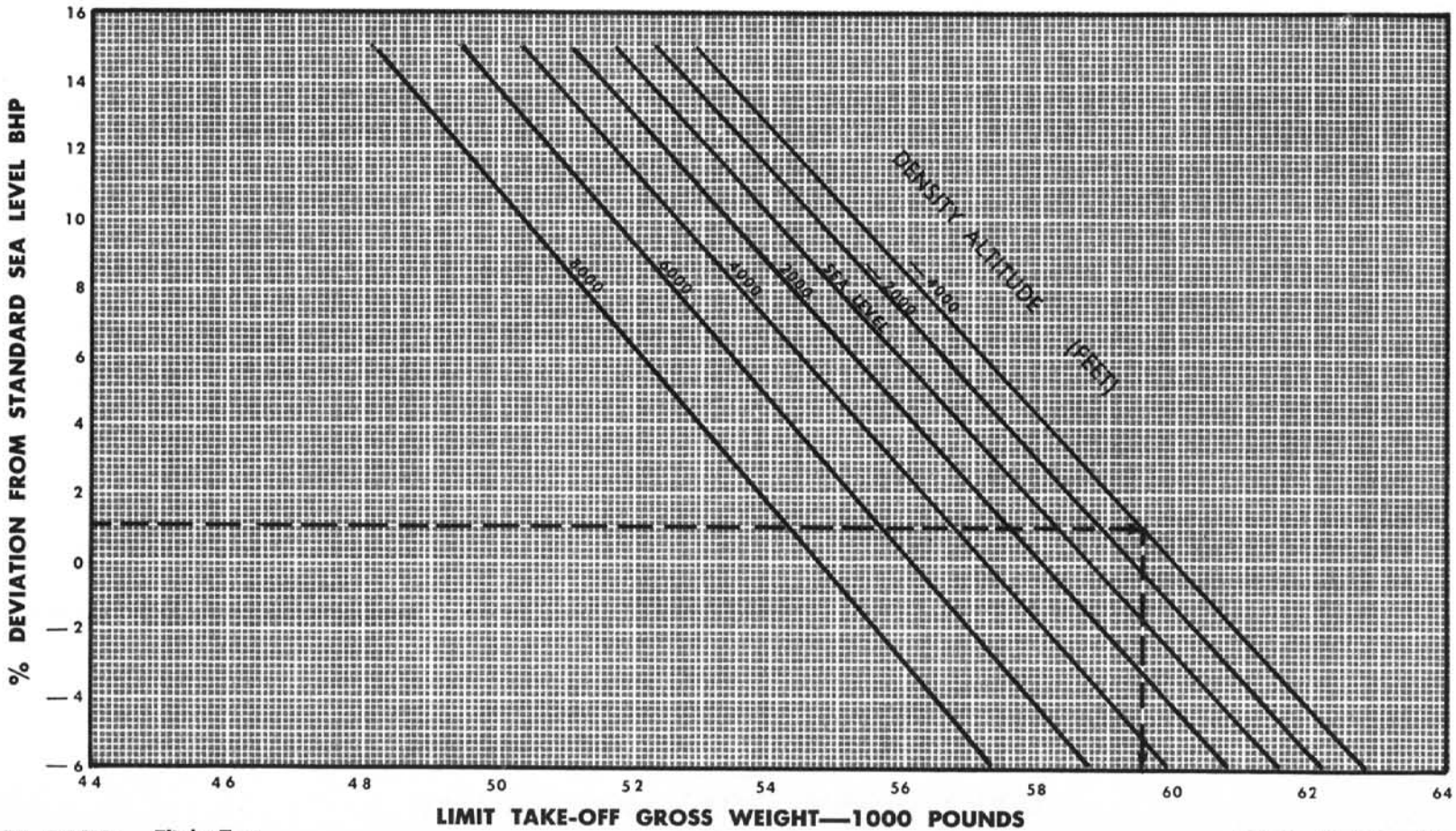
EXAMPLE

KNOWN: —4000 ft. = Density Altitude
1% = Deviation

FIND: Limit Take-off Gross Weight = 59,500 lbs.

NOTES

1. This curve is based on a single-engine rate-of-climb of 100 fpm.
2. Add 0.4% deviation for every 10° F increase in FAT above standard temperature to compensate for additional cooling drag.



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-99. Limit Take-off Weight Curve (100/130 Fuel—Take-off Dry Power—Flaps 0°)

MODEL: C-119G

LIMIT TAKE-OFF GROSS WEIGHT CHART

ENGINE: R3350-85-89

TAKE-OFF POWER (DRY) MAXIMUM POWER (DRY)

2600 BHP at Standard Sea Level Conditions

EXAMPLE

KNOWN: 2000 ft. = Density Altitude
—3% = Deviation

FIND: Limit Take-off Gross Weight = 54,400 lbs.

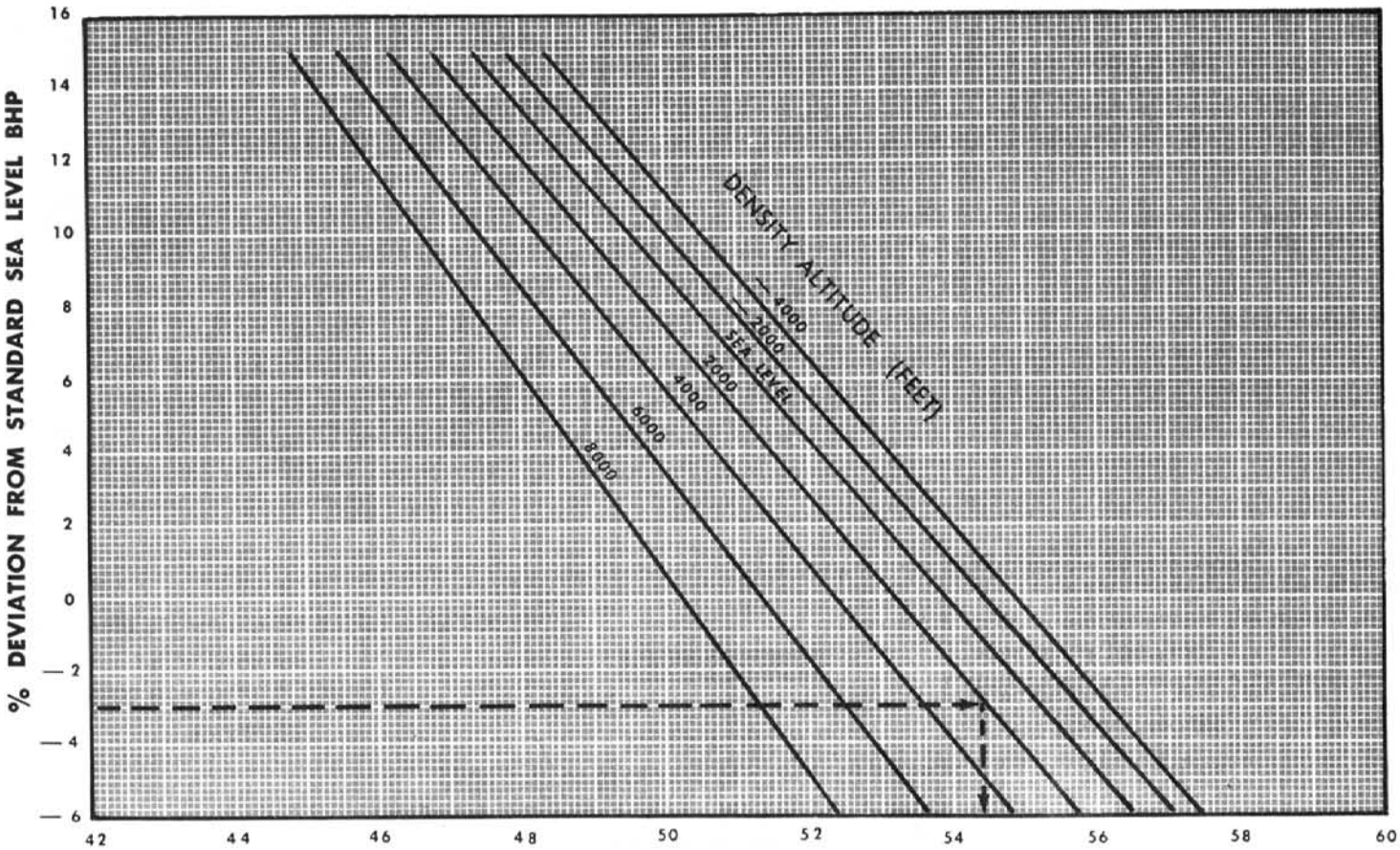
WING FLAPS 14°

ALTERNATE FUEL 100/130

CARGO DOORS OFF

NOTES

1. **This curve is based on a single-engine rate-of-climb of 100 fpm.**
2. **Add 0.4% deviation for every 10° F increase in FAT above standard temperature to compensate for additional cooling drag.**



DATA BASIS: Flight Test

DATA AS OF: March 55

Figure A-100. Limit Take-off Weight Curve (100/130 Fuel—Take-off Dry Power—Flaps 14°)

ALPHABETICAL INDEX

NOTE: *Italics denote illustrations.*

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