Section 4

PERFORMANCE

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES (CONT)

Section 4

PERFORMANCE

4-1. INTRODUCTION

Performance data presented herein are derived from engine manufacturer's specification power for engine less installation losses. These data are applicable to basic helicopter without any optional equipment that would appreciably affect lift, drag, or power available.

4-2. POWER ASSURANCE CHECK

4-2-A. POWER ASSURANCE CHECKS - PT6T-3B

Power assurance check charts (figure 4-1) are provided to determine if engines can produce installed specification power.

A power assurance check should be performed daily. Additional checks should be made if unusual operating conditions or indications arise. Hover check is performed prior to takeoff and in-flight check is provided for periodic in-flight monitoring of engine performance. Either power assurance check may be selected at discretion of pilot. It is pilot responsibility to accomplish procedure safely, considering passenger load, terrain being overflown, and qualifications of persons on board to assist in watching for other air traffic and to record power check data.

If either engine does not meet requirements of hover or in-flight power assurance check, published performance may not be achievable. Cause of engine power loss, or excessive ITT or GAS PROD RPM (N_1) should be determined as soon as practical.

4-2-B. POWER ASSURANCE CHECK - PT6T-3

Power assurance check chart (figure 4-2) is provided to determine if engines can produce installed specification power.

A power assurance check should be performed daily. Additional checks should be made if unusual operating conditions or indications arise. Ground check is performed prior to takeoff.

If either engine does not meet requirements of ground power assurance check, published performance may not be achievable. Cause of engine power loss, or excessive ITT or GAS PROD RPM (N_1), should be determined as soon as practical.

4-3. DENSITY ALTITUDE

A Density Altitude Chart (figure 4-3) is provided to aid in calculation of performance and limitations. Density altitude is an expression of the density of the air in terms of height above sea level; hence, the less dense the air, the higher the density altitude. For standard conditions of temperature and pressure, density altitude is the same as pressure altitude. As temperature increases above standard for any altitude, the density altitude will also increase to values higher than pressure altitude. The chart expresses density altitude as a function of pressure altitude and temperature.

The chart also includes the inverse of the square root of the density ratio ($1/\sqrt{\sigma}$),

which is used to calculate KTAS by the relation: KTAS = KCAS $\times$ $1/\sqrt{\sigma}$

EXAMPLE

If ambient temperature is -15 °C and the pressure altitude is 6000 feet, find the density altitude, $1/\sqrt{\sigma}$, and true airspeed for 100 KCAS.

SOLUTION

Enter the bottom of the chart at -15 °C.

Move vertically to the 6000 foot pressure altitude line.

From this point, move horizontally to the left and read a density altitude of 4000 feet and move horizontally to the right and read $1/\sqrt{\sigma}$ = 100 $\times$ 1.06 = 106 KTAS.

4-4. HEIGHT - VELOCITY ENVELOPE

Refer to SECTION 1.

4-5. HOVER CEILING

IGE and OGE hover ceiling charts (figures 4-4 and 4-5) present hover performance as allowable GW for conditions of H_P and OAT.

Published IGE hover performance can be achieved with adequate tail rotor control margins in relative winds up to 20 knots from any direction. More favorable tail rotor control margins will be realized when winds are outside critical relative wind azimuth area (figure 4-6).

Downwind takeoffs and landings are not recommended.

4-6. TAKEOFF DISTANCE

Takeoff distance required to clear a 50 foot (15.2 meter) obstacle is presented in figure 4-7 as a function of OAT, H_P, and GW.

4-7. CLIMB AND DESCENT

4-7-A. TWIN ENGINE TAKEOFF CLIMBOUT SPEED

Twin engine takeoff climbout speed (V_{TOCS}) is that indicated airspeed which will allow takeoff distance over a 50 foot (15.2 meter) obstacle to be realized and will comply with HV restrictions to allow a safe landing in case of an engine failure (figure 4-8.)

4-7-B. TWIN ENGINE RATE OF CLIMB

Twin engine rate of climb charts are provided for takeoff power and maximum continuous power for GW ranging from 7000 to 11,200 pounds (figure 4-9).

4-7-C. SINGLE ENGINE RATE OF CLIMB - PT6T-3B

Single engine rate of climb charts are provided for $2^1/_2$ minute OEI power and 30 minute OEI power for GW ranging from 7000 to 11,200 pounds (figure 4-10).

4-7-D. SINGLE ENGINE RATE OF CLIMB - PT6T-3

Single engine rate of climb charts are provided for 30 minute power and maximum continuous power for GW ranging from 7000 to 11,200 pounds (figure 4-11).

4-8. AIRSPEED CALIBRATION

Indicated airspeed (IAS) corrected for position and instrument error equals calibrated airspeed (CAS). Determine corrected airspeed from figures 4-12 and 4-13.

4-9. LANDING DISTANCE

Single engine landing distance over a 50-foot (15.2-m) obstacle is shown in Figure 4-14 as a function of OAT, H_P, and GW.

4-10. NOT USED

4-11. SAMPLE PERFORMANCE PROBLEM

Helicopter is chartered to transport cargo from airport A (elevation 3000 feet, temperature 30°C) to airport B (elevation 8500 feet, temperature 19°C). Duration of flight will be 30 minutes and a 30-minute fuel reserve at cruise power is required. Average fuel consumption is determined from helicopter historical records to be 545 pounds (247 kg) per hour at 8000 feet H_P, 20°C OAT, and cruise power (approximately 55% torque). Crew consists of one 190-pound (86-kg) pilot. Determine maximum allowable cargo payload for flight.

• SOLUTION

Fuel required for 30-minute flight plus 30-minute reserve is 545 pounds (247 kg). Considering fuel needed for start, run-up, taxi, and takeoff, pilot elects to refuel to 600 pounds (272 kg).

According to Weight-altitude-temperature limitations for takeoff, landing, and in ground effect maneuvers chart (Section 1), maximum allowable GW for existing ambient conditions are as follows:

Maximum allowable takeoff GW at airport A (5676 feet H_D)	11,000 pounds (4989 kg)
Maximum allowable landing GW at airport B (10,861 feet H_D)	9250 pounds (4196 kg)
Estimated fuel burnoff during flight (30 minutes at 545 pounds per hour)	272 pounds (123 kg)

If pilot takes off at 11,000 pounds (4989 kg), he will arrive at destination 10,728 pounds (4866 kg) (11,000 - 272 pounds) (4989 - 123 kg). This exceeds maximum allowable landing weight by 1478 pounds (670 kg) (10,728 - 9250 pounds) (4866 - 4196 kg); therefore, maximum allowable payload must be based on allowable landing weight for this particular flight.

Maximum allowable landing GW	9250 pounds (4196 kg)
GW at landing:	6482 pounds (2940 kg)
Empty weight	5942 pounds (2695 kg)
Oil	22 pounds (10 kg)
Pilot	190 pounds (86 kg)
Fuel (600 - 272 pounds) (272 - 123 kg)	328 pounds (149 kg)
Maximum allowable cargo payload	2768 pounds (1256 kg)

Although it is permissible to take off from airport A at 11,000 pounds (4989 kg) GW, upon landing at airport B helicopter would have exceeded allowable landing GW by 1478 pounds (670 kg) due to higher $H_{D\ at}$ destination.

PT6T-3B

POWER ASSURANCE CHECK (HOVER)
(WITH GAS PRODUCER GAGE P/N 212-075-037-101)

HEATER/ECU — OFF.

THROTTLES:
TEST ENGINE — FULL OPEN, FRICTIONED.
OTHER ENGINE — IDLE.

ENG RPM (N2) — 97%.

COLLECTIVE — INCREASE UNTIL LIGHT ON SKIDS OR HOVERING. DO NOT EXCEED 810° ITT OR 100.8% GAS PROD (N1) RPM.

STABILIZE POWER ONE MINUTE, THEN RECORD H_P, OAT, ENGINE TORQUE, ITT, AND GAS PROD (N1) RPM.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT H_P, PROCEED TO RIGHT TO INTERSECT OAT, THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD (N1) RPM.

IF INDICATED ITT OR GAS PROD (N1) RPM EXCEEDS MAXIMUM ALLOWABLE, REPEAT CHECK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD (N1) RPM AFTER STABILIZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AND CORRECTED AS SOON AS PRACTICAL.

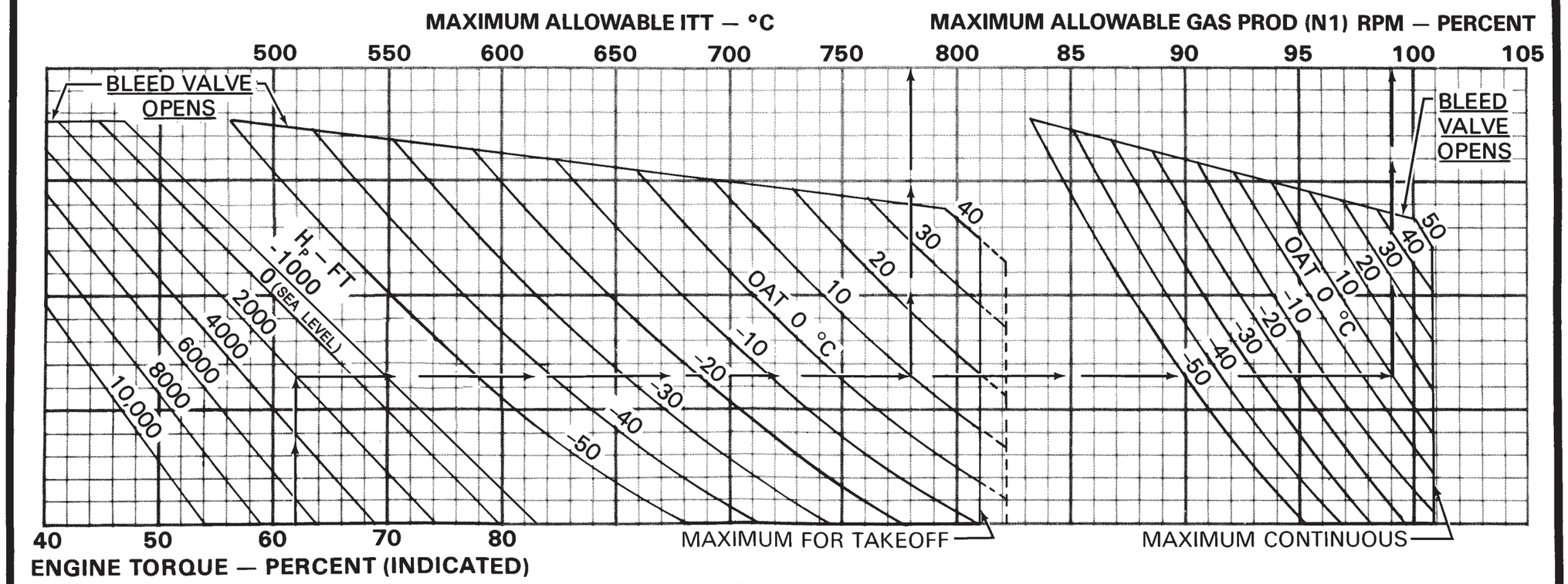

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Figure 4-1. Power Assurance Check Chart — PT6T-3B (Sheet 1 of 4)

PT6T-3B

POWER ASSURANCE CHECK (IN-FLIGHT)
(WITH GAS PRODUCER GAGE P/N 212-075-037-101)

ESTABLISH LEVEL FLIGHT ABOVE 1000 FEET AGL.

AIRSPEED — 100 KIAS (OR V_{NE}, IF LESS).

HEATER/ECU — OFF.

THROTTLES:
TEST ENGINE — FULL OPEN, FRICTIONED.

OTHER ENGINE — DECREASE SLOWLY UNTIL TEST ENGINE TORQUE IS WITHIN TEST RANGE. DO NOT EXCEED 810°C ITT OR 100.8% GAS PROD (N1) RPM.

ENG RPM (N2) — 97%.

STABILIZE POWER ONE MINUTE IN LEVEL FLIGHT, THEN RECORD H_p, OAT, ENGINE TORQUE, ITT, AND GAS PROD (N1) RPM.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT H_p, PROCEED TO RIGHT TO INTERSECT OAT, THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD (N1) RPM.

IF INDICATED ITT OR GAS PROD (N1) RPM EXCEEDS MAXIMUM ALLOWABLE, REPEAT CHECK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD (N1) RPM AFTER STABILIZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AND CORRECTED AS SOON AS PRACTICAL.

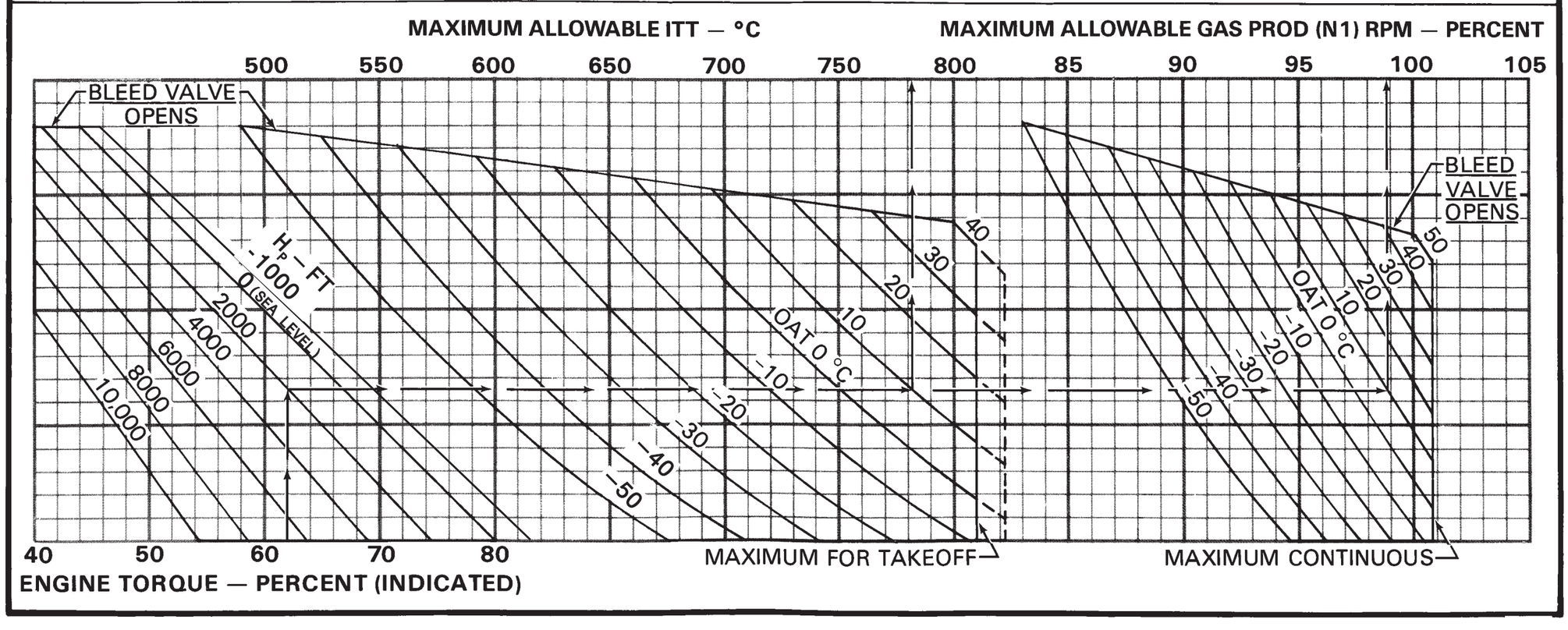

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Figure 4-1. Power Assurance Check Chart — PT6T-3B (Sheet 2 of 4)

PT6T-3B

POWER ASSURANCE CHECK (HOVER)
(WITH GAS PRODUCER GAGE P/N 212-075-037-113)

HEATER/ECU — OFF.

THROTTLES:
TEST ENGINE — FULL OPEN, FRICTIONED.
OTHER ENGINE — IDLE.

ENG RPM (N2) — 97%.

COLLECTIVE — INCREASE UNTIL LIGHT ON SKIDS OR HOVERING. DO NOT EXCEED 810° ITT OR 101.8% GAS PROD (N1) RPM.

STABILIZE POWER ONE MINUTE, THEN RECORD H_P, OAT, ENGINE TORQUE, ITT, AND GAS PROD (N1) RPM.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT H_P, PROCEED TO RIGHT TO INTERSECT OAT, THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD (N1) RPM.

IF INDICATED ITT OR GAS PROD (N1) RPM EXCEEDS MAXIMUM ALLOWABLE, REPEAT CHECK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD (N1) RPM AFTER STABILIZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AND CORRECTED AS SOON AS PRACTICAL.

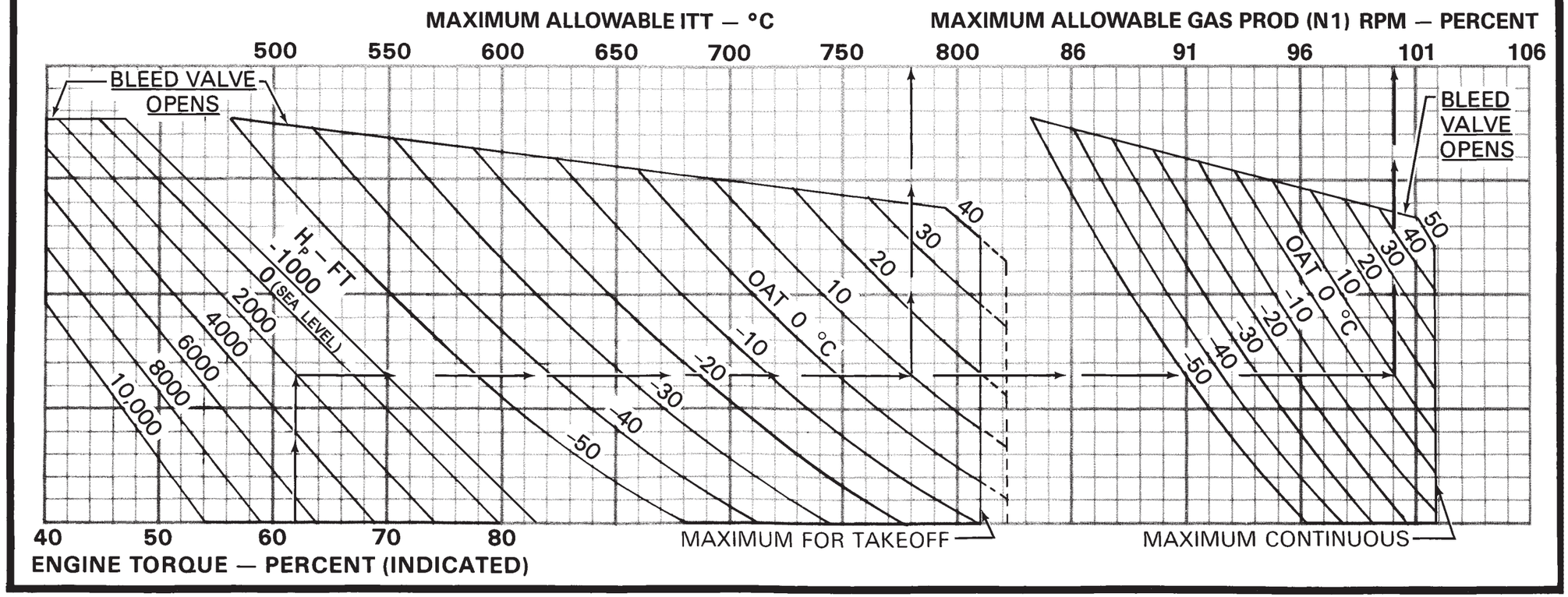

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Figure 4-1. Power Assurance Check Chart — PT6T-3B (Sheet 3 of 4)

PT6T-3B

POWER ASSURANCE CHECK (IN-FLIGHT)
(WITH GAS PRODUCER GAGE P/N 212-075-037-113)

ESTABLISH LEVEL FLIGHT ABOVE 1000 FEET AGL.

AIRSPEED — 100 KIAS (OR V_{NE}, IF LESS).

HEATER/ECU — OFF.

THROTTLES:
TEST ENGINE — FULL OPEN, FRICTIONED.

OTHER ENGINE — DECREASE SLOWLY UNTIL TEST ENGINE TORQUE IS WITHIN TEST RANGE. DO NOT EXCEED 810°C ITT OR 101.8% GAS PROD (N1) RPM.

ENG RPM (N2) — 97%.

STABILIZE POWER ONE MINUTE IN LEVEL FLIGHT, THEN RECORD H_p, OAT, ENGINE TORQUE, ITT, AND GAS PROD (N1) RPM.

ENTER CHART AT INDICATED ENGINE TORQUE, MOVE UP TO INTERSECT H_p, PROCEED TO RIGHT TO INTERSECT OAT, THEN MOVE UP TO READ VALUES FOR MAXIMUM ALLOWABLE ITT AND GAS PROD (N1) RPM.

IF INDICATED ITT OR GAS PROD (N1) RPM EXCEEDS MAXIMUM ALLOWABLE, REPEAT CHECK, STABILIZING POWER FOUR MINUTES.

REPEAT CHECK USING OTHER ENGINE.

IF EITHER ENGINE EXCEEDS ALLOWABLE ITT OR GAS PROD (N1) RPM AFTER STABILIZING FOUR MINUTES, PUBLISHED PERFORMANCE MAY NOT BE ACHIEVABLE. CAUSE SHOULD BE DETERMINED AND CORRECTED AS SOON AS PRACTICAL.

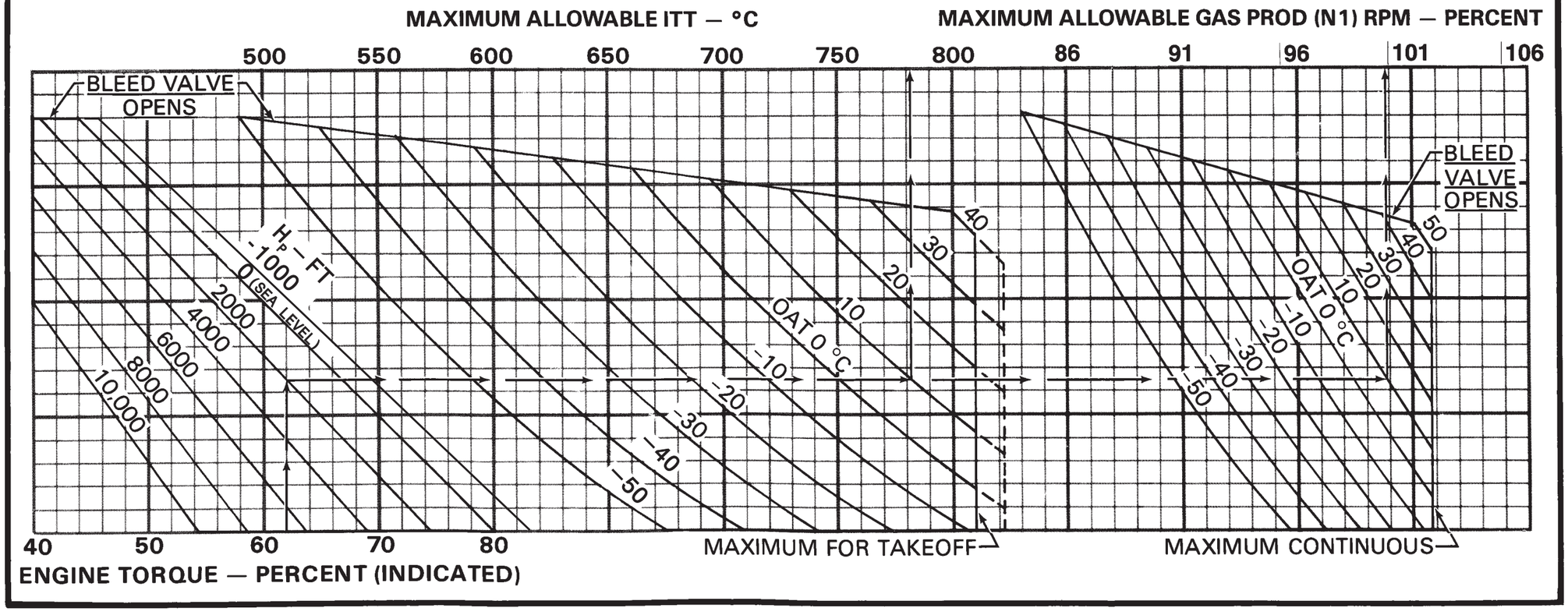

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Figure 4-1. Power Assurance Check Chart — PT6T-3B (Sheet 4 of 4)

POWER ASSURANCE CHECK (GROUND)
PT6T-3

CHART A												
H_P	-500	-1000	-1500									
% TORQUE	50.5	51.5	52.5									
H_P	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
% TORQUE	49.5	48.5	48.0	47.0	46.0	45.0	44.0	43.5	42.5	42.0	41.0	40.5
H_P	6000	6500	7000	7500	8000	8500	9000	9500	10,000	10,500	11,000	
% TORQUE	39.5	38.5	38.0	37.5	36.5	36.0	35.0	34.5	34.0	33.0	32.5	

EXAMPLE

1. ALTIMETER . . . . . 29.92 IN HG
2. OBSERVED H_P . . . . . 1500 FT
3. OBSERVED CHART A TORQUE 47.0%
4. START BOTH ENGINES
5. TURN HEATER OFF
6. ON GROUND, ENGINE NO. 2 TO IDLE
7. STABILIZE NO. 1 ENGINE, 4 MINUTES MINIMUM, AT 97% (N2) ENG RPM AND CHART A TORQUE AND OBSERVE

GAS PROD (N1)	95.2% RPM
ITT	710°C
OAT	20°C

8. OBSERVED GAS PROD (N1) RPM AND ITT MUST BE LESS THAN CHART GAS PROD (N1) RPM AND ITT FOR OBSERVED OAT.
9. REPEAT CHECK ON NO. 2 ENGINE WITH NO. 1 ENGINE AT IDLE.
10. If OBSERVED GAS PROD (N1) RPM AND/OR ITT ARE GREATER THAN CHART B GAS PROD (N1) RPM AND/OR ITT FOR OBSERVED OAT, STEPS SHOULD BE TAKEN TO DETERMINE CAUSE OF POWER LOSS.
11. HOVER IGE AND CHECK NO. 1 AND NO. 2 ENGINE TORQUE NEEDLE SPLIT NO GREATER THAN 4%.

CHART B												
OAT ~ °C	52	50	45	40	35	30	25	20	15	10	5	0
GAS PROD (N1) — % RPM	100	100	99.8	99.1	98.4	97.7	97.0	96.3	95.6	94.8	94.1	93.4
ITT ~ °C	810	810	805	795	780	765	750	735	720	705	690	675
OAT ~ °C	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-54	
GAS PROD (N1) — % RPM	92.7	92.0	91.3	90.6	89.9	89.2	88.5	87.8	87.1	86.4	85.8	
ITT ~ °C	660	645	630	615	605	590	575	560	545	530	520	

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Figure 4-2. Power Assurance Check Chart — PT6T-3

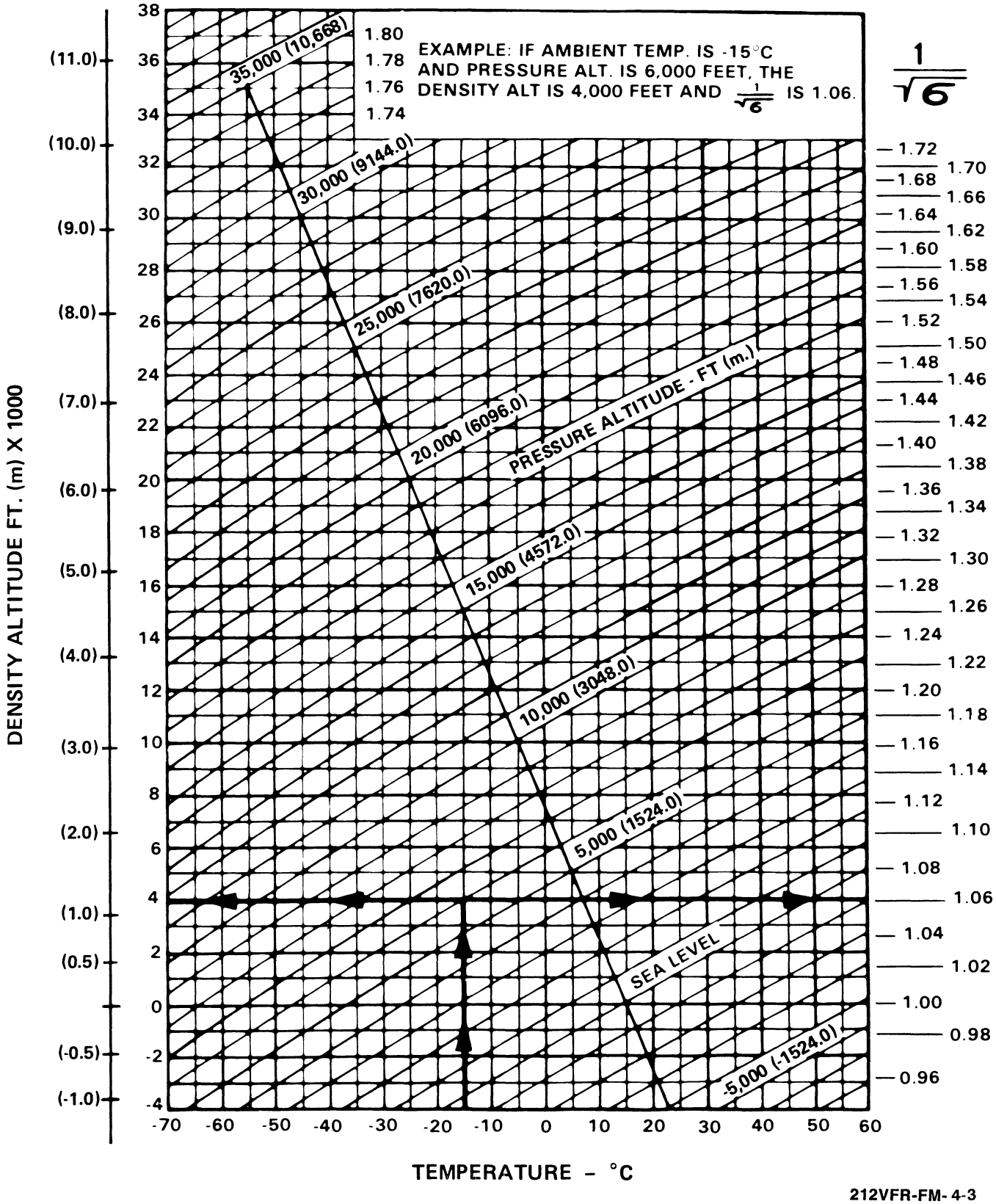

Figure 4-3. Density altitude chart

HOVER CEILING
IN GROUND EFFECT

POWER: SEE NOTE BELOW
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH
0° TO 52°C

SKID HEIGHT 4 FT
HEATER ON OR OFF
WINTERIZATION KIT HTR ON OR OFF

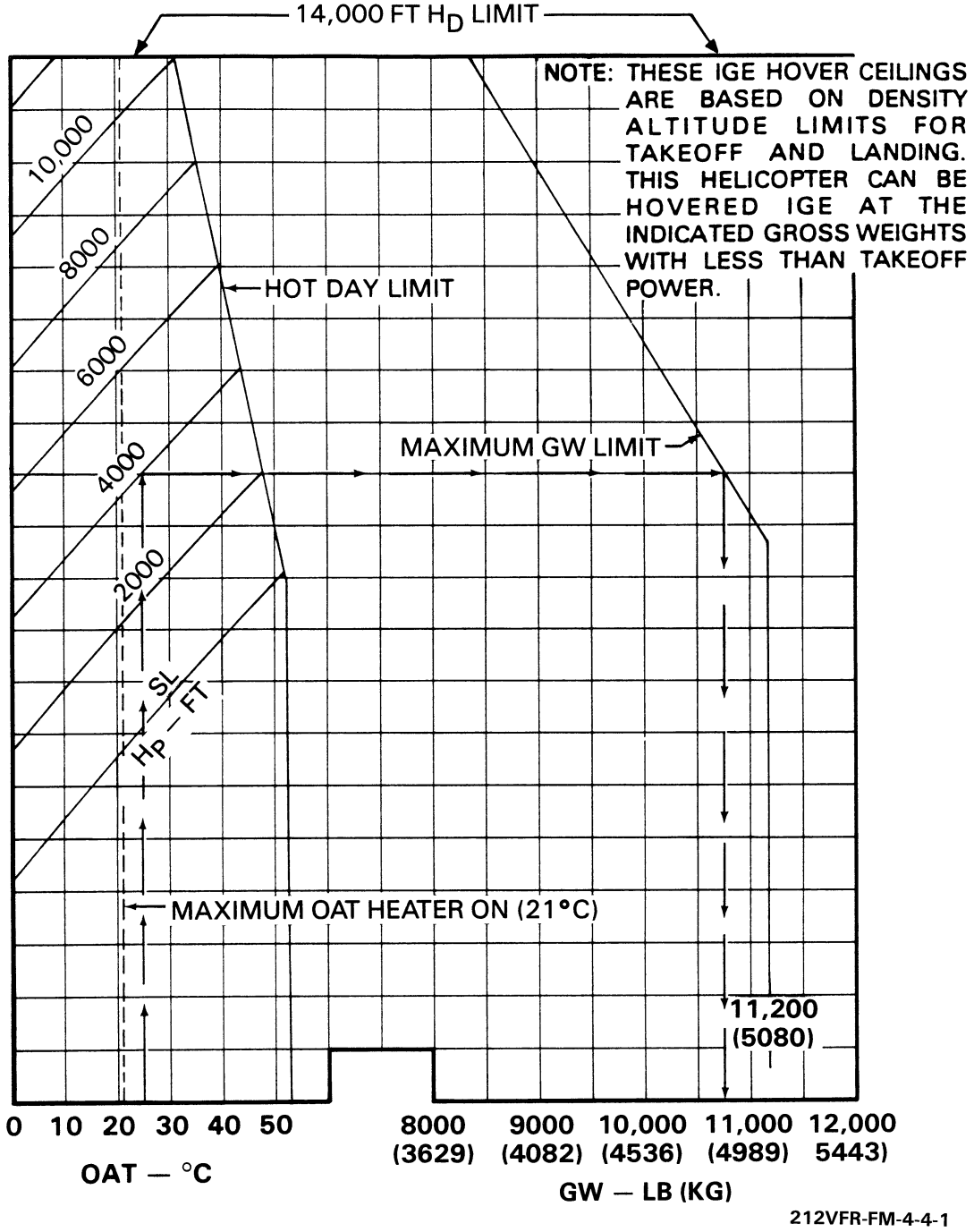

Figure 4-4. Hover ceiling in ground effect (Sheet 1 of 3)

HOVER CEILING
IN GROUND EFFECT

POWER: SEE NOTE BELOW
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH
0° TO −54°C

SKID HEIGHT 4 FT
HEATER ON OR OFF
WINTERIZATION KIT HTR ON OR OFF

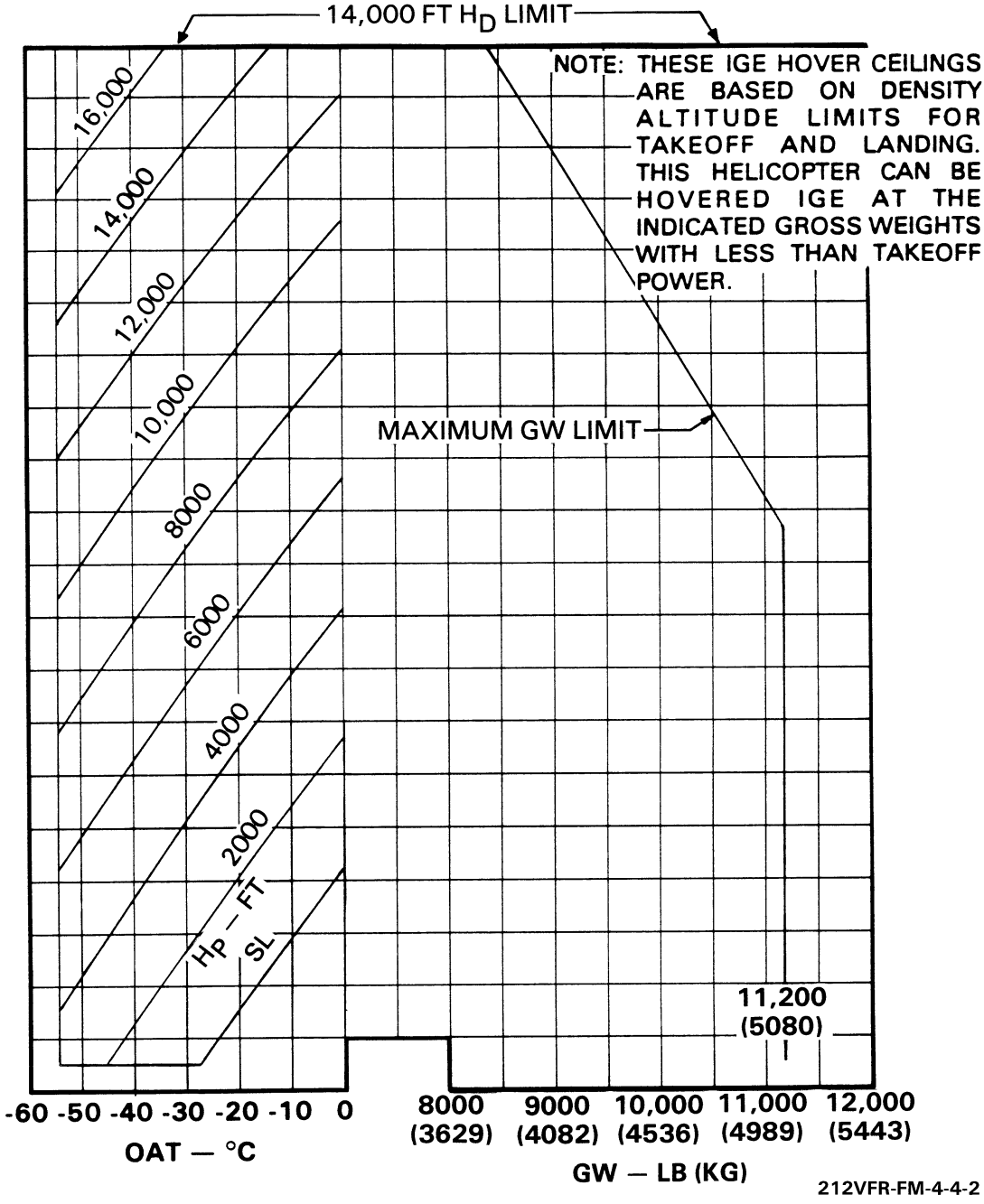

Figure 4-4. Hover ceiling in ground effect (Sheet 2 of 3)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH
0° TO 52°C

SKID HEIGHT 4 FT
HEATER ON OR OFF
WINTERIZATION KIT HTR ON OR OFF

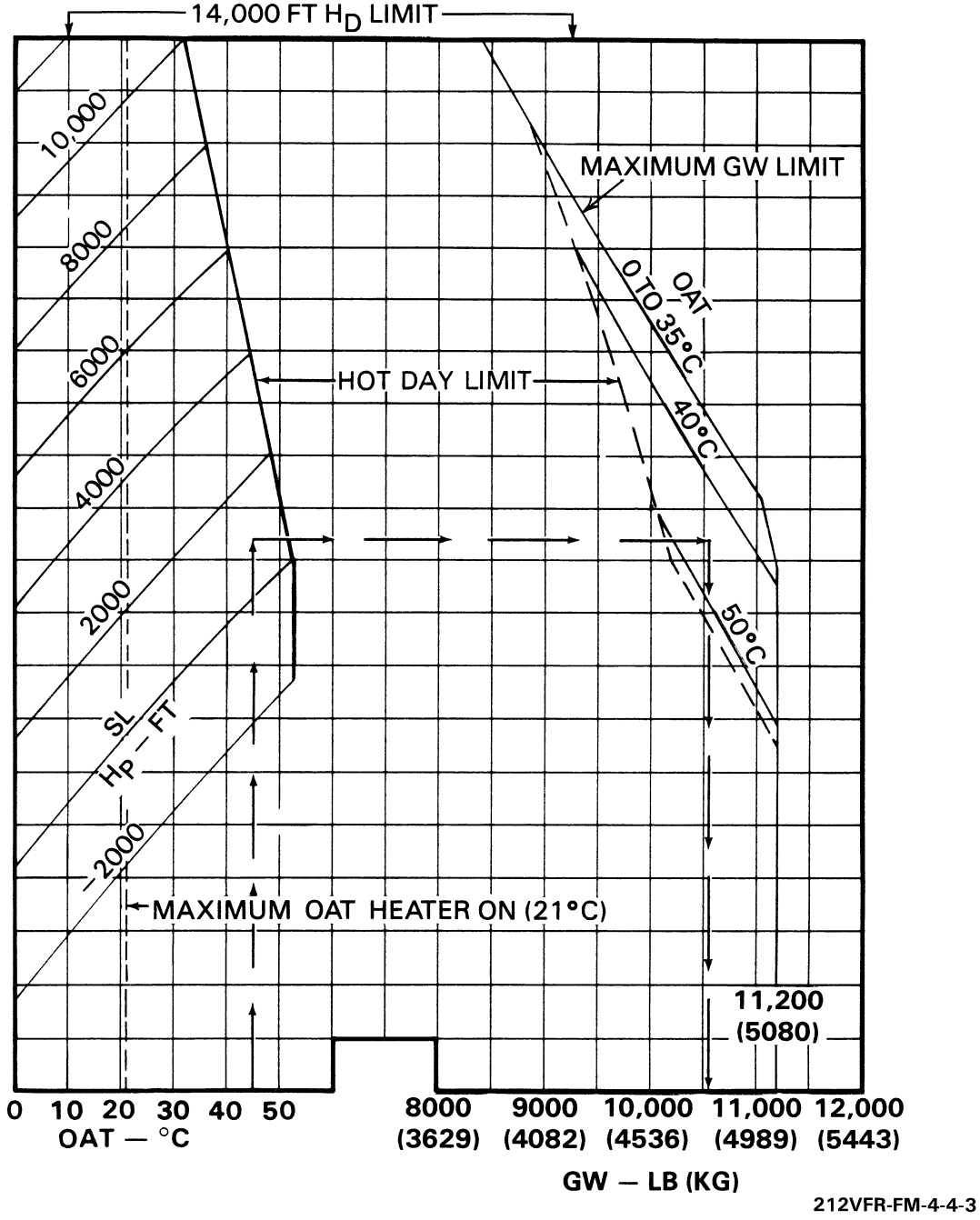

Figure 4-4. Hover ceiling in ground effect (Sheet 3 of 3)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER OFF
0° TO 52°C

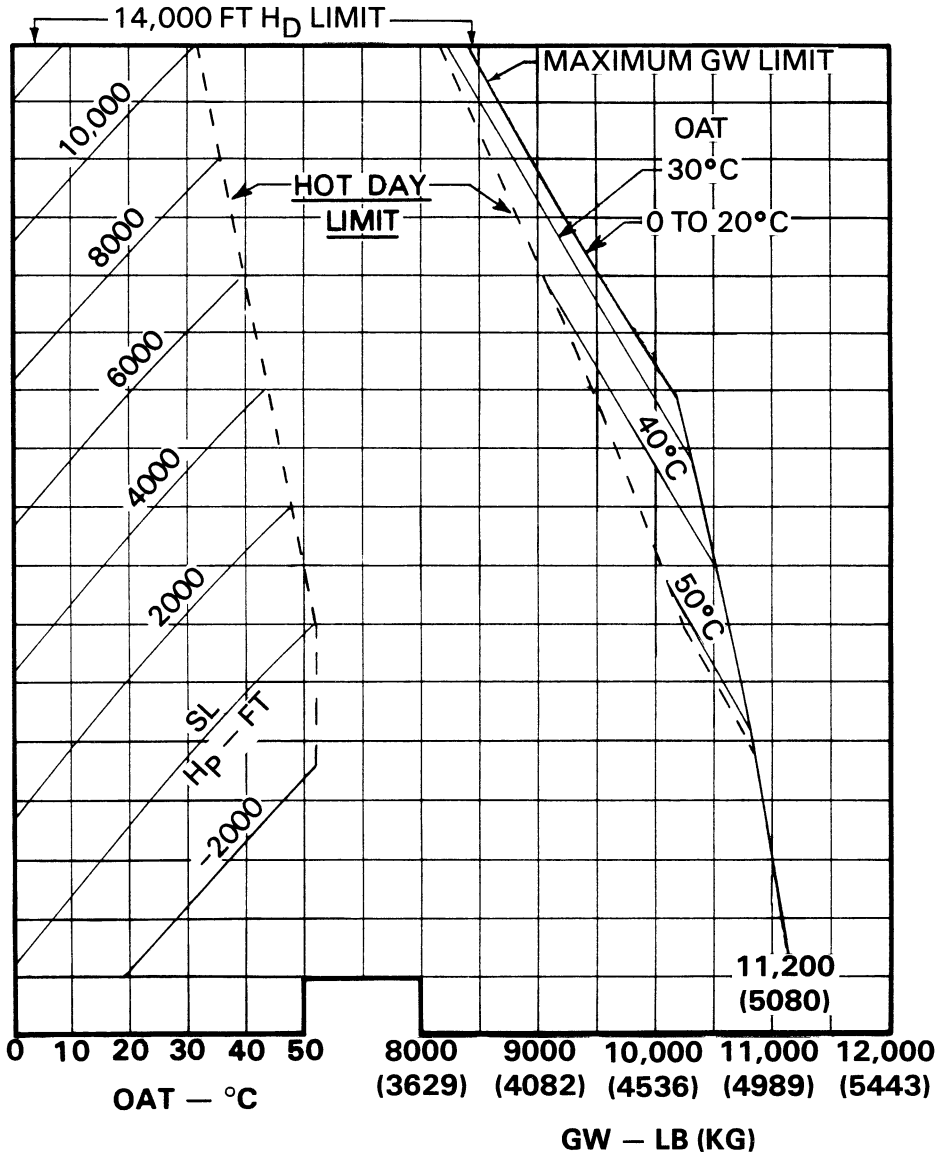

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Figure 4-5. Hover ceiling out of ground effect (Sheet 1 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER OFF
0° TO −54°C

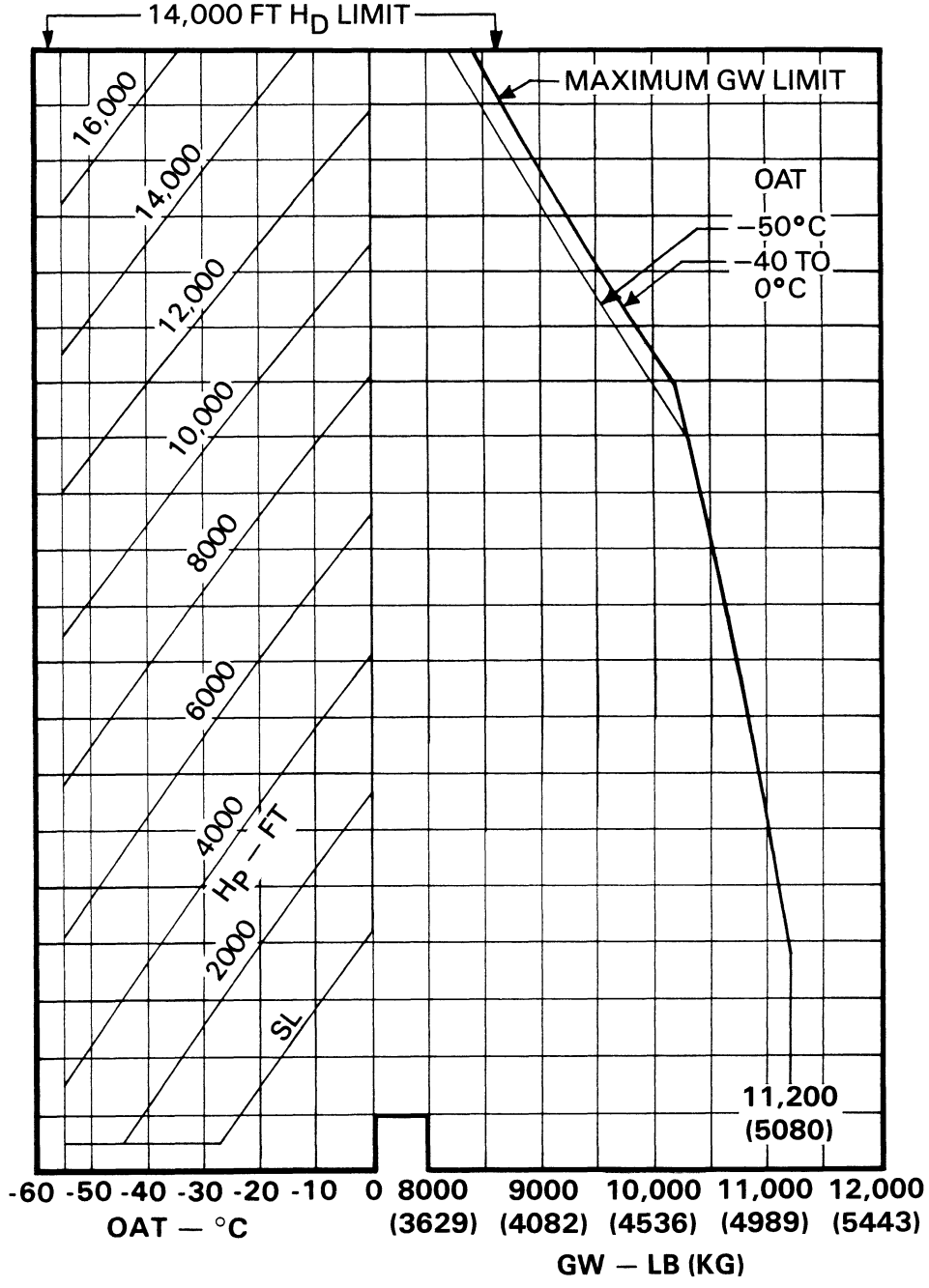

Figure 4-5. Hover ceiling out of ground effect (Sheet 2 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER ON
0° TO 20°C

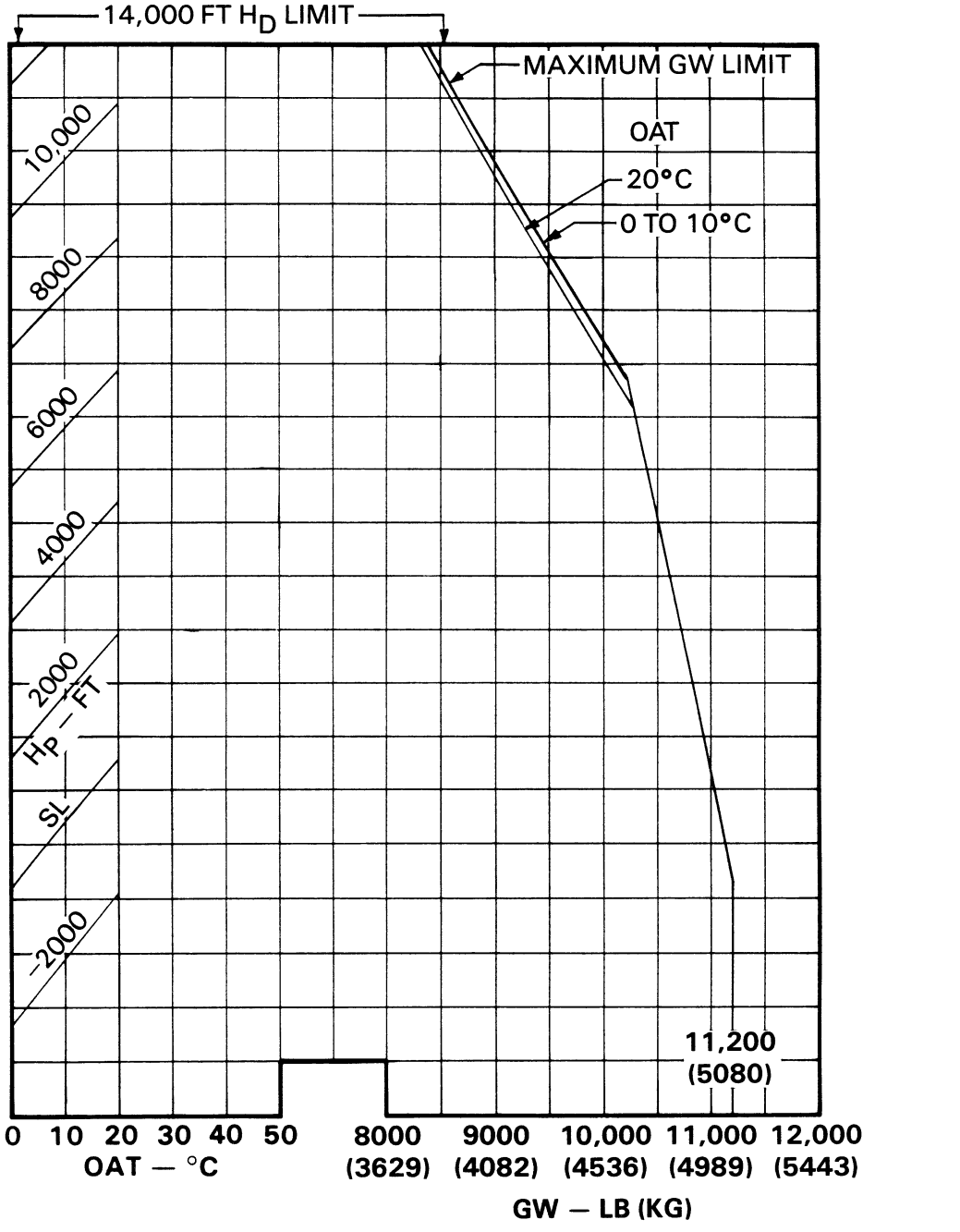

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Figure 4-5. Hover ceiling out of ground effect (Sheet 3 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER ON
0° TO −54°C

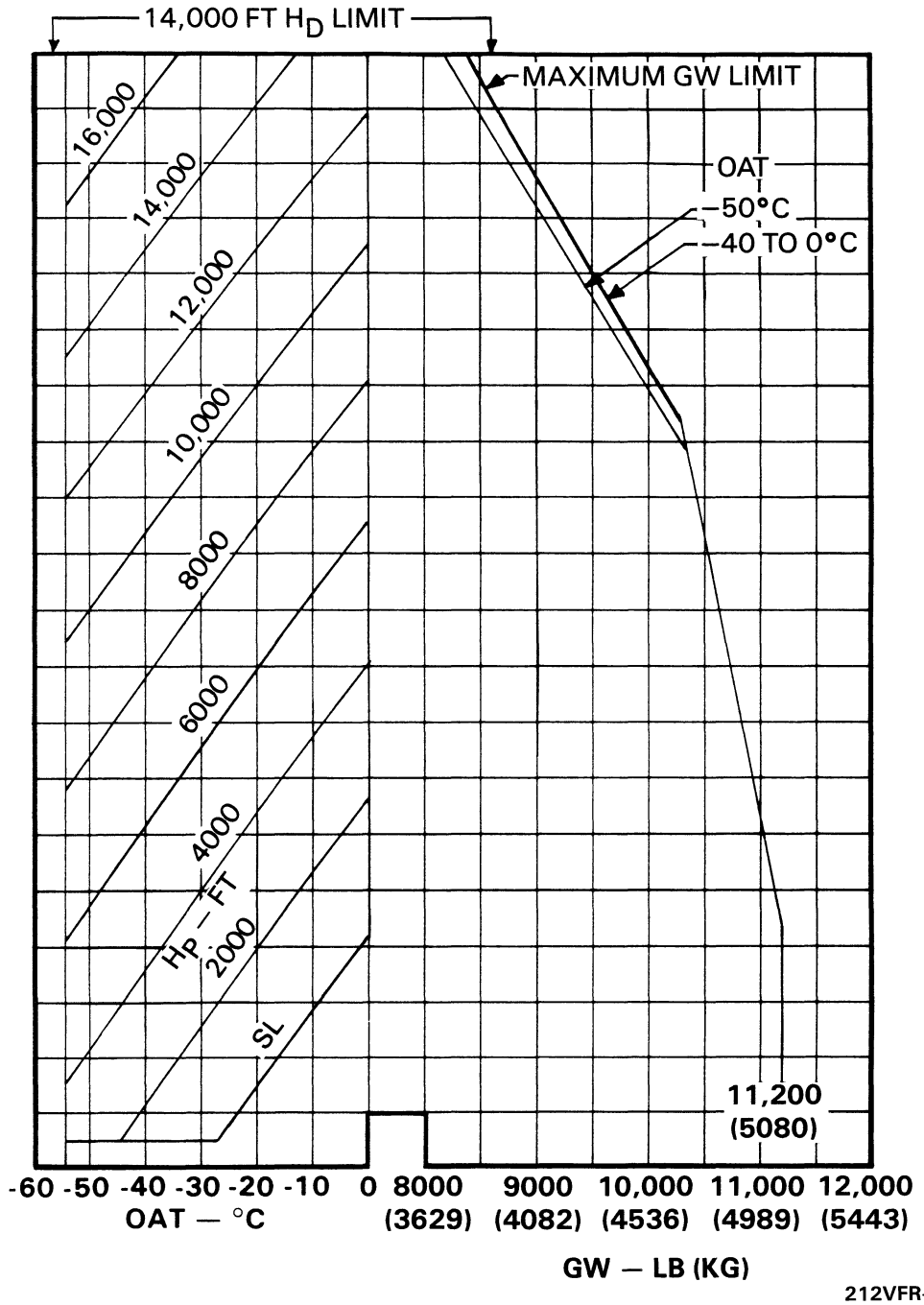


Figure 4-5. Hover ceiling out of ground effect (Sheet 4 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER OFF
0° TO 52°C

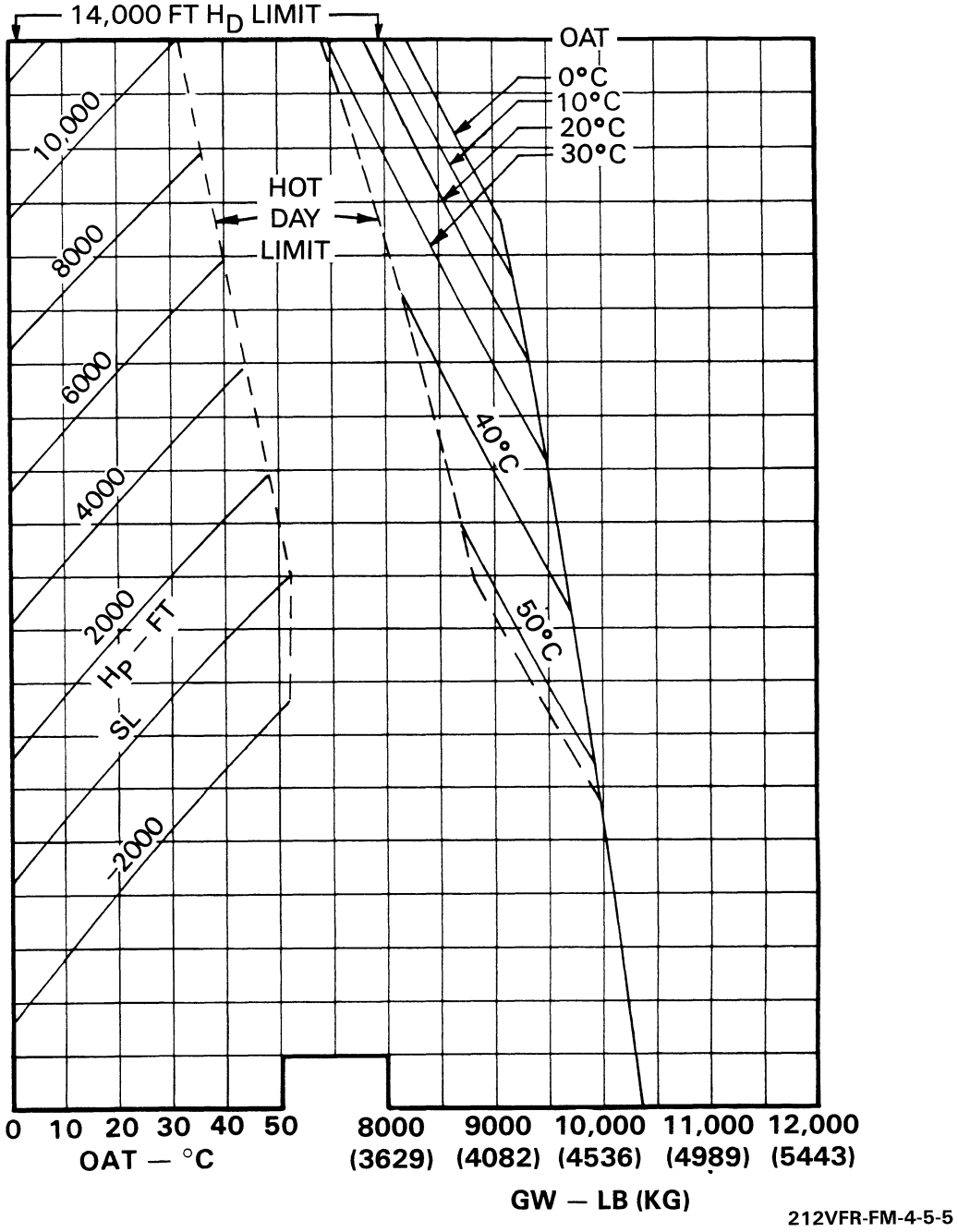


Figure 4-5. Hover ceiling out of ground effect (Sheet 5 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER OFF
0° TO −54°C

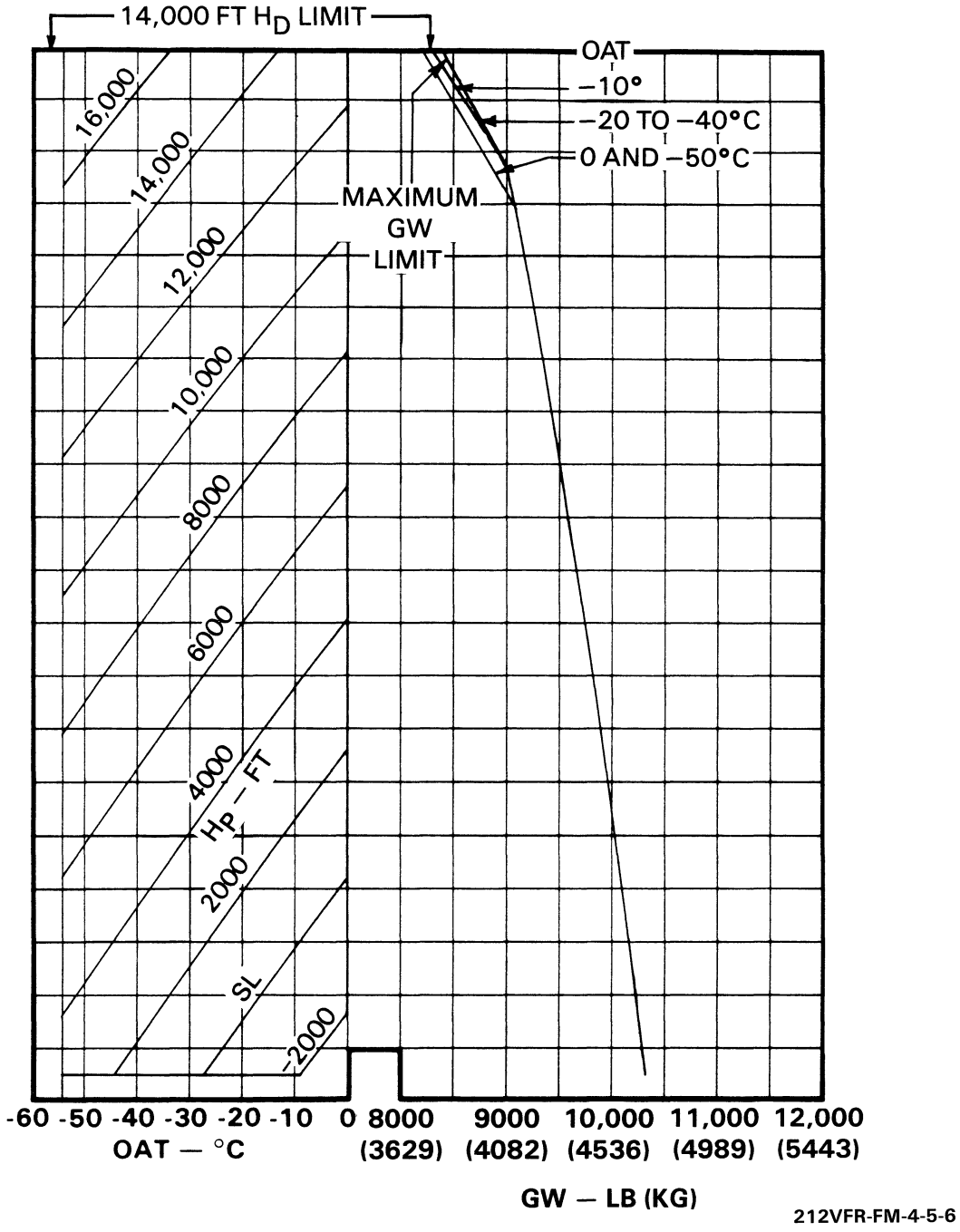


Figure 4-5. Hover ceiling out of ground effect (Sheet 6 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER ON
0° TO 20°C

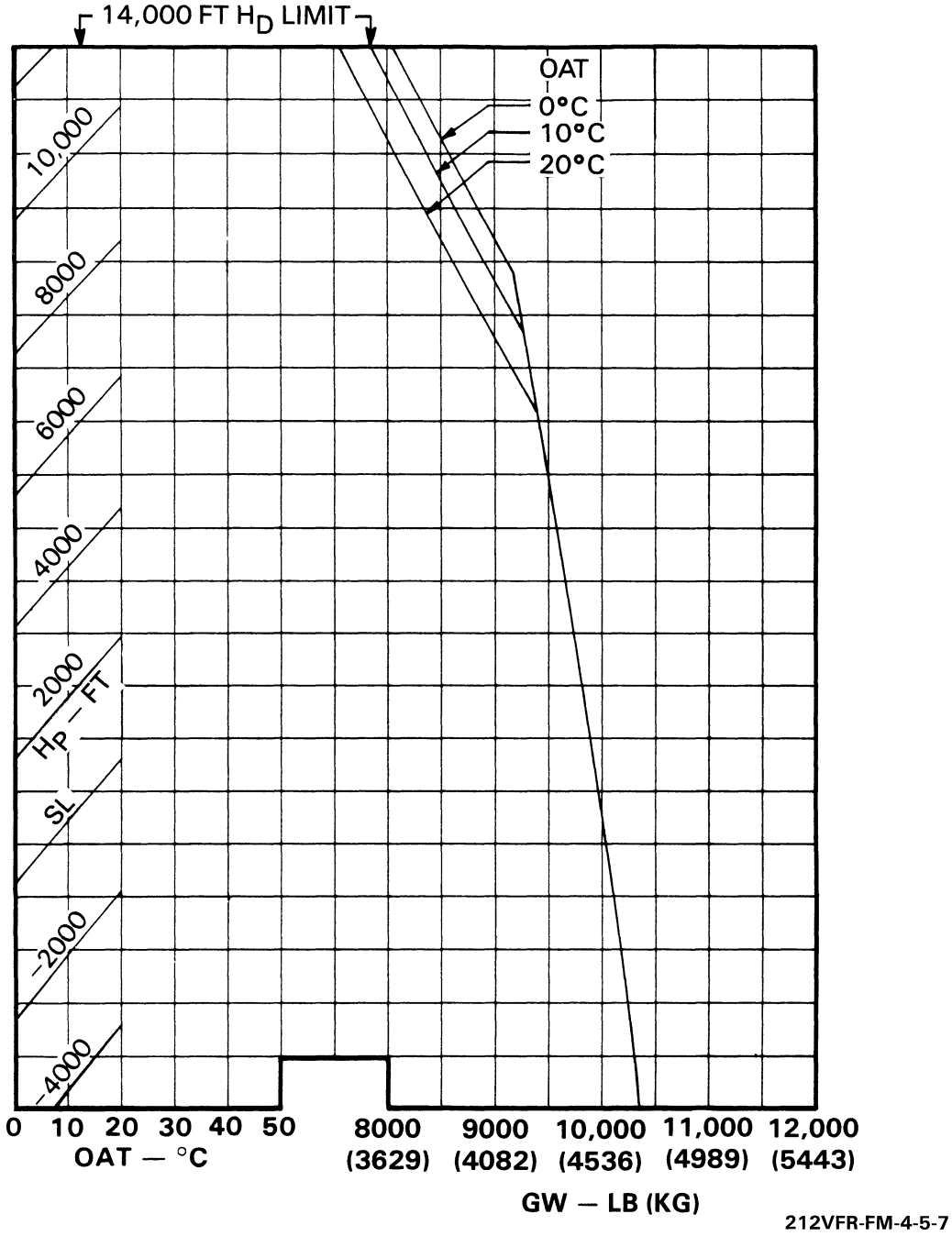


Figure 4-5. Hover ceiling out of ground effect (Sheet 7 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

SKID HEIGHT 60 FT
HEATER ON
0° TO −54°C

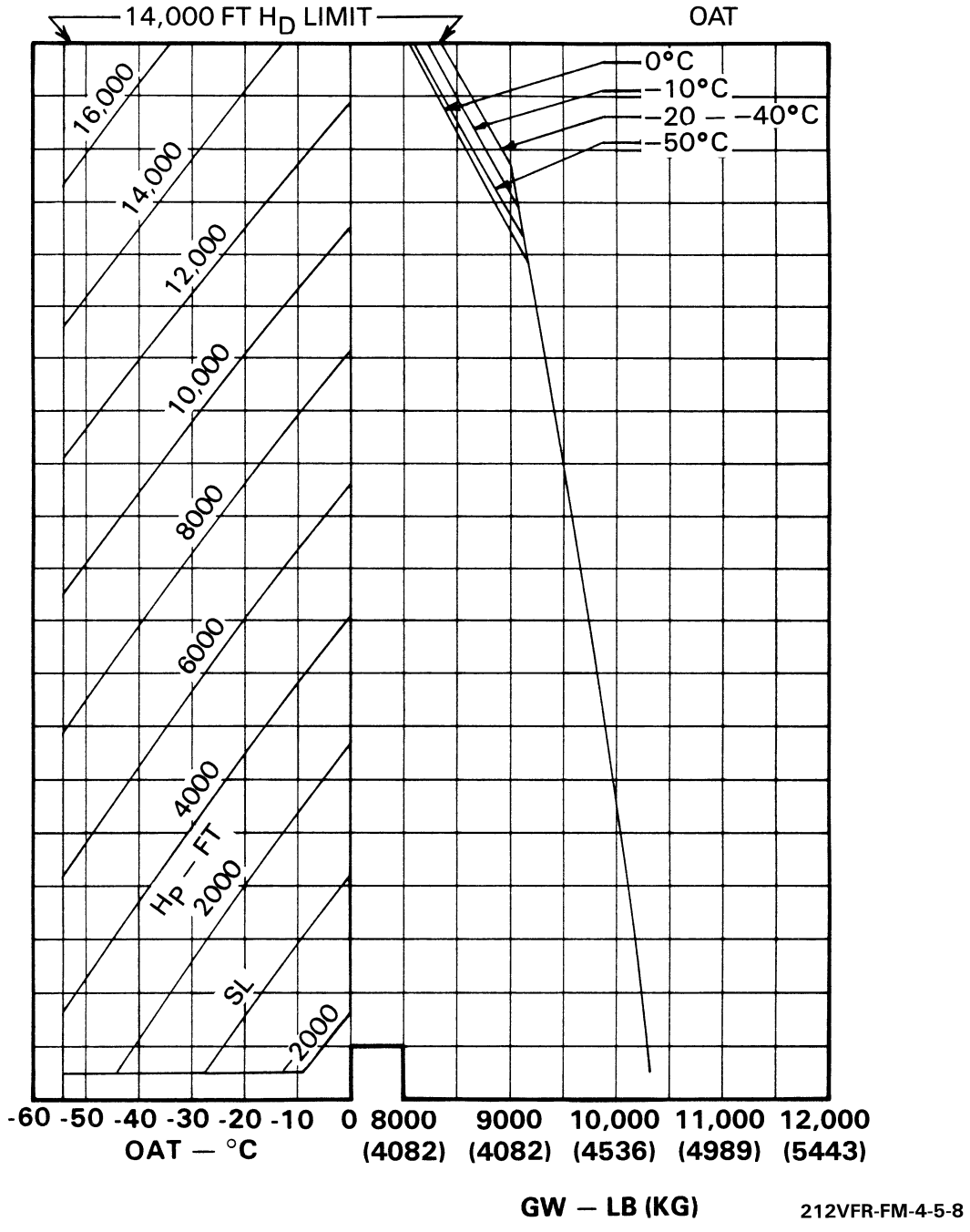


Figure 4-5. Hover ceiling out of ground effect (Sheet 8 of 8)

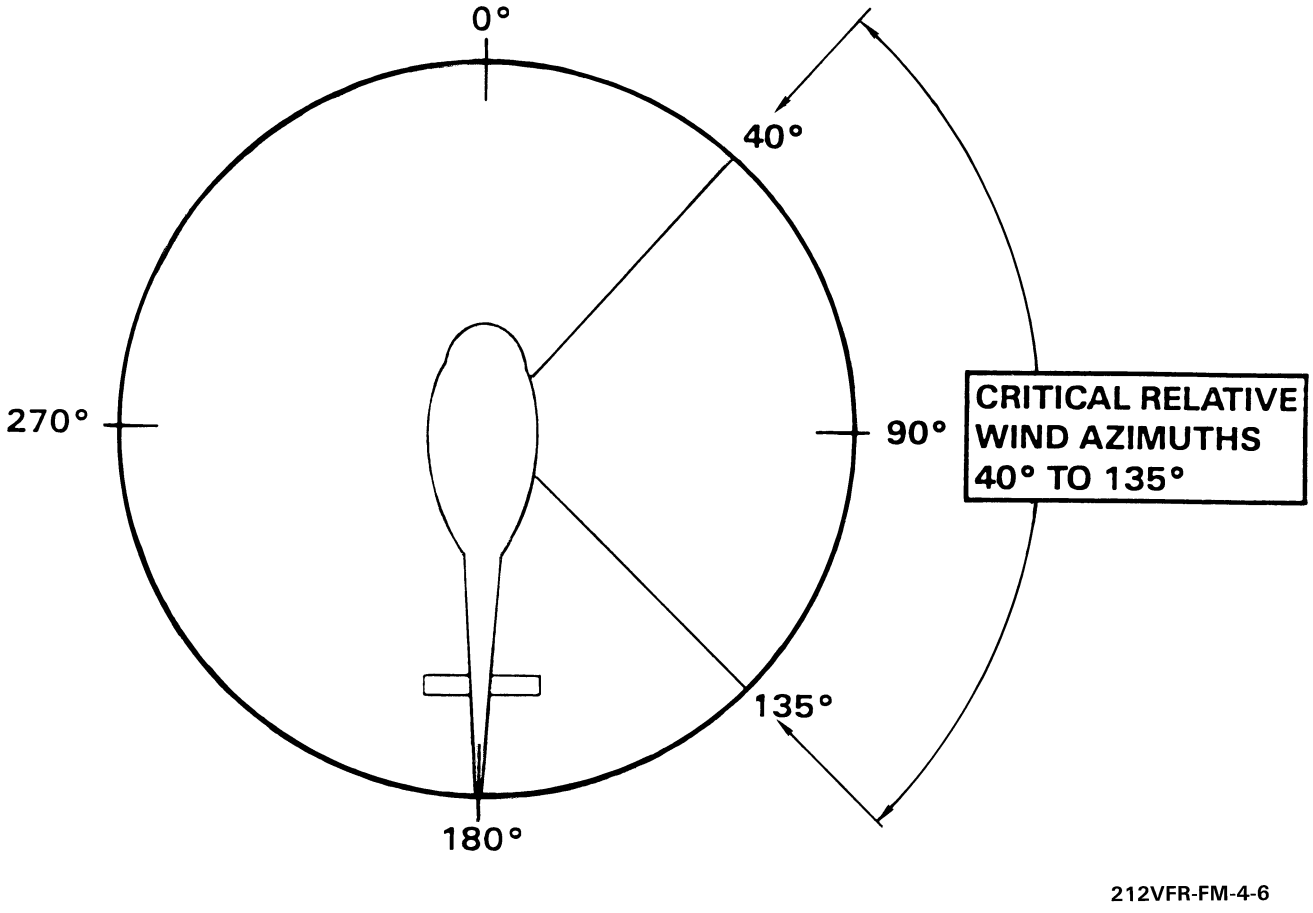


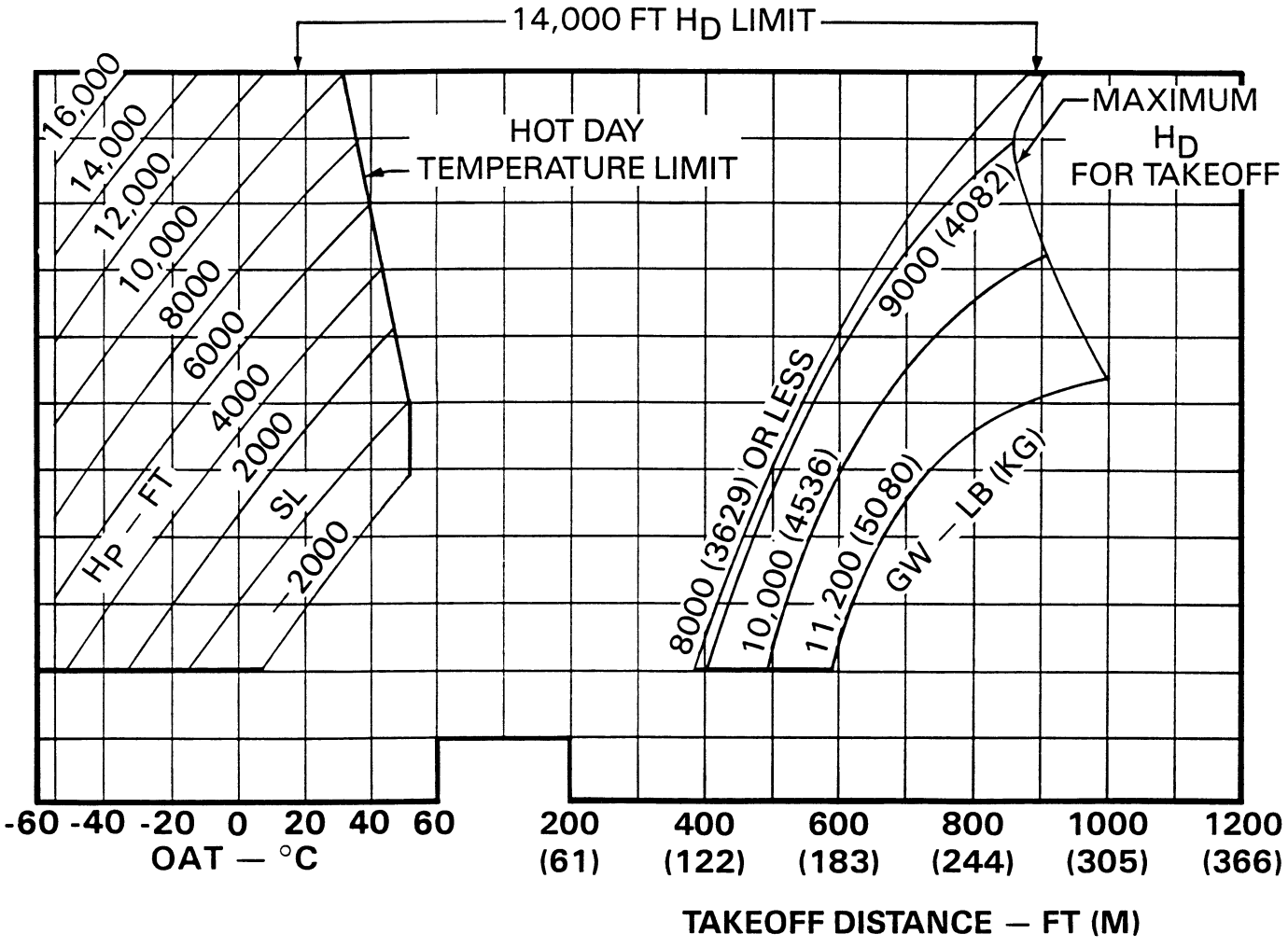
Figure 4-6. Critical relative wind azimuths for hover flight

TAKEOFF DISTANCE
OVER 50 FT (15.2m) OBSTACLE

HOVER POWER +15% TORQUE
ENG RPM 100% (N2)
GENERATOR 150 AMPS

INITIATED FROM 4 FT SKID HEIGHT
HEATER ON OR OFF
WINTERIZATION KIT HTR ON OR OFF

REFER TO V_{TOCS} CHART FOR TAKEOFF SPEED



212VFR-FM-4-7

Figure 4-7. Takeoff distance over a 50 foot (15.2 meter) obstacle

TWIN ENGINE TAKEOFF CLIMBOUT SPEED - KIAS							
H_D - FT*	GW - LB (KG)						
	7000 (3175)	8000 (3629)	9000 (4082)	10,000 (4536)	10,500 (4763)	11,000 (4989)	11,200 (5080)
0	30	30	30	35	38	40	40
1000	30	30	30	35	38	40	40
2000	30	30	30	35	38	40	40
3000	30	30	30	36	38	40	42
4000	30	30	32	36	40	42	42
5000	30	30	32	38	40	42	-
6000	30	30	34	38	42	-	-
7000	30	30	34	40	42	-	-
8000	30	30	34	40	-	-	-
9000	30	30	36	-	-	-	-
10,000	30	32	36	-	-	-	-
11,000	30	32	38	-	-	-	-
12,000	30	34	38	-	-	-	-
13,000	30	34	-	-	-	-	-
14,000	30	36	-	-	-	-	-

* Refer to Density Altitude Chart.

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Figure 4-8. Twin engine takeoff climbout speed

TWIN ENGINE RATE OF CLIMB

GW 7000 LB (3175 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

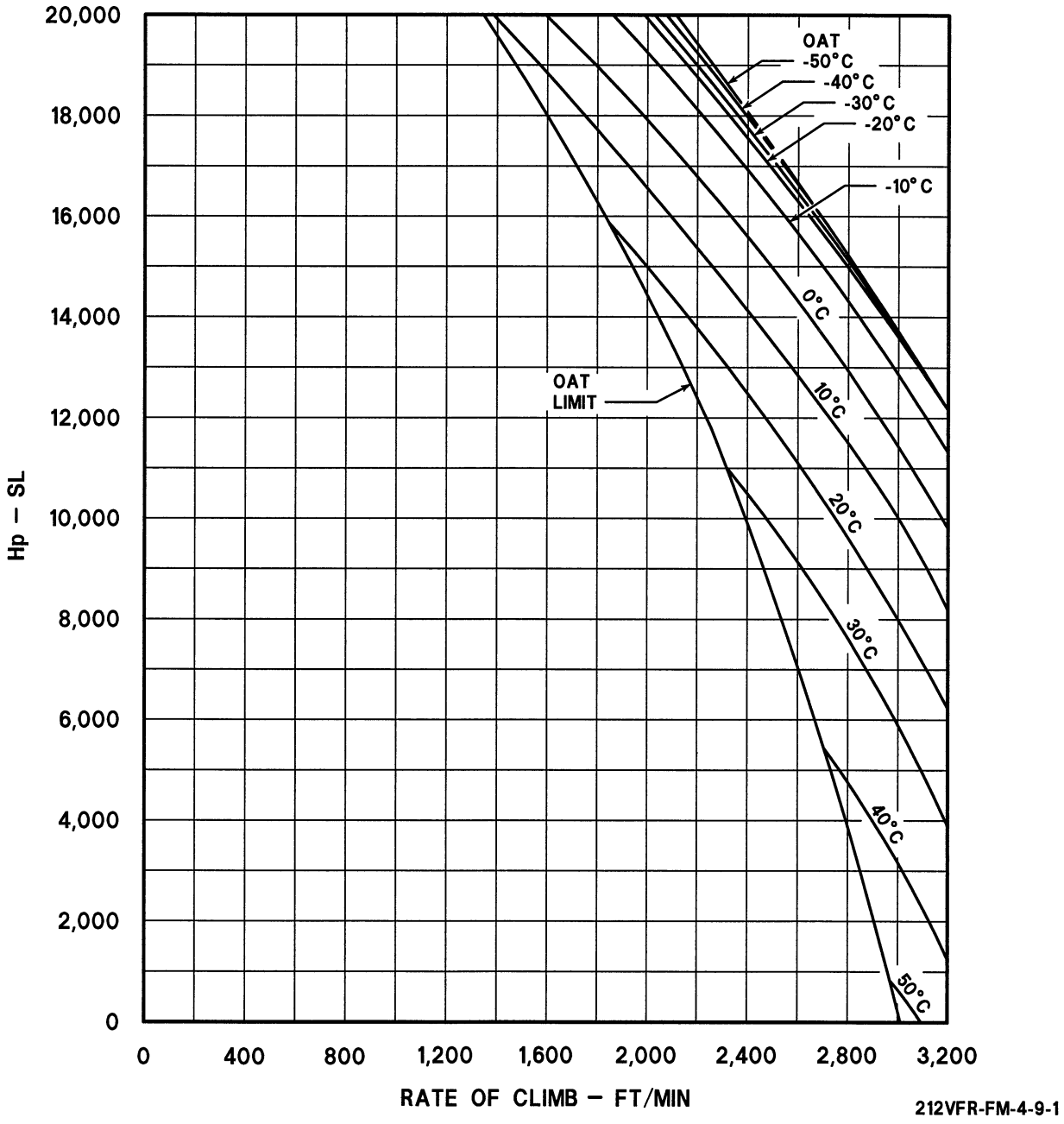

Figure 4-9. Twin engine rate of climb (Sheet 1 of 30)

TWIN ENGINE RATE OF CLIMB
GW 7000 LB (3175 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

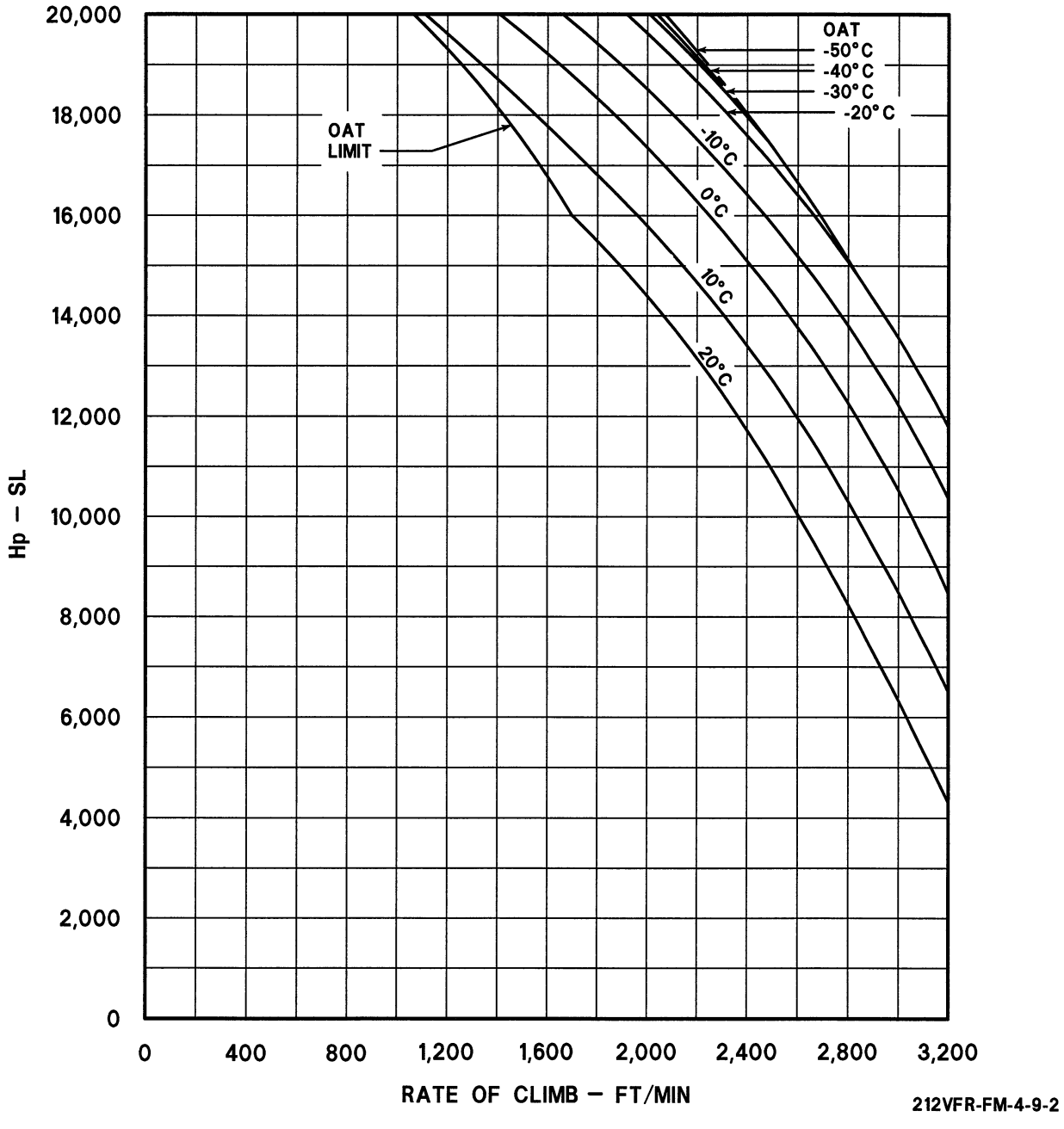

Figure 4-9. Twin engine rate of climb (Sheet 2 of 30)

TWIN ENGINE RATE OF CLIMB
GW 8000 LB (3629 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

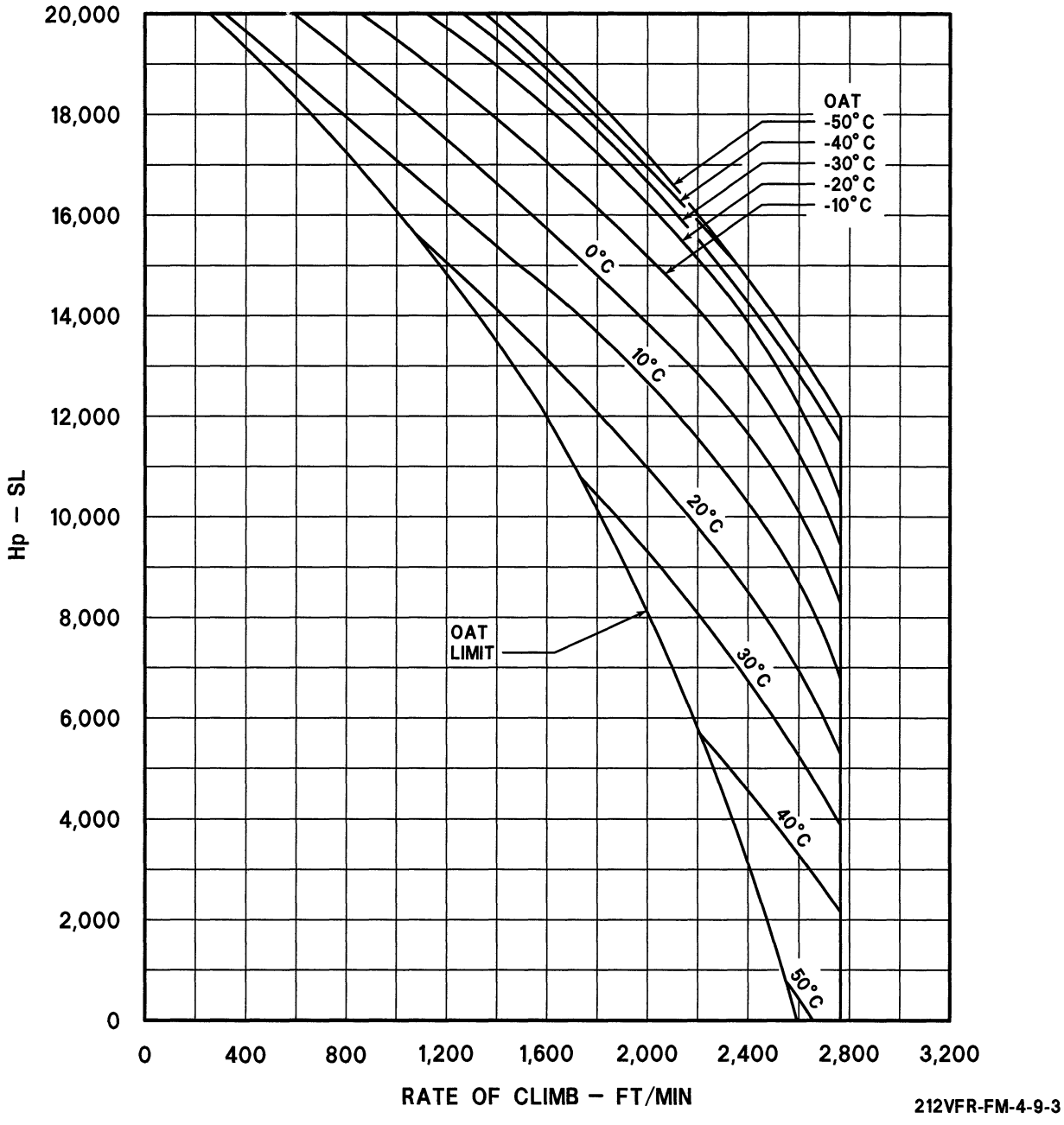

Figure 4-9. Twin engine rate of climb (Sheet 3 of 30)

TWIN ENGINE RATE OF CLIMB
GW 8000 LB (3629 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

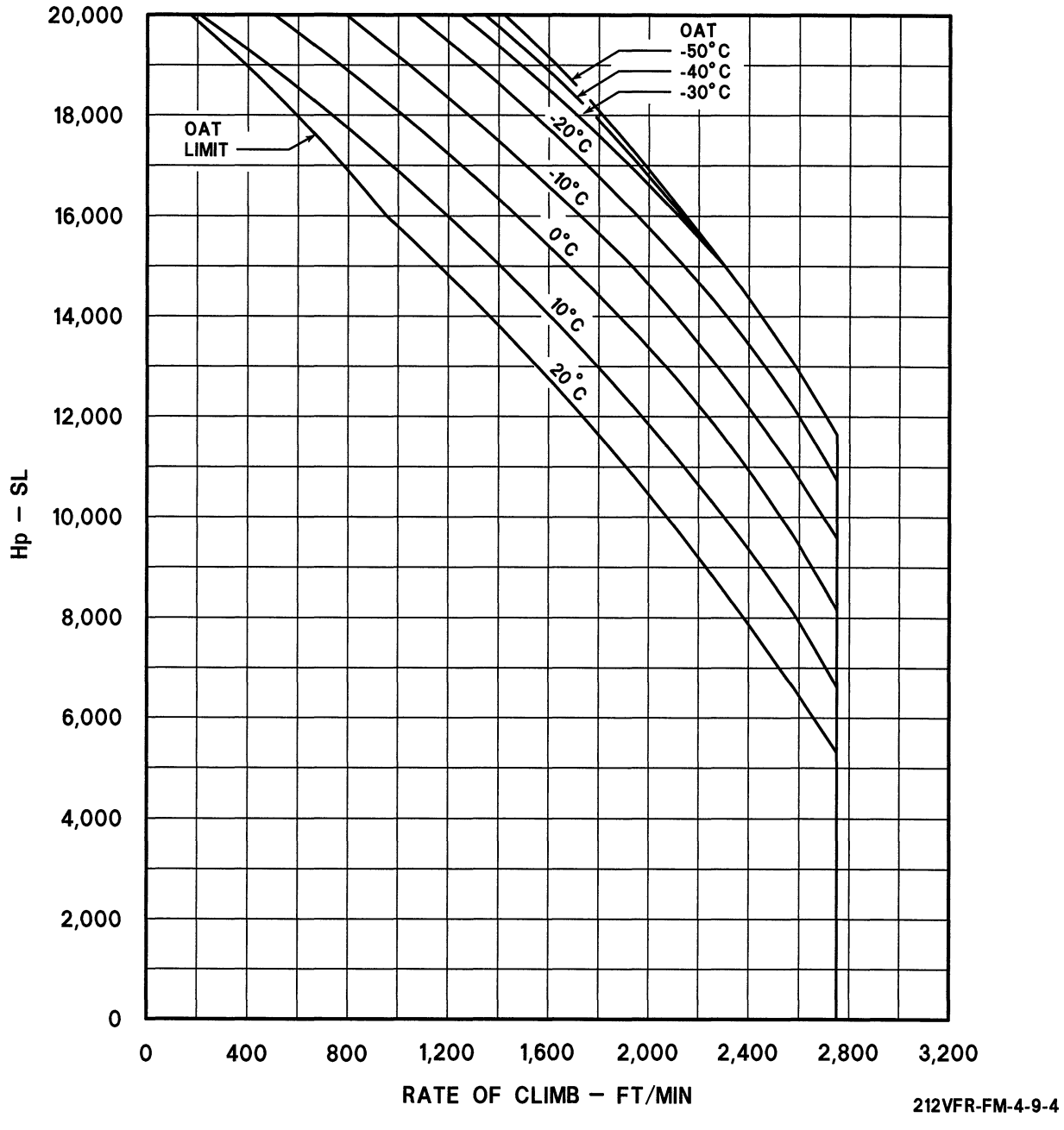

Figure 4-9. Twin engine rate of climb (Sheet 4 of 30)

TWIN ENGINE RATE OF CLIMB
GW 9000 LB (4082 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

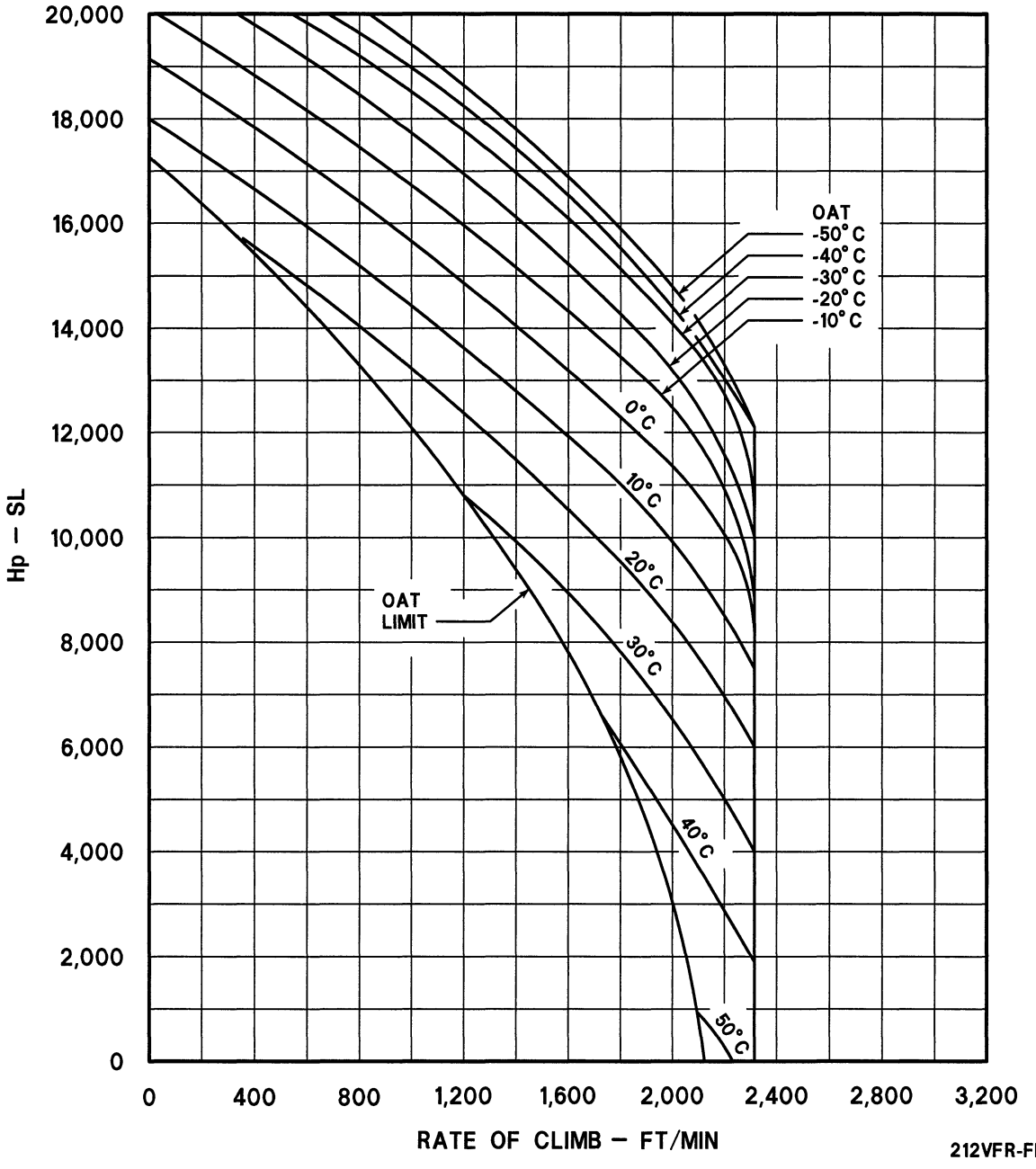

Figure 4-9. Twin engine rate of climb (Sheet 5 of 30)

TWIN ENGINE RATE OF CLIMB

GW 9000 LB (4082 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

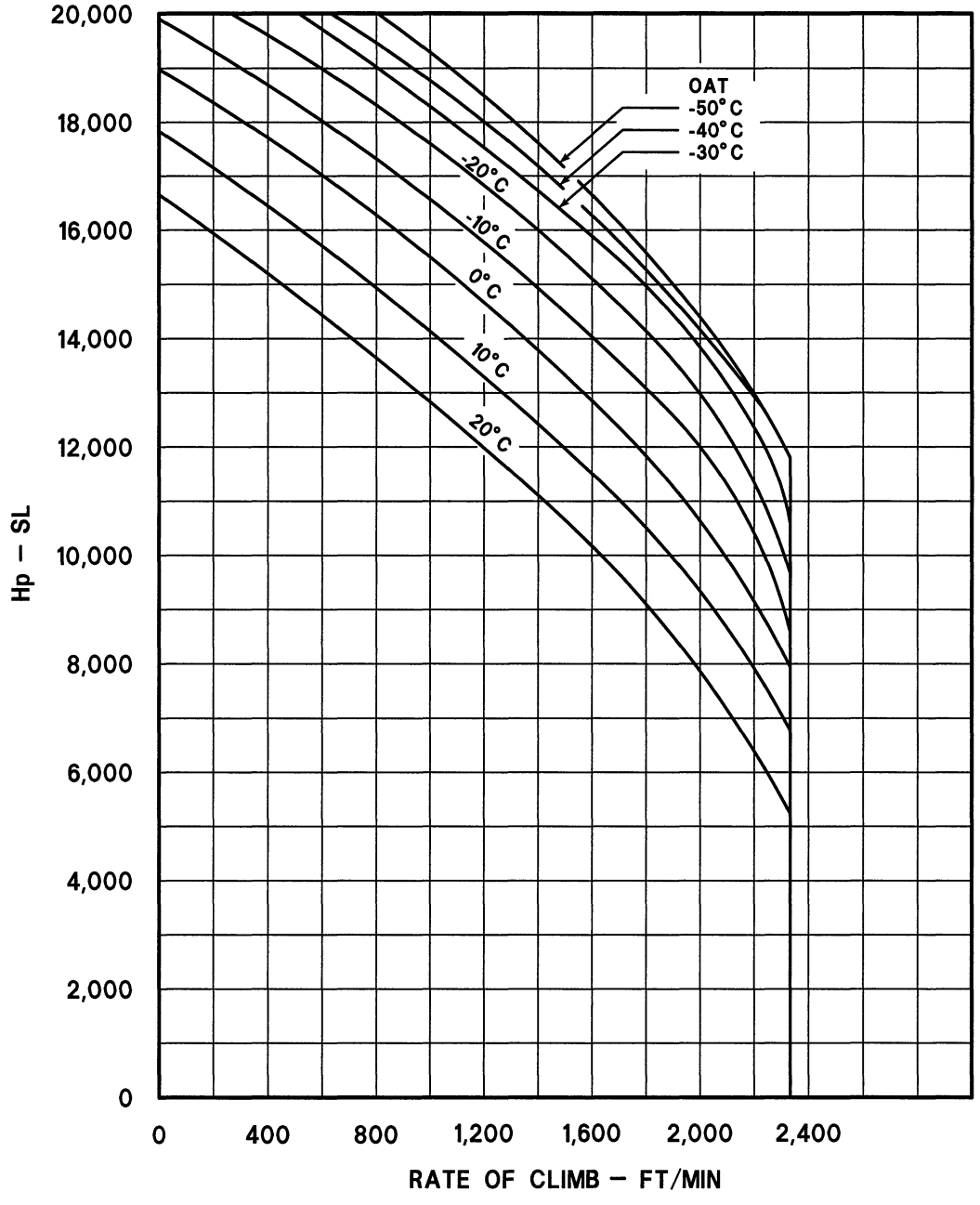

Figure 4-9. Twin engine rate of climb (Sheet 6 of 30)

TWIN ENGINE RATE OF CLIMB

GW 10,000 LB (4536 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

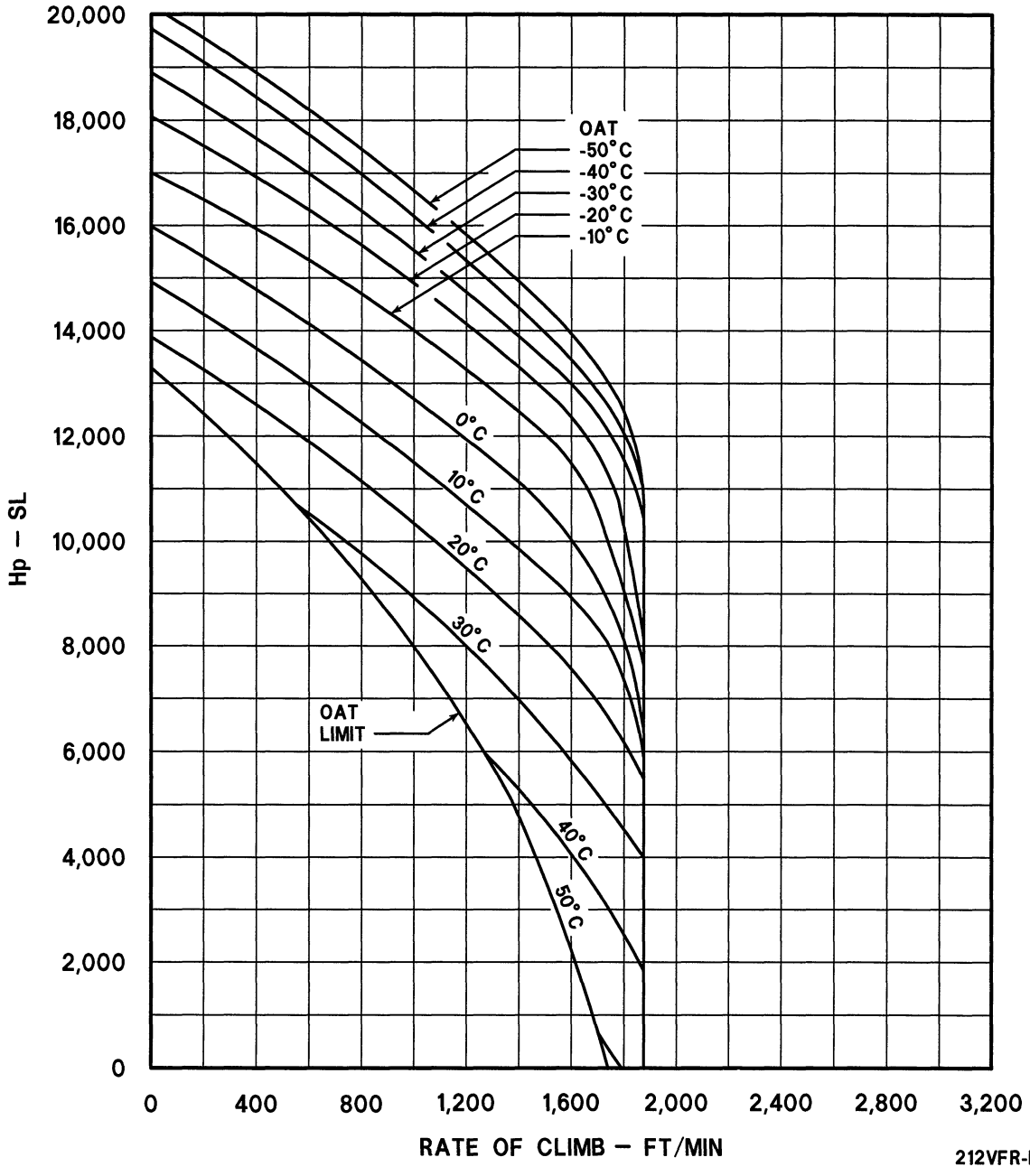

Figure 4-9. Twin engine rate of climb (Sheet 7 of 30)

TWIN ENGINE RATE OF CLIMB
GW 10,000 LB (4536 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

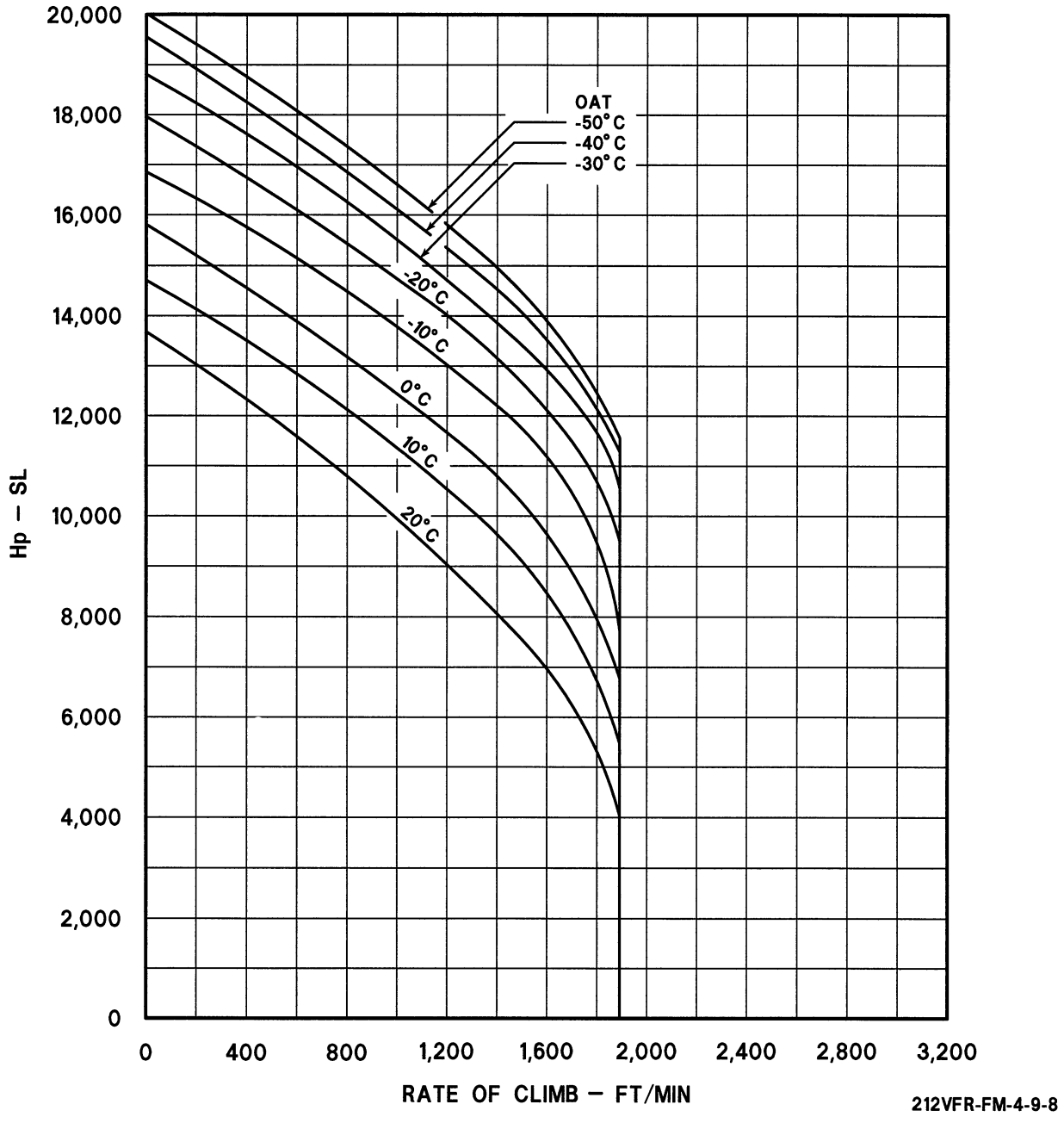

Figure 4-9. Twin engine rate of climb (Sheet 8 of 30)

TWIN ENGINE RATE OF CLIMB

GW 11,200 LB (5080 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

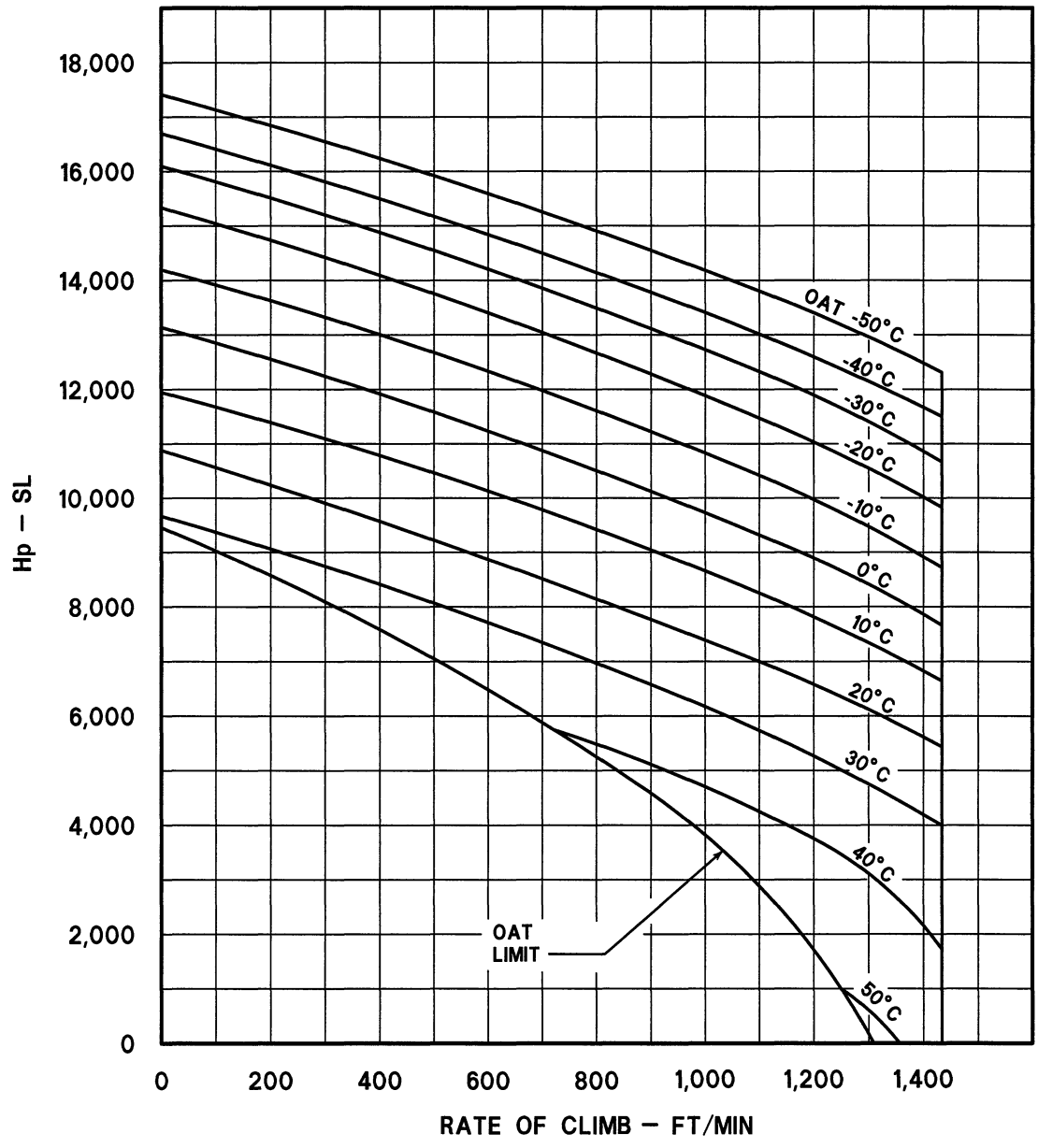

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Figure 4-9. Twin engine rate of climb (Sheet 9 of 30)

TWIN ENGINE RATE OF CLIMB

GW 11,200 LB (5080 KG)

TAKEOFF POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

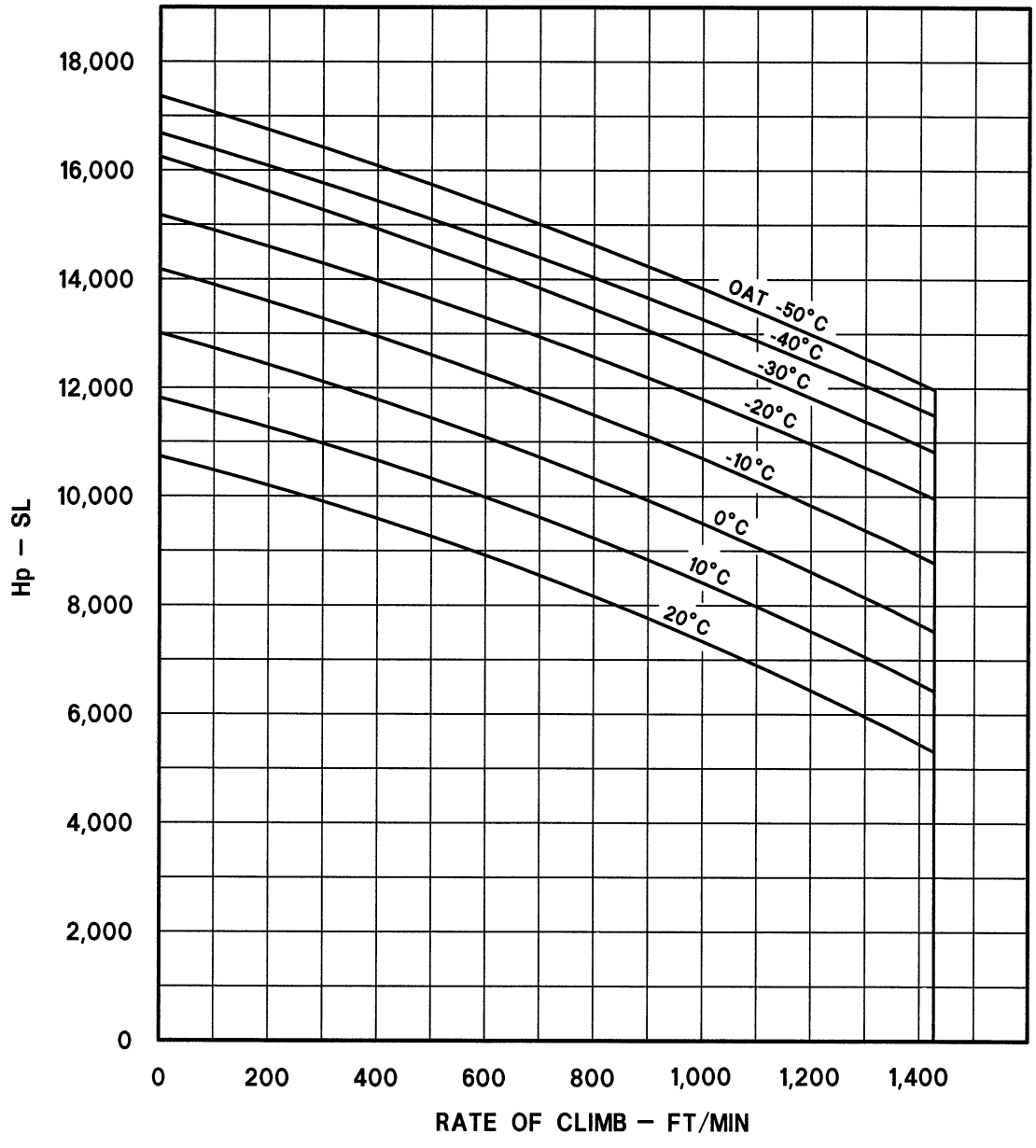

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Figure 4-9. Twin engine rate of climb (Sheet 10 of 30)

TWIN ENGINE RATE OF CLIMB

GW 7000 LB (3175 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

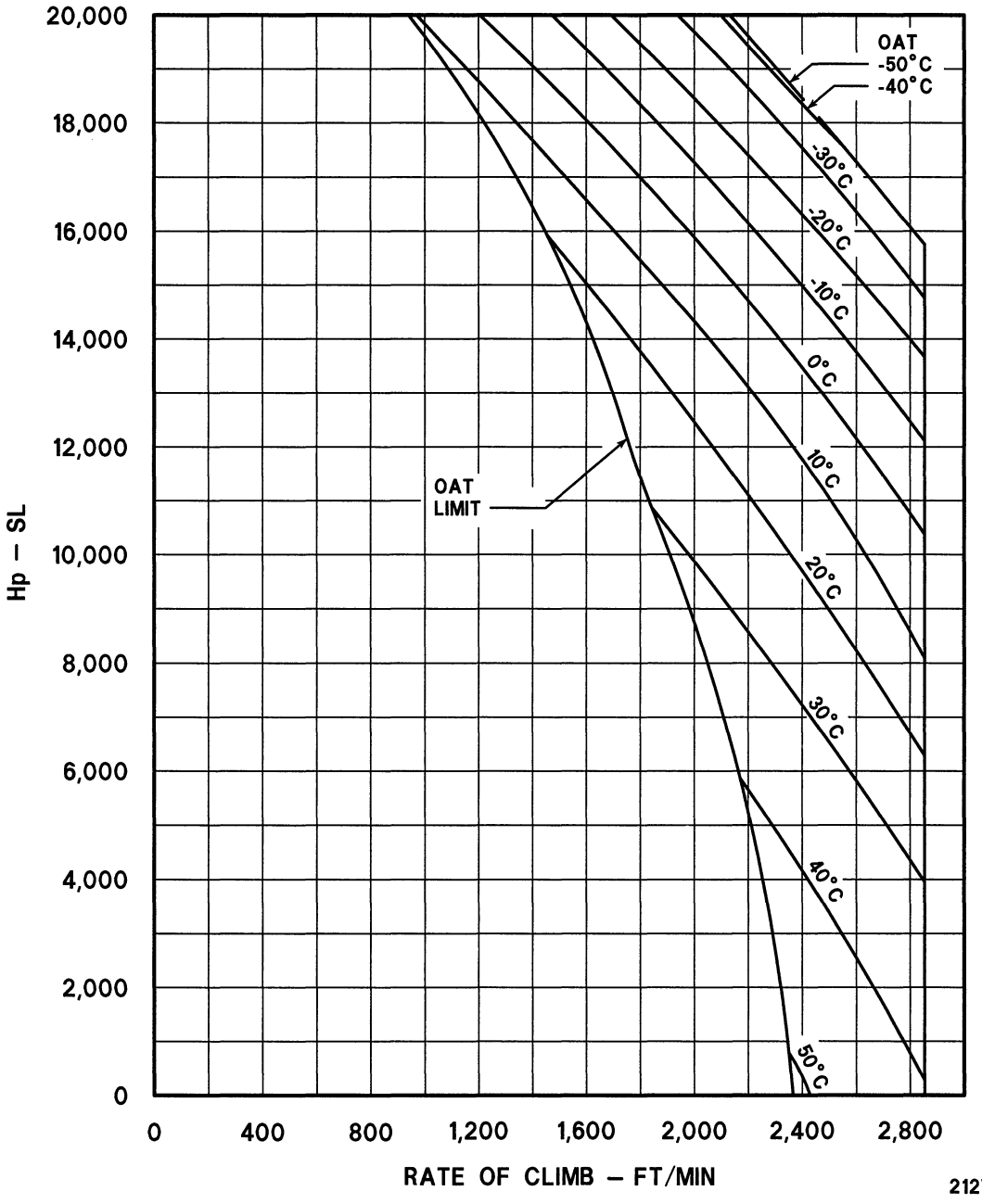

Figure 4-9. Twin engine rate of climb (Sheet 11 of 30)

TWIN ENGINE RATE OF CLIMB

GW 7000 LB (3175 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

83 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

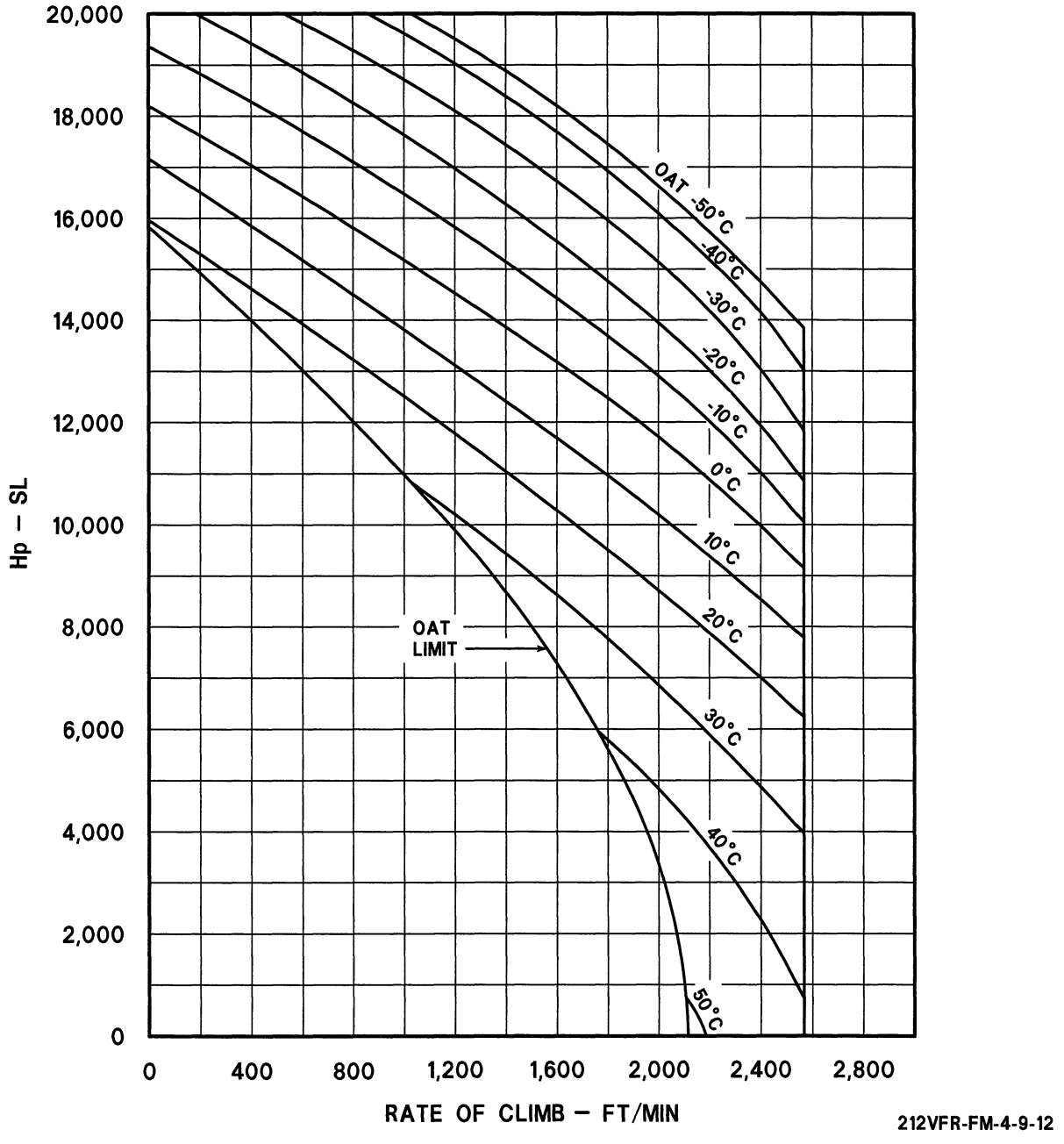

Figure 4-9. Twin engine rate of climb (Sheet 12 of 30)

TWIN ENGINE RATE OF CLIMB
GW 7000 LB (3175 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

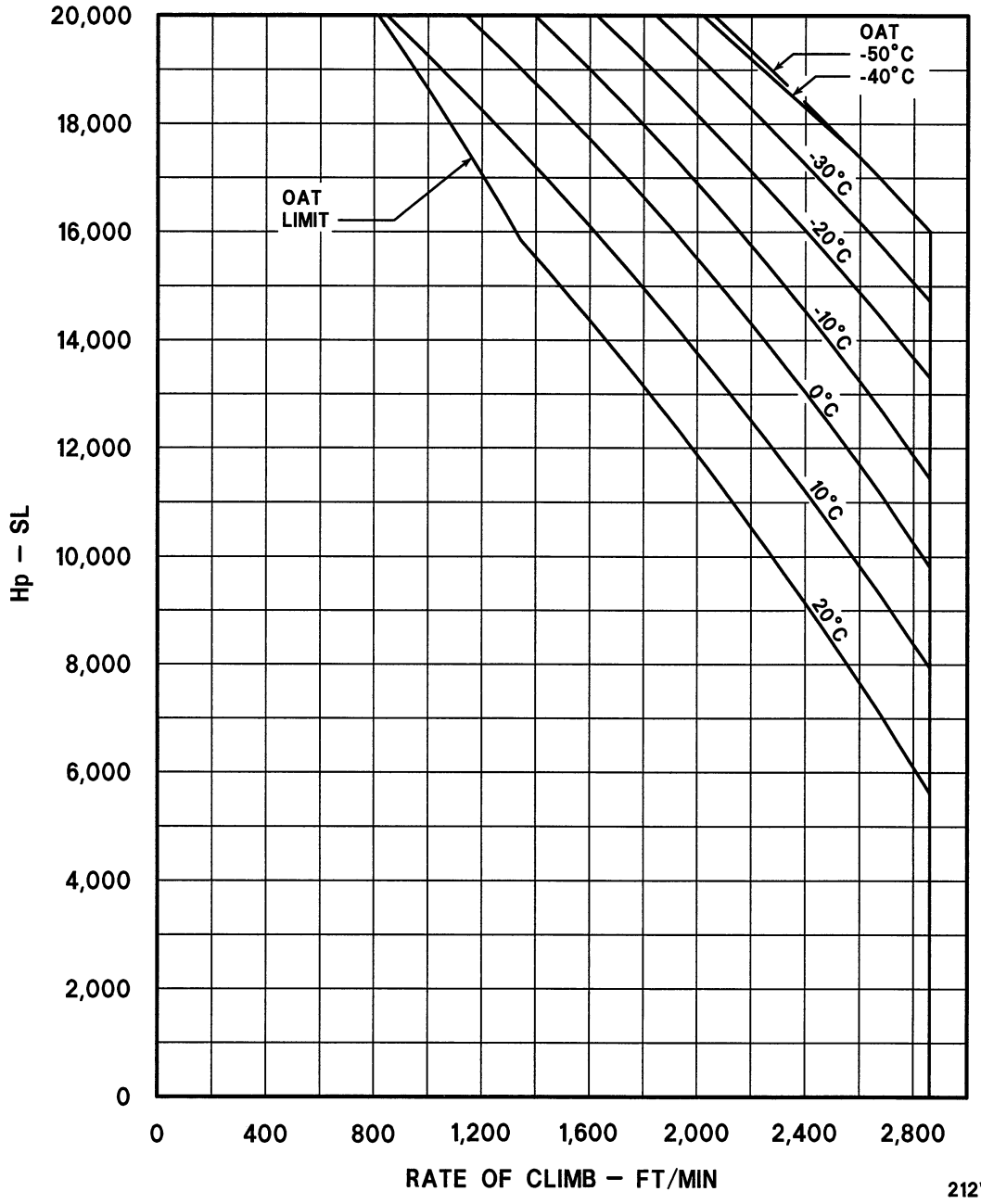

Figure 4-9. Twin engine rate of climb (Sheet 13 of 30)

TWIN ENGINE RATE OF CLIMB

GW 7000 LB (3175 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

83 KIAS
HEATER OR WINTERIZATION KIT ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

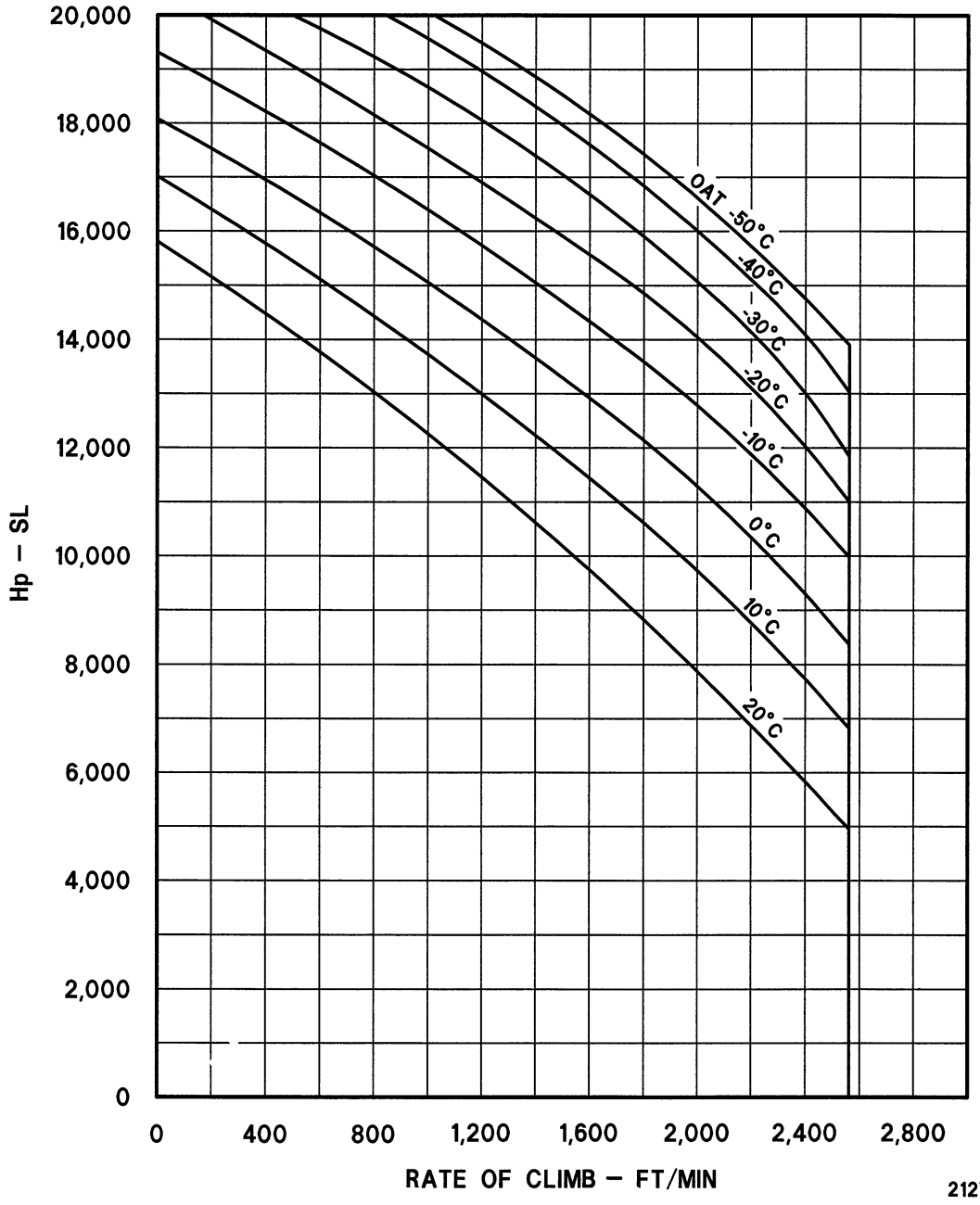

Figure 4-9. Twin engine rate of climb (Sheet 14 of 30)

TWIN ENGINE RATE OF CLIMB
GW 8000 LB (3629 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

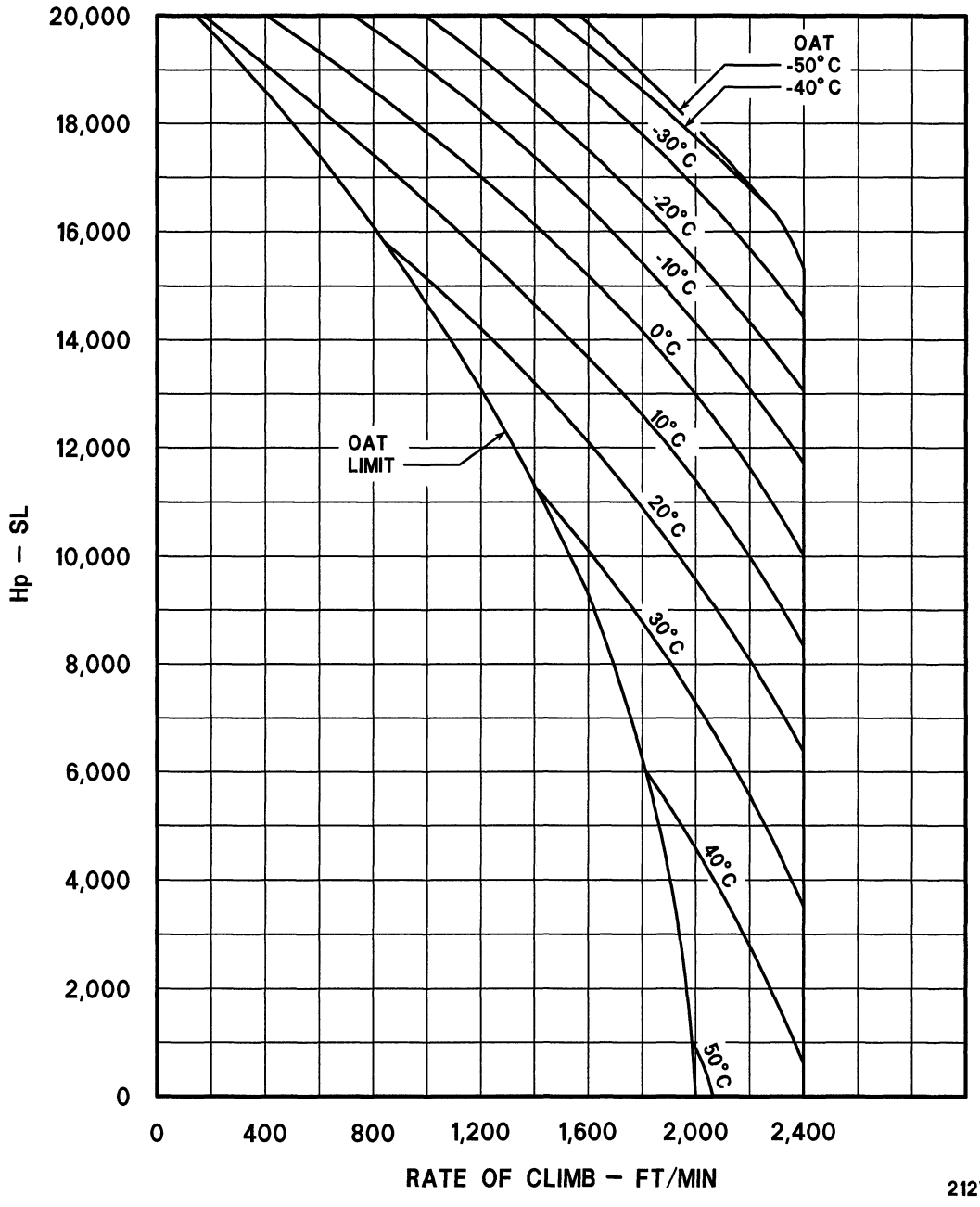

Figure 4-9. Twin engine rate of climb (Sheet 15 of 30)

TWIN ENGINE RATE OF CLIMB
GW 8000 LB (3629 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

83 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

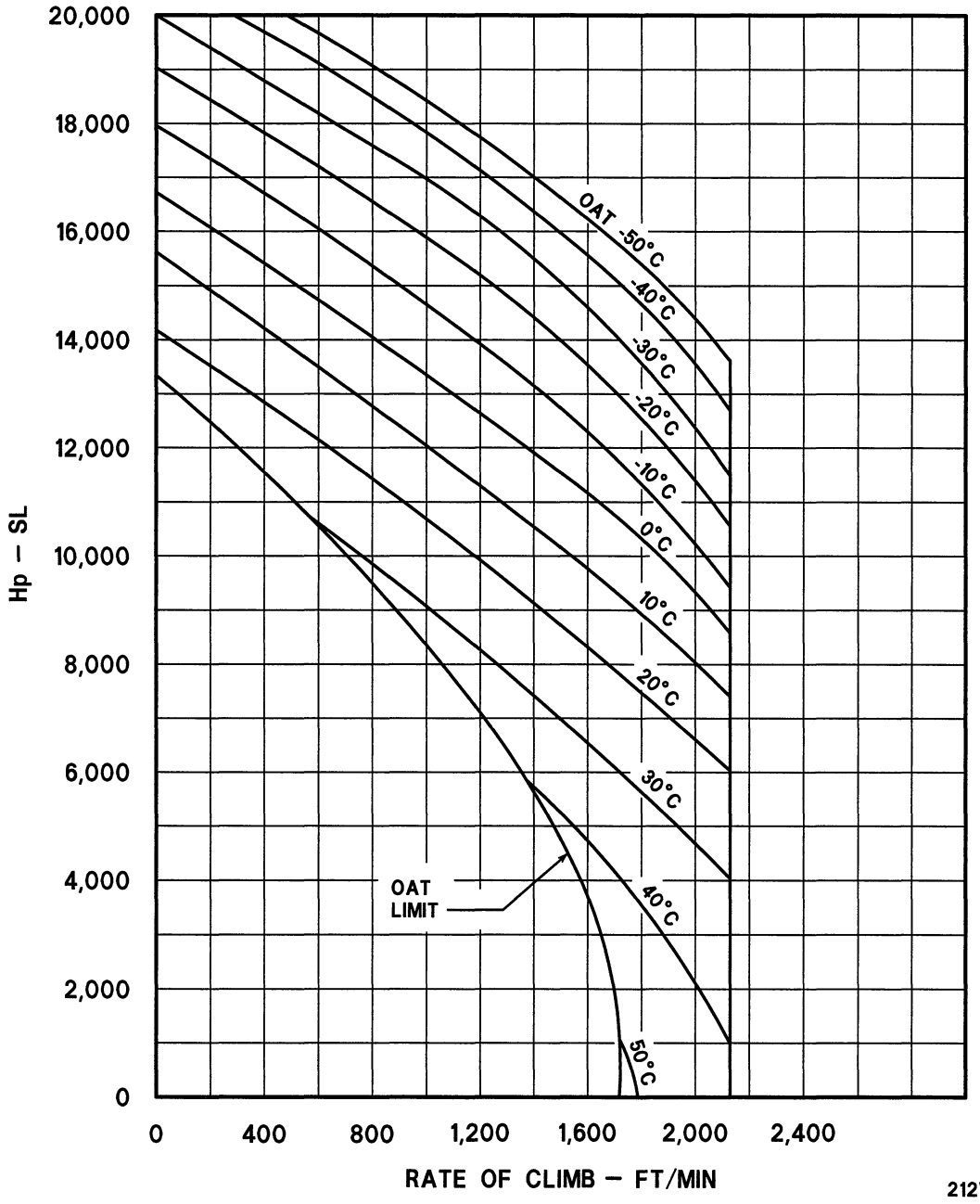

Figure 4-9. Twin engine rate of climb (Sheet 16 of 30)

TWIN ENGINE RATE OF CLIMB

GW 8000 LB (3629 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

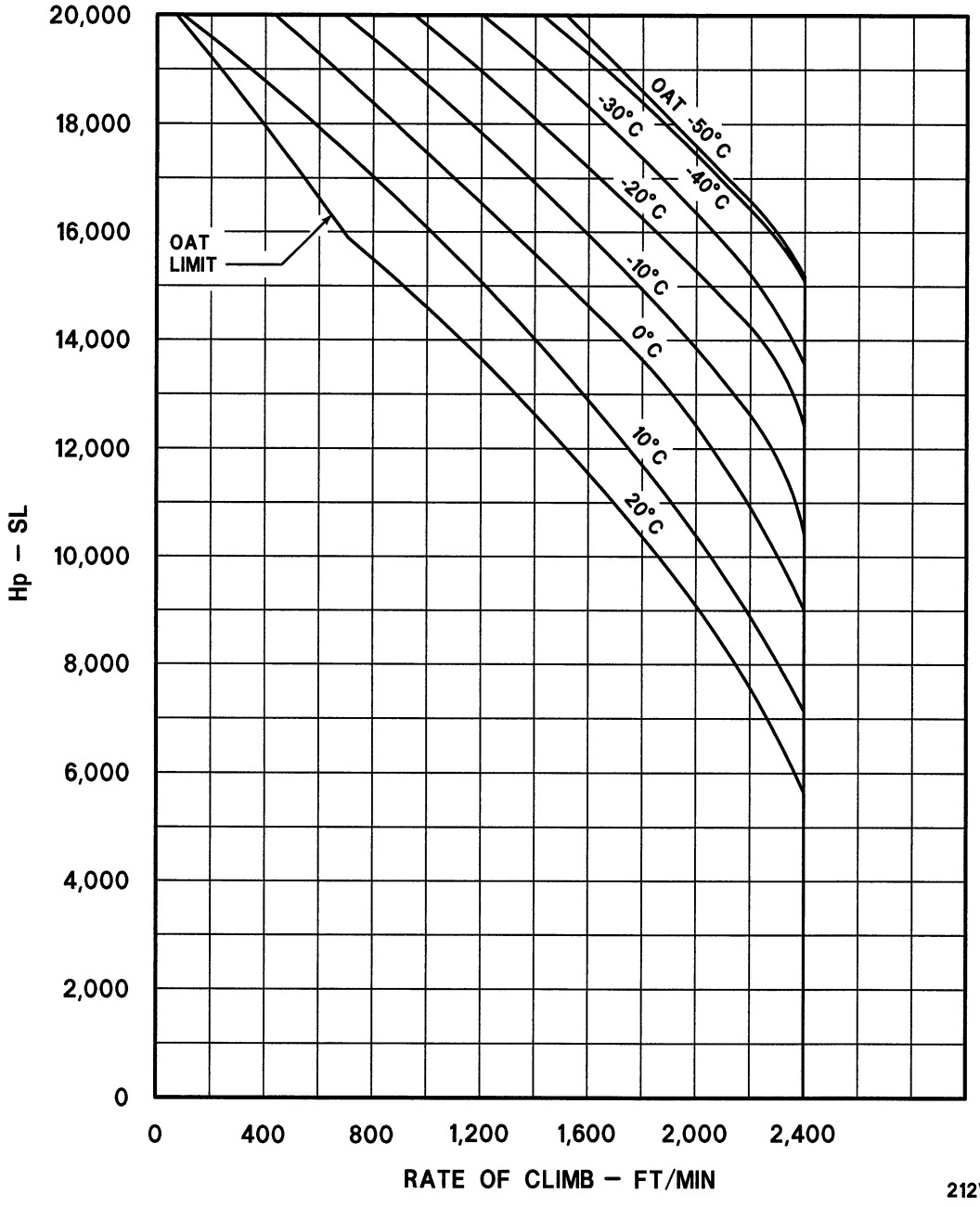

Figure 4-9. Twin engine rate of climb (Sheet 17 of 30)

TWIN ENGINE RATE OF CLIMB

GW 8000 LB (3629 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OR
WINTERIZATION KIT ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

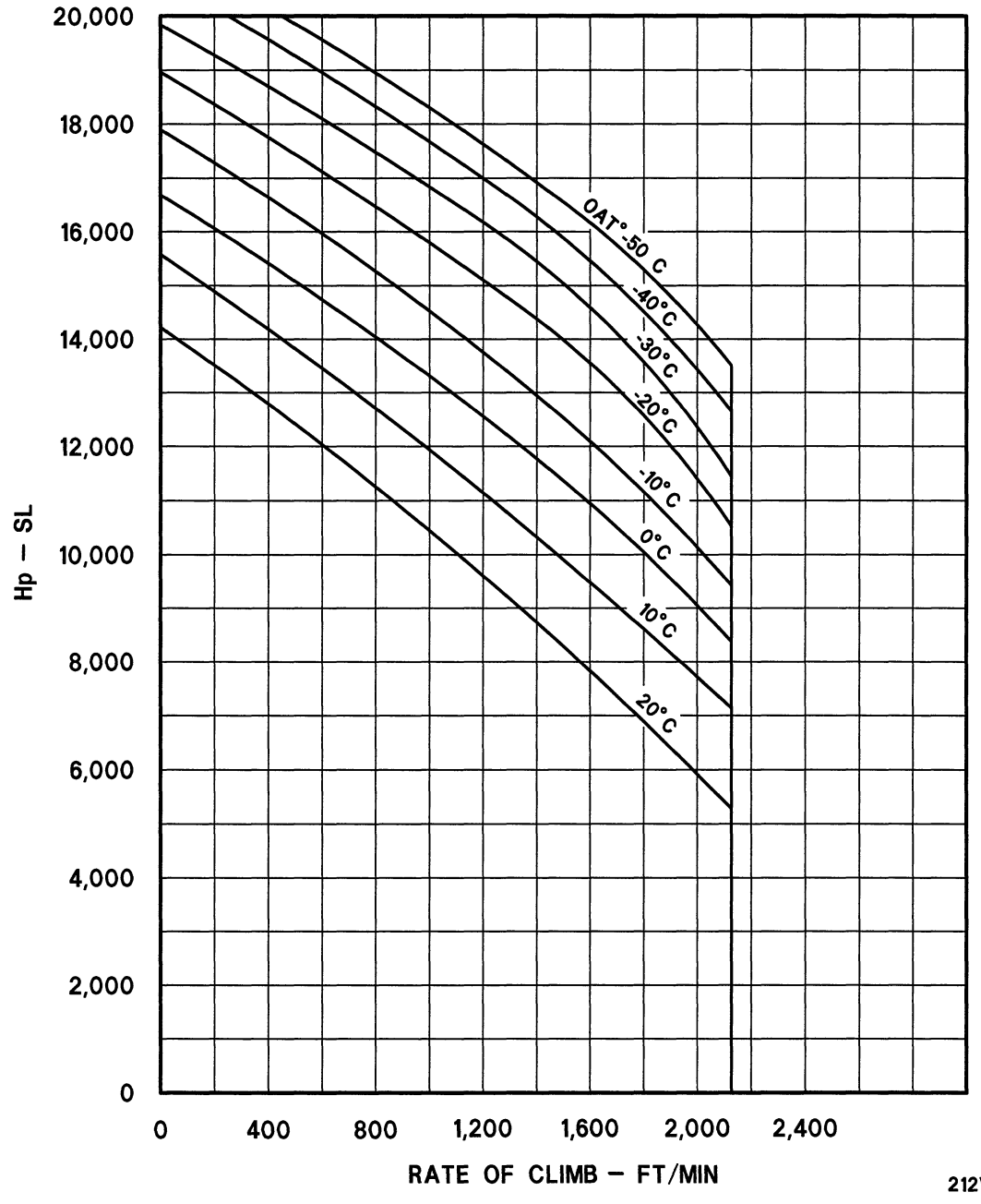

Figure 4-9. Twin engine rate of climb (Sheet 18 of 30)

TWIN ENGINE RATE OF CLIMB

GW 9000 LB (4082 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

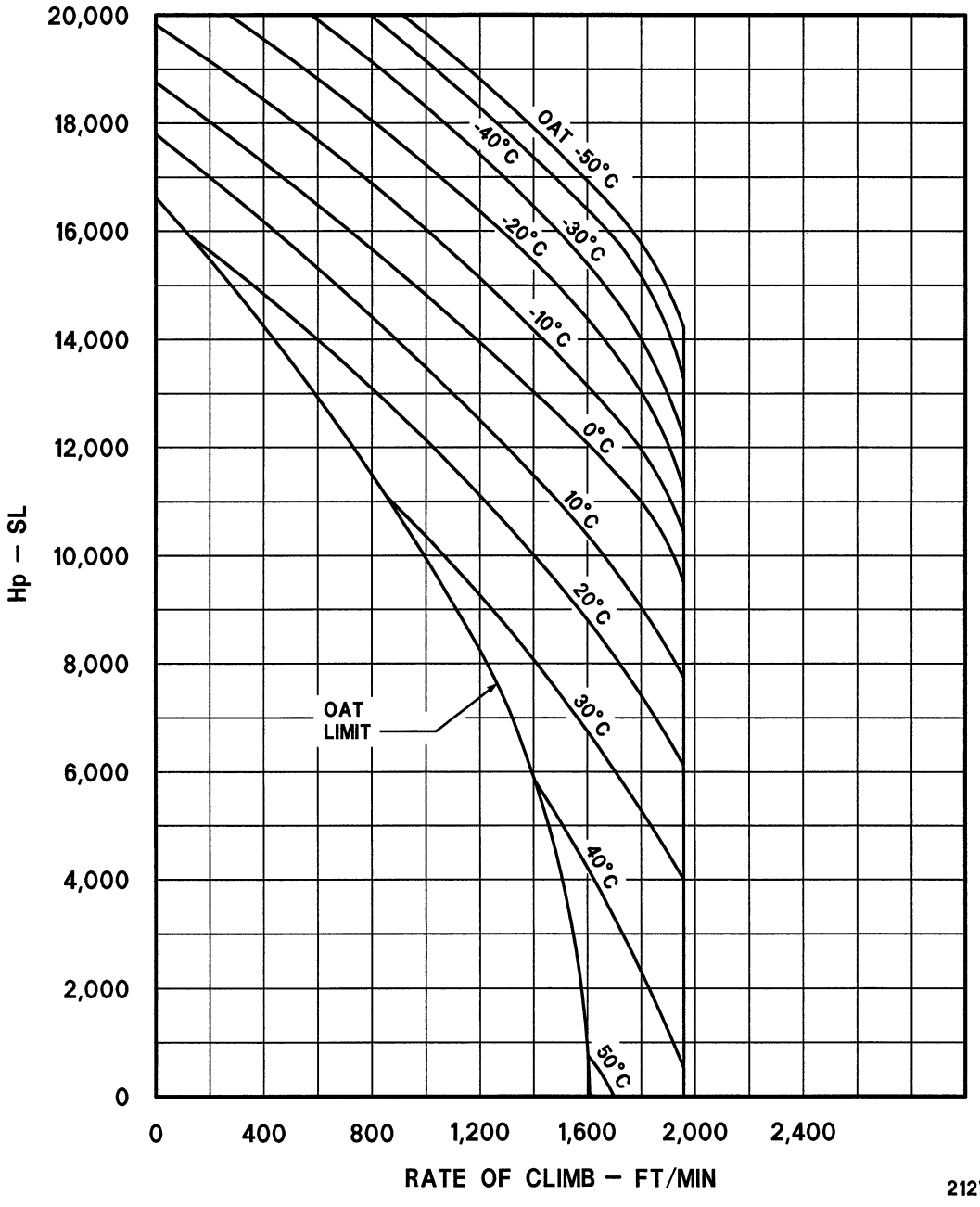

Figure 4-9. Twin engine rate of climb (Sheet 19 of 30)

TWIN ENGINE RATE OF CLIMB
GW 9000 LB (4082 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

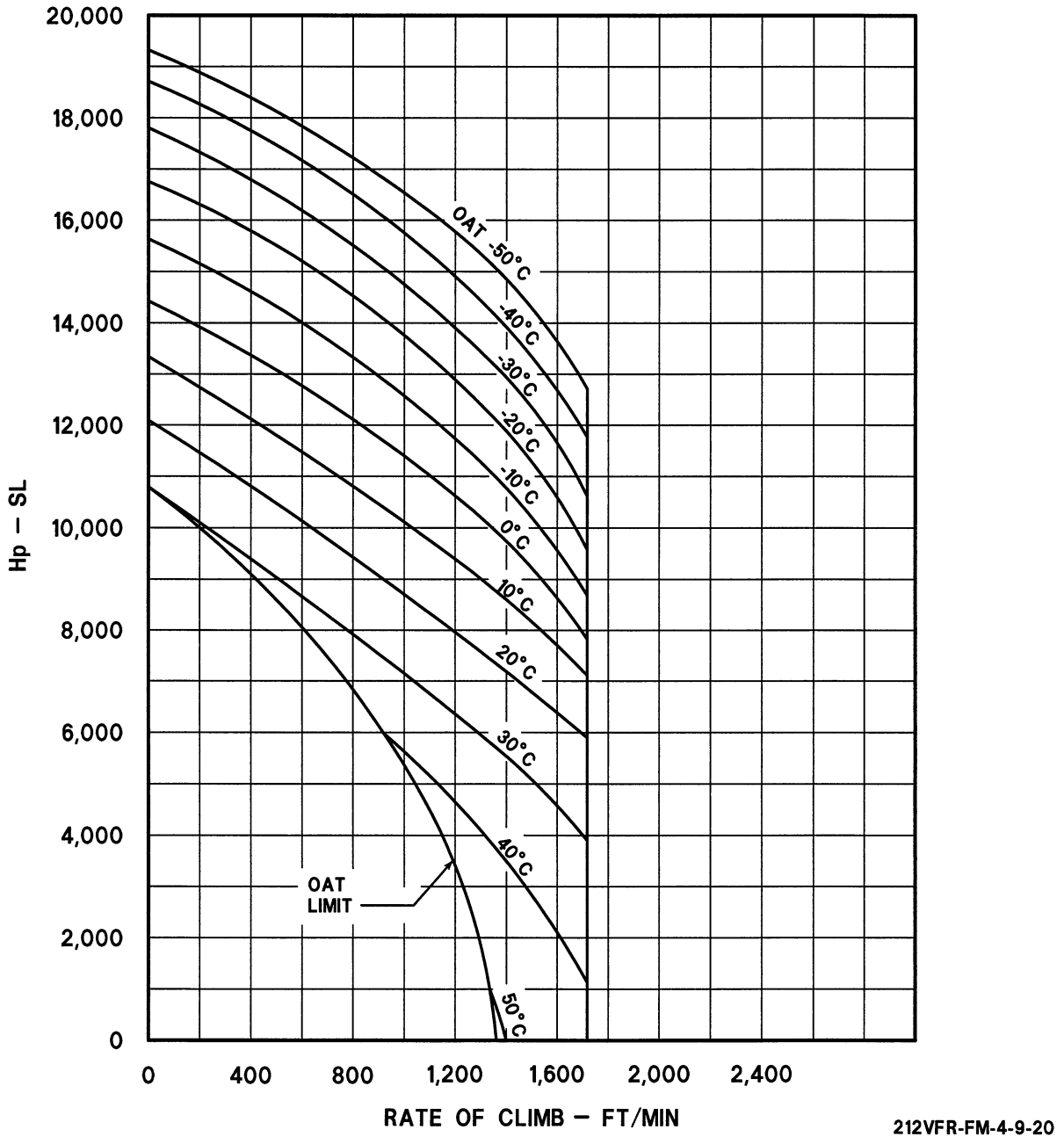

Figure 4-9. Twin engine rate of climb (Sheet 20 of 30)

TWIN ENGINE RATE OF CLIMB
GW 9000 LB (4082 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

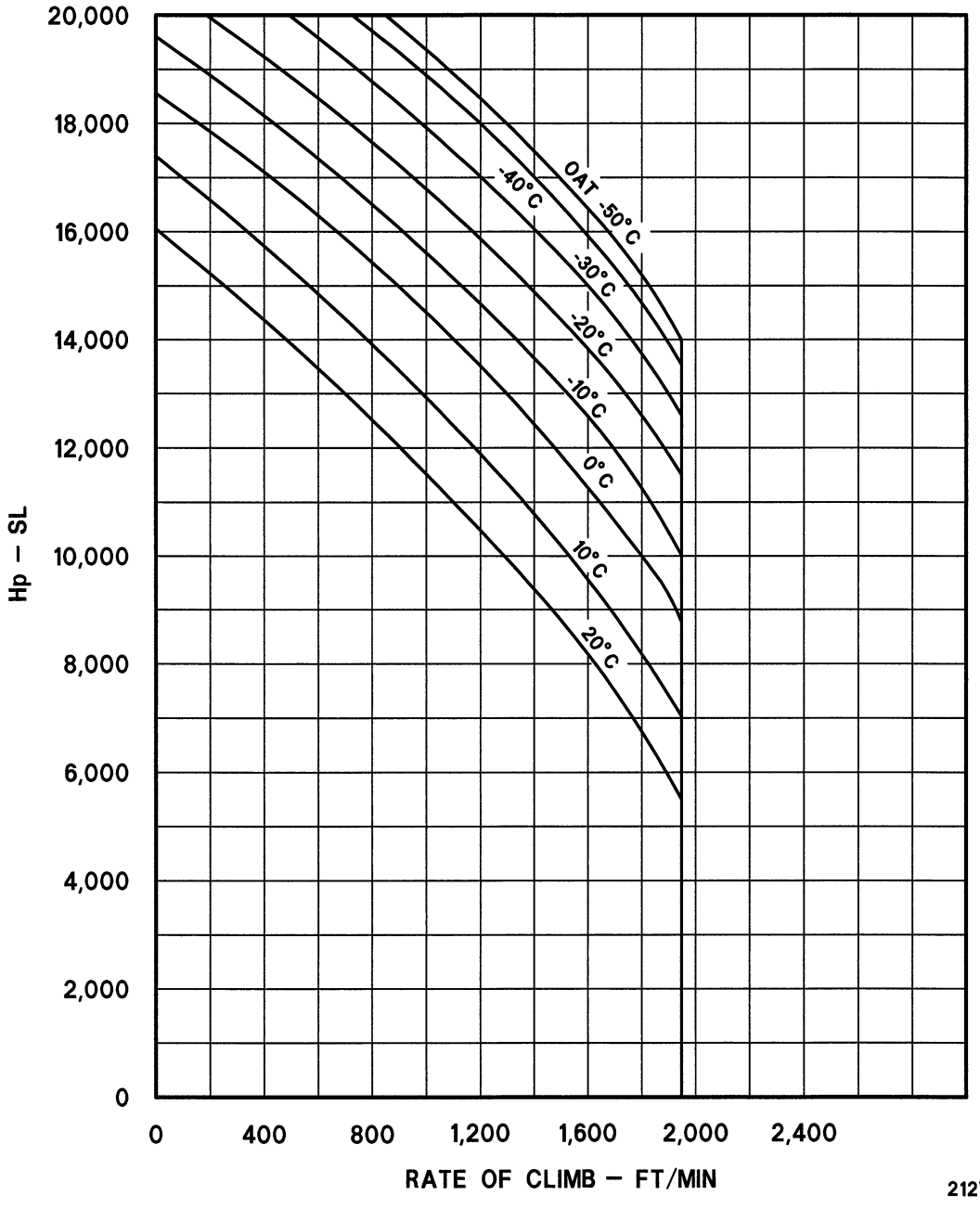

Figure 4-9. Twin engine rate of climb (Sheet 21 of 30)

TWIN ENGINE RATE OF CLIMB

GW 9000 LB (4082 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OR
WINTERIZATION KIT ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

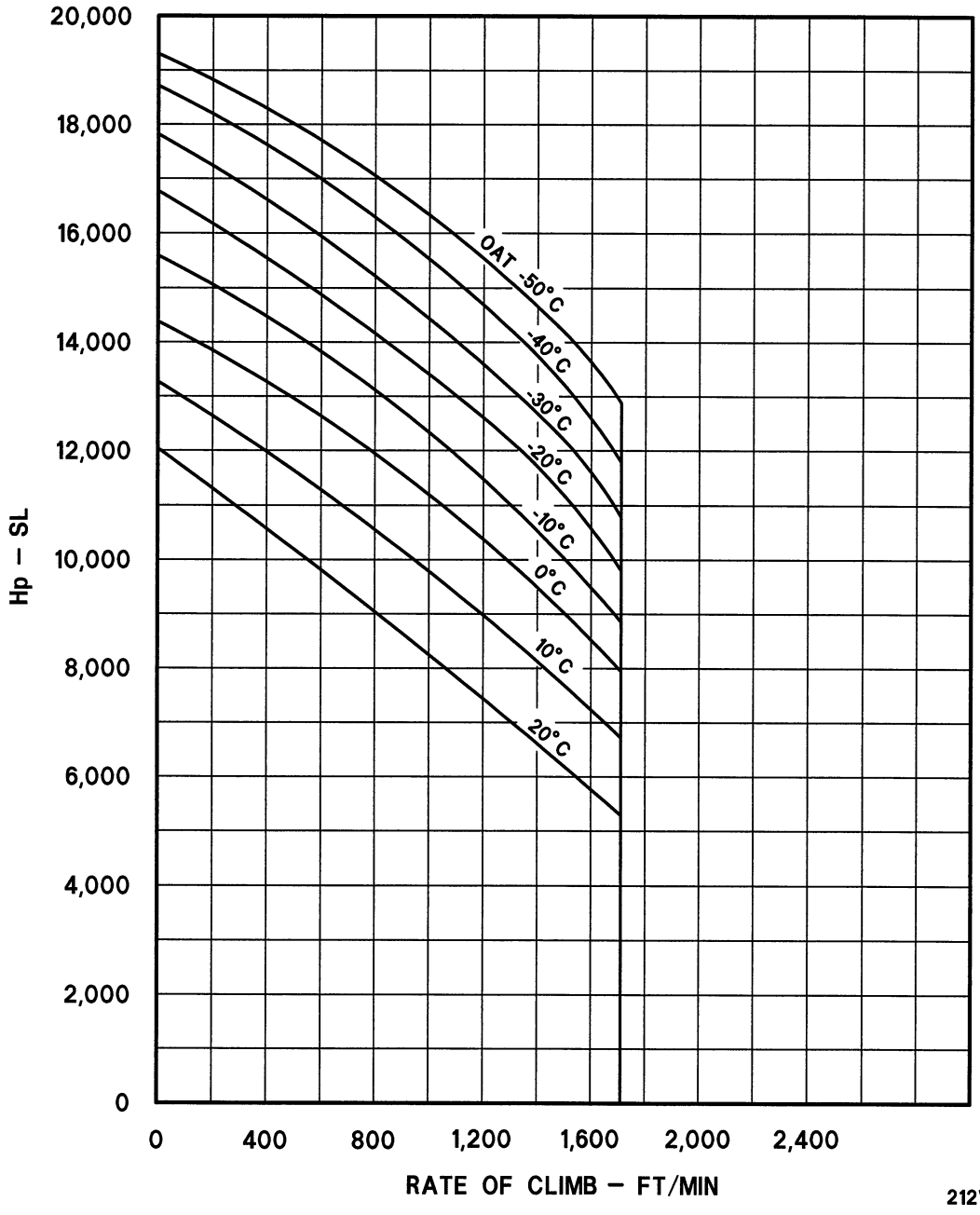

Figure 4-9. Twin engine rate of climb (Sheet 22 of 30)

TWIN ENGINE RATE OF CLIMB

GW 10,000 LB (4536 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

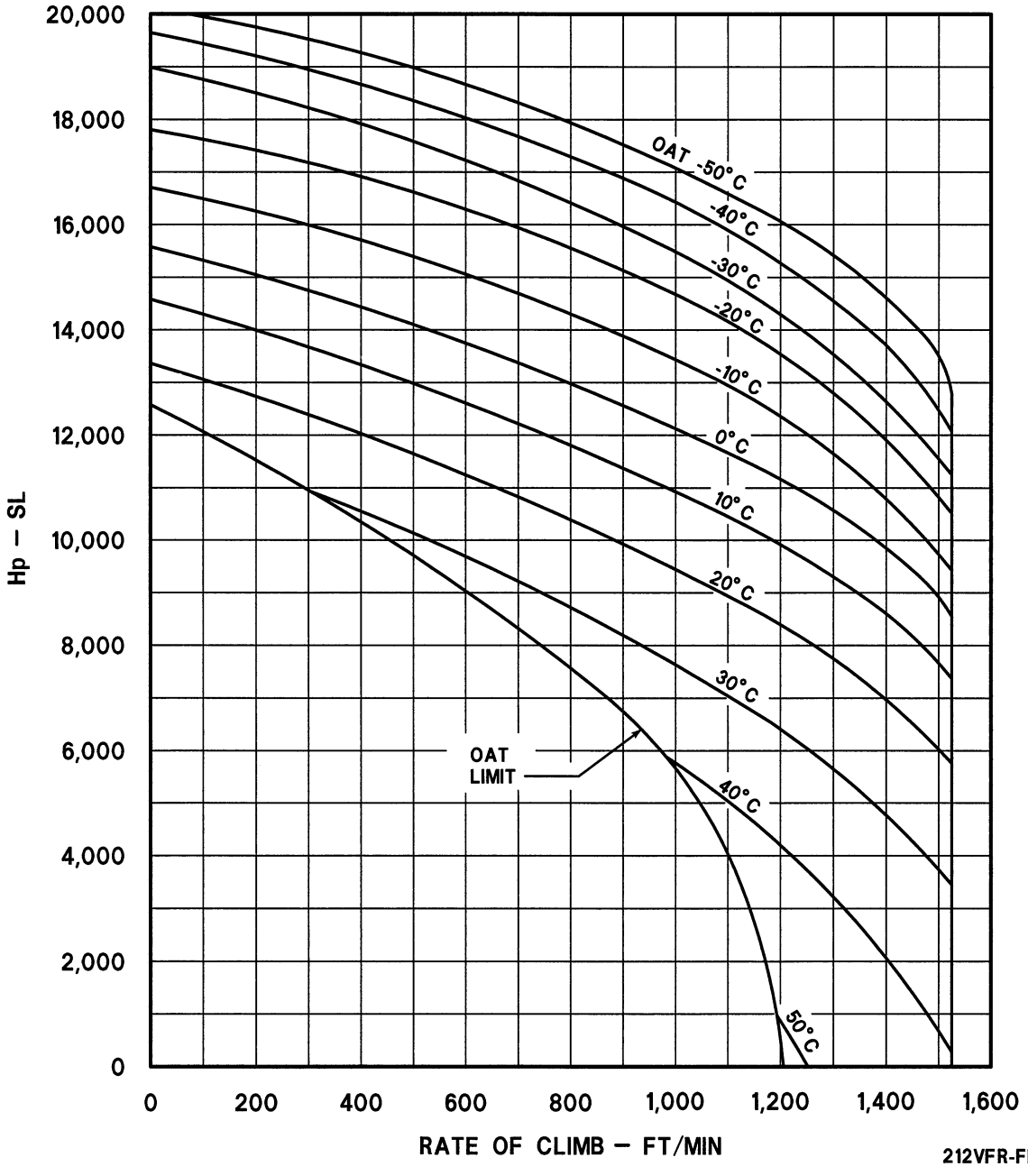

Figure 4-9. Twin engine rate of climb (Sheet 23 of 30)

TWIN ENGINE RATE OF CLIMB

GW 10,000 LB (4536 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

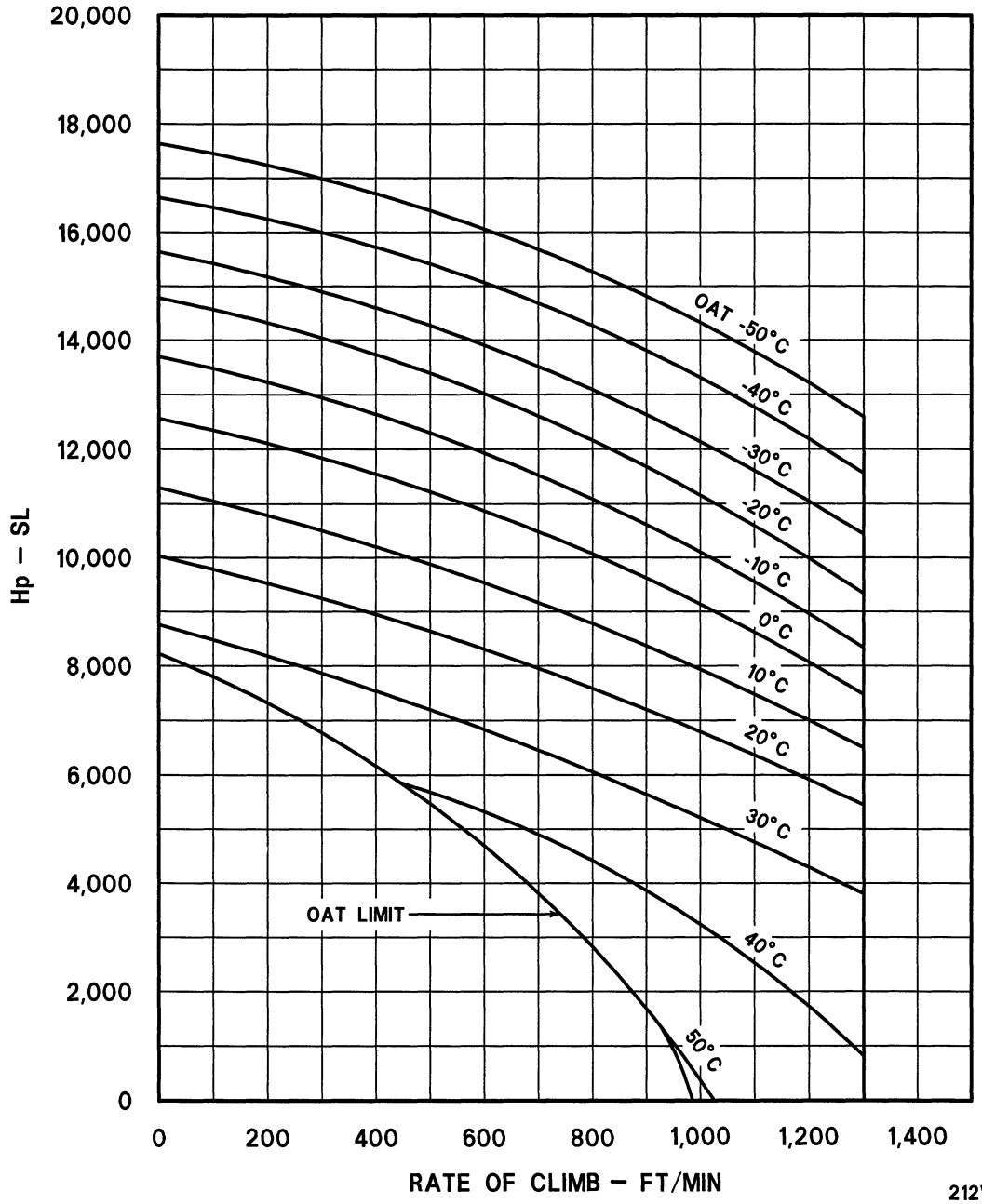

Figure 4-9. Twin engine rate of climb (Sheet 24 of 30)

TWIN ENGINE RATE OF CLIMB
GW 10,000 LB (4536 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

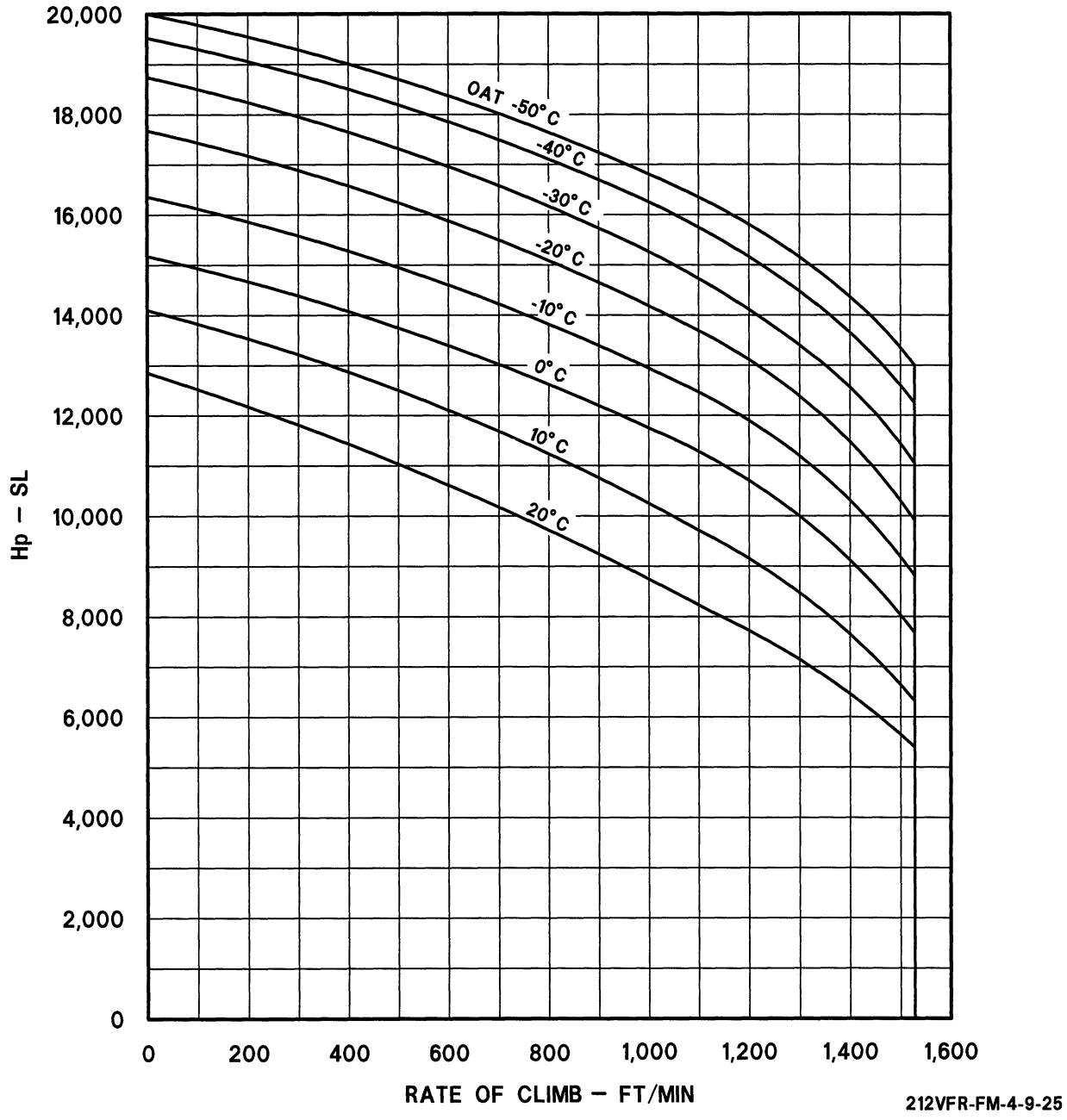

Figure 4-9. Twin engine rate of climb (Sheet 25 of 30)

TWIN ENGINE RATE OF CLIMB

GW 10,000 LB (4536 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OR
WINTERIZATION KIT ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

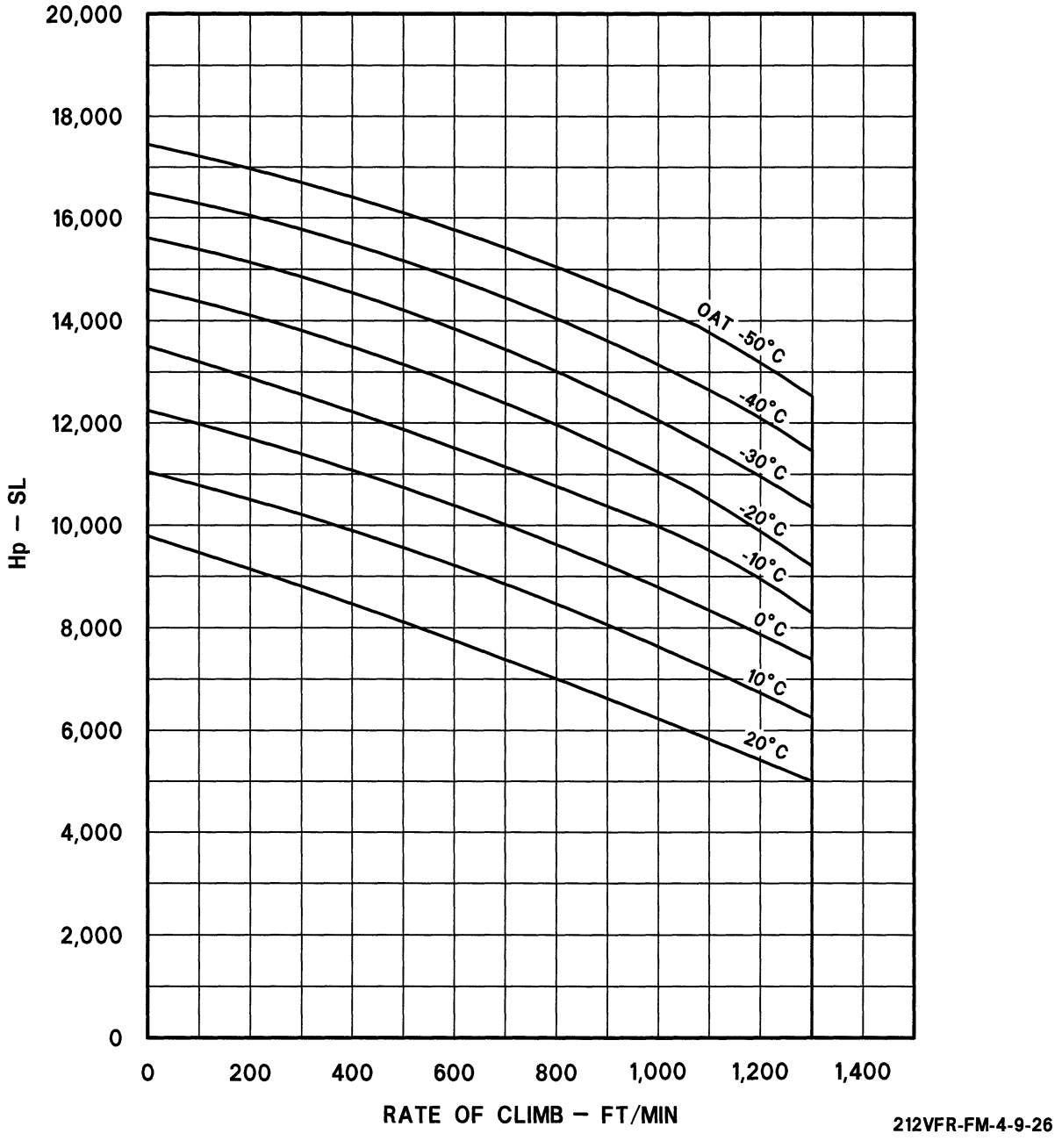

Figure 4-9. Twin engine rate of climb (Sheet 26 of 30)

TWIN ENGINE RATE OF CLIMB
GW 11,200 LB (5080 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

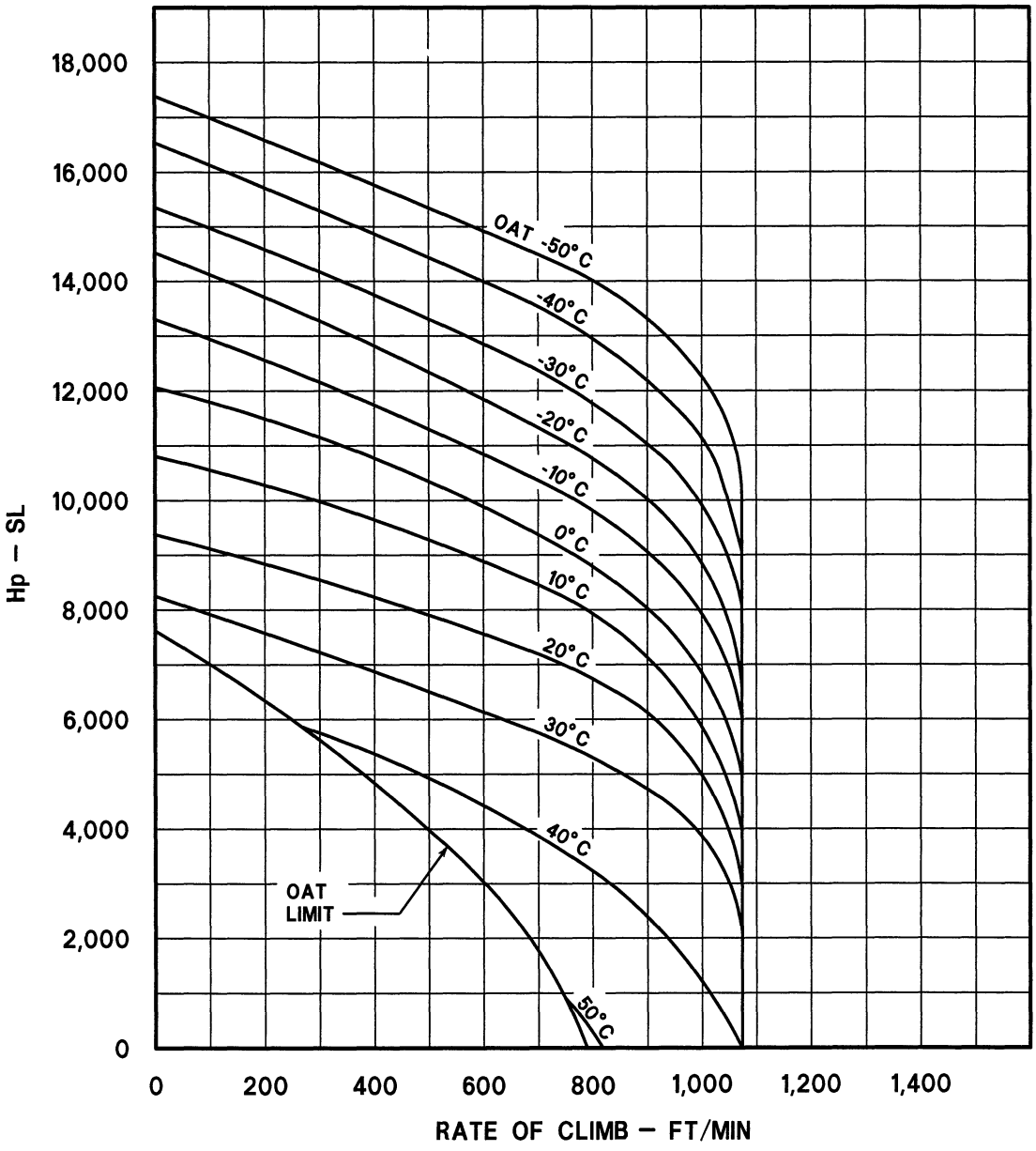

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Figure 4-9. Twin engine rate of climb (Sheet 27 of 30)

TWIN ENGINE RATE OF CLIMB
GW 11,200 LB (5080 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OFF

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

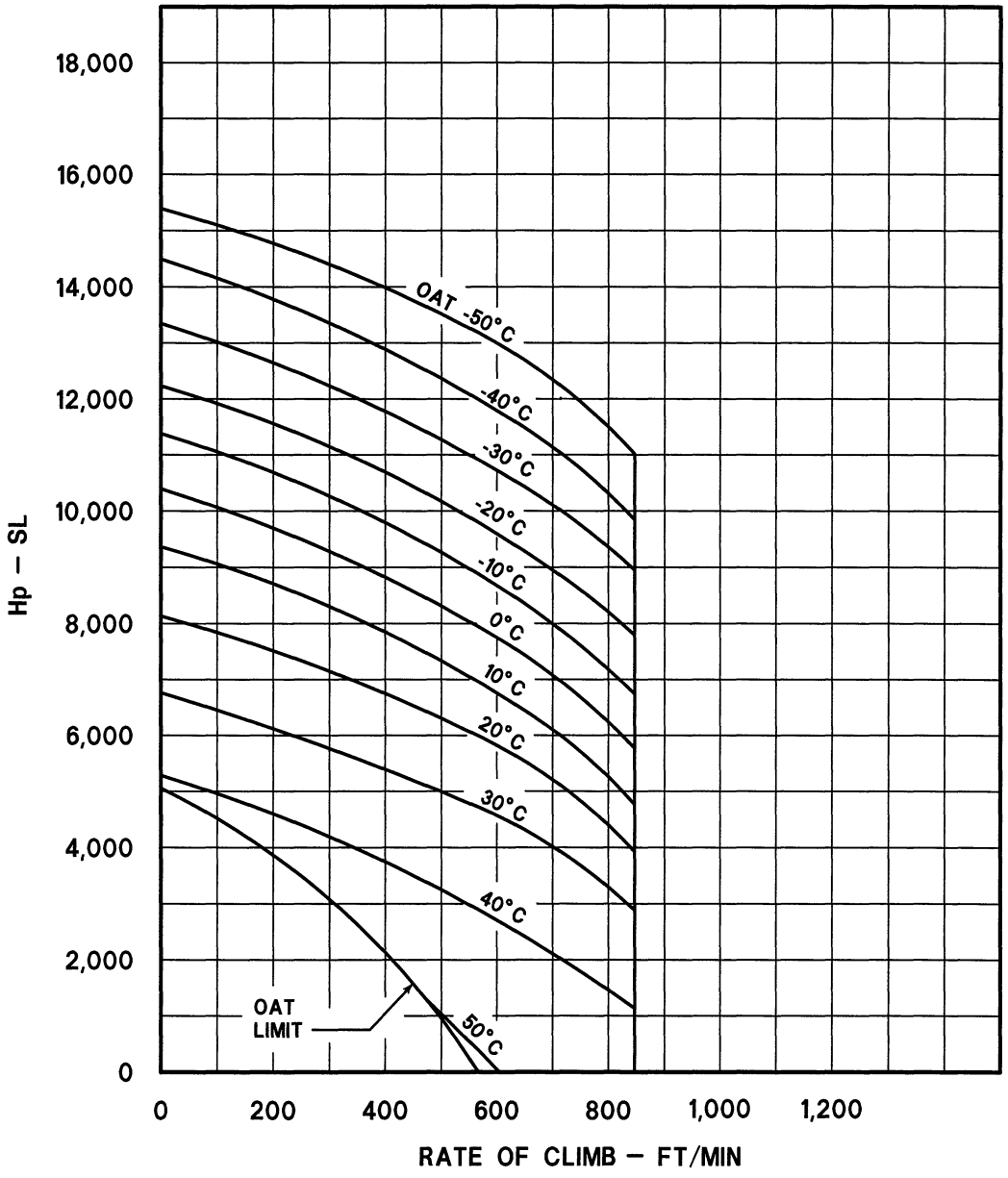

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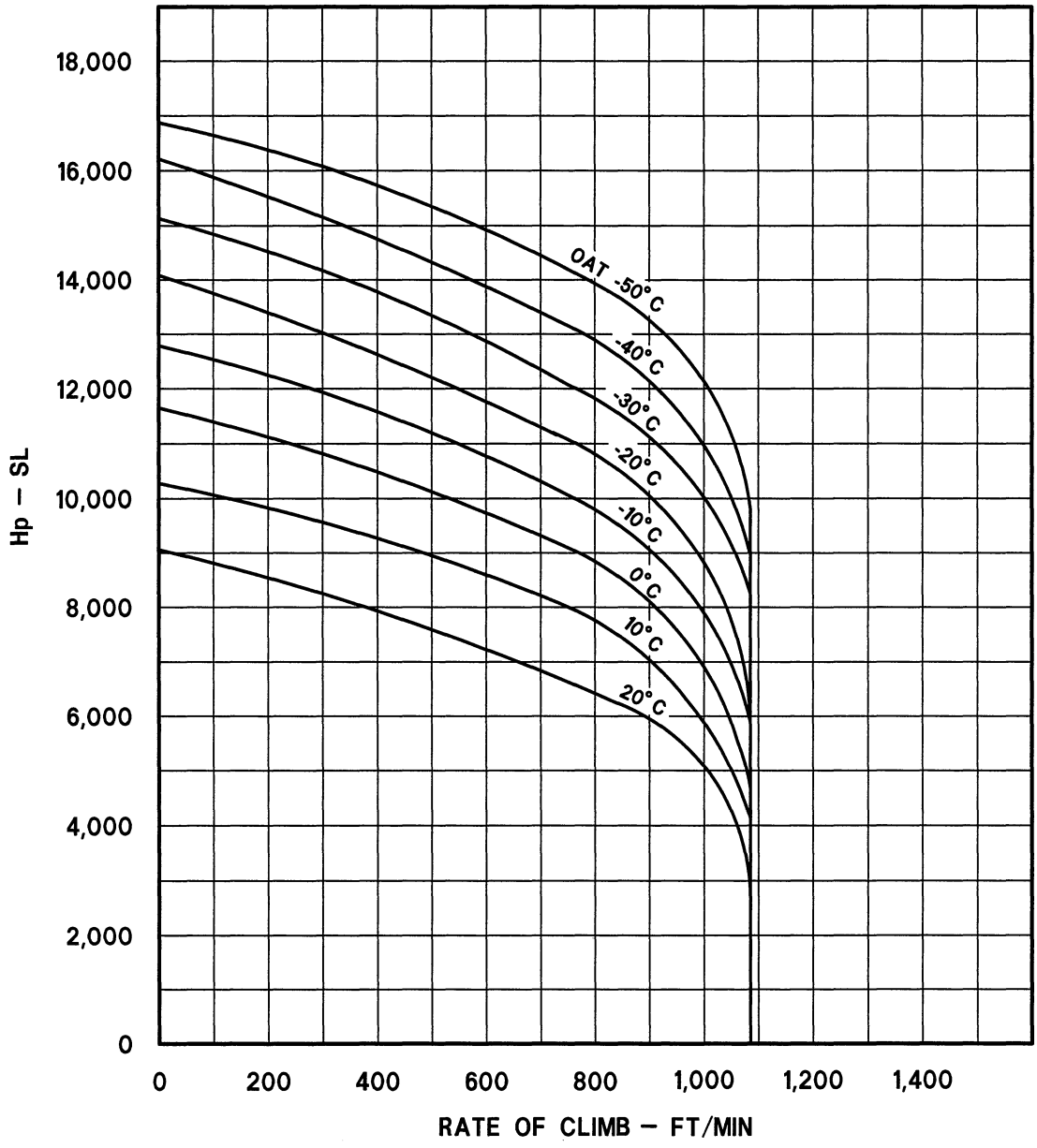
Figure 4-9. Twin engine rate of climb (Sheet 28 of 30)

TWIN ENGINE RATE OF CLIMB
GW 11,200 LB (5080 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN



212VFR-FM-4-9-29

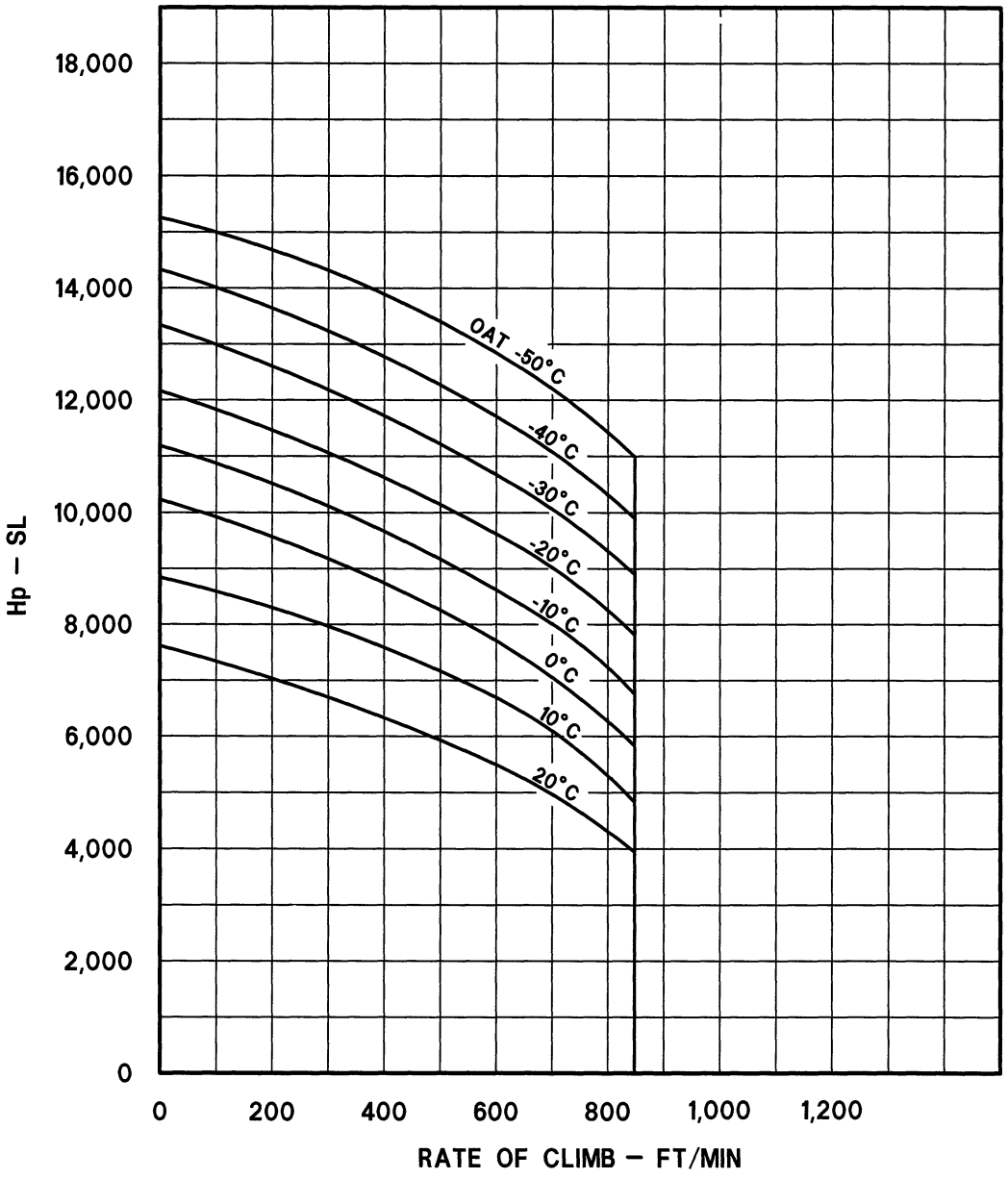
Figure 4-9. Twin engine rate of climb (Sheet 29 of 30)

TWIN ENGINE RATE OF CLIMB
GW 11,200 LB (5080 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 100% (N2)
GENERATOR 150 AMPS EACH

83 KIAS
HEATER OR
WINTERIZATION KIT ON

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN



212VFR-FM-4-9-30

Figure 4-9. Twin engine rate of climb (Sheet 30 of 30)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B

GW 7000 LB (3175 KG)

2 1/2 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

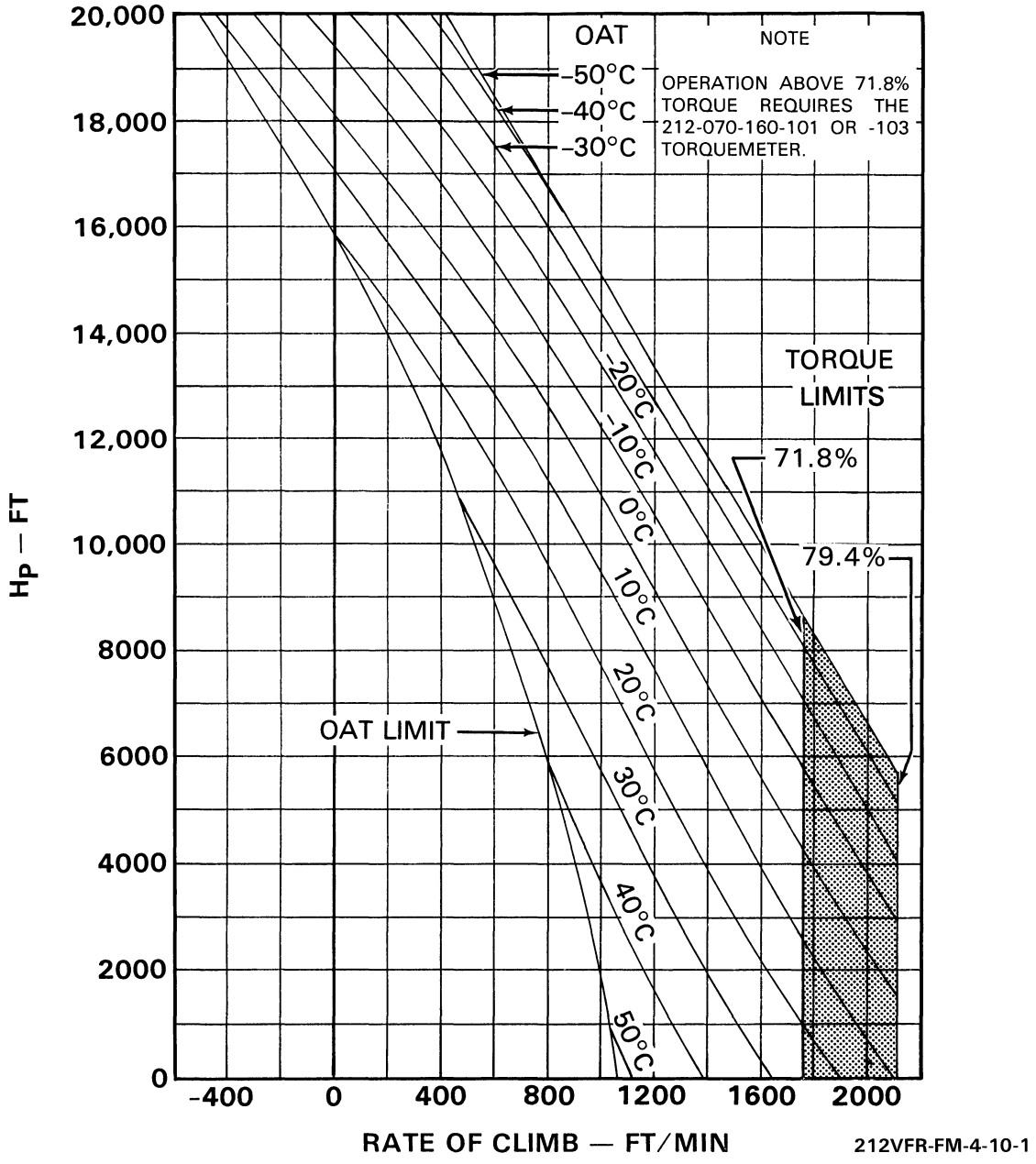


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 1 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 8000 LB (3629 KG)

2 1/2 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

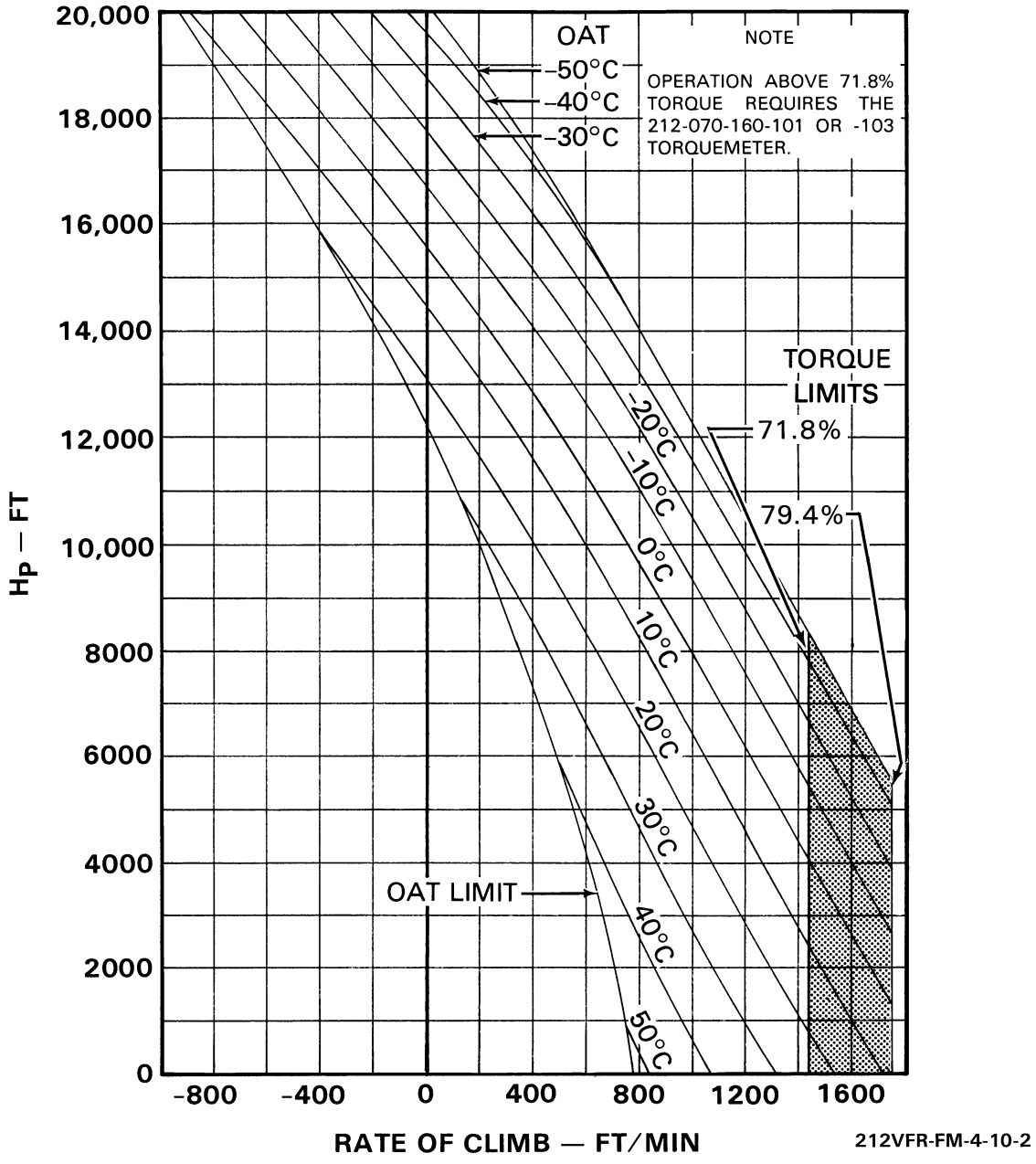


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 2 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 9000 LB (4082 KG)

2 1/2 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

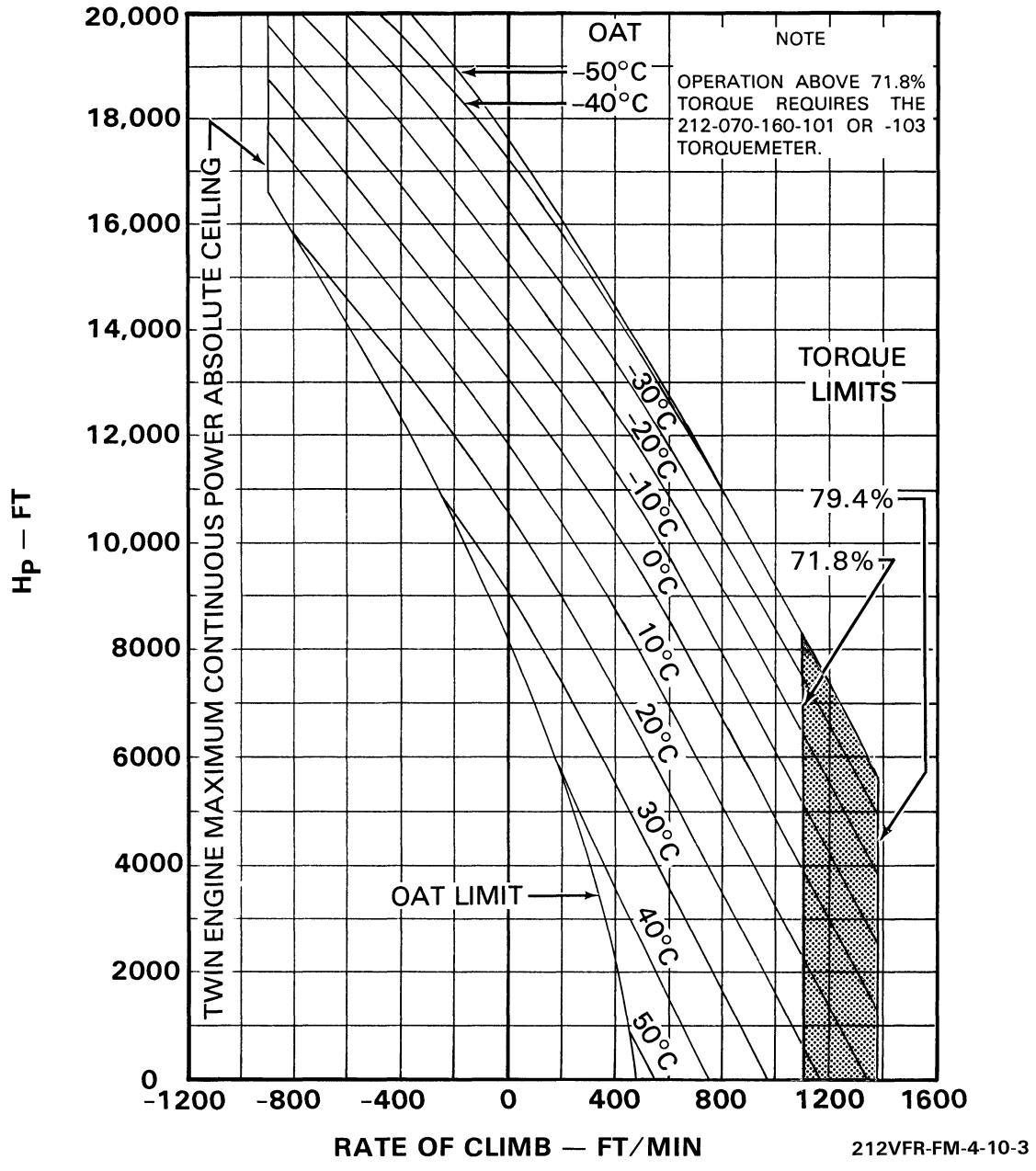


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 3 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 10,000 LB (4536 KG)

2 1/2 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

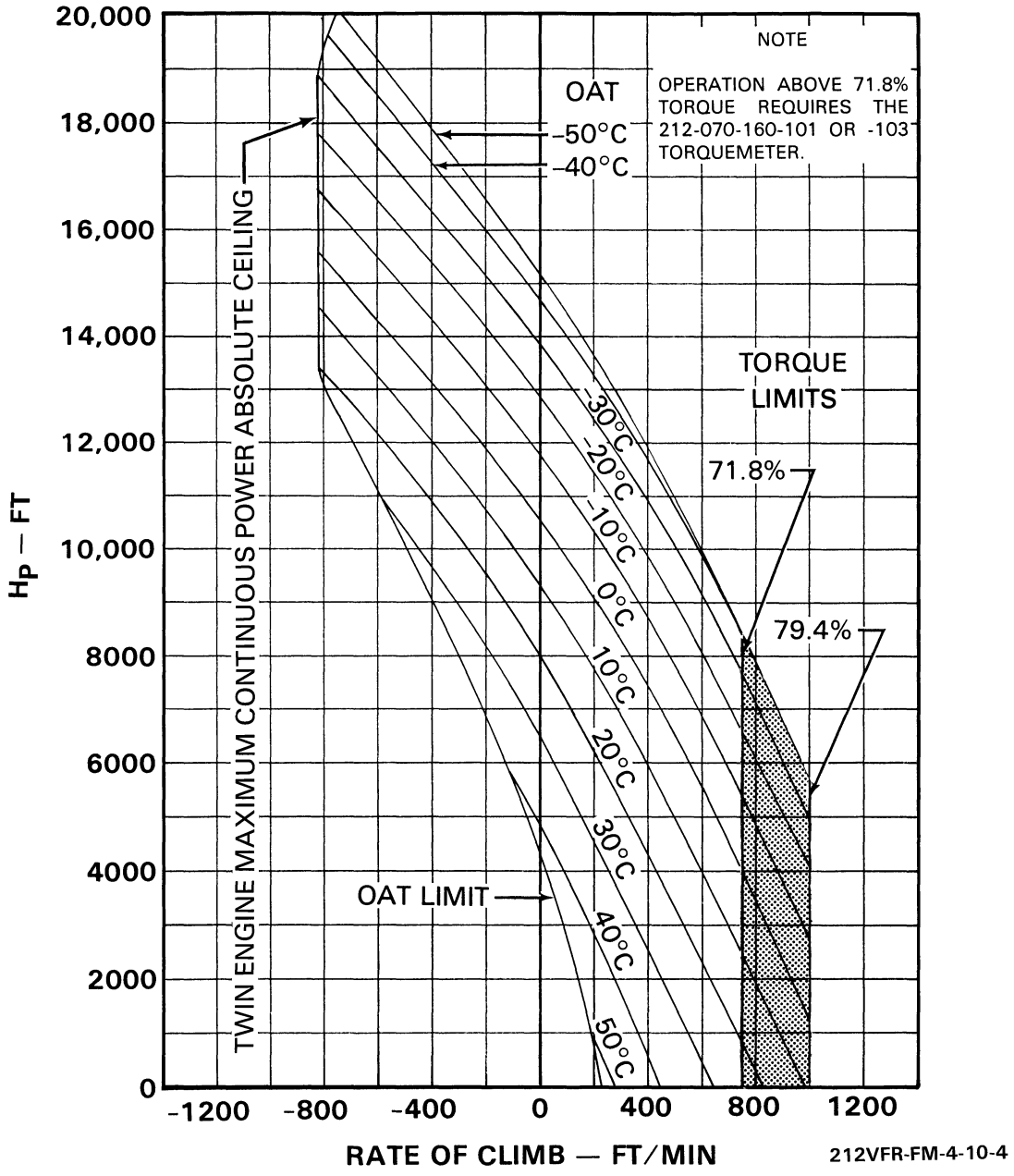


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 4 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 11,200 LB (5080 KG)

2 1/2 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

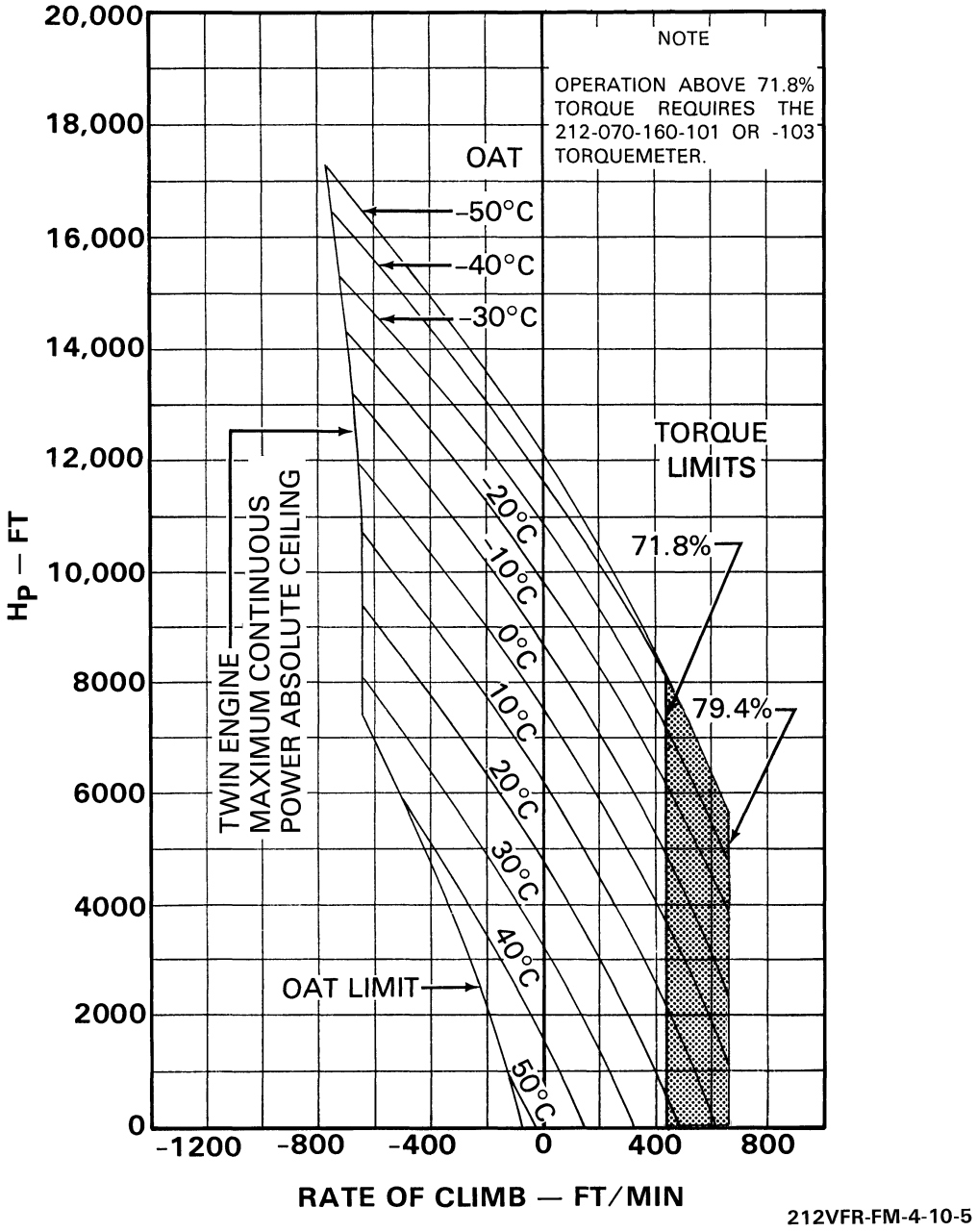


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 5 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 7000 LB (3175 KG)

30 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

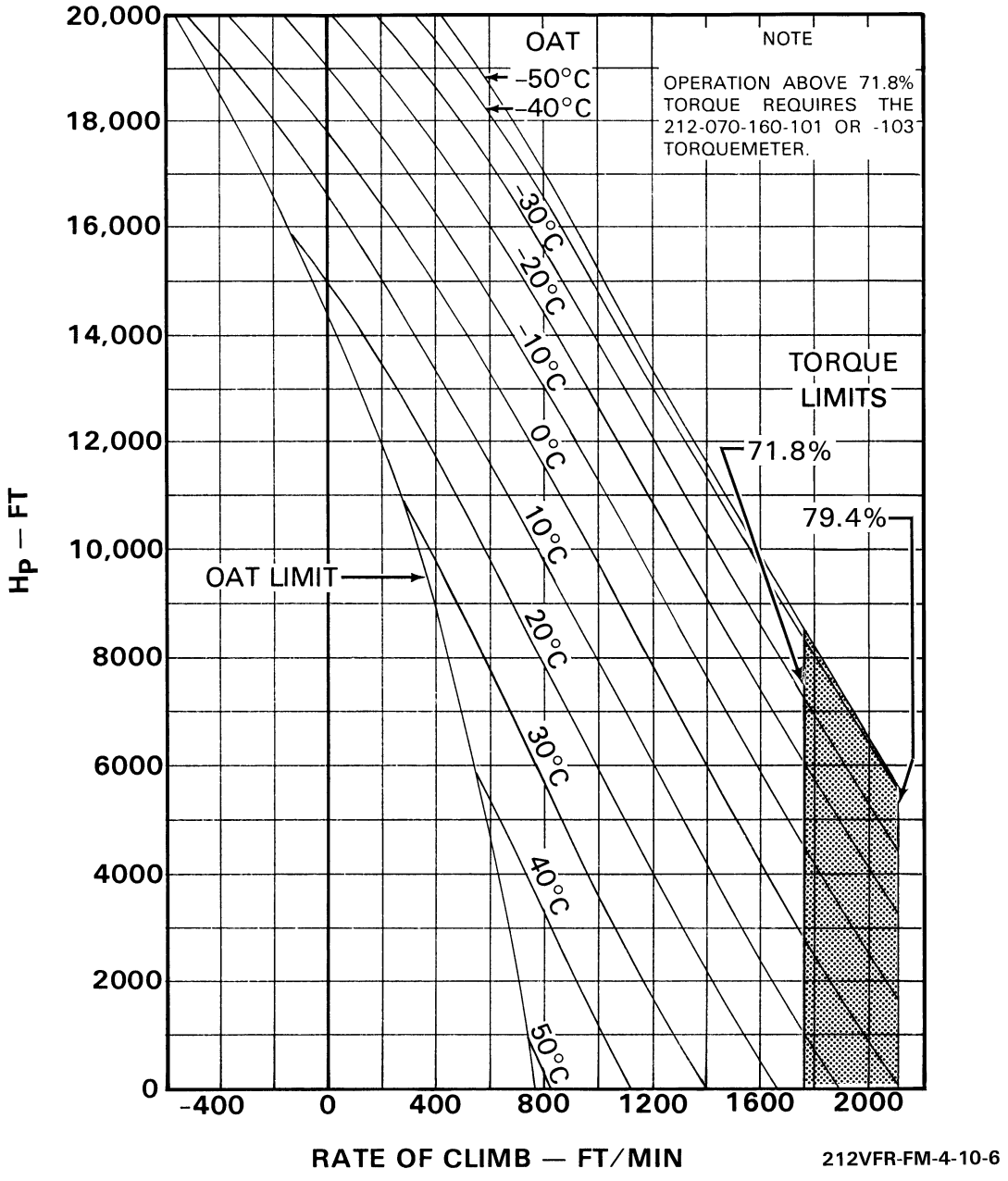


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 6 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 8000 LB (3629 KG)

30 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

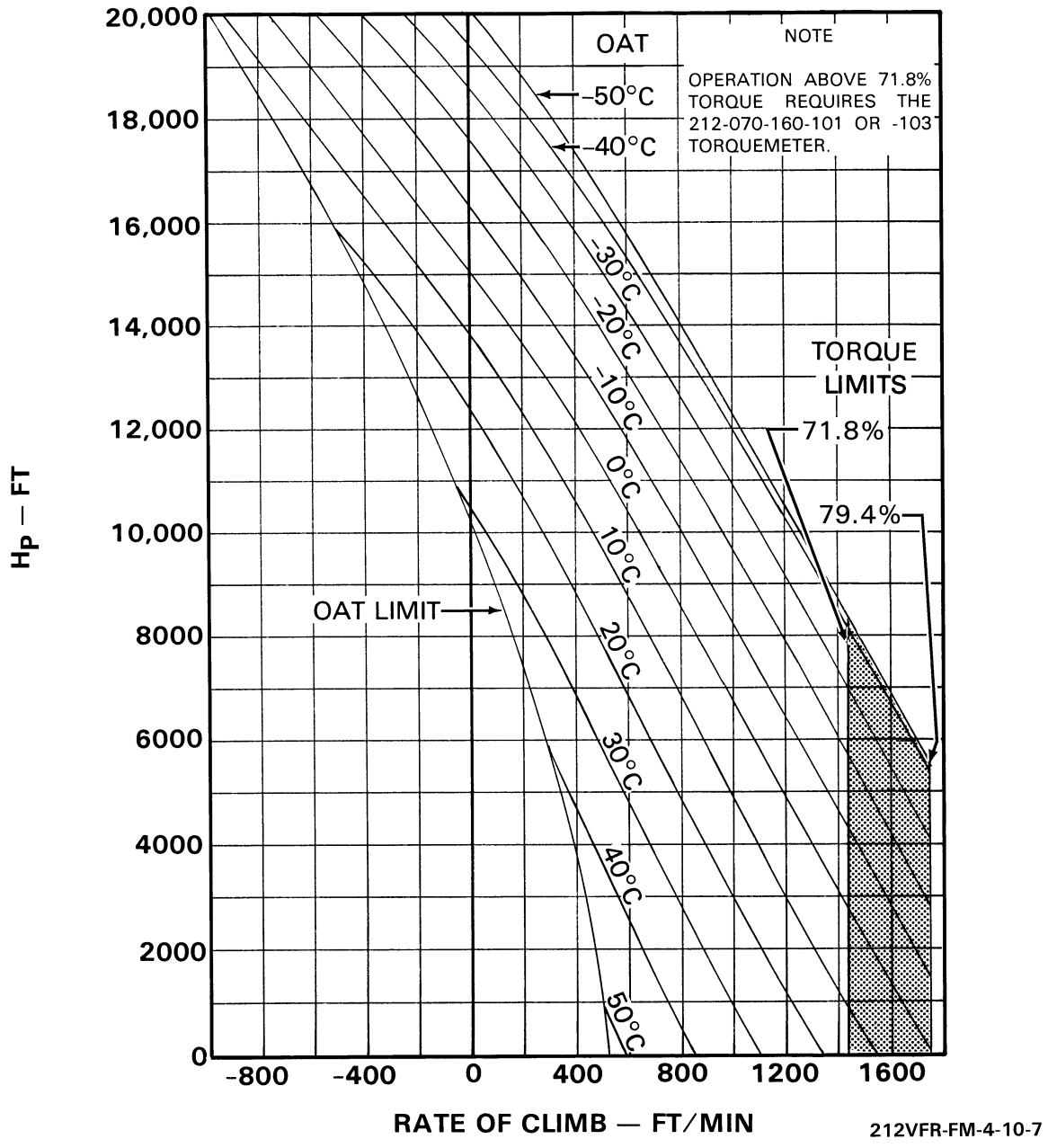


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 7 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B

GW 9000 LB (4082 KG)

30 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

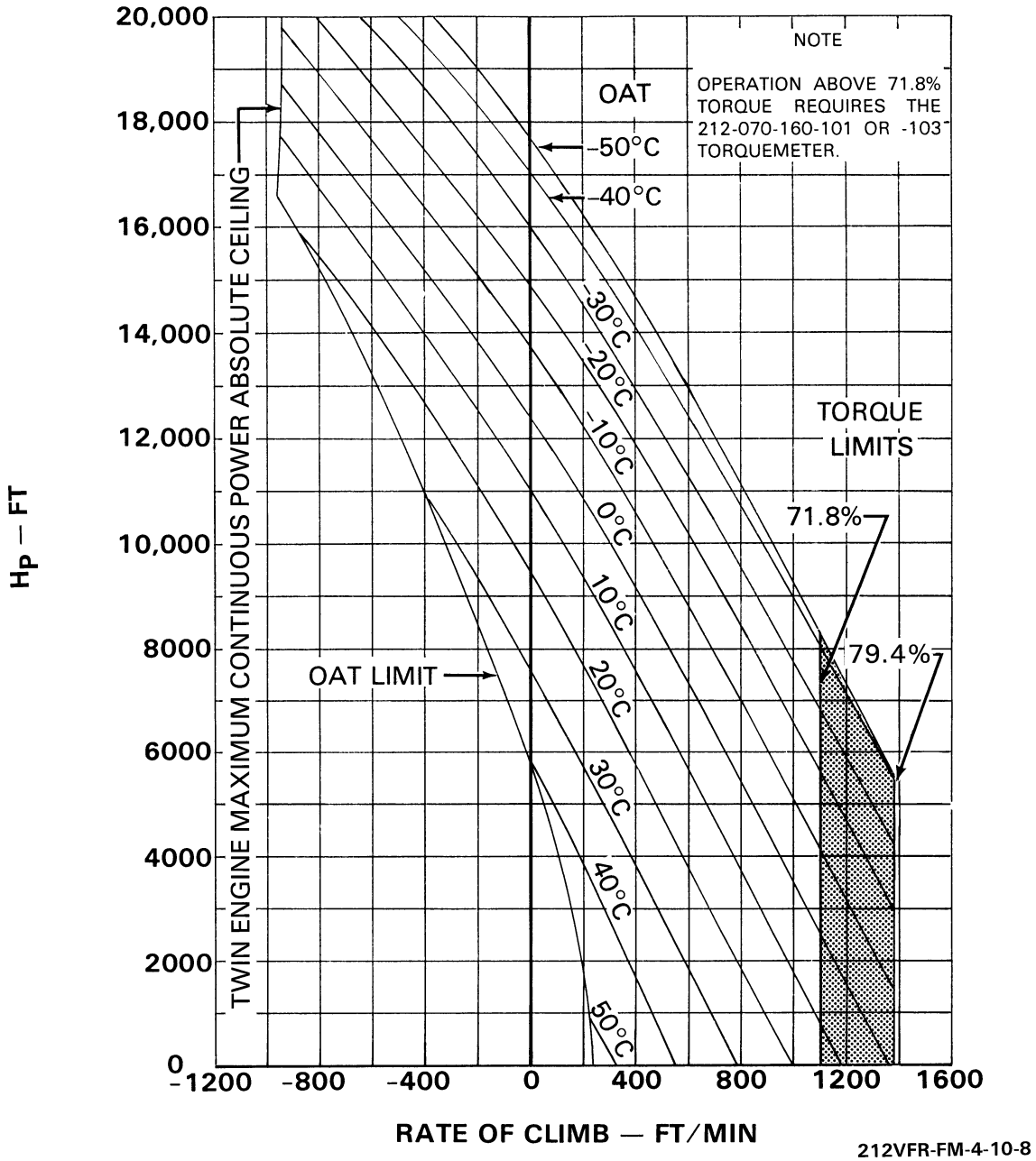


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 8 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 10,000 LB (4536 KG)

30 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

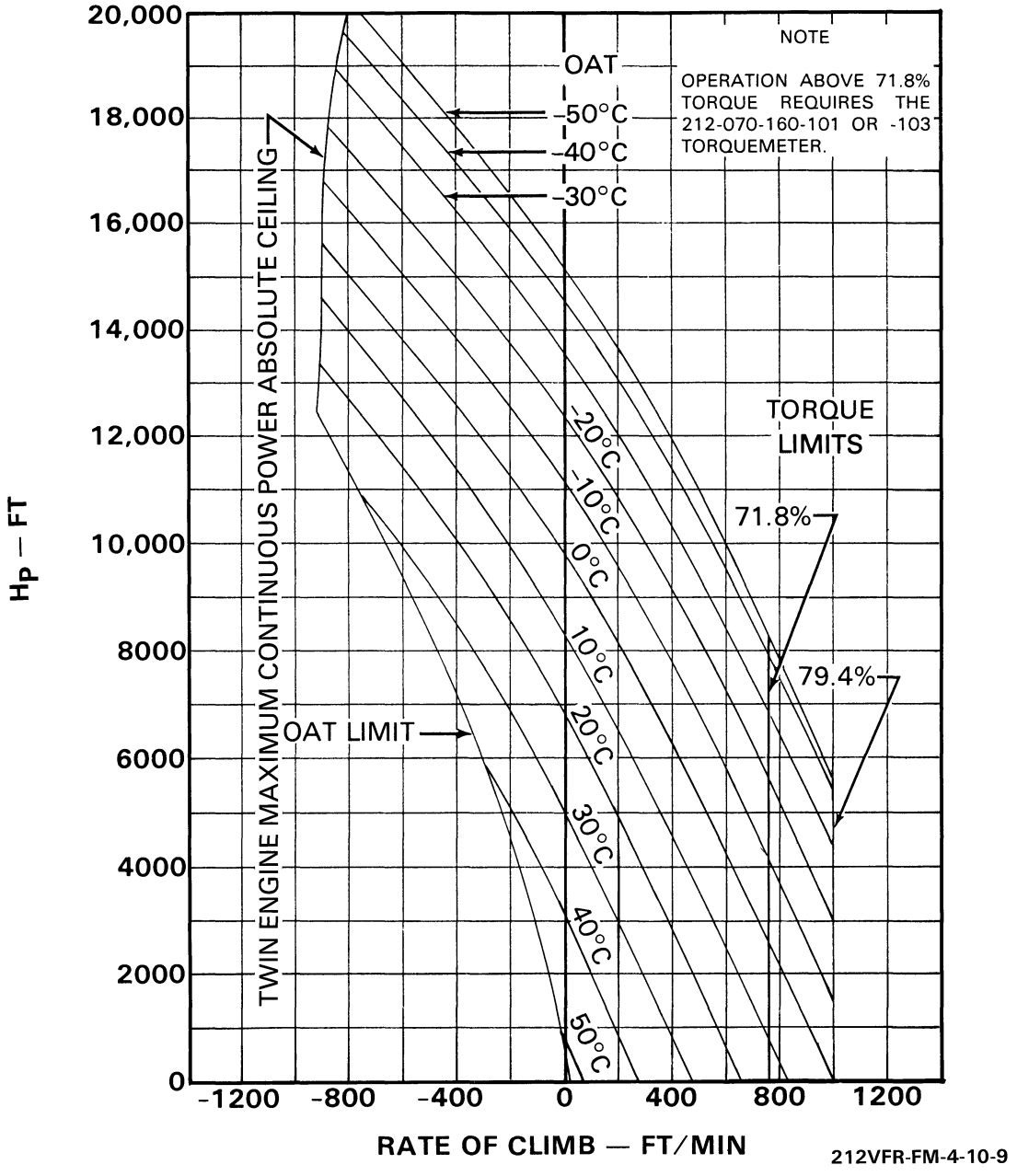


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 9 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3B
GW 11,200 LB (5080 KG)

30 MINUTE OEI POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

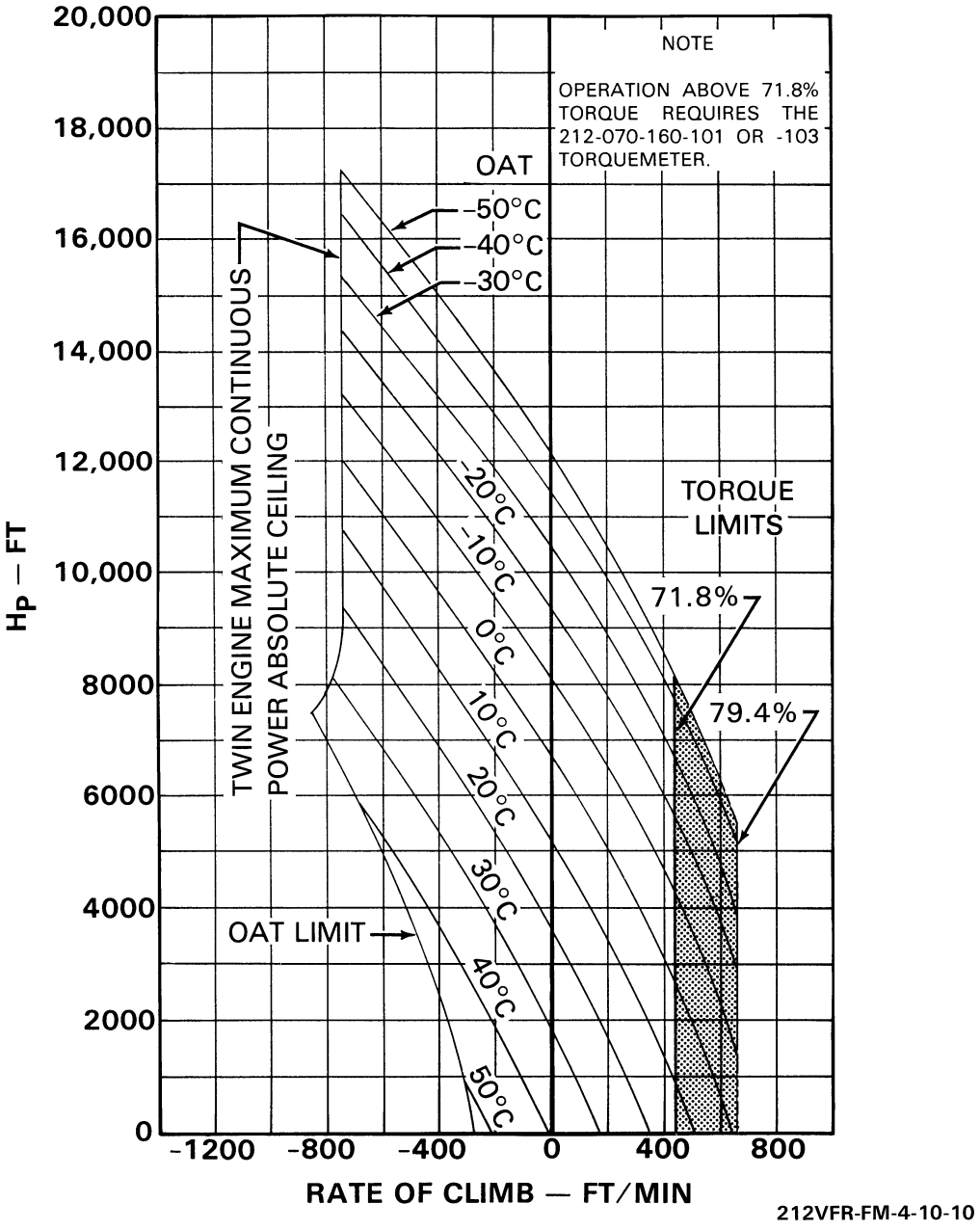


Figure 4-10. Single engine rate of climb - PT6T-3B (Sheet 10 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3

GW 7000 LB (3175 KG)

30 MINUTE POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

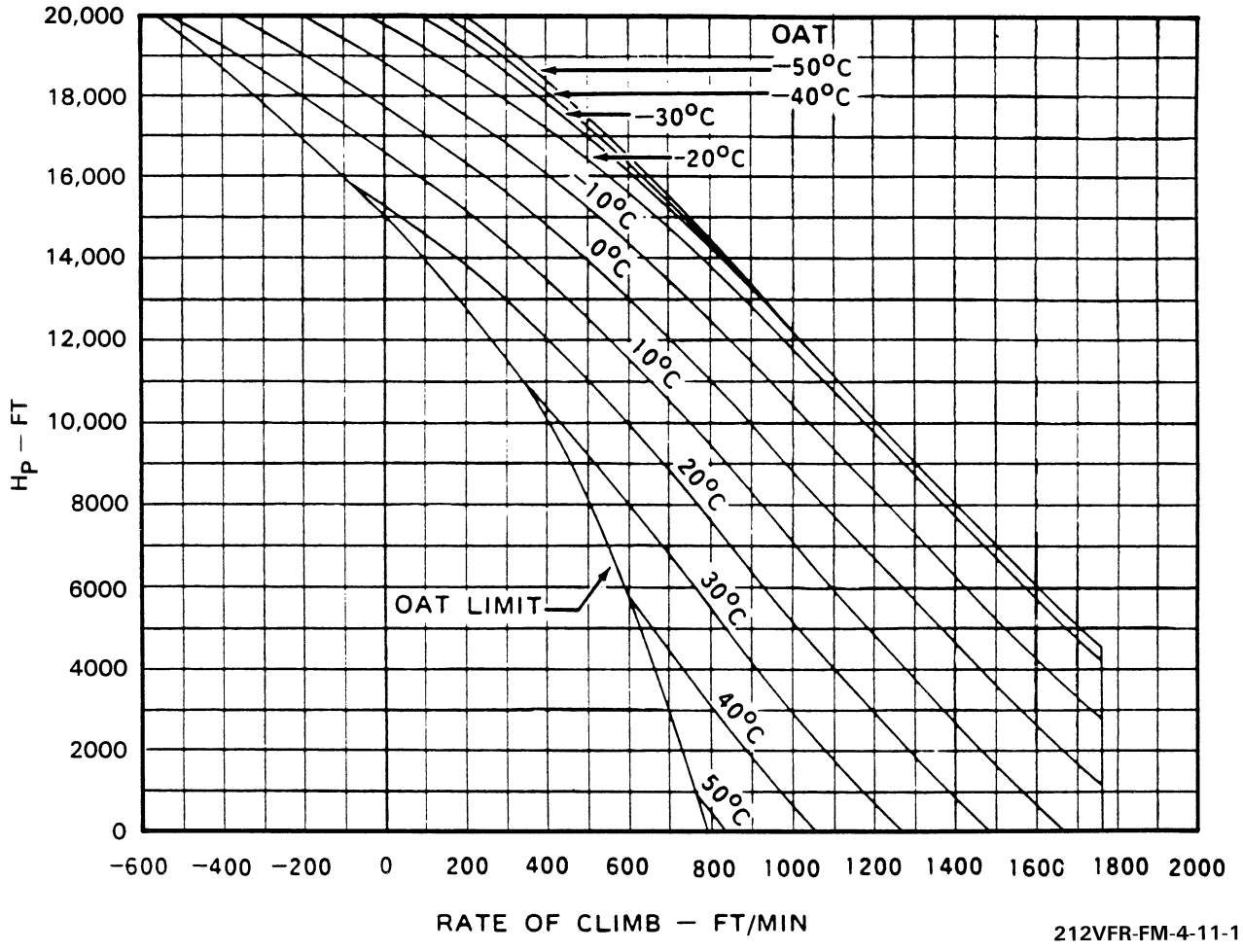


Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 1 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3
GW 8000 LB (3629 KG)

30 MINUTE POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

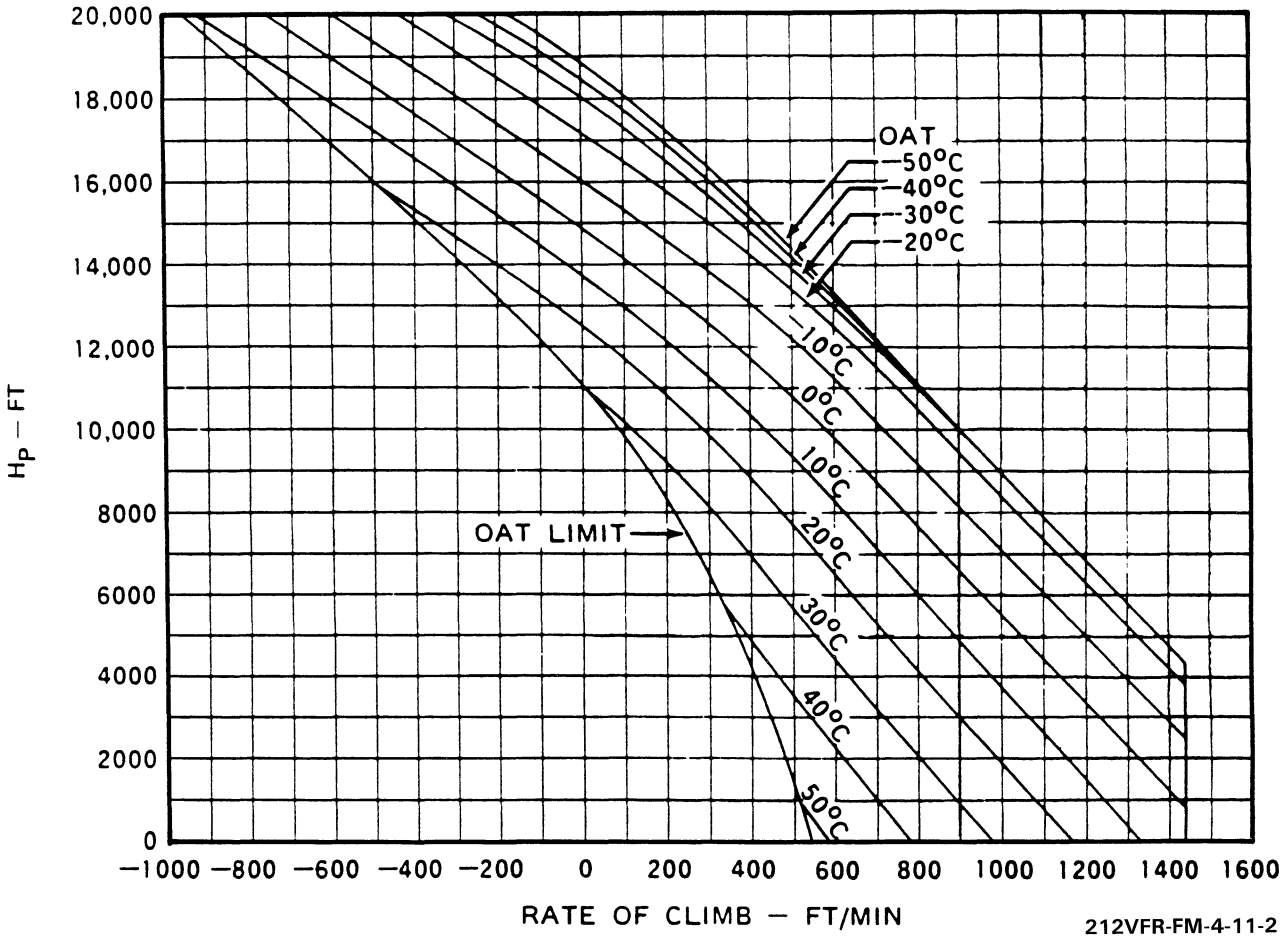


Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 2 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3

GW 9000 LB (4082 KG)

30 MINUTE POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

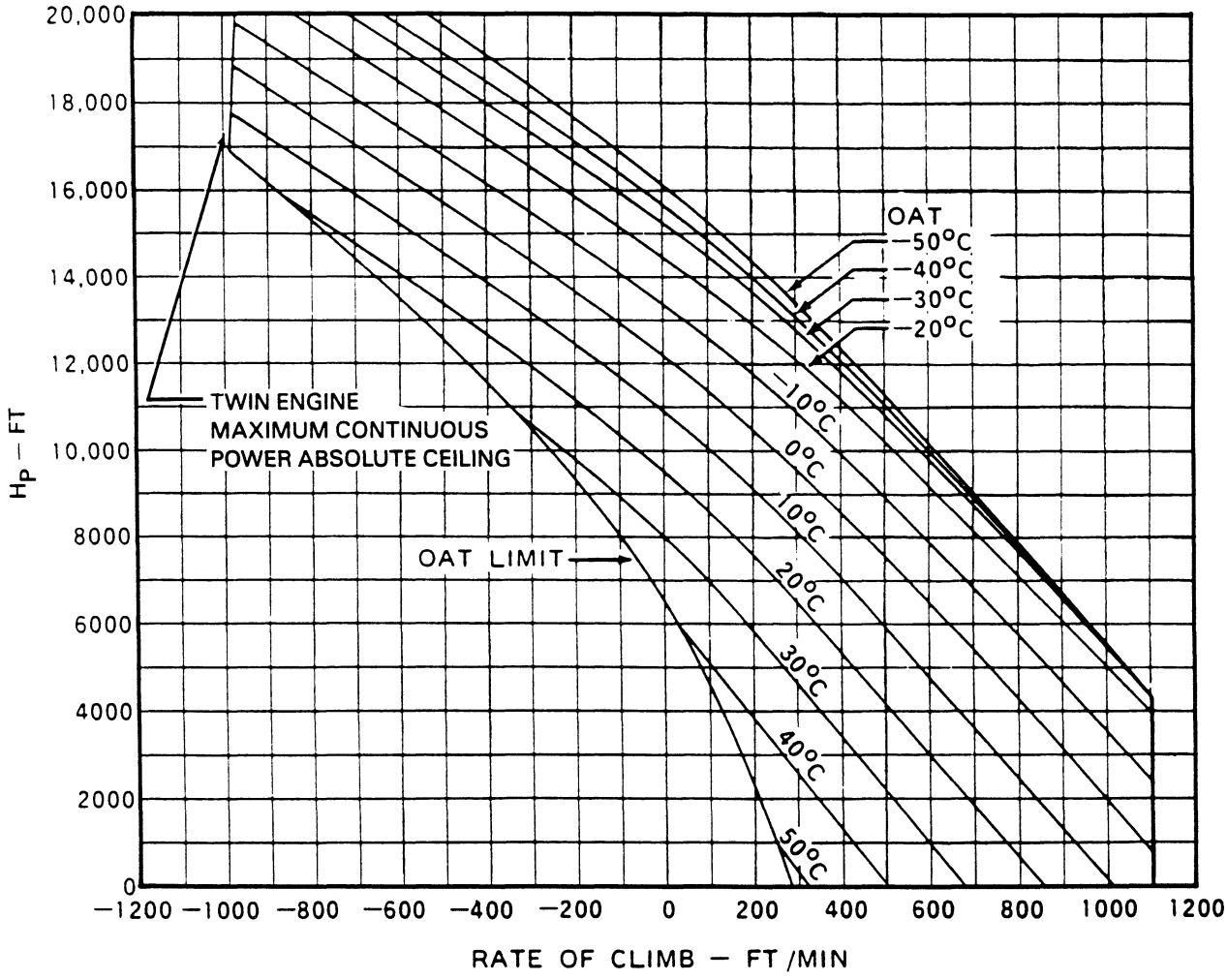


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Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 3 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3
GW 10,000 LB (4536 KG)

30 MINUTE POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

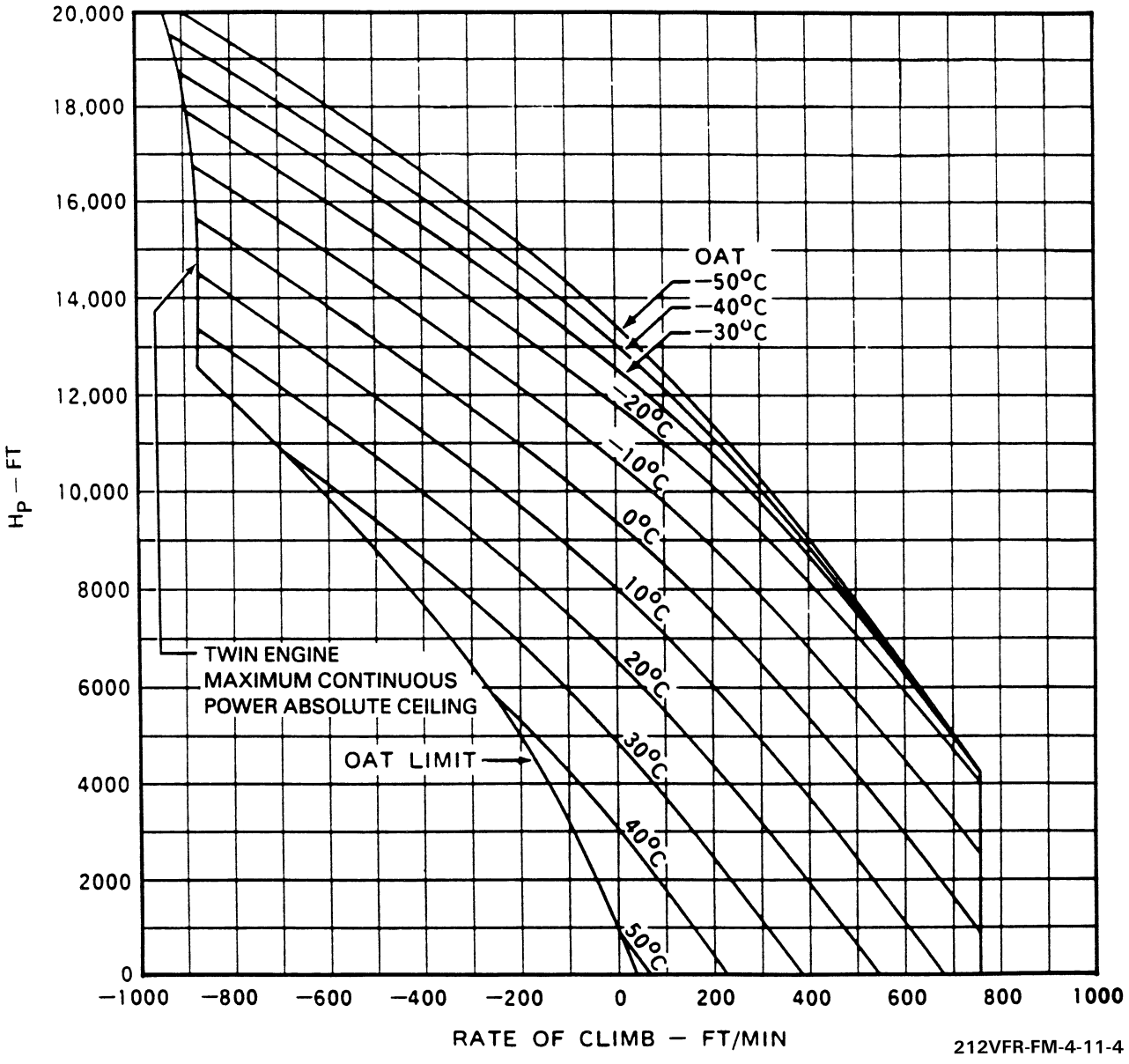


Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 4 of 10)

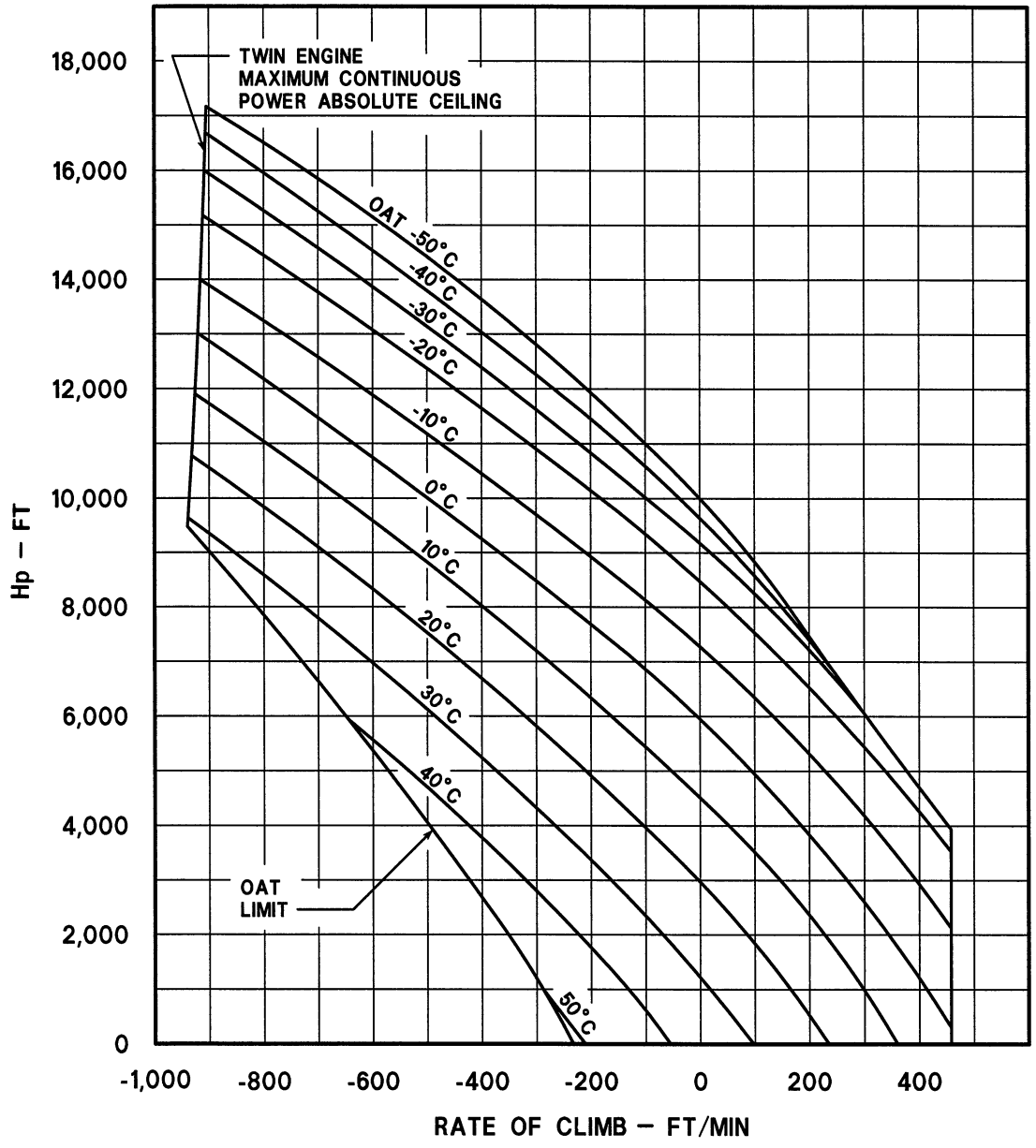
SINGLE ENGINE RATE OF CLIMB – PT6T-3

GW 11,200 LB (5080 KG)

30 MINUTE POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN



212VFR-FM-4-11-5

Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 5 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3
GW 7000 LB (3175 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

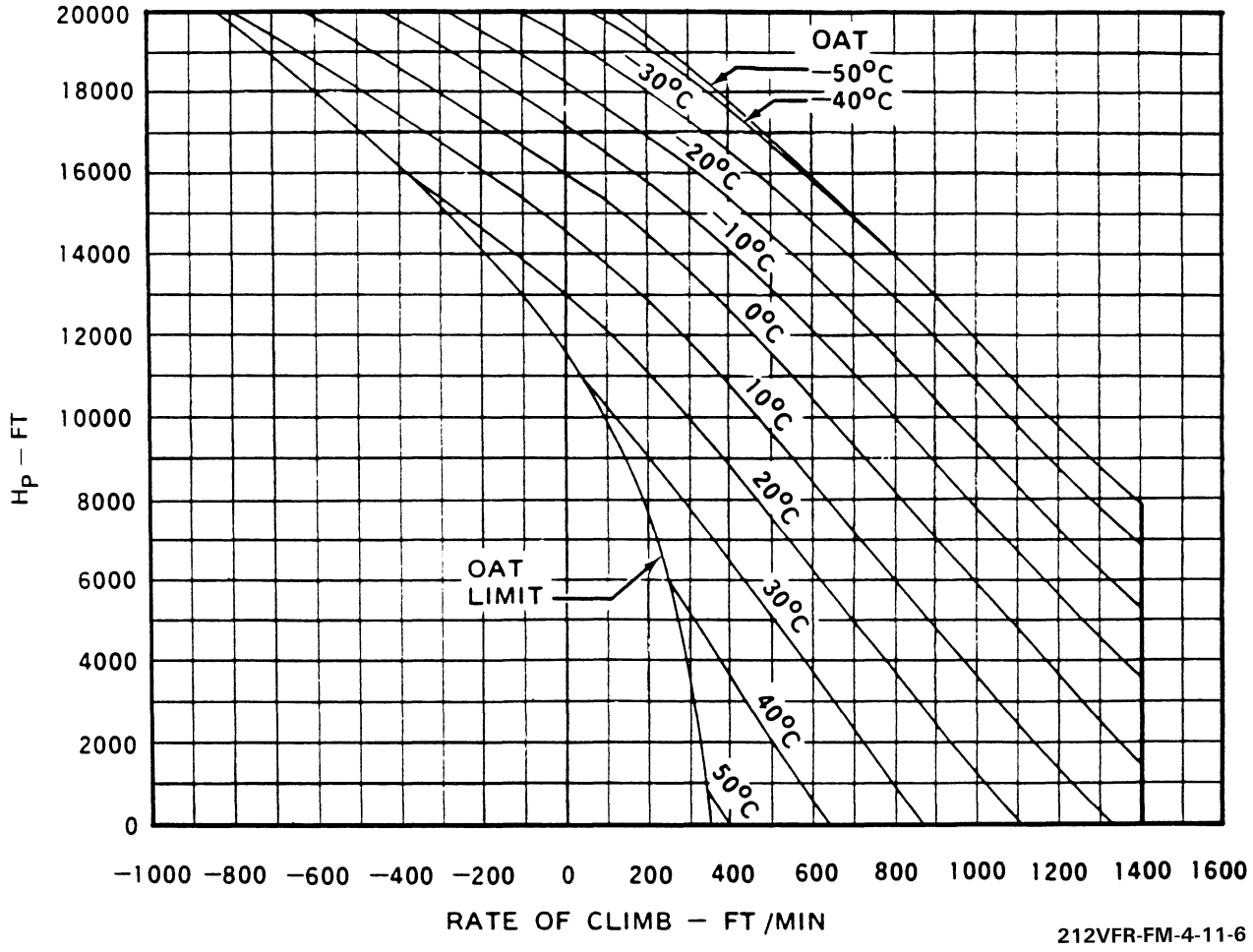


Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 6 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3
GW 8000 LB (3629 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

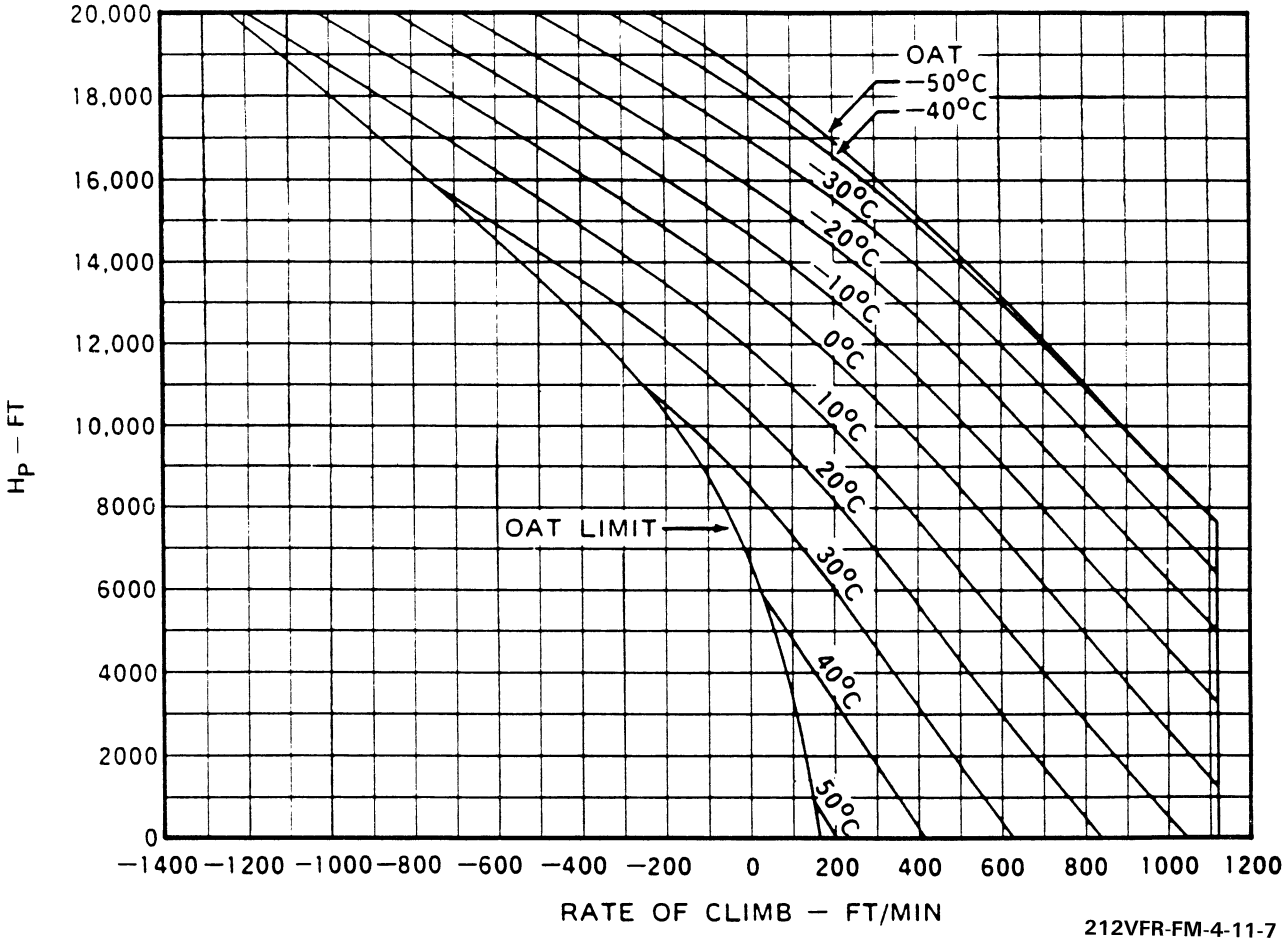


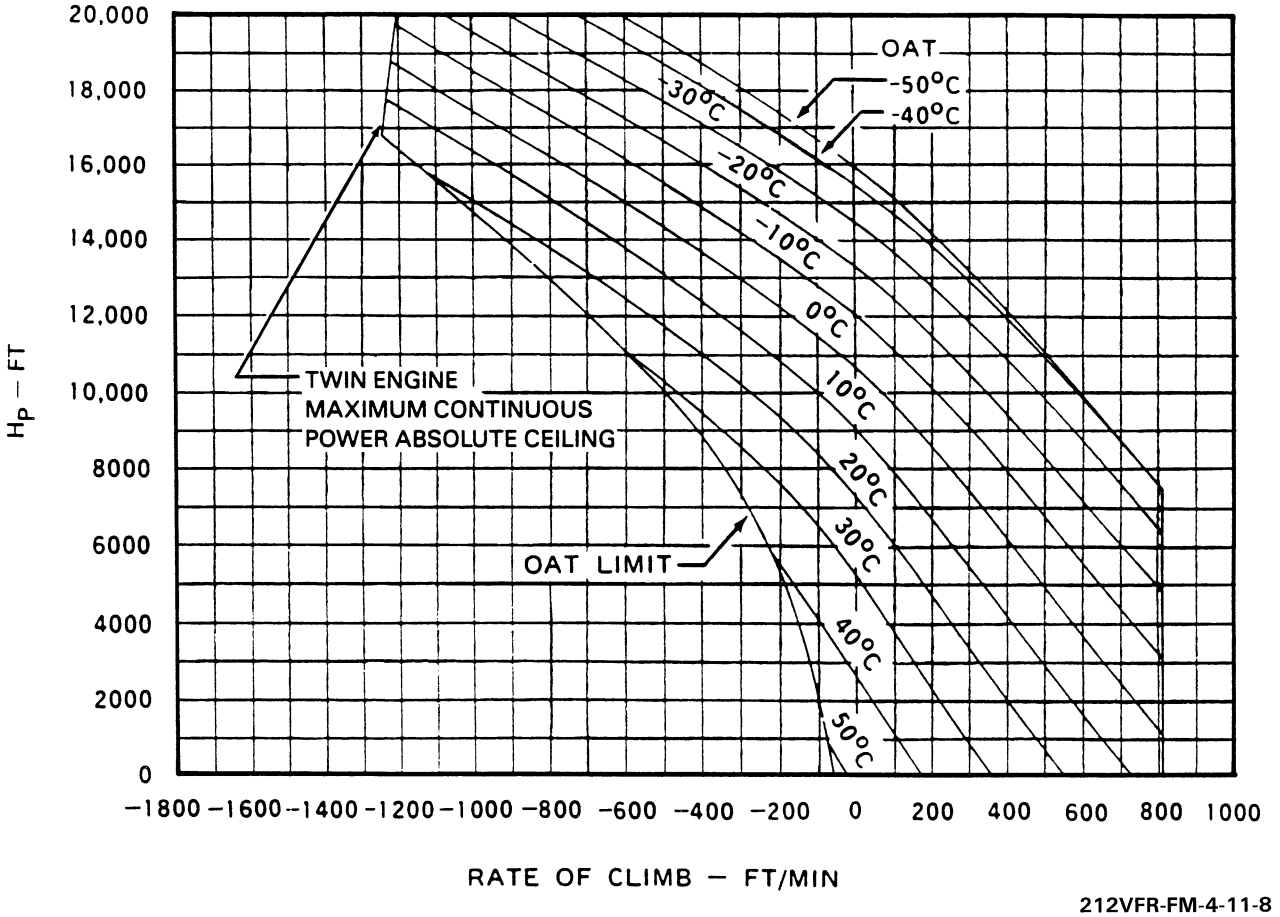
Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 7 of 10)

SINGLE ENGINE RATE OF CLIMB — PT6T-3
GW 9000 LB (4082 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN



212VFR-FM-4-11-8

Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 8 of 10)

SINGLE ENGINE RATE OF CLIMB – PT6T-3

GW 10,000 LB (4536 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN

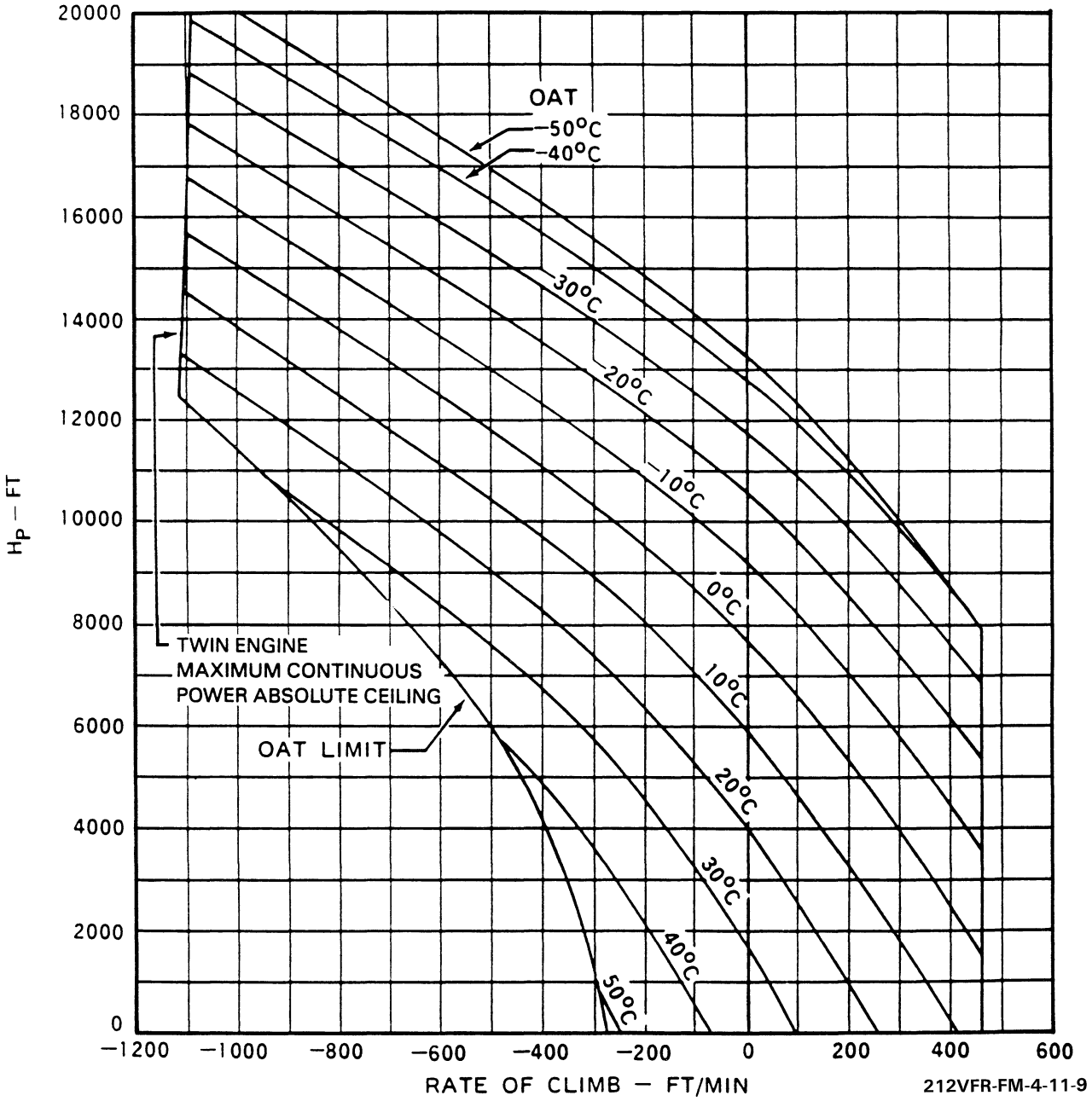


Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 9 of 10)

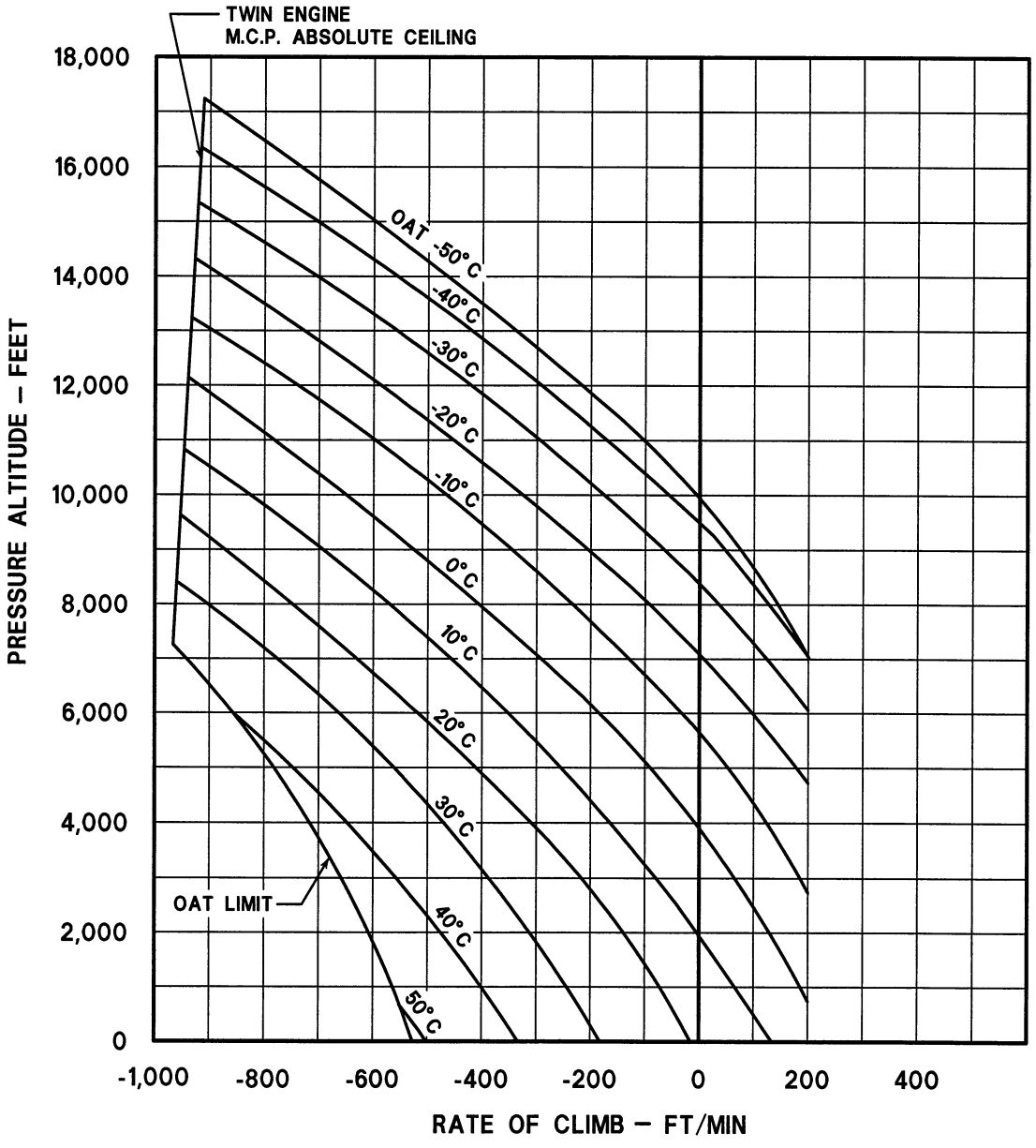
SINGLE ENGINE RATE OF CLIMB - PT6T-3

GW 11,200 LB (5080 KG)

MAXIMUM CONTINUOUS POWER
ENG RPM 97% (N2)
GENERATOR 150 AMPS EACH

58 KIAS
HEATER OFF
INOPERATIVE ENGINE SECURED

WITH ALL DOORS OPEN OR REMOVED, RATE OF CLIMB WILL DECREASE 200 FT/MIN



212VFR-FM-4-11-10

Figure 4-11. Single engine rate of climb - PT6T-3 (Sheet 10 of 10)

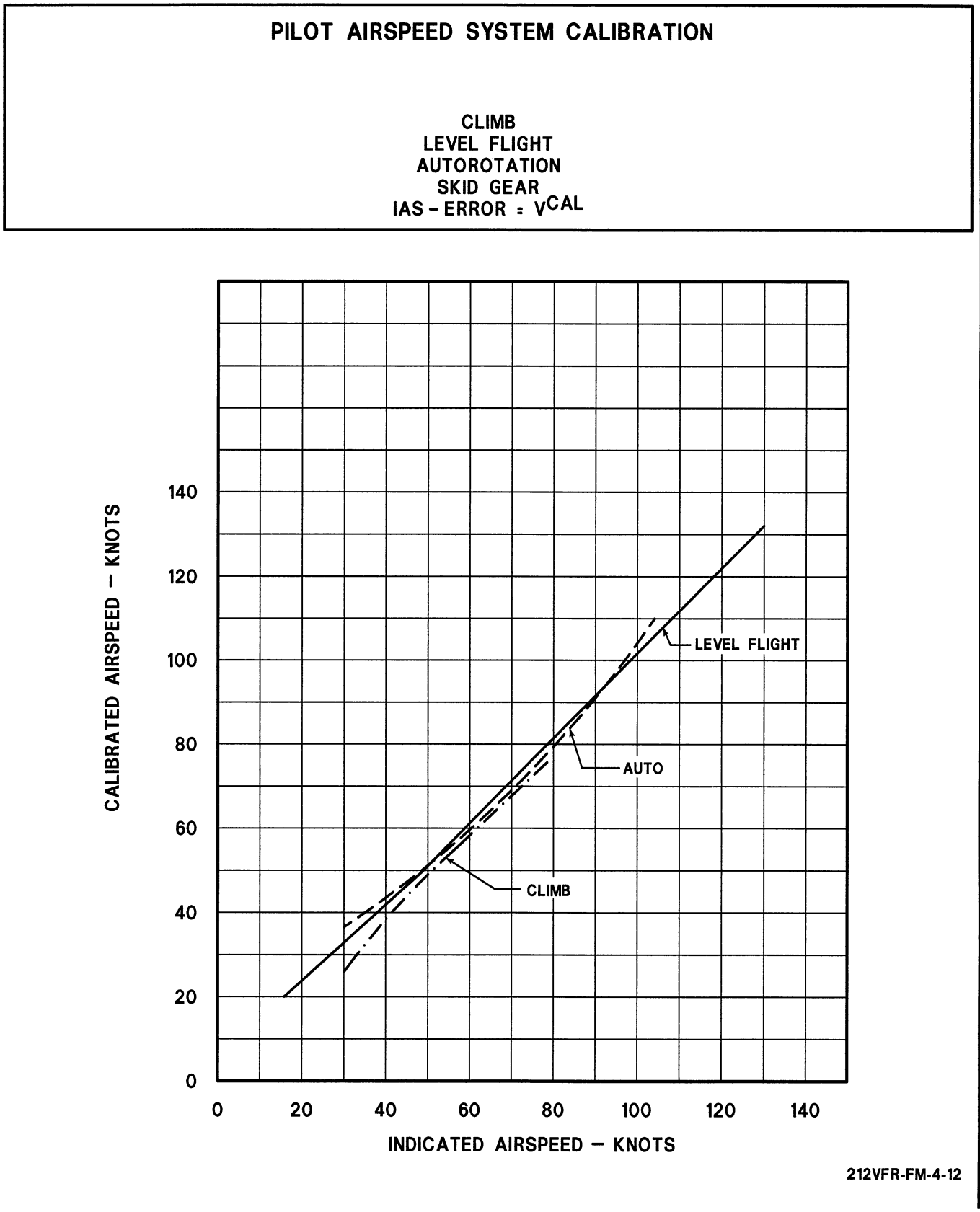


Figure 4-12. Pilot airspeed system calibration

COPILOT AIRSPEED SYSTEM CALIBRATION

CLIMB
LEVEL FLIGHT
AUTOROTATION
SKID GEAR
IAS - ERROR = V^{CAL}

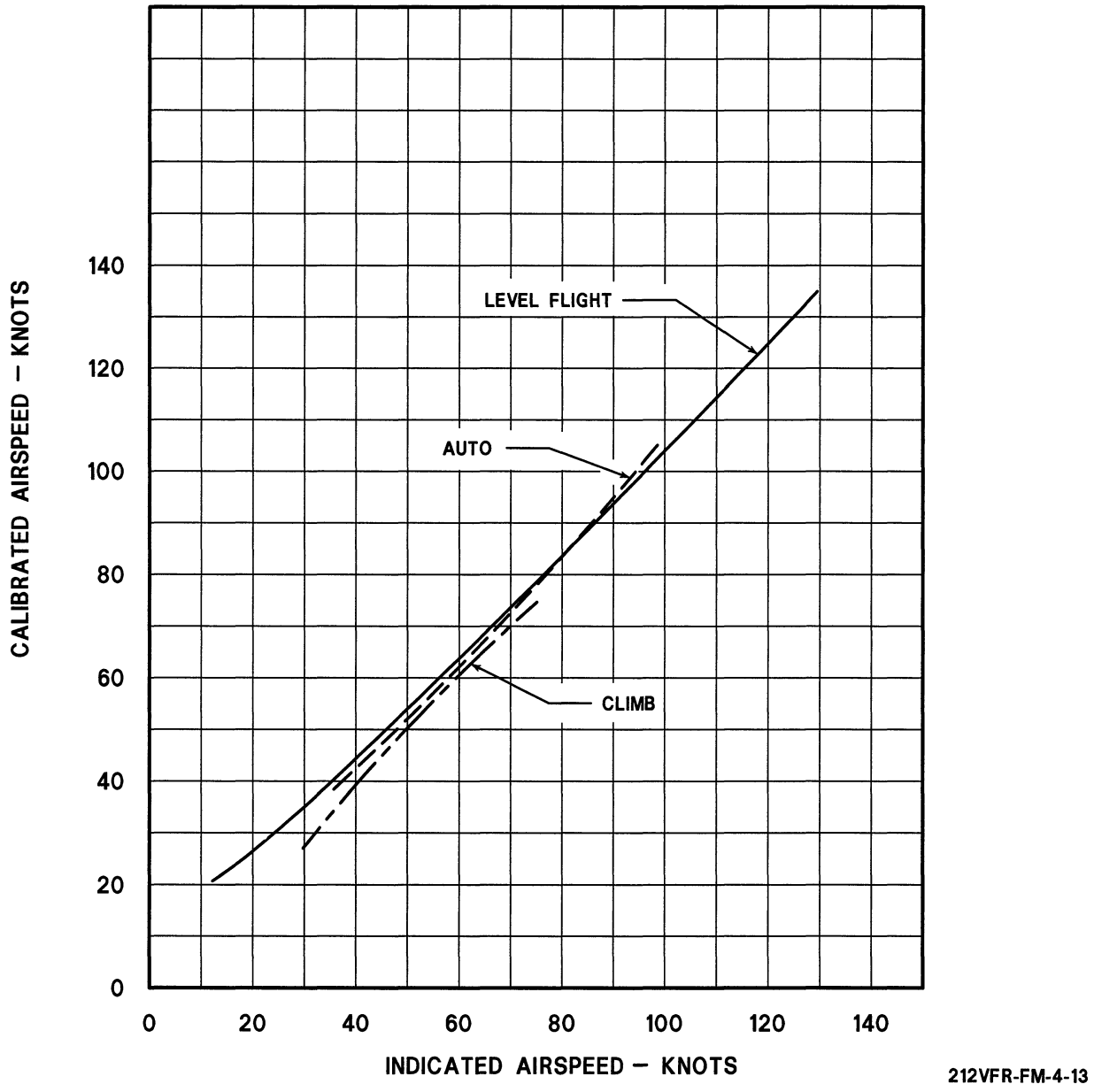


Figure 4-13. Copilot airspeed system calibration

SINGLE ENGINE LANDING DISTANCE
OVER 50 FT (15.2 M) OBSTACLE

POWER AS REQUIRED
ENG RPM 97% (N2)
GENERATOR 150 AMPS

40 KIAS
RATE OF DESCENT 500 FPM
HARD SURFACED RUNWAY

INOPERATIVE ENGINE SECURED

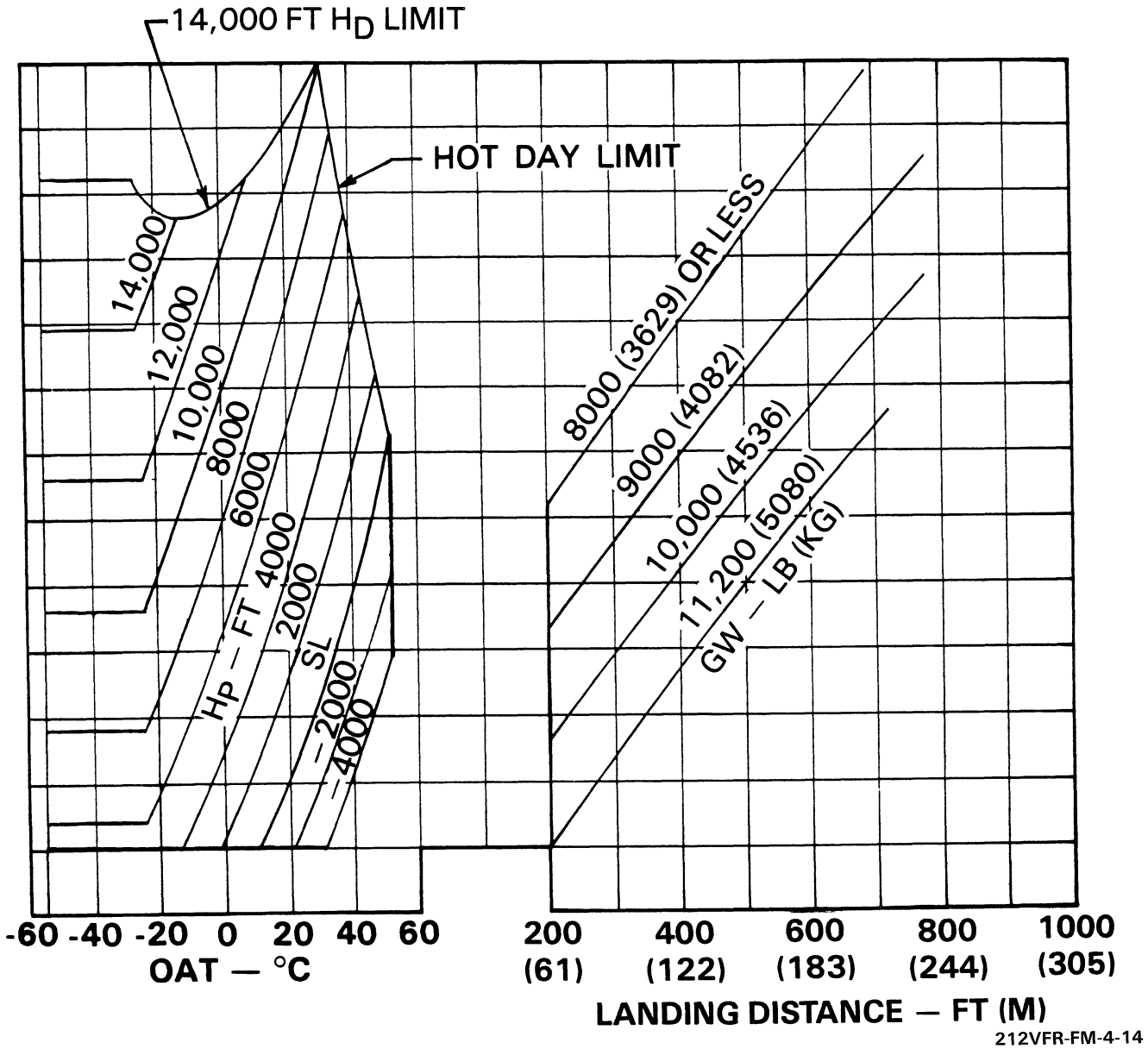


Figure 4-14. Single engine landing distance over a 50 foot (15.2 meter) obstacle