BHT-407-FM-1

MODEL 407

ROTORCRAFT FLIGHT MANUAL

Bell Helicopter
A Textron Company
POST OFFICE BOX 482 •FORT WORTH, TEXAS 76101

Bell MODEL 407

ROTORCRAFT FLIGHT MANUAL

TYPE CERTIFICATE NO. H-92

REGISTRATION NO. ______________________ SERIAL NO. ______________________

APPROVED BY R Walker DATE 9 FEBRUARY 1996

for DIRECTOR — AIRCRAFT CERTIFICATION BRANCH
DEPARTMENT OF TRANSPORT

THE AVIATION REGULATORY AUTHORITY FOR THIS FLIGHT MANUAL IS THE CANADIAN DEPARTMENT OF TRANSPORT, AIRCRAFT CERTIFICATION BRANCH.

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REISSUE — 17 DECEMBER 2002
REVISION 4 — 29 JUNE 2005

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

TEMPORARY REVISION FOR SUSTAINED HOVER AND VERTICAL TAKEOFF/LANDING OPERATIONS WITH TAILWIND

Insert these Temporary Revision pages next to like-number pages in the basic Flight Manual.

DO NOT remove existing pages. DO NOT remove temporary pages until replacement pages are received or temporary pages are canceled.

NOTE

For tracking purposes, Temporary Revisions are now being numbered. This Temporary Revision is issued as TR-9, following previously issued Temporary Revisions.

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09 FEBRUARY 1996
TEMPORARY REVISION (TR-9) — 15 JANUARY 2002

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NOTICE

CHANGED INFORMATION IN THIS TEMPORARY REVISION APPEARS IN **BOLD TYPE.**
ALL OTHER INFORMATION IS OUTLINED.

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15 January 2002

CHIEF, FLIGHT TEST
FOR
DIRECTOR — AIRCRAFT CERTIFICATION BRANCH
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Bell MODEL 407

ROTORCRAFT FLIGHT MANUAL

TEMPORARY REVISION FOR THE INCORPORATION OF OIL COOLER BLOWER INLET DUCTS AND BEARING AIRFLOW SHIELDS

This Temporary Revision supersedes and replaces in its entirety, Temporary Revision for Sustained Hover and Vertical Takeoff/Landing Operations with Tailwind, TR-9 dated 15 January 2002, when Oil Cooler Blower Inlet Ducts and Bearing Airflow Shields have been incorporated. DO NOT incorporate this Temporary Revision into manual or remove previously issued TR-9, until modifications 407-799-057 (Inlet Ducts) and 407-799-055 (Bearing Airflow Shields) or ASB 407-02-54 has been accomplished.

Helicopter S/N 53519 and subsequent will have these modifications incorporated as basic configuration.

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NOTE

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CHIEF, FLIGHT TEST
FOR
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NOTICE PAGE

The following Warning is not applicable to helicopters on which all kits and customizing installations have been qualified and approved by Bell Helicopter.

WARNING

THE HELICOPTER MAY CONTAIN INSTALLATIONS, PARTS, OR PROCESSES CERTIFIED BY PARTIES OTHER THAN BELL HELICOPTER TEXTRON. BELL HELICOPTER CAN NOT CONFIRM THAT SUCH INSTALLATIONS HAVE BEEN FULLY QUALIFIED OR CONFORMED TO BELL HELICOPTER DESIGN CRITERIA. AS A RESULT OF SUCH INSTALLATIONS, BELL HELICOPTER SUPPLIED DATA MAY NOT BE VALID CONCERNING IN-FLIGHT HANDLING QUALITIES, WEIGHT AND BALANCE, OR HELICOPTER PERFORMANCE. IF MULTIPLE STC KITS OR SIMILAR INSTALLATIONS ARE INCORPORATED, THERE MAY BE NOT VALID TEST DATA TO QUALIFY THE HELICOPTER AS MODIFIED BY THESE INSTALLATIONS. FOR REVISED DATA, CONTACT THE OWNER OF THE INSTALLED STC OR THE SUPPLIER FOR THE APPLICABLE APPROVAL OF EACH INSTALLATION.

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NOTE

Revised text is indicated by a black vertical line. Insert latest revision pages; dispose of superseded pages.

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GENERAL INFORMATION

ORGANIZATION

This Rotorcraft Flight Manual is divided into five sections and an appendix as follows:

Section 1	—	LIMITATIONS
Section 2	—	NORMAL PROCEDURES
Section 3	—	EMERGENCY AND MALFUNCTION PROCEDURES
Section 4	—	PERFORMANCE
Section 5	—	WEIGHT AND BALANCE
Appendix A	—	OPTIONAL EQUIPMENT SUPPLEMENTS

Sections 1 through 4 contain Transport Canada (TC) approved data necessary to operate basic helicopter in a safe and efficient manner.

Section 5 contains weight and balance data necessary for flight planning.

Appendix A contains a list of approved supplements for optional equipment, which shall be used in conjunction with basic Flight Manual when respective optional equipment kits are installed.

Manufacturer's Data manual (BHT-407-MD-1) contains information to be used in conjunction with Flight Manual. Manufacturer's data manual is divided into four sections:

Section 1	—	SYSTEMS DESCRIPTION
Section 2	—	HANDLING AND SERVICING
Section 3	—	CONVERSION CHARTS AND TABLES
Section 4	—	EXPANDED PERFORMANCE

TERMINOLOGY

WARNINGS, CAUTIONS, AND NOTES

Warnings, cautions, and notes are used throughout this manual to emphasize important and critical instructions as follows:

WARNING

AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT CORRECTLY FOLLOWED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

CAUTION

AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN DAMAGE TO OR DESTRUCTION OF EQUIPMENT.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

USE OF PROCEDURAL WORDS

Concept of procedural word usage and intended meaning which has been adhered to in preparing this manual is as follows:

SHALL has been used only when application of a procedure is mandatory.

SHOULD has been used only when application of a procedure is recommended.

MAY and NEED NOT have been used only when application of a procedure is optional.

WILL has been used only to indicate futurity, never to indicate a mandatory procedure.

ABBREVIATIONS, ACRONYMS AND PLACARDING

Abbreviations, acronyms and placarding used throughout this manual are defined as follows:

ADF	—	Automatic direction finder
AIR COND	—	Air conditioner
A/F	—	Airframe
ALT	—	Altimeter
ANTI COLL LT	—	Anticollision light
ATT	—	Attitude
AUTO	—	Automatic
AUX	—	Auxiliary
BATT	—	Battery
BIT	—	Built in test
BL	—	Buttock line
BLO	—	Blower
BRT	—	Bright
°C	—	Degrees Celsius
CAUT	—	Caution
CAUT LT	—	Caution lights
CG	—	Center of gravity
CKPT	—	Cockpit
CM	—	Centimeter (s)
COMM	—	Communication
CONT	—	Control
dBA	—	Decibel, “A” type filter
DC	—	Direct current
DG	—	Directional gyro
DOT	—	Department of Transport
ECS	—	Environmental control system
ECU	—	Engine control unit
ELT	—	Emergency locator transmitter
ENCDG	—	Encoding
ENG	—	Engine
ENG ANTI ICE	—	Engine anti icing
°F	—	Degrees Fahrenheit
FADEC	—	Full authority digital engine control
FS	—	Fuselage station
FT or ft	—	Foot, feet
FWD	—	Forward
GEN	—	Generator
GOV	—	Governor
GPS	—	Global positioning system
GPU	—	Ground power unit
GW	—	Gross weight
H_D	—	Density altitude
HG	—	Inches of mercury
HMU	—	Hydromechanical unit
Hp	—	Pressure altitude
HYD	—	Hydraulic
HV	—	Height-velocity
ICAO	—	International Civil Aviation Organization
ICS	—	Intercommunication system
IFL	—	Inflate

IGE	—	In ground effect
IGNTR	—	Ignitor
IN	—	Inch(es)
INSTR CHK	—	Instrument check
INSTR LT	—	Instrument light
KCAS	—	Knots calibrated airspeed
KG or kg	—	Kilogram(s)
KIAS	—	Knots indicated airspeed
KTAS	—	Knots true airspeed
L	—	Liter(s)
LB(S) or lb(s)	—	Pound(s)
LDG LTS	—	Landing lights
L/FUEL	—	Left fuel
LT	—	Light
MAN	—	Manual
MCP	—	Maximum continuous power
MD	—	Manufacturer's Data
MGT	—	Measured gas temperature
MM or mm	—	Millimeter(s)
NAV	—	Navigation
NG	—	Gas producer RPM
NP	—	Power turbine RPM
NR	—	Rotor RPM
OAT	—	Outside air temperature
OBS	—	Omni bearing selector
OGE	—	Out of ground effect
OVSPD	—	Overspeed
PART SEP	—	Particle separator
PASS	—	Passenger(s)
PMA	—	Permanent Magnetic Alternator
POS LT	—	Position light
PRESS	—	Pressure
PSI	—	Pounds per square inch
PTT	—	Press to Test
PWR	—	Power
QTY	—	Quantity
R/FUEL	—	Right fuel
RECP	—	Receptacle
RLY	—	Relay
RPM	—	Revolutions per minute
RTR	—	Rotor
s/w Ver		Soft ware version
SEL	—	Sound exposure level
SHP	—	Shaft horsepower
SL	—	Sea level
SPKR	—	Speaker
Sq	—	Square
SYS	—	System
T/R	—	Tail rotor
TCA	—	Transport Canada Aviation
TEMP	—	Temperature
TRQ	—	Torque
VFR	—	Visual flight rules
VHF	—	Very high frequency
V_{NE}	—	Never exceed velocity
VOR	—	VHF omnidirectional range
WL	—	Water line
WARN	—	Warning
XFR	—	Transfer
XMSN	—	Transmission
XPDR	—	Transponder

Section 1

LIMITATIONS

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LIST OF FIGURES

Section 1

LIMITATIONS

1-1. INTRODUCTION

Compliance with limitations section is required by appropriate operating rules. Anytime an operating limitation is exceeded, an appropriate entry shall be made in helicopter logbook. Entry shall state which limit was exceeded, duration of time, extreme value attained, and any additional information essential in determining maintenance action required.

Intentional use of transient limits is prohibited.

Torque events shall be recorded. A torque event is defined as a takeoff or lift, internal or external load (BHT-407-MD-1).

Landings shall be recorded. Run-on landings shall be recorded separately.

A run-on landing is defined as one where there is forward ground travel of the helicopter greater than three feet with the weight on the skids.

1-2. BASIS OF CERTIFICATION

This helicopter is certified under FARs Part 27 and 36, Appendix J. Additionally, it is approved under Canadian Airworthiness Manual Chapters 516 (ICAO Chapter 11) and 527, Sections 1093 (b) (1) (ii) and (iii), 1301-1, 1557 (c) (3), 1581 (e) and 1583 (h).

1-3. TYPES OF OPERATION

1-3-A. PASSENGERS

Basic configured helicopter is approved for seven place seating and is certified for land operation under day or night VFR nonicing conditions.

1-3-B. CARGO

The maximum allowable cabin deck loading for cargo is 75 pounds per square foot (3.7 kilograms per 100 square centimeters). The maximum allowable baggage compartment deck loading is 86 pounds per square foot (4.2 kilograms per 100 square centimeters) with a maximum allowable weight of 250 pounds (113.4 kilograms). Refer to BHT-407-MD-1 for cargo restraint and tiedown locations.

Cargo must be properly secured by tiedown devices to prevent the load from shifting under anticipated flight and ground operations. If the mission requires both passengers and cargo to be transported together, the cargo must be loaded and secured so that it does not obstruct passenger access to exits.

1-4. FLIGHT CREW

Minimum flight crew consists of one pilot who shall operate helicopter from right crew seat.

Left crew seat may be used for an additional pilot when approved dual controls are installed.

1-5. CONFIGURATION

1-5-A. REQUIRED EQUIPMENT

A functional flashlight is required for night flights.

FADEC system software shall be version 5.202.

1-5-B. OPTIONAL EQUIPMENT

The snow deflector kit (BHT-407-FMS-4) shall be installed when conducting flight operations in falling and/or blowing snow.

Refer to appropriate flight manual supplement(s) (FMS) for additional limitations, procedures, and performance data for optional equipment.

1-5-C. DOORS REMOVED

NOTE

Indicated altitude may be up to 100 feet lower than actual altitude with crew door(s) removed.

Flight with any combination of doors removed is approved. With litter door removed, left passenger door shall be removed. Refer to Airspeed limitations.

With door(s) removed, determine weight change and adjust ballast if necessary. Refer to Section 5.

NOTE

All unsecured items shall be removed from cabin when any door is removed.

1-6. WEIGHT AND CENTER OF GRAVITY

1-6-A. WEIGHT

Maximum approved internal GW for takeoff and landing is 5000 pounds (2268 kilograms).

Minimum GW for flight is 2650 pounds (1202 kilograms).

Minimum weight at fuselage station 65.0 is 170 pounds (77.1 kilograms).

Maximum approved GW with jettisonable external load for takeoff and landings is 6000 pounds (2722 kilograms).

1-6-B. CENTER OF GRAVITY

The pilot is responsible for determining weight and balance to ensure gross weight and center of gravity will remain within limits throughout each flight. Refer to Section 5 for loading tables and instructions.

NOTE

Ballast as required to maintain most forward or most aft CG within GW flight limits (Figure 1-1). For standard passenger and fuel loadings, applicable Weight empty center of gravity chart in BHT-407-MM-1 may be used to determine required ballast.

For longitudinal CG limits refer to Gross weight longitudinal center of gravity limits chart (Figure 1-1).

For lateral CG limits refer to Gross weight lateral center of gravity limits (Figure 1-2).

1-7. AIRSPEED

Basic V_{NE} is 140 KIAS, sea level to 3000 feet H_D. Decrease V_{NE} for ambient conditions in accordance with AIRSPEED LIMITATIONS placards and decals (Figure 1-3).

V_{NE} at 93.5 to 100% TORQUE (takeoff power) is 100 KIAS, not to exceed placarded V_{NE}.

V_{NE} is 100 KIAS or placarded V_{NE}, whichever is less, when takeoff loading is in shaded area of the Gross weight lateral center of gravity limits (Figure 1-2).

V_{NE} is 100 KIAS with any door(s) removed, not to exceed placarded V_{NE}.

V_{NE} is 100 KIAS or placarded V_{NE}, whichever is less for steady state autorotation.

Maximum allowable airspeed for sideward and rearward flight or crosswind hover is 35 KTAS.

Sustained hover and vertical takeoff/ landing operation (greater than one minute) with tailwind (relative winds within ± 90° of tail) greater than 5 knots is prohibited.

1-8. ALTITUDE

Maximum operating altitude is 20,000 feet H_p.

Maximum allowable airspeed for sideward and rearward flight or crosswind hover is 35 KTAS.

1-8. ALTITUDE

Maximum operating altitude is 20,000 feet H_D or 20,000 feet H_P, whichever is lower.

1-9. MANEUVERING

1-9-A. PROHIBITED MANEUVERS

Aerobatic maneuvers are prohibited.

1-9-B. CLIMB AND DESCENT

Maximum rate of climb is 2,000 feet per minute.

1-9-C. SLOPE LANDING

Slope landings are limited to 10° side slopes, 10° nose up slope or 5° nose down slope.

1-10. NOT USED

1-11. AMBIENT TEMPERATURES

Maximum sea level ambient air temperature for operation is +51.7°C (+125°F) and decreases with H_P at standard lapse rate of 2°C (3.6°F) per 1000 feet to 20,000 feet. Refer to Ambient air temperature limitations chart (Figure 1-4).

Minimum ambient air temperature for operation at all altitudes is –40 °C (–40°F).

ENG ANTI ICE shall be ON in visible moisture when OAT is below 5°C (40 °F).

1-12. ELECTRICAL

1-12-A. GENERATOR

Continuous operation, up to 10,000 feet H_p	0 to 180 Amps
Maximum continuous up to 10,000 feet H_p	180 Amps
Continuous operation, above 10,000 feet H_p	0 to 170 Amps
Maximum continuous above 10,000 feet H_p	170 Amps
Transient, 2 minutes	180 to 300 Amps
Transient, 5 seconds	300 to 400 Amps

1-12-B. STARTER

External Power Start	Battery Start
40 seconds ON	60 seconds ON
30 seconds OFF	60 seconds OFF
40 seconds ON	60 seconds ON
30 seconds OFF	60 seconds OFF
40 seconds ON	60 seconds ON
30 minutes OFF	30 minutes OFF

NOTE

28 VDC GPU for starting shall be limited to 500 amps.

1-13. POWER PLANT

Rolls-Royce model 250-C47B.

NOTE

Intentional use of any power transient is prohibited.

1-13-A. GAS PRODUCER RPM (NG)

Continuous operation	63 to 105%
Maximum continuous operation	105%
Transient, 10 seconds	105.1 to 106%

1-13-B. POWER TURBINE RPM (NP)

Avoid continuous operations	68.4 to 87.1%
Minimum	99%
Continuous operation	99 to 100%
Maximum continuous	100%
Maximum transient, 15 seconds	102.1 to 107% NP

NOTE

ENGINE OVSPD warning light will illuminate when NP versus TORQUE is between 102.4% NP at 100% TORQUE and 108.6% NP at 0% TORQUE.

When operating in MANUAL mode NP should be maintained between 95% and 100%.

1-13-C. MEASURED GAS TEMPERATURE (MGT)

GAUGE P/N 407-375-001-101/-103

Continuous operation	100 to 727°C
Maximum continuous	727°C
Takeoff, 5 minutes	727 to 779°C
Maximum for takeoff	779°C
Transient, 12 seconds	780 to 826°C
Maximum starting, do not exceed 10 seconds above 826°C or 1 second at 927°C.	927 °C

NOTE

Either MGT gauge may be installed.

GAUGE P/N 407-375-001-105 AND SUB

Continuous operation	100 to 727°C
Maximum continuous	727°C
Takeoff, 5 minutes	727 to 779°C
Maximum for takeoff	779°C
Transient, 12 seconds	780 to 905°C
Maximum starting, do not exceed 10 seconds above 843°C or 1 second at 927°C.	927°C

1-13-D. ENGINE TORQUE

Continuous operation	0 to 93.5%
Maximum continuous	93.5%
Takeoff, 5 minute	93.5 to 100%
Transient, 5 seconds	105%

NOTE

Use of takeoff power is limited to 100 KIAS, not to exceed placarded V_{NE}.

1-13-E. FUEL PRESSURE

Minimum	8 PSI
Continuous operation	8 to 25 PSI
Maximum	25 PSI

1-13-F. ENGINE OIL PRESSURE

Minimum below 79% NG	50 PSI
Minimum from 79 to 94% NG	90 PSI
Minimum above 94% NG	115 PSI
Maximum	130 PSI
Maximum cold starts only	200 PSI

NOTE

When 130 PSI is exceeded during start, operate engine at idle until oil pressure drops below 130 PSI.

1-13-G. ENGINE OIL TEMPERATURE

Continuous operation	0 to 107°C
Maximum	107°C

CAUTION

IF HOVERING WITH A TAILWIND GREATER THAN 5 KNOTS AT OAT ABOVE 24°C (75°F), CLOSELY MONITOR ENGINE AND TRANSMISSION OIL TEMPERATURES. IF ENGINE OR TRANSMISSION OIL TEMPERATURES RISE ABNORMALLY, TURN INTO WIND, REDUCE POWER OR TRANSITION TO FORWARD FLIGHT UNTIL TEMPERATURE DECREASES.

NOTE

Positive temperature indication is when the second segment of the trend arc is illuminated.

1-14. TRANSMISSION

1-13-G. ENGINE OIL TEMPERATURE

Continuous operation	0 to 107°C
Maximum	107°C

If hovering with a tailwind greater than 10 knots at OAT above 37.8°C (100°F), closely monitor engine oil temperature. The oil temperature may be reduced by either turning into wind, reducing power or transition to forward flight.

NOTE

Positive temperature indication is when the second segment of the trend arc is illuminated.

1-14. TRANSMISSION

1-13-G. ENGINE OIL TEMPERATURE

Continuous operation	0 to 107°C
Maximum	107°C

NOTE

Positive temperature indication is when the second segment of the trend arc is illuminated.

1-14. TRANSMISSION

1-14-A. TRANSMISSION OIL PRESSURE

Minimum	30 PSI
Continuous operation	40 to 70 PSI
Maximum	70 PSI

1-14-B. TRANSMISSION OIL TEMPERATURE

Continuous operation	15 to 110°C
Maximum	110°C

1-15. ROTOR

1-15-A. ROTOR RPM — POWER ON

Continuous operation	99 to 100%
Maximum continuous	100%

NOTE

When operating in MANUAL mode NR should be maintained between 95% and 100%.

1-15-B. ROTOR RPM — POWER OFF

Minimum	85%
Continuous operation	85 to 107%
Maximum	107%

CAUTION

FOR AUTOROTATIVE TRAINING MAINTAIN STEADY STATE NR ABOVE 90%.

1-16. HYDRAULIC

Hydraulic fluid MIL-H-5606 may be used at all ambient temperatures.

1-17. FUEL AND OIL

1-17-A. FUEL

Fuel conforming to following specifications may be used at all ambient temperatures:

ASTM-D-1655, Type B

MIL-T-5624, Grade JP-4 (NATO F-40).

Fuels conforming to following specifications are limited to ambient temperatures of –32°C (-25°F) and above:

ASTM-D-1655, Type A or A-1

MIL-T-5624, Grade JP-5 (NATO F-44)

MIL-T-83133, Grade JP-8 (NATO F-34).

For operations below –32 °C (-25 °F), refer to Rolls-Royce Operation and Maintenance Manual for cold weather fuel and blending instructions.

1-17-B. OIL

1-17-B-1. OIL – ENGINE

Oil conforming to MIL-L-7808 (NATO O-148), DOD-L-85734 (Turbine oil 555) or MIL-L-23699 (NATO O-156) is limited to ambient temperatures above –40 °C (–40 °F).

NOTE

Refer to Rolls-Royce Operation and Maintenance Manual and BHT-407-MD-1 manual for approved oils and mixing of oils of different brands, types, and manufacturers.

1-17-B-2. OIL – TRANSMISSION AND TAIL ROTOR GEARBOX

NOTE

It is recommended DOD-L-85734 oil be used in transmission and tail rotor gearbox to maximum extent allowed by temperature limitations.

Oil conforming to DOD-L-85734 is limited to ambient temperatures above –40°C (–40°F).

Oil conforming to MIL-L-7808 (NATO O-148) is limited to ambient temperatures below –18°C (–0°F).

1-18. ROTOR BRAKE

Rotor brake (if installed) application is limited to ground operation after engine has been shut down and NR has decreased to 40% or lower.

For emergency stops, apply rotor brake any time after engine is shut down.

Engine starts with rotor brake engaged are prohibited.

1-19. NOT USED

1-20. INSTRUMENT MARKINGS AND PLACARDS

Refer to Figure 1-3 for Placards and decals. Refer to Figure 1-5 for Instrument markings.

NOTE

Illustrations shown in Figure 1-5 are artist representations and may or may not depict actual approved instruments due to printing limitations. Instrument operating ranges and limits shall agree with those presented in this section.

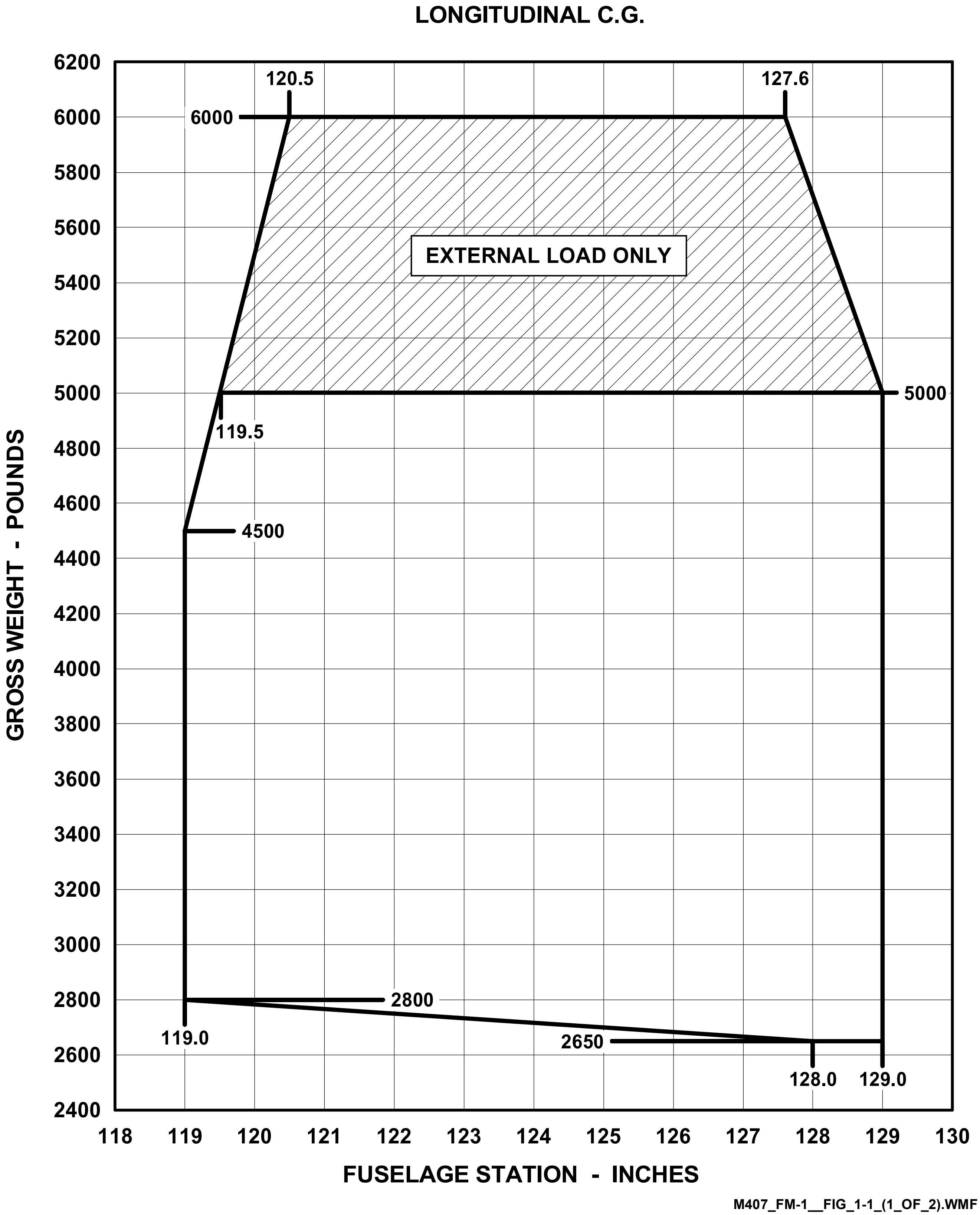


Figure 1-1. Gross weight longitudinal center of gravity limits (Sheet 1 of 2)

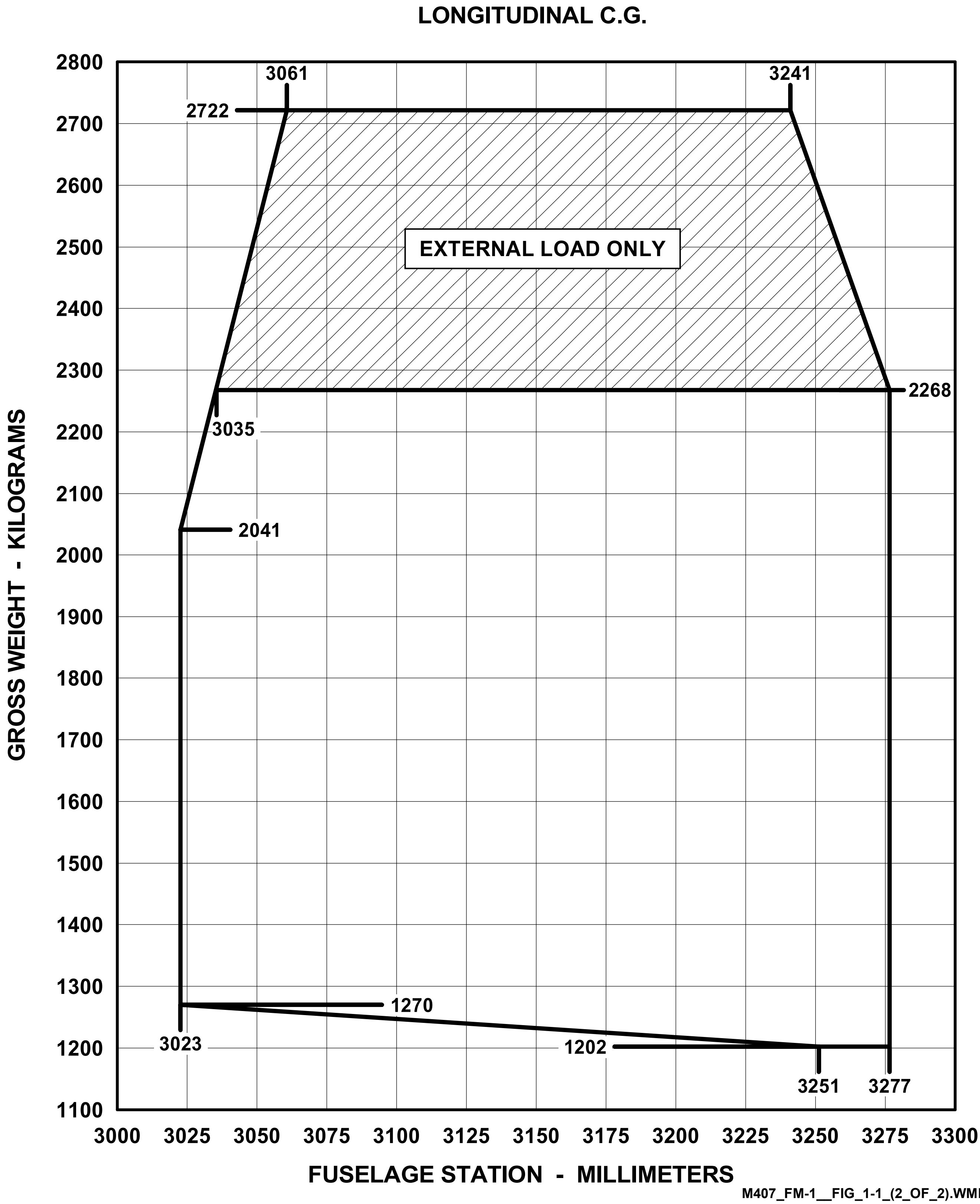


Figure 1-1. Gross weight longitudinal center of gravity limits (Sheet 2 of 2)

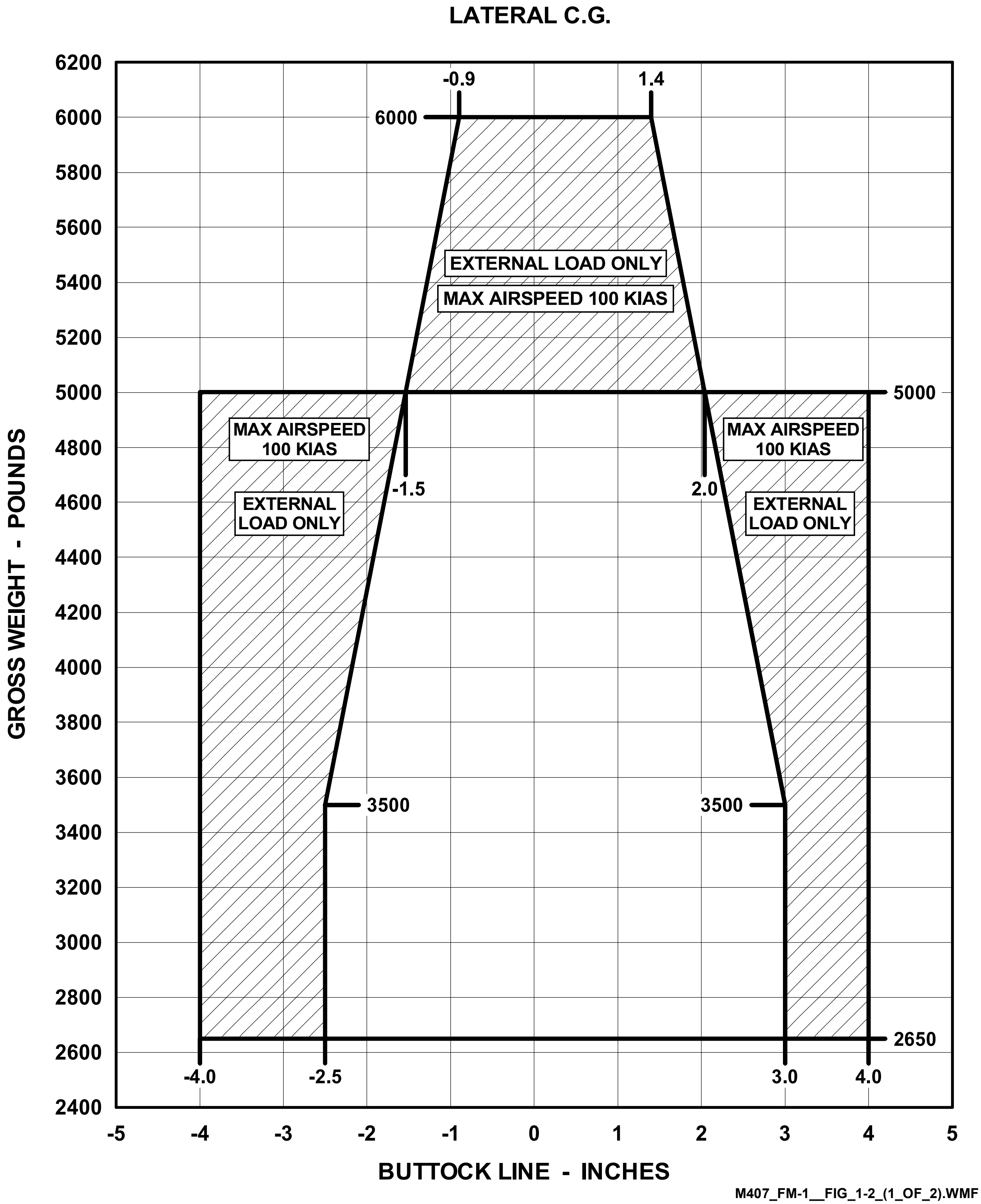


Figure 1-2. Gross weight lateral center of gravity limits (Sheet 1 of 2)

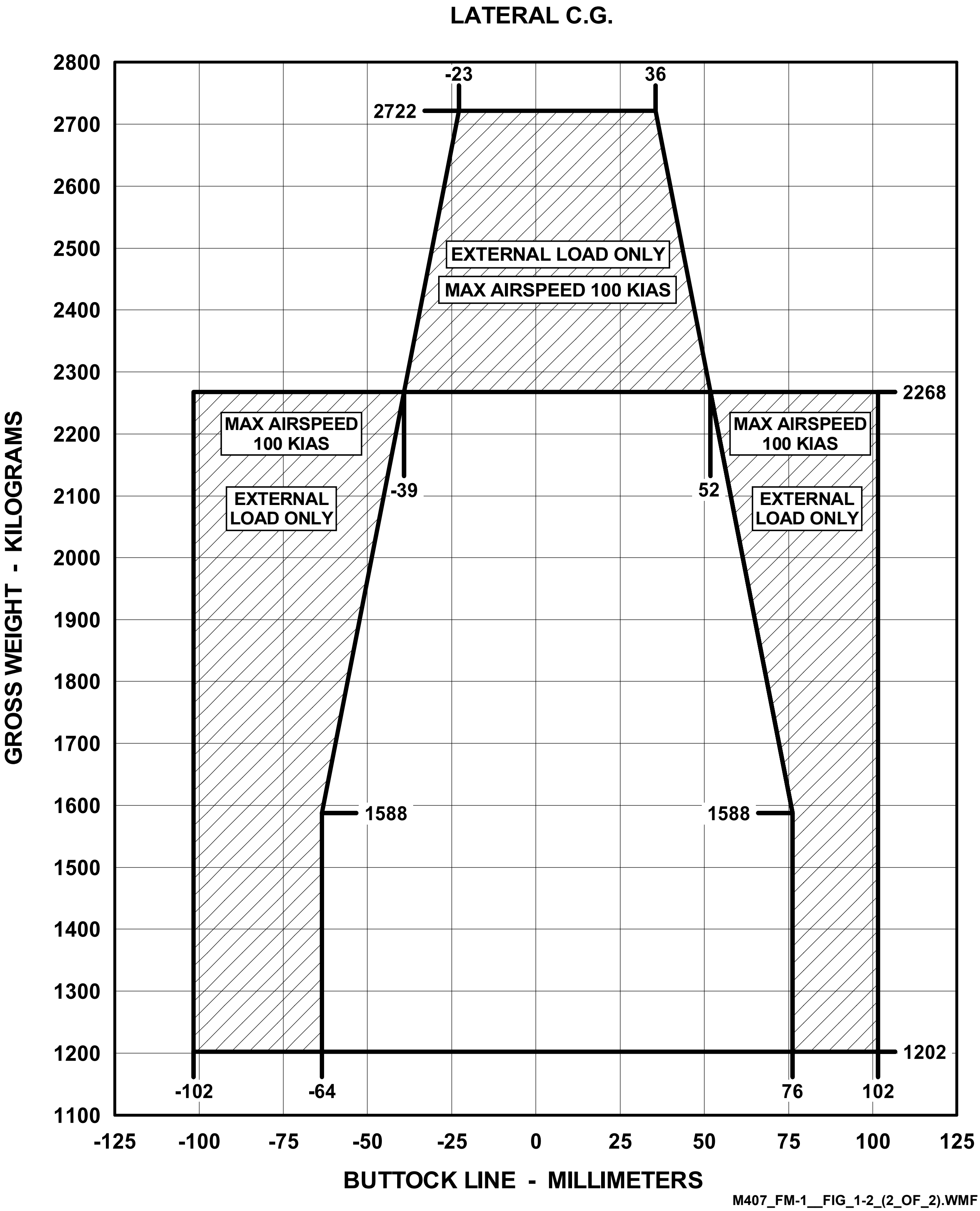


Figure 1-2. Gross weight lateral center of gravity limits (Sheet 2 of 2)

EMERGENCY PEDAL
STOP RELEASE
— PULL ONLY—
MAINT. RESET
REQUIRED

Location: Between Pilot and Copilot seats

407 AIRSPEED LIMITATIONS - KIAS											
OAT °C	PRESSURE ALTITUDE FT x 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137										
45	139	132	125								
40	140	133	126	119							
35	140	135	128	120	113						
30	140	137	129	122	115	108					
25	140	138	131	124	116	109	102	95			
20	140	140	133	125	118	111	103	96	89		
0	140	140	140	132	125	117	110	103	95	88	
-25	140	140	140	135	130	125	119	111	104	97	89
-40	137	133	128	123	118	114	110	105	101	97	93
MAXIMUM AUTOROTATION VNE 100 KIAS											

Airspeed limits shown are valid only for corresponding altitudes and temperatures. Hatched areas indicate conditions which exceed approved temperature or density altitude limitations.

Location: Forward of Overhead Console

M407_FM-1__FIG_1-3_(VNE).WMF

Figure 1-3. Placards and decals (Sheet 1 of 3)

FUEL
FUEL SYSTEM USABLE CAPACITY
BASIC AIRCRAFT 127 U.S. GALLONS - 483 LITERS
WITH 407-706-011 AUX KIT 147 U.S. GALLONS = 559 LITERS
SEE FLIGHT MANUAL FOR APPROVED FUELS

Location: Above fuel filler cap.

AVOID CONT OPS 68.4% TO 87.1% NP

Location: Instrument panel.

THIS HELICOPTER MUST BE OPERATED IN
COMPLIANCE WITH THE OPERATING LIMITATIONS
SPECIFIED IN THE APPROVED FLIGHT MANUAL

Location: Bottom and centered on instrument panel.

DO NOT APPLY ROTOR BRAKE
ABOVE 40% RPM

Location: Near rotor brake (if installed).

CARGO MUST BE SECURED
IN ACCORDANCE WITH
FLIGHT MANUAL INSTR

Location: Inside of baggage door.

407-FM-1-3-2

Figure 1-3. Placards and decals (Sheet 2 of 3)

FADEC SOFTWARE VERSION 5.202
WITH DIRECT REVERSION TO
MANUAL INSTALLED. REFER TO
FLIGHT MANUAL FOR OPERATION

Location: Instrument panel.

MAX ALLOWABLE WEIGHT 250 LBS.
MAX ALLOWABLE WEIGHT PER SQ. FT. 86 LBS.

Location: Inside of baggage door.

FUEL CAPACITY
BASIC 869 LBS
WITH AUX 1005 LBS
(JET A AT 15°C)

Location: Instrument panel

Location: Instrument panel and passenger compartment.

407-FM-1-3-3

Figure 1-3. Placards and decals (Sheet 3 of 3)

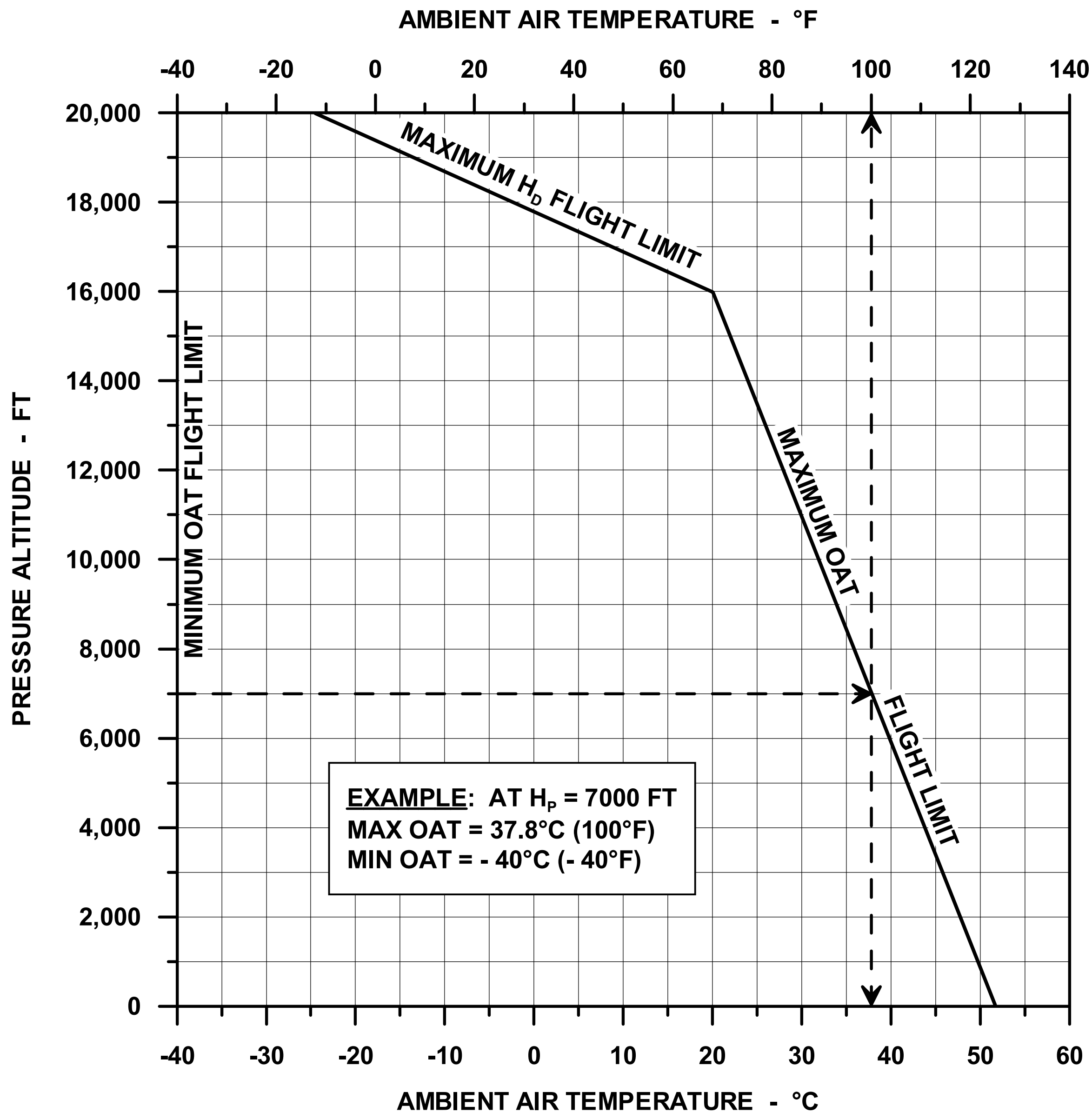
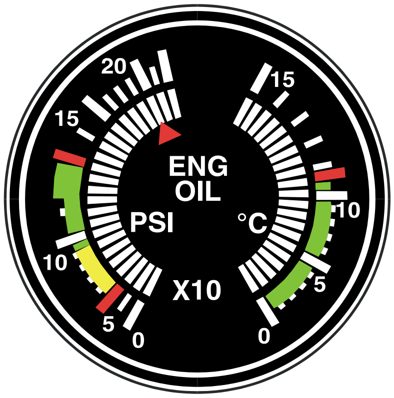


Figure 1-4. Ambient air temperature limitations

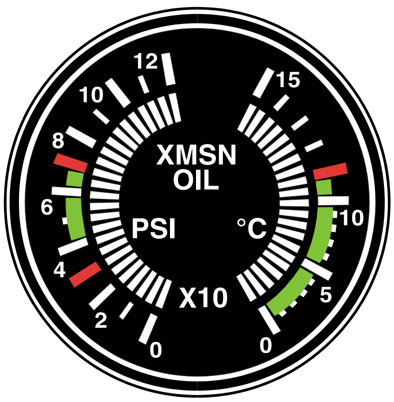


ENGINE OIL PRESSURE

50 PSI	Minimum
50 to 90 PSI	Operation below 79% NG RPM
90 to 115 PSI	Continuous operation below 94% NG RPM
115 to 130 PSI	Continuous operation
130 PSI	Maximum for continuous operation
200 PSI	Maximum for cold start

ENGINE OIL TEMPERATURE

0 to 107 C	Continuous operation
107 C	Maximum



TRANSMISSION OIL PRESSURE

30 PSI	Minimum
40 to 70 PSI	Continuous operation
70 PSI	Maximum

TRANSMISSION OIL TEMPERATURE

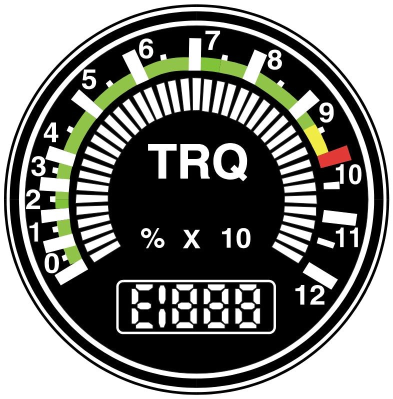
15 to 110 C	Continuous operation
110 C	Maximum

NG (GAS PRODUCER RPM)

63 to 105%	Continuous operation
105%	Maximum continuous operation
106%	Maximum transient, 10 seconds

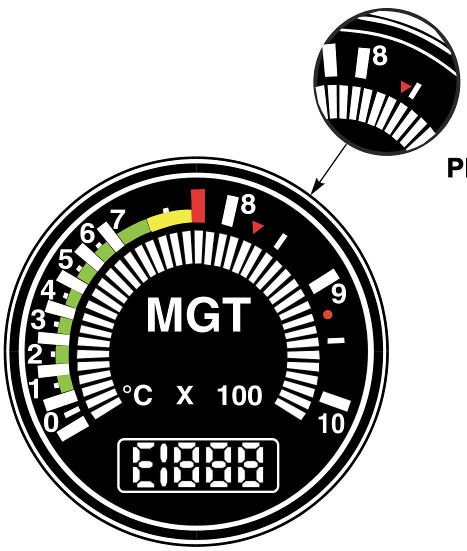
M407_FM-1__FIG_1-5_(1_OF_4).EPS

Figure 1-5. Instrument markings (Sheet 1 of 4)



TRQ (TORQUE)

0 to 93.5%	Continuous operation
93.5 to 100%	5 minute takeoff range
100%	Maximum



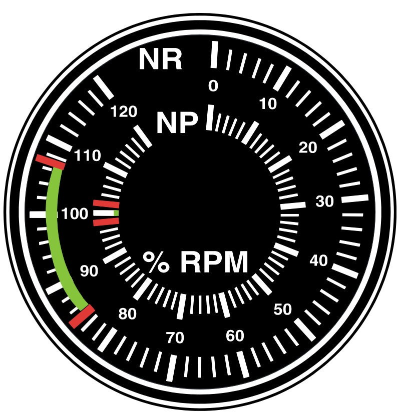
* Either gage may be installed

PN 407-375-001-105 AND SUB

MGT (MEASURED GAS TEMPERATURE)

100 to 727 C	Continuous operation
727 to 779 C	5 minute takeoff range
779 C	Maximum for takeoff
* 826 C or 843 C	Beginning of 10 seconds range for starting
927 C	Maximum for start and shutdown (1 second maximum)

PN 407-375-001-101/-103



NP (POWER TURBINE RPM)

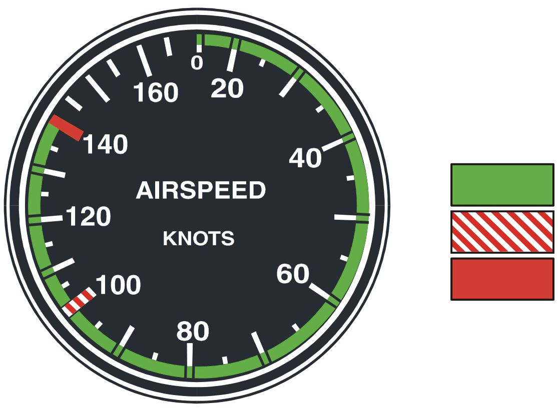
99%	Minimum
99 to 100%	Continuous operation
100%	Maximum continuous

NR (ROTOR RPM)

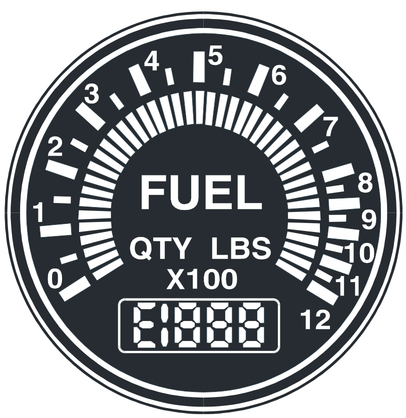
85%	Minimum (power off)
85 to 107%	Continuous operation (power off)
107%	Maximum (power off)

M407_FM-1__FIG_1-5_(2_OF_4).EPS

Figure 1-5. Instrument markings (Sheet 2 of 4)



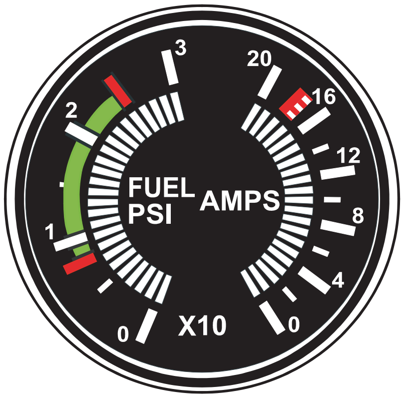
AIRSPEED		
0 to 140 Knots	Continuous operation	
100 Knots	Maximum for autorotation	
140 Knots	Maximum	



FUEL QUANTITY	(Jet A 6.8 lbs/gal)
0 LBS	All tanks empty (zero useable)
185 LBS	Forward tank empty
869 LBS	Forward and aft tanks full
1005 LBS	Forward, aft and auxiliary tanks full

M407_FM-1__FIG_1-5_(3_OF_4).WMF

Figure 1-5. Instrument markings (Sheet 3 of 4)



* Either gauge may be installed.

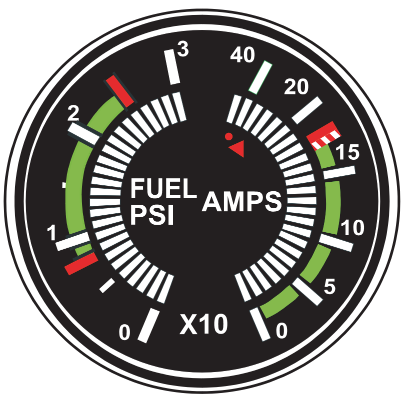
* P/N 407-075-024-101

DC LOAD

170 Amps	Maximum continuous above 10,000 FT Hp
180 Amps	Maximum

FUEL PRESSURE

8 PSI	Minimum
8 to 25 PSI	Continuous operation
25 PSI	Maximum



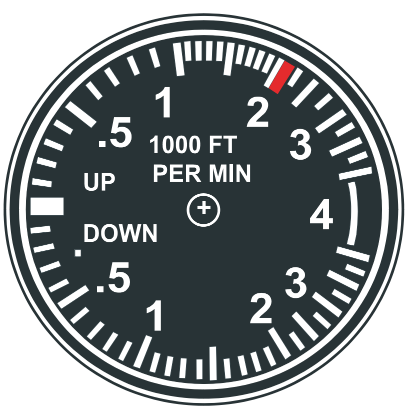
* P/N 407-075-024-103,
407-375-007-105 or 407-375-007-107

DC LOAD

0 to 180 Amps	Continuous operation
170 Amps	Maximum continuous above 10,000 FT Hp
180 Amps	Maximum
300 Amps	Maximum transient, 2 minutes
400 Amps	Maximum transient, 5 seconds

FUEL PRESSURE

8 PSI	Minimum
8 to 25 PSI	Continuous operation
25 PSI	Maximum



VERTICAL SPEED INDICATOR

2,000 Feet per minute up	Maximum

407FM_1_0001

Figure 1-5. Instrument markings (Sheet 4 of 4)

Section 2

NORMAL PROCEDURES

TABLE OF CONTENTS

LIST OF FIGURES

Section 2

NORMAL PROCEDURES

2-1-B. HOT WEATHER OPERATIONS

CAUTION

IF HOVERING WITH A TAILWIND GREATER THAN 10 KNOTS AT OAT ABOVE 37.8°C (100°F), CLOSELY MONITOR ENGINE OIL TEMPERATURE. THE OIL TEMPERATURE MAY BE REDUCED BY EITHER TURNING INTO WIND, REDUCING POWER OR TRANSITION TO FORWARD FLIGHT.

2-2. FLIGHT PLANNING

Section 2

NORMAL PROCEDURES

2-1. INTRODUCTION

This section contains instructions and procedures for operating helicopter from planning stage, through actual flight conditions, to securing helicopter after landing.

Normal and standard conditions are assumed in these procedures. Pertinent data in other sections is referenced when applicable.

Instructions and procedures contained herein are written for purpose of standardization and are not applicable to all situations.

2-1-A. COLD WEATHER OPERATIONS

Battery starts have been demonstrated to -29°C (-20°F) with standard 17 amp-hour battery and -35°C (-31°F) with optional 28 amp-hour battery.

During engine start in cold temperatures initial engine oil pressure of 200 PSI and pressure excursions down to 50 PSI during warm up are normal. Normal oil pressure and temperature indications as per limitations section should be obtained after approximately 5 minutes at idle.

2-1-B. HOT WEATHER OPERATIONS

CAUTION

DURING EXTENDED HOVER AT TAKEOFF POWER WITH THE OAT ABOVE 49.7°C (121.4°F), MONITOR THE ENGINE OIL TEMPERATURE. IF TEMPERATURE RISES ABNORMALLY, REDUCE POWER OR TRANSITION TO FORWARD FLIGHT UNTIL TEMPERATURE DECREASES.

2-2. FLIGHT PLANNING

Each flight should be planned adequately to ensure safe operations and to provide pilot with data to be used during flight.

Check type of mission to be performed and destination.

Determine that aircraft has adequate performance to complete mission utilizing appropriate performance charts in Section 4.

Determine aircraft weight and balance will be within limits during entire mission. Utilize appropriate weight and balance charts in Section 5 and limitations in Section 1.

2-3. PREFLIGHT CHECK

Pilot is responsible for determining whether helicopter is in condition for a safe flight. Refer to Figure 2-1 for preflight check sequence.

NOTE

A preflight check is not intended to be a detailed mechanical inspection, but simply a guide to help pilot check condition of helicopter. It may be as comprehensive as conditions warrant at discretion of pilot.

All areas checked shall include a visual check for evidence of corrosion, particularly when helicopter is flown near salt water or in areas of high industrial emissions.

2-3-A. BEFORE EXTERIOR CHECK

1. Flight planning — Completed.
2. Publications — Checked.
3. GW and CG — Computed.
4. Helicopter servicing — Completed.
5. Battery — Connected.

2-3-B. EXTERIOR CHECK

2-3-B-1. FUSELAGE – CABIN RIGHT SIDE

WARNING

FAILURE TO REMOVE ROTOR TIEDOWNS BEFORE ENGINE STARTING MAY RESULT IN SEVERE DAMAGE AND POSSIBLE INJURY.

1. All main rotor blades — Tiedowns removed, condition.
2. Right static port — Condition.
3. Cabin doors and hinge bolts — Condition and security.
4. Windows — Condition and security.
5. Landing gear — Condition. Ground handling wheels removed.
6. Forward and aft crosstube fairings (if installed) — Secured, condition, and aligned.

2-3-B-2. FUSELAGE – CENTER RIGHT SIDE

1. Engine inlet — Condition; remove inlet covers.
2. Cabin roof, transmission cowling, and engine air inlet area — Cleaned of all debris, accumulated snow and ice; cowling secured.
3. Forward fairing — Secured.
4. Transmission — Check oil level. Verify actual presence of oil in sight gauge.
5. Transmission oil cooler lines — Condition and security.
6. Transmission mounts — Condition and security.
7. Main driveshaft — Condition.
8. Access door — Secured.
9. Fuel filler cap — Visually check fuel level and cap secured.

NOTE

If helicopter is not parked on a level surface fuel sump may not properly drain contaminants.

10. Fuel sump — Drain fuel sample as follows:
    a. RIGHT and LEFT FUEL BOOST/ XFR circuit breaker switches — OFF.
    b. BATT switch — BATT (on).
    c. FUEL VALVE switch — OFF.
    d. FWD and AFT FUEL SUMP drain buttons — Press, drain sample, then release.

f. Hydromechanical unit — Security and condition; evidence of leakage.

g. Hoses and tubing — Chafing, security, and condition.

h. Oil cooler blower inlet duct and screen — Clear of obstructions, condition and security.

17. Engine cowl — Secured.

18. Generator cooling scoop — Clear of debris.

11. Airframe fuel filter — Drain and check before first flight of day as follows:

    a. RIGHT and LEFT FUEL BOOST/XFR circuit breaker switches — LEFT and RIGHT (on).

    b. FUEL VALVE switch — ON.

    c. Fuel filter drain valve — Open, drain sample, then close.

12. Fuel filter test switch — Press and check FUEL FILTER caution light illuminates. Release switch and check light extinguishes.

13. FUEL VALVE switch — OFF.

14. LEFT and RIGHT FUEL BOOST/XFR circuit breaker switches — OFF.

15. BATT switch — OFF.

16. Powerplant area:

    a. Main driveshaft aft flexure — Condition.

    b. Engine — Condition, security of attachments, evidence of oil leakage.

    c. Engine mounts — Condition and security.

    d. Throttle linkage — Condition, security, and freedom of operation.

    e. Engine fuel pump — Security and condition, evidence of leakage.

    f. Hydromechanical unit — Security and condition, evidence of leakage.

    g. Hoses and tubing — Chafing, security, and condition.

17. Engine cowl — Secured.

18. Generator cooling scoop — Clear of debris.

19. Oil tank — Leaks, security, and cap secured.

20. Access door — Secured.

21. Aft fairing — Secured.

2-3-B-3. FUSELAGE – AFT RIGHT SIDE

1. Fuselage — Condition.

2. Tail rotor driveshaft cover — Condition and security.

3. Tailboom — Condition.

4. Horizontal stabilizer and position light — Condition and security.

2-3-B-4. FUSELAGE – FULL AFT

1. Vertical fin — Condition.

2. Tail rotor guard — Condition and security.

3. Anticollision light — Condition and security of lens.

4. Aft position light — Condition.

5. Tail rotor gearbox — Oil level, leaks and security.

6. Tail rotor — Tiedown removed, condition and free movement.

7. Tail rotor controls — Condition and security.

8. Tail rotor blades:
   a. General condition.
   b. Tip block — Security and seal integrity.
   c. Internal blade root — Clear of snow and ice.
9. Tail rotor yoke — Condition, evidence of static stop contact damage (deformed static stop yield indicator).

2-3-B-5. FUSELAGE – AFT LEFT SIDE

1. Tailboom — Condition.
2. Tail rotor driveshaft cover — Condition and security.
3. Horizontal stabilizer area:
   a. Horizontal stabilizer — General condition and security of attachment.
   b. Position light — Condition and security.
   c. Forward and aft section of left upper stabilizer support to tailboom area — Condition of tailboom.
4. Fuselage — Condition.
5. Forward tail rotor driveshaft coupling — Condition of splined adapter.
6. Oil cooler blower shaft hanger bearings — Evidence of grease leakage and overheating.
7. Oil cooler blower — Clear of obstructions and condition.
8. Oil cooler — Condition and leaks.
9. Oil cooler blower access door — Secured.
10. Oil tank sight glass — Check oil level.
11. Aft fairing — Secured.
12. Baggage compartment — Cargo tied down, door secured.
13. Exhaust cover — Removed.
14. Powerplant area:
    a. Engine — Condition, security of attachments.
    b. Engine mounts — Condition and security.
    c. Exhaust stack — Condition and security.
    d. Evidence of fuel and oil leaks.
    e. Fuel and oil filter bypass indicators — Check retracted.
    f. Hoses and tubing for chafing and condition.
    g. Pneumatic lines — Condition and security.
    h. Tail rotor driveshaft — Condition of splines and couplings.
    i. Air induction diffuser duct — Condition and security.
    j. Rotor brake disc and caliper (if installed) — Condition, security of attachment and leakage. Ensure brake pads are retracted from brake disc.
    k. Engine cowling — Secured.
    l. Air induction cowling — Secured.
    m. Cabin roof, transmission cowling, engine air inlet area, and plenum — Clear of all debris, accumulated snow and ice; cowling secured.
15. Transmission area:
    a. Transmission mounts — Condition and security of elastomeric mounts.
    b. Transmission oil filter — Bypass

c. Main driveshaft — Condition.

d. Transducers and pressure lines — Condition and security.

e. Access door — Secured.

2-3-B-6. CABIN ROOF

1. Main rotor dampers and fairing — Condition and security.
2. Main rotor hub, yoke and frahm — Condition and security.
3. Main rotor blade and skin — Condition.
4. Pitch horn bearing — Wear and security.
5. Main rotor pitch links — Condition and security of attachment bolts and locking hardware.
6. Swashplate assembly — Condition, security of attached controls, and boot condition.
7. Control linkages to swashplate — Condition, security of attachment bolts and locking hardware.
8. Control tube hydraulics-off balance springs — Condition and security.
9. Hydraulic reservoir filler cap — Closed and locked.
10. Hydraulic system filters — Bypass indicator retracted.
11. Hydraulic actuators and lines — Condition, security, interference, leakage.

2-3-B-7. FUSELAGE – CABIN LEFT SIDE

1. Forward fairing and access door — Secured.
2. Cabin doors and hinge bolts — Condition and security.
3. Windows — Condition and security.
4. Hydraulic reservoir — Check fluid level.
5. Landing gear — Condition and ground handling wheels removed.
6. Forward and aft crosstube fairings (if installed) — Secured, condition, and aligned.
7. Left static port — Condition.

2-3-B-8. FUSELAGE – FRONT

1. Exterior surfaces — Condition.
2. Windshield — Condition and cleanliness.
3. Battery and vent lines — Condition and security.
4. HOUR METER circuit breaker — In.
5. Battery access door — Secured.
6. Pitot tube — Cover removed, clear of obstructions.
7. External power door — Condition and security.
8. Landing light lamps — Condition.
9. Antennas — Condition and security.

2-4. INTERIOR AND PRESTART CHECK

1. Cabin interior — Clean, equipment secured.
2. Fire extinguisher — Installed and secured.
3. Cabin loading — Maintain CG within limits.
4. Passenger seat belts — Secured.
5. Copilot seat belt — Secured (if solo).
6. Doors — Secured.
7. Throttle — Closed.
8. LDG LTS switch — OFF.
9. Communications switches — Set.
10. Altimeter — Set.
11. Instruments — Correct indications.
12. Overhead switches — Set:
    a. BATT switch — OFF.
    b. GEN switch — OFF.
    c. PART SEP switch (if installed) — OFF.
    d. ANTI COLL LT switch — ANTI COLL LT. (on)
    e. HYD SYS switch — HYD SYS. (on)
    f. CABIN LT/PASS switch — OFF.
    g. POS LT switch — As desired.
    h. DEFOG switch — OFF.
    i. PITOT HEATER switch — OFF.
    j. ENG ANTI ICE switch — OFF.
    k. AVIONICS MASTER switch — OFF.
    l. HEATER switch (if installed) — OFF.
    m. INSTR LT rheostat — OFF.
13. Overhead circuit breaker switches — OFF.
14. Overhead circuit breakers — In.
15. Rotor brake handle (if installed) — Up and latched.

CAUTION

28 VDC GPU SHALL BE 500 AMPERES OR LESS TO REDUCE RISK OF STARTER DAMAGE FROM OVERHEATING.

16. GPU — Connected (if used).
17. BATT switch — ON for battery start, ON for GPU start, OFF for battery cart start. Observe the following:
    a. Low rotor audio horn activated.
    b. For 8 seconds,
        (1) Trend arcs on LCD instruments indicate full scale.
        (2) TORQUE and NG digits display 8188.8.
        (3) MGT and FUEL digits display 81888.
        (4) NR and NP needles move to 107% and 100%, respectively.

c. After 3 seconds; ENG OUT, FADEC DEGRADE, FADEC FAULT, RESTART FAULT, and ENGINE OVSPD lights illuminate with activation of engine out audio for 3 seconds.

d. ENG OUT light re-illuminates with reactivation of engine out audio, after 3 seconds.

18. HORN MUTE button — Press to mute.

19. Caution lights — ENG OUT, XMSN OIL PRESS, RPM, HYDRAULIC SYSTEM, GEN FAIL, L/FUEL BOOST, R/FUEL BOOST, L/FUEL XFR, and R/FUEL XFR will be illuminated.

NOTE

L/FUEL XFR and R/FUEL XFR will not be illuminated when forward fuel tank is empty.

20. PEDAL STOP PTT switch annunciator:

Pedals — Centered.

Press — Verify PEDAL STOP caution and ENGAGED annunciator illuminated and left pedal travel restricted.

Release — Verify PEDAL STOP caution and ENGAGED annunciator extinguished and both pedals travel unrestricted.

21. Flight controls — Loosen frictions; check travel and verify CYCLIC CENTERING light operation; position for start. Tighten friction as desired.

22. Throttle — Check freedom of travel and appropriate operation at OFF, I (idle), FLY and MAX positions. Return throttle to OFF position.

NOTE

With INSTR LT rheostat on and CAUT LT switch positioned to DIM, caution lights are dimmed to a fixed intensity and cannot be adjusted by INSTR LT rheostat.

23. INSTR LT rheostat — As desired.

24. CAUT LT switch — As desired.

25. FUEL BOOST/XFR circuit breaker switches — LEFT (on) and RIGHT (on) and verify all boost and transfer caution lights extinguish.

26. FUEL pressure — Check.

27. CAUTION LT TEST button — Press to test.

28. INSTR CHK button — Press and check for exceedances.

29. LCD TEST button — Press to test, if desired.

30. FADEC HORN TEST button — Press to test.

31. FADEC MODE switch — AUTO.

32. FUEL VALVE switch — ON, guard closed, FUEL VALVE light illuminates then extinguishes.

33. FUEL QTY — Check TOTAL and FWD tank quantity.

34. OAT/VOLTS display — Check OAT and select VOLTS.

CAUTION

ANY ATTEMPT TO START ENGINE WHEN VOLTAGE IS BELOW 24 VOLTS MAY RESULT IN A HOT START. MONITOR FOR FADEC FAILURE. IF FADEC FAILS (FADEC FAIL WARNING LIGHT), ABORT START BY ROLLING THROTTLE TO CUTOFF AND ENGAGE STARTER TO REDUCE MGT.

2-5. ENGINE START

1. Collective — Full down.
2. Cyclic and pedals — Centered and CYCLIC CENTERING light extinguished.

NOTE

If throttle is positioned in idle for more than 60 seconds, starter latching is disabled and throttle must be repositioned to cut off and then back to idle to enable it for another 60 seconds.

It is recommended that MGT be below 150°C when below 10,000 feet H_P or below 65 °C when above 10,000 feet H_P prior to attempting an engine start. Compliance with this recommendation will allow for cooler starts and reduce potential of reaching hot start abort limits. Refer to DRY MOTORING RUN, paragraph 2-5-A.

3. Throttle — Idle position.
4. START switch — Momentarily press (hold for approximately 1 second) and observe START and AUTO RELIGHT lights are illuminated.
5. MGT — Monitor.

CAUTION

IF MAIN ROTOR IS NOT ROTATING BY 25% NG, ABORT START BY ROLLING THROTTLE TO CUT OFF. ENSURE STARTER HAS DISENGAGED WHEN MGT DECREASES BELOW 150°C.

6. START light — Extinguished at 50% NG (starter has disengaged).
7. AUTO RELIGHT light — Extinguished at 60% NG.
8. ENG and XMSN OIL pressures — Check.

CAUTION

IF ENGINE HAS BEEN SHUT DOWN FOR MORE THAN 15 MINUTES, STABILIZE AT IDLE FOR 1 MINUTE BEFORE INCREASING THROTTLE.

NOTE

During cold temperature operations, normal transmission and engine oil pressure limits may be exceeded during start. Stabilize engine at idle until minimum temperature and pressure limits are attained.

9. Idle — 63 ± 1% NG.
10. BATT switch — ON (if applicable).
11. GPU — Disconnect and close door (if applicable).
12. GEN switch — GEN (on); observe GEN FAIL light extinguishes.

NOTE

Turn generator OFF if ammeter indication drops to zero amps after an initial full scale indication. One reset is allowed. RESET generator and then turn generator back ON (applicable with AMPS/FUEL PSI gauge PN 407-075-024-101 and sub.). Refer to BHT-407-MD-1.

13. Voltmeter — 28.5 ± 0.5 volts.

14. FLIGHT INSTR circuit breaker switches (3) (if installed) — DG, ATT and TURN (on).

NOTE

If dual controls are installed, guard throttle to prevent inadvertent manipulation from co-pilot position.

2-5-A. DRY MOTORING RUN

The following procedure is used to reduce residual MGT to recommended levels for engine start.

1. Throttle — Closed position.

2. START switch — Hold engaged for 15 seconds, then release.

Follow ENGINE START procedure, paragraph 2-5, once 0% NG is indicated.

2-6. SYSTEMS CHECK

2-6-A. PRELIMINARY HYDRAULIC SYSTEMS CHECK

NOTE

Uncommanded control movement or motoring with hydraulic system off may indicate hydraulic system malfunction.

1. HYD SYS switch — OFF.

2. HYDRAULIC SYSTEM caution light — Illuminated.

3. HYD SYS switch — HYD SYS (on).

4. HYDRAULIC SYSTEM caution light — Extinguished.

2-6-B. FADEC MANUAL CHECK

WARNING

AUTO TO MANUAL MODE TRANSITIONS WITH NR/NP AT 100% FLAT PITCH CAN RESULT IN RAPID NR/NP ACCELERATION IN APPROXIMATELY 7 SECONDS. TO AVOID POSSIBLE OVERSPEED CONDITION, PERFORM THE FOLLOWING CHECK AT IDLE (63% NG).

1. Throttle — Idle (63% NG).

2. FADEC MODE switch — MAN.

3. FADEC MANUAL and AUTO RELIGHT lights — Illuminated.

4. Check NG stabilized at 75% or less.

5. Throttle — Increase slowly to ensure engine responds, then return to idle.

6. FADEC MODE switch - AUTO.

7. FADEC MANUAL and AUTO RELIGHT lights — Extinguished.

2-6-C. ENGINE RUNUP

1. Throttle — Increase smoothly to FLY detent position. Check RPM warning light extinguished at 95% NR.

2. NR and NP needles — Check matching and indicating 100%.

NOTE

Overhead circuit breakers highlighted with arrow graphic ◤◢; are powered through AVIONICS MASTER switch.

3. AVIONICS MASTER switch — AVIONICS MASTER (on).

4. ELT (if installed) — Check for inadvertent transmission.

5. Flight controls — Check freedom with minimum friction.

6. ENG ANTI ICE switch — ENG ANTI ICE (on); check for MGT increase and illumination of ENGINE ANTI-ICE light (if installed).

7. ENG ANTI ICE switch — OFF; check MGT returns to normal and ENGINE ANTI-ICE light (if installed) extinguishes; then ENG ANTI ICE (on) if required.

NOTE

If temperature is below 5°C (40°F) and visible moisture is present, ENG ANTI ICE shall be on.

8. PART SEP switch (if installed) — As required.

2-6-D. HYDRAULIC SYSTEMS CHECK

NOTE

Hydraulic systems check is to determine proper operation of hydraulic actuators for each flight control system. If abnormal forces, unequal forces, control binding, or motoring are encountered, it may be an indication of a malfunctioning flight control actuator.

1. Collective — Full down.

2. NR — 100% RPM.

3. HYD SYS switch — OFF.

4. HYDRAULIC SYSTEM caution light — Illuminated.

5. Cyclic — Centered.

6. Cyclic control — Check normal operation by moving cyclic forward and aft, then left and right (approximately 1 inch). Center cyclic.

7. Collective — Check normal operation by increasing collective slightly (1 to 2 inches). Repeat two to three times as required. Return to full down position.

8. Pedals — Check normal operation by displacing pedals slightly (1 inch).

9. HYD SYS switch — HYD SYS (on).

10. HYDRAULIC SYSTEM caution light — Extinguished.

11. Cyclic and collective friction — Set as desired.

2-7. BEFORE TAKEOFF

1. ENG ANTI ICE switch — As required.

2. Light switches — As required.

3. INSTR LT rheostat — As desired.

NOTE

For night flight, it is recommended to point the map light at the flight instruments and set to a low intensity. Sufficient night lighting will be provided in the event of an instrument lighting failure.

4. Radio(s) — Check as required.

5. Flight controls — Position and adjust frictions for takeoff.

CAUTION

FAILURE TO POSITION AND MAINTAIN THROTTLE IN FLY DETENT POSITION PRIOR TO TAKEOFF AND DURING NORMAL FLIGHT OPERATIONS CAN LIMIT AVAILABLE ENGINE POWER.

6. Throttle — Open to FLY detent position. Check 99 to 100% NR/NP.
7. Engine, transmission, and electrical instruments — Within limits.
8. Flight and navigation instruments — Check.
9. FUEL QTY — Note indication.
10. FUEL QTY FWD TANK button — Press, note fuel remaining in forward cell.

2-8. TAKEOFF

1. Rear facing seat headrests — Adjusted to proper position.

NOTE

During takeoffs disregard CYCLIC CENTERING light and position cyclic as required.

2. Collective — Increase to hover.
3. Directional control — As required to maintain desired heading.
4. Cyclic — Apply as required to accelerate smoothly.
5. Increase collective, up to 5% torque above hover power, to obtain desired rate of climb and airspeed. Once clear of the HV diagram shaded areas, adjust power and airspeed as desired.
6. PEDAL STOP PTT switch — Check ENGAGED annunciator illuminated above 55 ± 5 KIAS.

2-9. IN-FLIGHT OPERATIONS

1. AIRSPEED — As desired (not to exceed V_{NE} at flight altitude).

CAUTION

AT HIGH POWER AND HIGH AIRSPEED, CYCLIC ONLY ACCELERATIONS AND MANEUVERING MAY SIGNIFICANTLY INCREASE MGT AND TORQUE WITH NO COLLECTIVE INPUT. THIS INCREASE IS MORE RAPID AT LOWER OAT.

NOTE

Pilot shall keep feet on tail rotor pedals at all times. Do not press PEDAL STOP PTT switch in flight.

2. PEDAL STOP PTT switch — Check ENGAGED annunciator illuminated above 55 ± 5 KIAS.
3. ENG ANTI ICE and PITOT HEATER switches — ENG ANTI ICE and PITOT HEATER switches on in visible moisture when ambient temperature is at or below 5°C (40°F).
4. PITOT HEATER — confirm operation (increase ammeter load).

NOTE

When ENG ANTI ICE switch is in ENG ANTI ICE (on), MGT will increase. Monitor MGT when selecting ENG ANTI ICE at high power settings.

5. Altimeter — Within limits.
6. FUEL QTY FWD TANK button — Press, note forward fuel tank indication.

NOTE

Full forward fuel tank quantity (approximately 256 pounds) will be indicated at approximately 770 pounds or greater total fuel. Fuel transfer will be complete at approximately 185 pounds total fuel.

2-10. DESCENT AND LANDING

NOTE

Large reductions in collective pitch at heavy GW may permit NR to increase independent of NP (needles split). Main rotor may be reengaged with a smooth increase in collective pitch.

1. Rear facing seat headrests — Adjusted to proper position.
2. Flight controls — Adjust friction as desired.
3. Throttle — Fly detent position. Check 99 to 100% NP.
4. Flight path — As required for type of approach.
5. ENG ANTI ICE — As required.
6. LDG LTS switch — As desired.

NOTE

During run-on or slope landings disregard CYCLIC CENTERING light and position cyclic as required. After landing is completed and collective is full down, reposition cyclic so that CYCLIC CENTERING light is extinguished.

7. PEDAL STOP PTT switch — Check ENGAGED annunciator extinguished below 50 ± 5 KIAS.

2-11. ENGINE SHUTDOWN

1. Collective — Full down.
2. Cyclic and pedals — Centered and CYCLIC CENTERING light extinguished.
3. Cyclic friction — Increase so that cyclic maintains centered position.
4. LDG LTS switch — OFF.
5. Throttle — Reduce to idle stop. Check RPM warning light illuminated and audio on at 95% NR.

NOTE

If dual controls are installed, guard throttle to prevent inadvertent manipulation from co-pilot position.

6. HORN MUTE button — Press to mute.
7. MGT — Stabilize at idle for 2 minutes.
8. ENG ANTI ICE switch — OFF.
9. FLIGHT INSTR circuit breakers switches (if installed) — OFF
10. FUEL BOOST/XFR LEFT circuit breaker switch — OFF.

NOTE

Left fuel boost and transfer pumps will continue to operate until either LEFT FUEL BOOST/XFR circuit breaker switch (highlighted with yellow border) or FUEL VALVE switch is positioned to OFF. These pumps operate directly from battery and will not be deactivated when BATT switch is OFF. Battery power will be depleted if both switches remain on.

11. ELT (if installed) — Check for inadvertent transmission.

12. AVIONICS MASTER switch — OFF.

13. GEN switch — OFF.

14. OVSPD TEST button — If required; press, hold 1 second, and release.

NOTE

Overspeed shut down test should be accomplished on first engine shut down of the day. ENGINE OVSPD light will momentarily illuminate in addition to those lights that illuminate during a normal shut down.

15. IDLE REL switch — Press and hold.

CAUTION

POSITIONING THROTTLE OUT OF CUT-OFF DURING NG SPOOL DOWN MAY CAUSE POST ENGINE SHUTDOWN FIRE.

16. Throttle — Closed; check MGT and NG decreasing, ENGINE OUT warning light illuminated and audio on at 55 ± 1%.

17. HORN MUTE button — Press to mute.

CAUTION

AVOID RAPID ENGAGEMENT OF ROTOR BRAKE IF HELICOPTER IS ON ICE OR OTHER SLIPPERY OR LOOSE SURFACE TO PREVENT ROTATION OF HELICOPTER.

18. Rotor brake (if installed) — Apply full rotor brake at or below 40% NR. Return rotor brake handle to stowed position just prior to main rotor stopping.

19. FUEL VALVE switch — OFF.

CAUTION

DO NOT INCREASE COLLECTIVE OR APPLY LEFT TAIL ROTOR PEDAL TO SLOW ROTOR DURING COAST DOWN.

20. Pilot — Remain on flight controls until rotor has come to a complete stop.

21. All overhead switches, except HYD SYS switch — OFF.

NOTE

Ensure engine rotation has completely stopped prior to positioning BATT switch to OFF.

22. BATT switch — OFF, with NG at 0%.

CAUTION

APPLICABLE MAINTENANCE ACTION MUST BE PERFORMED PRIOR TO FURTHER FLIGHT IF A FADEC LIGHT HAS ILLUMINATED DURING THE PREVIOUS FLIGHT OR ON ENGINE SHUTDOWN.

NOTE

If shutting down at, or refueling to, between approximately 185 to 210 pounds total fuel quantity, up to 18 pounds of fuel may remain in forward fuel cell as unusable.

2-12. POSTFLIGHT CHECK

If any of following conditions exist:

- Thunderstorms are in local area or forecasted.
- Winds in excess of 35 knots or a gust spread of 15 knots exists or is forecasted.
- Helicopter is parked within 150 feet of hovering or taxiing aircraft that are in excess of basic GW of helicopter.
- Helicopter to be left unattended.

Perform following:

1. Install main rotor blade tiedowns.
2. Secure tail rotor loosely to tailboom with tiedown strap to prevent excessive flapping.
3. Install exhaust cover, engine inlet protective plugs and pitot cover.

NOTE

Refer to BHT-407-MD-1 for additional tiedown data.

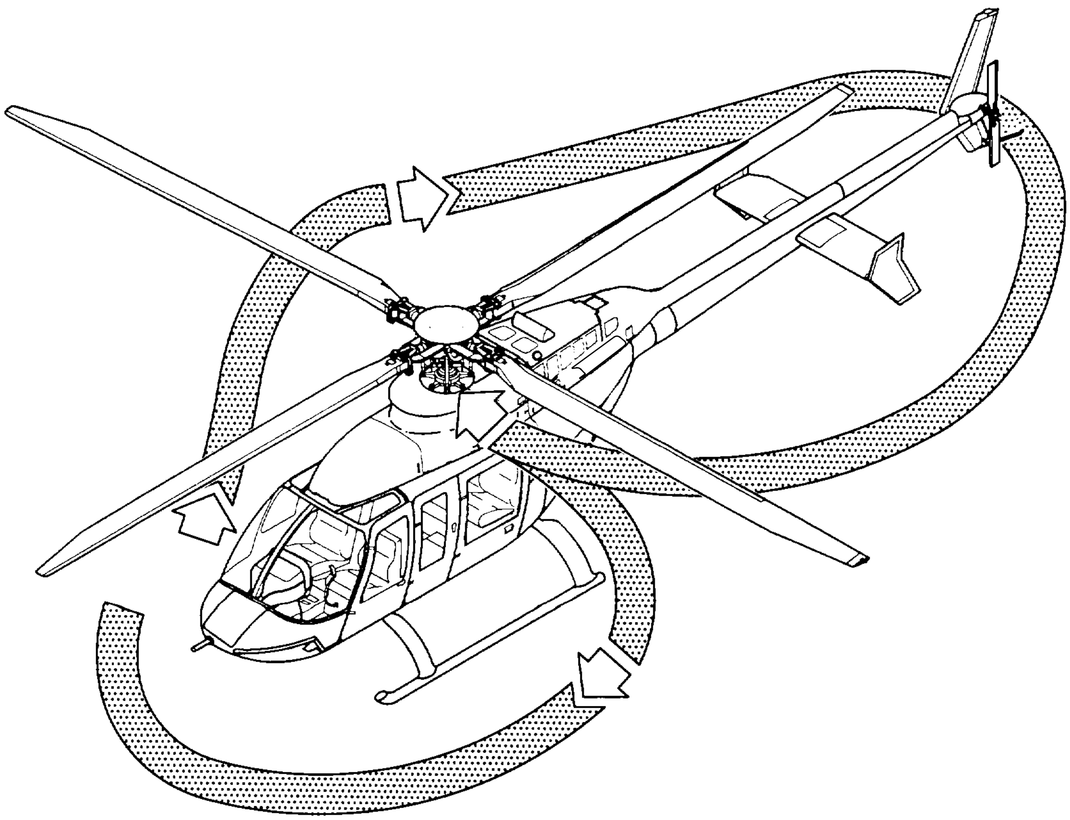


Figure 2-1. Preflight check sequence

Section 3

EMERGEMCY/MALFUNCTION PROCEDURES

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Section 3

EMERGEMCY/MALFUNCTION PROCEDURES

3-1. INTRODUCTION

Following procedures contain indications of failures or malfunctions which affect safety of crew, helicopter, ground personnel or property; use of emergency features of primary and backup systems; and appropriate warnings, cautions, and explanatory notes. Tables 3-1 and 3-2 list fault conditions and corrective actions for warning lights and caution/advisory lights respectively.

NOTE

All corrective action procedures listed herein assume pilot gives first priority to helicopter control and a safe flight path.

A tripped circuit breaker should not be reset in flight unless deemed necessary for safe completion of the flight.

If a tripped circuit breaker is deemed necessary for safe completion of the flight, it should only be reset one time.

Helicopter should not be operated following any precautionary landing until cause of malfunction has been determined and corrective maintenance action taken.

3-2. DEFINITIONS

Following terms indicate degree of urgency in landing helicopter.

LAND AS SOON AS POSSIBLE	Land without delay at nearest suitable area (i.e., open field) at which a safe approach and landing is reasonably assured.
LAND AS SOON AS PRACTICAL	Landing site and duration of flight are at discretion of pilot. Extended flight beyond nearest approved landing area is not recommended.

Following terms are used to describe operating condition of a system, subsystem, assembly, or component.

Affected	Fails to operate in intended or usual manner.
Normal	Operates in intended or usual manner.

3-3. ENGINE

3-3-A. ENGINE FAILURE

3-3-A-1. ENGINE FAILURE — HOVERING

- INDICATIONS:

  1. Left yaw.

  2. ENGINE OUT and RPM warning lights illuminated.

3. Engine instruments indicate power loss.

4. Engine out audio activated when NG drops below 55%.

5. NR decreasing with RPM warning light and audio on when NR drops below 95%.

- PROCEDURE:

1. Maintain heading and attitude control.

2. Collective — Adjust to control NR and rate of descent. Increase prior to ground contact to cushion landing.

NOTE

Amplitude of collective movement is a function of height above ground. Any forward airspeed will aid in ability to cushion landing.

3. Land.

4. Shut down helicopter.

3-3-A-2. ENGINE FAILURE — INFLIGHT

- INDICATIONS:

1. Left yaw.

2. ENGINE OUT and RPM warning lights illuminated.

3. Engine instruments indicate power loss.

4. Engine out audio activated when NG drops below 55%.

5. NR decreasing with RPM warning light and audio on when NR drops below 95%.

- PROCEDURE:

1. Maintain heading and attitude control.

2. Collective — Adjust as required to maintain 85 to 107% NR.

NOTE

Maintaining NR at high end of operating range will provide maximum rotor energy to accomplish landing, but will cause an increased rate of descent.

3. Cyclic — Adjust to obtain desired autorotative AIRSPEED.

NOTE

Maximum AIRSPEED for steady state autorotation is 100 KIAS. Minimum rate of descent airspeed is 55 KIAS. Maximum glide distance airspeed is 80 KIAS.

4. Attempt engine restart if ample altitude remains. (Refer to ENGINE RESTART, paragraph 3-3-B).

5. FUEL VALVE switch — OFF.

6. At low altitude:

   a. Throttle — Closed.

   b. Flare to lose airspeed.

7. Apply collective as flare effect decreases to further reduce forward speed and cushion landing. Upon ground contact, collective shall be reduced smoothly while maintaining cyclic in neutral or centered position.

8. Complete helicopter shutdown.

3-3-B. ENGINE RESTART IN FLIGHT

An engine restart may be attempted in flight if time and altitude permit.

CAUTION

IF CAUSE OF FAILURE IS OBVIOUSLY MECHANICAL, AS EVIDENCED BY ABNORMAL METALLIC OR GRINDING SOUNDS, DO NOT ATTEMPT A RESTART.

3-3-B-1. RESTART – AUTOMATIC MODE

I PROCEDURE (NO RESTART FAULT OR FADEC MANUAL LIGHTS ILLUMINATED):

1. Collective — Adjust to maintain 85 to 107% NR.
2. AIRSPEED — Adjust as desired.

NOTE

Minimum rate of descent airspeed of 55 KIAS and minimum NR will allow pilot more time for air restart.

3. FUEL VALVE switch — ON.
4. Throttle — Cutoff.
5. START switch — Hold to start position (start will latch after throttle is placed to idle).
6. NG — Between 12% and 50%.
7. Throttle — Idle.
8. MGT — Monitor.
9. Throttle — Advance smoothly to FLY detent position.

If restart is unsuccessful, abort start and secure engine as follows:

10. Throttle — Closed.
11. FUEL VALVE switch — OFF.
12. Accomplish autorotative descent and landing.

3-3-B-2. RESTART — MANUAL MODE

RESTART FAULT OR FADEC MANUAL LIGHTS ILLUMINATED.

I PROCEDURE:

1. Collective — Adjust to maintain 85 to 107% NR.
2. AIRSPEED — Adjust as desired.

NOTE

Minimum rate of descent airspeed of 55 KIAS and minimum NR will allow pilot more time for air restart.

3. Throttle — Closed.
4. FADEC MODE switch — MAN.
5. FUEL VALVE switch — ON.
6. START switch — Hold to start position (starter will not latch).
7. NG — 12%.
8. Throttle — Slowly advance out of cutoff and stop advancing throttle at light off.
9. MGT — Allow to peak.
10. Throttle — Increase fuel flow by modulating throttle to maintain MGT within limits.
11. START switch — Release at 50% NG.
12. Throttle — Advance smoothly and modulate to 100% NP.

If restart is unsuccessful, abort start and secure engine as follows:

13. Throttle — Closed.

14. FUEL VALVE switch — OFF.

15. Accomplish autorotative descent and landing.

3-3-C. ENGINE UNDERSPEED

NO CAUTION/WARNING/ADVISORY LIGHTS ILLUMINATED.

- INDICATIONS:

1. Decrease in NG.
2. Subsequent decrease in NP.
3. Possible decrease in NR.
4. Decrease in TRQ.

- PROCEDURE:

1. Collective — Adjust as required to maintain 85 to 107% NR.
2. Throttle — Confirm in FLY detent position.
3. Throttle — Position throttle to the approximate bezel position that coincides with the guage indicated NG.
4. FADEC MODE switch — MAN.
5. NR — Maintain 95 to 100% with throttle and collective.
6. Land as soon as practical.

3-3-D. ENGINE OVERSPEED

(NO CAUTION/WARNING/ADVISORY LIGHTS ILLUMINATED)

- INDICATIONS:

1. Increase in NR.
2. Increase in NP.
3. Increase in NG.
4. Increase in TRQ.

- PROCEDURE:

1. Throttle — Retard.
2. NG or NP — Attempt to stabilize with throttle and collective.
3. FADEC MODE switch — MAN.
4. NR — Maintain 95 to 100% with throttle and collective.

CAUTION

IF UNABLE TO MAINTAIN NR, NP, NG, OR MGT, PREPARE FOR A POWER OFF LANDING BY LOWERING COLLECTIVE AND SHUTTING DOWN ENGINE.

3-3-E. ENGINE COMPRESSOR STALL

- INDICATIONS:

1. Engine pops.
2. High or erratic MGT.
3. Decreasing or erratic NG or NP.
4. TRQ oscillations.

- PROCEDURE:

1. Collective — Reduce power, maintain slow cruise flight.
2. MGT and NG — Check for normal indications.
3. ENG ANTI ICE switch — ON.
4. PART SEP switch (if installed) — ON.

5. HEATER switch (if installed) — ON.

NOTE

Severity of compressor stalls will dictate if engine should be shut down and treated as an engine failure. Violent stalls can cause damage to engine and drive system components, and must be handled as an emergency condition. Stalls of a less severe nature (one or two low intensity pops) may permit continued operation of engine at a reduced power level, avoiding condition that resulted in compressor stall.

If pilot elects to continue flight:

6. Collective — Increase slowly to achieve desired power level.
7. MGT and NG — Monitor for normal response.
8. Land as soon as practical.

If pilot elects to shut down engine:

9. Enter autorotation.
10. Throttle — Closed.
11. FUEL VALVE switch — OFF.
12. Collective — Adjust as required to maintain 85 to 107% NR.
13. Cyclic — Adjust as required to maintain desired AIRSPEED.
14. Prepare for power-off landing.

3-3-F. ENGINE HOT START/SHUTDOWN

- INDICATIONS:

1. Excessive MGT.
2. Visible smoke or fire.

- PROCEDURE:

1. Throttle — Closed.
2. FUEL VALVE switch — OFF.

NOTE

Starter will remain engaged until MGT decreases to 150°C and then automatically disengage. Starter may be manually engaged by holding STARTER switch forward.

3. STARTER switch — Ensure starter is motoring engine until MGT stabilizes at normal temperature.
4. Shut down helicopter.

3-3-G. ENGINE OIL PRESSURE LOW OR FLUCTUATING

- INDICATIONS:

1. Engine oil pressure below minimum.
2. Engine oil pressure fluctuating abnormally.

- PROCEDURE:

1. Engine oil pressure and temperature — Monitor.
2. Land as soon as practical.

3-3-H. ENGINE OIL TEMPERATURE HIGH

- INDICATIONS:

1. Engine oil temperature increasing above normal.
2. Engine oil temperature above maximum.

- PROCEDURE:

Land as soon as practical.

3-3-J. DRIVESHAFT FAILURE

WARNING

FAILURE OF MAIN DRIVESHAFT TO TRANSMISSION WILL RESULT IN COMPLETE LOSS OF POWER TO MAIN ROTOR. ALTHOUGH COCKPIT INDICATIONS FOR A DRIVESHAFT FAILURE ARE SIMILAR TO AN ENGINE OVERSPEED, IT IS IMPERATIVE THAT AUTOROTATIVE FLIGHT PROCEDURES BE ESTABLISHED IMMEDIATELY. FAILURE TO REACT IMMEDIATELY TO LOW RPM AUDIO, RPM LIGHT AND NP/NR TACHOMETER CAN RESULT IN LOSS OF CONTROL.

- INDICATIONS:

1. Left yaw
2. Rapid decrease in NR
3. Rapid increase in NP
4. LOW RPM audio horn
5. Illumination of RPM light
6. Possible increase in noise level due to overspeeding engine and driveshaft breakage.

NOTE

Engine overspeed trip system will activate at 118.5% NP causing fuel flow to go to minimum. After initial overspeed, FADEC will adjust fuel flow to maintain engine at 100% NP.

- PROCEDURE:

1. Maintain heading and attitude control.
2. Collective — Adjust as required to maintain 85 to 107% NR.

NOTE

Minimum rate of descent airspeed is 55 KIAS. Maximum glide distance airspeed is 80 KIAS.

3. Cyclic — Adjust to obtain desired autorotative airspeed.

NOTE

To maintain tail rotor effectiveness do not shutdown engine.

4. Landing — Complete autorotative landing.
5. Complete helicopter shutdown.

3-3-K. FADEC FAILURE

NOTE

Takeoff power may not be available in the MAN mode. Maximum continuous power will be available for all ambient conditions.

- INDICATIONS

1. FADEC fail audio activated.
2. FADEC FAIL warning light illuminated.
3. FADEC MANUAL caution light illuminated.
4. AUTO RELIGHT advisory light illuminated.
5. FADEC MODE switch MAN light illuminated.

- PROCEDURE:

WARNING

WITHIN 2 TO 7 SECONDS AFTER THE FADEC FAUL WARNING NR/NP MAY INCREASE RAPIDLY, REQUIRING POSITIVE MOVEMENTS OF COLLECTIVE AND THROTTLE TO CONTROL NR.

1. Throttle — If time permits, match throttle bezel position to NG indication.
2. NR/NP — Maintain 95 to 100% with collective and throttle.
3. FADEC MODE switch — Depress one time, muting FADEC fail audio.

NOTE

Depressing FADEC MODE switch one time, will only mute FADEC fail audio. This step should not be accomplished until pilot is firmly established in MAN control.

4. Land as soon as practical.
5. Normal shutdown if possible.

3-4. FIRE

3-4-A. ENGINE FIRE ON GROUND

- INDICATIONS:

1. Smoke
2. Fumes
3. Fire

- PROCEDURE:

1. Throttle — Closed
2. FUEL VALVE switch — OFF
3. GEN switch — OFF
4. BATT switch — OFF
5. Rotor brake (if installed) — Engage
6. Exit helicopter

3-4-B. ENGINE FIRE DURING FLIGHT

- INDICATIONS:

1. Smoke.
2. Fumes.
3. Fire.

- PROCEDURE:

1. Inflight — Immediately enter autorotation.
2. Throttle — Closed.
3. FUEL VALVE switch — OFF.
4. If time permits, FUEL BOOST/XFR circuit breaker switches — OFF.
5. Execute autorotative descent and landing.
6. BATT switch — OFF.

NOTE

Do not restart engine until corrective maintenance has been performed.

3-4-C. CABIN SMOKE OR FUMES

- INDICATIONS:

1. Smoke
2. Fumes

- PROCEDURE:

1. Inflight — Start descent
2. AIR COND BLO switch (if installed) — OFF
3. HEATER switch (if installed) — OFF
4. All vents — Open
5. Side windows — Open

If time and altitude permits:

6. Source — Attempt to identify and secure.
7. If source is identified and smoke and/or fumes still persist — Land as soon as possible.
8. If source is identified and smoke and/or fumes are cleared — Land as soon as practical.

3-5. TAIL ROTOR

There is no single emergency procedure for all types of antitorque malfunctions . One key to a pilot successfully handling a tail rotor emergency lies in the ability to quickly recognize the type of malfunction that has occurred.

3-5-A. COMPLETE LOSS OF TAIL ROTOR THRUST

This is a situation involving a break in drive system (e.g., severed driveshaft), wherein tail rotor stops turning and delivers no thrust.

- INDICATIONS:

1. Uncontrollable yawing to right (left side slip).
2. Nose down tucking.
3. Possible roll of fuselage.

NOTE

Severity of initial reaction of helicopter will be affected by AIRSPEED, CG, power being used, and H_D.

- PROCEDURE:

3-5-A-1. HOVERING

Close throttle and perform a hovering autorotation landing. A slight rotation can be expected on touchdown.

3-5-A-2. IN-FLIGHT

Reduce throttle to idle, immediately enter autorotation, and maintain a minimum AIRSPEED of 55 KIAS during descent.

NOTE

When a suitable landing site is not available, vertical fin may permit controlled flight at low power levels and sufficient AIRSPEED. During final stages of approach, a mild flare should be executed, making sure all power to rotor is off. Maintain helicopter in a slight flare and smoothly use collective to execute a soft, slightly nose-high landing. Landing on aft portion of skids will tend to correct side drift. This technique will, in most cases, result in a run-on type landing.

CAUTION

IN A RUN-ON TYPE LANDING AFTER TOUCHING DOWN, DO NOT USE CYCLIC TO REDUCE FORWARD SPEED.

3-5-B. FIXED PITCH FAILURES

This is a situation involving inability to change tail rotor thrust (blade angle) with anti-torque pedals.

- INDICATIONS:

1. Lack of directional response.
2. Locked pedals.

NOTE

If pedals cannot be moved with a moderate amount of force, do not attempt to apply a maximum effort, since a more serious malfunction could result. If helicopter is in a trimmed condition when malfunction occurs, TRQ and AIRSPEED should be noted and helicopter flown to a suitable landing area. Certain combinations of TRQ, NR, and AIRSPEED will correct a yaw attitude, and these combinations should be used to land helicopter.

- PROCEDURE:

NOTE

Pull pedal stop emergency release to ensure pedal stop is retracted.

3-5-B-1. HOVERING

Do not close throttle unless a severe right yaw occurs. If pedals lock in any position at a hover, landing from a hover can be accomplished with greater safety under power-controlled flight rather than by closing throttle and entering autorotation.

3-5-B-2. IN-FLIGHT — LEFT PEDAL APPLIED

In a high power condition, helicopter will yaw to left when power is reduced. Power and AIRSPEED should be adjusted to a value where a comfortable yaw angle can be maintained. If AIRSPEED is increased, vertical fin will become more effective and an increased left yaw attitude will develop. To accomplish landing, establish a power-on approach with sufficiently low AIRSPEED (zero if necessary) to attain a rate of descent with a comfortable sideslip angle. (A decrease in NP decreases tail rotor thrust.) As collective is increased just before touchdown, left yaw will be reduced.

3-5-B-3. IN-FLIGHT — RIGHT PEDAL APPLIED

In cruise flight or reduced power situation, helicopter will yaw to right when power is increased. A low power, run-on type landing will be necessary by gradually reducing throttle to maintain heading while adding collective to cushion landing. If right yaw becomes excessive, close throttle completely.

3-6. HYDRAULIC SYSTEM

3-6-A. LOSS OF HYDRAULIC PRESSURE

- INDICATIONS:

1. HYDRAULIC SYSTEM caution light illuminated.
2. Grinding or howling noise from pump.
3. Increase in force required to move flight controls.
4. Feedback forces may be evident during flight control movement.

- PROCEDURE:

1. Reduce AIRSPEED to 70 to 100 KIAS.
2. HYD SYSTEM circuit breaker — Out. If hydraulic power is not restored, push breaker in.
3. HYD SYS switch — HYD SYS; OFF if hydraulic power is not restored.

4. For extended flight set comfortable AIRSPEED, up to 120 KIAS, to minimize control forces.

5. Land as soon as practical.

6. A run-on landing at effective translational lift speed (approximately 15 knots) is recommended.

3-6-B. FLIGHT CONTROL ACTUATOR MALFUNCTION

An actuator hardover can occur in any flight control axis, but a cyclic cam jam will only occur in the fore and aft axis. An actuator hardover is manifested by uncommanded movements of one or two flight controls. If two controls move, the pilot will find one of these controls will require a higher than normal control force to oppose the movement. This force cannot be "trimmed" to zero without turning the HYD SYS switch OFF. Once the hydraulic boost is OFF, the forces on the affected flight control will be similar to the "normal" hydraulic off forces.

- INDICATIONS:

1. Uncommanded flight control movements
2. High flight control forces to oppose movement in one axis
3. Feedback forces only in affected flight control axis
4. Flight control forces normal in unaffected axis

- PROCEDURE:

1. Attitude — Maintain
2. HYD SYS switch — OFF
3. AIRSPEED — Set to 70 to 100 KIAS
4. Land as soon as possible using procedure from paragraph 3-6-A

3-7. ELECTRICAL SYSTEM

3-7-A. GENERATOR FAILURE

- INDICATIONS:

1. GEN FAIL caution light illuminated.
2. AMPS indicates 0.
3. Voltmeter — Approximately 24 volts

- PROCEDURE:

1. GENERATOR FIELD and GENERATOR RESET circuit breakers — Check in.
2. GEN switch — RESET; then GEN.
3. If power is not restored, place GEN switch to OFF; land as soon as practical.

NOTE

With generator OFF, a fully charged battery will provide approximately 21 minutes of power for basic helicopter and one VHF COMM radio (35 minutes with optional 28 ampere/hour battery).

3-7-B. EXCESSIVE ELECTRICAL LOAD

- INDICATIONS:

1. AMPS indicates excessive load.
2. Smoke or fumes.

- PROCEDURE:

1. GEN switch — OFF.
2. BATT switch — OFF.

3. FUEL BOOST/XFR LEFT circuit breaker switch — LEFT (on).

WARNING

PRIOR TO BATTERY DEPLETION, ALTITUDE MUST BE REDUCED BELOW 8000 FEET H_P (JET A) OR 4000 H_P (JET B). UNUSABLE FUEL MAY BE AS HIGH AS 135 POUNDS AFTER THE BATTERY IS DEPLETED DUE TO INABILITY TO TRANSFER FUEL FROM FORWARD CELLS.

NOTE

With battery and generator OFF, an 80% charged battery will operate left fuel boost pump and left fuel transfer pump for approximately 1.7 hours (2.8 hours with optional 28 ampere/hour battery).

4. Airspeed — 60 KIAS or less.

NOTE

Pedal stop disengages with loss of electrical power.

5. Land as soon as practical.

NOTE

When throttle is repositioned to the idle stop (during engine shutdown) the PMA will go offline and the engine may flameout.

3-8. FUEL SYSTEM

DUAL FUEL TRANSFER FAILURE

- INDICATIONS:

1. L/FUEL XFR and R/FUEL XFR caution lights illuminate.
2. Last 135 pounds of fuel in forward cell may not be usable.
3. Fuel will stop transferring from forward to aft fuel cell at approximately 340 pounds total indicated fuel.

- PROCEDURE:

1. LEFT and RIGHT FUEL BOOST/XFR circuit breaker switches — Check ON.
2. Determine FUEL QTY in forward cell.
3. Subtract quantity of fuel trapped in forward cell from total to determine usable fuel remaining.
4. Plan landing accordingly.

3-9. CYCLIC CAM JAM

A cyclic cam jam can only occur in the fore and aft axis, whereas, an actuator hardover can occur in any flight control axis. A cyclic cam jam is manifested when a commanded control movement requires a higher than normal fore and aft spring force. The force felt when moving the cyclic fore and aft with a cam jam is the result of overriding a spring capsule.

- INDICATIONS:

1. High (approximately 15 pounds) fore and aft cyclic control forces.
2. Normal pedal, collective and lateral cyclic control forces.

- PROCEDURE:

1. Helicopter pitch attitude — Maintain normal pitch attitudes with forward or aft cyclic force.

CAUTION

DO NOT TURN HYDRAULIC BOOST OFF

2. Land as soon as practical.

3-10. WARNING, CAUTION, AND ADVISORY LIGHTS/ MESSAGES

Red warning lights/messages, fault conditions, and corrective actions are presented in Table 3-1.

Amber caution and White advisory lights/ messages and corrective actions are presented in Table 3-2.

Table 3-1. Warning (red) lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
BATTERY HOT	Battery overheating.	Turn BATT switch OFF and land as soon as practical. If BATTERY RLY light illuminates, turn GEN switch OFF if conditions permit. Land as soon as possible.
ENGINE OUT	NG less than 55 ± 1% and/or FADEC senses ENGINE OUT.	Verify engine condition. Accomplish engine failure procedure.
ENGINE OVSPD	NG greater than 110% or NP versus TORQUE is above maximum continuous limit (102.4% NP at 100% TORQUE to 108.6% NP at 0% TORQUE).	Adjust throttle and collective as necessary. Determine if engine is controllable, if not shut down. Maintenance action required before next flight.
FADEC FAIL(During start)	FADEC has detected a serious malfunction.	Close throttle immediately. Engage starter to reduce MGT. Applicable maintenance action required prior to next flight.
FADEC FAIL(Inflight)	FADEC has detected a malfunction and an overspeed may occur 2 to 7 seconds following activation of FADEC fail horn and illumination of FADEC FAIL warning light. Engine may underspeed significantly prior to overspeed. Any other FADEC related lights may be illuminated.	Accomplish FADEC FAILURE procedure, paragraph 3-3-K. Applicable maintenance action required prior to next flight.
RPM(with low RPM audio)	NR below 95%.	Reduce collective and ensure throttle is in FLY detent position. Light will extinguish and audio will cease when NR increases above 95%.
RPM(without audio)	NR above 107%.	Increase collective and/or reduce severity of maneuver. Light will extinguish when NR decreases below 107%.
XMSN OIL PRESS	Transmission oil pressure is below minimum.	Reduce power; verify fault with gage. Land as soon as possible.
XMSN OIL TEMP	Transmission oil temperature is at or above red line.	Reduce power; verify fault with gage. Land as soon as practical.

Table 3-2. Caution (amber) and advisory (white/green) lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
AUTO RELIGHT(white)	Engine igniter is operating.	None. NOTE AUTO RELIGHT light will be illuminated when ignition system is activated.Ignition system is activated: 1 - during start sequence 2 - in MANUAL mode with NG above 55% 3 - with FADEC detection of engine out condition with NG above 50%.
BAGGAGE DOOR	Baggage compartment door not securely latched.	Close door securely before flight. If light illuminates during flight, land as soon as practical.
BATTERY RLY	Battery relay has malfunctioned to closed (ON) position with BATT switch OFF. Battery is still connected to DC BUSS.	If BATTERY HOT light is illuminated, turn GEN switch OFF if conditions permit. Land as soon as possible.
CHECK INSTR	TRQ, MGT, or NG is about to or has detected an exceedance. Flashing LCD trend arc and digital display indicates impending exceedance. Letter E in digital display indicates an exceedance has occurred.	Reduce engine power if possible. Press INSTR CHK button to display magnitude of exceedance. Refer to BHT-407-MD-1.
CYCLIC CENTERING	Cyclic stick is not centered.	Reposition cyclic stick to center position to extinguish CYCLIC CENTERING light.
ENGAGED	Information system status.	None.
ENGINE ANTI-ICE (white)	ANTI-ICE switch ON. Engine receiving anti-icing air.	If light (if installed) remains illuminated with ENGINE ANTI-ICE switch OFF, avoid operations requiring maximum power.
ENGINE CHIP	Ferrous particles in engine oil.	Land as soon as possible.

Table 3-2. Caution (amber) and advisory (white/green) lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
FADEC DEGRADED (Inflight)	FADEC ECU operation is degraded which may result in NR droop, NR lag, or reduced maximum power capability.	Remain in AUTO mode. Fly helicopter smoothly and nonaggressively. Land as soon as practical. **NOTE** It may be necessary to use FUEL VALVE switch to shut down engine after landing. Applicable maintenance action required prior to next flight.
FADEC DEGRADED (With engine shutdown)	FADEC ECU has recorded a fault during previous flight or a current fault has been detected.	Position throttle to idle; if light extinguishes, fault is from previous flight. Applicable maintenance action required prior to next flight.
FADEC FAULT	PMA and or MGT, NP or NG automatic limiting circuit(s) not functional.	Remain in AUTO mode. Land as soon as practical. Applicable maintenance action required prior to next flight.
FADEC MANUAL	FADEC is operating in MANUAL mode. No automatic governing is available. AUTO RELIGHT light will be illuminated.	Fly helicopter smoothly and nonaggressively. Maintain NR with coordinated throttle and collective movements. Land as soon as practical.
FLOAT ARM	FLOAT ARM switch is ON. Float inflation solenoid is armed.	Normal operation for takeoff and landing over water. FLOAT ARM switch — OFF. If light remains illuminated, FLOATS circuit breaker — Out. Land as soon as practical. **NOTE** With float inflation solenoid armed, flight should not exceed 60 KIAS and 500 feet AGL.
FLOAT TEST (green)	Float system in test mode.	None.

Table 3-2. Caution (amber) and advisory (white/green) lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
FUEL FILTER	Airframe fuel filter in impending bypass.	Land as soon as practical. Clean before next flight.
FUEL LOW	100 ±10 pounds of fuel remain in aft tank.	Verify FUEL QTY. Land as soon as practical.
R/FUEL BOOST	Right fuel boost pump has failed.	If practical, descend below 8000 feet H_P if fuel is Jet A or 4000 feet H_P if fuel is Jet B to prevent fuel starvation if other fuel boost pump fails or has low output pressure. Land as soon as practical. NOTE If either or both fuel boost pumps fail, unusable fuel is unaffected. Corrective action is as per R/FUEL BOOST or L/FUEL BOOST light.
L/FUEL BOOST	Left fuel boost pump has failed.	If practical, descend below 8000 feet H_P if fuel is Jet A or 4000 feet H_P if fuel is Jet B to prevent fuel starvation if other fuel boost pump fails or has low output pressure. Land as soon as practical.
FUEL VALVE	Fuel valve position differs from FUEL VALVE switch indication or FUEL VALVE circuit breaker out.	Check FUEL VALVE circuit breaker in. Land a soon as practical. If on ground, cycle FUEL VALVE switch.
L/FUEL XFR	Left fuel transfer pump has failed.	Land as soon as practical.

Table 3-2. Caution (amber) and advisory (white/green) lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
		CAUTION IF BOTH FUEL TRANSFER PUMPS FAIL, UNUSABLE FUEL MAY BE AS HIGH AS 135 POUNDS DUE TO INABILITY TO TRANSFER FUEL FROM FORWARD CELL. LAND AS SOON AS PRACTICAL.
	NOTE Under normal fuel transfer conditions, helicopters S/N 53000 - 53174 L/FUEL XFR and R/FUEL XFR lights will illuminate for 2 1/2 minutes and then extinguish. This indicates transfer is complete and transfer pumps have been automatically turned off. Helicopters S/N 53175 and subsequent inhibit illumination of the lights.	
R/FUEL XFR	Right fuel transfer pump has failed.	Land as soon as practical.
GEN FAIL	Generator not connected to DC BUSS.	Verify fault with AMPS gage. GEN switch — RESET, then ON. If GEN FAIL light remains illuminated, GEN switch — OFF. Land as soon as practical.
HEATER OVERTEMP	An overtemp condition has been detected by a temperature probe either under pilot seat, copilot seat, or in vertical tunnel.	Turn HEATER switch OFF immediately.

Table 3-2. Caution (amber) and advisory (white/green) lights (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
HYDRAULIC SYSTEM	Hydraulic pressure below limit.	Verify HYD SYS switch position. Accomplish hydraulic system failure procedure (refer to paragraph 3-6).
LITTER DOOR	Litter door not securely latched.	Close door securely before flight. If light illuminates during flight, land as soon as practical.
PEDAL STOP	Pedal Restrictor Control Unit has detected a failure of part of system.	V_{NE} — 60 KIAS. PEDAL STOP emergency release — Pull. Land as soon as practical.
RESTART FAULT (white)	FADEC ECU has detected a fault which will not allow engine to be restarted in AUTO mode.	Remain in AUTO mode. Plan landing site accordingly. Applicable maintenance action required prior to next flight NOTE When throttle is repositioned to idle stop (during engine shutdown) the PMA will go offline and engine may flameout.
START (white)	Start relay is in START mode.	If START switch has not been engaged and there is zero indication on AMPS gage; START relay has malfunctioned and helicopter is on battery power. START circuit breaker — Out. Land as soon as practical.
T/R CHIP	Ferrous particles in tail rotor gearbox oil.	Land as soon as possible.
XMSN CHIP	Ferrous particles in transmission oil.	Land as soon as possible.

Section 4

PERFORMANCE

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LIST OF FIGURES

Section 4

PERFORMANCE

4-1. INTRODUCTION

Performance data presented herein are derived from engine manufacture'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

A Power assurance check chart (Figure 4-1) is provided for Rolls-Royce model 250-C47B engine. This chart indicates maximum allowable MGT for an engine meeting minimum Rolls-Royce specification. Engine must develop required torque without exceeding chart MGT in order to meet performance data contained in this manual.

Figure 4-1 may be used to periodically monitor engine performance.

To perform power assurance check, turn off all sources of bleed air, including ENGINE ANTI-ICING. Establish level flight at an AIRSPEED of 85 to 105 KIAS or V_{NE}, whichever is lower. Check may also be conducted in a hover prior to takeoff, depending on ambient conditions and gross weight.

Record following information from cockpit instruments:

EXAMPLE:

H_P	6000 feet
OAT	10°C
MGT	Actual reading
TORQUE	70%

SOLUTION:

Enter Power assurance check chart at observed TORQUE (70%), proceed vertically down to intersect H_P (6000 feet), follow horizontally to intersect indicated OAT (10°C), then drop vertically to read maximum allowable MGT.

If actual MGT is less than or equal to chart MGT, engine performance equals or exceeds minimum specification and performance data contained in this manual can be achieved.

If actual MGT is greater than chart MGT, engine performance is less than minimum specification and all performance data contained in this manual cannot be achieved. Refer to appropriate maintenance manual to determine cause of low power (high MGT).

NOTE

Chart may also be used to determine minimum specification power for actual MGT. Using above example, enter chart at actual MGT (675°C, proceed up to OAT (10°C), across to H_P (6000 feet), and up to read minimum torque available (70%). If actual power is equal to or greater than chart torque, engine performance equals or exceeds minimum specification and performance data contained in this manual can be achieved. If actual torque indication is less than chart torque, engine performance is less than minimum specification and all performance in this manual cannot be achieved. Refer to appropriate maintenance manual to determine cause of low power.

4-3. DENSITY ALTITUDE

A Density altitude and temperature conversion chart (Figure 4-2) is provided to aid in calculation of performance and limitations. H_D is an expression of density of air in terms of height above sea level; hence, the less dense the air, the higher the H_D. For standard conditions of temperature and pressure, H_D is same as H_P. As temperature increases above standard for an altitude, H_D will also increase to values higher than H_P. Figure 4-2 expresses H_D as a function of H_P and temperature.

Density altitude chart also includes the inverse of the square root of the density ratio ($1/\sqrt{\sigma}$), which is used to calculate true airspeed by the following relation:

$KTAS = KCAS \times 1/\sqrt{\sigma}$

EXAMPLE:

If ambient temperature is -15°C and H_P is 7000 feet, find H_D, $1/\sqrt{\sigma}$, and true airspeed for 100 KCAS.

SOLUTION:

Enter bottom of chart at -15°C.

Move vertically upward to 7000 feet H_P line.

From this point, move horizontally to left and read H_D of 5000 feet, move horizontally to right and read $1/\sqrt{\sigma}$ = 1.08.

True airspeed = KCAS $\times$ $1/\sqrt{\sigma}$ = 100 $\times$ 1.08 = 108 KTAS.

4-4. HEIGHT – VELOCITY ENVELOPE

The Height – Velocity envelope charts (Figures 4-3 and 4-4) define conditions from which a safe landing can be made on a smooth, level, firm surface; following an engine failure. The Height – Velocity diagram (Figure 4-4) is valid only when helicopter gross weight does not exceed limits of the Altitude vs Gross Weight for Height – Velocity diagram (Figure 4-3). Four envelopes (Gross Weight Regions) are specified. Each Gross Weight Region applies for all gross weights within its boundaries. No interpolation is allowed.

For a given ambient outside air temperature, pressure altitude, and gross weight, the appropriate limiting envelope (Region A, B, C, or D) can be determined. Using Figure 4-3 (Altitude VS Gross Weight), move upward vertically from entry OAT to pressure altitude. From that point, move right horizontally to determine the correct weight region. (Examples: 15°C at Sea Level at 5000 pounds GW = Region B, and 30°C at 2000 feet pressure altitude at 5000 pounds GW = Region D) Once the correct weight region has been determined (A, B, C, or D), the corresponding Avoid area is selected from Figure 4-4 (Height – Velocity diagram).

4-5. HOVER CEILING

NOTE

Hover performance charts are based on 100% ROTOR RPM.

Satisfactory stability and control have been demonstrated in each area of the Hover ceiling charts with winds as depicted on the Hover ceiling wind accountability chart (Figures 4-5, 4-5A and 4-5B).

Hover ceiling – in ground effect charts (Figure 4-6) and Hover ceiling – out of ground effect charts (Figure 4-7) present hover performance as allowable gross weight for conditions of H_P and OAT. These hovering weights are obtainable in zero wind conditions. Each chart is divided into two areas: Area A (non shaded area) and Area B (shaded area).

For the data presented below 14,000 ft H_D, Area A of the hover ceiling charts presents hover performance (relative to GW) for conditions where adequate control margins exist for all relative wind conditions up to 35 knots for lateral CG not exceeding ±2.5 inches (±63 mm); and up to 17 knots, for lateral CG not exceeding ±4.0 inches (±102 mm); for hover, takeoff and landing. Area B of the hover ceiling charts presents hover performance (relative to GW) for conditions where adequate control margins exist for relative winds within ±45° of the nose of helicopter up to 35 knots for lateral CG not exceeding ±2.5 inches (±63 mm), and up to 17 knots for lateral CG not exceeding ±4.0 inches (±102 mm); for hover, takeoff and landing.

For data presented between 14,000 and 17,000 ft H_D, Area A of the hover ceiling charts presents hover performance (relative to GW) for conditions where adequate control margins exist for all relative wind conditions up to 20 knots for lateral CG not exceeding ±2.5 inches (±63 mm); for hover, takeoff and landing. Area B of the hover ceiling charts presents recommended azimuth for takeoff and landing for all relative winds within ±30° of nose of helicopter for lateral CG not exceeding ±2.5 inches (±63 mm).

For data presented above 17,000 ft H_D, there is no Area A. Area B presents hover performance (relative to GW) for conditions where adequate control margins exist for all relative winds within ±30° of the nose of the helicopter for lateral CG not exceeding ±2.5 inches (±63 mm); for hover, takeoff and landing

The following example uses a Hover ceiling chart at takeoff power. The example is typical for use with all other Hover ceiling charts.

EXAMPLE:

What IGE GW hover capability could be expected for the following conditions:

A. HEATER and ANTI ICE – OFF
B. H_P – 6000 feet
C. OAT – +20°C
D. TAKE OFF POWER

SOLUTION:

Use Hover ceiling IGE – takeoff power chart (sheet 1 of Figure 4-6).

A. Enter OAT scale at +20 °C.
B. Move upward to 6000 feet H_P curve.
C. Move horizontally to +20 °C curve.
D. Drop down to read maximum external gross weight of 5400 pounds (IGE hover capability exceeds maximum internal GW of 5000 pounds).

4-6. NOT USED

4-7. CLIMB AND DESCENT

4-7-A. CLIMB

Rate of climb charts are presented for various combinations of power settings and ENGINE ANTI-ICING switch positions. Refer to Figures 4-8 and 4-9.

Recommended best rate of climb airspeed is 60 KIAS.

Reduce rate of climb data 100 feet per minute when operating with any combination of door(s) removed.

The following example uses a Rate of climb chart at takeoff power. The example is typical for use with all other Rate of climb charts.

EXAMPLE:

Find the maximum rate of climb that can be attained using takeoff power under the following conditions:

HEATER	OFF
ENGINE ANTI-ICING	OFF
OAT	10°C
H_P	14,000 feet
GW	3500 pounds

SOLUTION:

Enter appropriate gross weight chart (sheet 3 of Figure 4-8). At H_P scale of 14000 feet proceed horizontally to temperature of 10°C. Drop down vertically and read a rate of climb of 1700 feet per minute.

4-7-B. AUTOROTATION

Refer to Figure 4-10 for autorotational glide distance as a function of altitude.

4-8. AIRSPEED CALIBRATION

Refer to Figure 4-11 for airspeed installation correction during level flight and climb.

4-9. NOT USED

4-10. NOISE LEVELS

4-10-A. FAR PART 36 STAGE 2 NOISE LEVEL

This aircraft is certified as a Stage 2 helicopter as prescribed in FAR Part 36, Subpart H, for gross weights up to and including the certificated maximum takeoff and landing weight of 5000 pounds (2268 kilograms). There are no operating limitations to meet any of the noise requirements.

The following noise level complies with FAR Part 36, Appendix J, Stage 2 noise level requirements. It was obtained by analysis of approved data from noise tests conducted under the provisions of FAR Part 36, Amendment 36-20.

The certified flyover noise level for the Model 407 is 85.1 dBA SEL.

NOTE

No determination has been made by the certifying authorities that the noise levels of this aircraft are or should be acceptable or unacceptable for operations at, into, or out of any airport.

V_H is defined as the airspeed in level flight obtained using the minimum specification engine torque corresponding to maximum continuous power available for sea level, 25°C (77°F) ambient conditions at the relevant maximum certificated weight. The value of V_H thus defined for this aircraft is 127 KTAS.

4-10-B. CANADIAN AIRWORTHINESS MANUAL CHAPTER 516 AND ICAO ANNEX 16 NOISE LEVEL

This aircraft complies with the noise emission standards applicable to the aircraft as set out by the International Civil Aviation Organization (ICAO) in Annex 16, Volume 1, Chapter 11, for gross weights up to and including the certificated maximum takeoff and landing weight of 5000 pounds (2268 kilograms). There are no operating limitations to meet any of the noise requirements.

The following noise level complies with ICAO Annex 16, Volume 1, Chapter 11 noise level requirements. It was obtained by analysis of approved data from noise tests conducted under the provisions of ICAO Annex 16, Volume 1, Third Edition-1993.

The flyover noise level for the Model 407 is 84.6 dBA SEL.

NOTE

ICAO Annex 16, Volume 1, Chapter 11 approval is applicable only after endorsement by the Civil Aviation Authority of the country of aircraft registration.

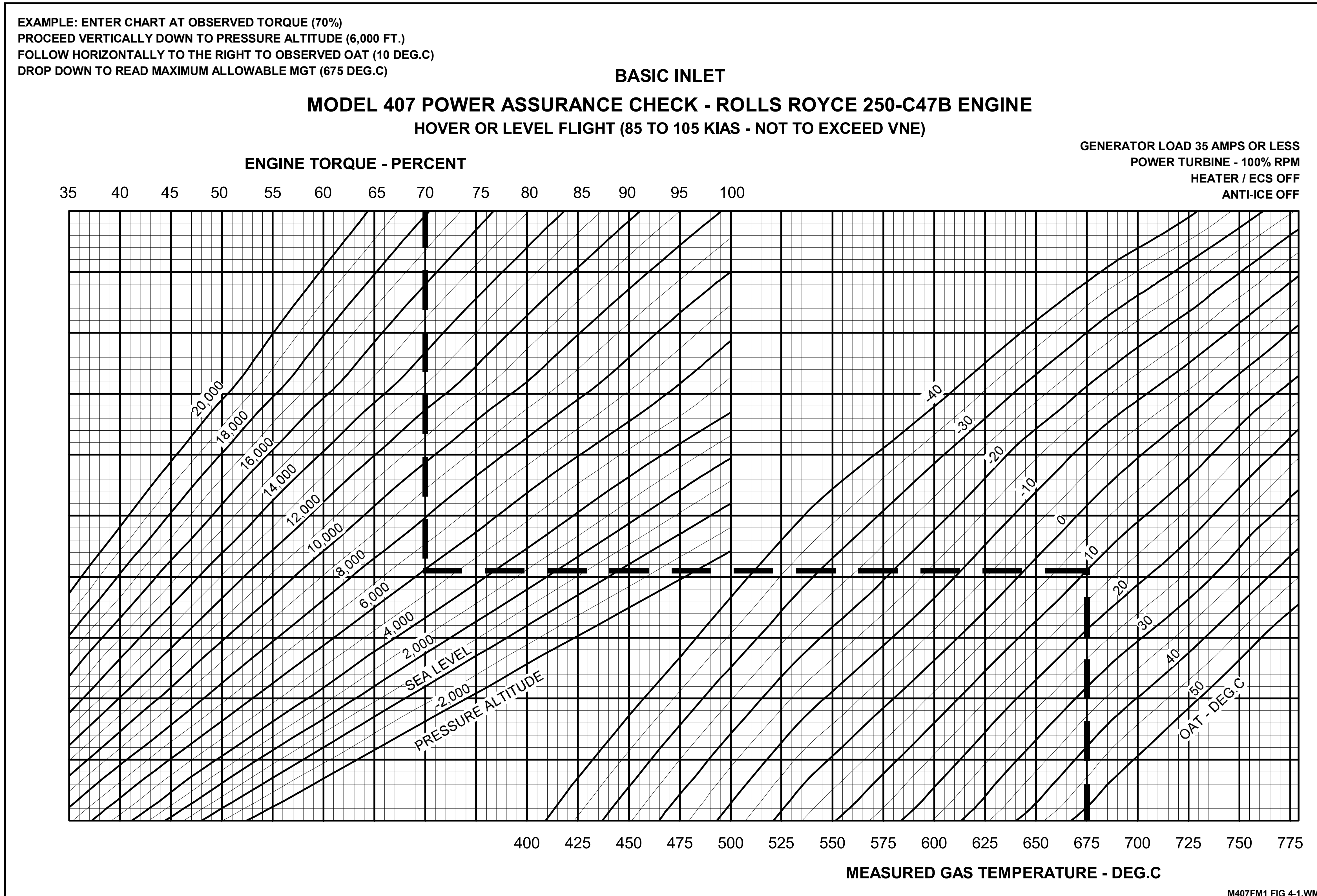


Figure 4-1. Power assurance check

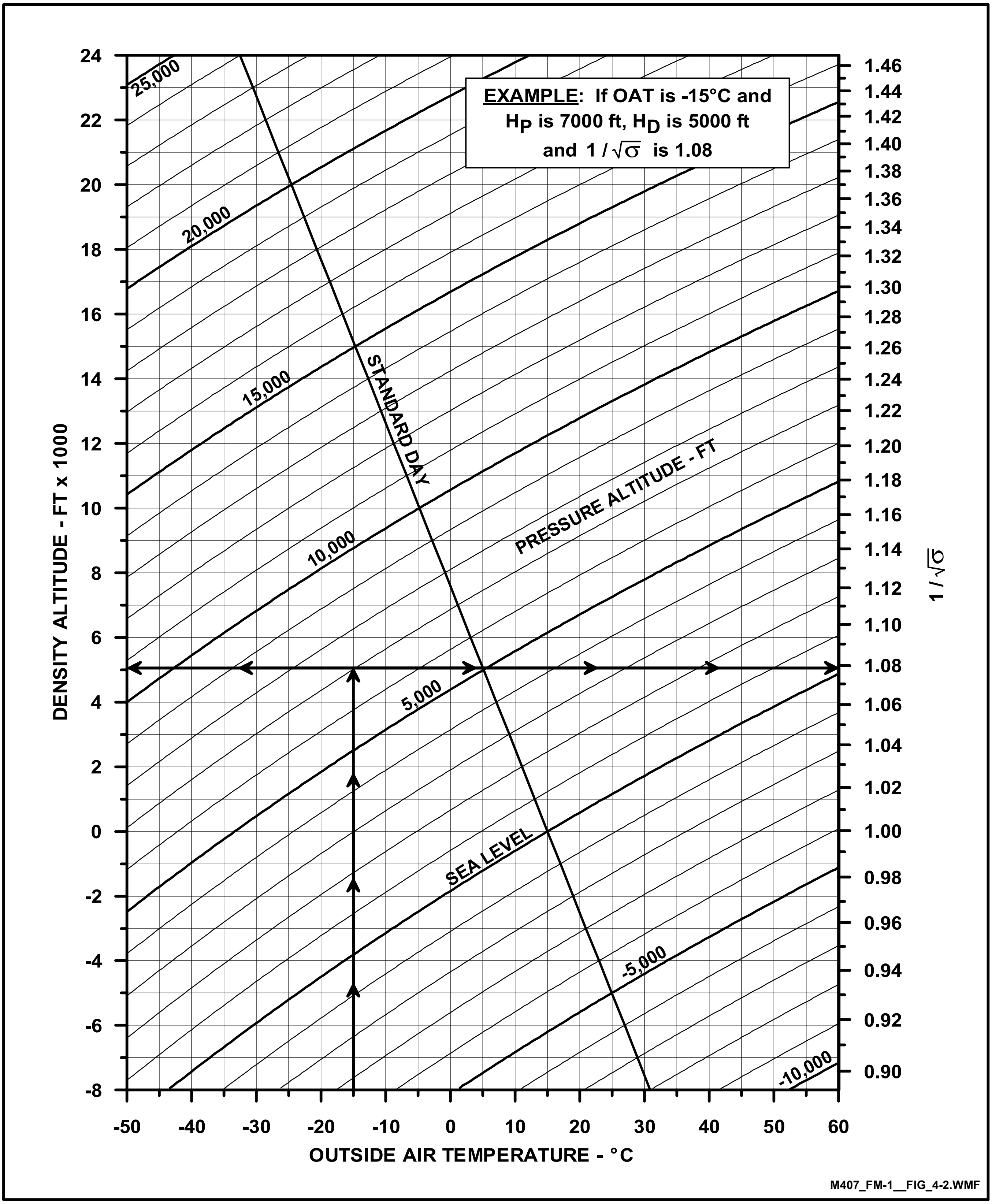


Figure 4-2. Density altitude

ALTITUDE VS GROSS WEIGHT
FOR HEIGHT-VELOCITY DIAGRAM

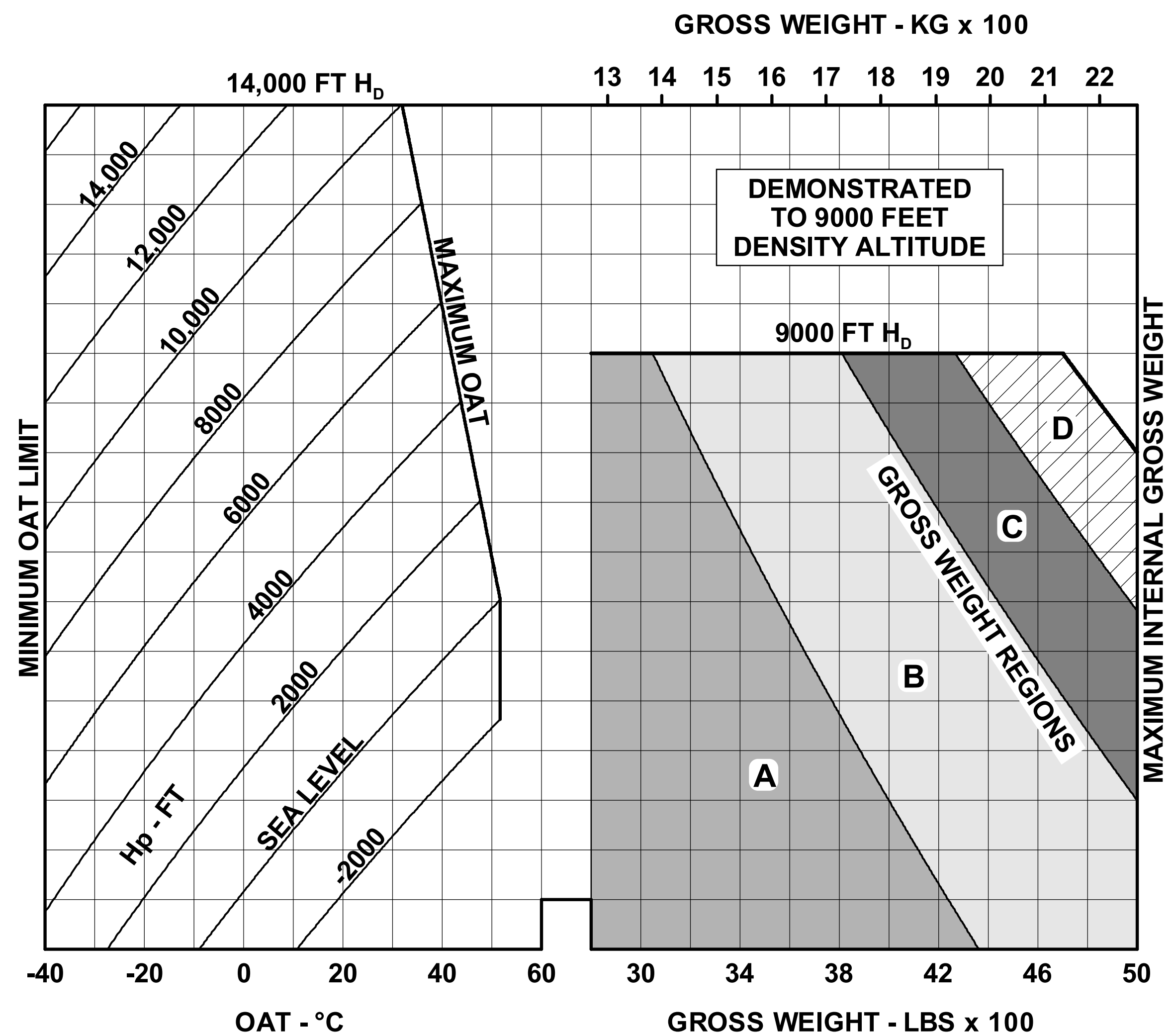


Figure 4-3. Altitude vs gross weight for height – velocity diagram

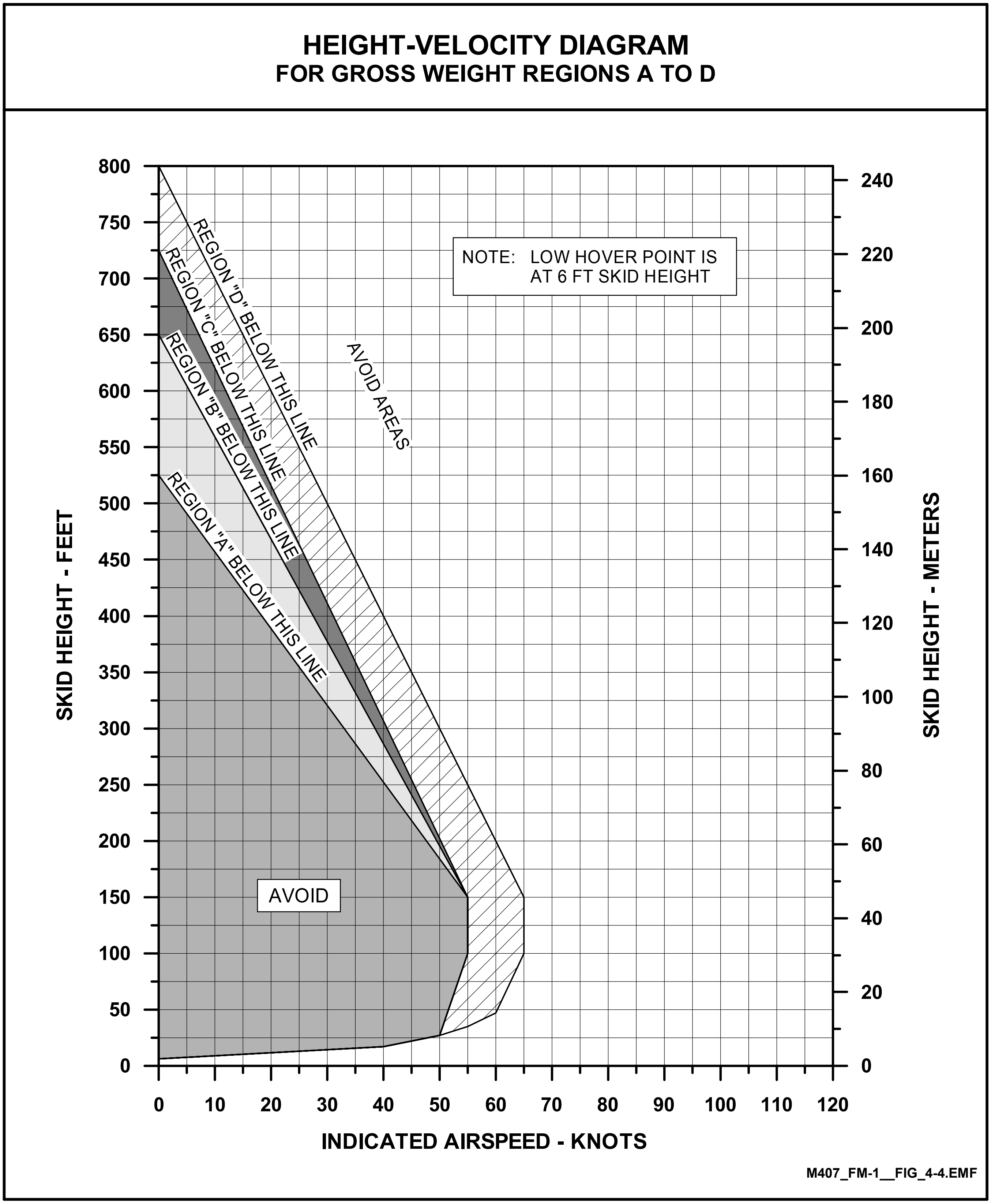
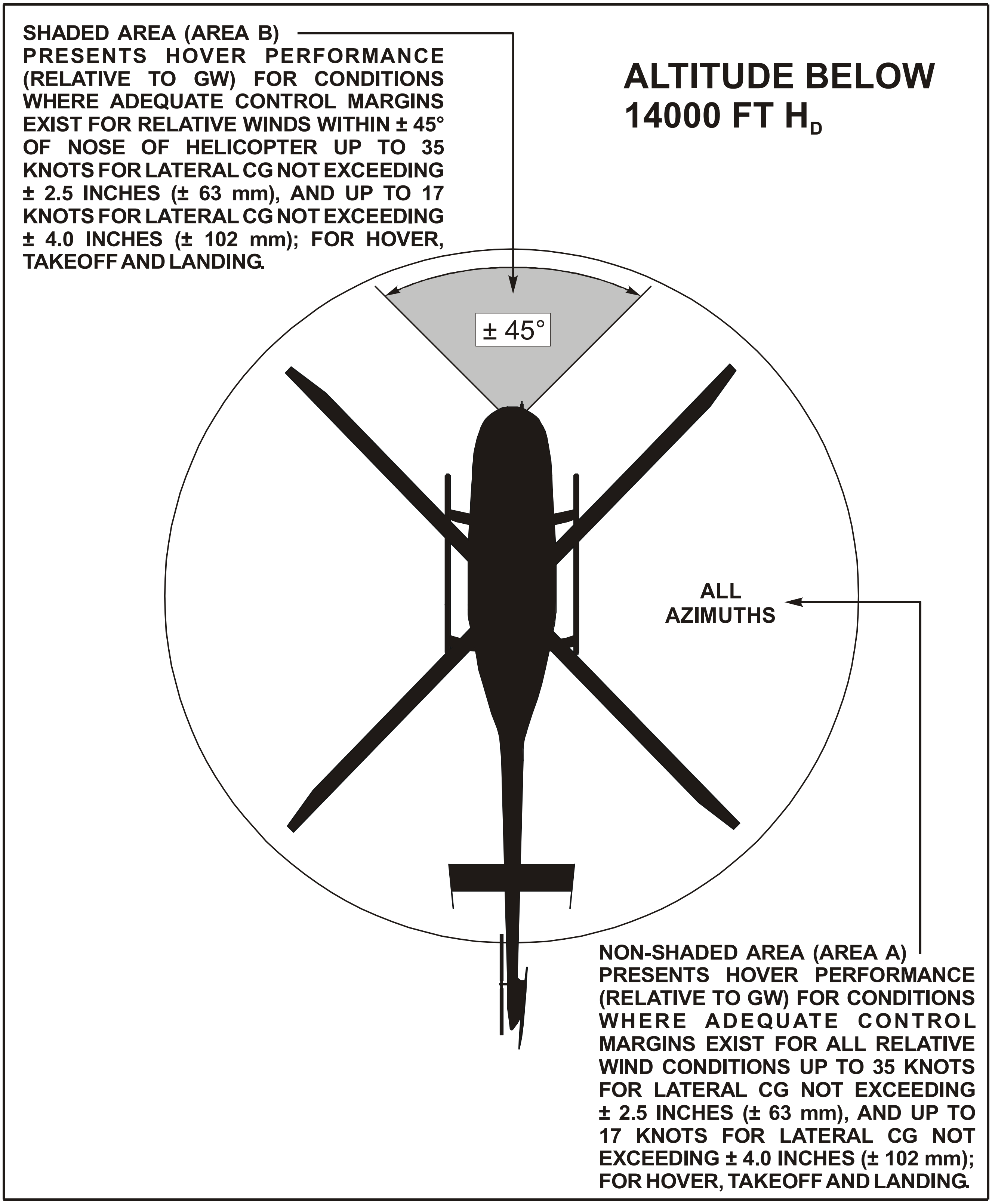


Figure 4-4. Height – velocity diagram



M407_FM-1_FIG_4-5.WMF

Figure 4-5. Hover ceiling wind accountability chart – below 14,000 feet H_D

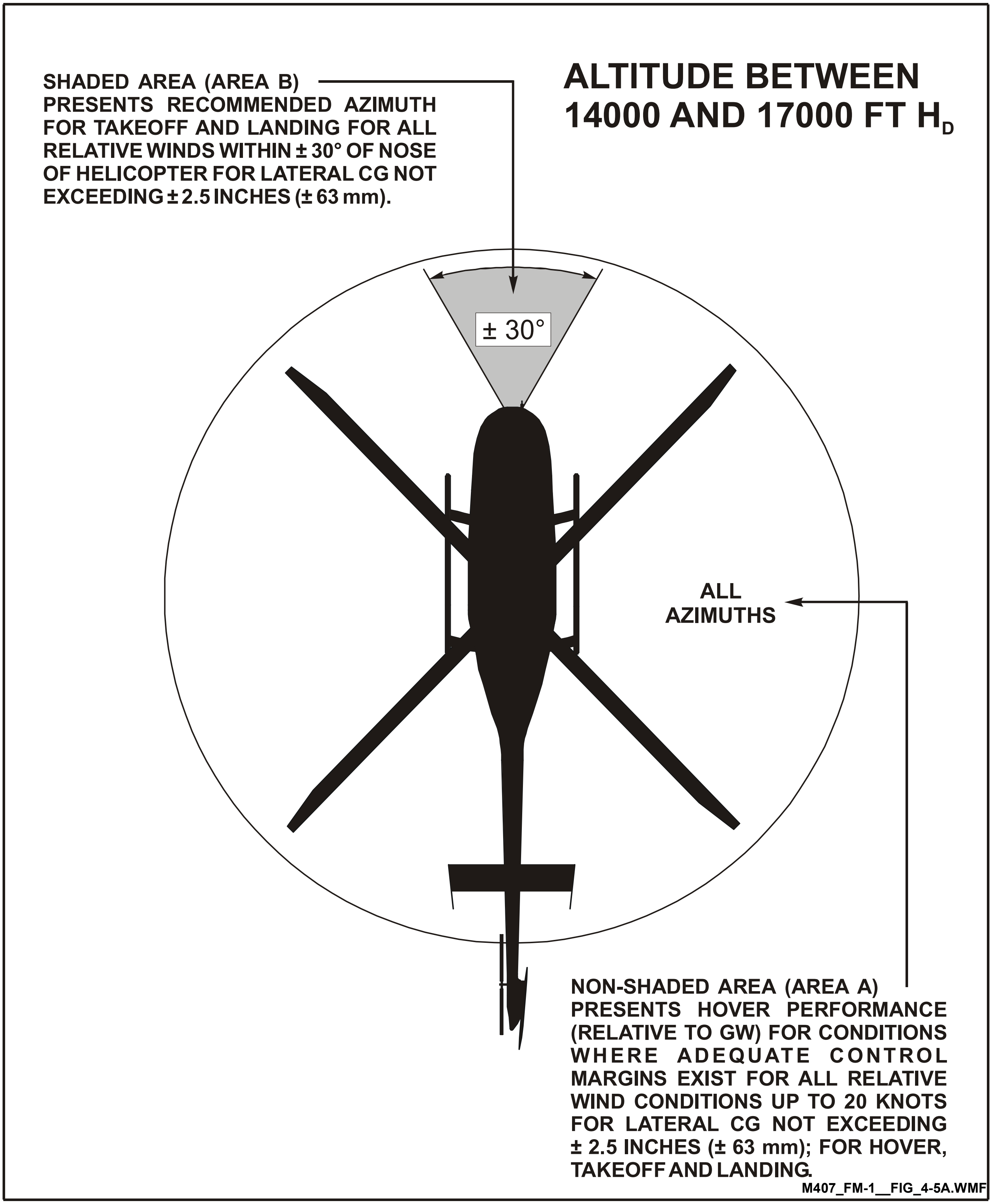


Figure 4-5A. Hover ceiling wind accountability chart – between 14,000 and 17,000 feet H_D

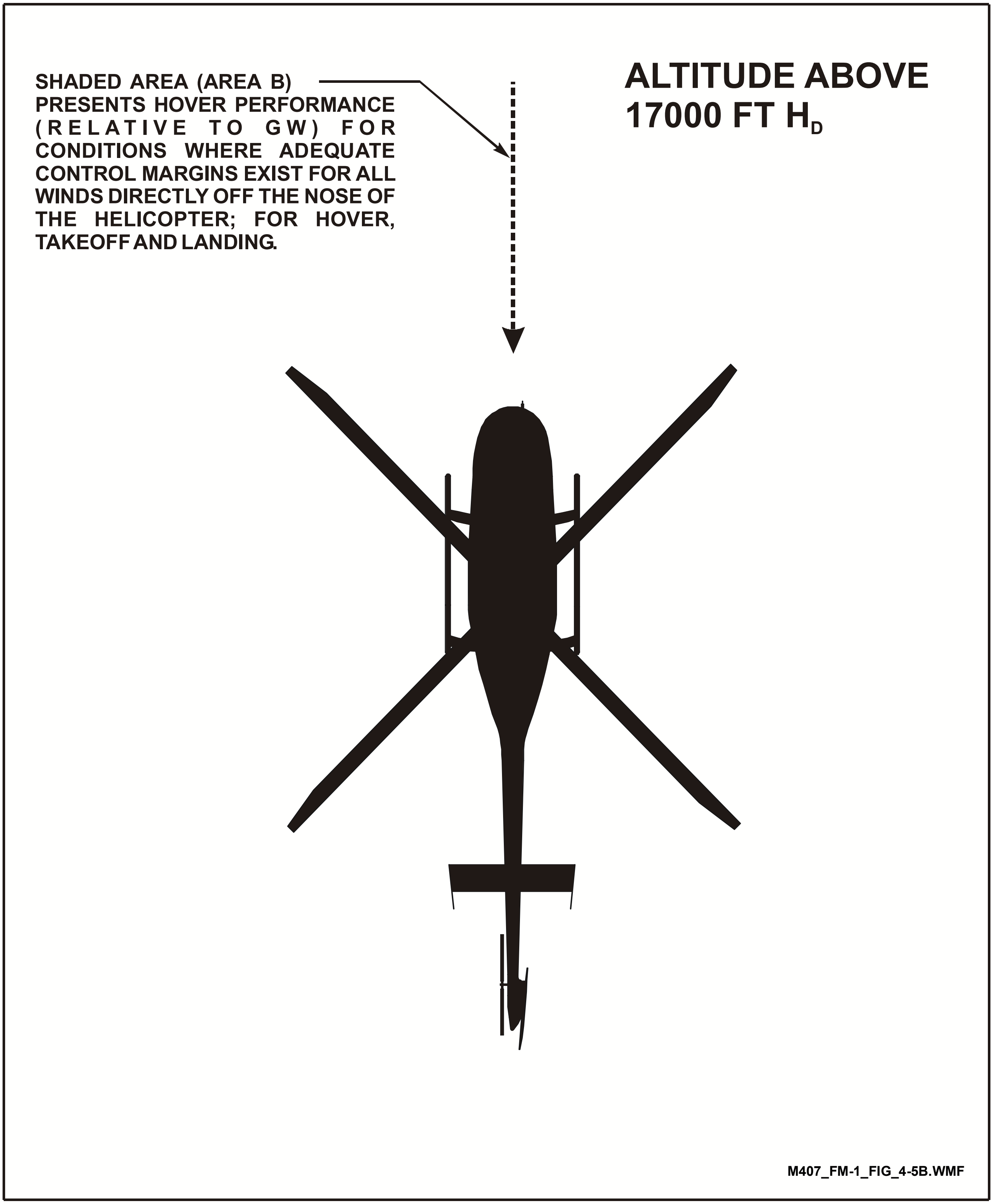


Figure 4-5B. Hover ceiling wind accountability chart – above 17,000 feet H_D

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

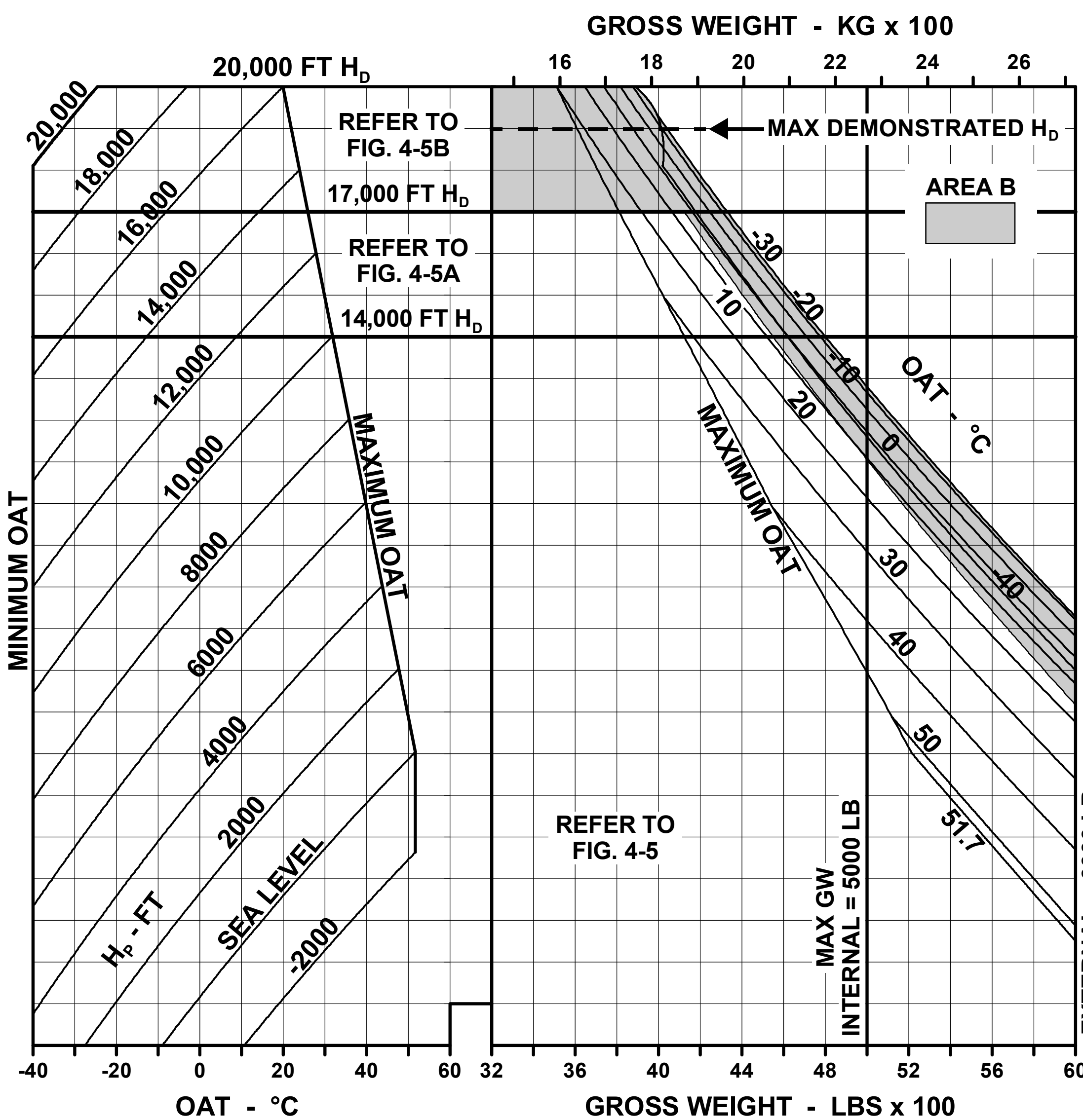


Figure 4-6. Hover ceiling IGE (sheet 1 of 8)

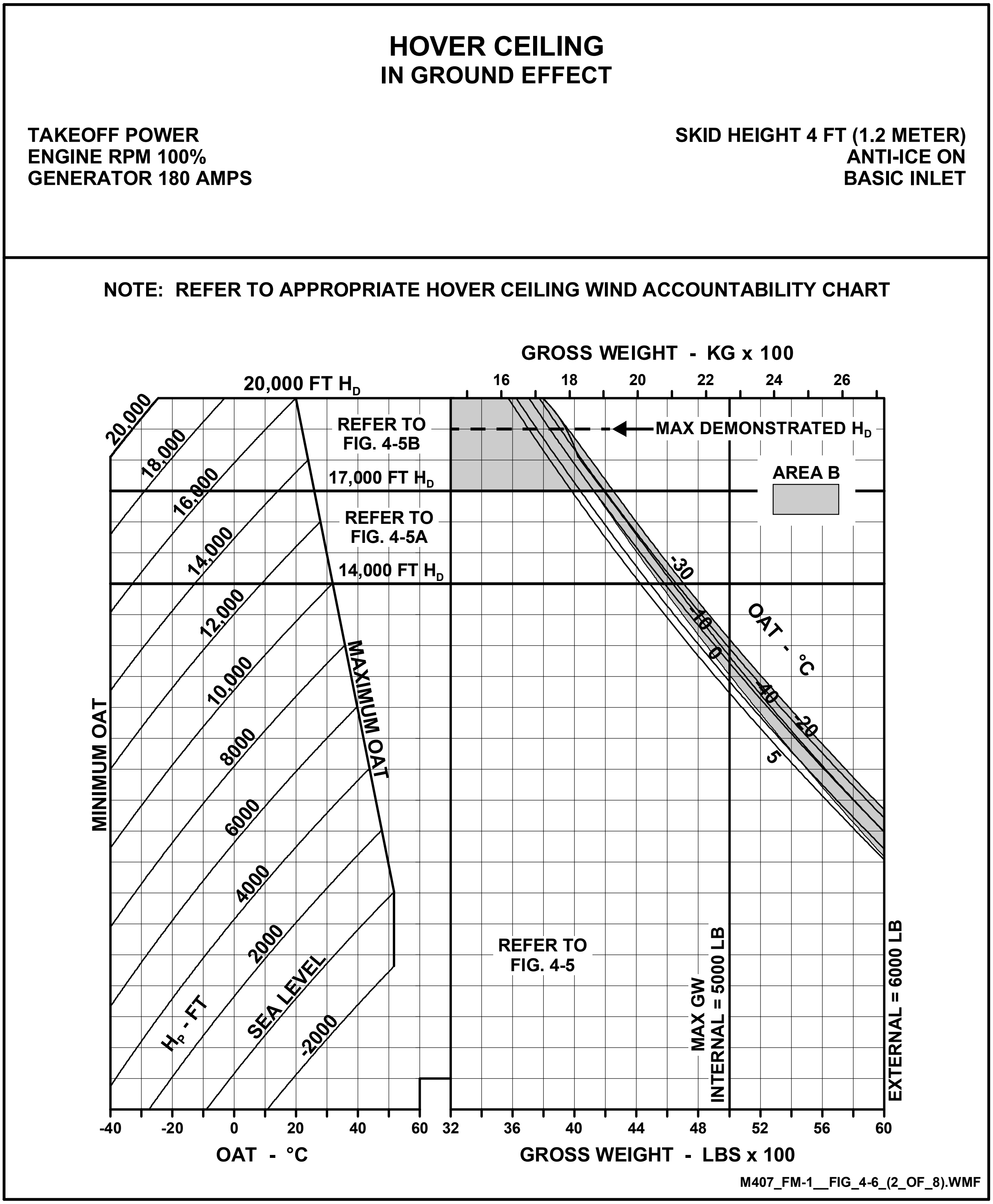


Figure 4-6. Hover ceiling IGE (sheet 2 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

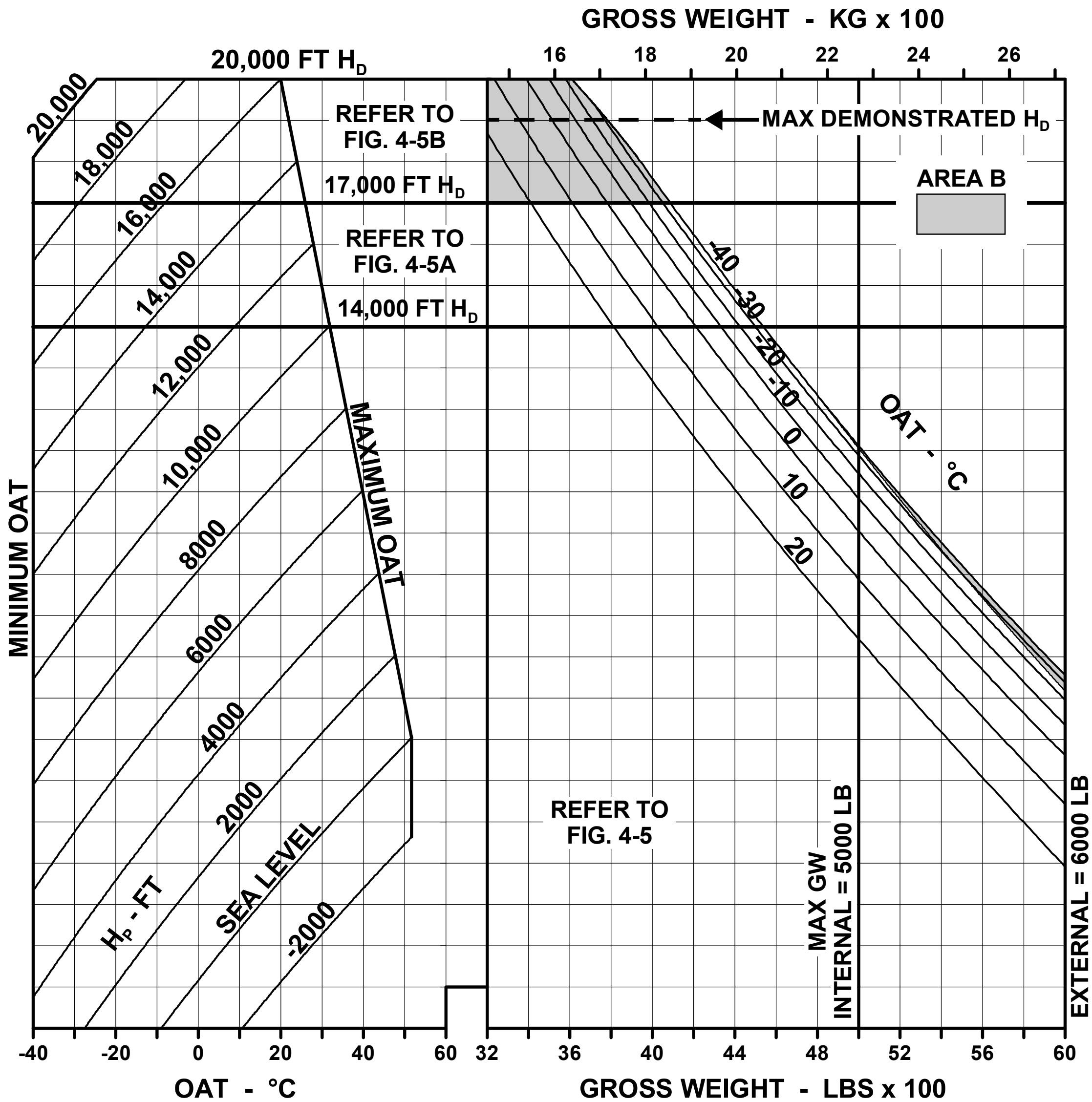


Figure 4-6. Hover ceiling IGE (sheet 3 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

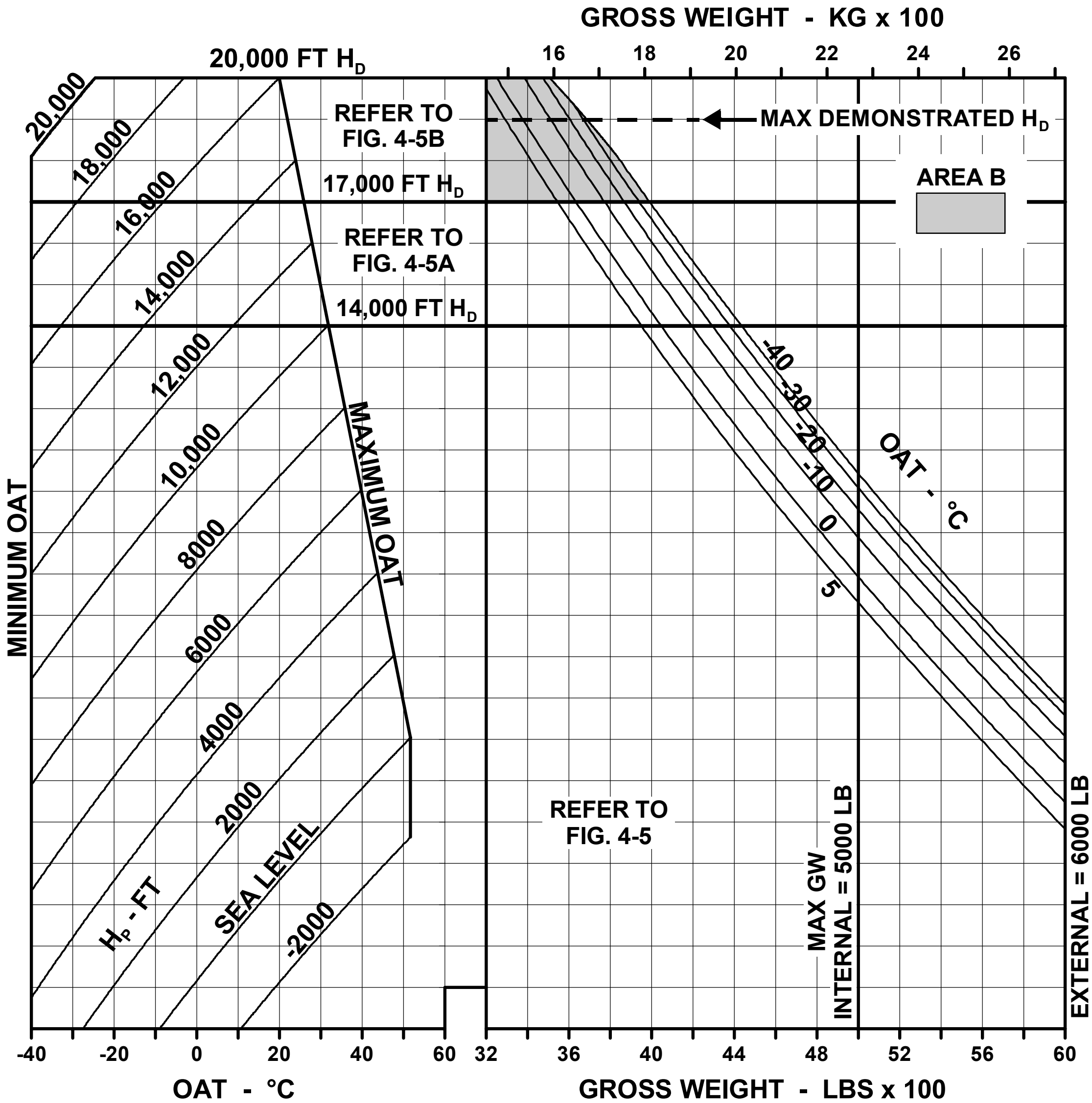


Figure 4-6. Hover ceiling IGE (sheet 4 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

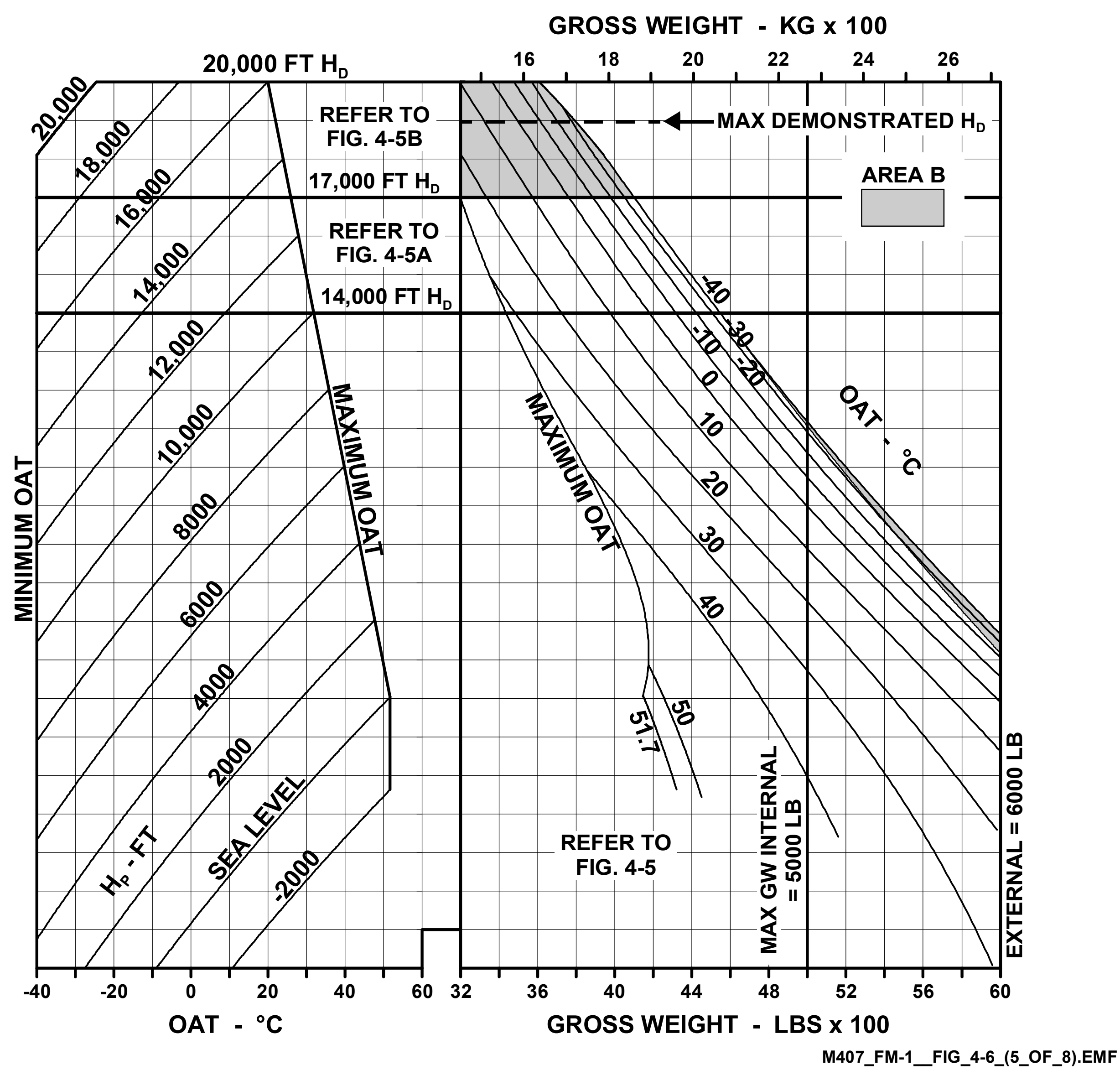


Figure 4-6. Hover ceiling IGE (sheet 5 of 8)

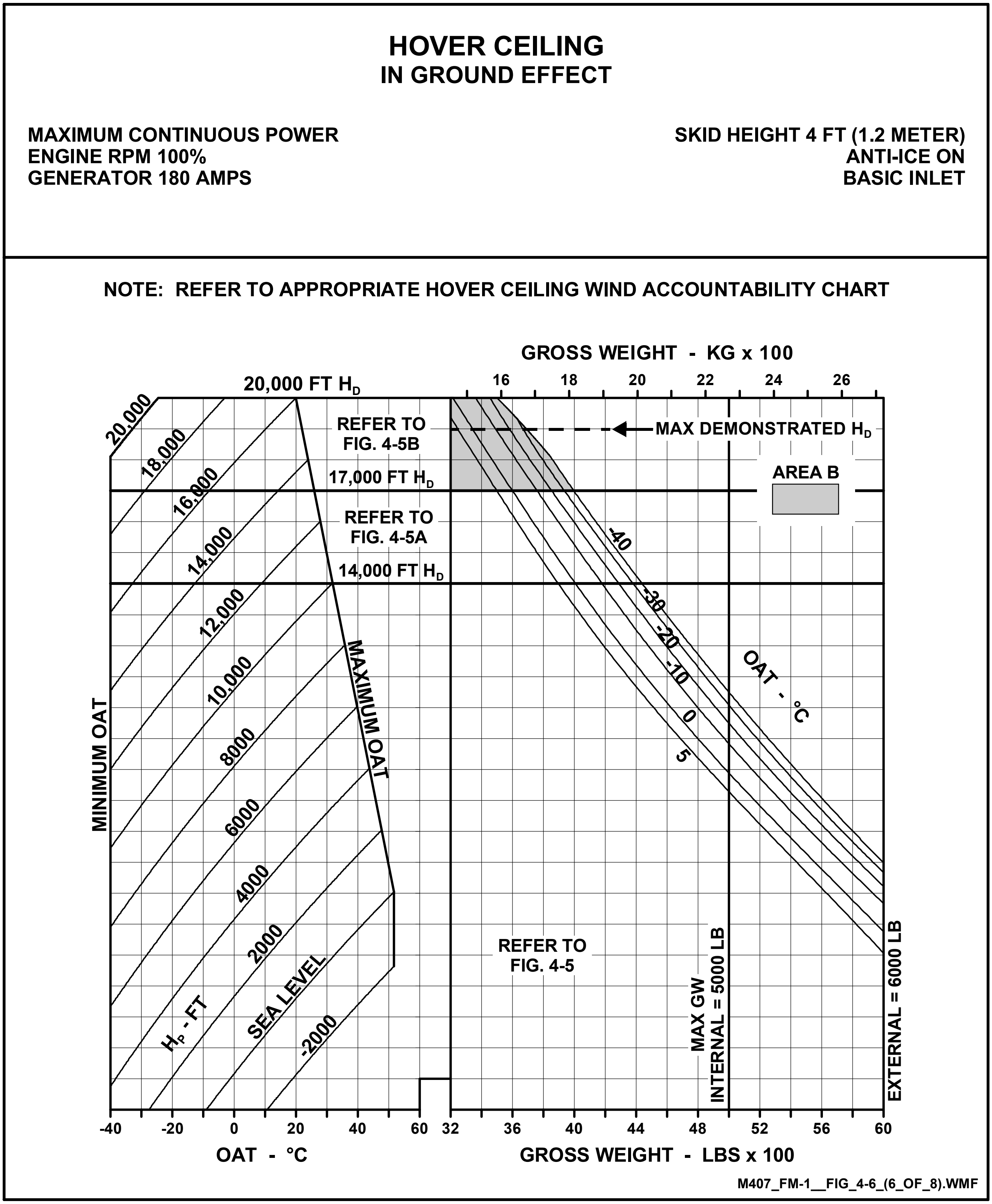


Figure 4-6. Hover ceiling IGE (sheet 6 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

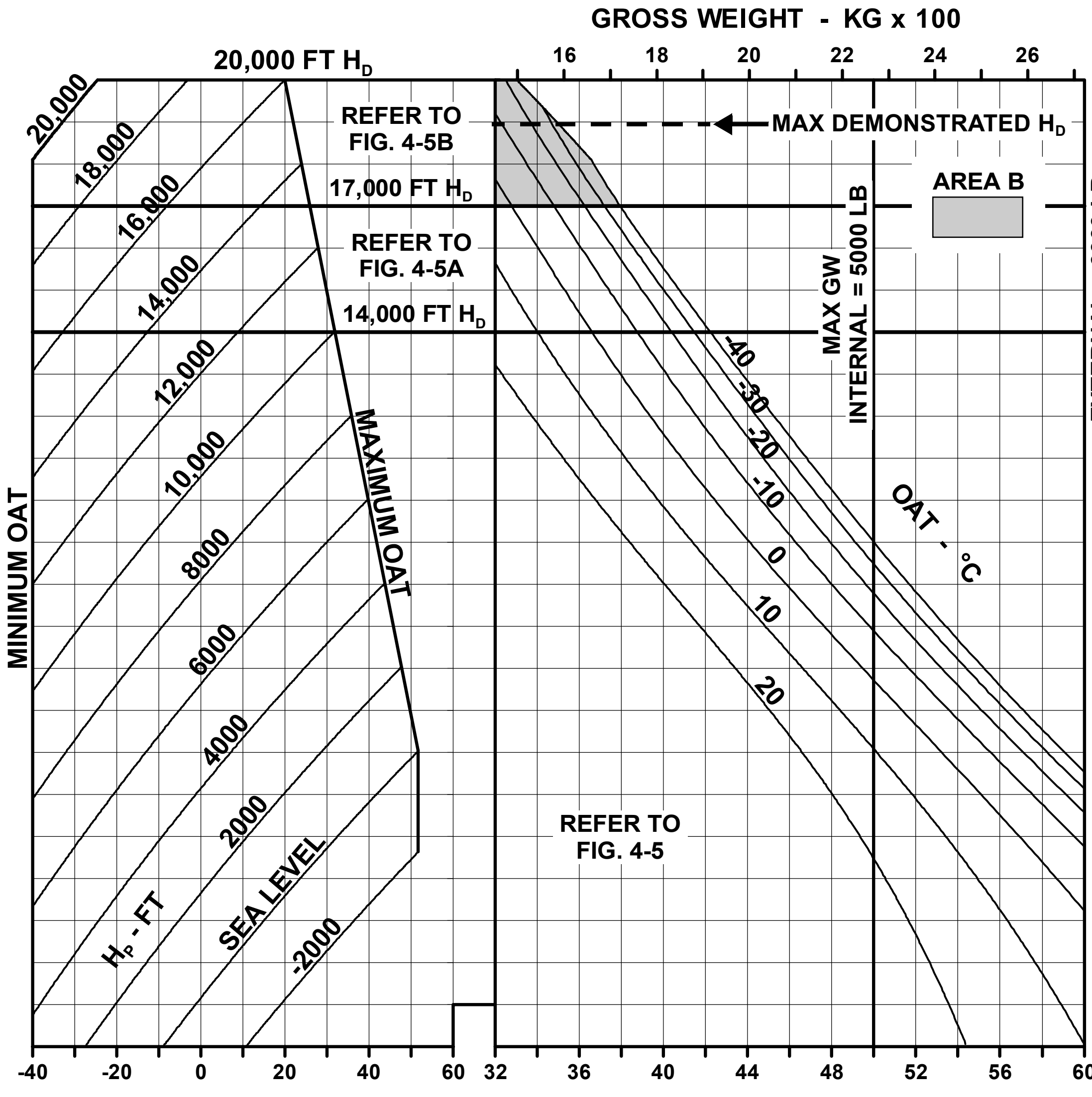


Figure 4-6. Hover ceiling IGE (sheet 7 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

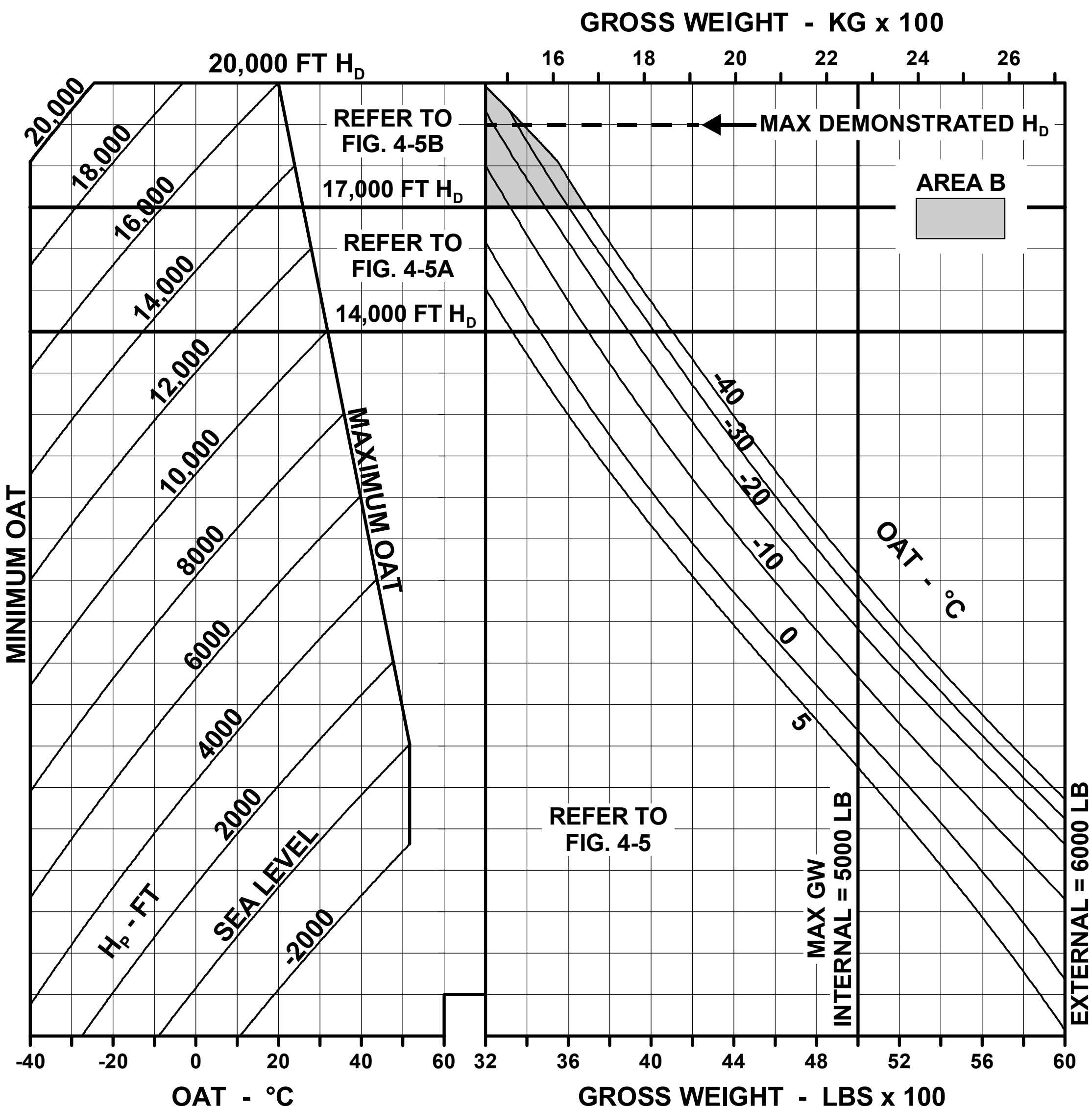


Figure 4-6. Hover ceiling IGE (sheet 8 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

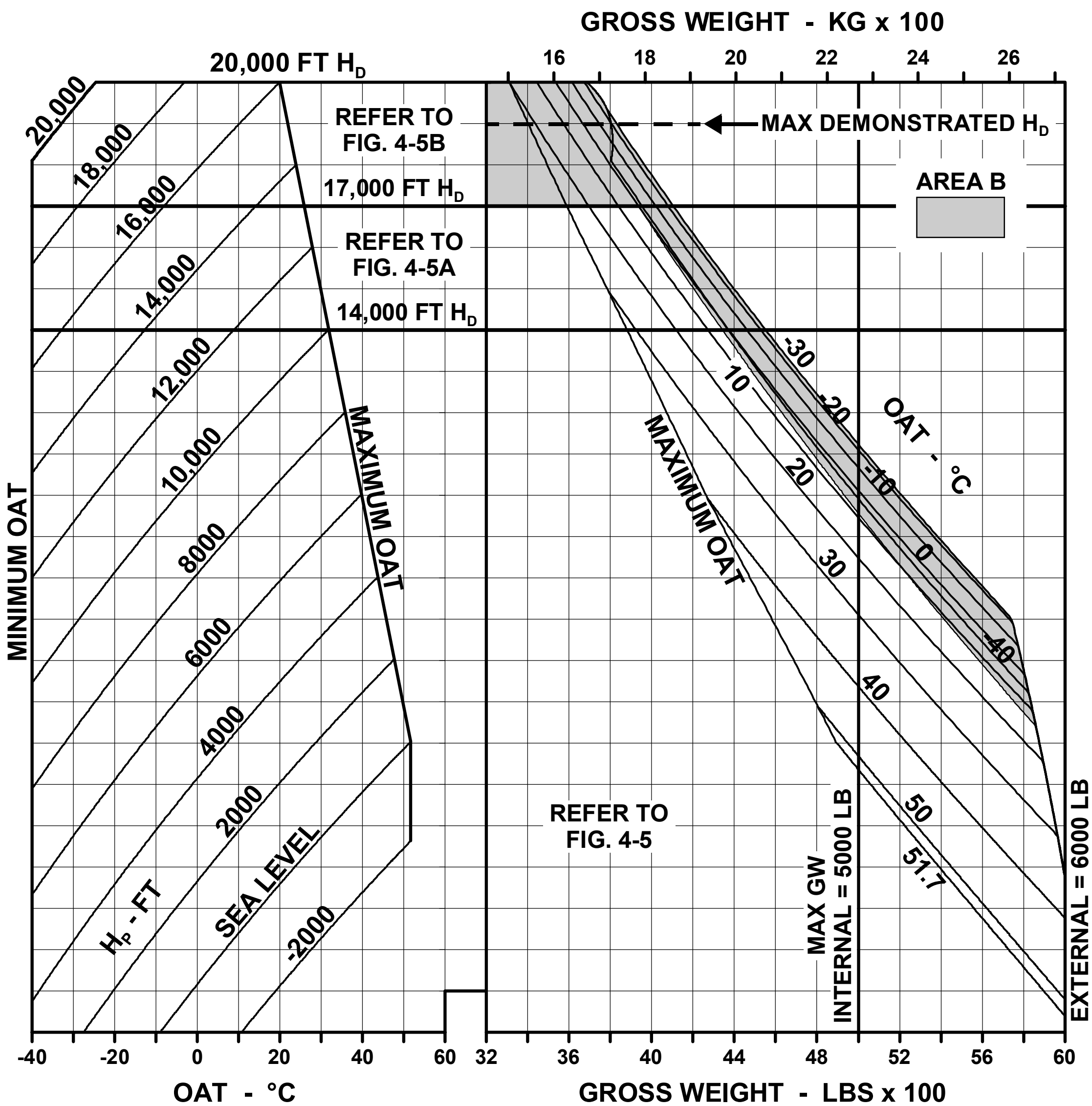


Figure 4-7. Hover ceiling OGE (sheet 1 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

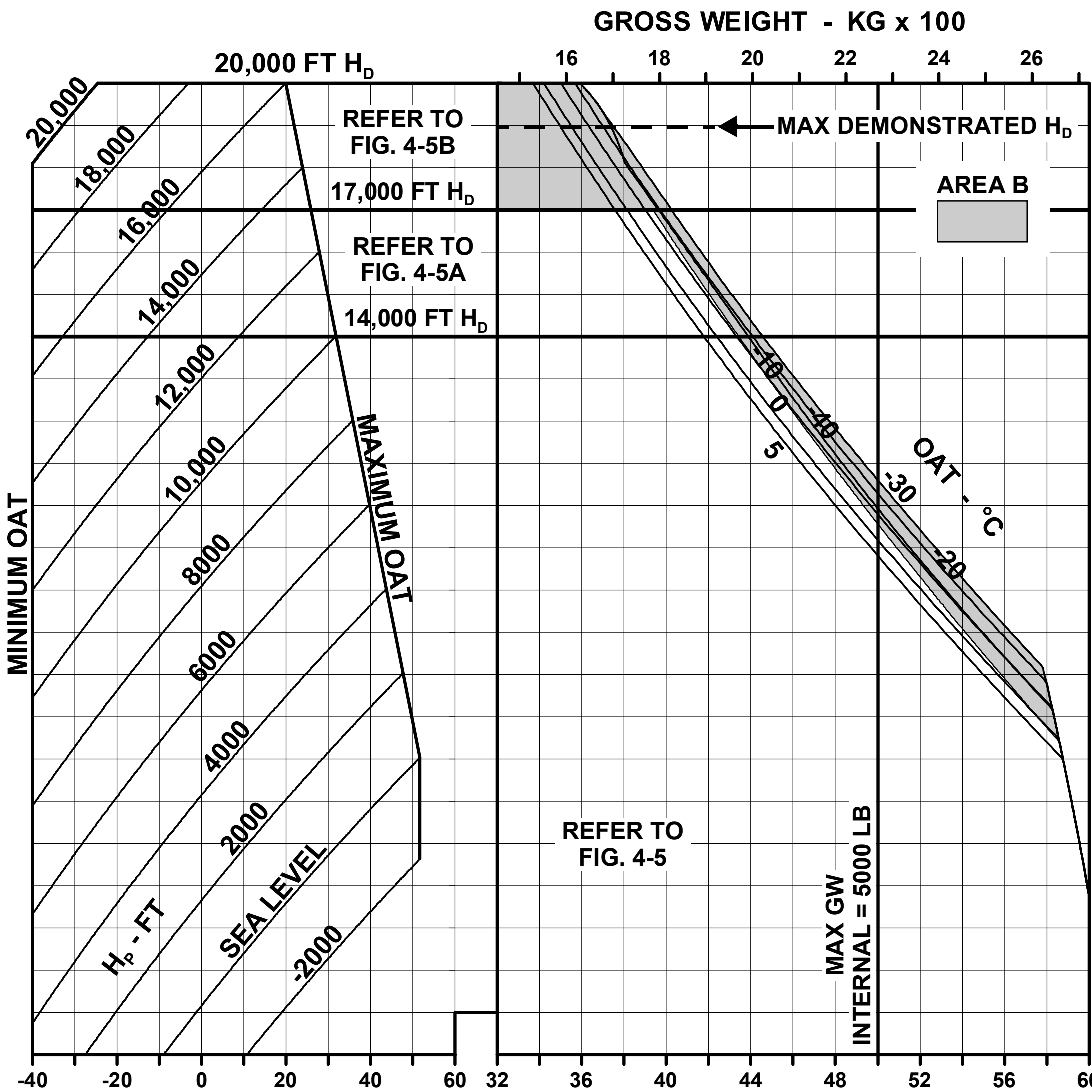


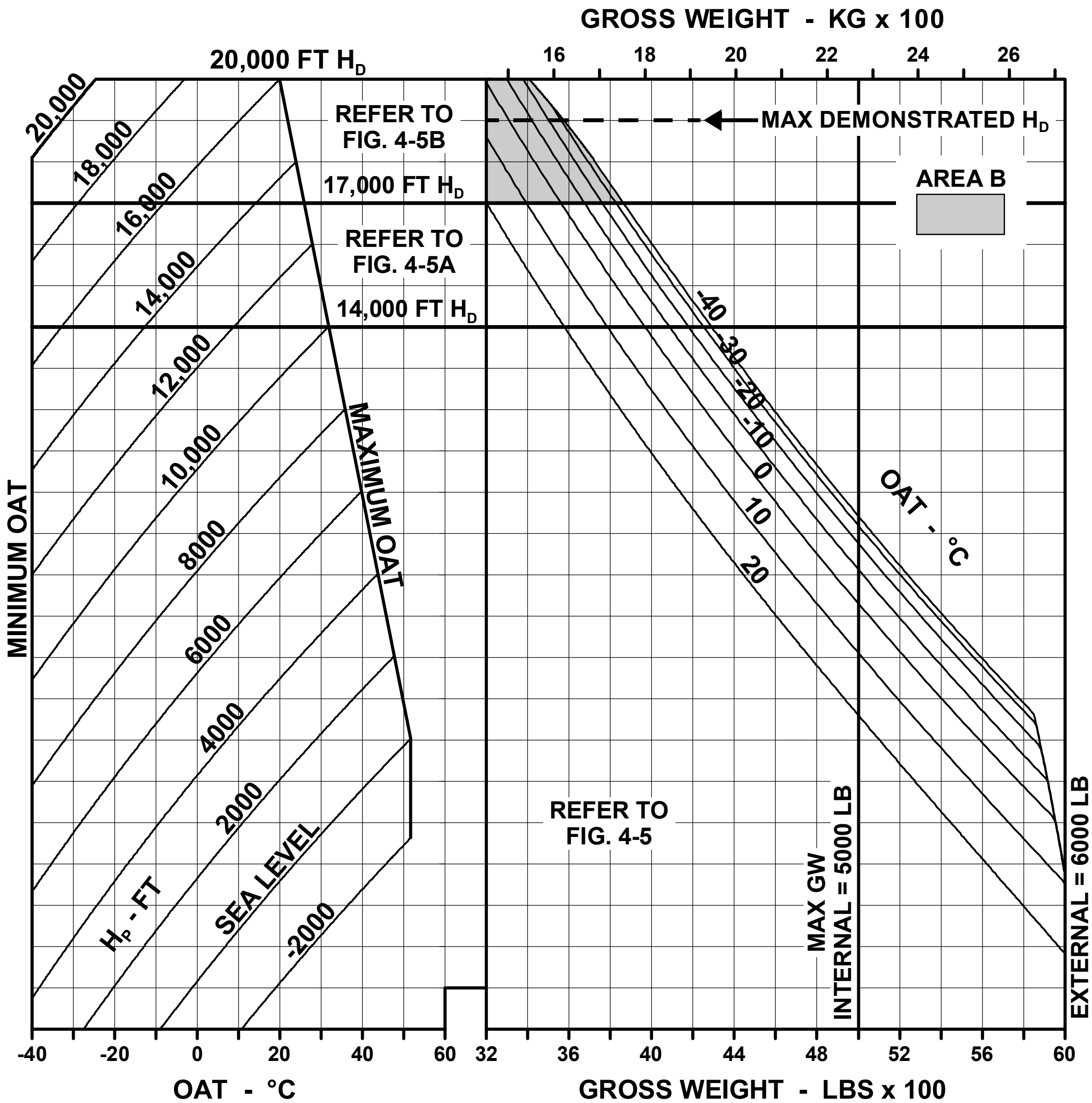
Figure 4-7. Hover ceiling OGE (sheet 2 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART



M407_FM-1__FIG_4-7_(3_OF_8).WMF

Figure 4-7. Hover ceiling OGE (sheet 3 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

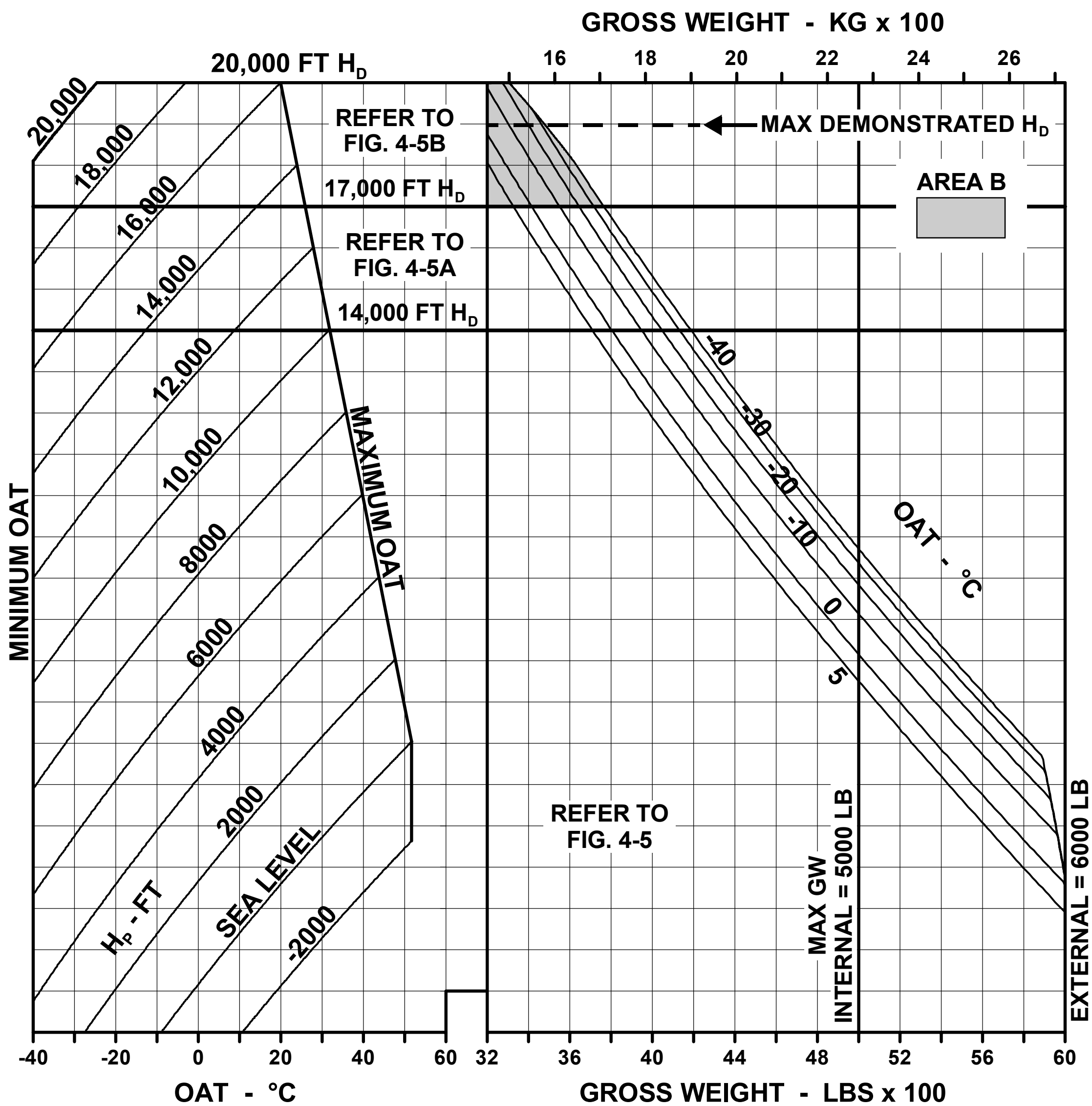


Figure 4-7. Hover ceiling OGE (sheet 4 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

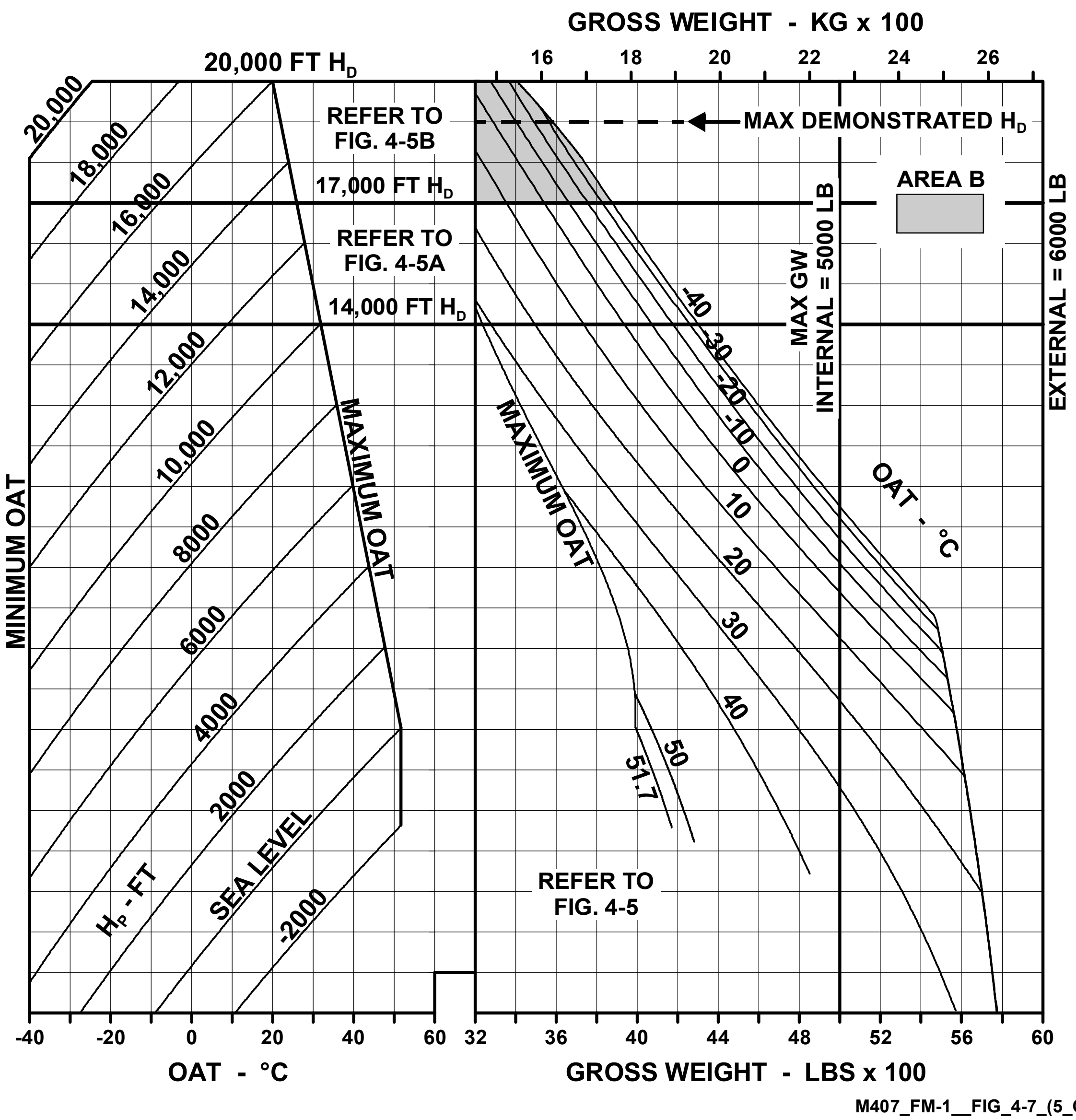


Figure 4-7. Hover ceiling OGE (sheet 5 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

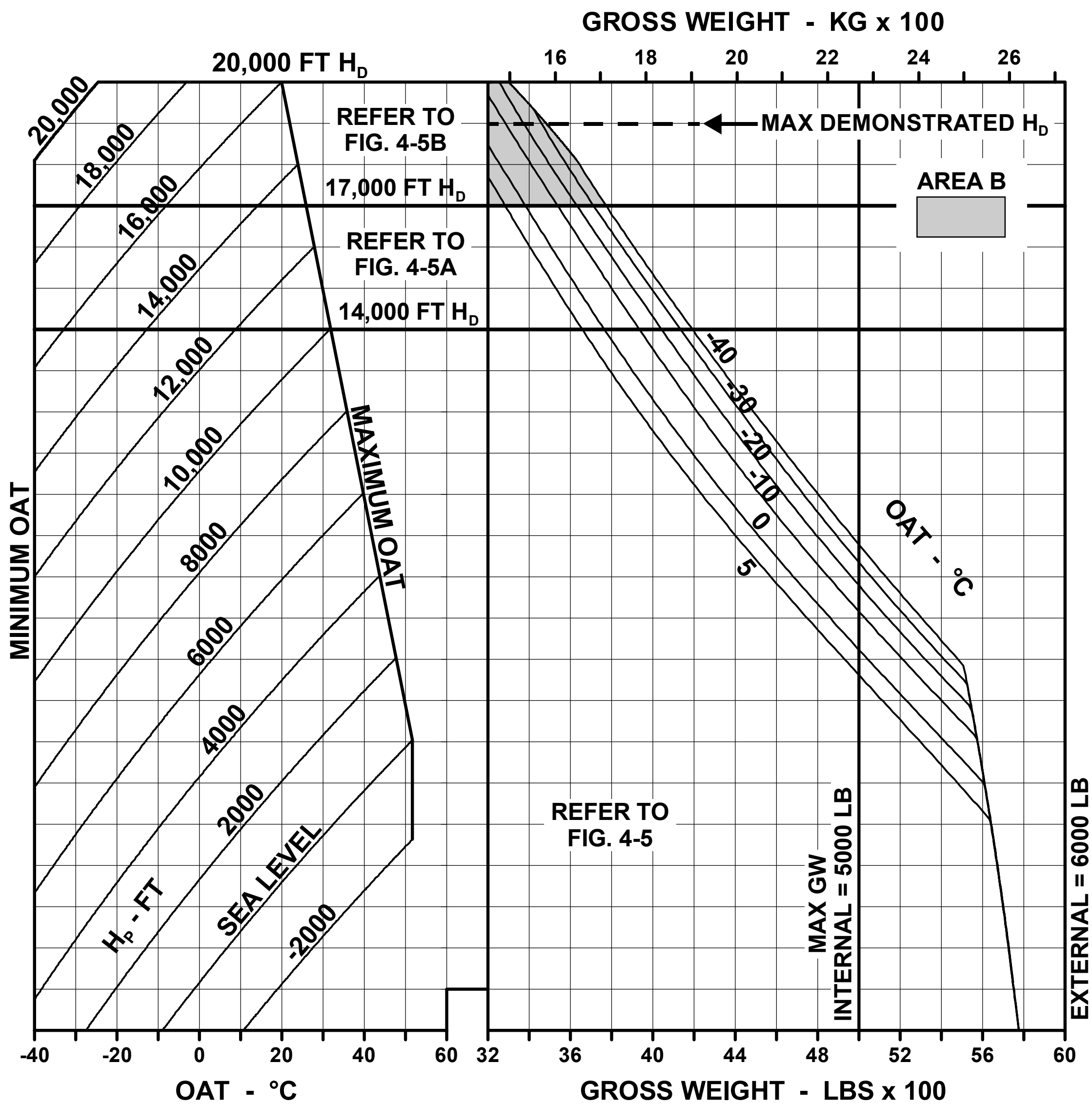


Figure 4-7. Hover ceiling OGE (sheet 6 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

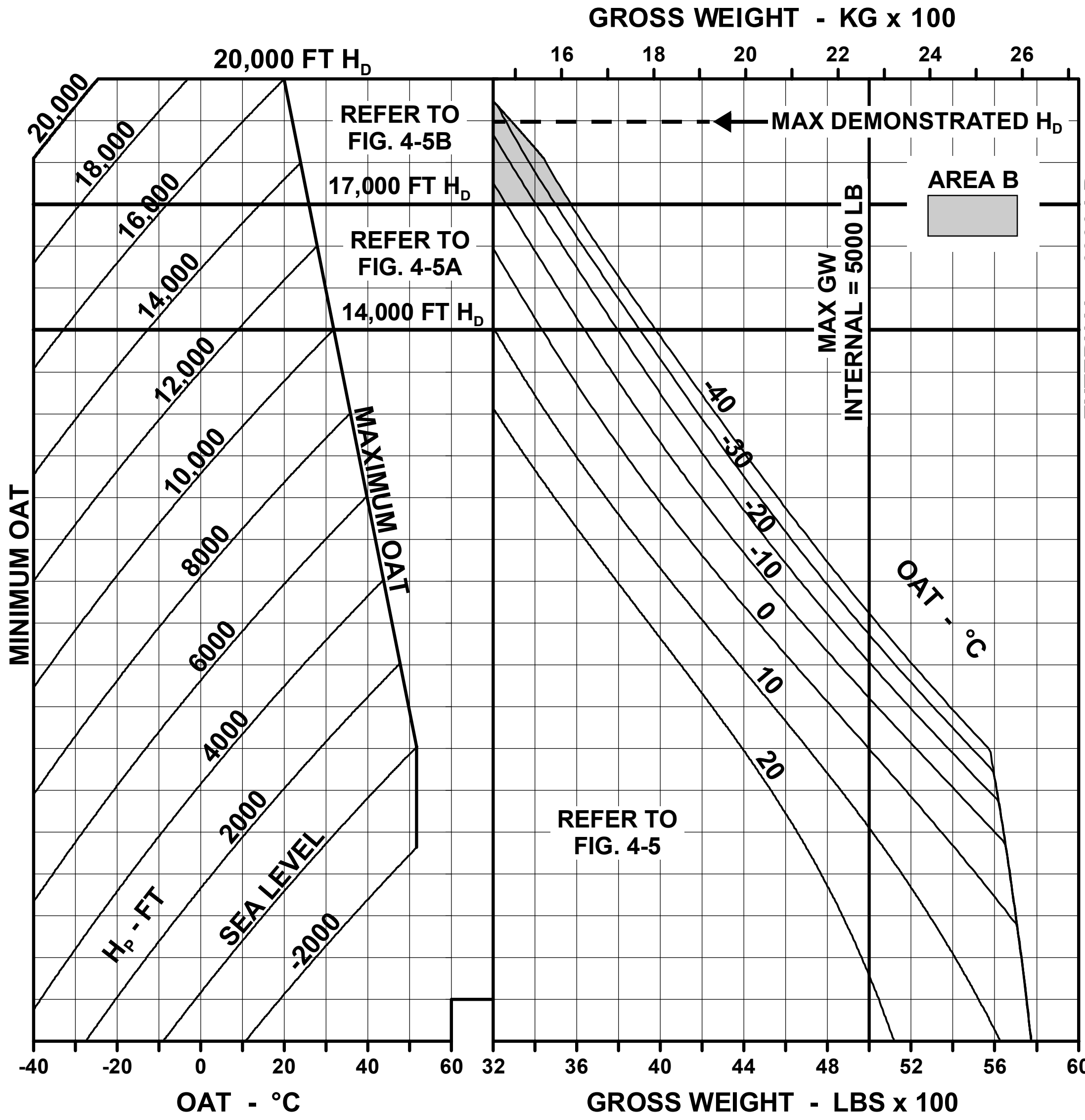


Figure 4-7. Hover ceiling OGE (sheet 7 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART

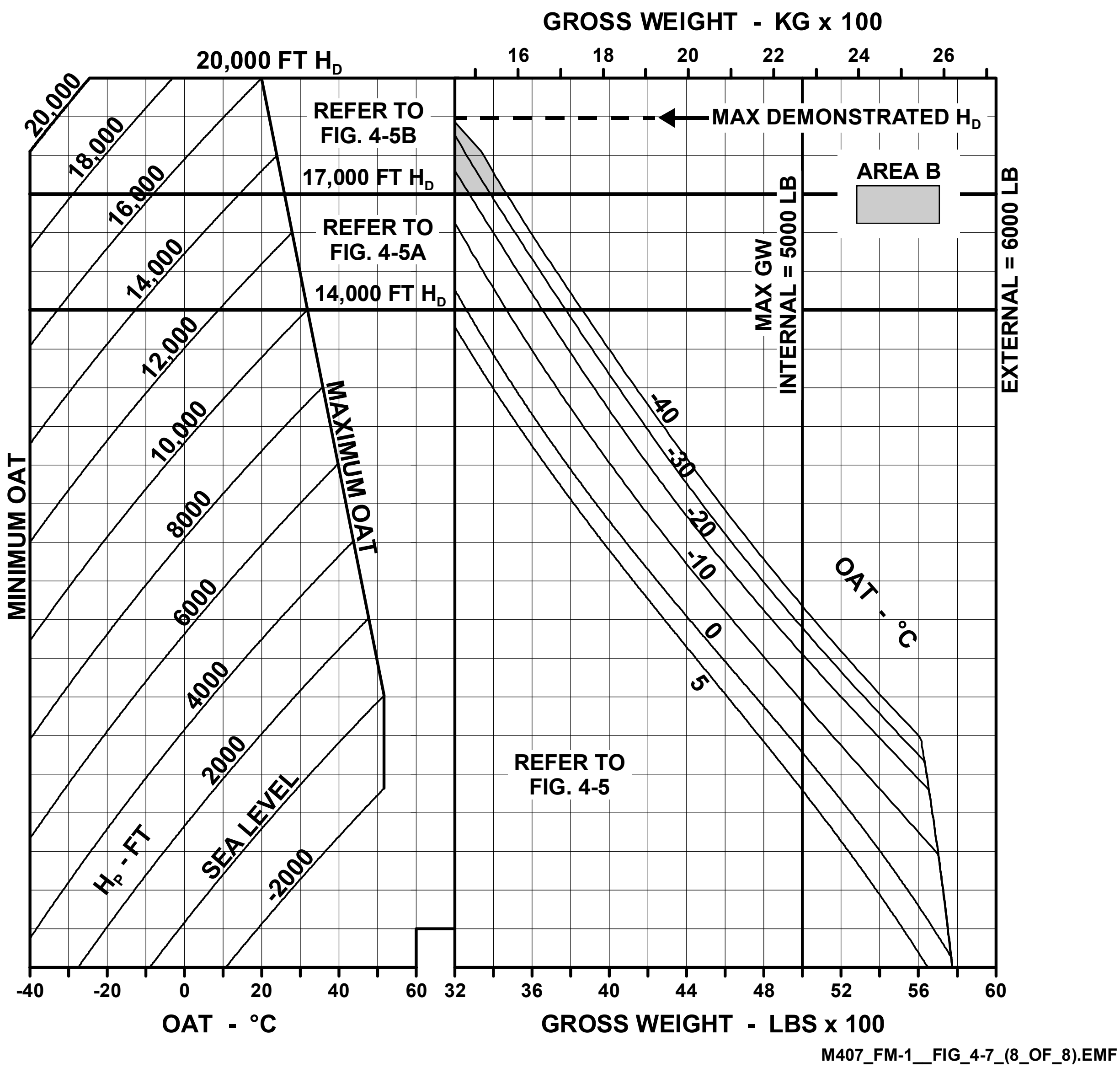


Figure 4-7. Hover ceiling OGE (sheet 8 of 8)

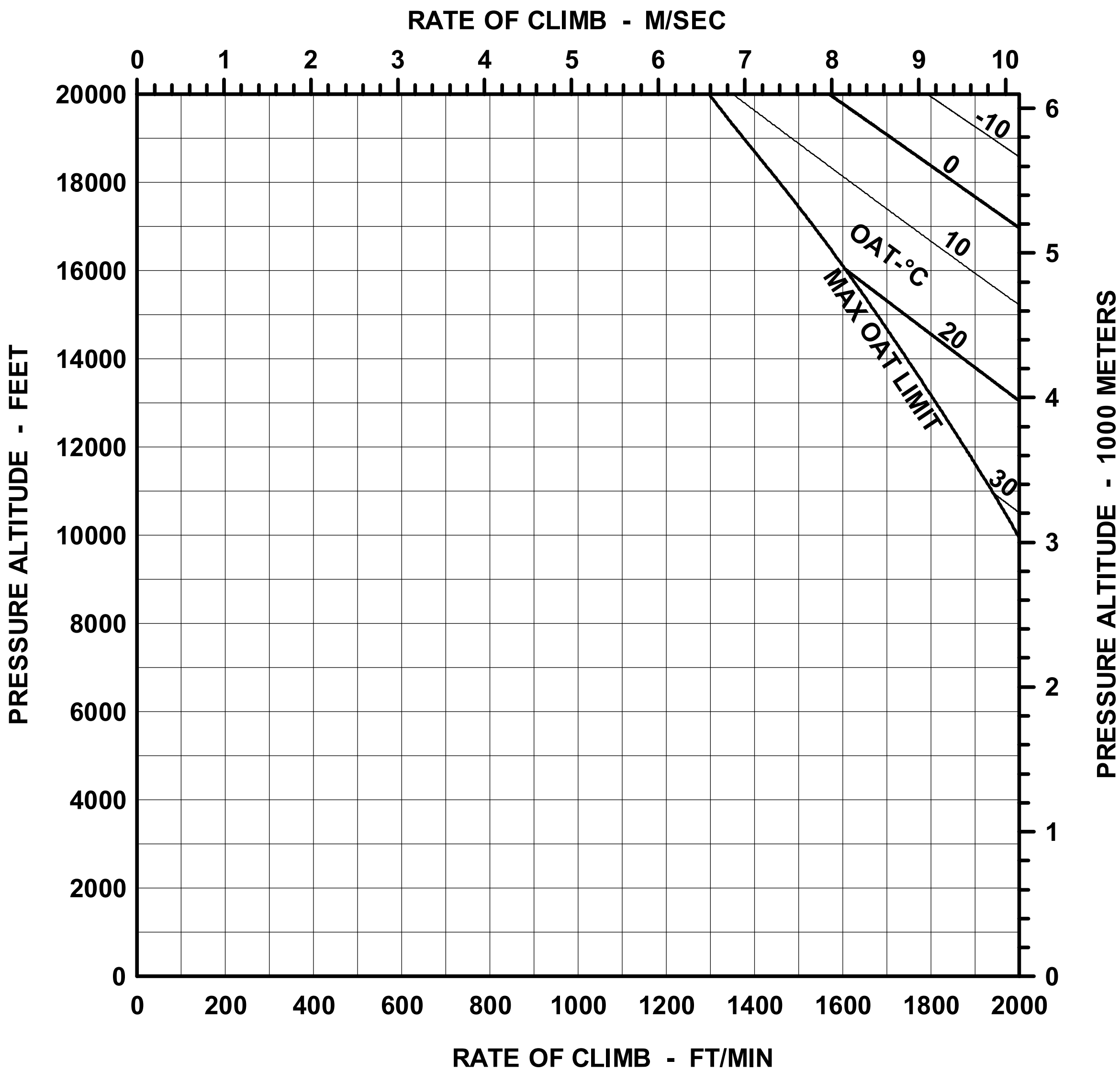
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
15,000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)



M407_FM-1__FIG_4-8_(1_OF_10).WMF

Figure 4-8. Rate of climb – takeoff power (sheet 1 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 11,000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)

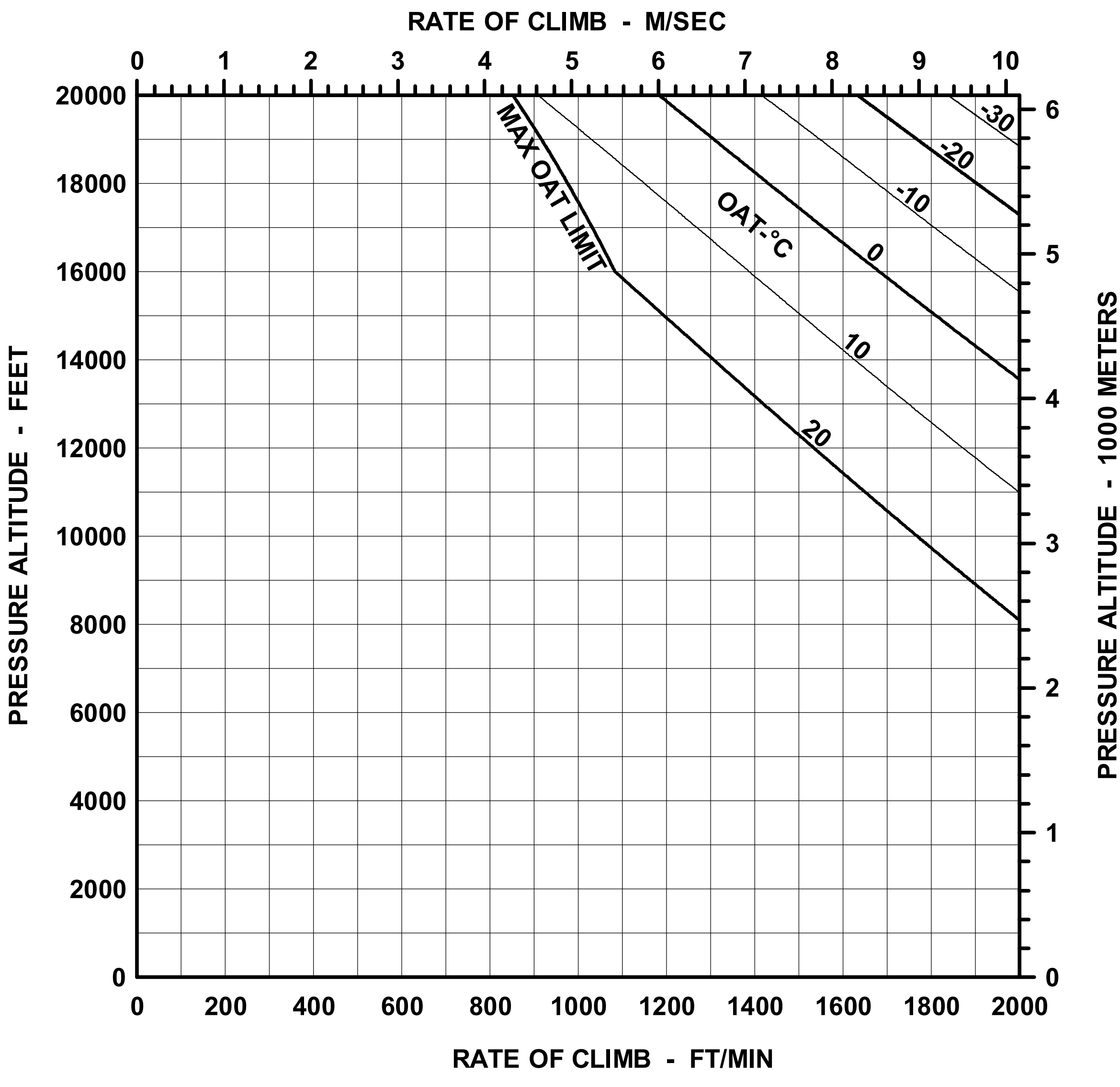


Figure 4-8. Rate of climb – takeoff power (sheet 2 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
11,500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3500 lb (1587 kg)

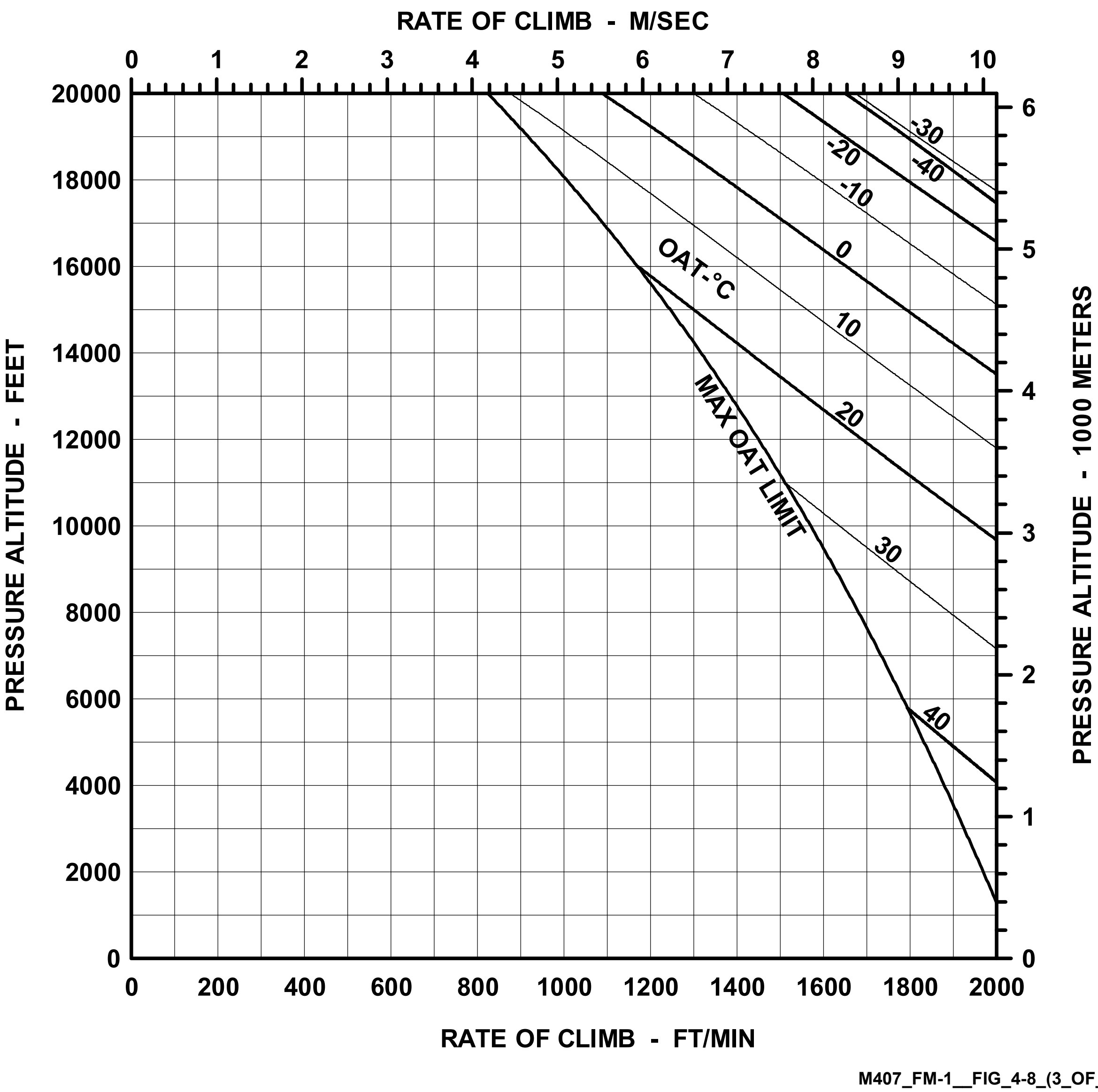


Figure 4-8. Rate of climb – takeoff power (sheet 3 of 10)

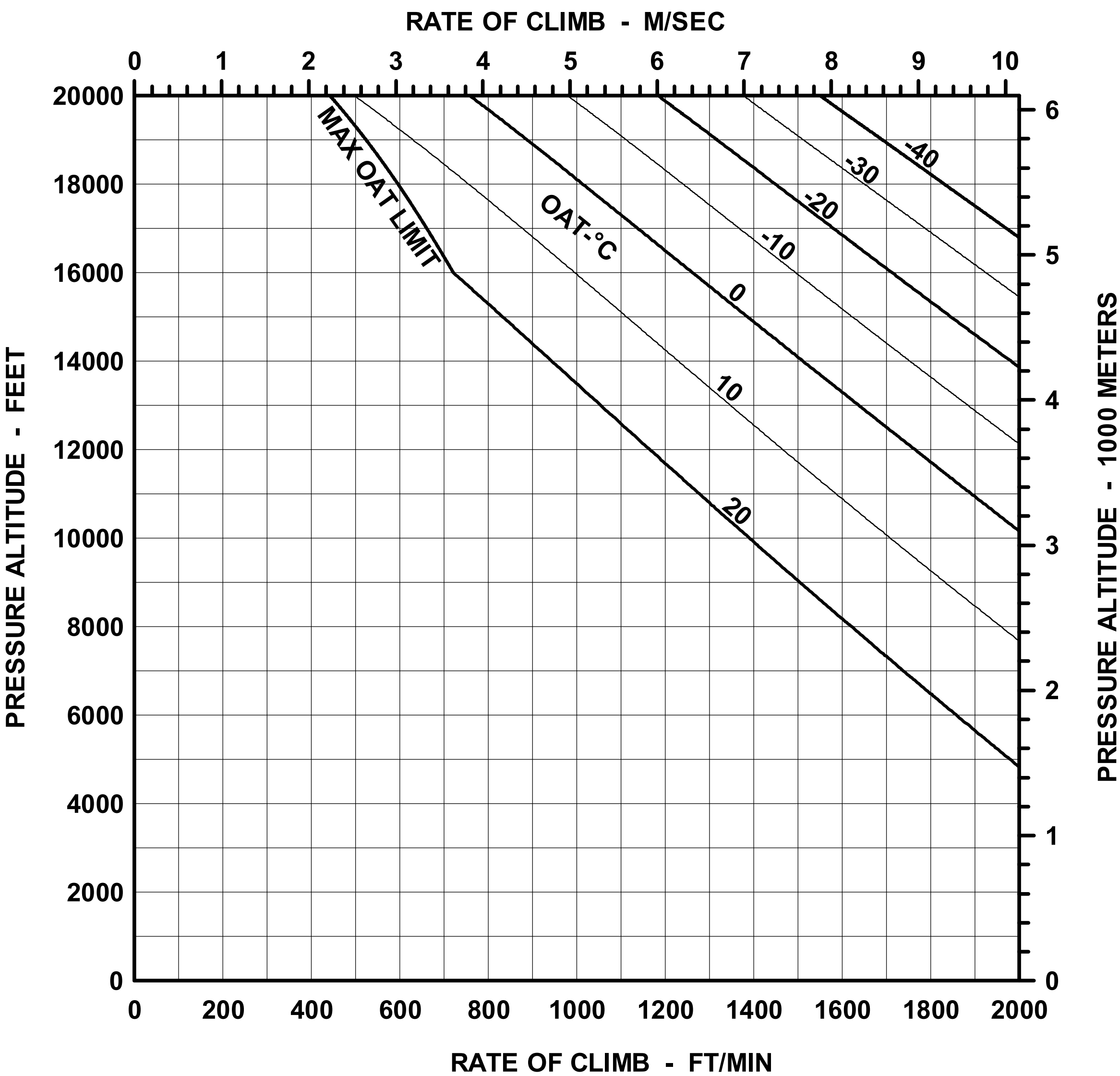
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
7500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3500 lb (1587 kg)



M407_FM-1__FIG_4-8_(4_OF_10).WMF

Figure 4-8. Rate of climb – takeoff power (sheet 4 of 10)

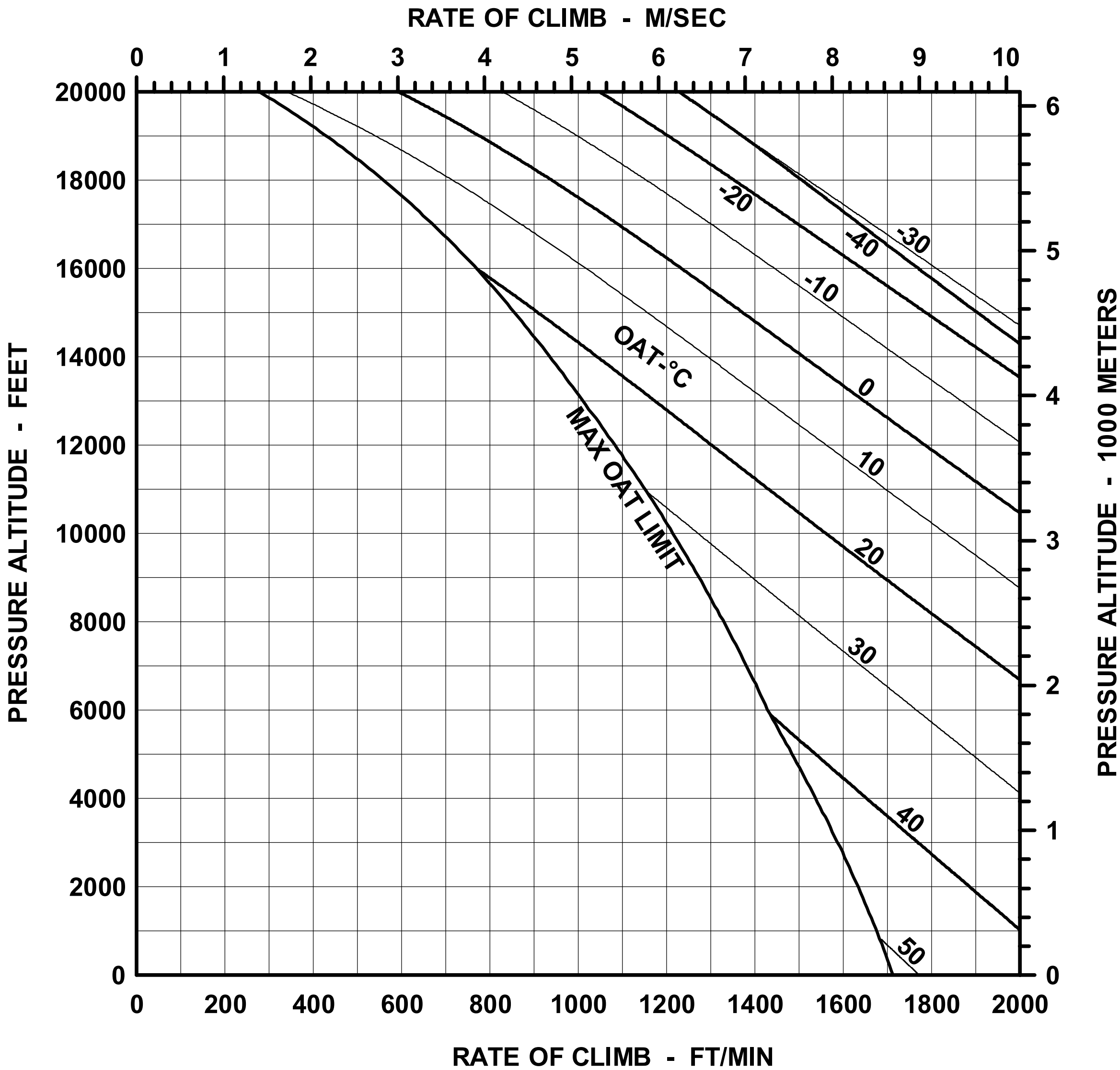
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
9000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4000 lb (1814 kg)



M407_FM-1__FIG_4-8_(5_OF_10).WMF

Figure 4-8. Rate of climb – takeoff power (sheet 5 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
4500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4000 lb (1814 kg)

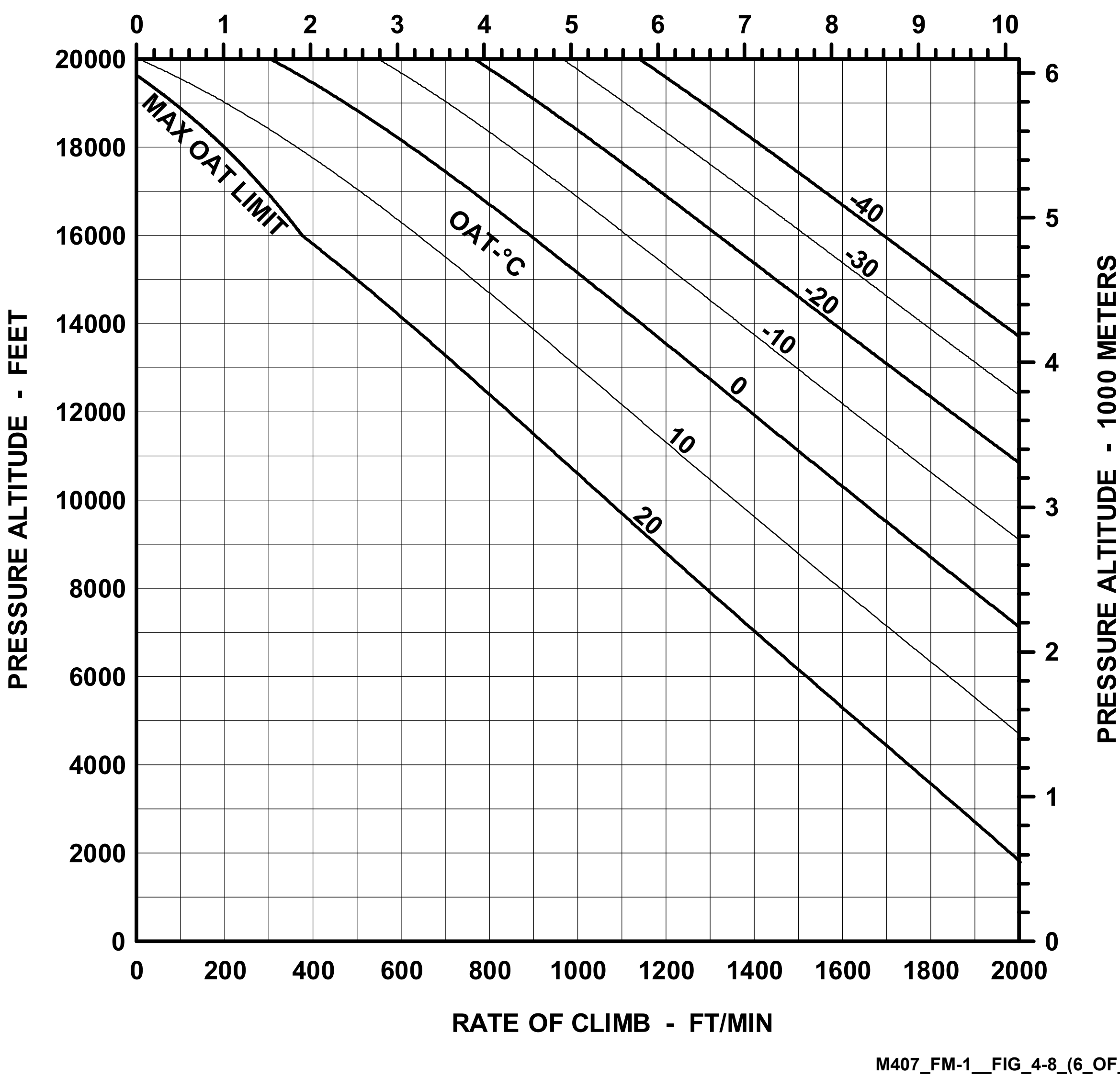


Figure 4-8. Rate of climb – takeoff power (sheet 6 of 10)

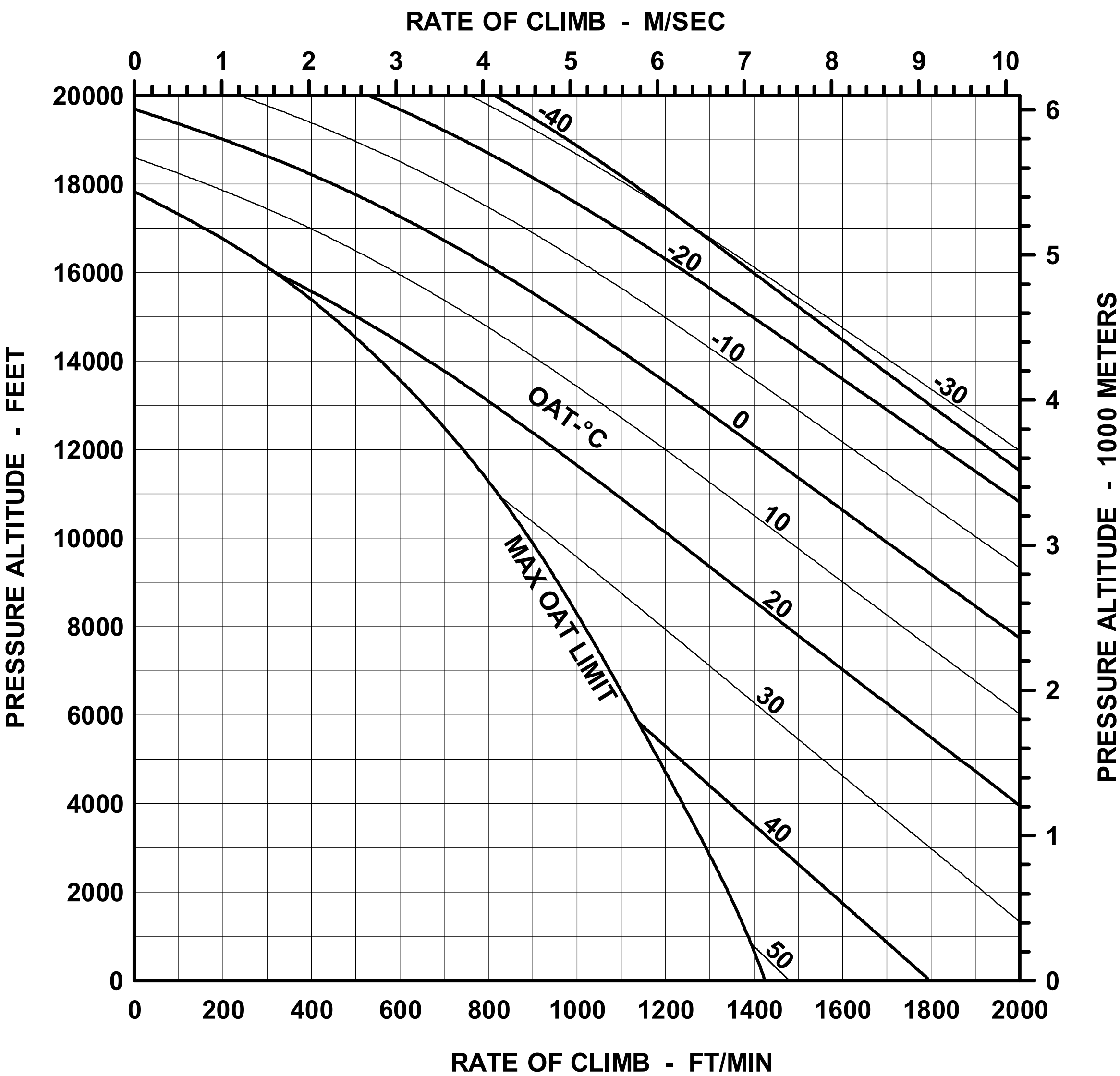
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
6500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4500 lb (2041 kg)



M407_FM-1__FIG_4-8_(7_OF_10).WMF

Figure 4-8. Rate of climb – takeoff power (sheet 7 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
2000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4500 lb (2041 kg)

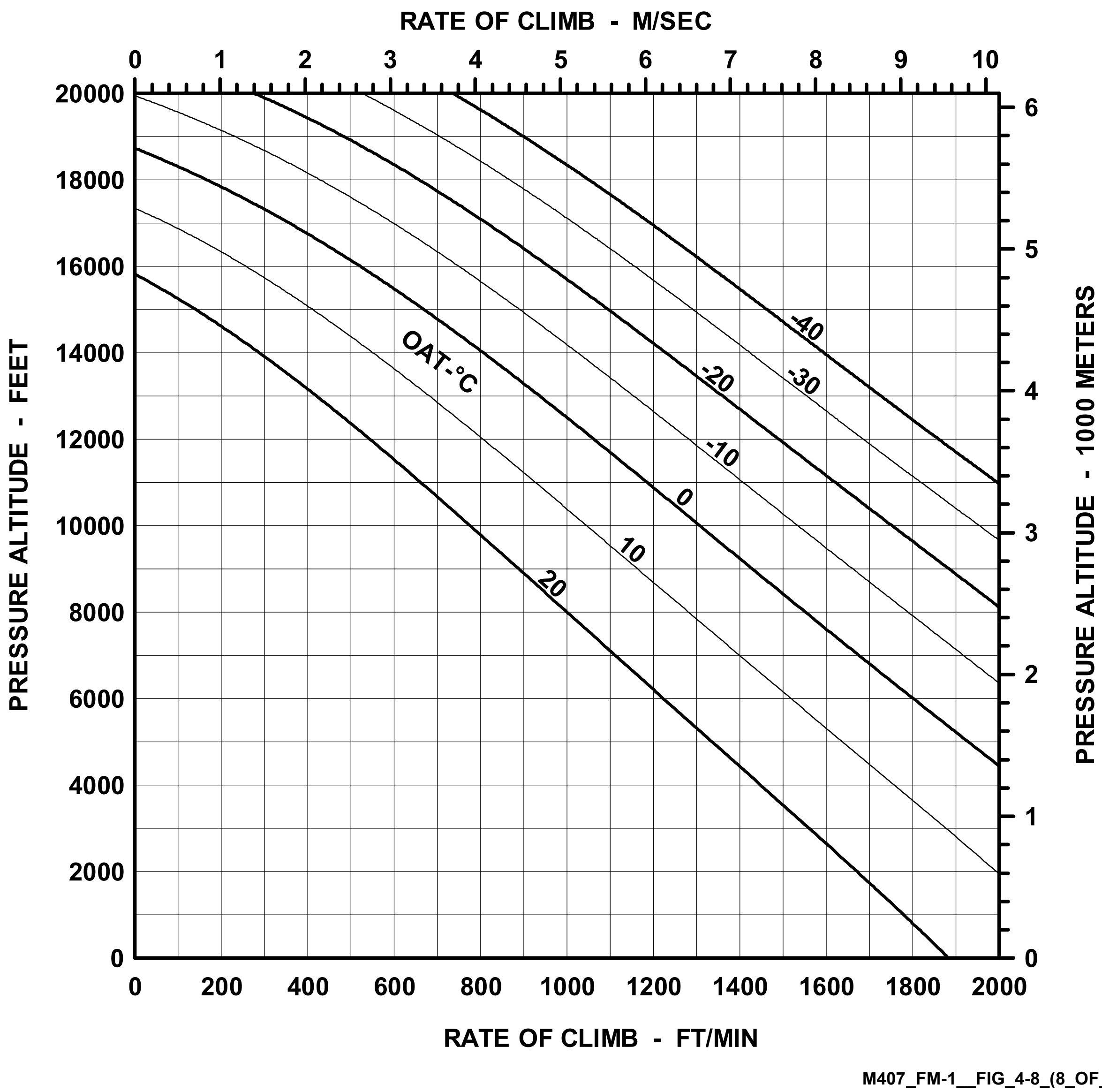


Figure 4-8. Rate of climb – takeoff power (sheet 8 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
5000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5000 lb (2268 kg)

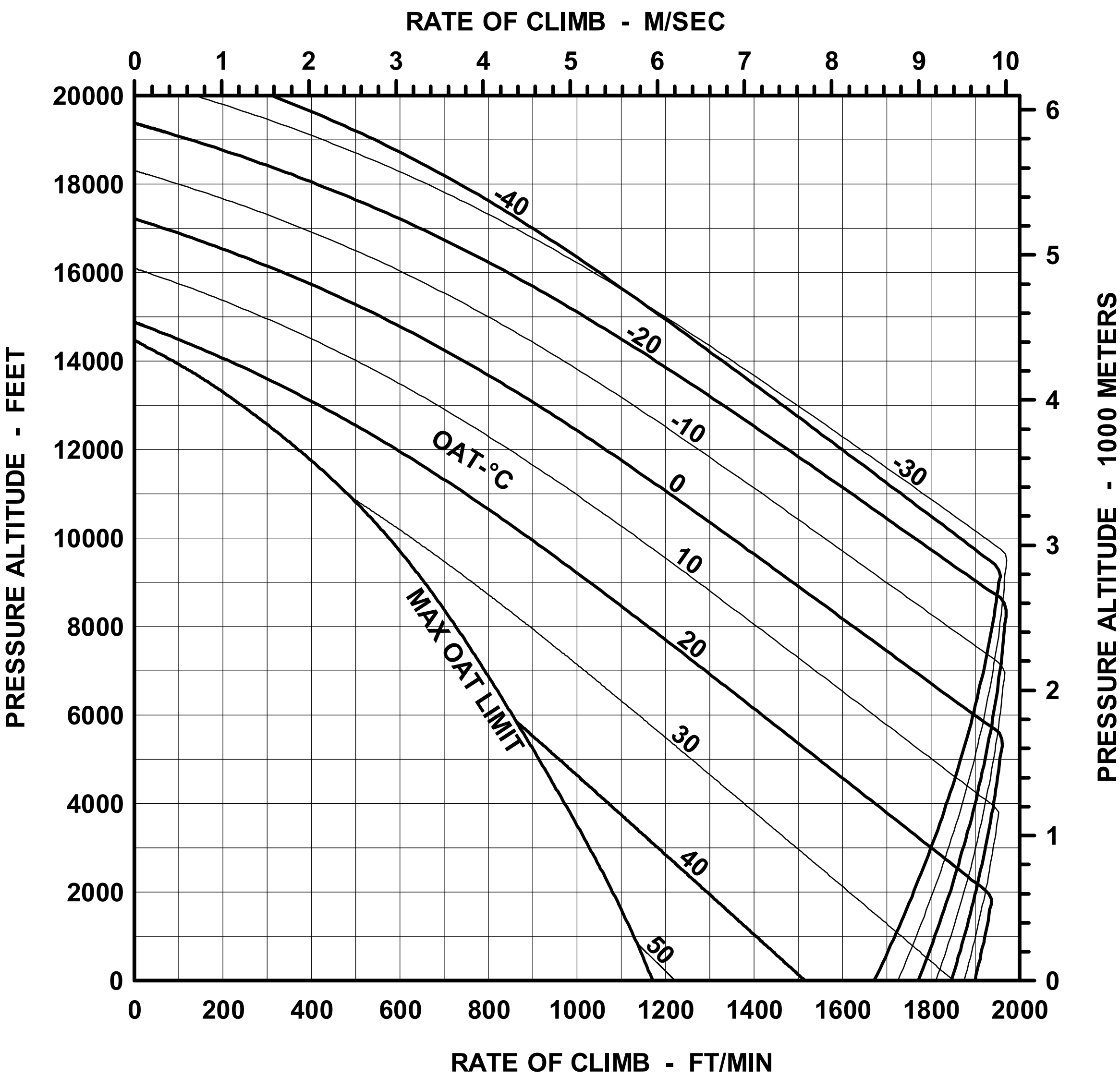


Figure 4-8. Rate of climb – takeoff power (sheet 9 of 10)

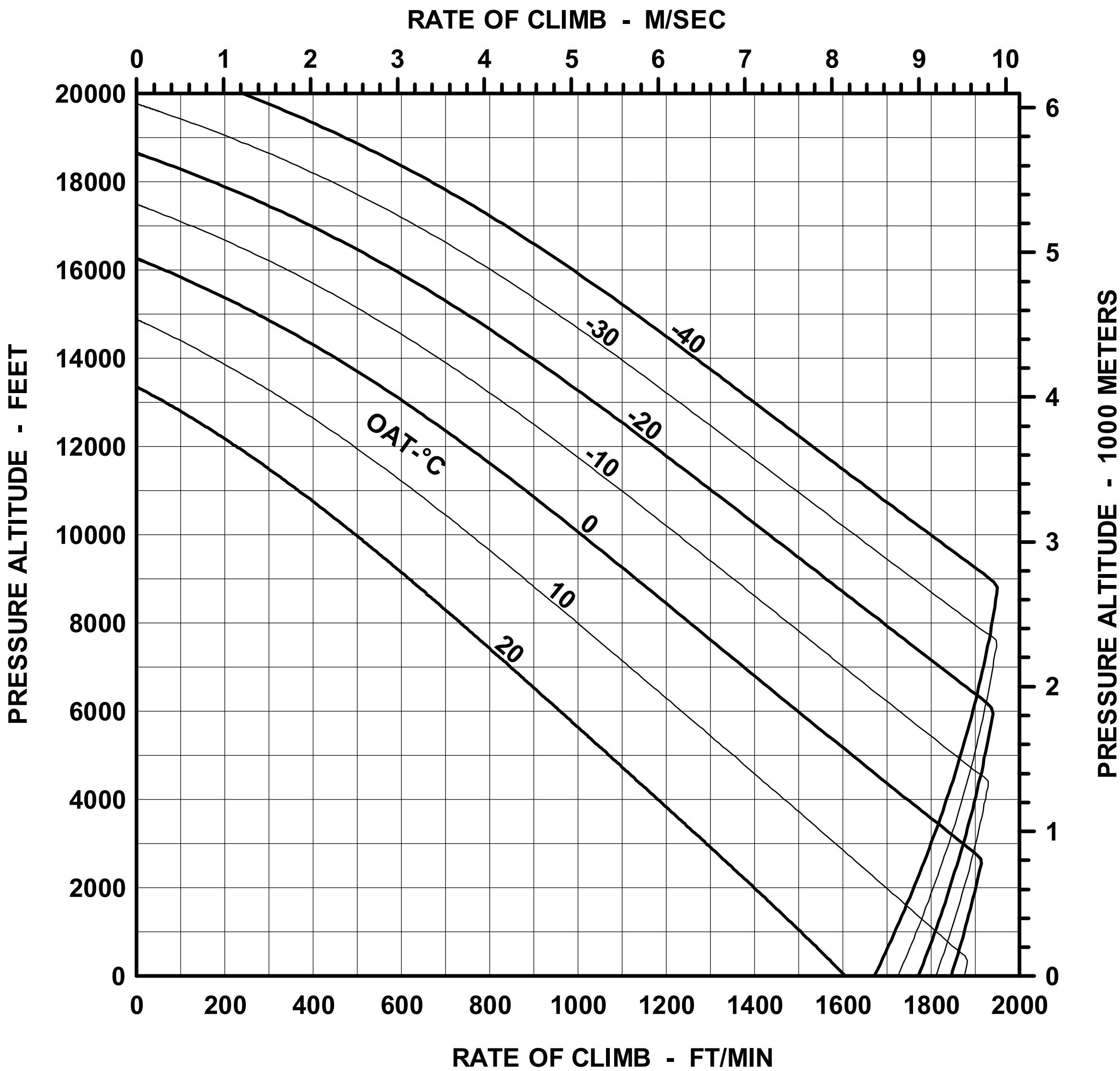
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
1000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5000 lb (2268 kg)



M407_FM-1__FIG_4-8_(10_OF_10).WMF

Figure 4-8. Rate of climb – takeoff power (sheet 10 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
10,000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)

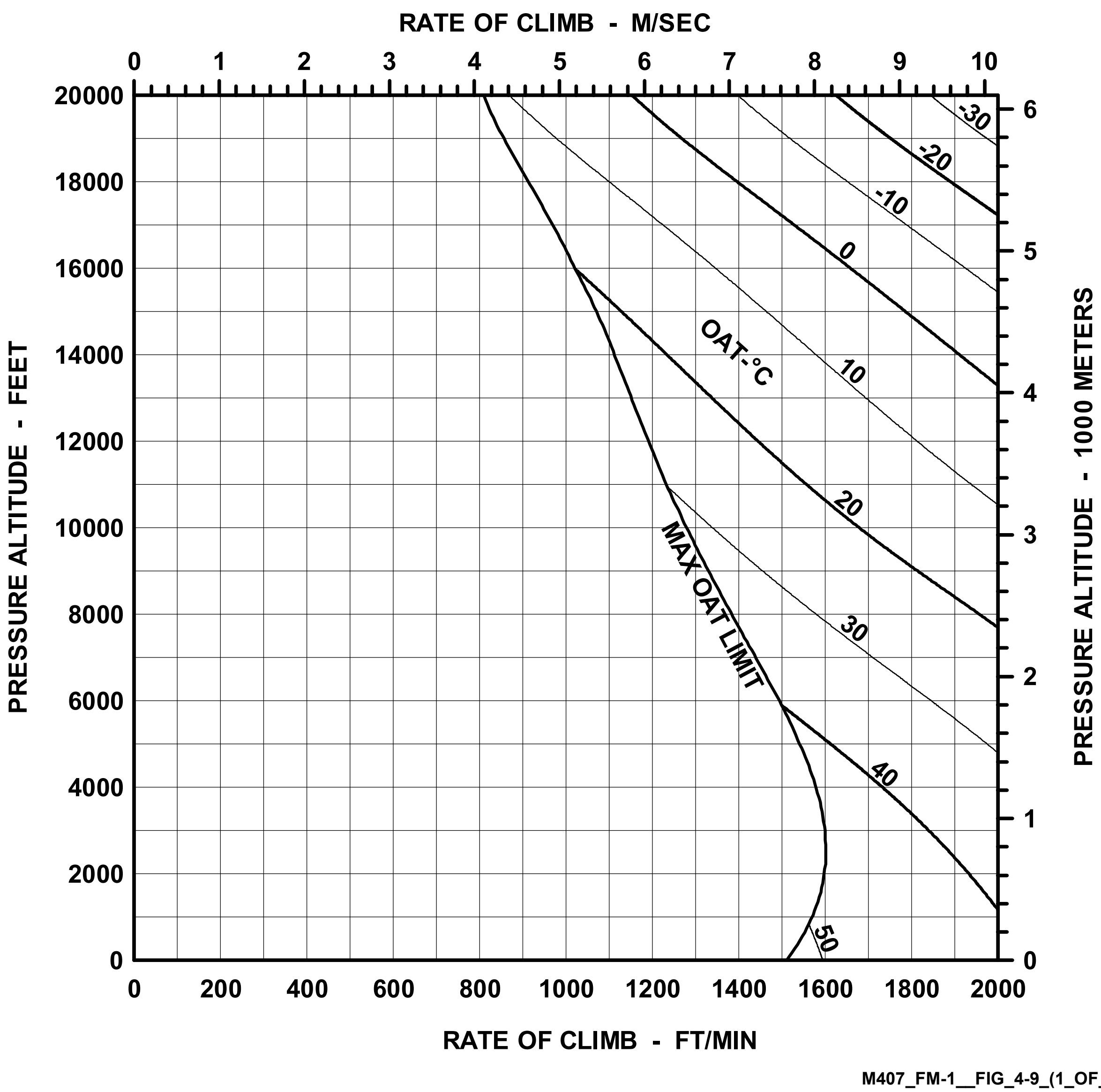


Figure 4-9. Rate of climb – maximum continuous power (sheet 1 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
6000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)

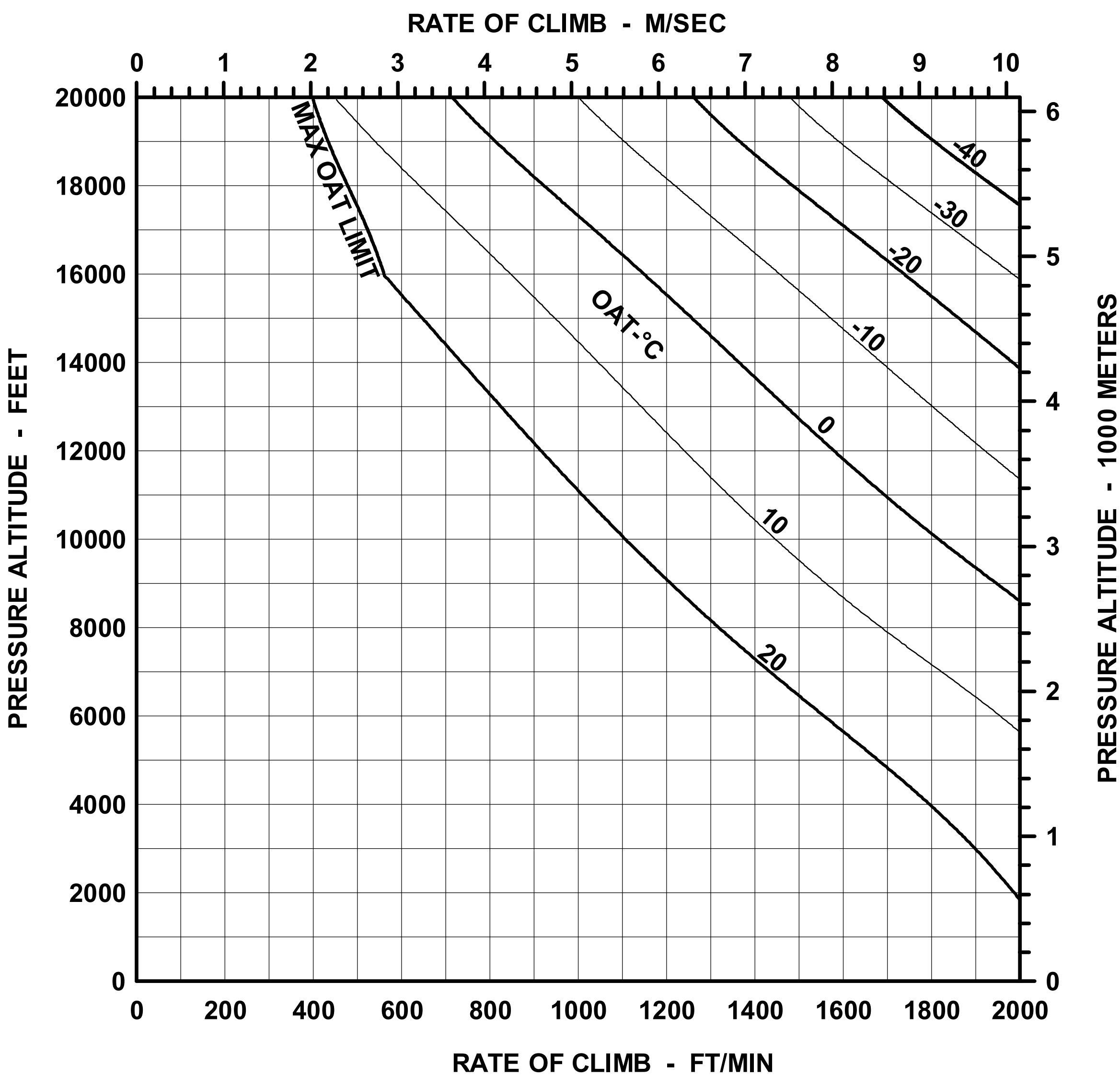


Figure 4-9. Rate of climb – maximum continuous power (sheet 2 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
7500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3500 lb (1587 kg)

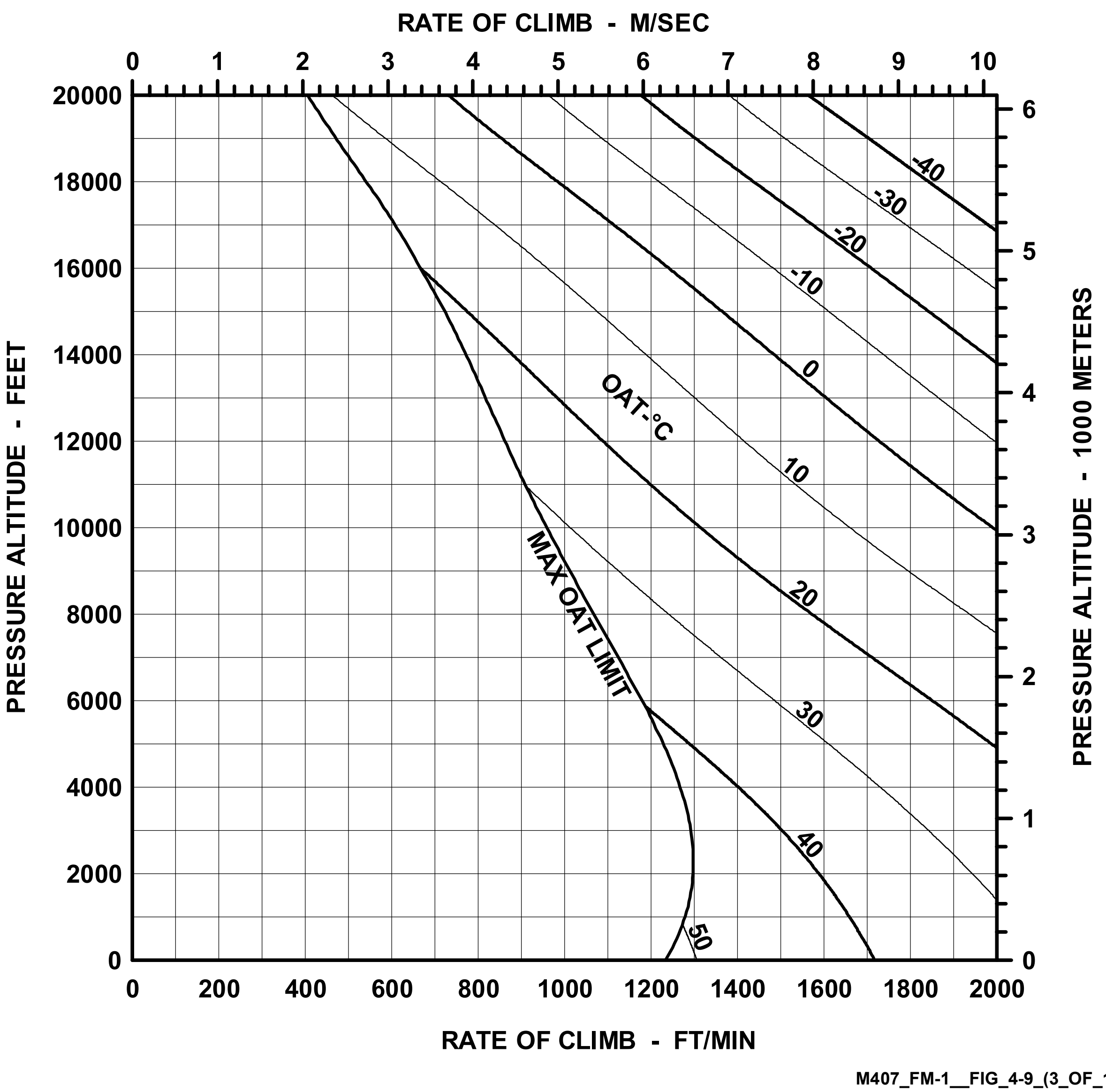


Figure 4-9. Rate of climb – maximum continuous power (sheet 3 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
2500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3500 lb (1587 kg)

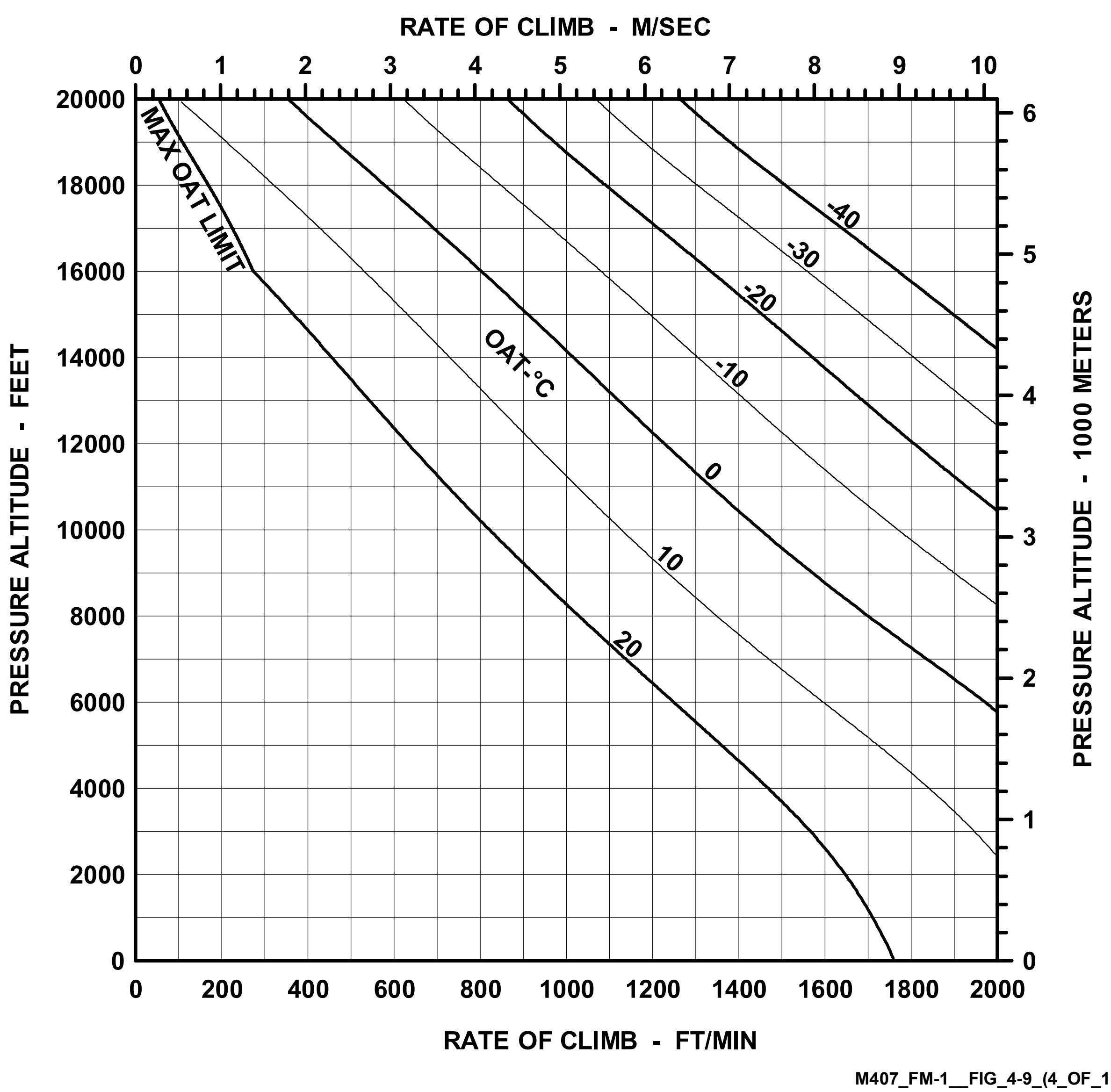


Figure 4-9. Rate of climb – maximum continuous power (sheet 4 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
5000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4000 lb (1814 kg)

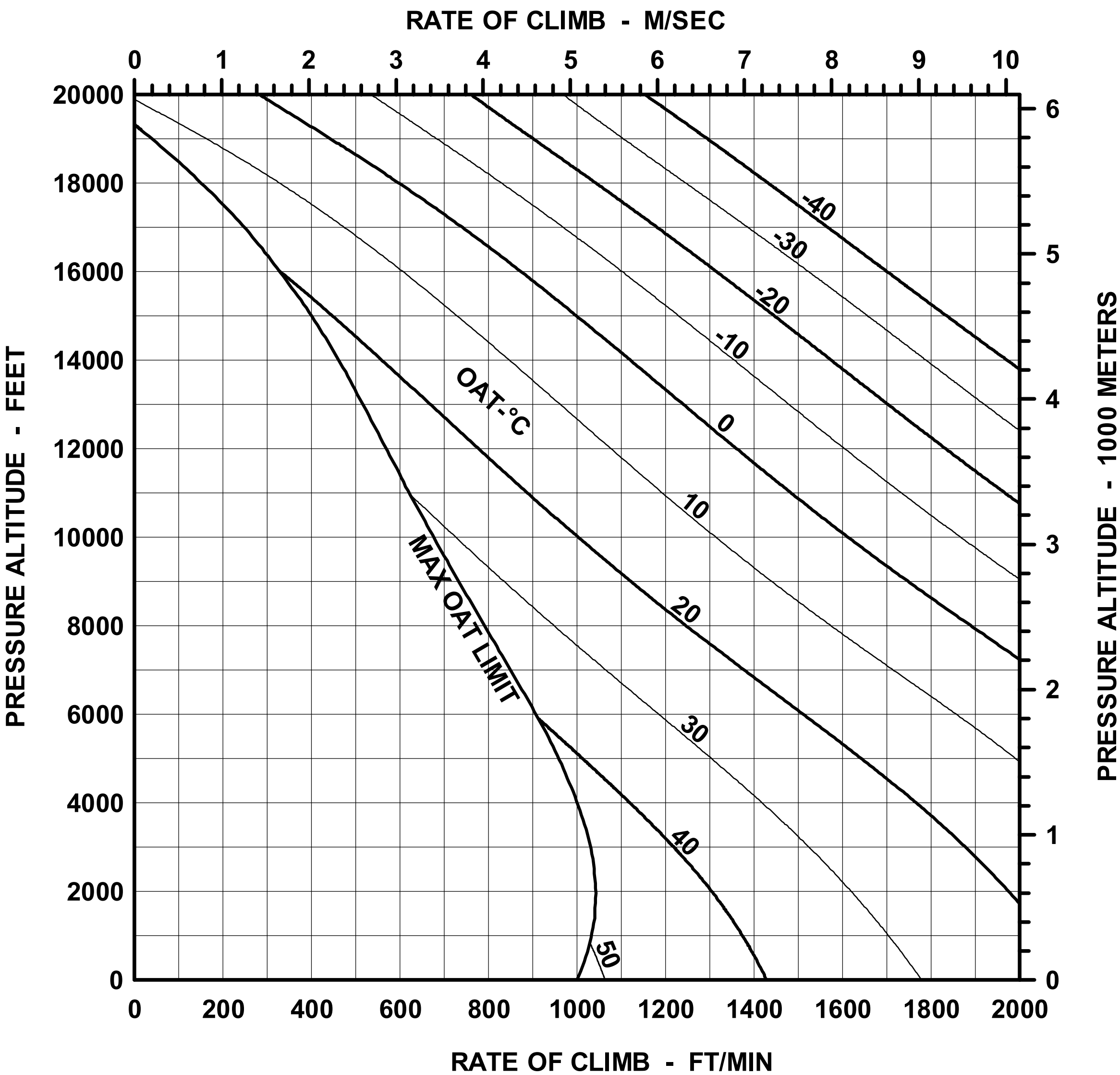


Figure 4-9. Rate of climb – maximum continuous power (sheet 5 of 10)

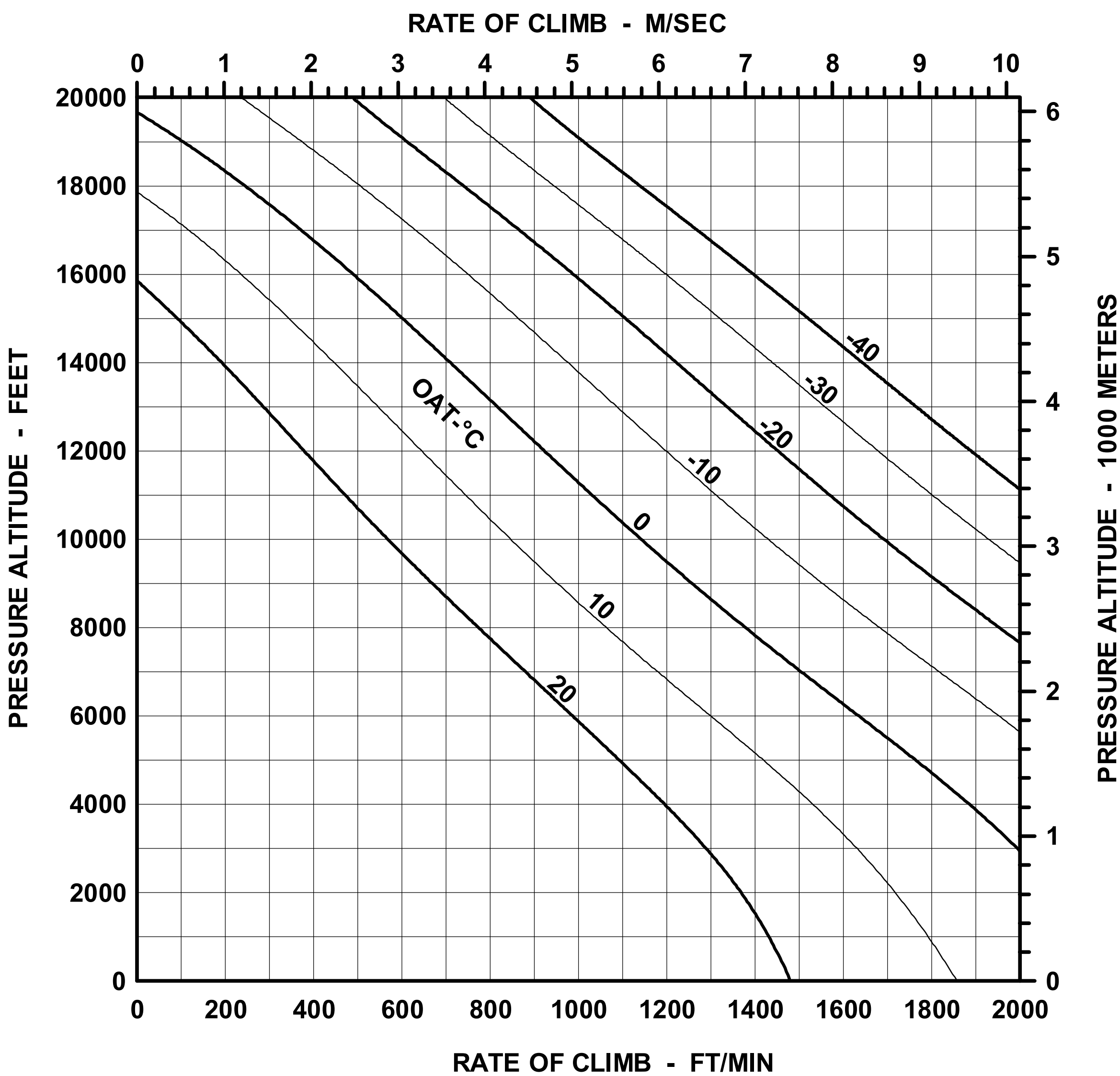
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 170 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4000 lb (1814 kg)



M407_FM-1__FIG_4-9_(6_OF_10).WMF

Figure 4-9. Rate of climb – maximum continuous power (sheet 6 of 10)

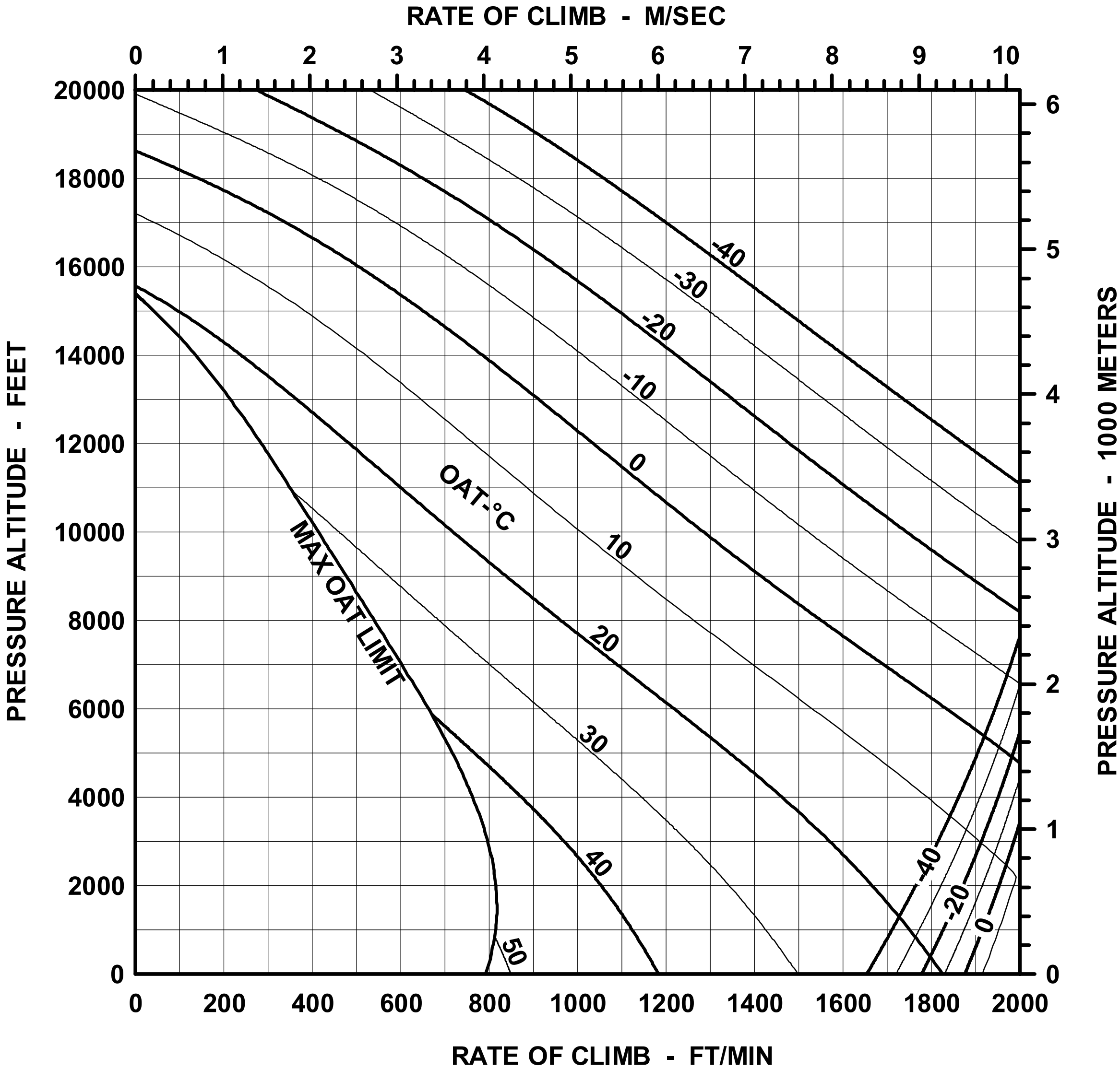
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
3000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4500 lb (2041 kg)



M407_FM-1__FIG_4-9_(7_OF_10).WMF

Figure 4-9. Rate of climb – maximum continuous power (sheet 7 of 10)

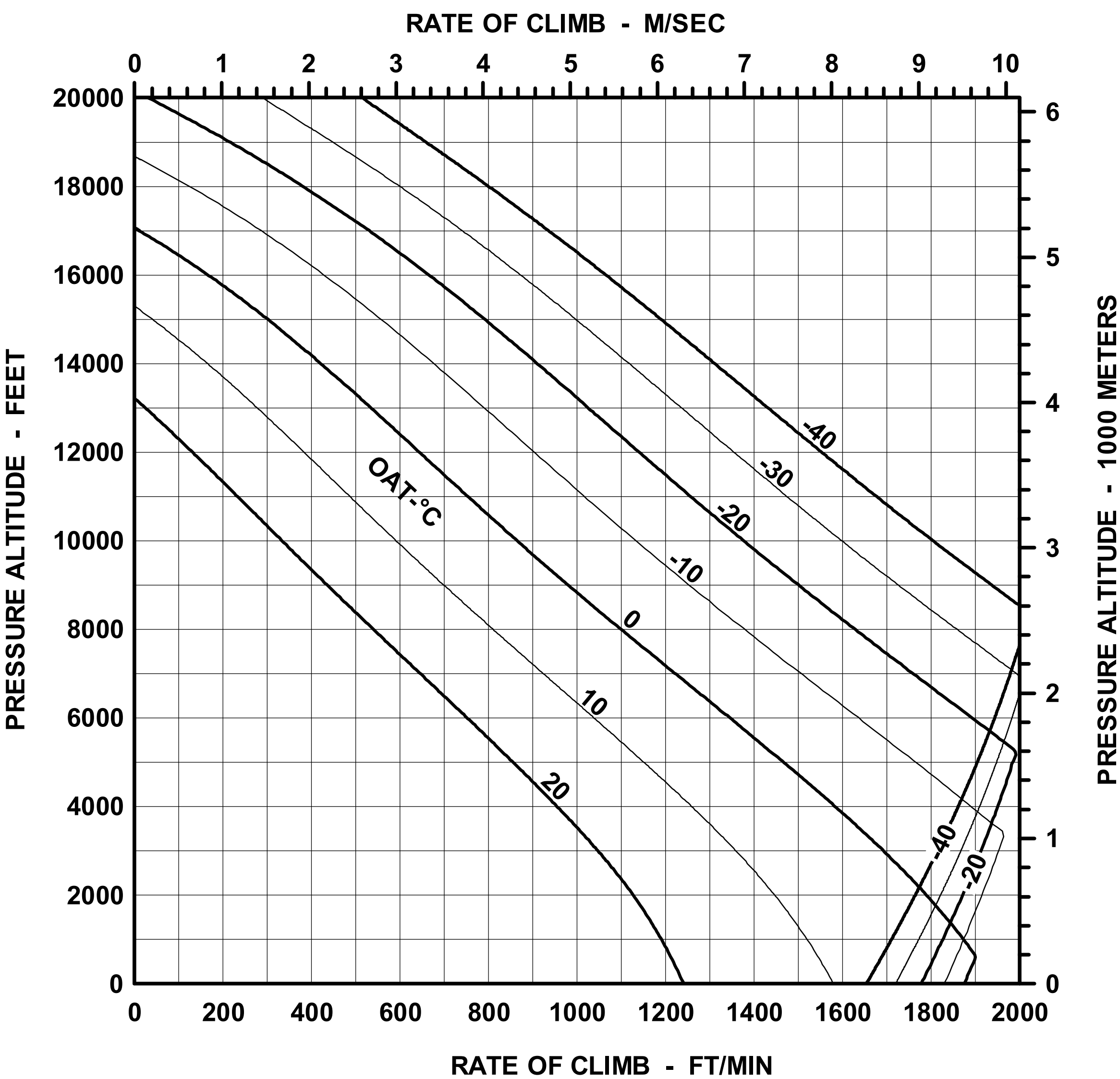
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4500 lb (2041 kg)



M407_FM-1__FIG_4-9_(8_OF_10).WMF

Figure 4-9. Rate of climb – maximum continuous power (sheet 8 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
3000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5000 lb (2268 kg)

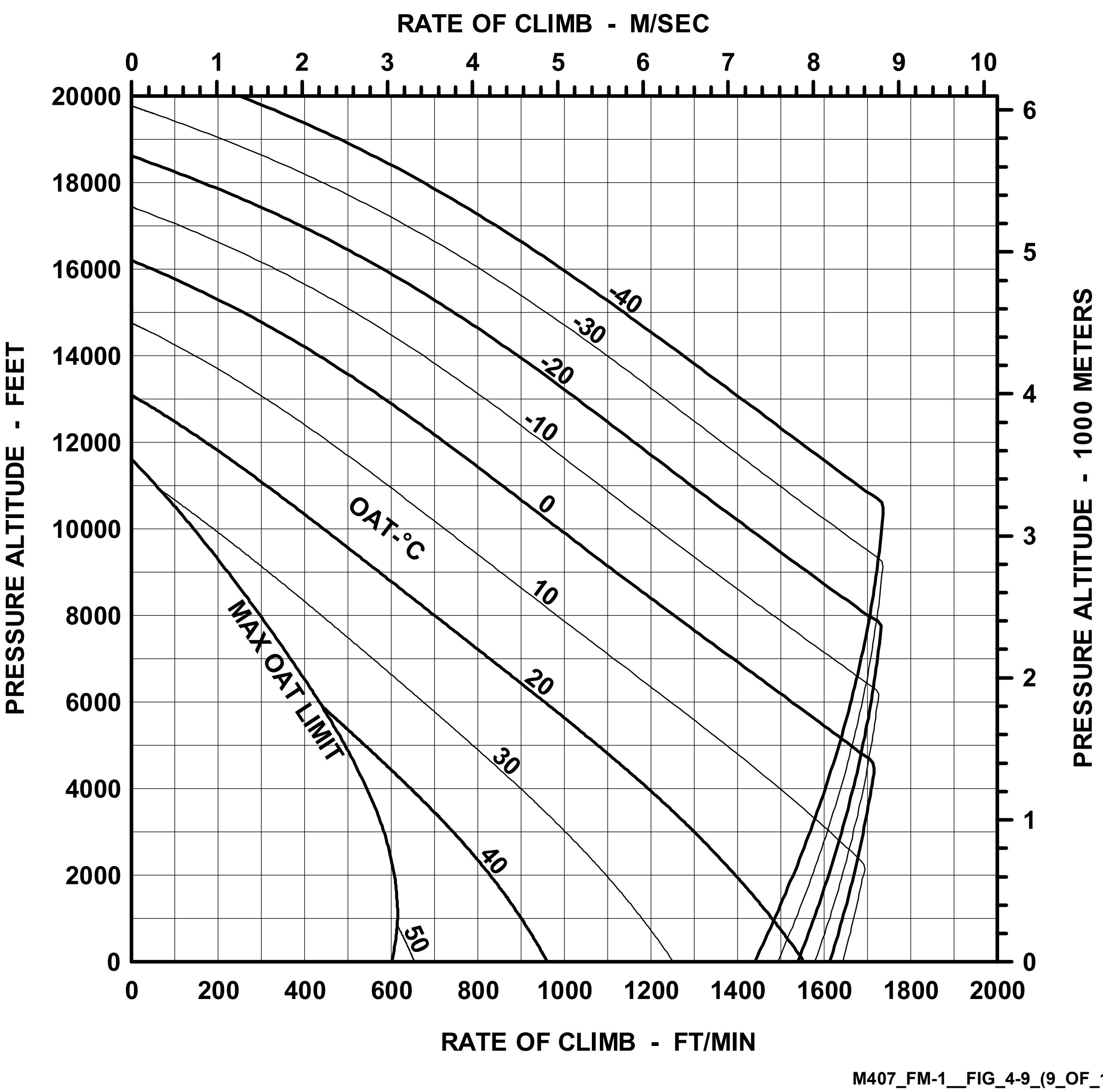


Figure 4-9. Rate of climb – maximum continuous power (sheet 9 of 10)

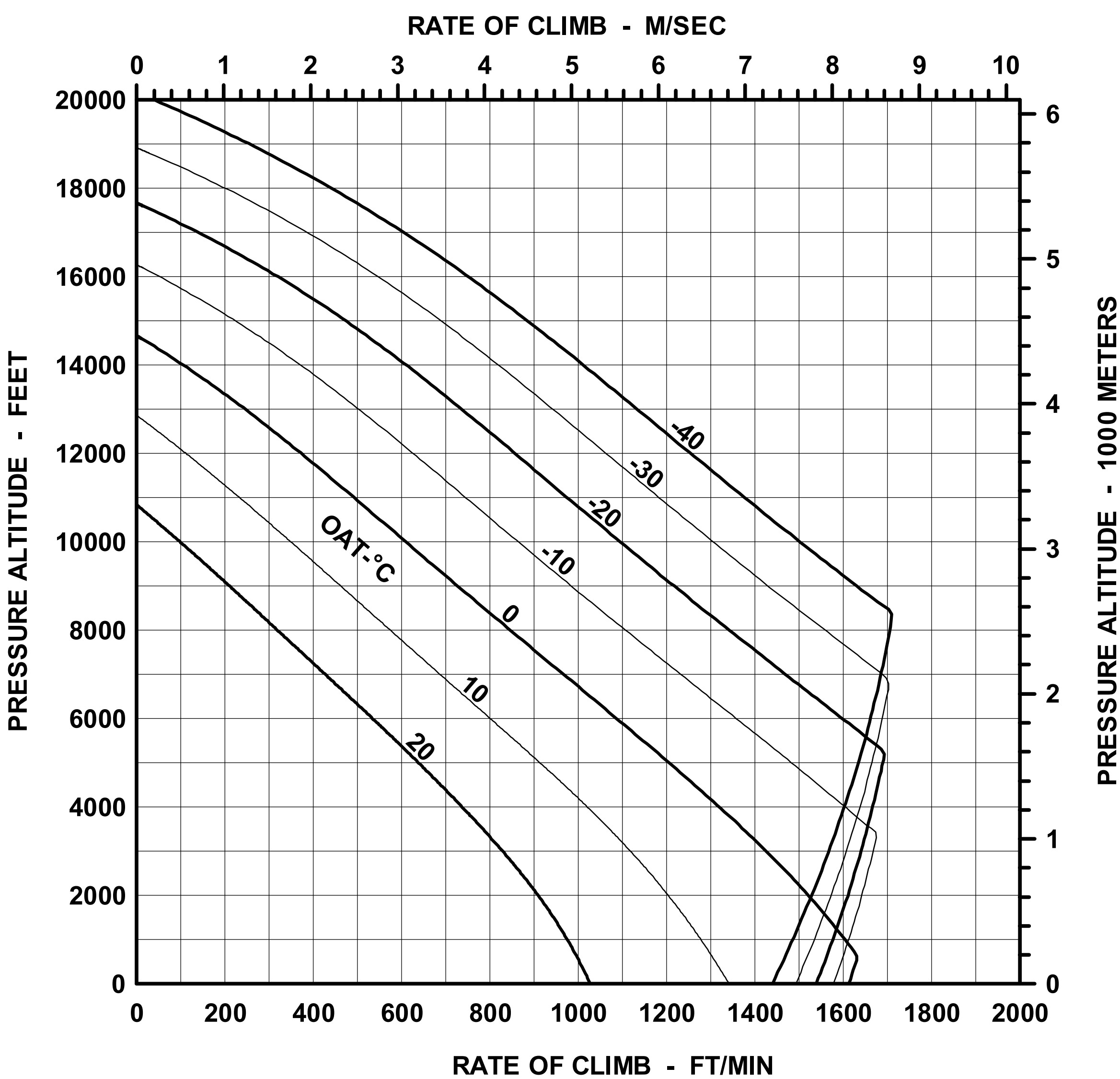
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 135 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

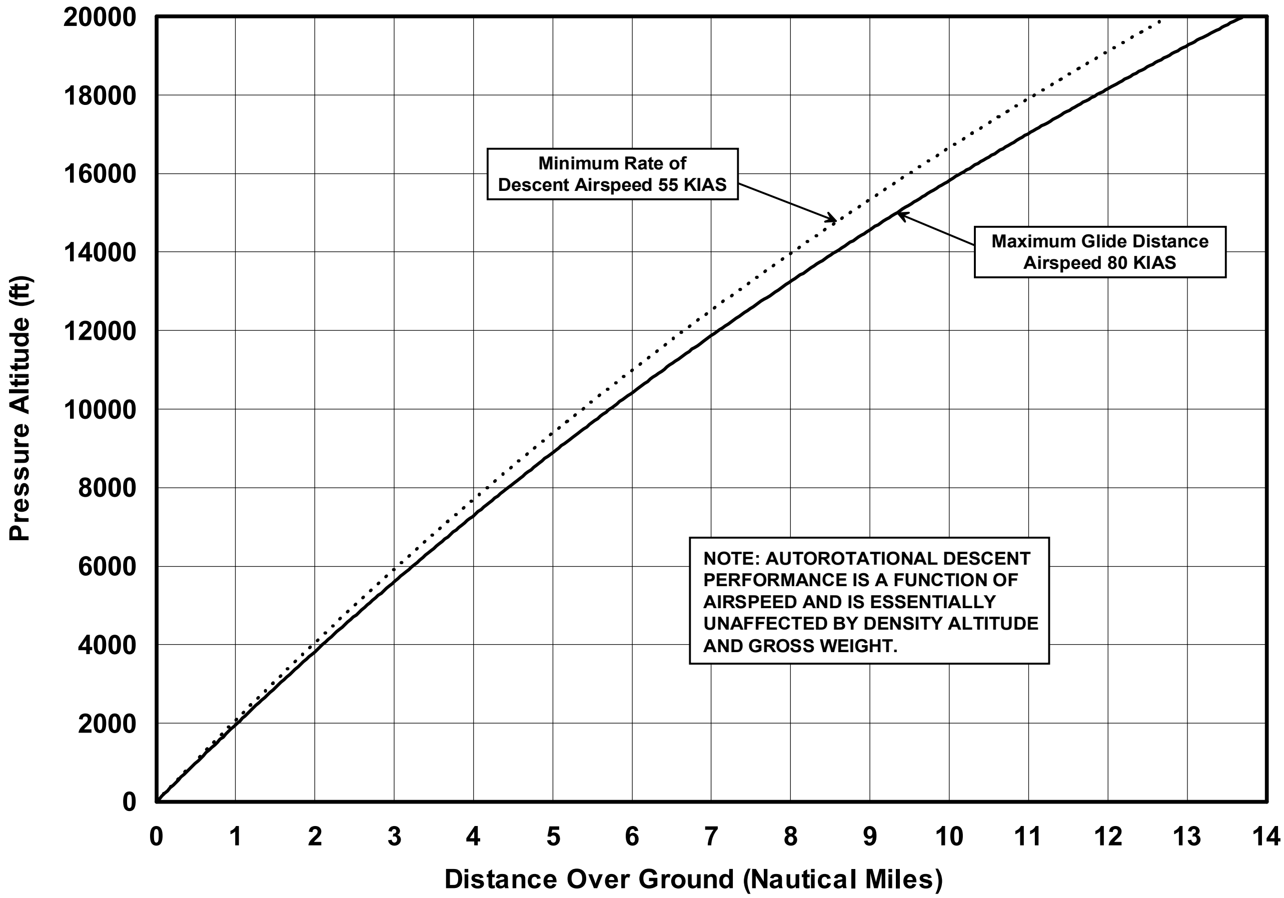
Gross Weight 5000 lb (2268 kg)



M407_FM-1__FIG_4-9_(10_OF_10).WMF

Figure 4-9. Rate of climb – maximum continuous power (sheet 10 of 10)

AUTOROTATION GLIDE DISTANCE



M407_FM-1__FIG_4-10.EMF

Figure 4-10. Autorotation glide distance

AIRSPEED INSTALLATION CORRECTION TABLE

KCAS = (KIAS – INSTRUMENT ERROR – POSITION ERROR)

NOTE: This chart assumes zero instrument error.

KIAS	CLIMB KCAS	LEVEL FLIGHT KCAS
20	– –	22
30	30	33
40	37	43
50	47	52
60	58	63
70	69	73
80	78	82
90	87	92
100	95	100
110	– –	110
120	– –	121
130	– –	131
140	– –	144

M407_FM-1_FIG_4-11.WMF

Figure 4-11. Airspeed installation correction

Section 5

WEIGHT AND BALANCE

TABLE OF CONTENTS

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Section 5

WEIGHT AND BALANCE

5-1. INTRODUCTION

This section presents loading information and instructions necessary to ensure that flight can be performed within approved gross weight and center of gravity limitations as defined in Section 1.

5-2. EMPTY WEIGHT CENTER OF GRAVITY

5-2-A. EMPTY WEIGHT

The empty weight condition consists of the basic helicopter with required equipment, optional equipment kits, transmission and gearbox oils, hydraulic fluid, unusable fuel, undrainable engine oil, and fixed ballast. The empty weight and center of gravity are recorded on the Actual Weight Record, a copy of which should be carried in the helicopter to enable weight and balance computations.

5-2-B. CENTER OF GRAVITY

An empty weight center of gravity chart is provided in maintenance manual as a guide to simplify computing ballast requirements. This chart was derived from gross weight longitudinal center of gravity limits shown in Section 1, using most forward and most aft useful loads for standard seating and fuel.

NOTE

Empty weight center of gravity chart is not valid if helicopter has a nonstandard fuel system or seating arrangement.

5-3. GROSS WEIGHT CENTER OF GRAVITY

Gross weight condition is empty weight condition plus useful load.

5-3-A. USEFUL LOADS

Useful load consists of usable fuel, engine oil, crew, passengers, baggage and cargo. Combinations of these items which have most adverse effect on helicopter center of gravity are known as most forward and most aft useful loads. Whenever cargo and/or baggage are carried, these useful loads may be different for each flight, and weight and balance must be computed to ensure gross weight and center of gravity will remain within limits throughout flight.

Standard most forward and most aft useful loads are combinations of fuel, crew and passenger loading only. These loads, in conjunction with empty weight center of gravity chart, allow passengers only (no baggage or other cargo) to be carried within appropriate weight limitations without computing center of gravity for each flight.

If helicopter has a nonstandard fuel system or seating arrangement, or is not ballasted in accordance with empty weight center of gravity chart in maintenance manual, pilot must determine weight and balance to ensure gross weight and center of gravity will remain within limits throughout each flight.

5-3-B. CENTER OF GRAVITY

It is the responsibility of the pilot to ensure that helicopter is properly loaded to maintain center of gravity throughout each flight within gross weight center of gravity limits shown in Section 1 or appropriate supplement. Gross weight longitudinal and lateral center of gravity can be calculated using Actual Weight Record, diagrams and loading tables in this section and loading tables in applicable flight manual supplements.

When carrying baggage, cargo or nonstandard loads, effects of fuel consumption and addition/deletion of passengers, baggage or cargo at intermediate points should be checked prior to flight.

Significant fuselage stations and buttock lines are shown in Figures 5-1 and 5-2 to aid in weight and balance computations.

5-4. DOORS OPEN OR REMOVED

When one or more cabin doors are removed, helicopter may exceed gross weight center of gravity limits during flight. If using Weight empty center of gravity chart, refer to BHT-407-MM-1, a ballast adjustment to offset moment change is necessary (Table 5-1). Otherwise, gross weight center of gravity should be computed for each flight.

5-4-A. DOOR WEIGHTS AND MOMENTS

Following table presents weight and moment adjustments for cabin doors. Sign convention for buttock lines used to compute lateral moments are:

1. Left is negative.
2. Right is positive.

ACTION	MOMENT CHANGE	
	LEFT DOOR	RIGHT DOOR
Remove	Positive (+)	Negative (-)
Install	Negative (-)	Positive (+)

Example:

When removing a left door only, subtract positive weight value and negative moment value shown in table. Net effect on helicopter is a reduction in weight and a shift in lateral CG to right (positive direction).

5-4-B. BALLAST ADJUSTMENT

Following check can be made to determine if a ballast adjustment is necessary after doors are removed or installed.

1. For helicopters without ballast or with nose ballast, apply weight and moment changes to most aft useful load condition to determine if an increase in nose ballast is required, or a reduction is allowed.
2. For helicopters with tail ballast, apply weight and moment changes to most forward useful load condition to determine if a reduction in tail ballast is allowed, or an increase is required.

NOTE

Ballast changes are performed by maintenance personnel. After any ballast change, Actual Weight Record must be revised to show new weight empty condition.

5-5. COCKPIT AND CABIN LOADING

Loading tables (Tables 5-2 and 5-3) provide weights and moments for each passenger location, litter patient and baggage compartment in both U.S. and metric units.

To find moments for weights in excess of those shown on tables, multiply weight by fuselage station at which center of gravity of the object is located. An alternate method is to calculate amount of weight in excess of maximum weight listed on table, then read moment for this excess weight from table and add it to moment for maximum weight shown on table. This will give desired moment for the object.

5-5-A. LONGITUDINAL LOADING

1. A minimum weight of 170 pounds (77.1 kilograms) is required in cockpit at fuselage station 65.0 when the empty weight center of gravity chart is used.
2. Passenger seating is unrestricted.
3. Cargo loading is restricted only by floor load limit. Refer to Section 1.

5-5-B. MOST FORWARD AND MOST AFT CG

When using empty weight center of gravity chart, following combinations of crew, fuel and passenger loading will have most extreme effects on longitudinal center of gravity, assuming standard weights for all crew and passengers.

1. Most forward CG will occur with forward and mid seats occupied and fuel quantity of 74.8 gallons (283.0 liters).
2. Most aft CG will occur with one forward seat occupied (pilot) and fuel quantity of 28.4 gallons (107.5 liters).

Since center of gravity of aft passengers is on aft limit, weight of passengers is not included in most aft useful load. However when most aft center of gravity of a configuration is forward of aft limit, addition of aft passengers will shift center of gravity further aft, and should be included in computation.

5-5-C. ALTERNATE LOADING

Gross weight center of gravity chart must be used to determine cabin loading requirements under following conditions:

1. Whenever cargo and/or baggage are carried.
2. When actual passenger weights are used.
3. When seating arrangement and/or fuel system are non-standard.
4. When performing specialty missions, such as hoisting or rappelling.

5-5-D. CABIN FLOOR LOADING

Cabin floor is structurally designed for 75 pounds per square foot (3.7 kilograms per 100 square centimeters).

5-6. BAGGAGE COMPARTMENT LOADING

When weight is loaded into baggage compartment, the pilot is required to compute weight and balance, regardless of passenger loading.

Baggage compartment is structurally designed for 86 pounds per square foot (4.2 kilograms per 100 square centimeters) for a total weight of 250 pounds (113.4 kilograms).

Loading of baggage compartment should be from front to rear. Load shall be secured to tiedown fittings if shifting of load in flight could result in structural damage to baggage compartment or in gross weight center of gravity being exceeded.

If load is not secured, center of gravity must be computed with load in most adverse position.

5-7. FUEL LOADING

Longitudinal center of gravity of fuel shifts as it is consumed (Figure 5-3). Extreme effects of fuel consumption on helicopter center of gravity for standard fuel system are as follows:

1. Critical fuel for computing most forward useful load is 74.8 gallons (283.0 liters).
2. Critical fuel for computing most aft useful load is 28.4 gallons (107.5 liters).

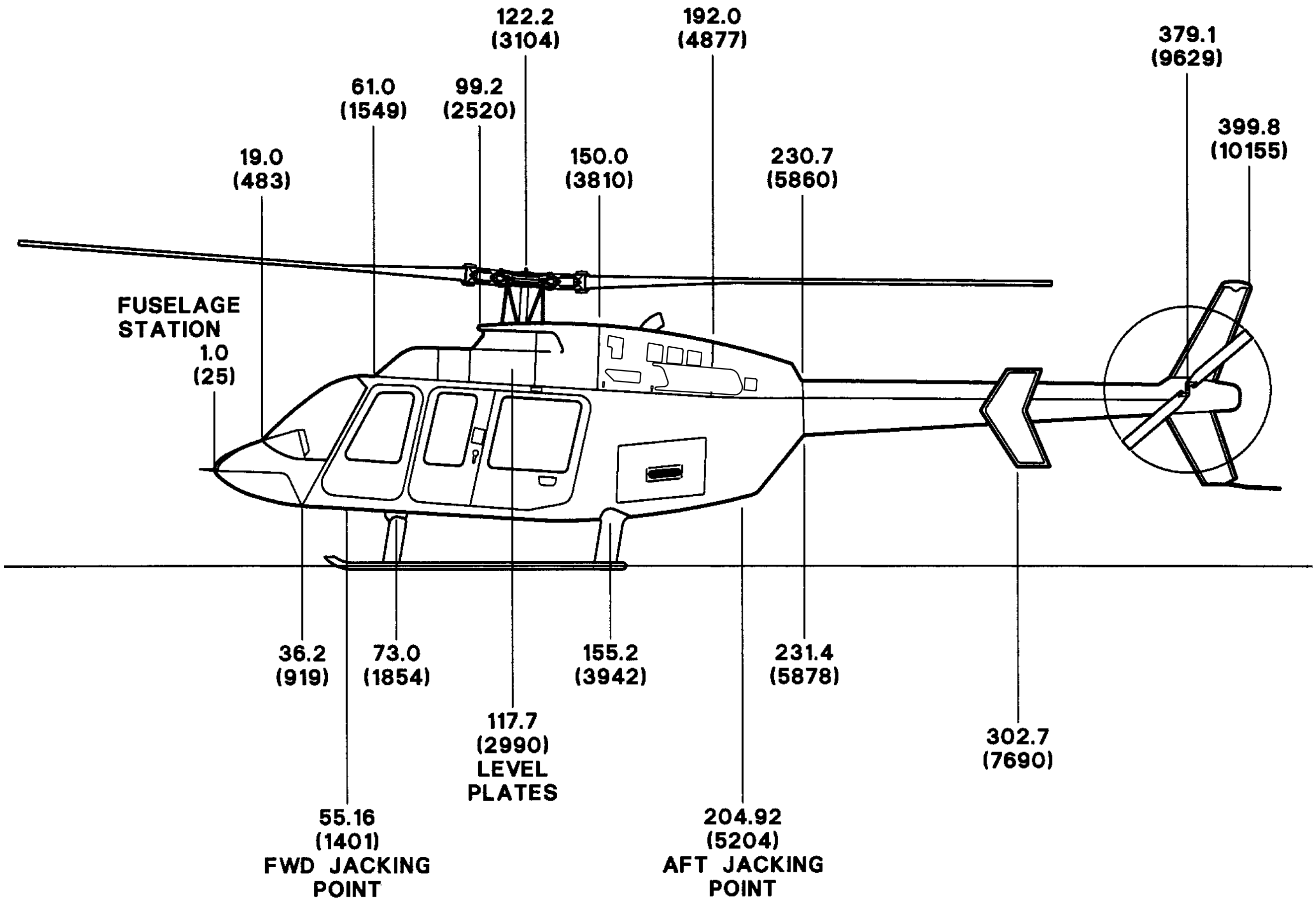
Fuel loading tables (Tables 5-4 and 5-5) list usable fuel quantities, weight and moments in both U.S. and metric units.

Fuel density vs temperature (Table 5-6), is provided to calculate fuel weight variation for equivalent volumes of fuel caused by a change in temperature. For example weight of 127.8 gallons (full fuel) of JP-5 at -40°F is 913.8 pounds (414.5 kilograms) versus 869.0 pounds (394.1 kilograms) shown on Fuel loading chart (Tables 5-4 and 5-5).

5-8. SAMPLE LOADING PROBLEM

A sample loading problem showing derivation of critical gross weights and center of gravity locations for a typical mission is presented in U.S. and metric units (Tables 5-7 and 5-8). Method shown derives a gross weight with zero fuel for each load condition to be checked, then adds appropriate fuel weight and moment read directly from Fuel loading table. Center of gravity for each condition is calculated by dividing total moment by total weight.

Forms have been provided (Tables 5-9 and 5-10) in both U.S. and Metric Units, to aid in computing critical load conditions for a flight.



NOTE

Reference datum line, (Fuselage Station 0), is located 55.16 inches (1401 millimeters) forward of the forward jack point center line.

407L-MD-1

Figure 5-1. Fuselage stations

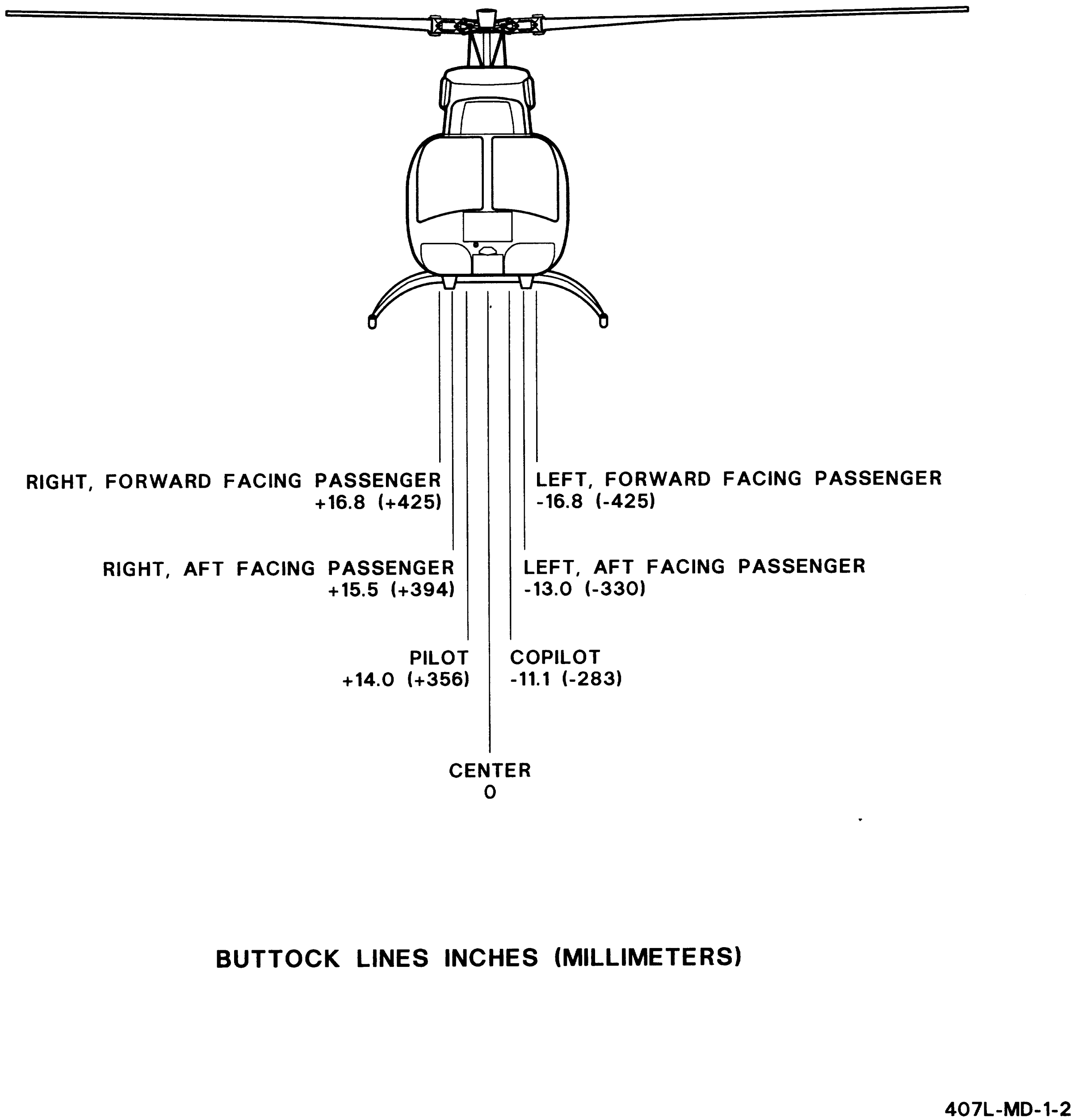
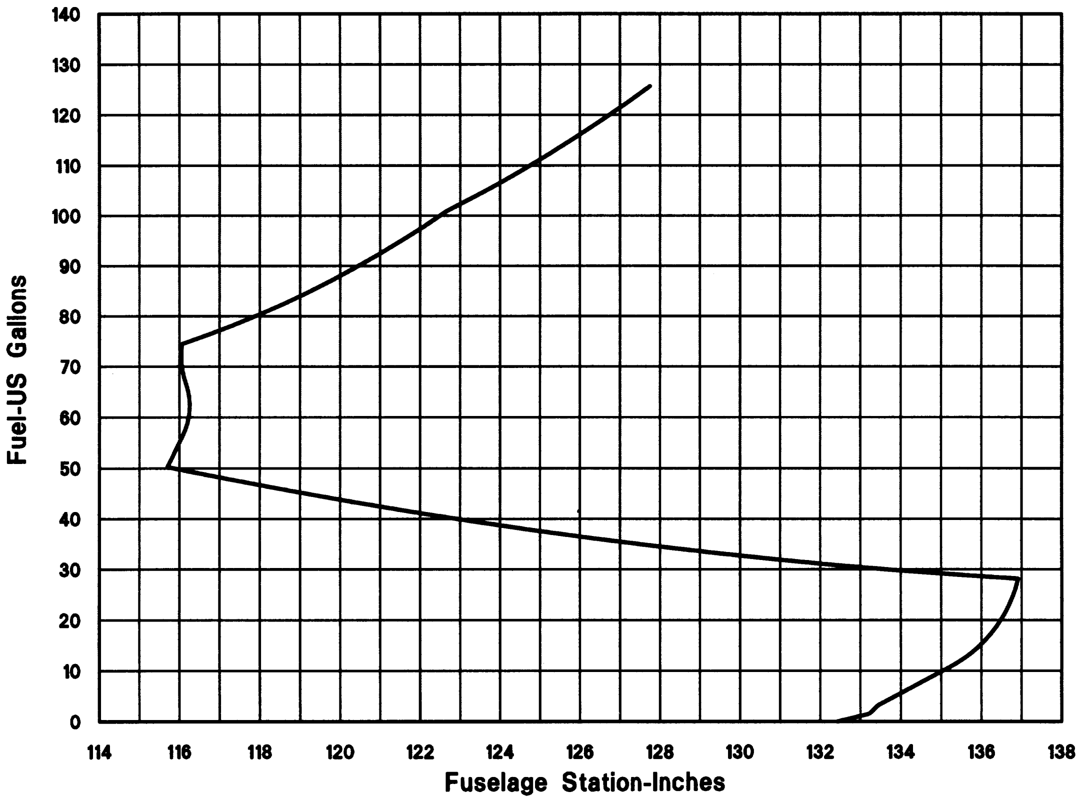


Figure 5-2. Buttock lines



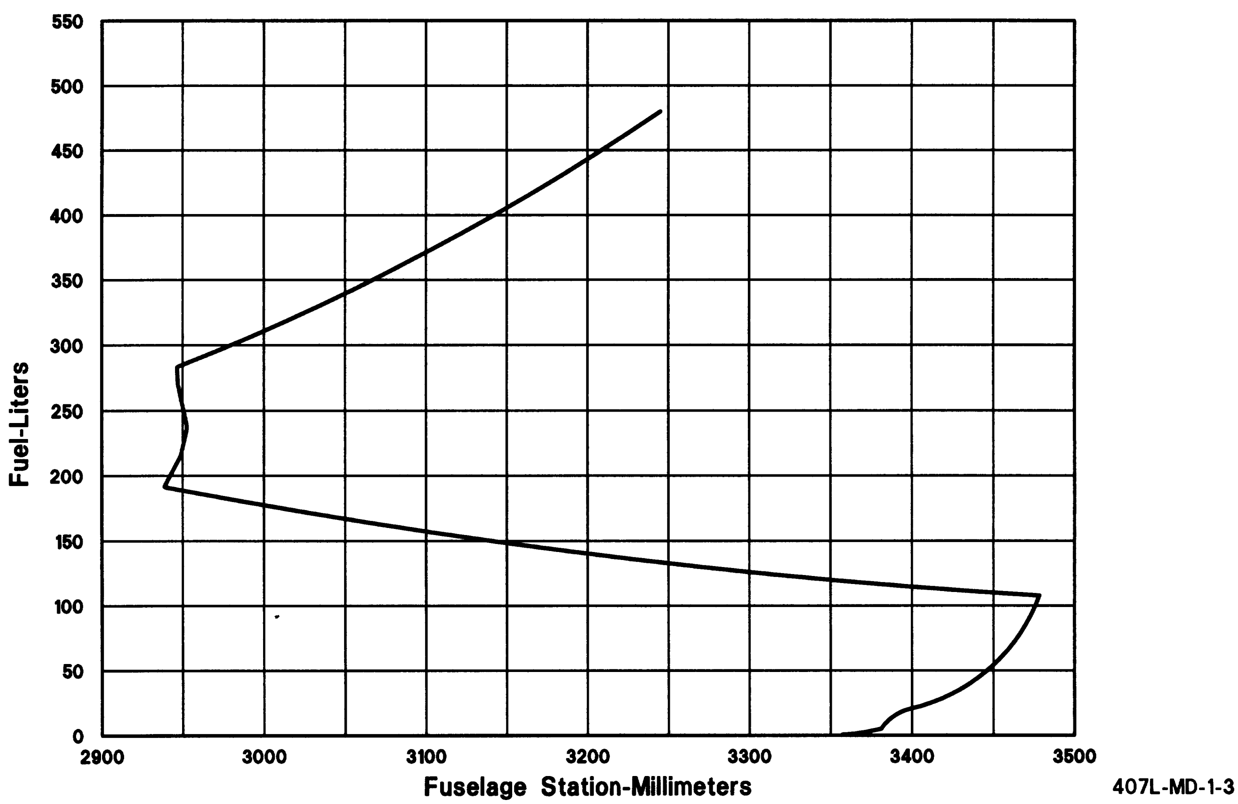


Figure 5-3. Fuel center of gravity

Table 5-1. Door Weights and Moments (U.S.)

DOOR	WEIGHT (LB)	LONGITUDINAL CG (IN)	LONGITUDINAL MOMENT (IN-LBS)	LATERAL CG (IN)	LATERAL MOMENT (IN-LBS)
One crew door	13	64	832	±26	±338
Both crew doors	26	64	1664	0	0
One passenger door	15	125	1875	±27	±405
Both passenger doors	30	125	3750	0	0
Left passenger door and litter door	29	111	3219	–27	–783

Door Weights and Moments (Metric)

DOOR	WEIGHT (kg)	LONGITUDINAL CG (mm)	LONGITUDINAL MOMENT (kg•mm/100)	LATERAL CG (mm)	LATERAL MOMENT (kg•mm/100)
One crew door	5.9	1626	95.9	±660	±38.9
Both crew doors	11.8	1626	191.9	0	0
One passenger door	6.8	3175	215.9	±686	±46.6
Both passenger doors	13.6	3175	431.8	0	0
Left passenger door and litter door	13.2	2819	372.1	–586	–90.6

(TABLE I.D. 911618)

Table 5-2. Cabin and baggage loading (U.S.)

CABIN AND BAGGAGE COMPARTMENT
TABLE OF MOMENTS
INCH-POUNDS

WEIGHT (LB)	FRONT SEAT FS 65	MID-PASS. (FACING AFT) FS 91	AFT-PASS. (FACING FWD) FS 129	LITTER PATIENT(S) FS 108	BAGGAGE FS 174
10	650	910	1290	1080	1740
20	1300	1820	2580	2160	3480
30	1950	2730	3870	3240	5220
40	2600	3640	5160	4320	6960
50	3250	4550	6450	5400	8700
60	3900	5460	7740	6480	10440
70	4550	6370	9030	7560	12180
80	5200	7280	10320	8640	13920
90	5850	8190	11610	9720	15660
100	6500	9100	12900	10800	17400
110	7150	10010	14190	11880	19140
120	7800	10920	15480	12960	20880
130	8450	11830	16770	14040	22620
140	9100	12740	18060	15120	24360
150	9750	13650	19350	16200	26100
160	10400	14560	20640	17280	27840
170	11050	15470	21930	18360	29580
180	11700	16380	23220	19440	31320
190	12350	17290	24510	20520	33060
200	13000	18200	25800	21600	34800
210	13650	19110	27090	22680	36540
220	14300	20020	28380	23760	38280
230	14950	20930	29670	24840	40020
240	15600	21840	30960	25920	41760
250	16250	22750	32250	27000	43500
260	16900	23660	33540	28080	
270	17550	24570	34830	29160	
280	18200	25480	36120	30240	
290	18850	26390	37410	31320	
300	19500	27300	38700	32400	
310	20150	28210	39990	33480	
320	20800	29120	41280	34560	
330	21450	30030	42570	35640	
340	22100	30940	43860	36720	
350	22750	31850	45150	37800	

(TABLE I.D. 911252)

Table 5-3. Cabin and baggage loading (Metric)

CABIN AND BAGGAGE COMPARTMENT
TABLE OF MOMENTS
(mm – kg)
100

WEIGHT (kg)	FRONT SEAT 1651.0 mm	MID-PASS. (FACING AFT) 2311.4 mm	AFT-PASS. (FACING FWD) 3276.6 mm	LITTER PATIENT(S) 2743.2 mm	BAGGAGE 4419.6 mm
5	82.6	115.6	163.8	137.2	221.0
10	165.1	231.1	327.7	274.3	442.0
15	247.7	346.7	491.5	411.5	622.9
20	330.2	462.3	655.3	548.6	883.9
25	412.8	577.9	819.2	685.8	1104.9
30	495.3	693.4	983.0	923.0	1325.9
35	577.9	809.0	1146.8	960.1	1546.9
40	660.4	924.6	1310.6	1097.3	1767.8
45	743.0	1040.1	1474.5	1234.4	1988.8
50	825.5	1155.7	1638.3	1371.6	2209.8
55	908.1	1271.3	1802.1	1508.8	2430.8
60	990.6	1386.8	1966.0	1645.9	2651.8
65	1073.2	1502.4	2129.8	1783.1	2872.7
70	1155.7	1618.0	2293.6	1920.2	3093.7
75	1238.3	1733.6	2457.5	2057.4	3314.7
80	1320.8	1849.1	2621.3	2194.6	3535.7
85	1403.4	1964.7	2785.1	2331.7	3756.7
90	1485.9	2080.3	2948.9	2468.9	3977.6
95	1568.5	2195.8	3112.8	2606.0	4198.6
100	1651.0	2311.4	3276.6	2743.2	4419.6
105	1733.6	2427.0	3440.4	2880.4	4640.6
110	1816.1	2542.4	3604.3	3017.5	4861.6
113.4	1872.2	2621.1	3715.7	3110.8	5011.8
115	1898.7	2658.1	3768.1	3154.7	
120	1981.2	2773.7	3931.9	3291.8	
125	2063.8	2889.3	4095.8	3429.0	
130	2146.3	3004.8	4259.6	3566.2	
135	2228.9	3120.4	4423.4	3703.3	
140	2311.4	3236.0	4587.2	3840.5	
145	2394.0	3351.5	4751.1	3977.6	
150	2476.5	3467.1	4914.9	4114.8	

(TABLE I.D. 911251)

Table 5-4. Fuel Loading (U.S.)

QUANTITY (U.S. GAL)	JP-4 WEIGHT (LBS)	LONGITUDINAL CG (IN)	LONGITUDINAL MOMENT (IN-LBS)	QUANTITY (U.S. GAL)	JP-5 WEIGHT (LBS)	LONGITUDINAL CG (IN)	LONGITUDINAL MOMENT (IN-LBS)
5	32.5	133.7	4,345	5	34.0	133.7	4,546
10	65.0	135.0	8,775	10	68.0	135.0	9,180
15	97.5	135.9	13,250	15	102.0	135.9	13,862
20	130.0	136.4	17,732	20	136.0	136.4	18,550
25	162.5	136.7	22,214	25	170.0	136.7	23,239
28.4△	184.6	137.0	25,290	28.4△	193.1	137.0	26,455
30	195.0	134.3	26,189	30	204.0	134.3	27,397
35	227.5	127.8	29,075	35	238.0	127.8	30,416
40	260.0	122.9	31,954	40	272.0	122.9	33,429
45	292.5	119.1	34,837	45	306.0	119.1	36,445
50	325.0	116.0	37,700	50	340.0	116.0	39,440
50.6**	328.9	115.7	38,054	50.6**	344.1	115.7	39,812
55	357.5	116.1	41,506	55	374.0	116.1	43,421
60	390.0	116.2	45,318	60	408.0	116.2	47,410
65	422.5	116.2	40,095	65	442.0	116.2	51,360
70	455.0	116.1	52,826	70	476.0	116.1	55,264
74.8☐	486.2	116.0	56,399	74.8☐	508.6	116.0	58,998
75	487.5	116.1	56,599	75	510.0	116.1	59,211
80	520.0	117.7	61,204	80	544.0	117.7	64,029
85	552.5	119.0	65,748	85	578.0	119.0	68,782
90	585.0	120.3	70,376	90	612.0	120.3	73,624
95	617.5	121.4	74,965	95	646.0	121.4	78,424
100	650.0	122.3	79,495	100	680.0	122.3	83,164
105	682.5	123.4	84,221	105	714.0	123.4	88,108
110	715.0	124.6	89,089	110	748.0	124.6	93,201
115	747.5	125.6	93,886	115	782.0	125.6	98,219
120	780.0	126.6	98,748	120	816.0	126.6	103,306
125	812.5	127.5	103,504	125	850.0	127.5	108,375
127.8★	830.7	127.9	106,247	127.8★	869.0	127.9	111,145

△ CRITICAL FUEL FOR MOST AFT C.G. CONDITION
** MOST FORWARD FUEL C.G.
☐ CRITICAL FUEL FOR MOST FORWARD C.G. CONDITION)
★ FULL FUEL

(TABLE I.D. 911580)

Table 5-5. Fuel Loading (Metric)

		LONGITUDINAL				LONGITUDINAL	
QUANTITY (LITERS)	JP-4 WEIGHT (kg)	CG (mm)	MOMENT (kg•mm/100)	QUANTITY (LITERS)	JP5,JP-8 WEIGHT (kg)	CG (mm)	MOMENT (kg•mm/100)
15	11.7	3389	397	15	12.2	3389	413
30	23.4	3415	799	30	24.4	3415	833
45	35.0	3439	1204	45	36.7	3439	1262
60	46.7	3455	1613	60	48.9	3455	1689
75	58.4	3465	2024	75	61.1	3465	2117
90	70.1	3472	2434	90	73.3	3472	2545
105	81.8	3478	2845	105	85.6	3478	2977
107.5Δ	83.7	3479	2912	107.5Δ	87.6	3479	3048
120	93.5	3352	3134	120	97.8	3352	3278
135	105.1	3228	3393	135	110.0	3228	3551
150	116.8	3129	3655	150	122.2	3129	3824
165	128.5	3049	3918	165	134.4	3049	4098
180	140.2	2982	4181	180	146.7	2982	4375
191.6**	149.2	2938	4383	191.6**	156.1	2938	4586
195	151.9	2940	4466	195	158.9	2940	4672
210	163.6	2949	4825	210	171.1	2949	5046
225	175.2	2951	5170	225	183.3	2951	5409
240	186.9	2953	5519	240	195.6	2953	5776
255	198.6	2950	5859	255	207.8	2950	6130
270	210.3	2948	6200	270	220.0	2948	6486
283.0□	220.4	2948	6497	283.0□	230.6	2948	6798
285	222.0	2951	6551	285	232.2	2951	6852
300	233.7	2983	6971	300	244.5	2983	7293
315	245.3	3012	7388	315	256.7	3012	7732
330	257.0	3038	7808	330	268.9	3038	8169
345	268.7	3061	8225	345	281.1	3061	8604
360	280.4	3083	8645	360	293.3	3083	9042
375	292.1	3103	9064	375	305.6	3103	9483
390	303.8	3123	9488	390	317.8	3123	9925
405	315.4	3147	9926	405	330.0	3147	10385
420	327.1	3169	10366	420	342.2	3169	10844
435	338.8	3190	10808	435	354.5	3190	11309
450	350.5	3210	11251	450	366.7	3210	11771
465	362.2	3228	11692	465	378.9	3228	12231
480	373.9	3245	12133	480	391.1	3245	12691
483.7★	376.7	3249	12239	483.7★	394.1	3249	12804

Δ CRITICAL FUEL FOR MOST AFT C.G. CONDITION
** MOST FORWARD FUEL C.G.
□ CRITICAL FUEL FOR MOST FORWARD C.G. CONDITION)
★ FULL FUEL

(TABLE I.D. 911579)

Table 5-6. Fuel Density vs Temperature

TEMPERATURE DEG F	DENSITY LBS/GALLON	DENSITY LBS/GALLON	TEMPERATURE DEG C	DENSITY kg/liter	DENSITY kg/liter
	JP-4	JP-5		JP-4	JP-5
120	6.27	6.59	40	0.759	0.797
100	6.35	6.66	30	0.767	0.805
80	6.42	6.73	20	0.775	0.812
60*	6.50	6.80	15.56*	0.779	0.815
40	6.58	6.87	10	0.784	0.820
20	6.65	6.94	0	0.792	0.827
0	6.73	7.01	–10	0.800	0.835
–20	6.80	7.08	–20	0.808	0.842
–40	6.88	7.15	–30	0.816	0.850
			–40	0.824	0.857

*Standard density, used to derive fuel burn curves

(TABLE I.D. 911576)

Table 5-7. Sample Loading Problem (U.S.)

A helicopter is chartered to transport 4 passengers plus pilot and 200 pounds of baggage on a trip that will require approximately 113 gallons of JP-5 fuel (one way). The pilot will return alone. Compute weight and center of gravity at takeoff and landing, and determine extreme cg conditions for both flights.

OUTBOUND FLIGHT

	Weight (Lbs)	Longitude CG (In)	Longitude Moment (In-Lbs)	Latitude CG (In)	Latitude Moment (In-Lbs)
Weight Empty	★2824.1	131.0	369957	0.1	317
+Oil	13.0	205.0	2665	0.0	0
+Pilot	200.0	65.0	13000	14.0	2800
+Forward Passenger	200.0	65.0	13000	−11.1	−2220
+Mid Passenger (1)	180.0	91.0	16380	15.5	2790
+Aft Passenger (2)	320.0	129.0	41280	0.0	0
+Baggage	200.0	174.0	34800	0.0	0
Gross Weight at Zero Fuel	3937.1	124.7	491082	0.9	3687
+Full Fuel (JP-5)	869.0	127.9	111145	0.0	0
Takeoff Gross Weight	4806.1√	125.3√	602227	0.8√	3687
Gross Weight at Zero Fuel	3937.1	124.7	491082	0.9	3687
+Critical Fuel for Most Forward	508.6	116.0	58998	0.0	0
Most Forward CG Condition	4445.7√	123.7√	550080	0.8√	3687
Gross Weight at Zero Fuel	3937.1	124.7	491082	0.9	3687
+Critical Fuel for Most Aft	193.1	137.0	26455	0.0	0
Most Aft CG Condition	4130.2√	125.3√	517537	0.9√	3687
Gross Weight at Zero Fuel	3937.1	124.7	491082	0.9	3687
+Fuel Remaining at Landing (14.8 gal)	100.6	135.9	13672	0.0	0
Landing Condition	4037.7√	125.0√	504754	0.9√	3687

RETURN FLIGHT

	Weight (Lbs)	Longitude CG (In)	Longitude Moment (In-Lbs)	Latitude CG (In)	Latitude Moment (In-Lbs)
Weight Empty	★2824.1	131.0	369957	0.1	317
+Oil	13.0	205.0	2665	0.0	0
+Pilot	200.0	65.0	13000	14.0	2800
Gross Weight at Zero Fuel	3037.1	127.0	385622	1.0	3117
+Full Fuel (JP-5)	869.0	127.9	111145	0.0	0
Takeoff Gross Weight	3906.1√	127.2√	496767	0.8√	3117
Gross Weight at Zero Fuel	3037.1	127.0	385622	1.0	3117
+Critical Fuel for Most Forward	508.6	116.0	58998	0.0	0
Most Forward CG Condition	3545.7√	125.4√	444620	0.9√	3117
Gross Weight at Zero Fuel	3037.1	127.0	385622	1.0	3117
+Critical Fuel for Most Aft	193.1	137.0	26455	0.0	0
Most Aft CG Condition	3230.2√	127.6√	412077	1.0√	3117
Gross Weight at Zero Fuel	3037.1	127.0	385622	1.0	3117
+Fuel Remaining at Landing (14.8 gal)	100.6	135.9	13672	0.0	0
Landing Condition	3137.7√	127.3√	399294	1.0√	3117

★ Example only. Refer to Actual Weight Record for actual Weight Empty data.

√ A check of the weight and cg values against the gross weight center of gravity limits chart shows that the loading will be within limits throughout flight. In lateral calculations, – is left side and + is right side.

(TABLE I.D. 911582)

Table 5-8. Sample Loading Problem (Metric)

A helicopter is chartered to transport 4 passengers and 90.7 kilograms of baggage on a trip that will require approximately 427 liters of JP-5 fuel (one way). The pilot will return alone. Compute weight and center of gravity at takeoff and landing, and determine extreme cg conditions for both flights.

OUTBOUND FLIGHT

		LONGITUDE		LATITUDE	
	WEIGHT (kg)	CG (mm)	MOMENT (kg•mm/100)	CG (mm)	MOMENT (kg•mm/100)
Weight Empty	★1281.0	3327	42618.9	3	36.7
+Oil	5.9	5207	307.2	0	0.0
+Pilot	90.7	1651	1497.5	356	322.9
+Forward Passenger	90.7	1651	1497.5	–283	–256.7
+Mid Passenger (1)	81.6	2311	1885.8	394	321.5
+Aft Passenger (2)	145.2	3277	4758.2	0	0.0
+Baggage	90.7	4420	4008.9	0	0.0
Gross Weight at Zero Fuel	1785.8	3168	56573.9	24	424.4
+Full Fuel (JP-5)	394.1	3249	12804.3	0	0.0
Takeoff Gross Weight	2179.9√	3183√	69378.2	19√	424.4
Gross Weight at Zero Fuel	1785.8	3168	56573.9	24	424.4
+Critical Fuel for Most Forward	230.6	2948	6798.1	0	0.0
Most Forward CG Condition	2016.4√	3143√	63372.0	21√	424.4
Gross Weight at Zero Fuel	1785.8	3168	56573.9	24	424.4
+Critical Fuel for Most Aft	87.6	3479	3047.6	0	0.0
Most Aft CG Condition	1873.4√	3183√	59621.5	23√	424.4
Gross Weight at Zero Fuel	1785.8	3168	56573.9	24	424.4
+Fuel Remaining at Landing (56.7 liters)	46.2	3469	1602.7	0	0.0
Landing Condition	1832.0√	3176√	58176.6	23√	424.4

RETURN FLIGHT

	WEIGHT (kg)	CG (mm)	MOMENT (kg•mm/100)	CG (mm)	MOMENT (kg•mm/100)
Weight Empty	★1281.0	3327	42618.9	3	36.7
+Oil	5.9	5207	307.2	0	0.0
+Pilot	90.7	1651	1497.5	356	322.9
Gross Weight at Zero Fuel	1377.6	3225	44423.5	26	359.6
+Full Fuel (JP-5)	394.1	3249	12804.3	0	0.0
Takeoff Gross Weight	1771.7√	3230√	57227.8	20√	359.6
Gross Weight at Zero Fuel	1377.6	3225	44423.5	26	359.6
+Critical Fuel for Most Forward	230.6	2948	6798.1	0	0.0
Most Forward CG Condition	1608.2√	3185√	51221.6	22√	359.6
Gross Weight at Zero Fuel	1377.6	3225	44423.5	26	359.6
+Critical Fuel for Most Aft	87.6	3479	3047.6	0	0.0
Most Aft CG Condition	1465.2√	3240√	47471.1	25√	359.6
Gross Weight at Zero Fuel	1377.6	3225	44423.5	26	359.6
+Fuel Remaining at Landing (56.7 liters)	46.2	3469	1602.7	0	0.0
Landing Condition	1423.8√	3233√	46026.2	25√	359.6

★ Example only. Refer to Actual Weight Record for actual Weight Empty data.

√ A check of the weight and cg values against the gross weight center of gravity limits chart shows that the loading will be within limits throughout flight. In lateral calculations, – is left side and + is right side.

(TABLE I.D. 911581)

Table 5-9. Weight and Balance Worksheet (U.S.)

WEIGHT AND BALANCE WORKSHEET (U.S.)					
		LONGITUDINAL		LATERAL	
	WEIGHT (LBS)	ARM (IN)	MOMENT (IN-LBS)	ARM (IN)	MOMENT (IN-LBS)
Weight Empty					
+Oil	13.0	205.0	2665	0.0	0
+Pilot		65.0		14.0	
+Forward Passenger		65.0		–11.1	
+Mid Passenger (L)		91.0		–13.0	
+Mid Passenger (R)		91.0		15.5	
+Aft Passenger (L)		129.0		–16.8	
+Aft Passenger (M)		129.0		0.0	
+Aft Passenger (R)		129.0		16.8	
+Baggage					
+Litter					
Gross Weight at Zero Fuel					
+Fuel				0.0	0
Takeoff Gross Weight					
Gross Weight at Zero Fuel					
+Critical Fuel for Most Forward		116.0		0.0	0
Most Forward CG Condition					
Gross Weight at Zero Fuel					
+Critical Fuel for Most Aft		137.0		0.0	0
Most Aft CG Condition					
Gross Weight at Zero Fuel					
+Fuel Remaining at Landing				0.0	0
Landing CG Condition					

(TABLE I.D. 911578)

Table 5-10. Weight and Balance Worksheet (Metric)

WEIGHT AND BALANCE WORKSHEET (METRIC)					
		LONGITUDINAL		LATERAL	
	WEIGHT (kg)	ARM (mm)	MOMENT (kg•mm/100)	ARM (mm)	MOMENT (kg•mm/100)
Weight Empty					
+Oil	5.9	5207	307.2	0	0.0
+Pilot		1651		356	
+Forward Passenger		1651		−283	
+Mid Passenger (L)		2311		−330	
+Mid Passenger (R)		2311		394	
+Aft Passenger (L)		3277		−425	
+Aft Passenger (M)		3277		0	
+Aft Passenger (R)		3277		425	
+Baggage					
+Litter					
Gross Weight at Zero Fuel					
+Fuel				0	0.0
Takeoff Gross Weight					
Gross Weight at Zero Fuel					
+Critical Fuel for Most Forward		2948		0	0.0
Most Forward CG Condition					
Gross Weight at Zero Fuel					
+Critical Fuel for Most Aft		3479		0	0.0
Most Aft CG Condition					
Gross Weight at Zero Fuel					
+Fuel Remaining at Landing				0	0.0
Landing Condition					

(TABLE I.D. 911577)

Appendix A

OPTIONAL EQUIPMENT SUPPLEMENTS

TABLE OF CONTENTS

LIST OF TABLES

Appendix A

OPTIONAL EQUIPMENT SUPPLEMENTS

A-1. OPTIONAL EQUIPMENT

Bell Helicopter Textron's policy is one of continuous product improvement and Bell reserves the right to incorporate changes, make additions to and improve its products without imposing any obligation upon the company to furnish for or install such changes, additions, improvement, etc., on its products previously manufactured.

The following items may be installed on the basic helicopter by authorized personnel. Only the optional equipment listed in this section require a Flight Manual Supplement.

Table A-1. Flight Manual Supplements for Optional Equipment

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	CURRENT REVISION
BHT-407-FMS-1 Lightweight Emergency Flotation Landing Gear	407-706-008	11 APR 96	Original
BHT-407-FMS-2 High Skid Gear	407-706-007	14 FEB 96	Original
BHT-407-FMS-3 Particle Separator	206-706-212	1 MAR 96	Reissue 16 DEC 02
BHT-407-FMS-4 Snow Deflector	206-706-208	1 MAR 96	Reissue 16 DEC 02
BHT-407-FMS-5 Cargo Hook	206-706-341	14 FEB 96	Rev. 1 04 SEP 98
BHT-407-FMS-6 Auxiliary Fuel Kit	407-706-011	20 MAR 96	Original
BHT-407-FMS-7 Litter(s) Kit	407-706-631 or 407-799-100 or 407-799-001	14 FEB 96	Rev. 1 16 SEP 99
BHT-407-FMS-10 Helicopters Registered In U.S.A.			CANCELLED
BHT-407-FMS-17 Cargo Tie-down Provisions Kit	407-705-201	1 APR 96	Original
BHT-407-FMS-20 KLN 89B GPS Navigator	407-705-001	14 FEB 96	Rev. 1 26 NOV 96
BHT-407-FMS-21 Fire Detection System	407-799-004 or 407-706-015	2 MAY 96	Reissue 08 SEP 98

Table A-1. Flight Manual Supplements for Optional Equipment (Cont)

NAME OF EQUIPMENT	KIT NUMBER	DATE CERTIFIED	CURRENT REVISION
BHT-407-FMS-22 Auxiliary Vertical Fin Strobe Lights	407-899-023	10 MAY 96	Original
BHT-407-FMS-23 Ryan Traffic Collision Avoidance Device	407-899-022	15 MAY 96	Original
BHT-407-FMS-25 Quiet Cruise Mode	407-706-016	8 MAY 98	Reissue 17 DEC 02
BHT-407-FMS-26 Modified Hydromechanical Unit			CANCELED
BHT-407-FMS-27 FADEC Software 5.201			CANCELED
BHT-407-FMS-28 Increased Internal Gross Weight	407-706-020	16 MAR 99	Reissue 16 DEC 02
BHT-407-FMS-29 Airspeed Actuated Pedal Stop			CANCELED
BHT-407-FMS-CAA United Kingdom Registered Helicopters		08 JAN 02	Original
BHT-407-FMS-IAC AR Interstate Aviation Committee — Aviation Register Commonwealth of Independent States	407-706-021	20 MAY 99	Original
BHT-407-FMS-32 Hanger Bearing Vibration Monitor Kit (not distributed to all customers)	407-706-023	15 July 03	Original

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

LIGHTWEIGHT EMERGENCY FLOTATION LANDING GEAR

407-706-008

CERTIFIED
11 APRIL 1996

This supplement shall be attached to Model 407 Flight Manual when 407-706-008 Lightweight Emergency Flotation Landing Gear kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

Lightweight emergency flotation landing gear kit (407-706-008) will allow helicopter to land in water during an emergency situation. Kit consists of six skid mounted pop-out float bags, an inflation system with electrically operated solenoid valves, and attaching hardware. Two pneumatic charging bottles, located on underside of helicopter, are interconnected by a pneumatic line that will cause charging bottle valve to open in event that its solenoid valve fails while floats are being inflated. Each float assembly is equipped with an inlet check valve, high pressure relief valve which opens at 5.25 PSIG ± 0.25 PSI and a finger operated manual stop-cock/inflation valve. A GEN FAIL caution light alerts pilot of generator failure and of battery power possibly being insufficient to inflate floats. Float inflation time is approximately 5 seconds.

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Emergency floats are installed for assistance during emergency ditching.

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

1-7. AIRSPEED

1-7-A. FLOATS STOWED

Floats stowed, covers installed — Same as basic helicopter.

1-7-B. FLOATS INFLATED

Maximum arming/inflation airspeed is 60 KIAS.

Maximum allowable airspeed, floats inflated, is 60 KIAS.

Maximum autorotation airspeed, floats inflated, is 60 KIAS.

1-8. ALTITUDE

Maximum inflation altitude is 5000 feet H_P.

1-9. MANEUVERING

1-9-B. CLIMB AND DESCENT

Maximum rate of climb with floats inflated is 1000 feet per minute.

1-20. INSTRUMENT MARKINGS AND PLACARDS

FLOAT ARMING/INFLATION ABOVE 60 KIAS PROHIBITED

Section 2

NORMAL PROCEDURES

2-3. PREFLIGHT CHECK

1. Floats — Stowed.
2. Nitrogen lines — Condition and security.
3. Float covers — Clean and secured.
4. Float inflation cylinders — Check for proper inflation pressure vs temperature and altitude. Refer to placard on cylinders. Check electrical connectors for security.

2-4. INTERIOR AND PRESTART CHECK

2-4-A. PREFLIGHT FLOAT SYSTEM CHECK

1. BATT switch — BATT. With GEN switch OFF, verify GEN FAIL light illuminates.

CAUTION

IF *GEN FAIL* LIGHT DOES NOT ILLUMINATE, MONITOR VOLTMETER TO DETERMINE GENERATOR OPERATION. IF VOLTAGE DROPS BELOW 25 VOLTS, PERFORM GEN FAIL CORRECTIVE ACTION PER TABLE 3-1.

2. FLOAT ARM switch — Down, guard closed.
3. FLOATS circuit breaker — Check in.
4. FLOAT TEST and FLOAT ARM lights — Press C/W LT TEST button.
5. FLOAT TEST button — Press and hold.
6. FLOAT INFLATE button — Press; check FLOAT TEST light illuminates. Release button, check light extinguishes.
7. FLOAT TEST button — Release.
8. FLOAT ARM switch — Up, guard open. Check FLOAT ARM light illuminates, then switch down, guard closed. Check light extinguishes.

2-9. IN-FLIGHT OPERATIONS

2-9-A. OVER WATER OPERATIONS

1. FLOAT ARM switch — Up, guard open.
2. FLOAT ARM light — illuminated.

CAUTION

DURING FLIGHT AT ALTITUDES ABOVE 500 FEET AGL AND AT AIRSPEEDS OF 60 KIAS AND ABOVE, SYSTEM SHOULD BE DEACTIVATED BY PLACING *FLOAT ARM* SWITCH TO DOWN POSITION AND CLOSING GUARD.

3. Rearm system prior to landing.

2-9-B. OVER LAND OPERATIONS

FLOAT ARM switch — Down, guard closed.

2-10. DESCENT AND LANDING

WARNING

IF CG IS AFT OF STATION 126, PRACTICE TOUCHDOWN AUTOROTATIONS SHALL BE AVOIDED DUE TO NOSEDOWN PITCHING.

RUN-ON LANDINGS, ON OTHER THAN A HARD FIRM SURFACE, SHOULD BE EXERCISED WITH CAUTION.

NOTE

Tail-low run-on landings should be avoided to prevent nosedown pitching.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-1. INTRODUCTION

Table 3-1 presents fault conditions and corrective actions for cautions lights.

WARNING

IF *GEN FAIL* LIGHT ILLUMINATES, BATTERY POWER MAY NOT BE SUFFICIENT TO INFLATE FLOATS. IF VOLTAGE DROPS BELOW 25 VOLTS, PERFORM GEN FAIL CORRECTIVE ACTION PER TABLE 3-1.

Table 3-1.

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
GEN FAIL	Generator not connected to DC buss.	Verify fault with AMP or VOLT gage. Over land: GEN switch — RESET, then ON. If GEN FAIL light remains illuminated or voltage drops below 25 volts, switch — OFF. Land as soon as practical.

Table 3-1. (Cont)

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
		Over water: GEN switch — RESET, then ON. If GEN FAIL light remains illuminated or voltage drops below 25 volts, switch — OFF. Turn off all nonessential electrical equipment to conserve battery power. Land as soon as practical.

3-15. EMERGENCY FLOAT INFLATION

1. Reduce airspeed below maximum inflation airspeed — 60 KIAS.

2. Establish autorotation or low power descent at approximately 500 feet per minute.

NOTE

If floats are inflated in level flight, there is a possibility that floats will not align, which will allow right or left forward bag to oscillate. If this occurs, a low power descent will align float bags and stop oscillation.

3. FLOAT ARM switch — Up, guard open.

4. FLOAT ARM light — illuminated.

CAUTION

MAXIMUM INFLATION ALTITUDE IS 5000 H_P.

5. FLOAT INFLATE button — Press.

3-16. AFTER EMERGENCY WATER LANDING

WARNING

FLIGHT FOLLOWING A WATER LANDING IS PROHIBITED.

Section 4

PERFORMANCE

4-5. HOVER CEILING

4-5-A. IN-GROUND-EFFECT HOVER

Subtract 50 pounds (22.68 kilograms) from IGE hover gross weight for takeoff power or maximum continuous power.

4-5-B. OUT-OF-GROUND-EFFECT HOVER

Out-of-ground-effect hover performance is same as basic helicopter.

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT
HIGH SKID GEAR

407-706-007

CERTIFIED
14 FEBRUARY 1996

This supplement shall be attached to Model 407 Flight Manual when High Skid Gear kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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for K.J. Mansfield
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GENERAL INFORMATION

High skid landing gear kit (407-706-007) provides approximately 8.75 inches (222.25 millimeters) of additional ground clearance over standard skid gear.

Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

Section 2

NORMAL PROCEDURES

2-10. DESCENT AND LANDING

Tail-low run-on landings should be avoided to prevent nosedown pitching.

WARNING

RUN-ON LANDINGS ON OTHER THAN A HARD, FIRM SURFACE SHOULD BE EXERCISED WITH CAUTION.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

4-5. HOVER CEILING

4-5-A. IN-GROUND-EFFECT HOVER

Subtract 50 pounds (22.68 kilograms) from IGE hover gross weight for takeoff power or maximum continuous power.

4-5-B. OUT- OF-GROUND-EFFECT HOVER

Out-of-ground-effect hover performance is same as basic helicopter.

MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

PARTICLE SEPARATOR

206-706-212

CERTIFIED
1 MARCH 1996

This supplement shall be attached to Model 407 Flight Manual when Particle Separator is installed.

Information contained herein supplements information of basic Flight Manual. For limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

Bell particle separator kit (206-706-212) consists of particle separator, bleed air tubing and hose, electrical cable and required hardware for installation.

This supplement incorporates performance information for various combinations of Bell kits. It also includes limitations and operating procedures made necessary because of kit combinations. This supplement is not intended to replace approved supplements for other optional equipment, but should be used in conjunction with such supplements.

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Particle separator can be removed and the engine air intake screen installed to attain basic helicopter performance.

1-5. CONFIGURATION

1-5-A. OPTIONAL EQUIPMENT

For operations with particle separator installed in conjunction with 206-706-208 snow deflector, refer to LIMITATIONS section and PERFORMANCE section of snow deflector supplement (BHT-407-FMS-4).

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits.

Section 2

NORMAL PROCEDURES

2-7. BEFORE TAKEOFF

1. PART SEP purge switch – As required.

2-7-A. BEFORE FLIGHT WHEN OPERATING IN SNOW CONDITIONS

1. Thoroughly check cabin roof, transmission cowling, deflector baffles and engine air intake areas. All areas checked shall be clean and free of accumulated snow, slush, and ice before each flight.
2. Check engine air plenum chamber through plexiglass windows on each side of inlet cowling for snow, slush, or ice, paying particular attention to firewalls and rear face of particle separator. Clean thoroughly before each flight.

2-9. IN-FLIGHT OPERATIONS

1. PART SEP purge switch – As required.

2-10. DESCENT AND LANDING

1. PART SEP purge switch – As required.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

4-2. POWER ASSURANCE CHECK

Performance is reduced with particle separator installed. This reduction increases with use of particle separator purge and is primarily result of bleed air being taken from engine. A Power assurance check chart (Figure 4-1) is provided to determine if engine can produce installed power.

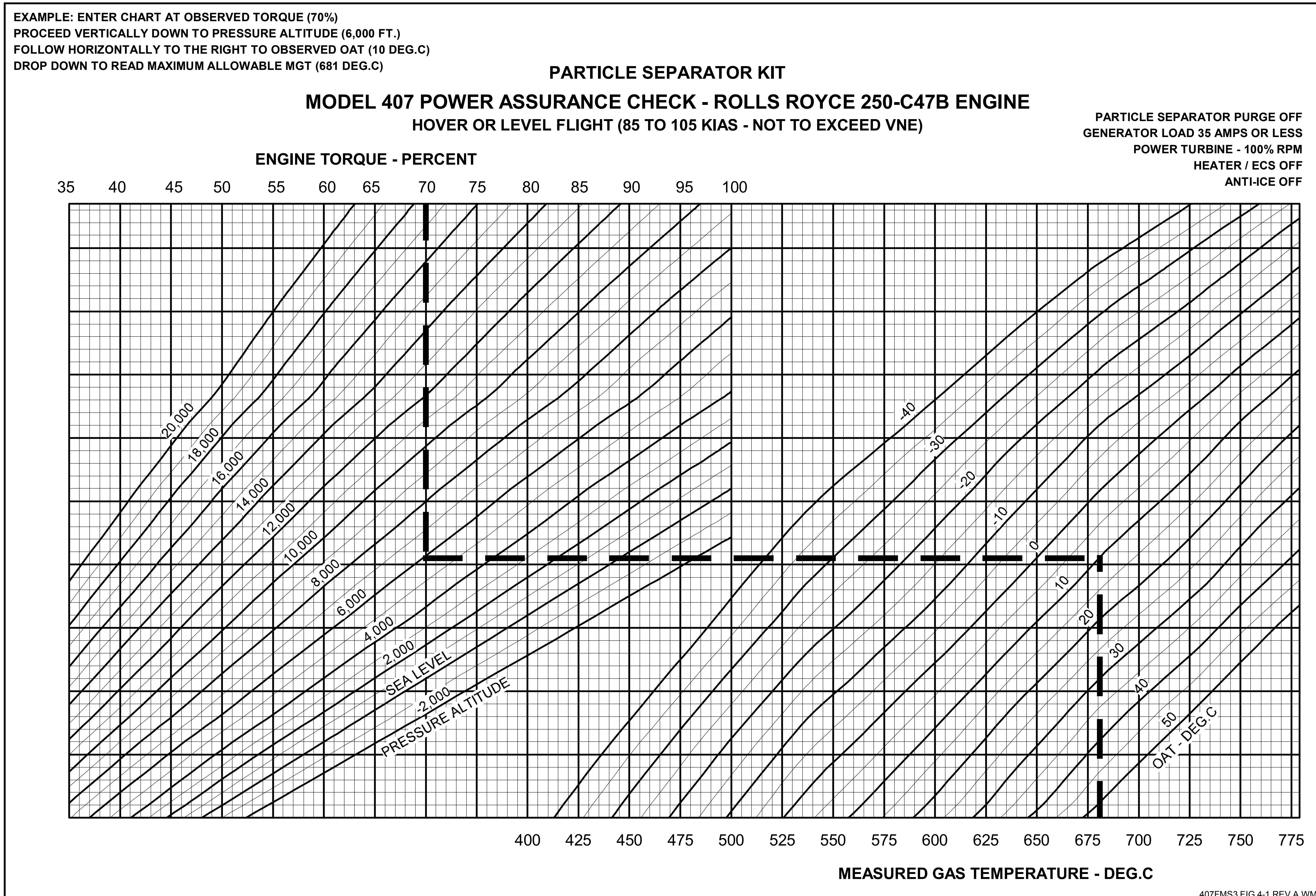


Figure 4-1. Power assurance check

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

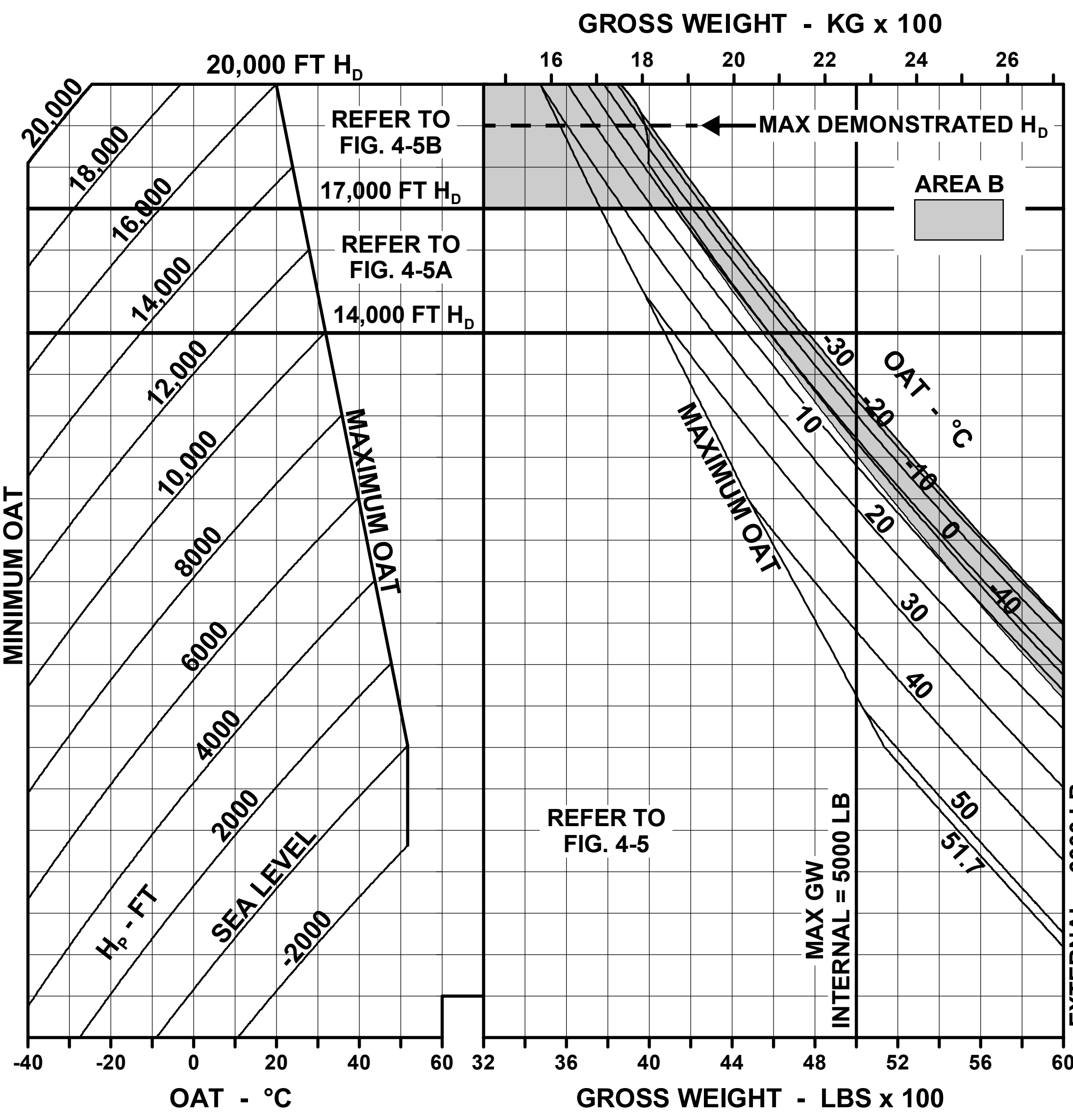


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 1 of 4)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

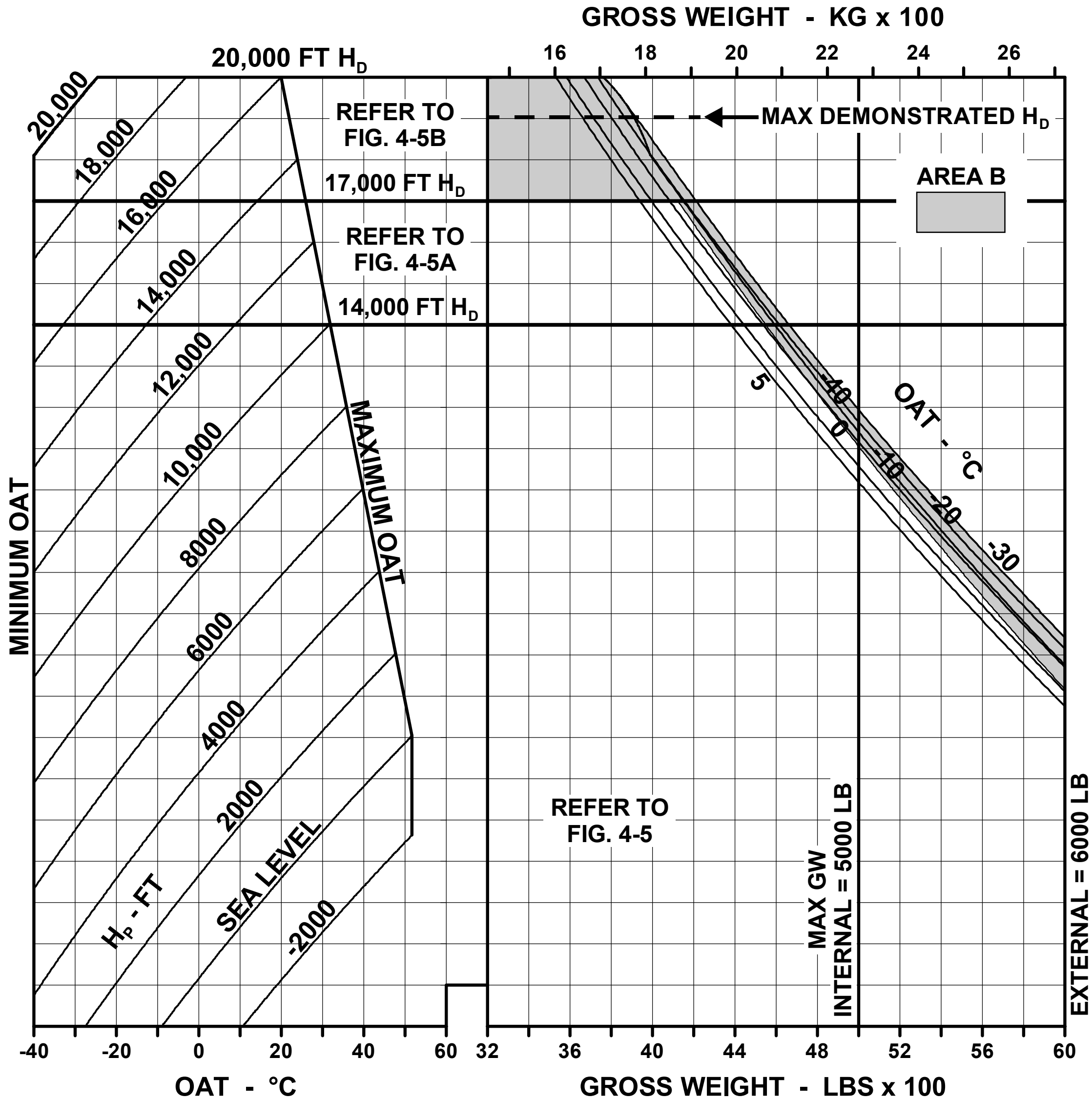


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 2 of 4)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

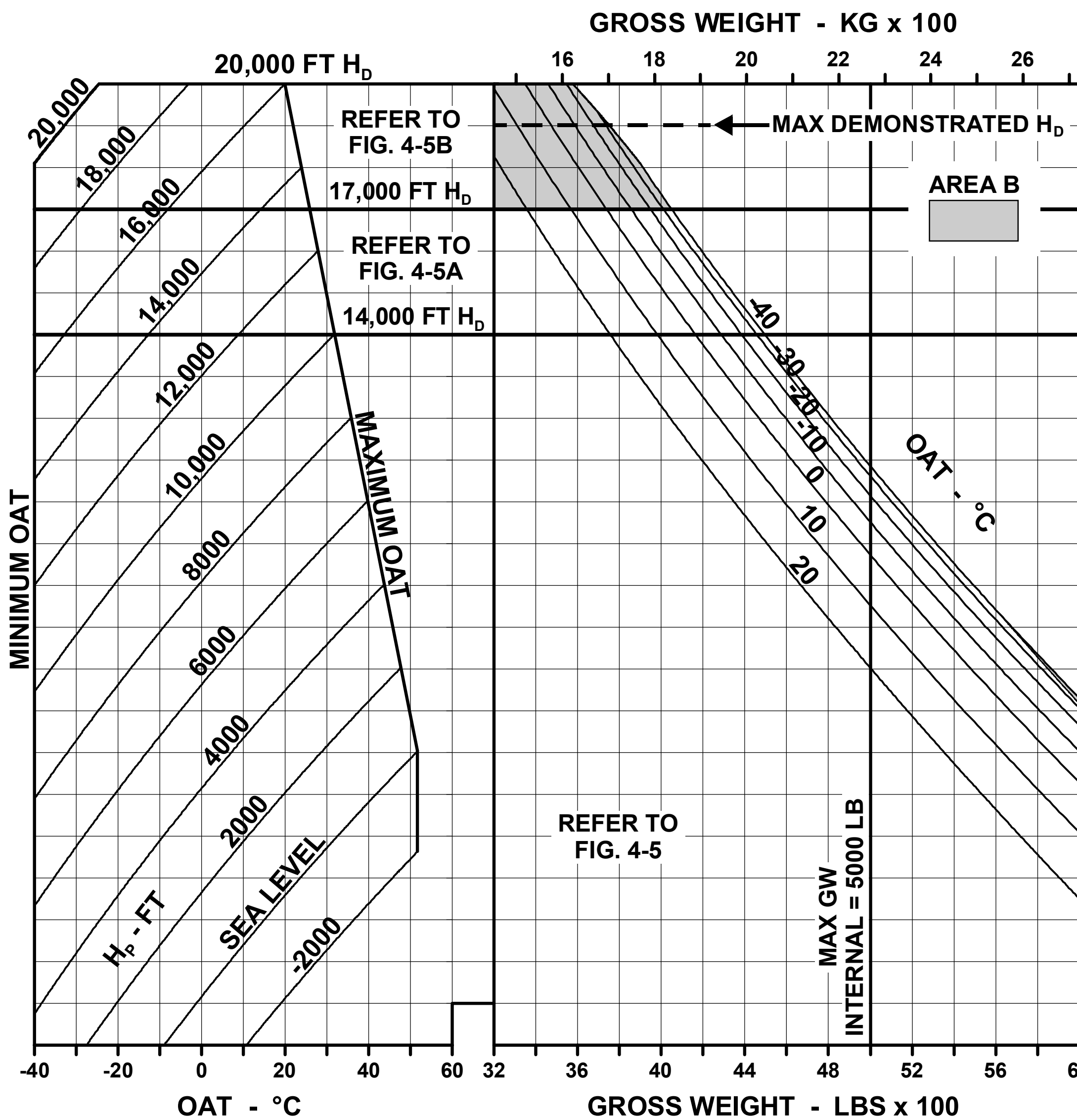


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 3 of 4)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

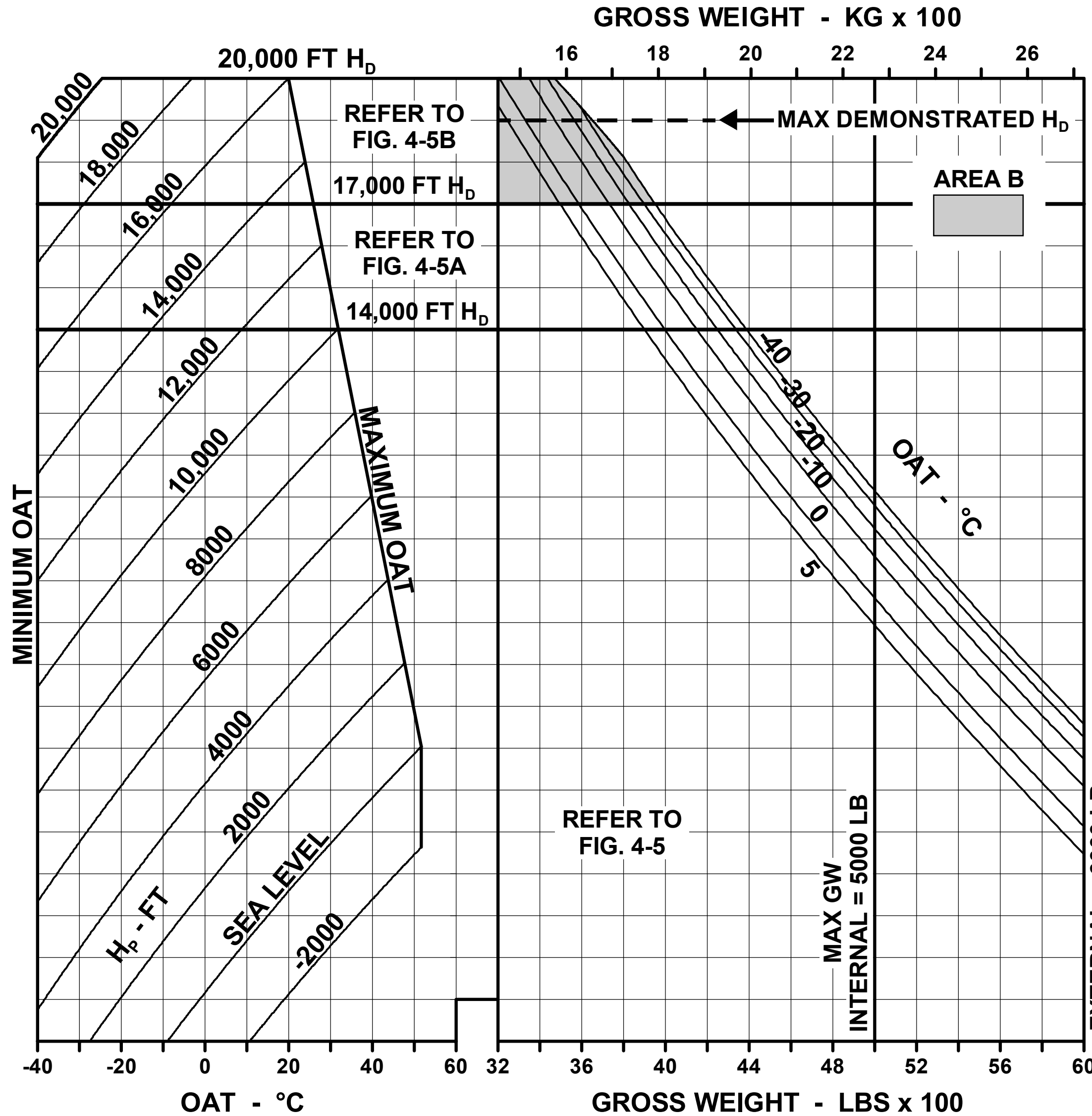


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 4 of 4)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

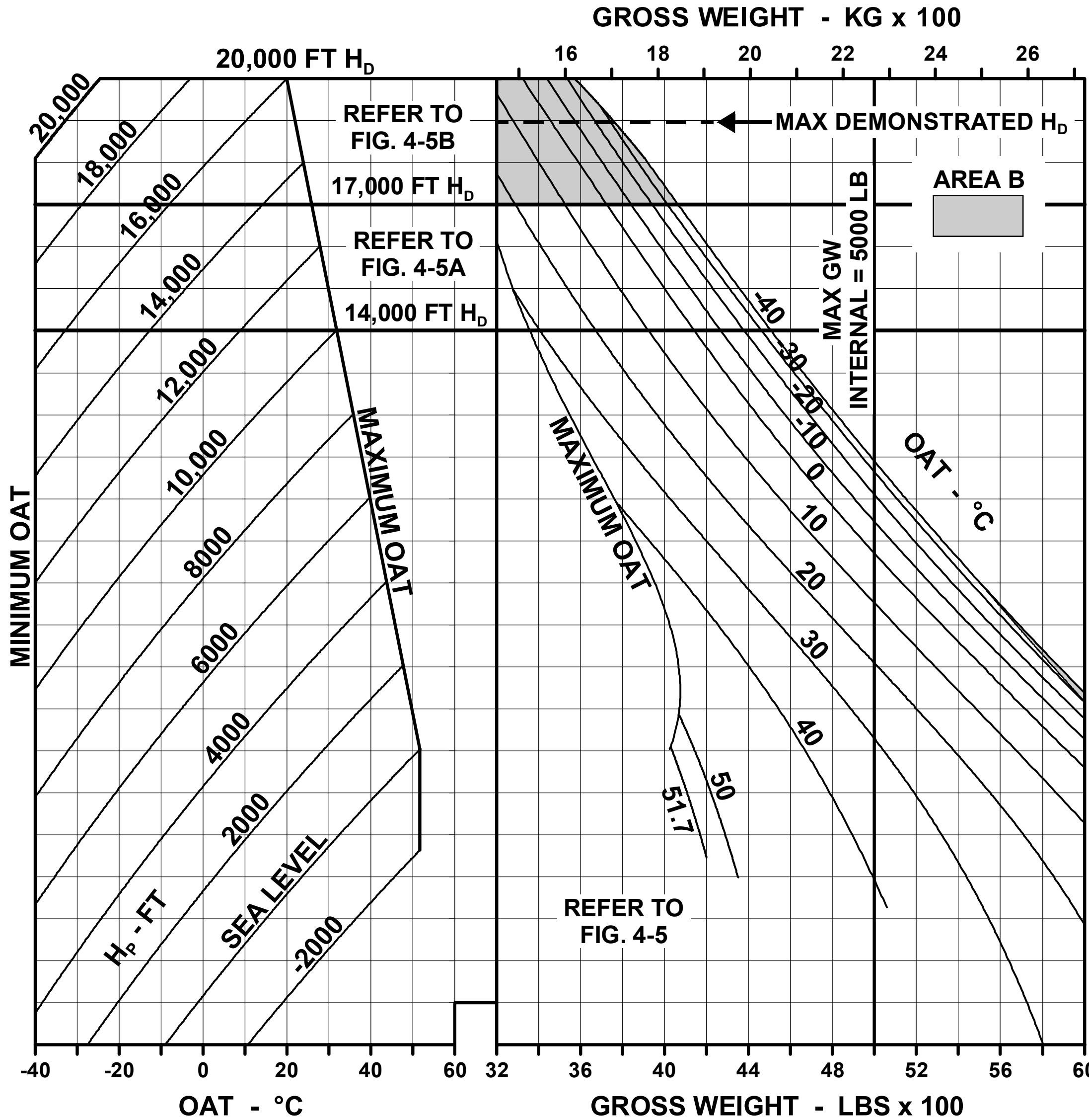


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 1 of 4)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

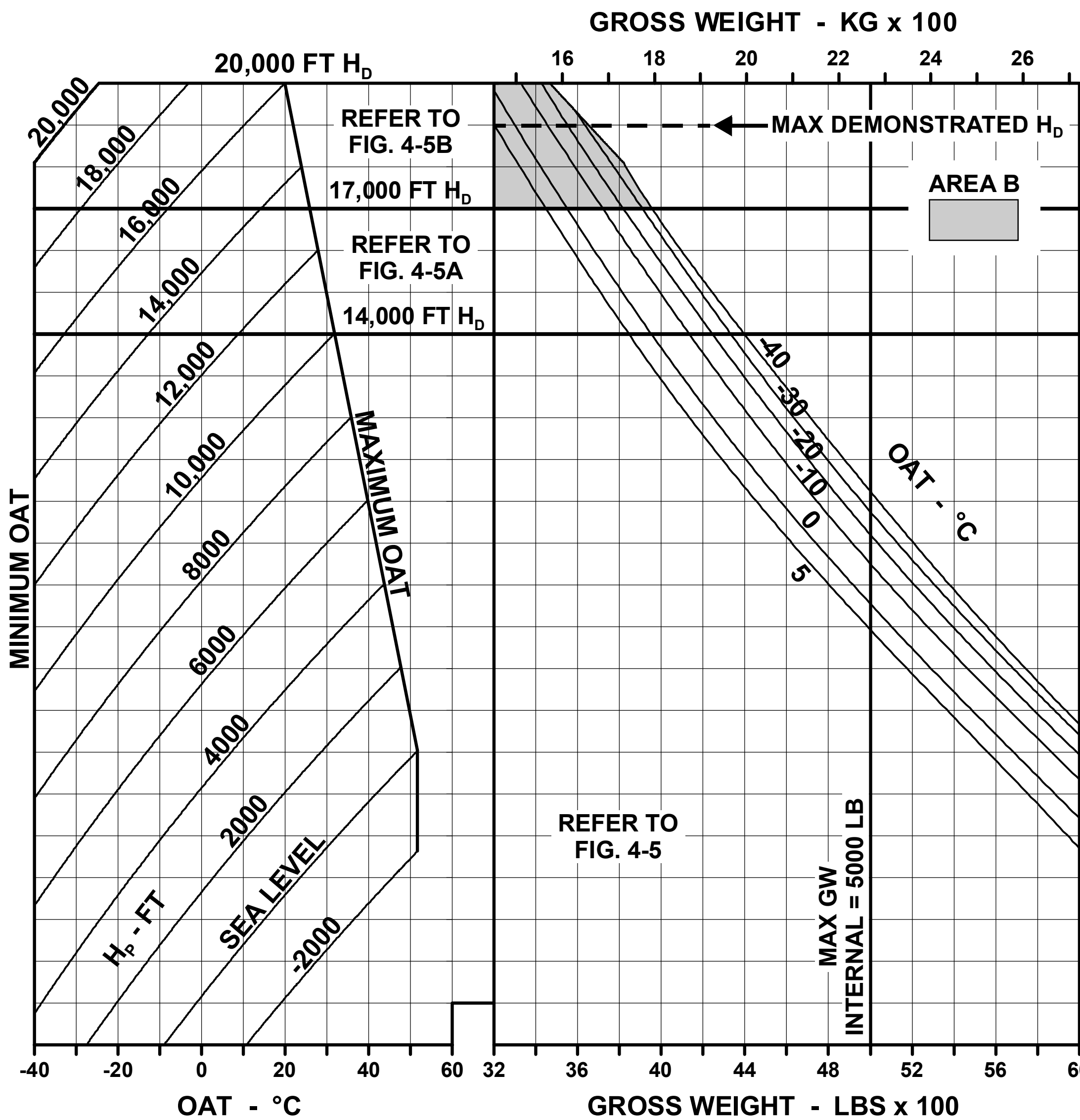


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 2 of 4)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

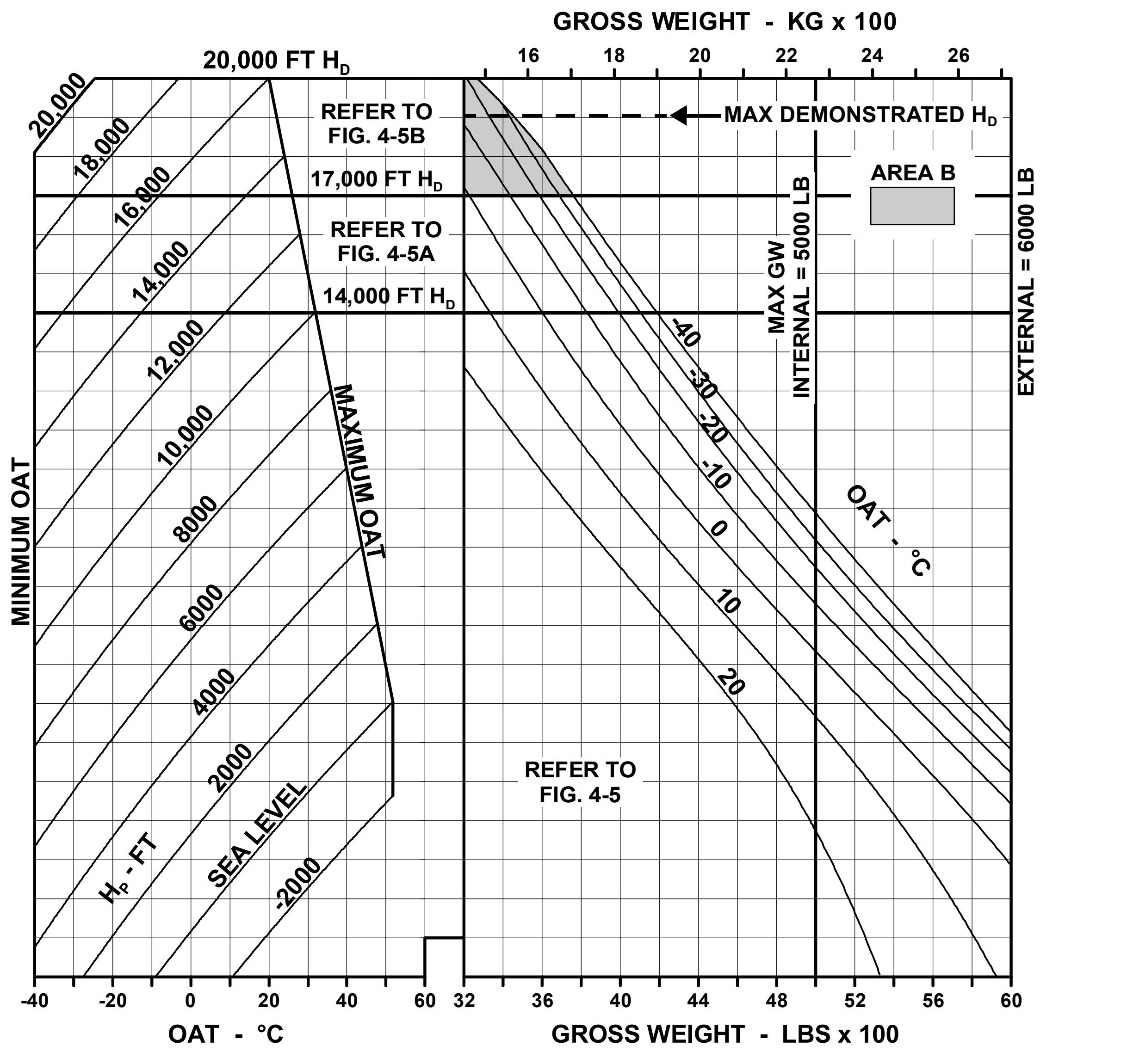


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 3 of 4)

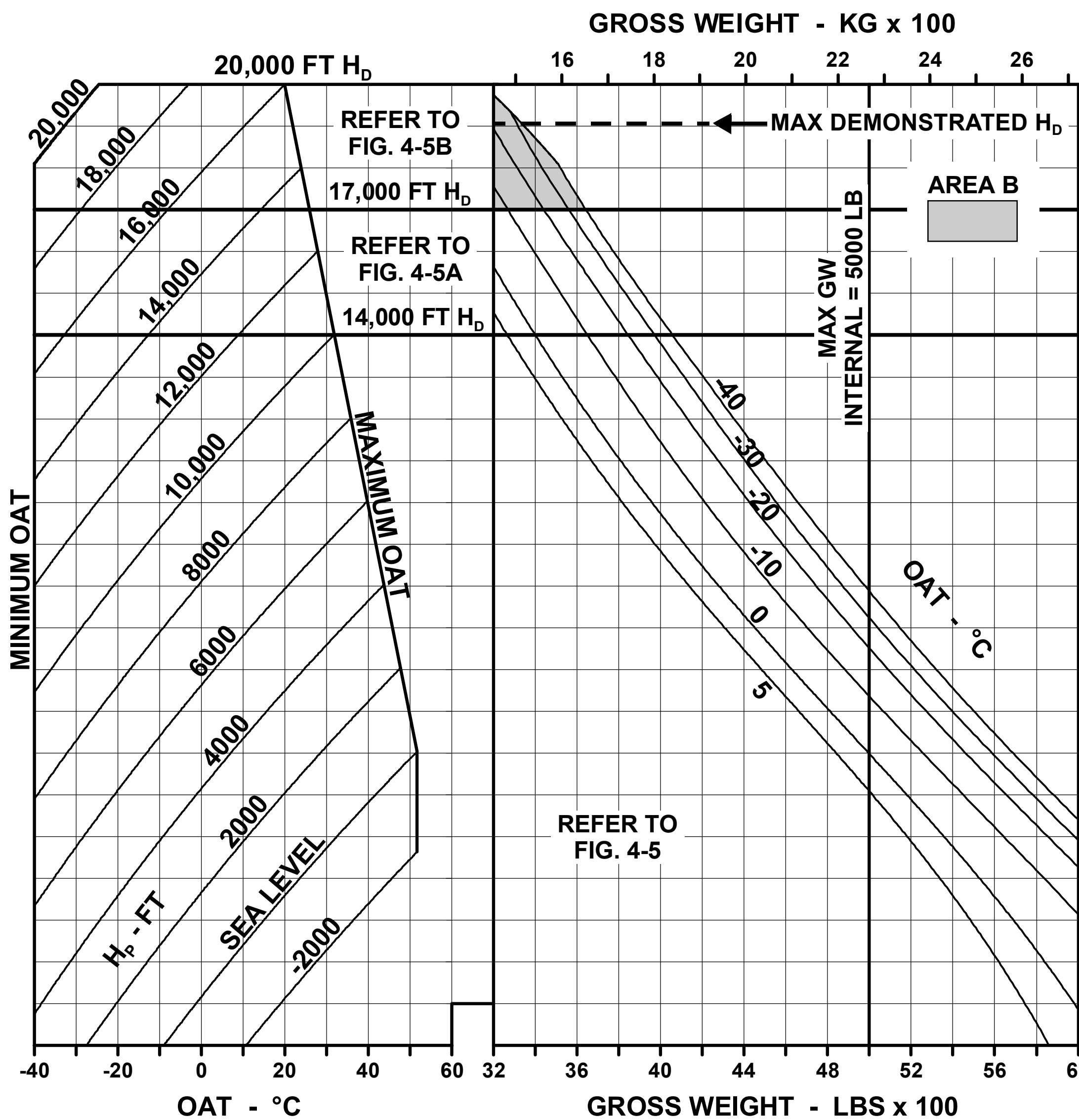
HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)



M407_FMS-3__FIG_4-3_(4_OF_4).EMF

Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 4 of 4)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

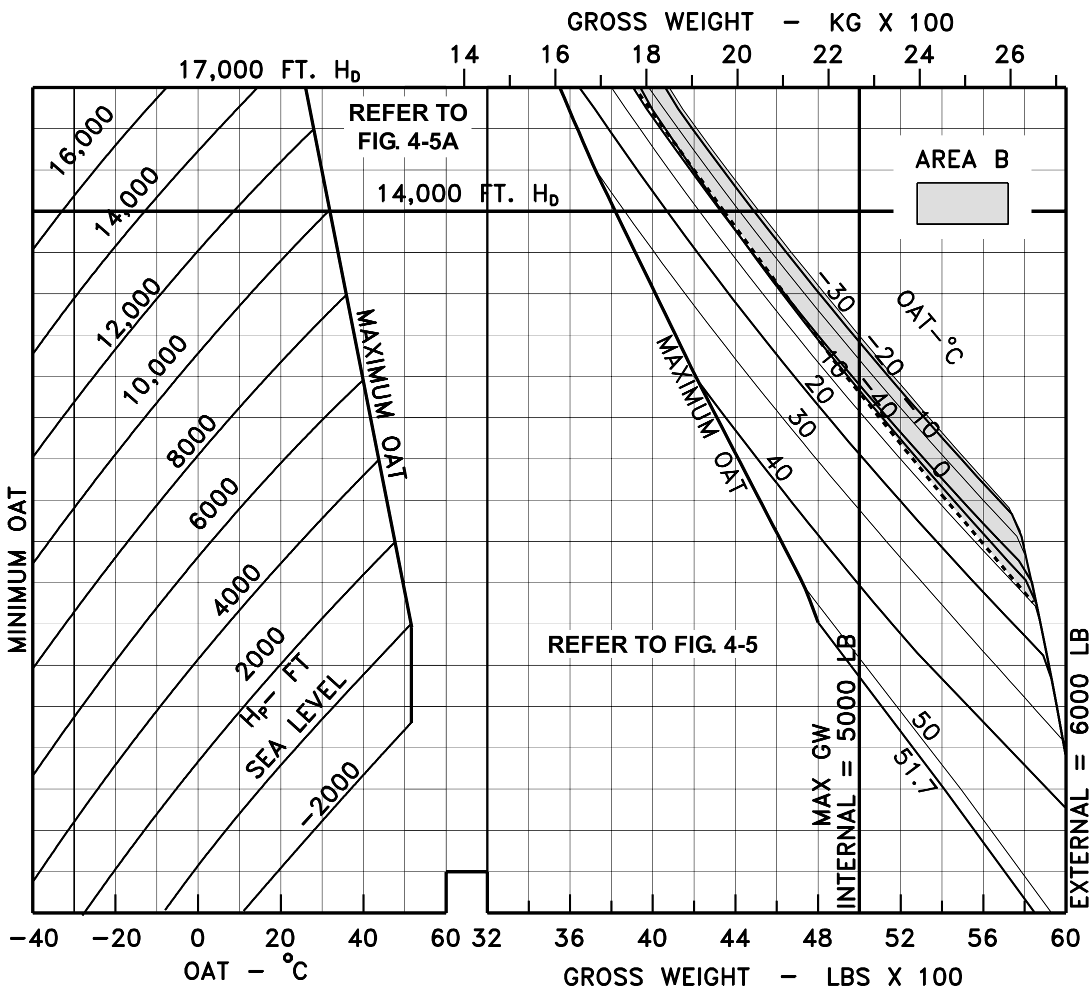


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 1 of 4)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

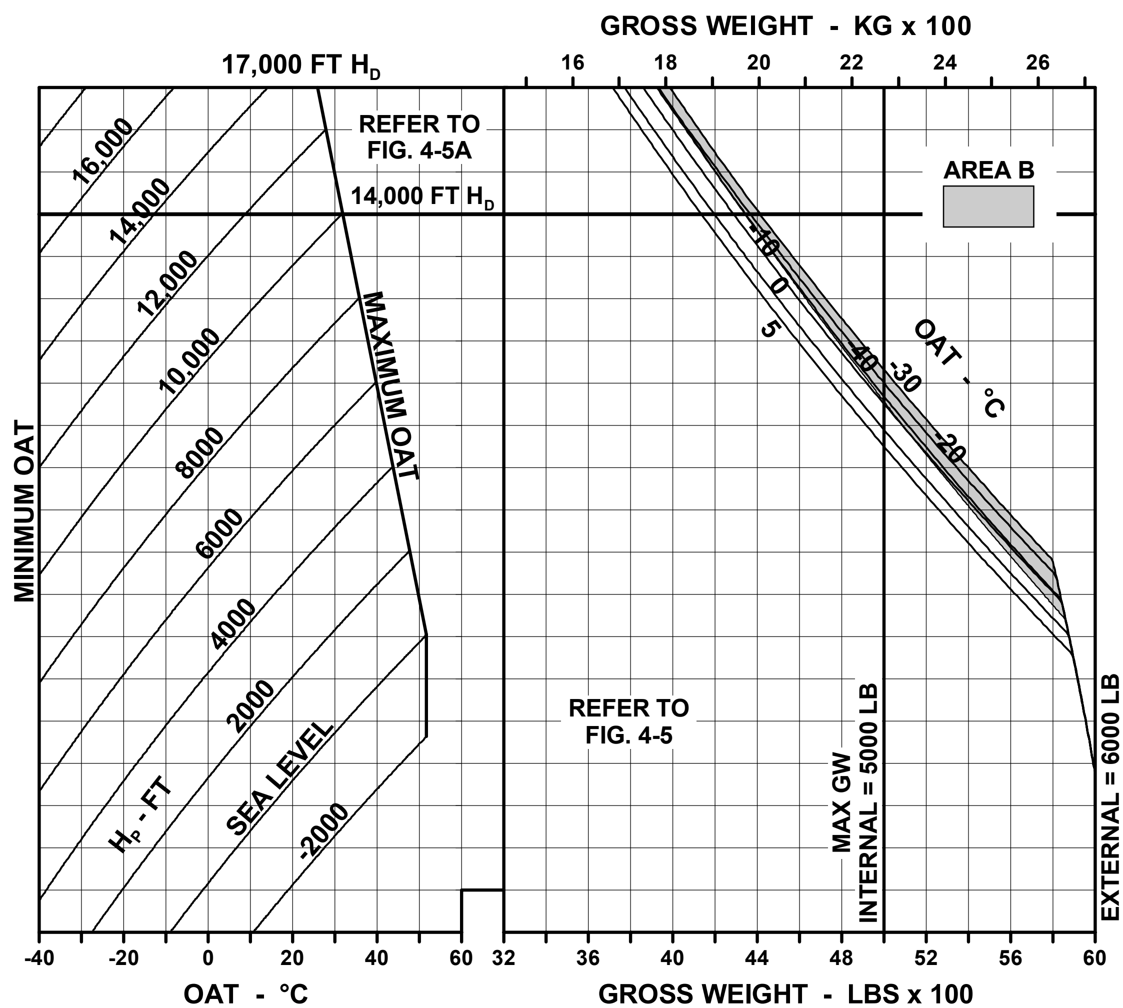


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 2 of 4)

HOVER CEILING

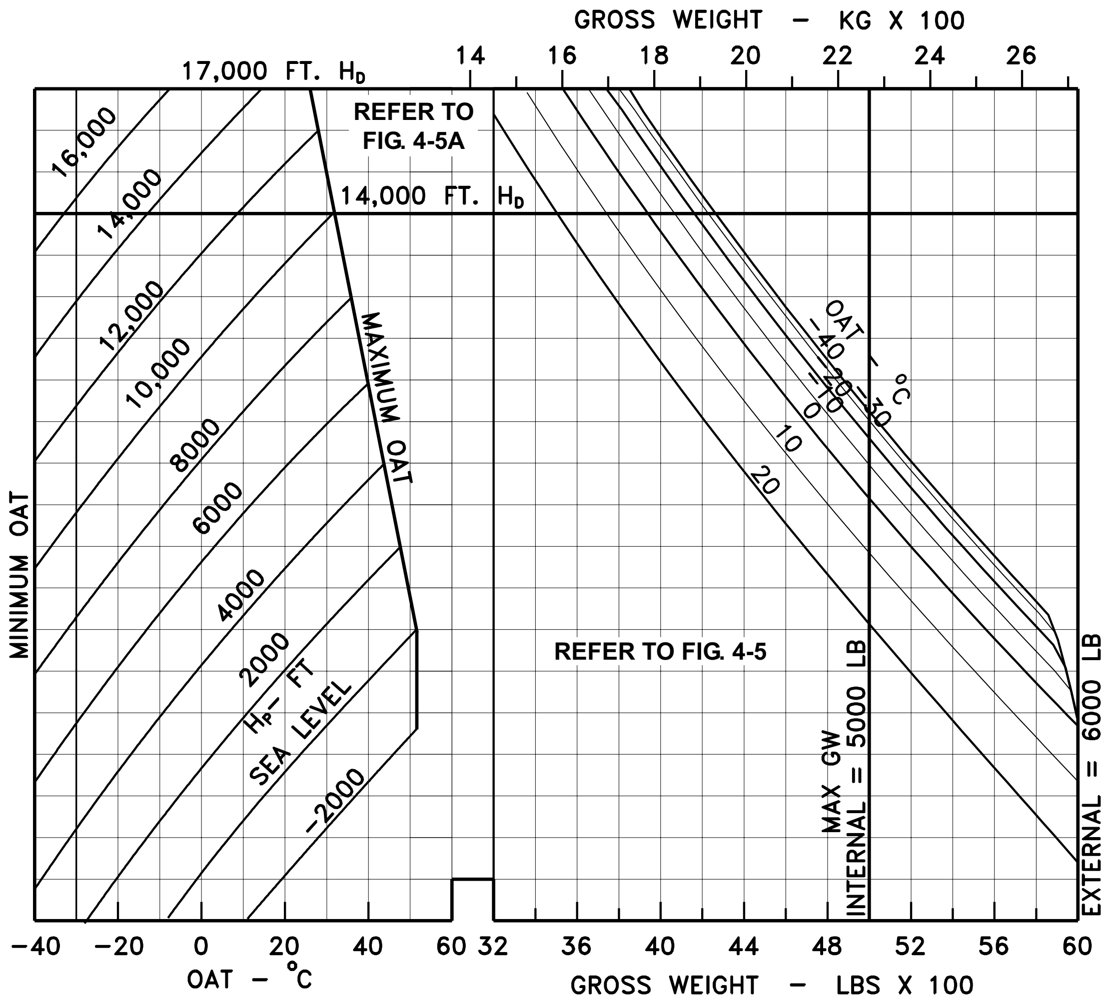
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-3__FIG_4-4_(3_OF_4).EPS

Figure 4-4. Hover ceiling OGE – takeoff power (sheet 3 of 4)

HOVER CEILING

OUT OF GROUND EFFECT

TAKEOFF POWER	SKID HEIGHT 40 FT (12.2 METER)
ENGINE RPM 100%	HEATER AND ANTI-ICE ON
GENERATOR 180 AMPS	PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

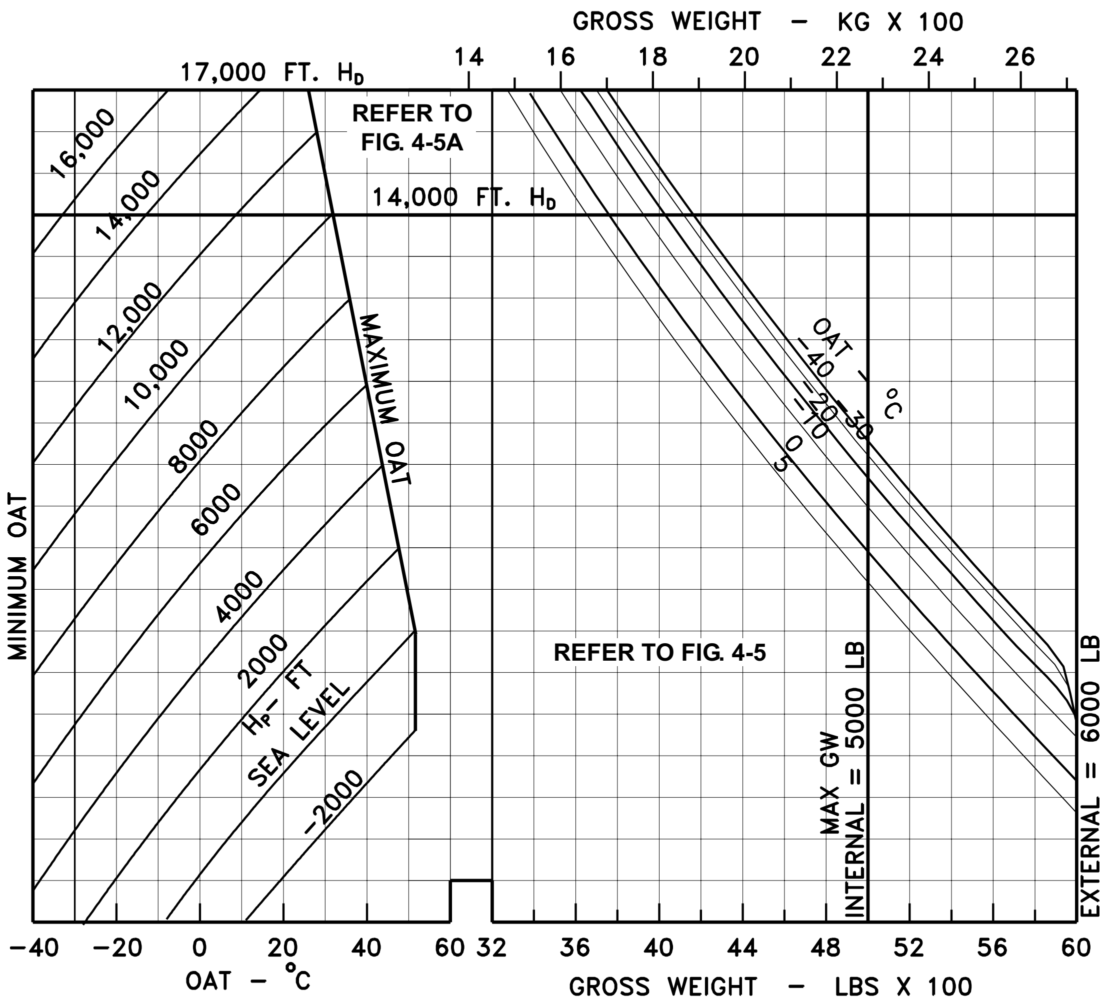


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 4 of 4)

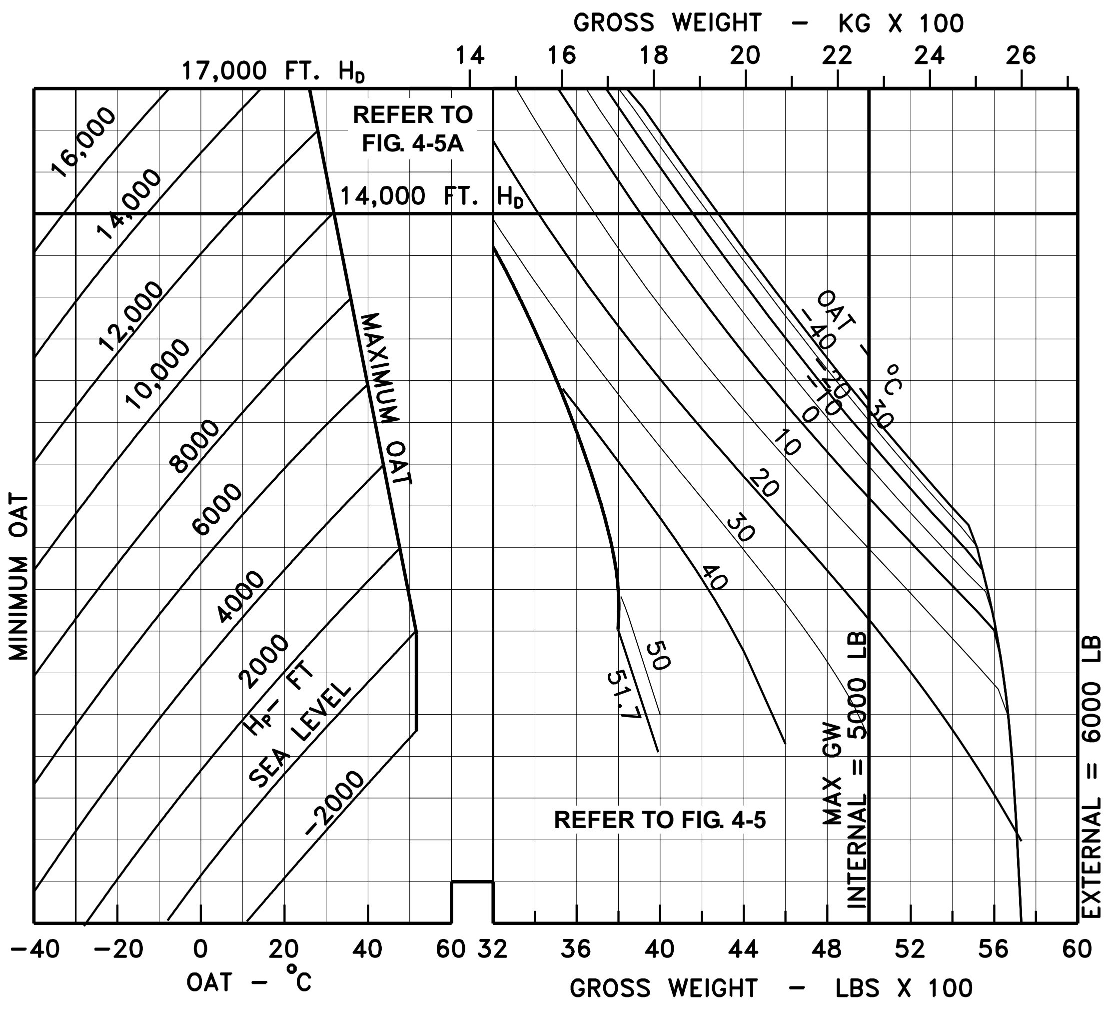
HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-3__FIG_4-5_(1_OF_4).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 1 of 4)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

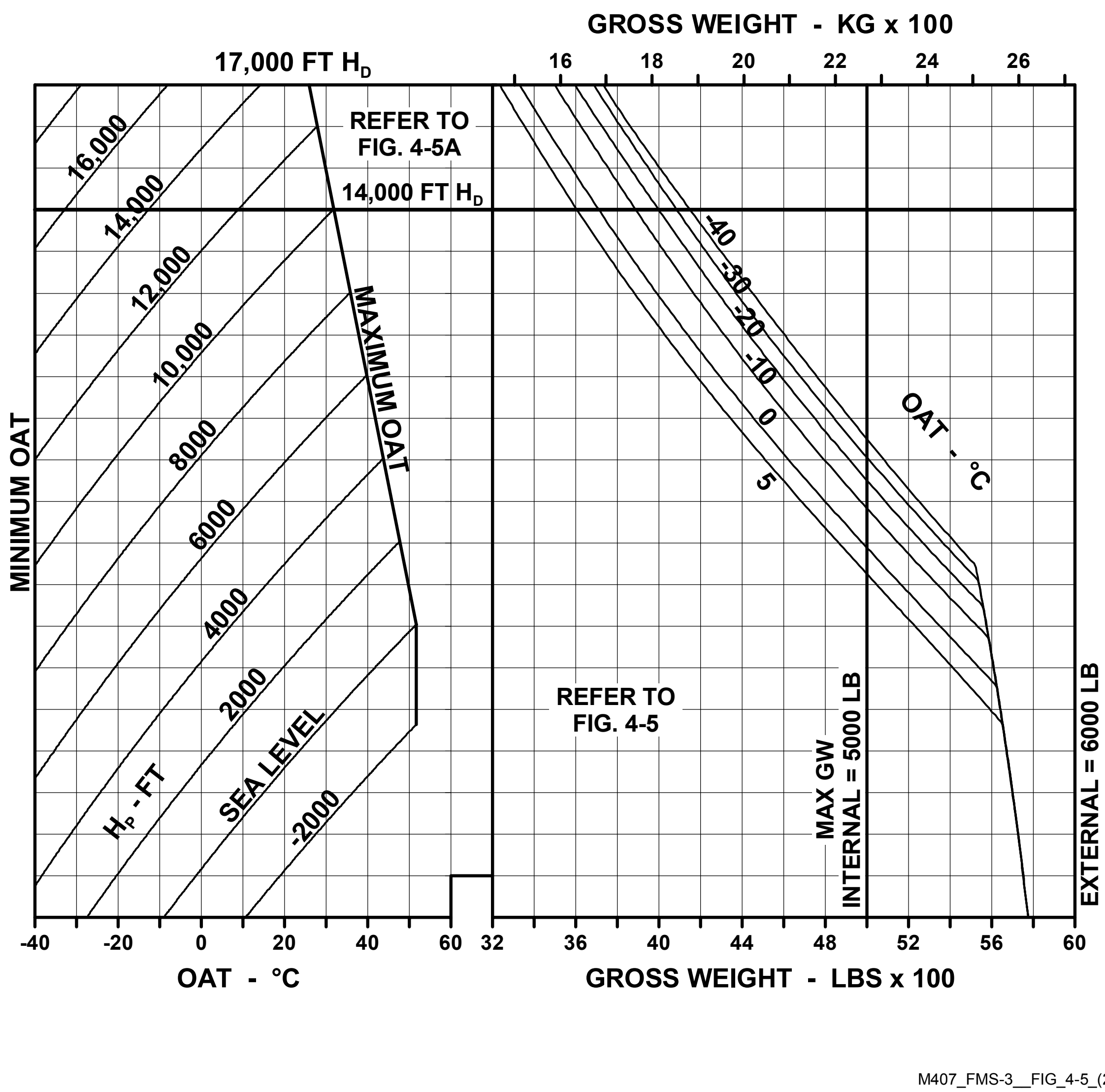


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 2 of 4)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

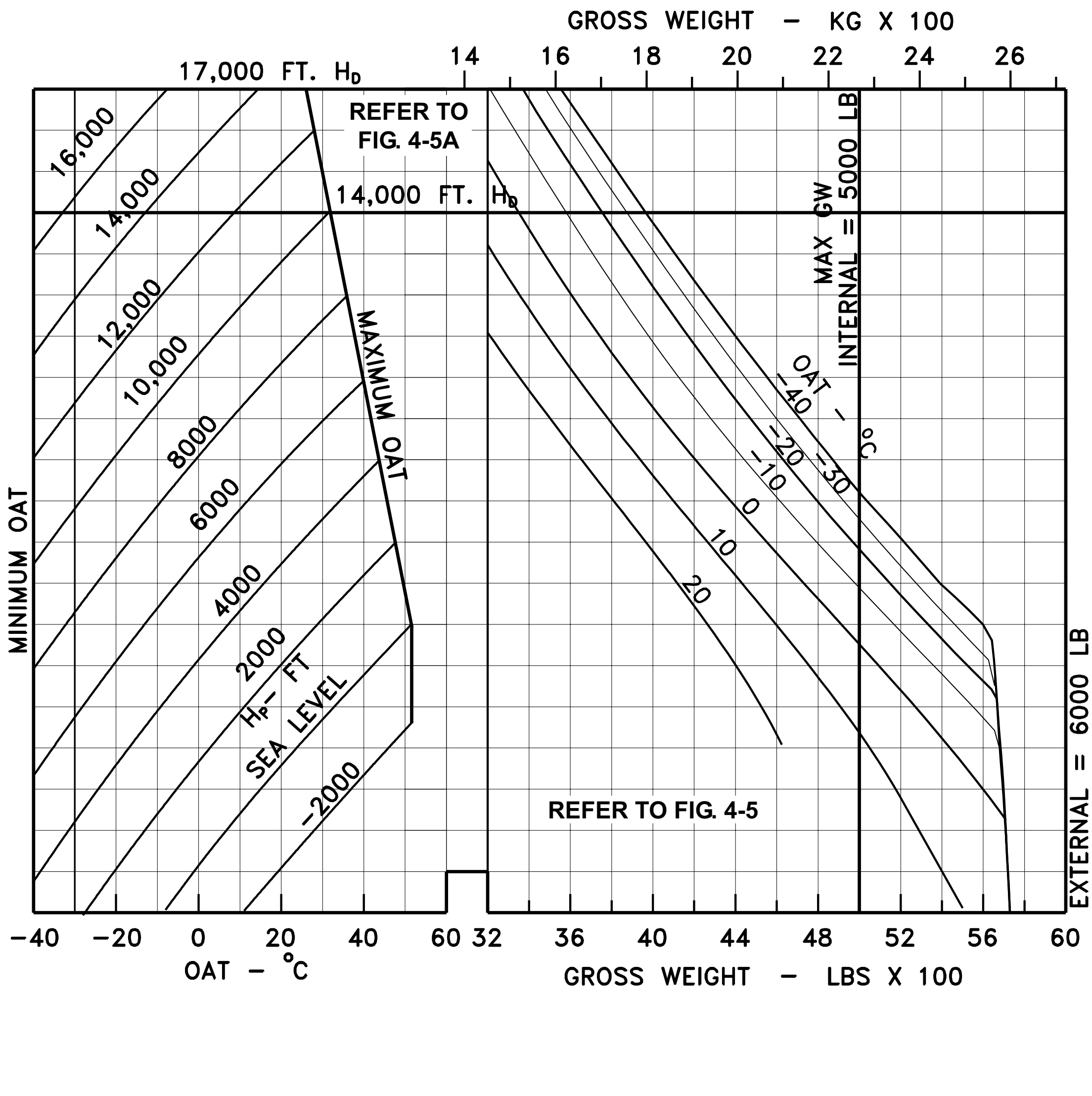


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 3 of 4)

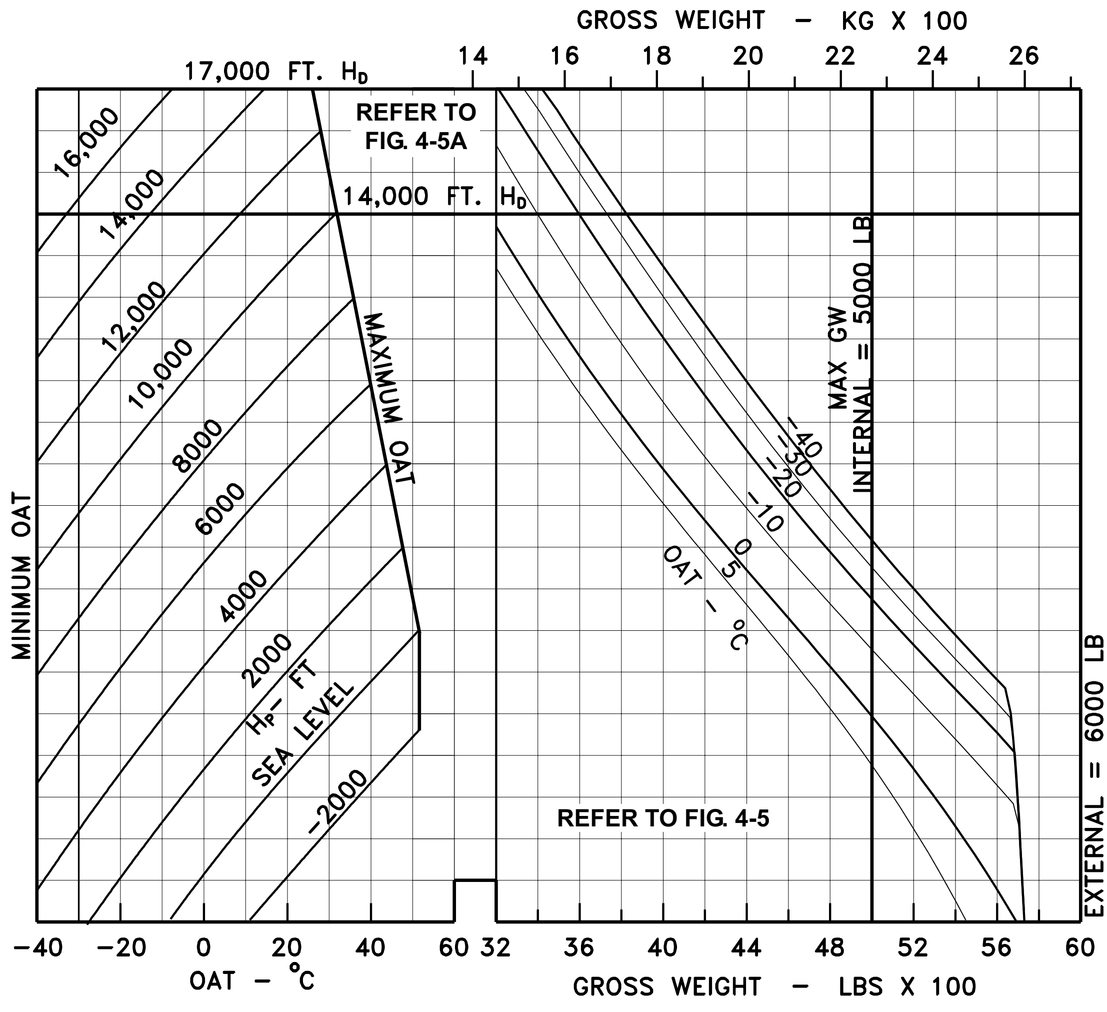
HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER	SKID HEIGHT 40 FT (12.2 METER)
ENGINE RPM 100%	HEATER AND ANTI-ICE ON
GENERATOR 180 AMPS	PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-3__FIG_4-5_(4_OF_4).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 4 of 4)

RATE OF CLIMB

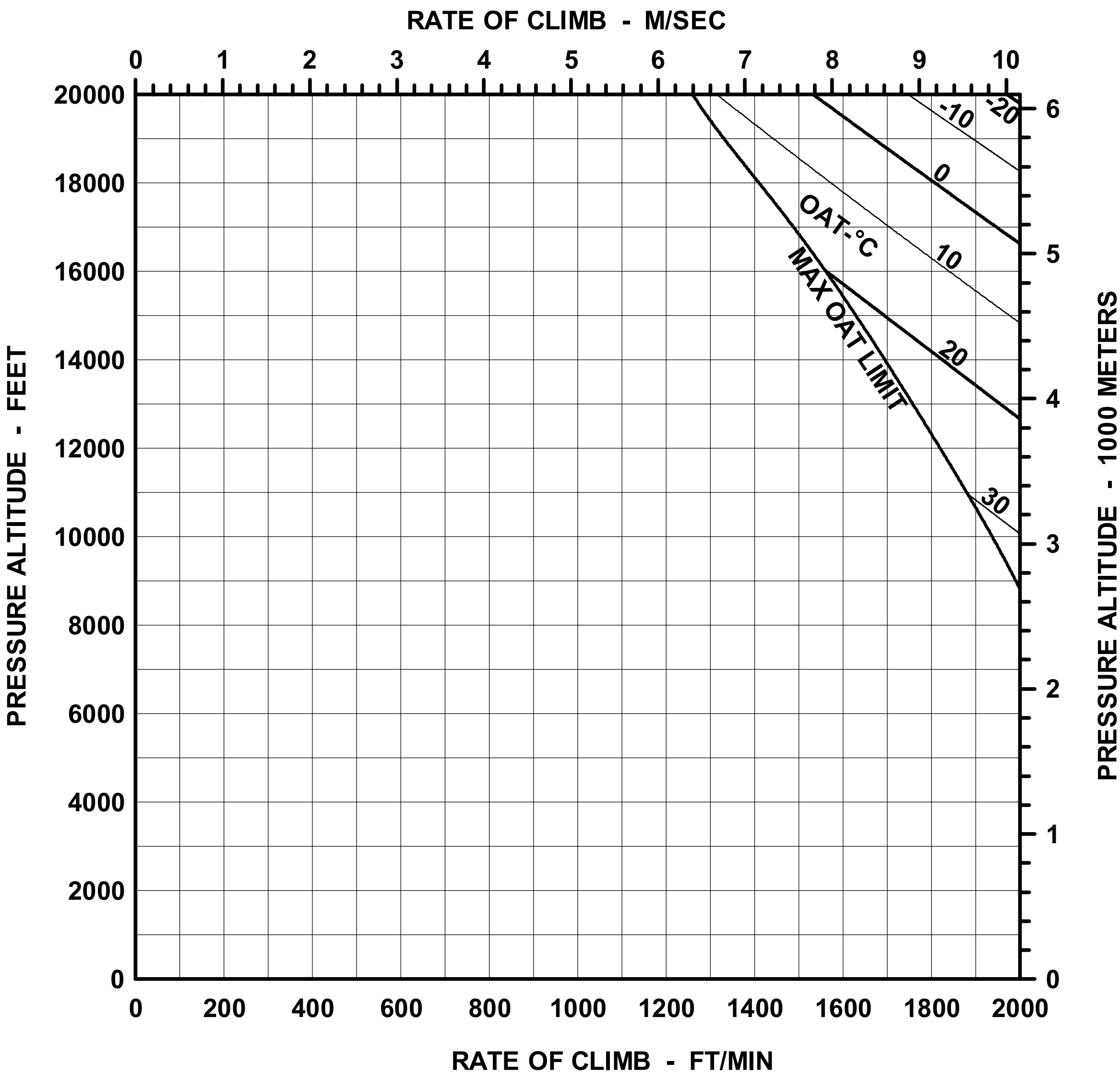
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
14,500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)



M407_FMS-3__FIG_4-6_(1_OF_10).WMF

Figure 4-6. Rate of climb takeoff power (sheet 1 of 10)

RATE OF CLIMB

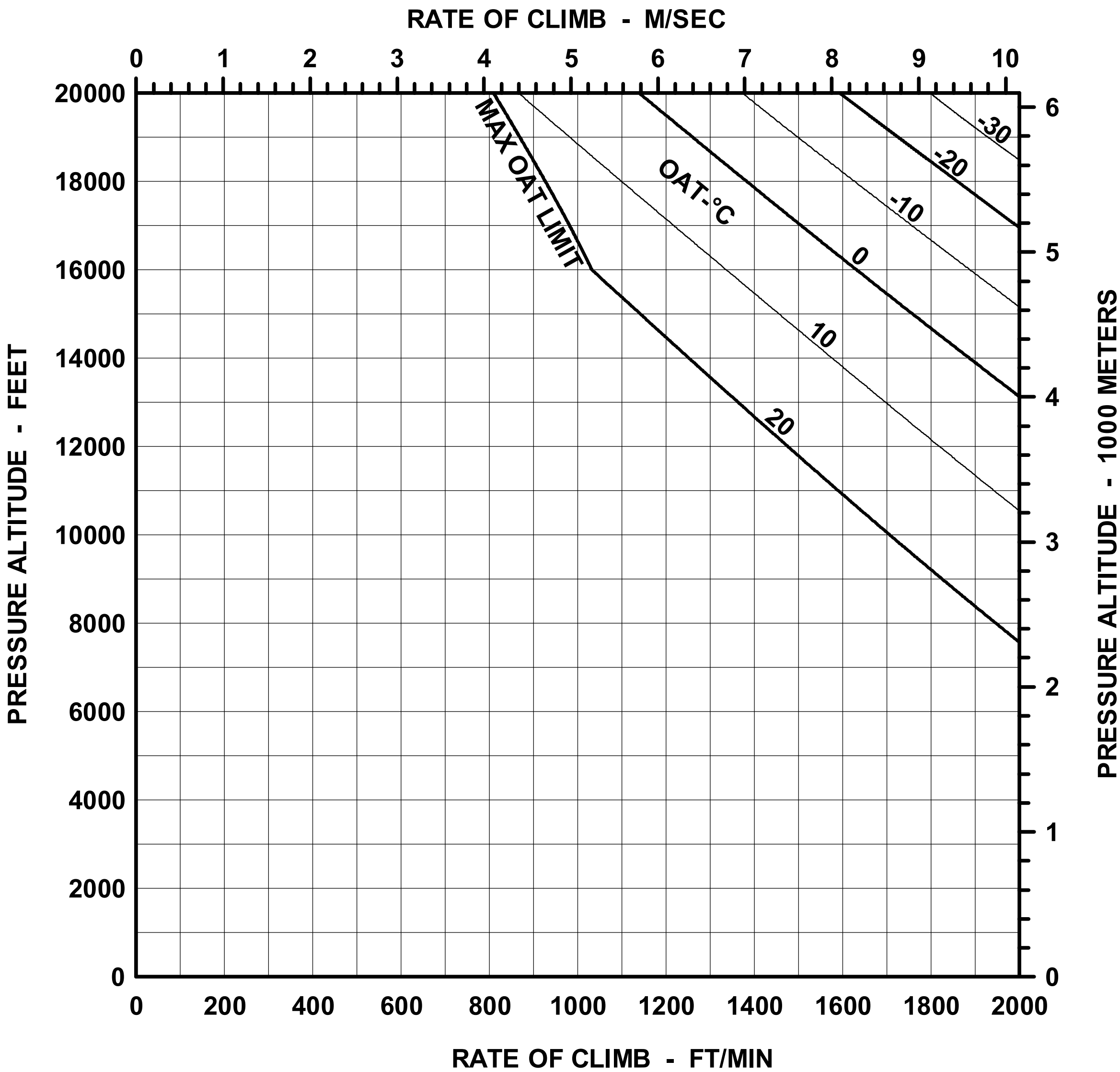
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
10,500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)



M407_FMS-3__FIG_4-6_(2_OF_10).WMF

Figure 4-6. Rate of climb takeoff power (sheet 2 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
11,000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)

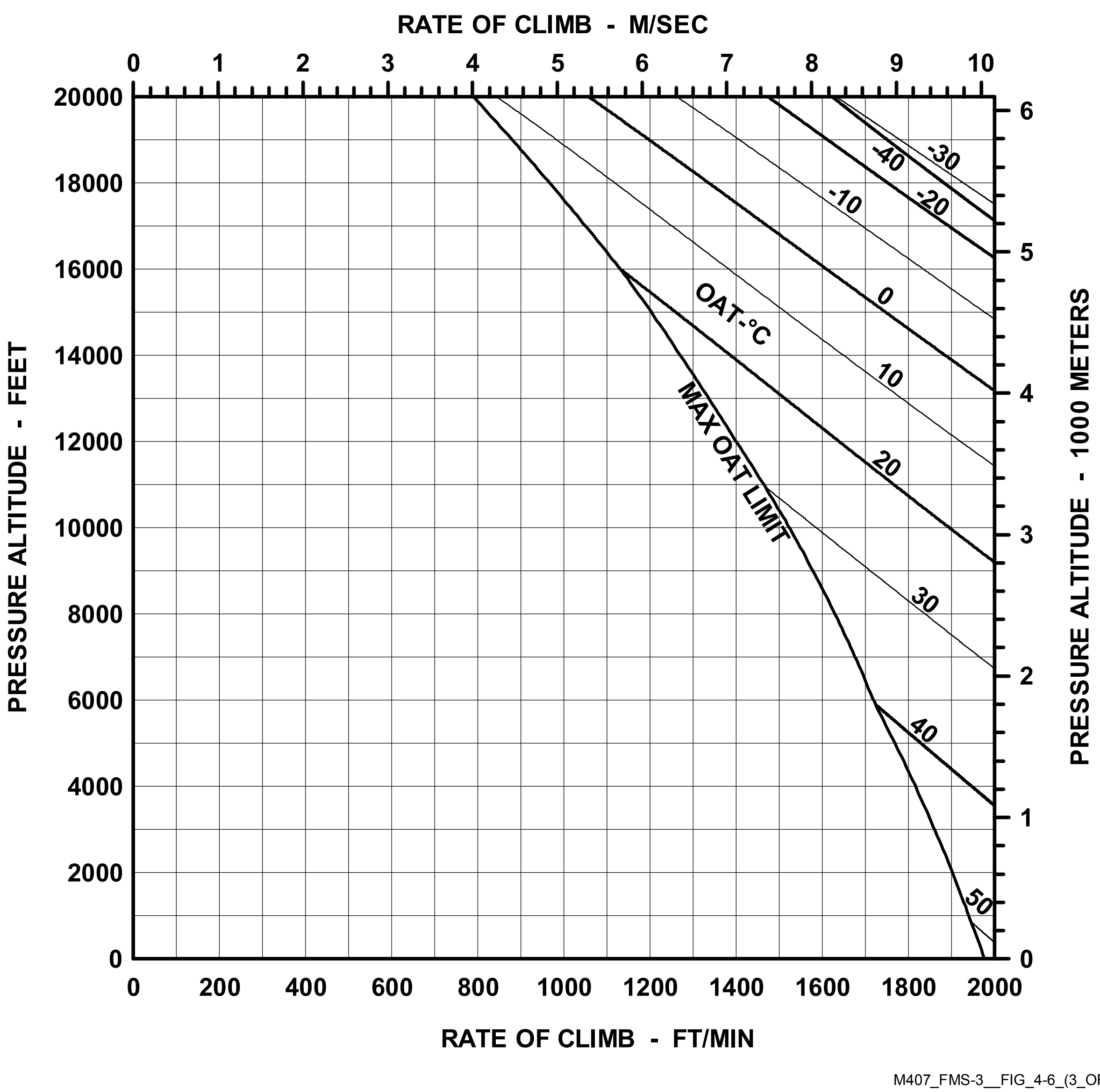


Figure 4-6. Rate of climb takeoff power (sheet 3 of 10)

RATE OF CLIMB

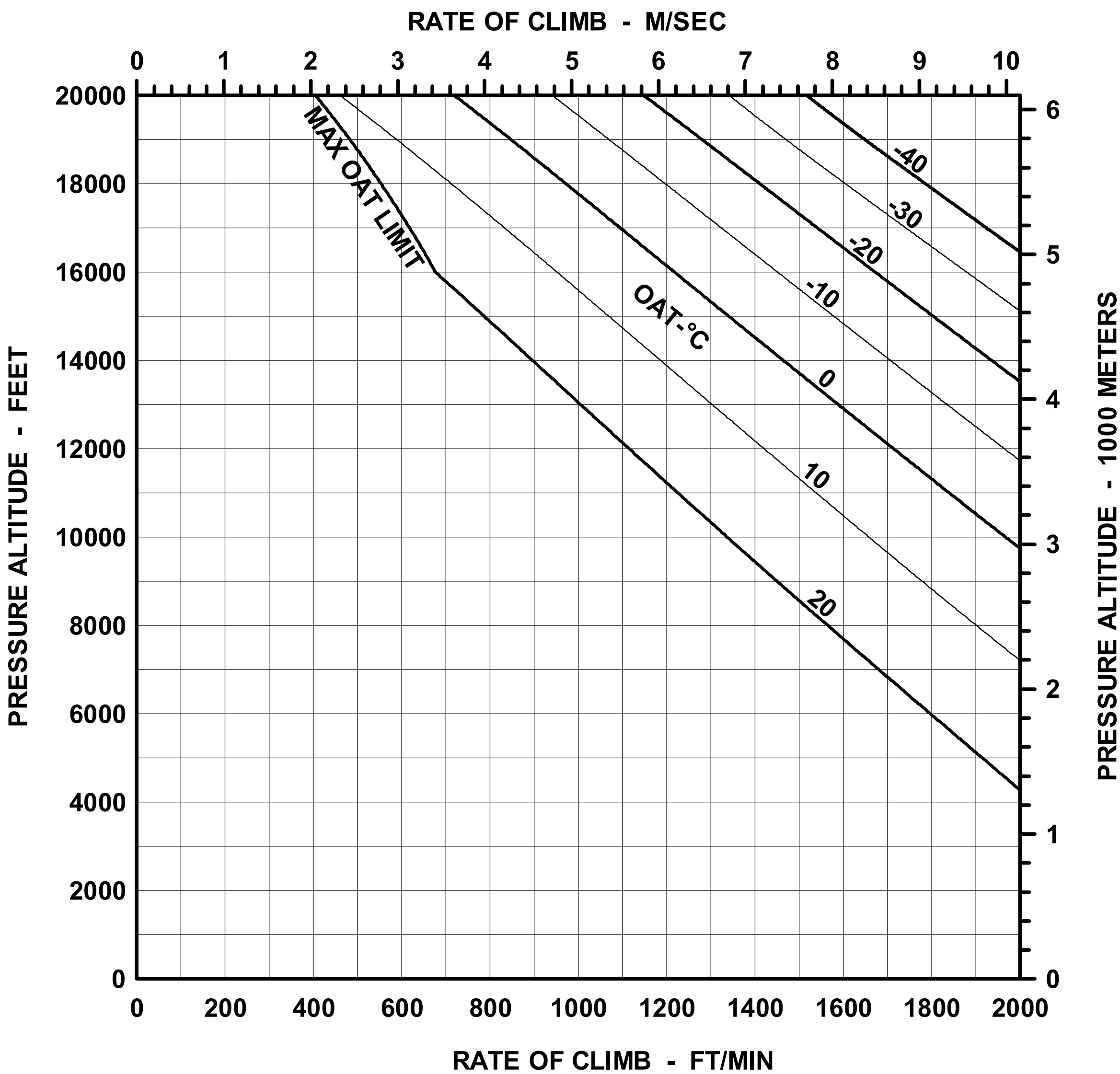
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
7500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)



M407_FMS-3__FIG_4-6_(4_OF_10).WMF

Figure 4-6. Rate of climb takeoff power (sheet 4 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
8500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

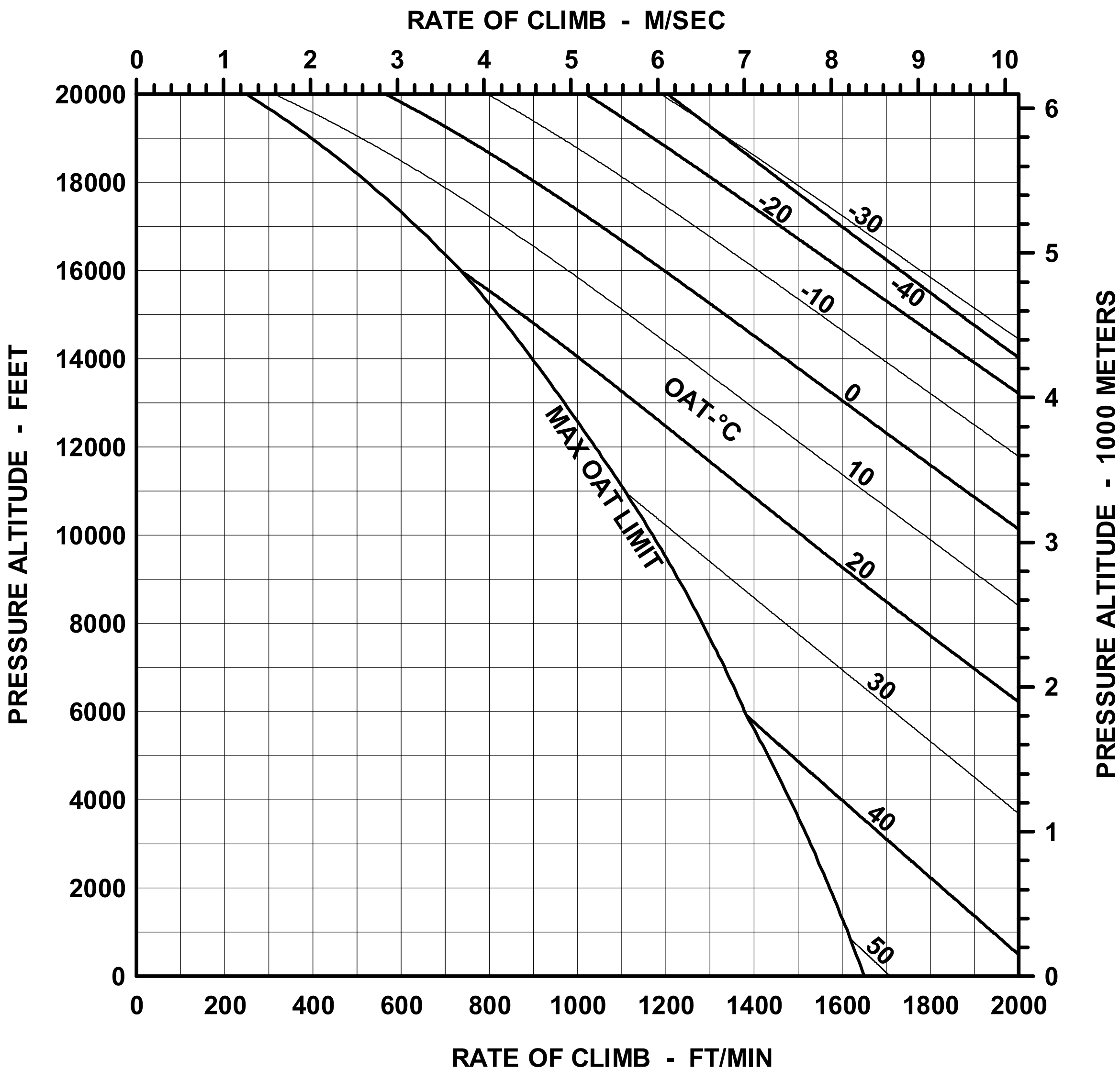


Figure 4-6. Rate of climb takeoff power (sheet 5 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
4500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

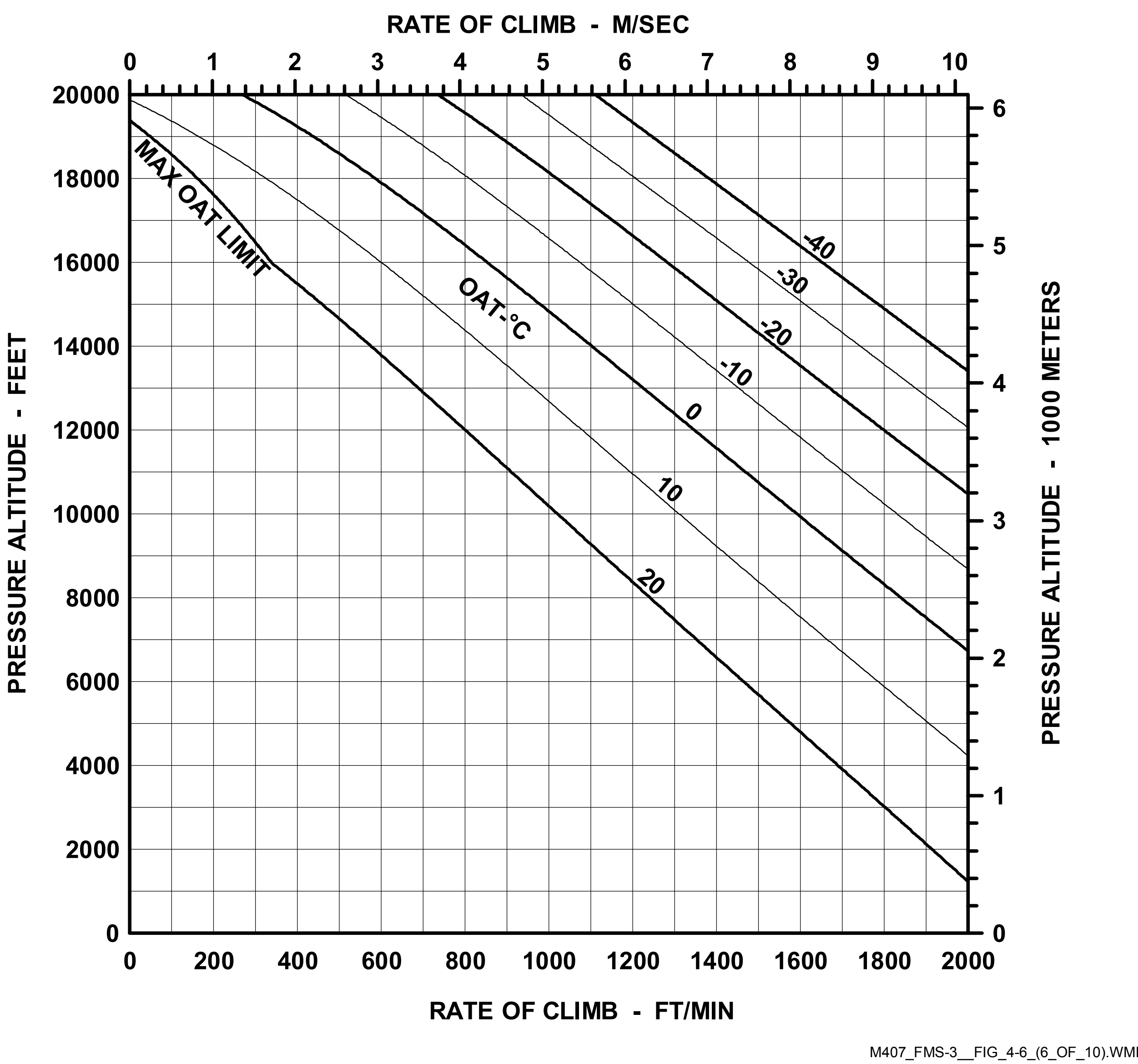


Figure 4-6. Rate of climb takeoff power (sheet 6 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
6000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

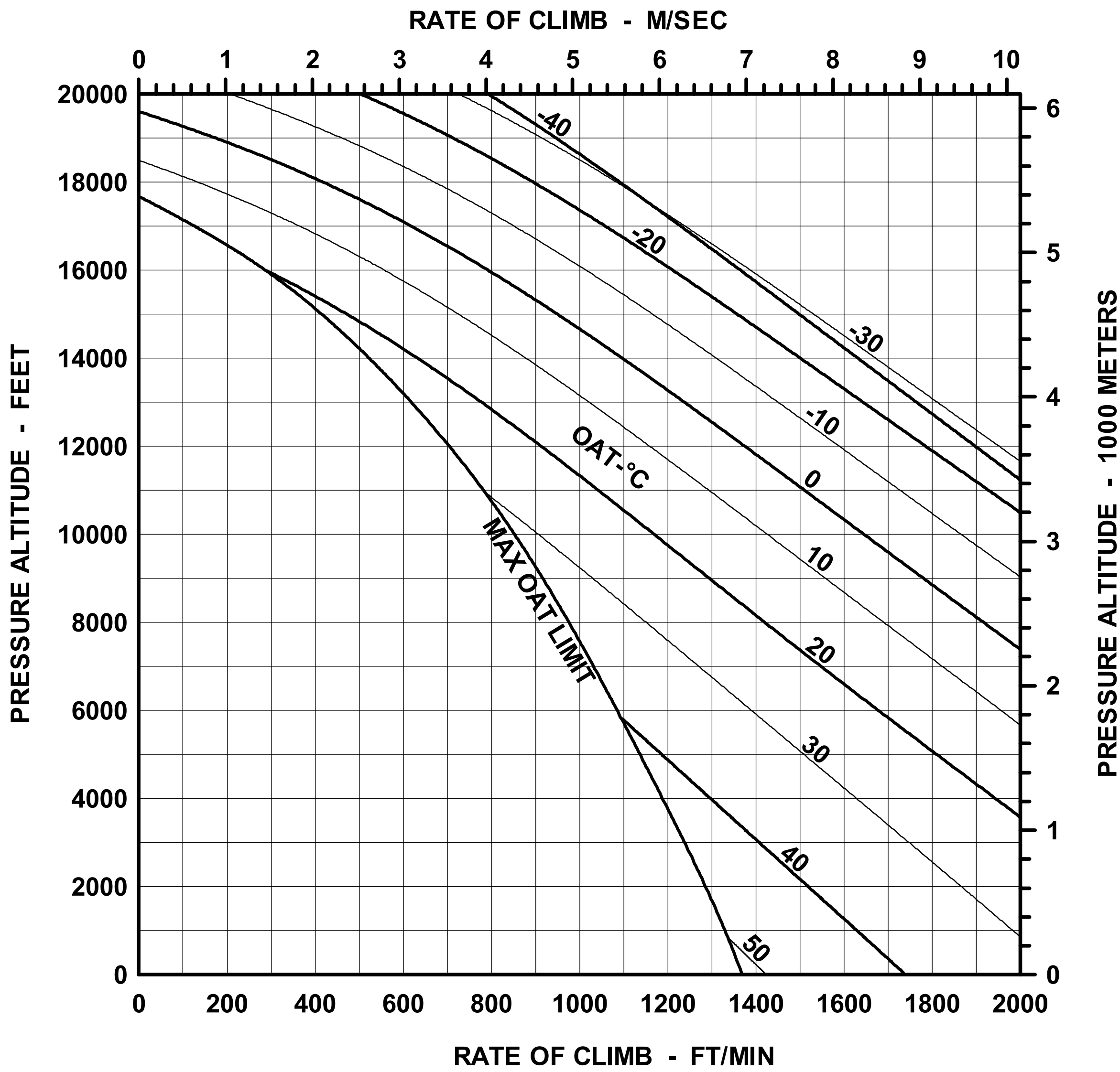


Figure 4-6. Rate of climb takeoff power (sheet 7 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
1500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

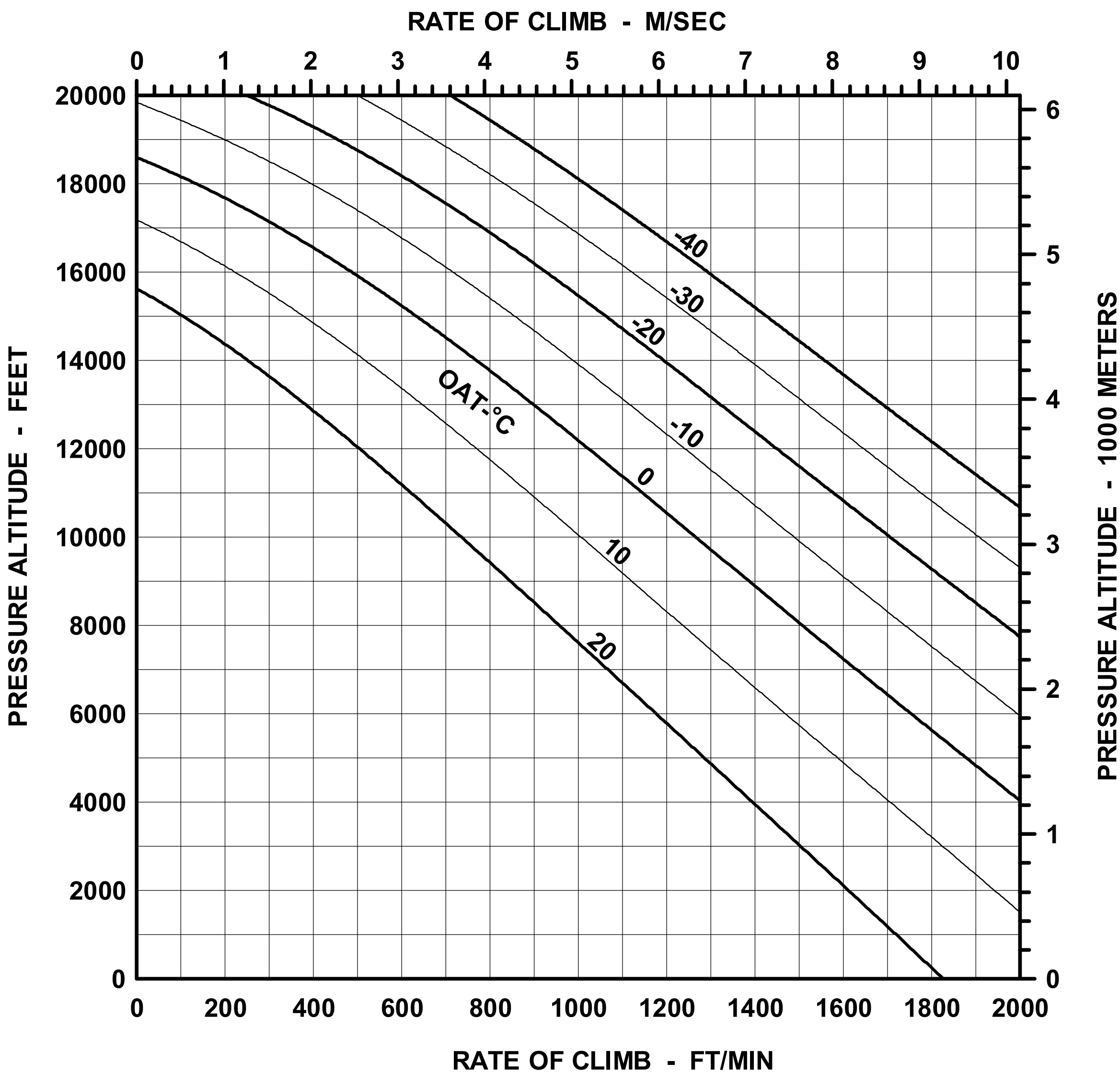


Figure 4-6. Rate of climb takeoff power (sheet 8 of 10)

RATE OF CLIMB

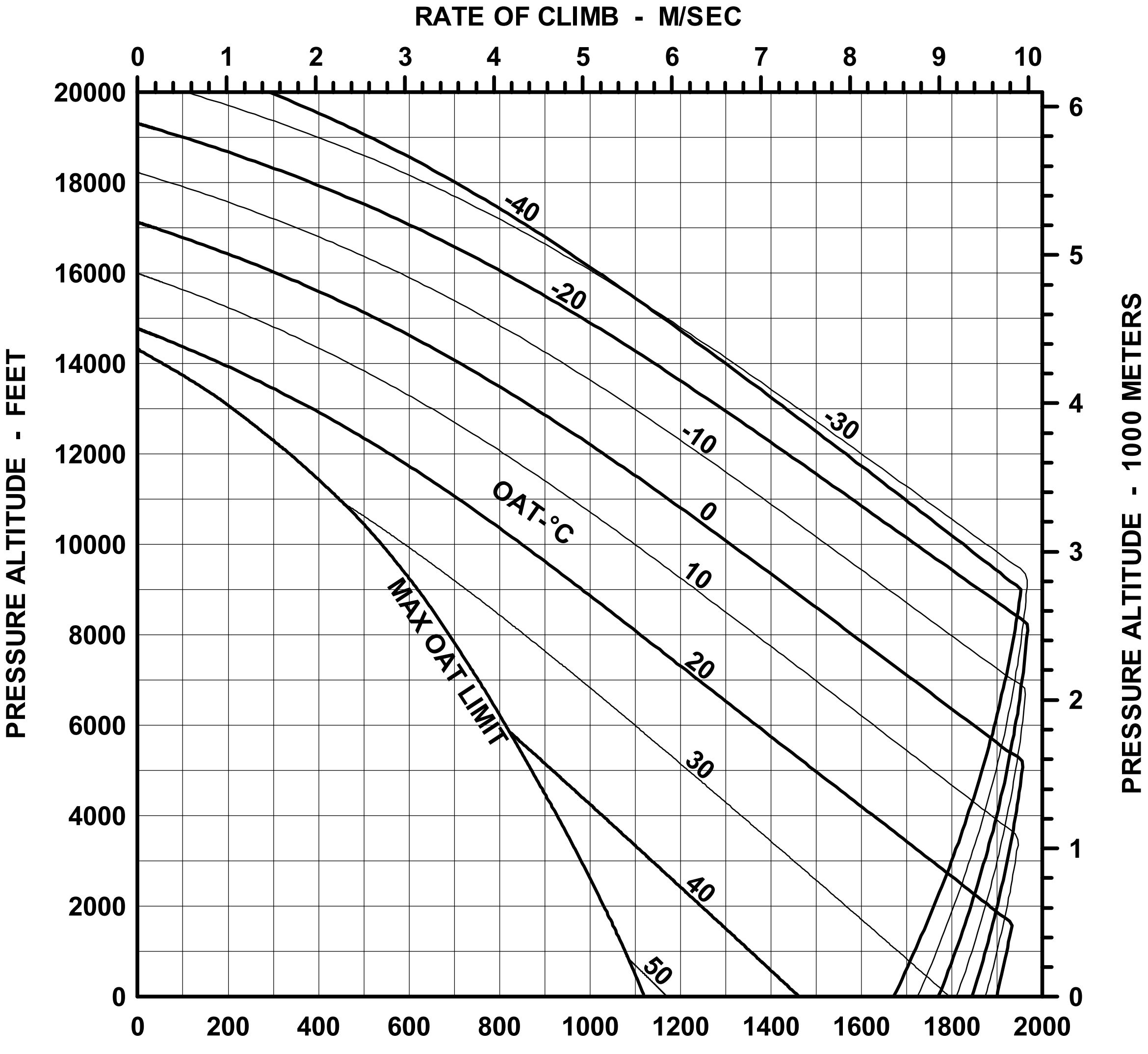
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
4500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)



M407_FMS-3__FIG_4-6_(9_OF_10).WMF

Figure 4-6. Rate of climb takeoff power (sheet 9 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)

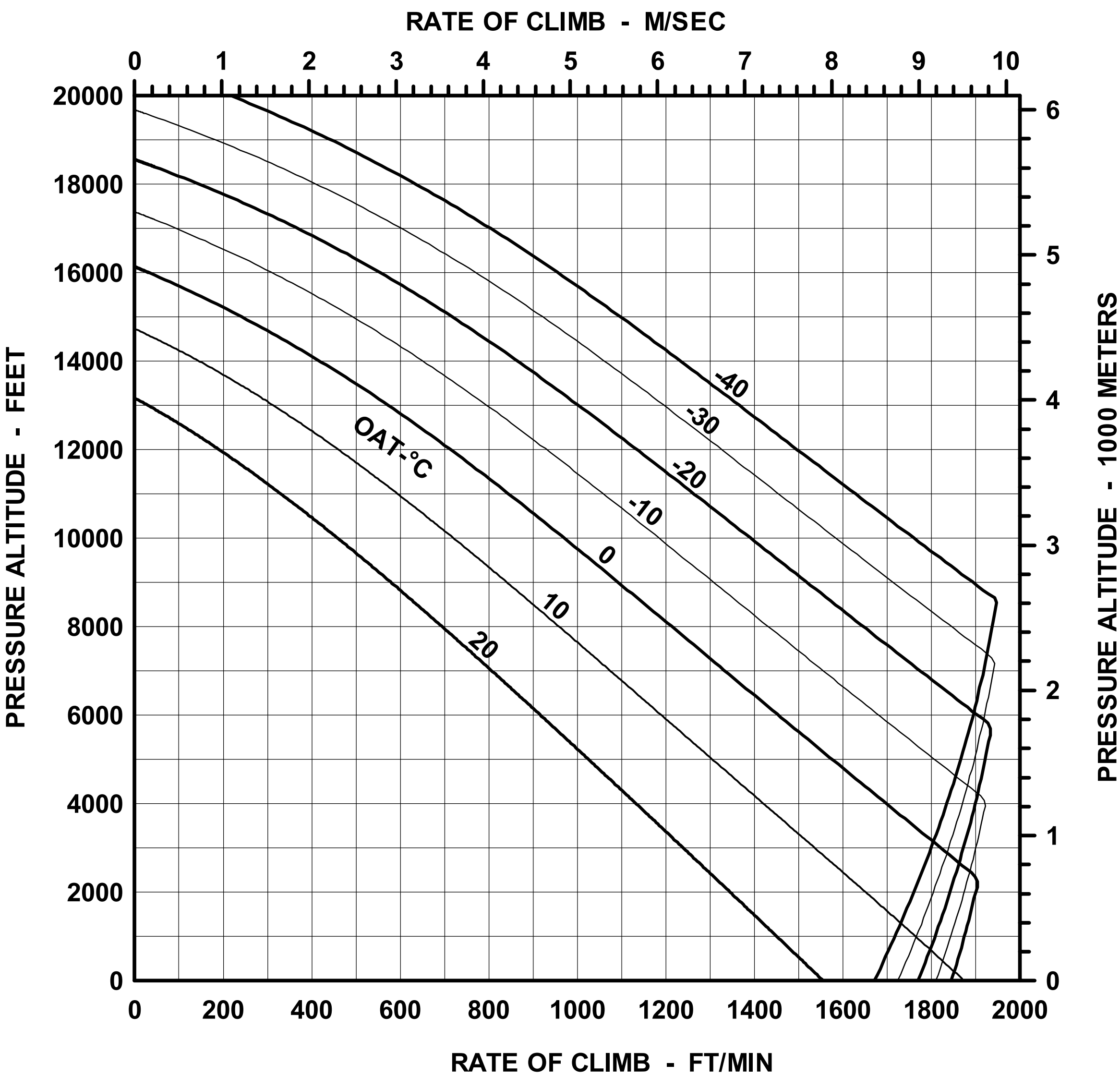


Figure 4-6. Rate of climb takeoff power (sheet 10 of 10)

RATE OF CLIMB

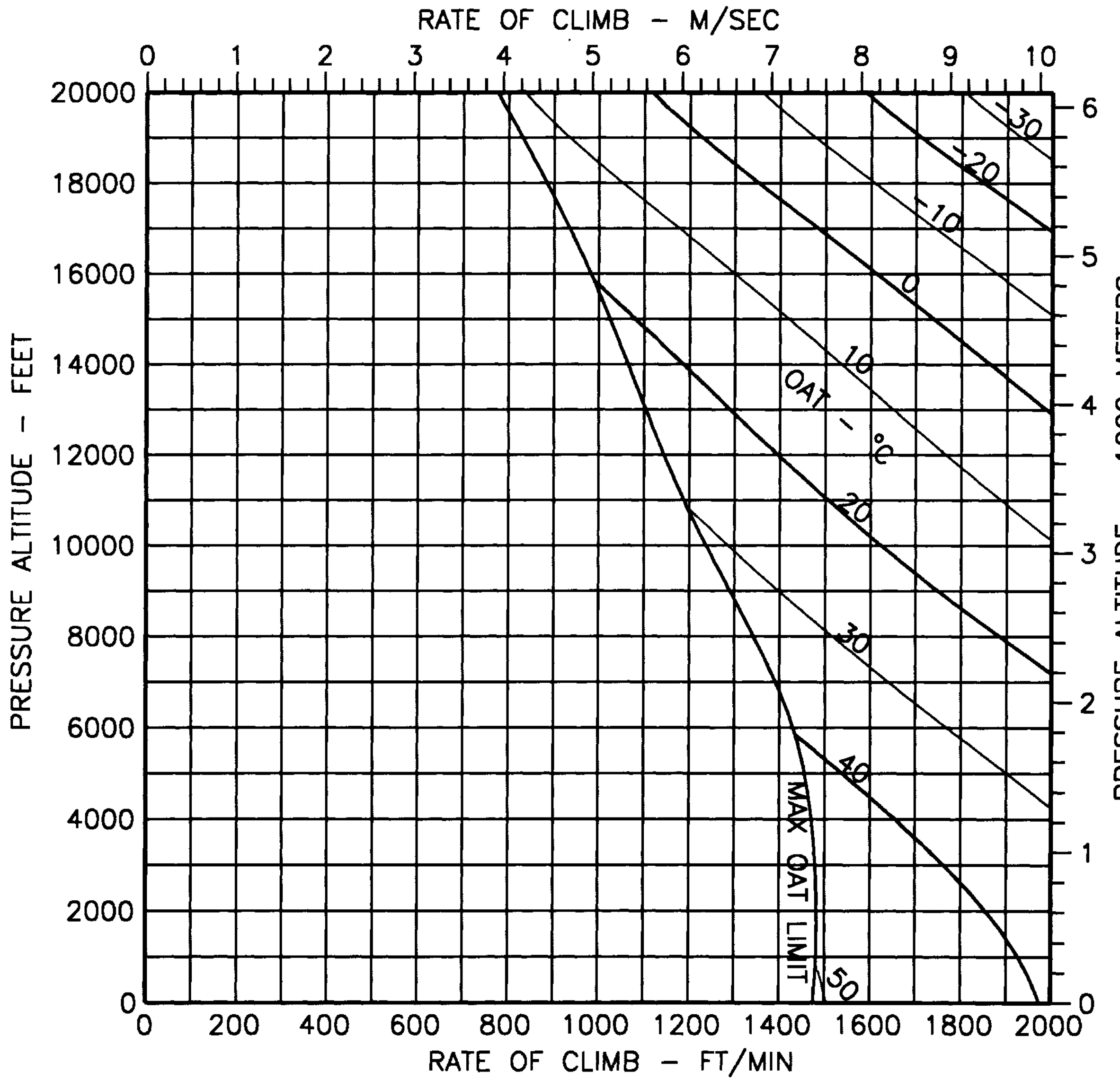
MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
9500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)



407FMS-3-4-7-1.TIF

Figure 4-7. Rate of climb maximum continuous power (sheet 1 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 5500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)

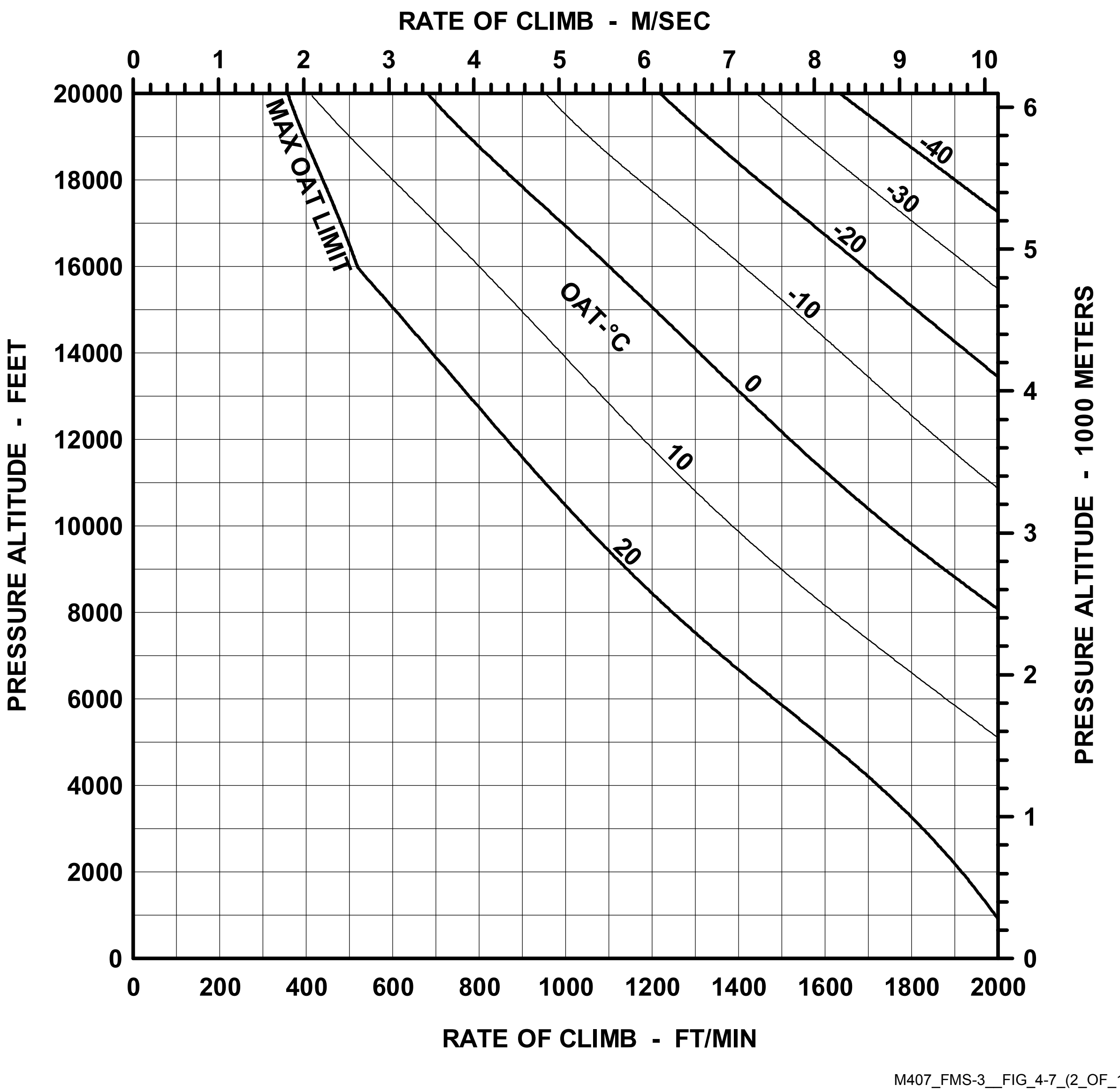


Figure 4-7. Rate of climb maximum continuous power (sheet 2 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE 7000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)

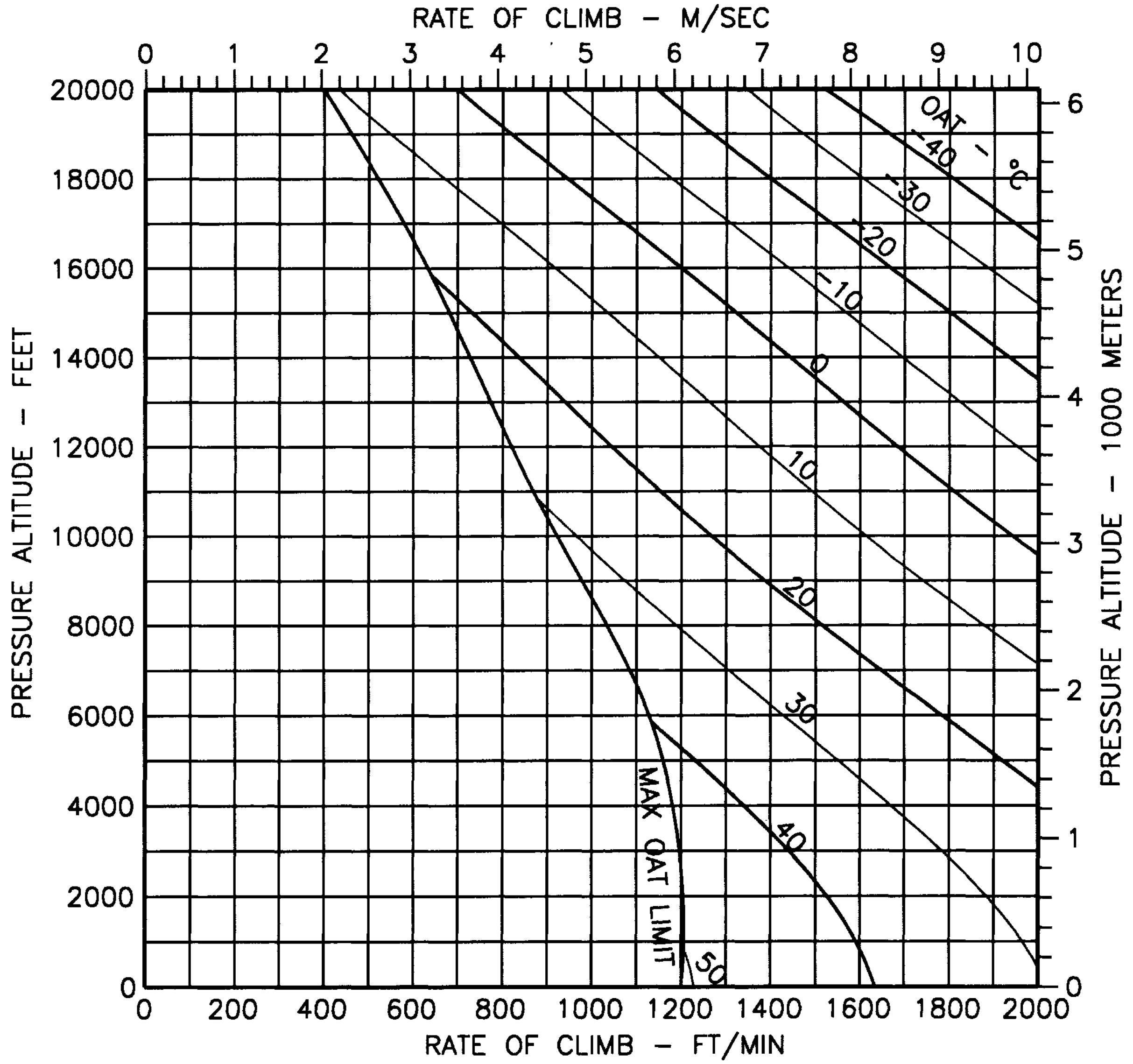


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Figure 4-7. Rate of climb maximum continuous power (sheet 3 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
2500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)

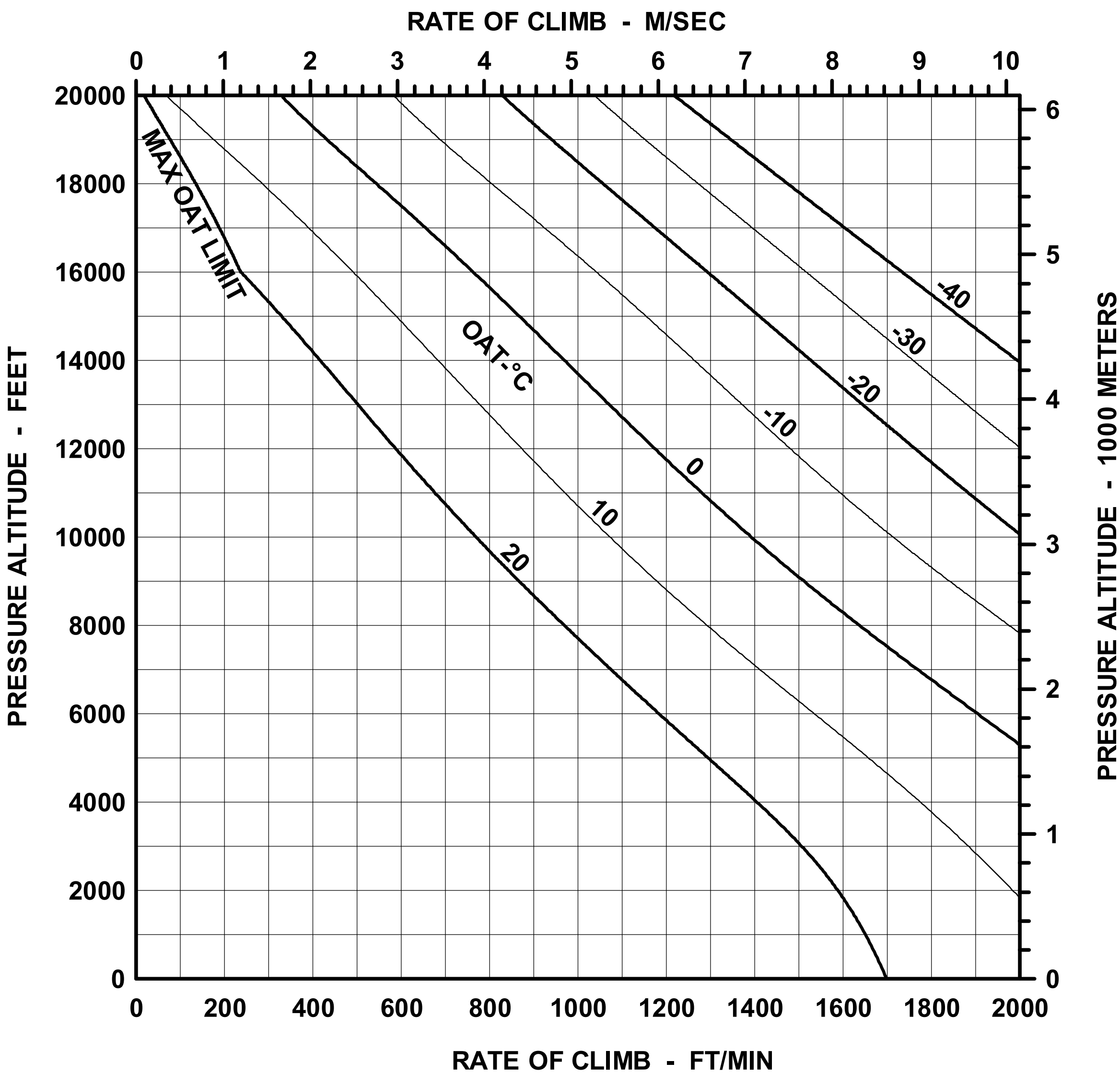

Figure 4-7. Rate of climb maximum continuous power (sheet 4 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
4500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

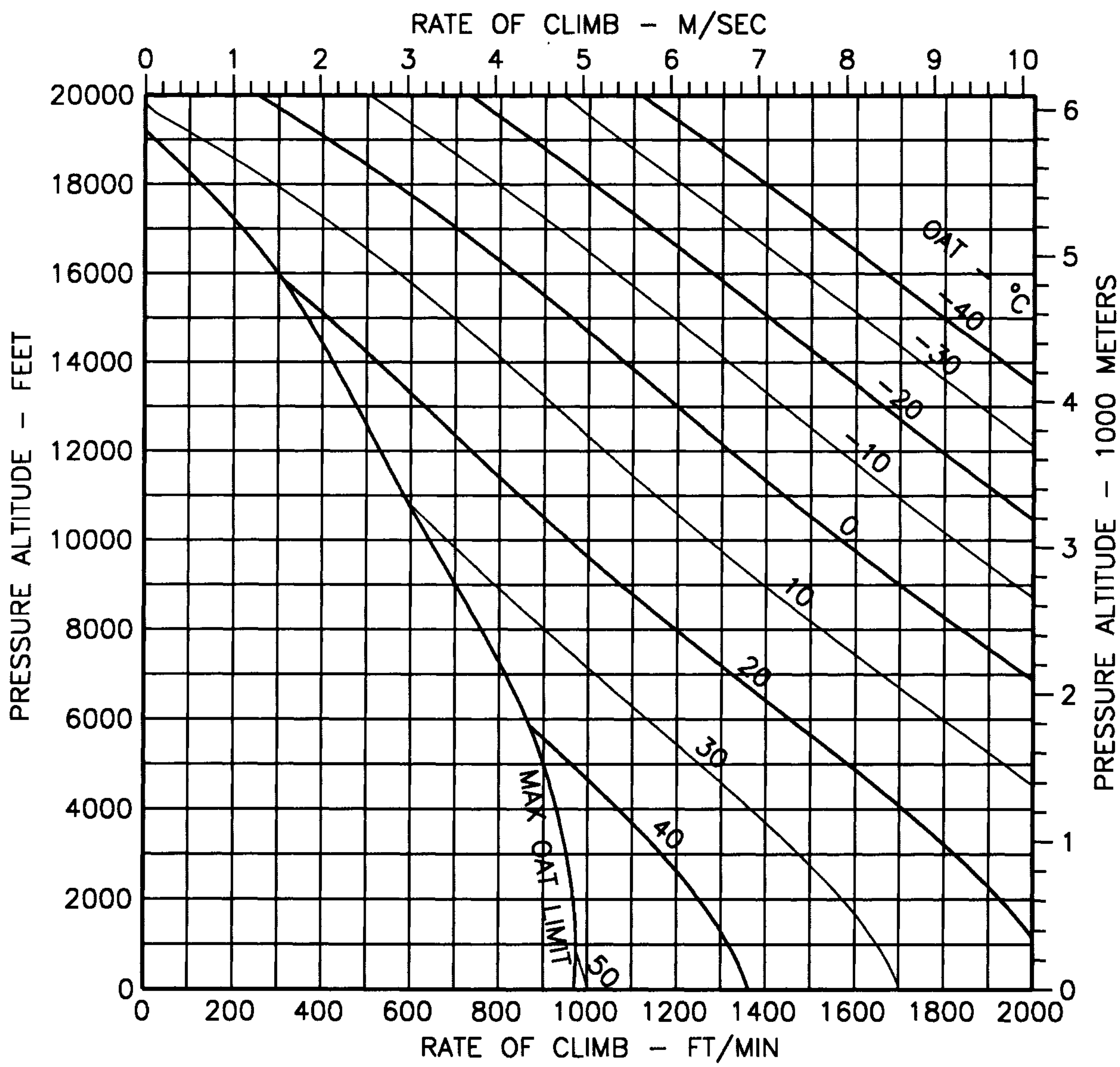

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Figure 4-7. Rate of climb maximum continuous power (sheet 5 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 170 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

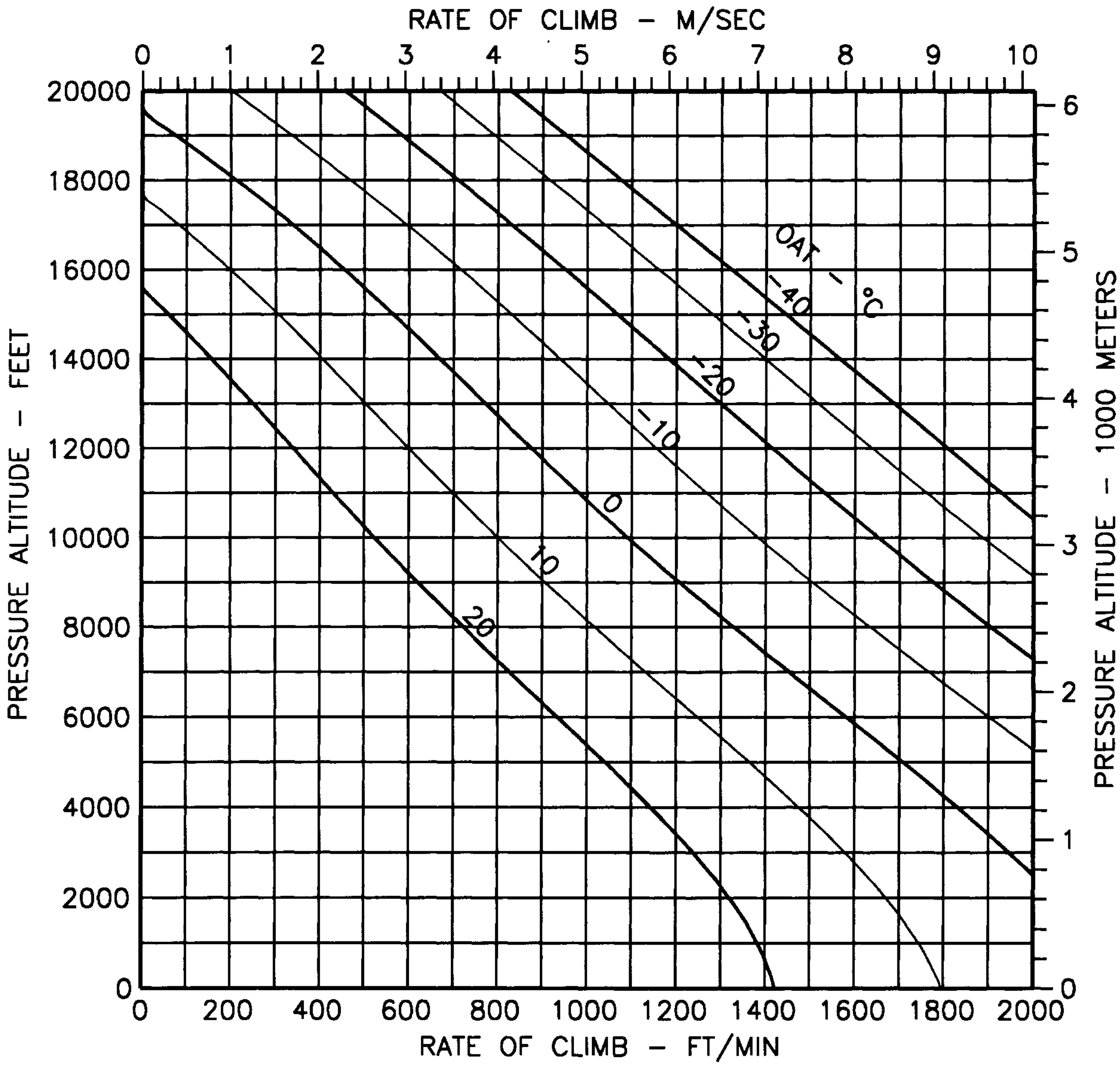

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Figure 4-7. Rate of climb maximum continuous power (sheet 6 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE 3000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

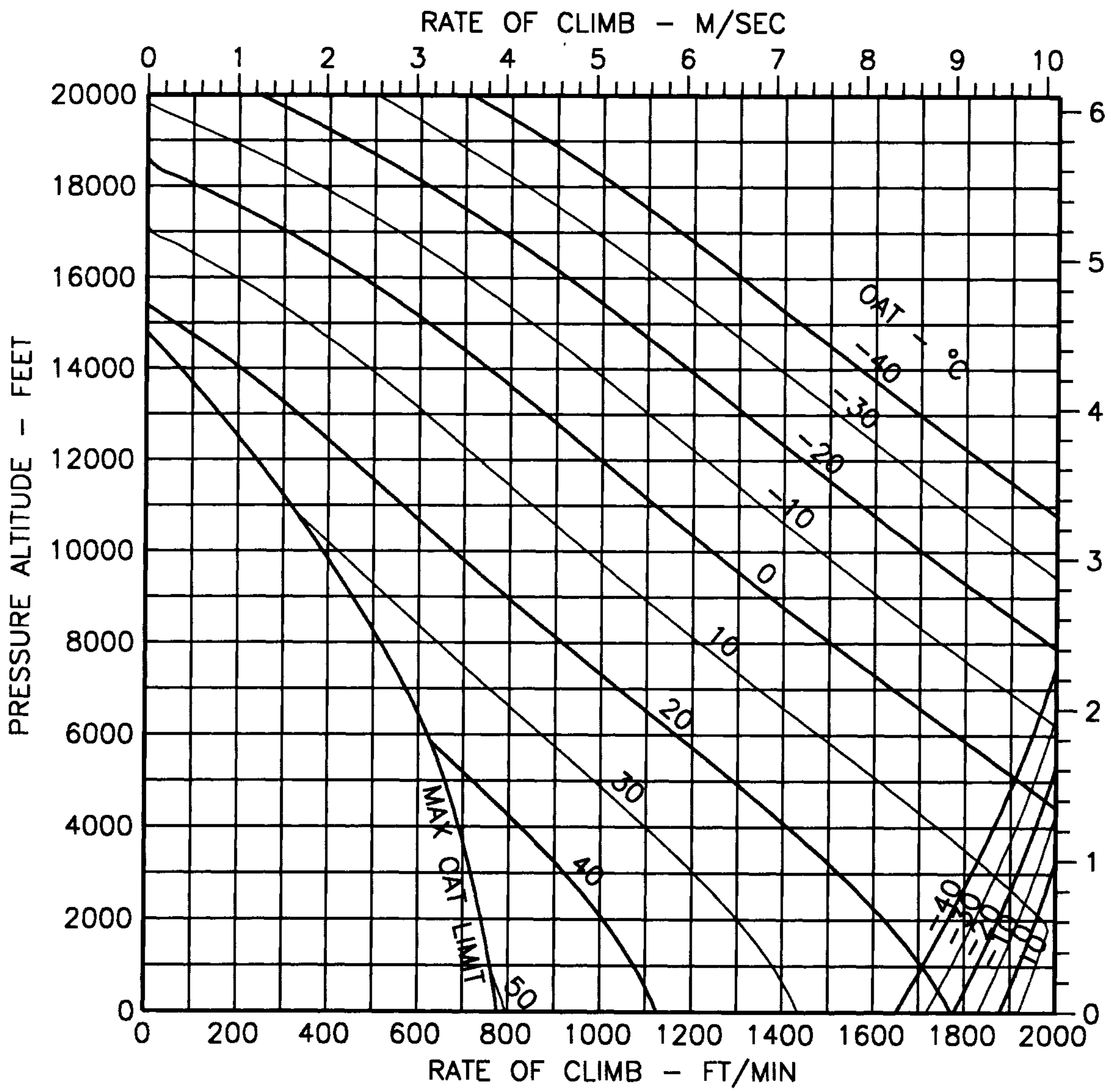

Figure 4-7. Rate of climb maximum continuous power (sheet 7 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

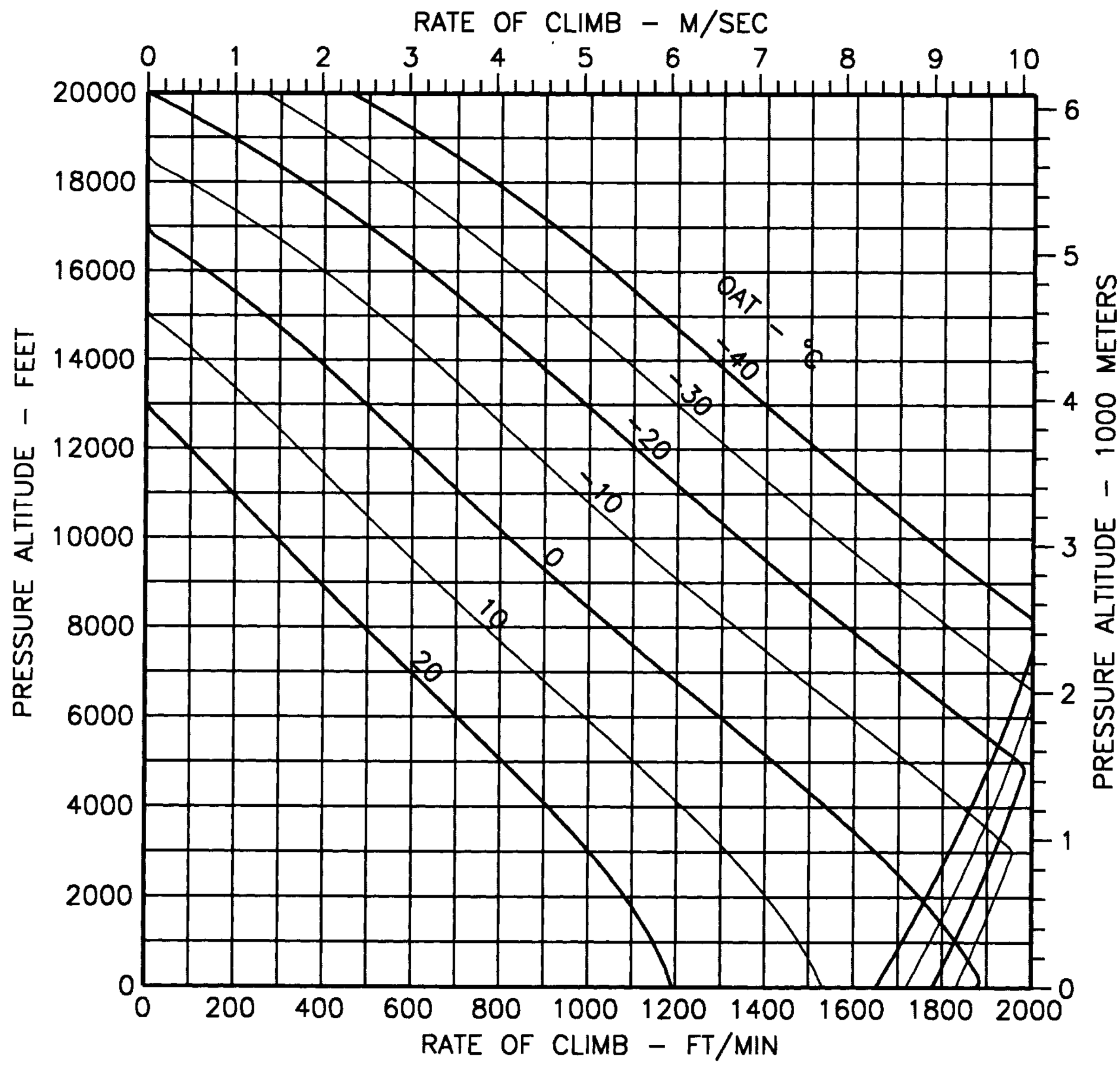

Figure 4-7. Rate of climb maximum continuous power (sheet 8 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
2500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)

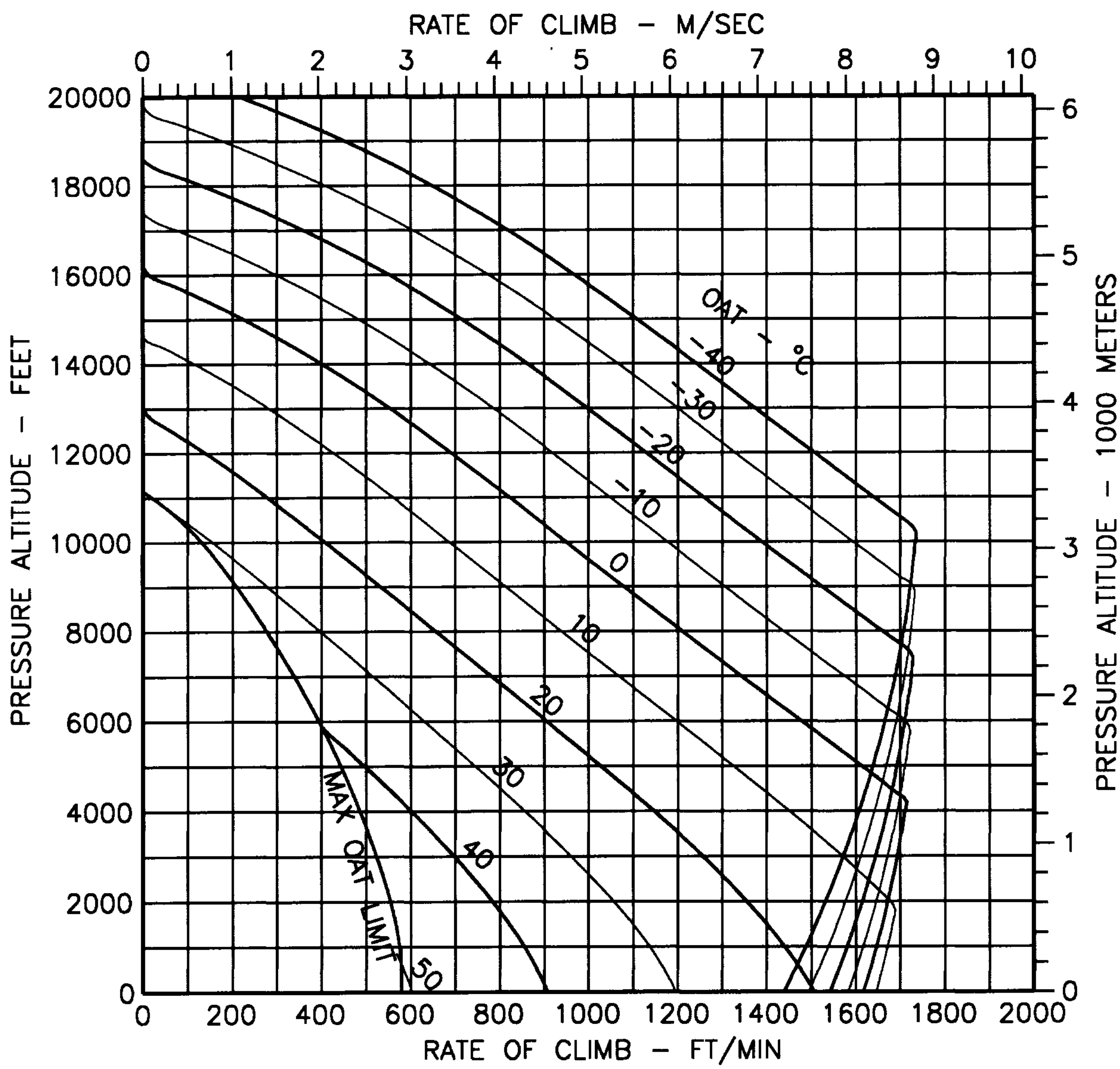

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Figure 4-7. Rate of climb maximum continuous power (sheet 9 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF

REDUCE RATE OF CLIMB 135 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)

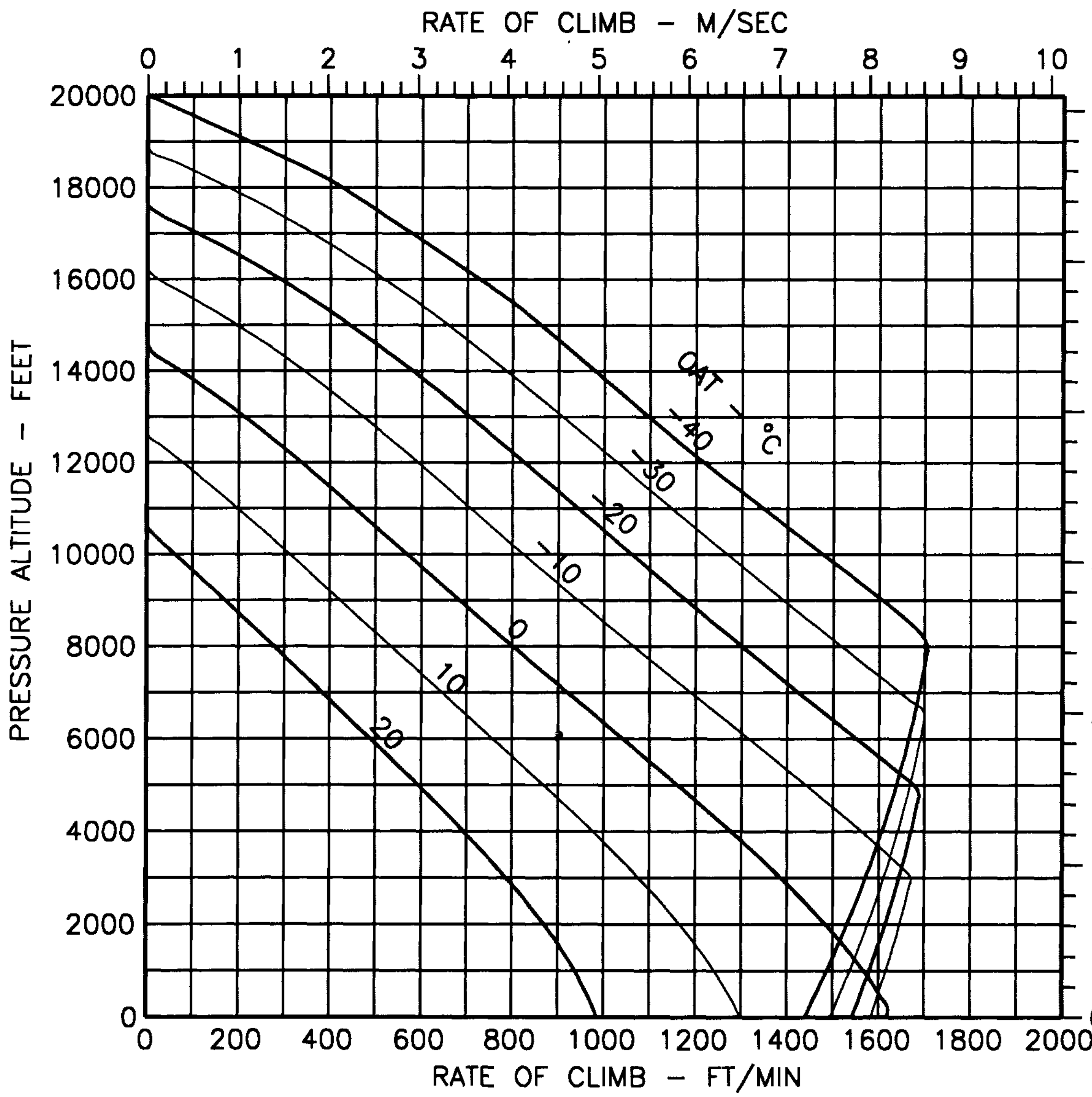

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Figure 4-7. Rate of climb maximum continuous power (sheet 10 of 10)

Section 1

SYSTEMS DESCRIPTION

This kit is equipped with a PART SEP switch located on overhead console. When switch is OFF, engine bleed air is not used to purge debris from particle separator. When switch is ON, engine bleed is used to purge debris.

MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

SNOW DEFLECTOR

206-706-208

CERTIFIED
1 MARCH 1996

This supplement shall be attached to Model 407 Flight Manual when Snow Deflector kit is installed.

Information contained herein supplements Information of basic Flight Manual. For limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual

Bell Helicopter
A Textron Company
POST OFFICE BOX 482 • FORT WORTH, TEXAS 76101

REISSUED — 16 DECEMBER 2002

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Revision	2	04 SEP 98			

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NOTE

Revised text is indicated by a black vertical line. Insert latest revision pages; dispose of superseded pages.

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Original	0	01 MAR 96
Revision	1	27 MAY 97
Revision	2	04 SEP 98
Revision	3	17 APR 00
Reissue	0	16 DEC 02

APPROVED

DATE 16 December 2002

CHIEF, FLIGHT TEST
FOR
DIRECTOR — AIRWORTHINESS BRANCH
DEPARTMENT OF TRANSPORT

LOG OF FAA APPROVED REVISIONS

Original	0	01 MAR 96
Revision	1	27 MAY 97
Revision	2	18 MAY 99
Revision	3	05 MAY 00
Reissue	0	24 SEP 03

GENERAL INFORMATION

Snow deflector kit (206-706-208) consists of two deflectors that mount on either side of transmission fairing, just forward of engine air inlets.

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Snow deflector kit shall be installed for operation in falling or blowing snow. They may be installed with basic inlet screen or particle separator kit (206-706-212).

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight changes shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

1-11. AMBIENT TEMPERATURES

Snow deflectors shall be removed for operations above 30°C (86°F).

1-22. SNOW OPERATION

For operation in falling or blowing snow,the following limits apply:

Hover flight in falling and/or blowing snow is limited to 15 minute duration after which helicopter shall be landed and checked for snow and/or ice accumulation.

Flight operations are prohibited when visibility in falling or blowing snow is less than one-half (1/2) statute mile.

Section 2

NORMAL PROCEDURES

2-3. PREFLIGHT CHECK

2-3-A. EXTERIOR CHECK

2-3-A-1. OPERATION IN FALLING OR BLOWING SNOW

1. Thoroughly check cabin roof, transmission fairing, deflector baffles, and engine air intake areas. All areas checked shall be clean and free of accumulated snow, slush, and ice before each flight.

NOTE

Due to reduced performance at higher temperatures, it is recommended that snow deflectors be removed above 20°C (68°F).

2. Particle separator kit (if installed), check engine air plenum chamber through plexiglass windows on each side of inlet cowling for snow, slush, or ice, paying particular attention to firewalls and rear face of particle separator. Clean thoroughly before each flight.

2-3-A-2. AFTER EXITING HELICOPTER

WARNING

FAILURE TO INSTALL ENGINE INTAKE COVERS COULD ALLOW FALLING/BLOWING SNOW TO ENTER THE PARTICLE SEPARATOR PLENUM (IF INSTALLED).

Install protective covers (engine intake, exhaust, and pitot tube).

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

4-1. INTRODUCTION

Refer to appropriate performance charts in accordance with optional equipment installed.

NOTE

Due to reduced performance at higher temperatures, it is recommended that snow deflectors be removed above 20°C (68°F).

4-2. POWER ASSURANCE CHECK

Power assurance check chart Figure 4-1.

Performance is reduced with snow baffles installed. Power assurance check chart (Figure 4-1) is provided to determine if engine can produce installed power. Power assurance check shall be conducted in level flight only. This chart is valid for both basic inlet with snow deflectors installed and snow deflectors with particle separator installed. PARTICLE SEP PRG switch (if installed) shall be OFF when performing a power assurance check.

4-5. HOVER CEILING

4-5-A. HOVER CEILING IN-GROUND-EFFECT

Hover ceiling IGE (takeoff power) charts are presented in Figure 4-2, and Hover ceiling IGE (maximum continuous power) charts are presented in Figure 4-3.

4-5-B. HOVER CEILING OUT-OF-GROUND-EFFECT

Hover ceiling OGE (takeoff power) charts are presented in Figure 4-4, and Hover ceiling OGE (maximum continuous power) charts are presented in Figure 4-5.

4-7. CLIMB AND DESCENT

4-7-A. RATE OF CLIMB

Rate of climb (takeoff power) charts are presented in Figure 4-6, Rate of climb (maximum continuous power) charts are presented in Figure 4-7, Rate of climb (takeoff power) (particle separator) charts are presented in Figure 4-8, and Rate of climb (maximum continuous power) (particle separator) charts are presented in Figure 4-9.

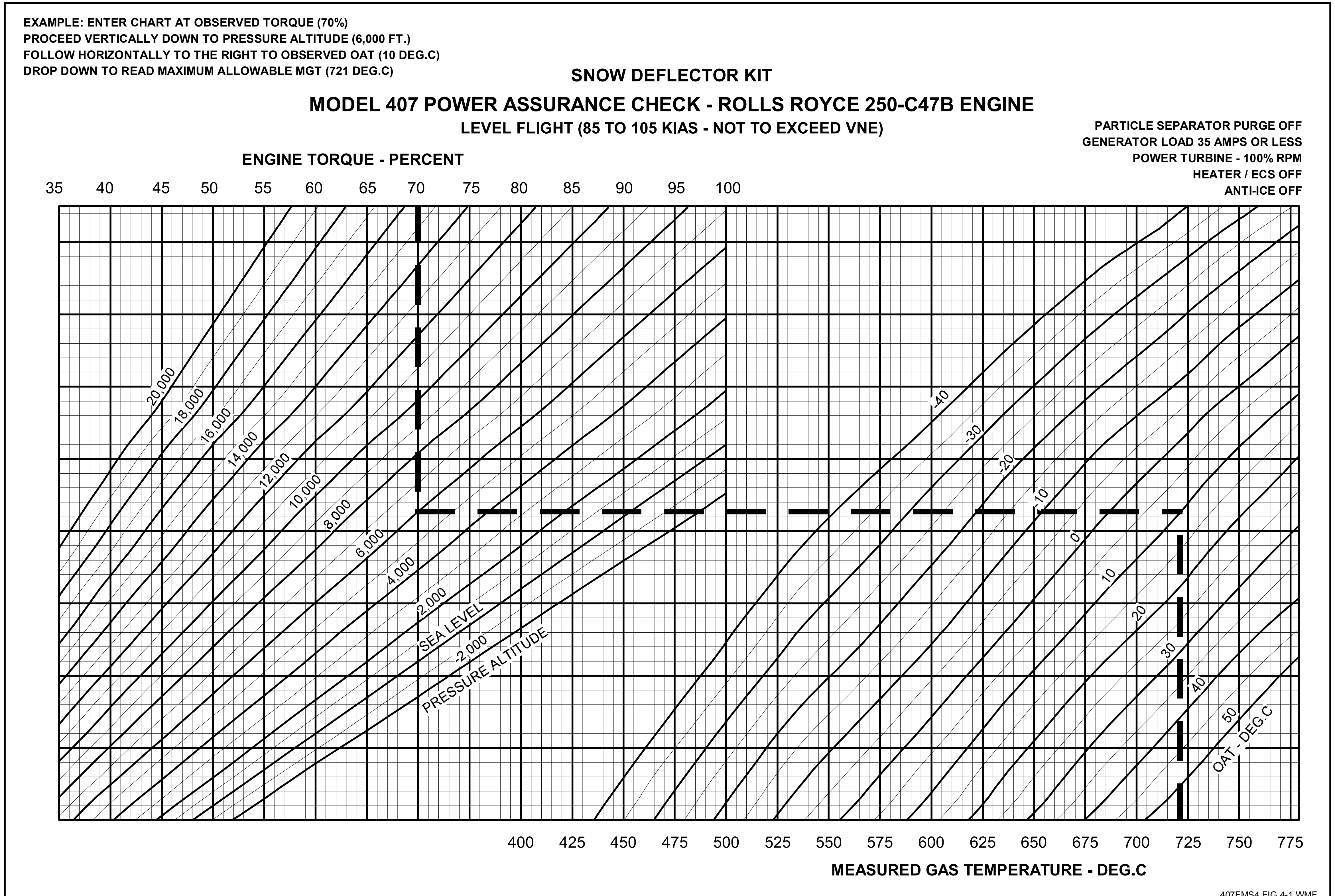


Figure 4-1. Power assurance check chart

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

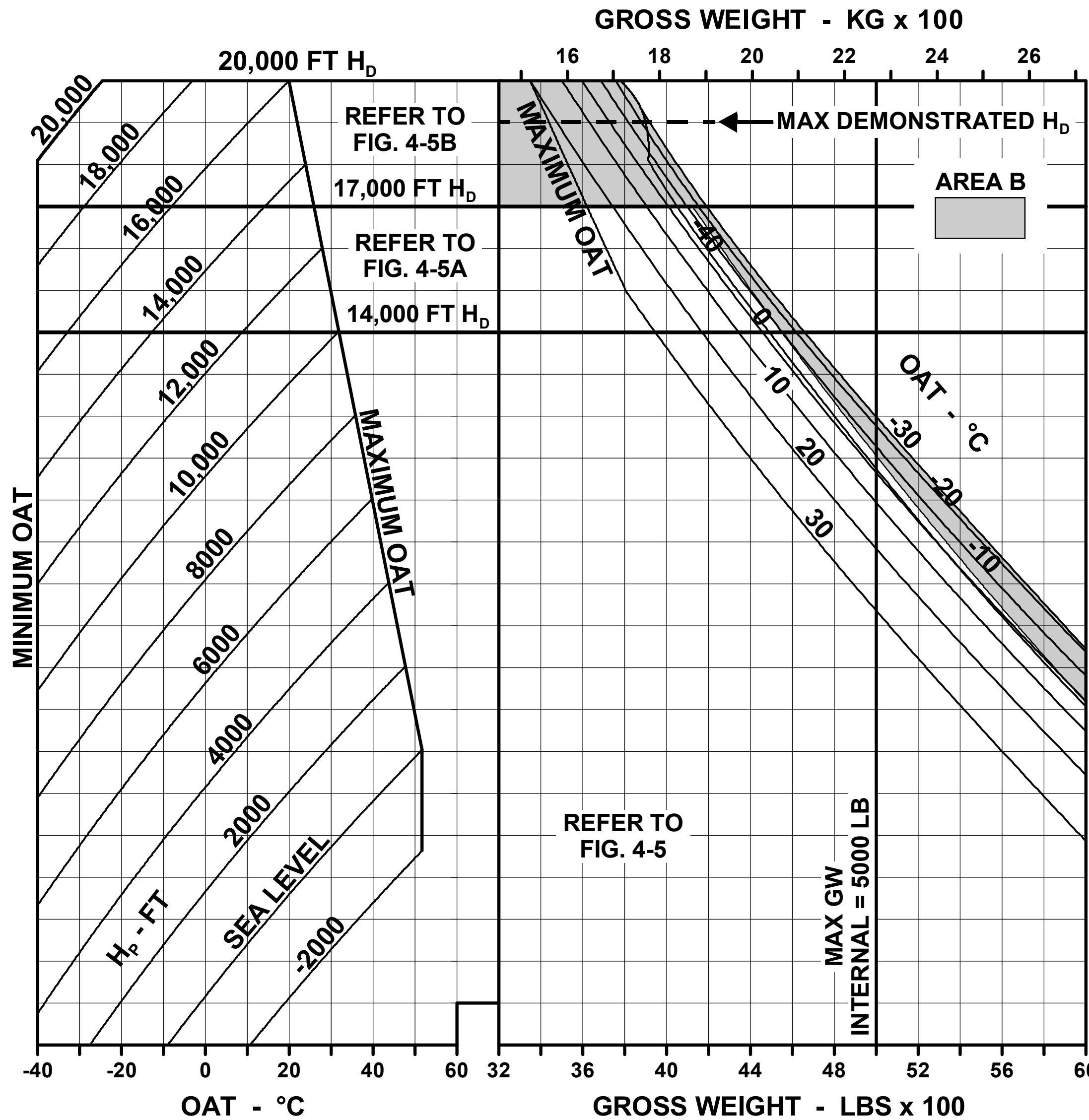


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 1 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

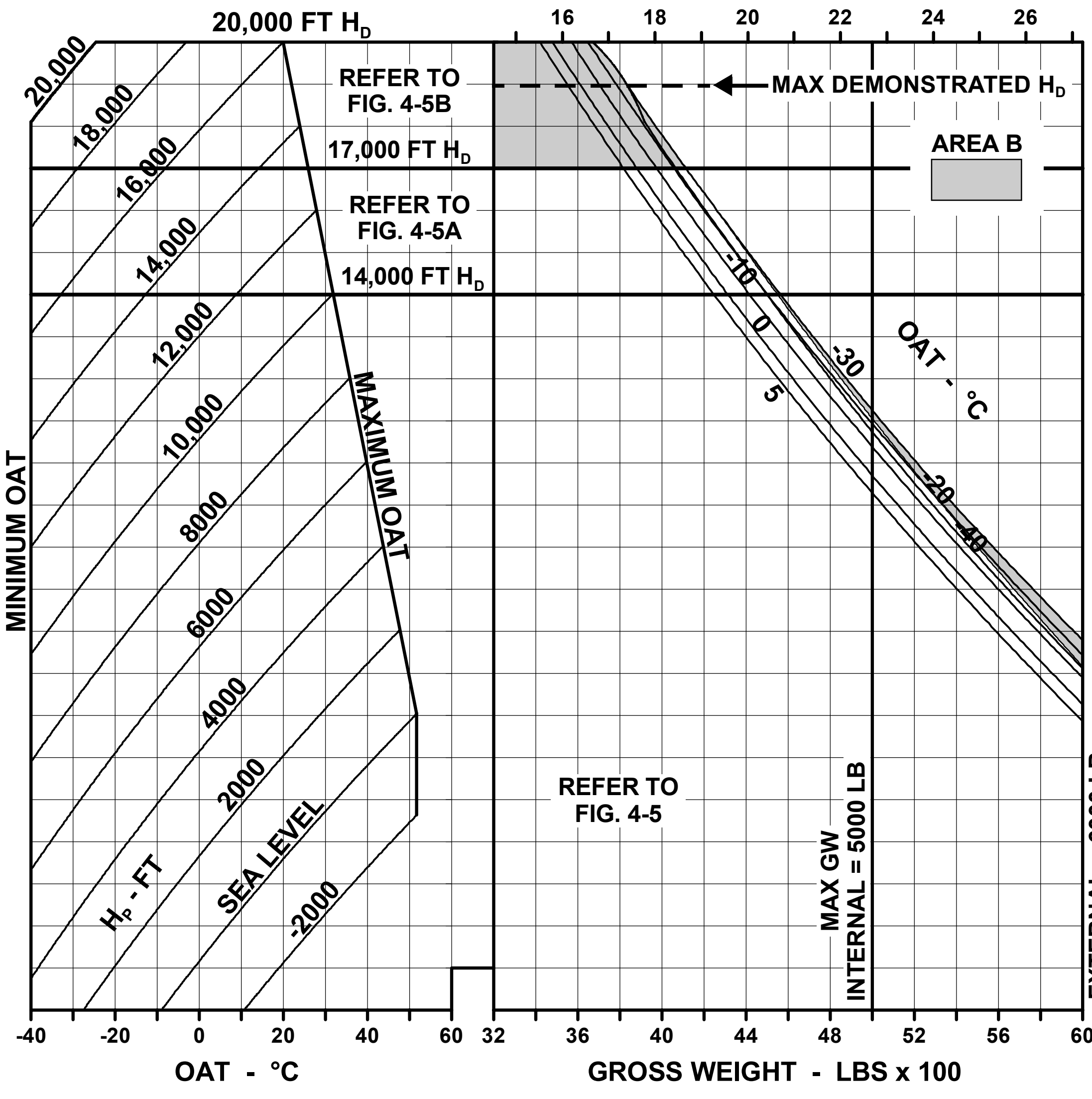


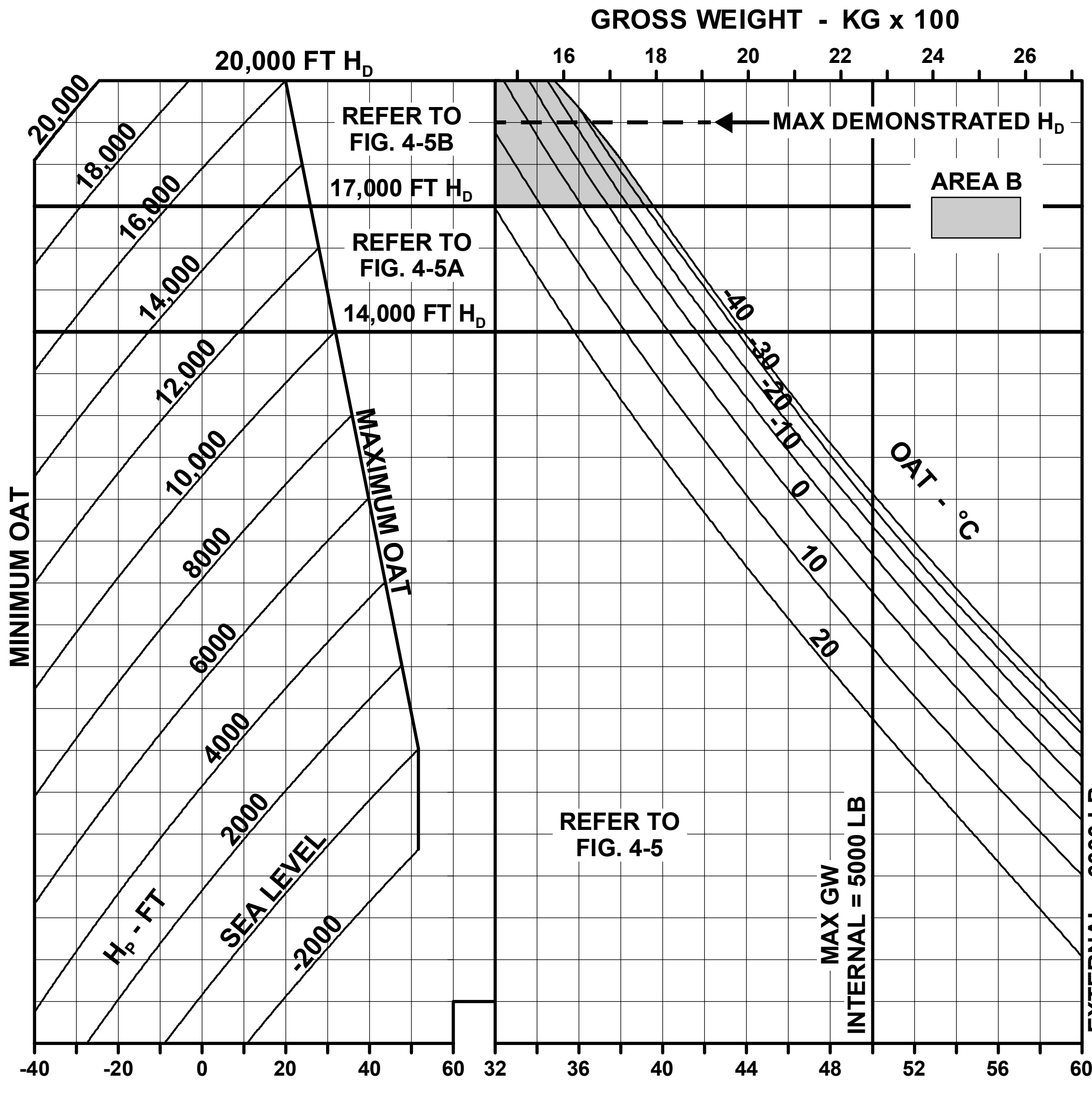
Figure 4-2. Hover ceiling IGE – takeoff power (sheet 2 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)



M407_FMS-4__FIG_4-2_(3_OF_8).WMF

Figure 4-2. Hover ceiling IGE – takeoff power (sheet 3 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

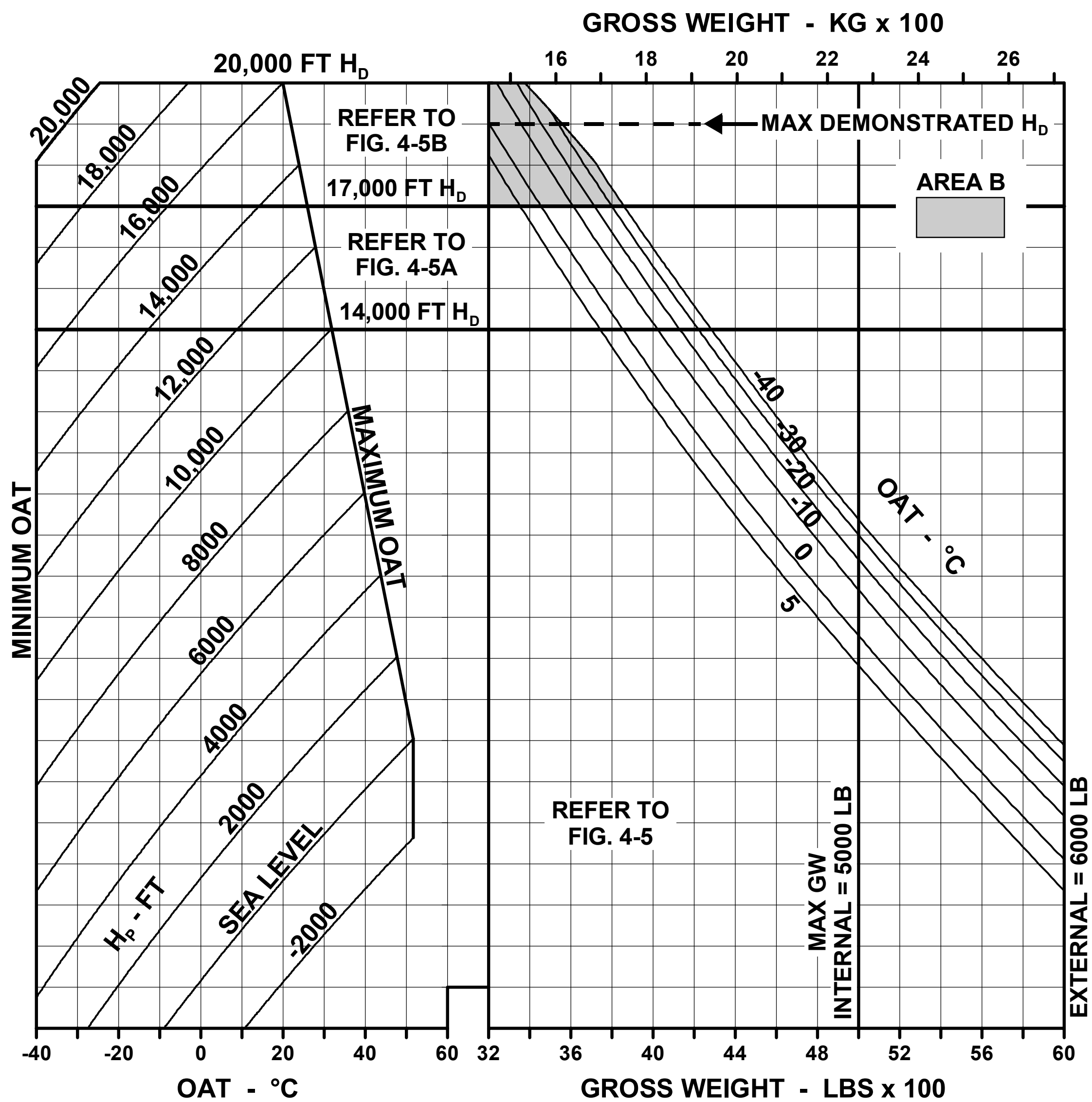


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 4 of 8)

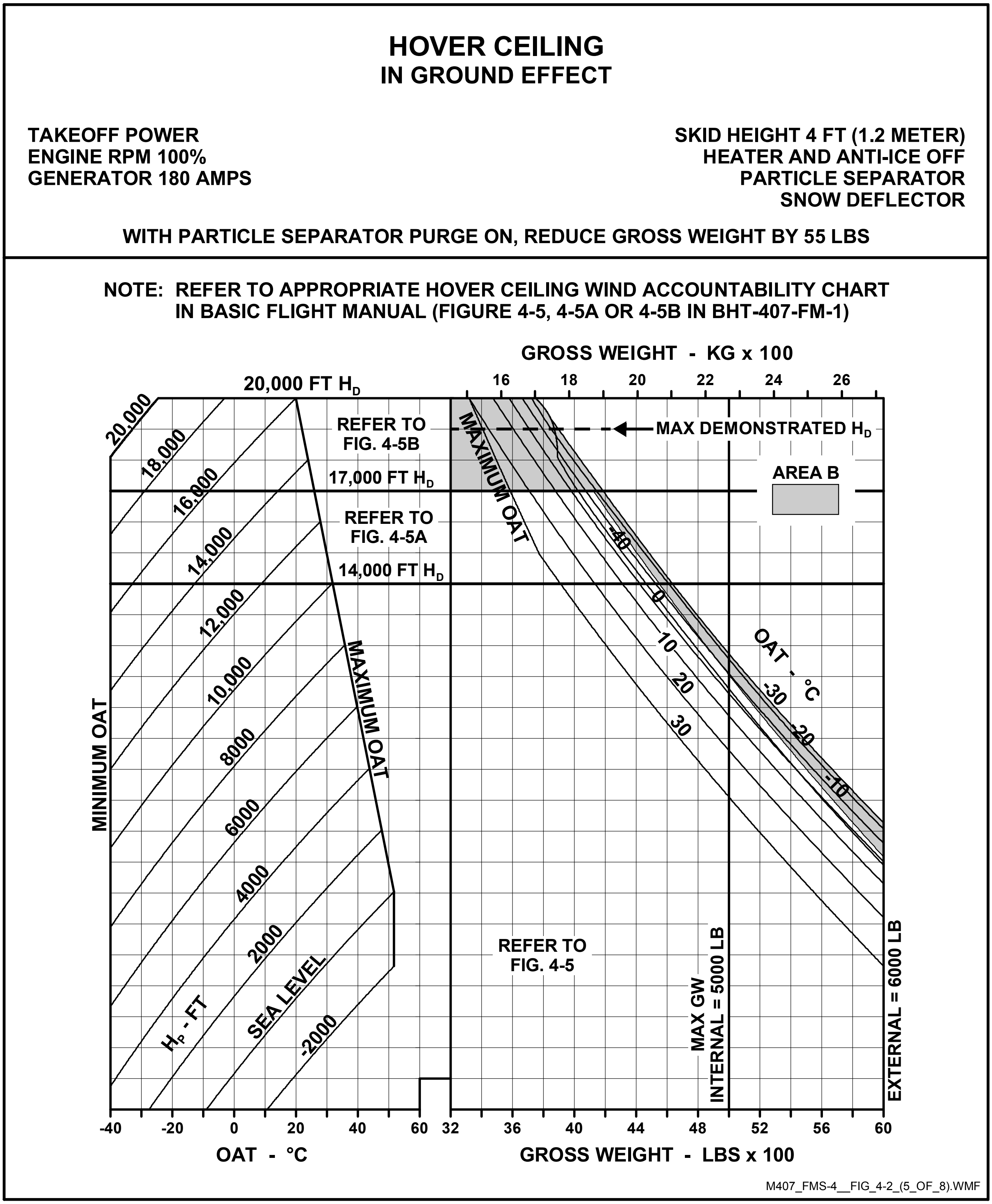


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 5 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

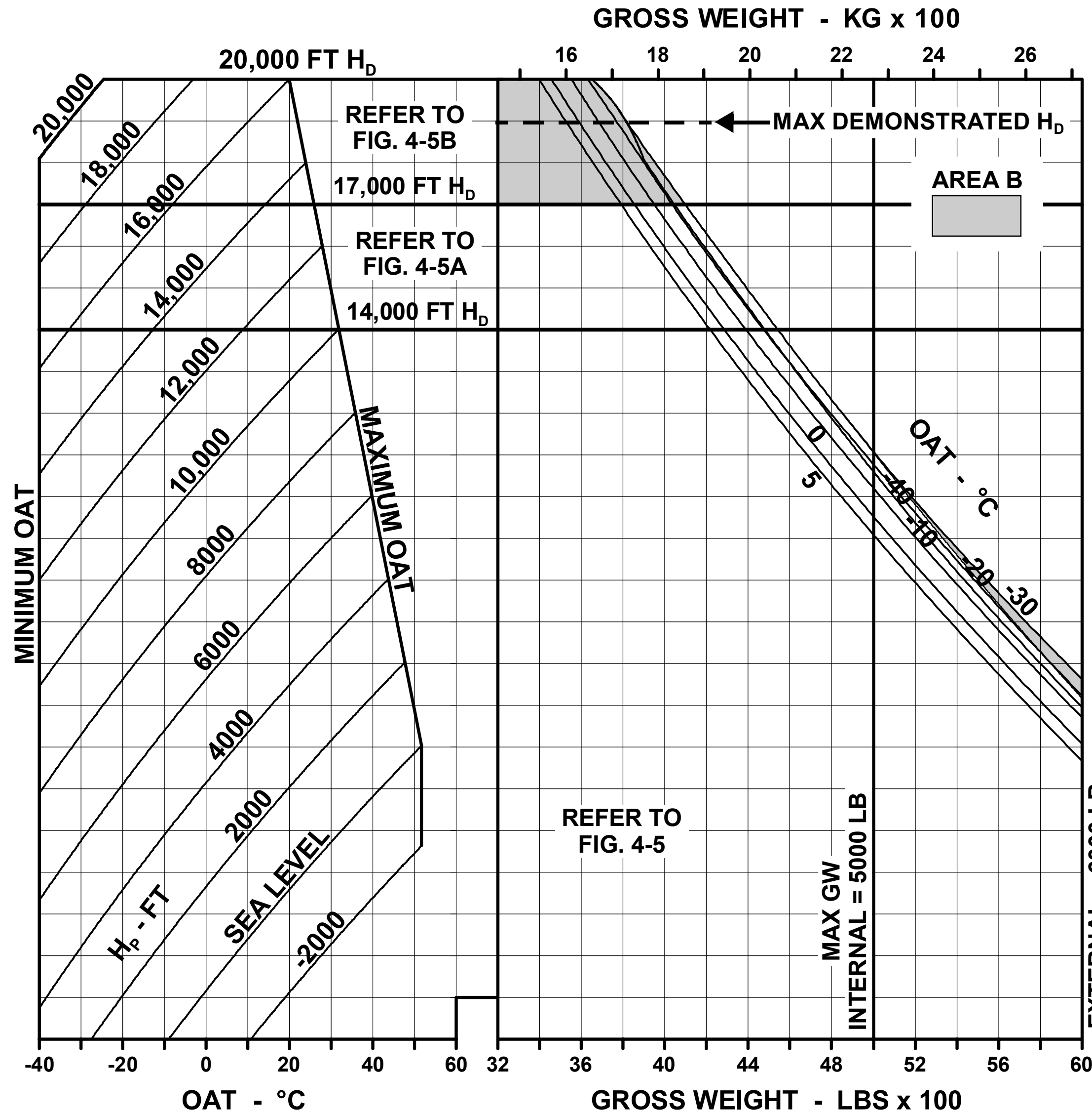


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 6 of 8)

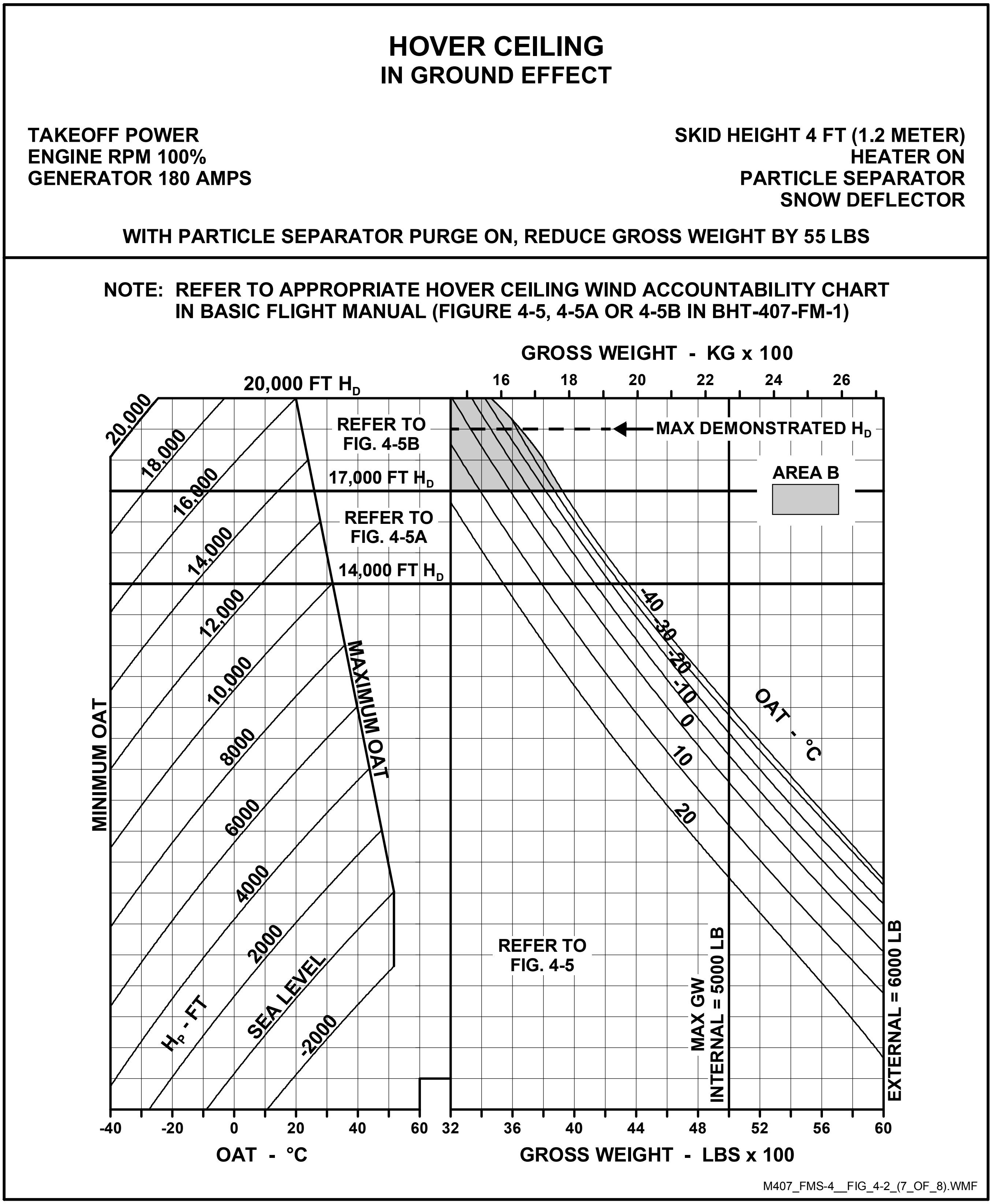


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 7 of 8)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

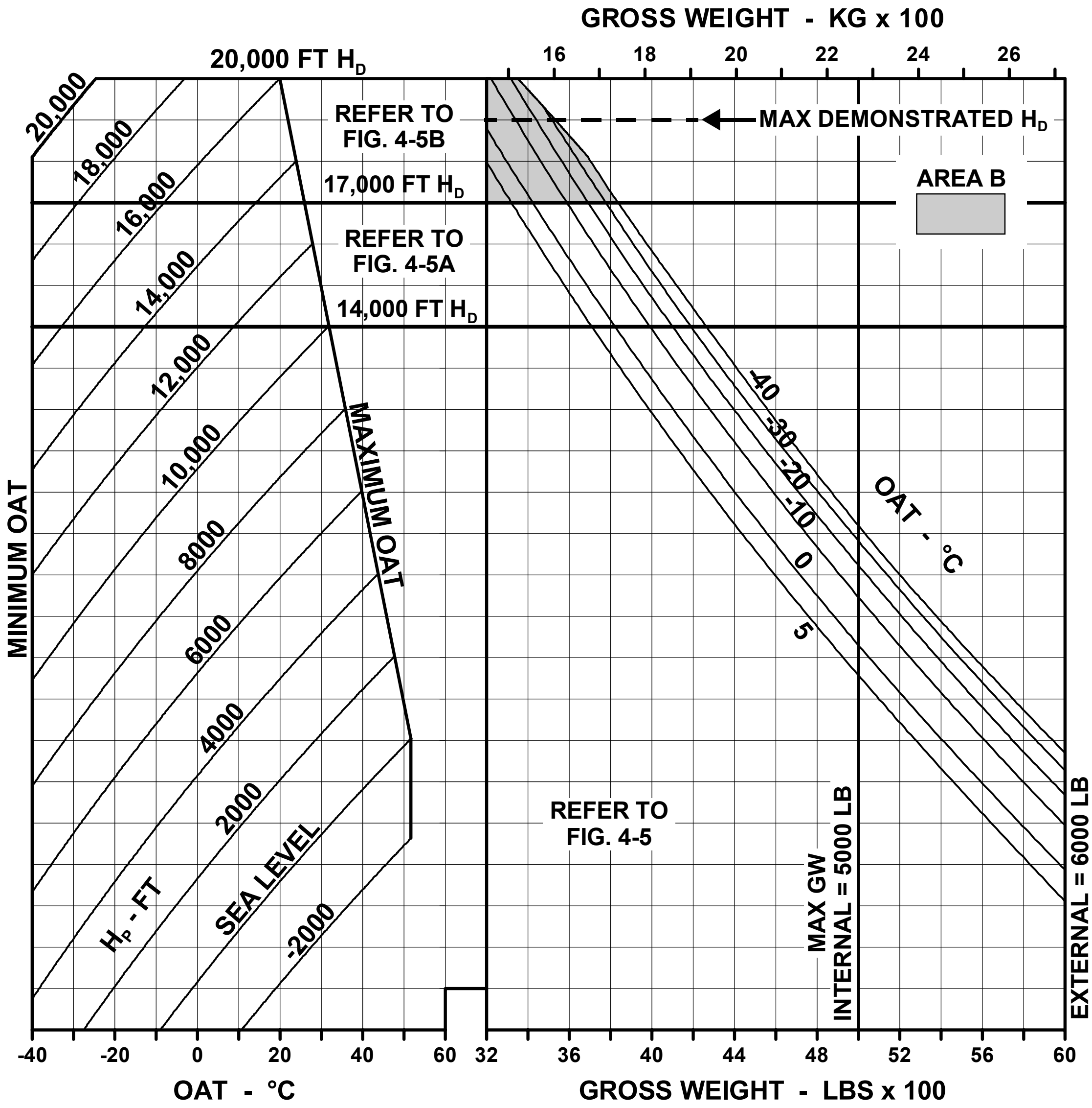


Figure 4-2. Hover ceiling IGE – takeoff power (sheet 8 of 8)

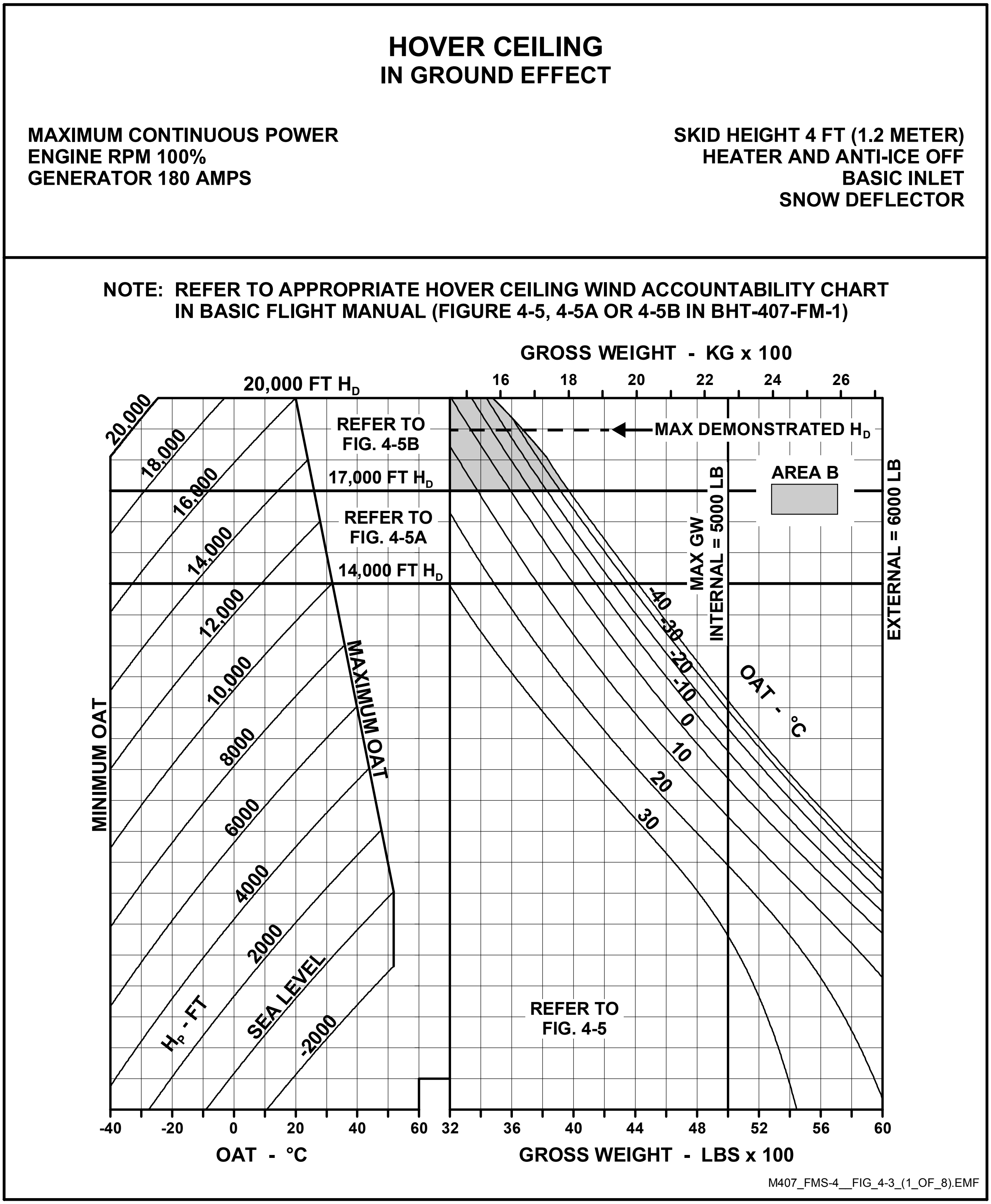


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 1 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

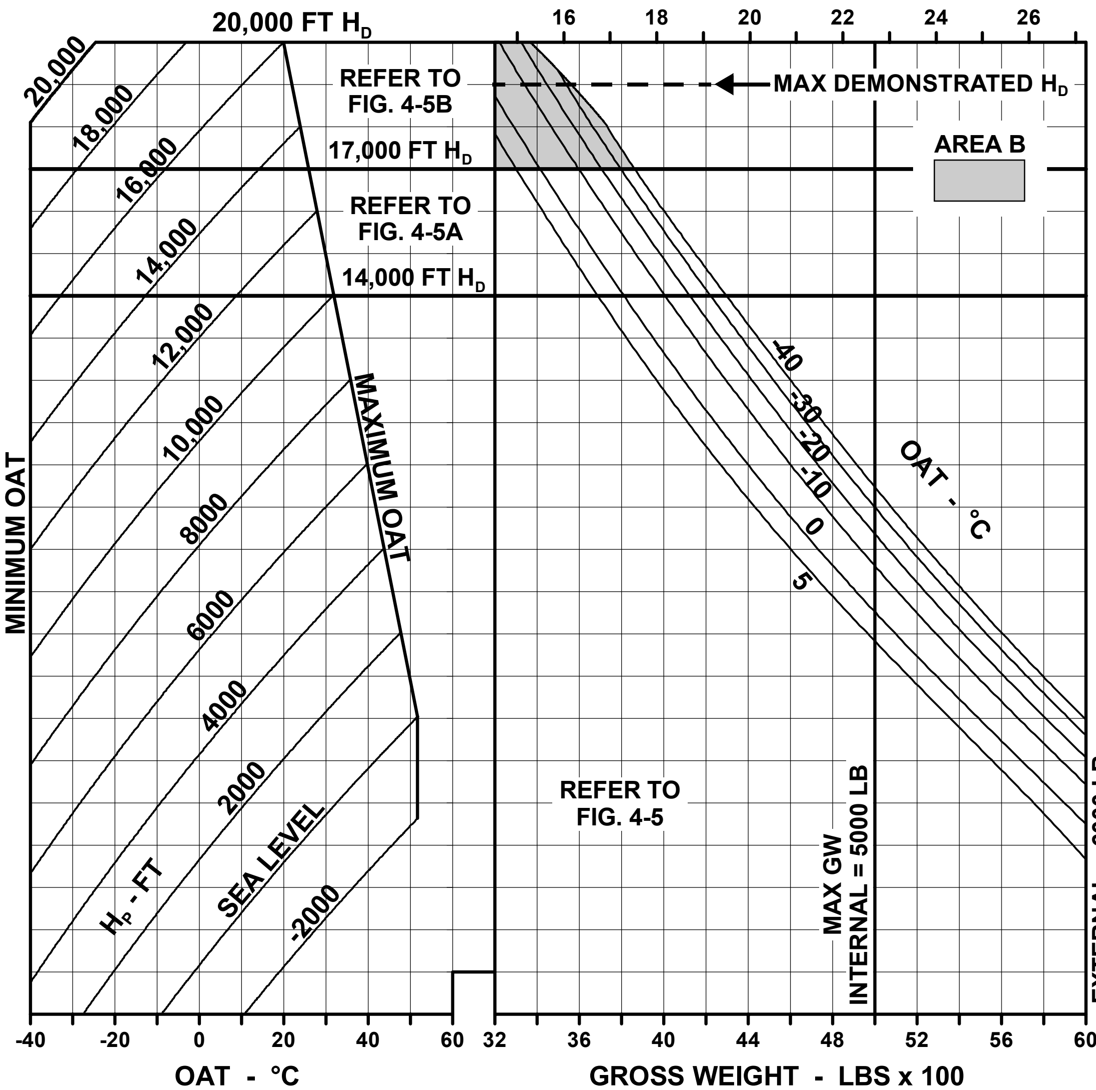


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 2 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

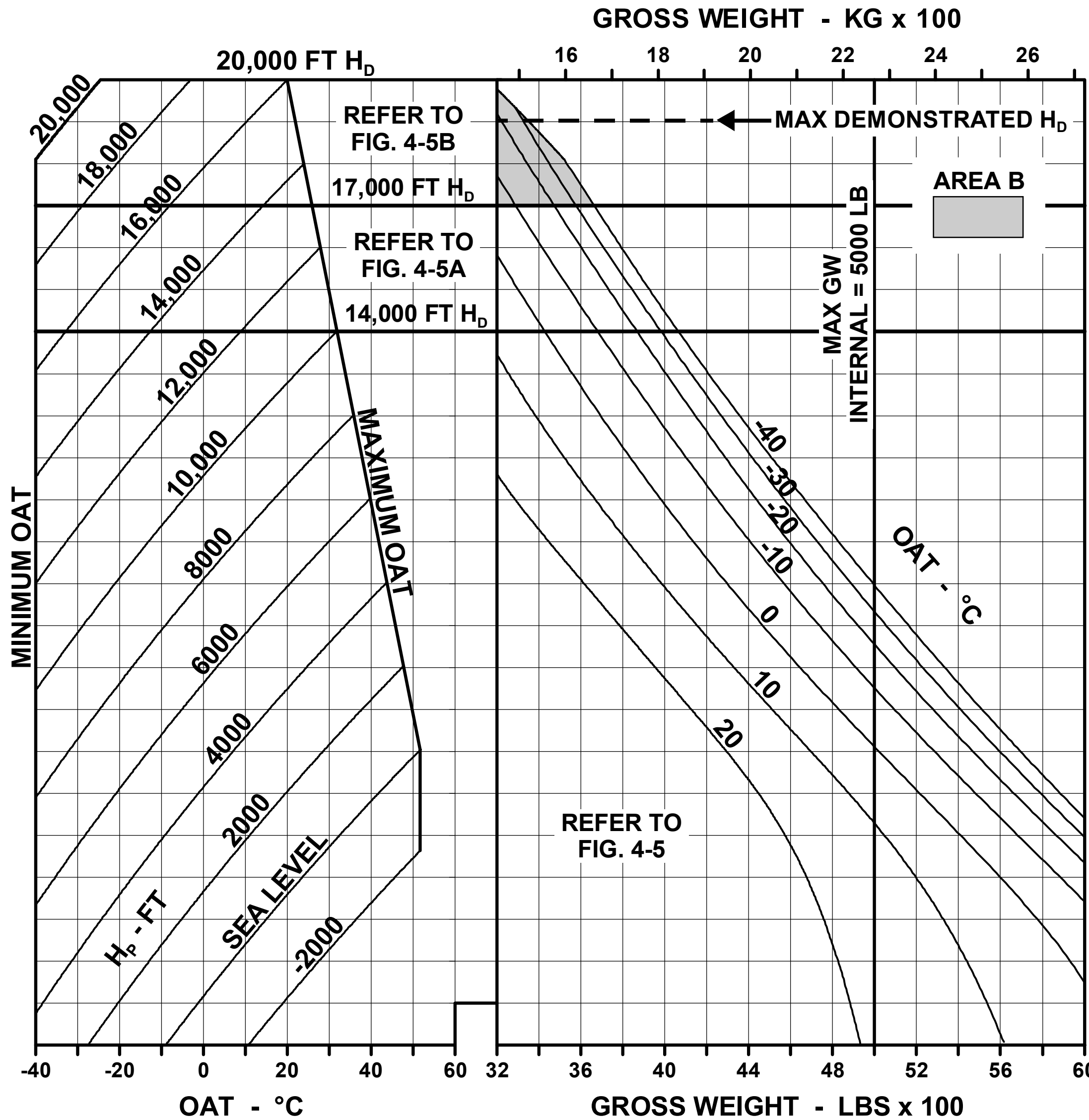


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 3 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

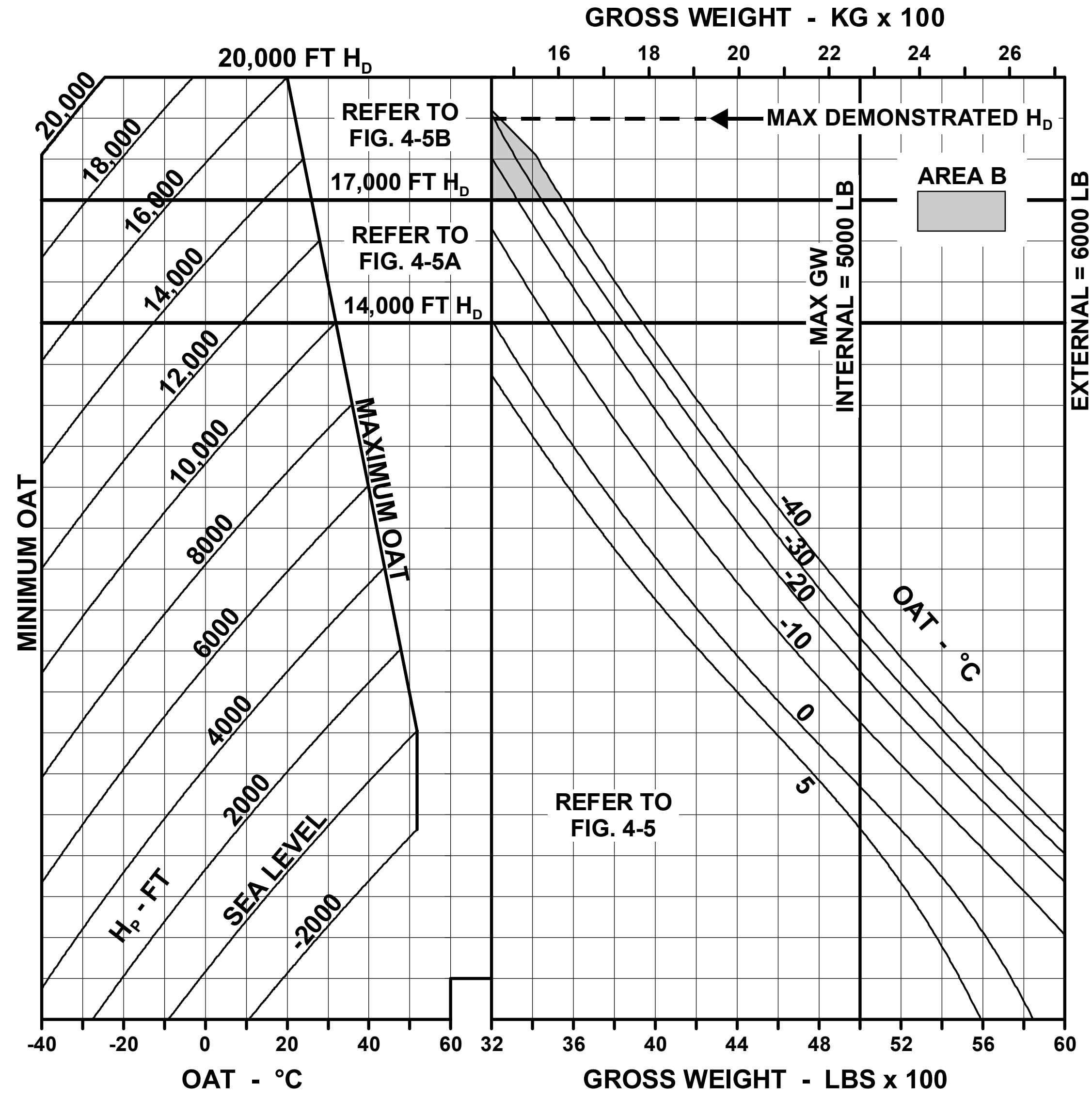


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 4 of 8)

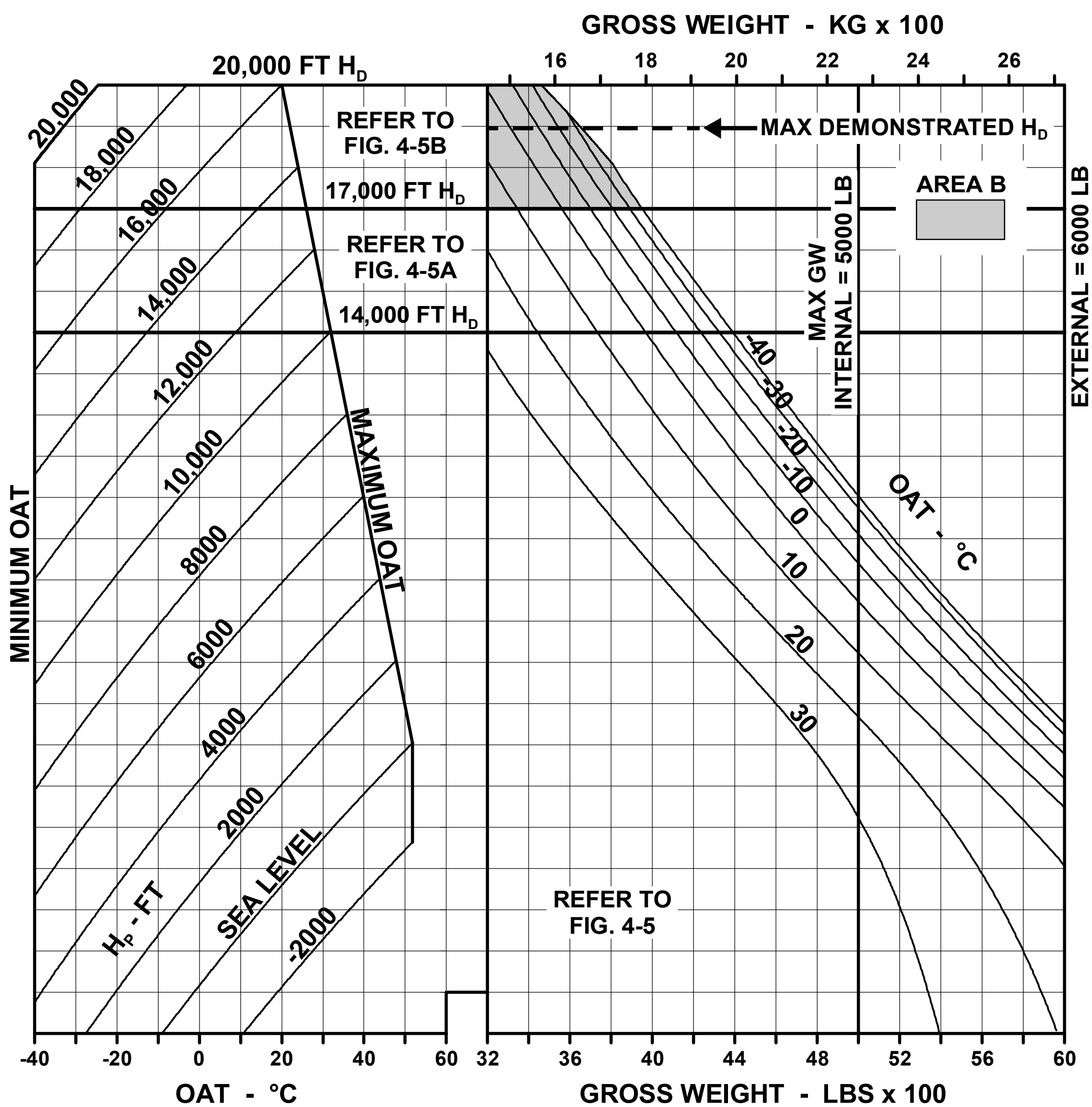
HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)



M407_FMS-4__FIG_4-3_(5_OF_8).EMF

Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 5 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

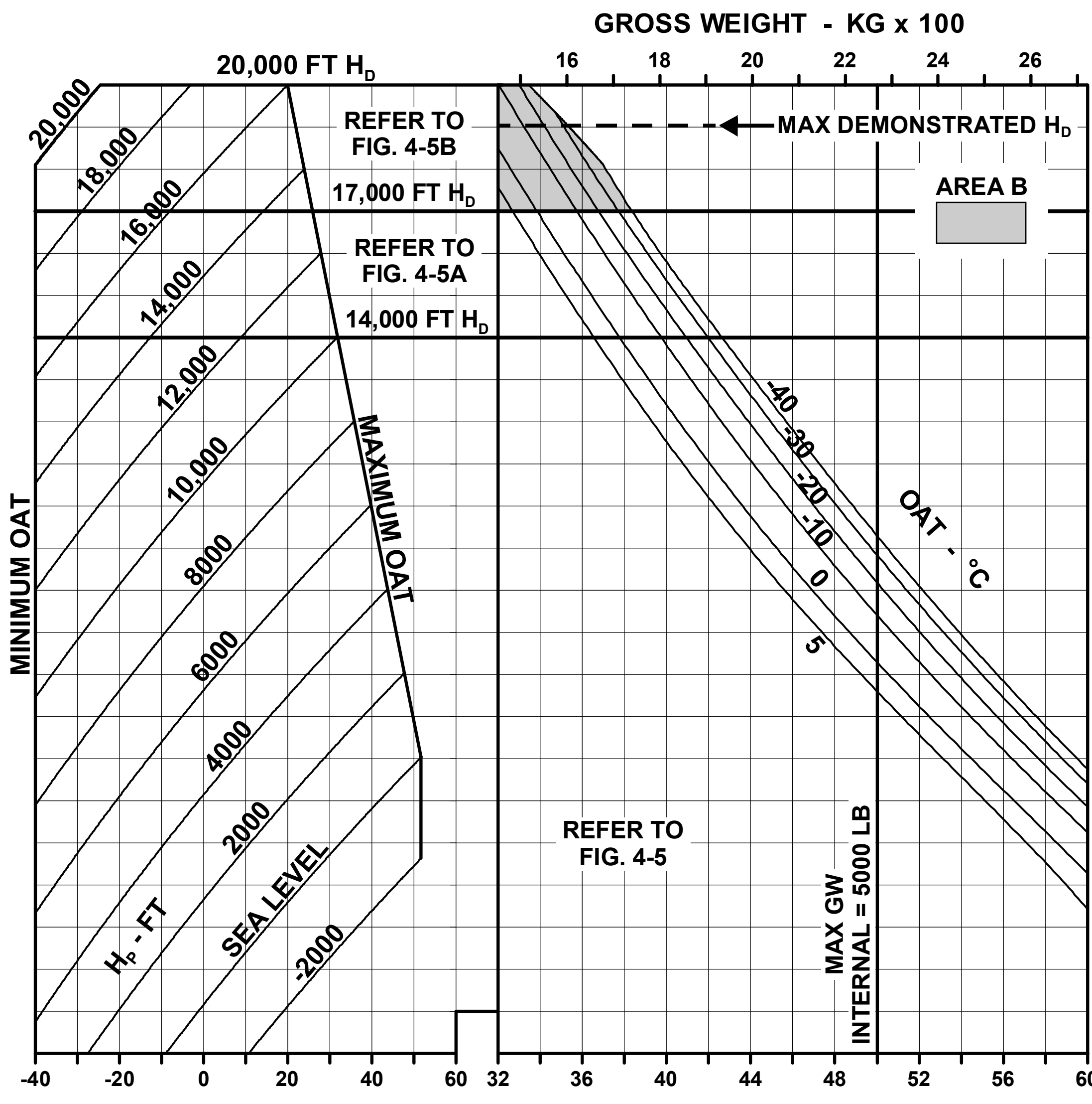


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 6 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

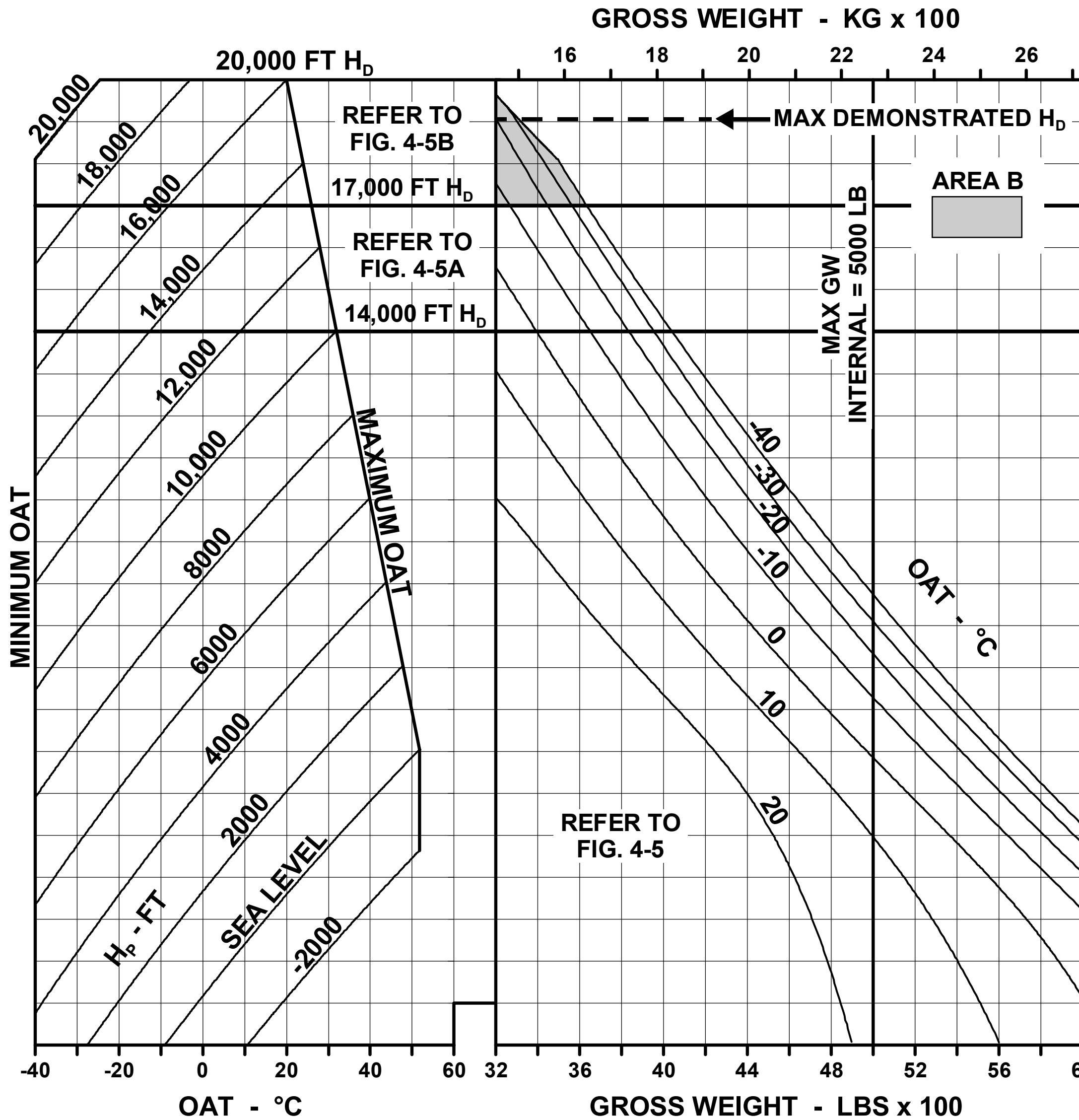


Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 7 of 8)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5, 4-5A OR 4-5B IN BHT-407-FM-1)

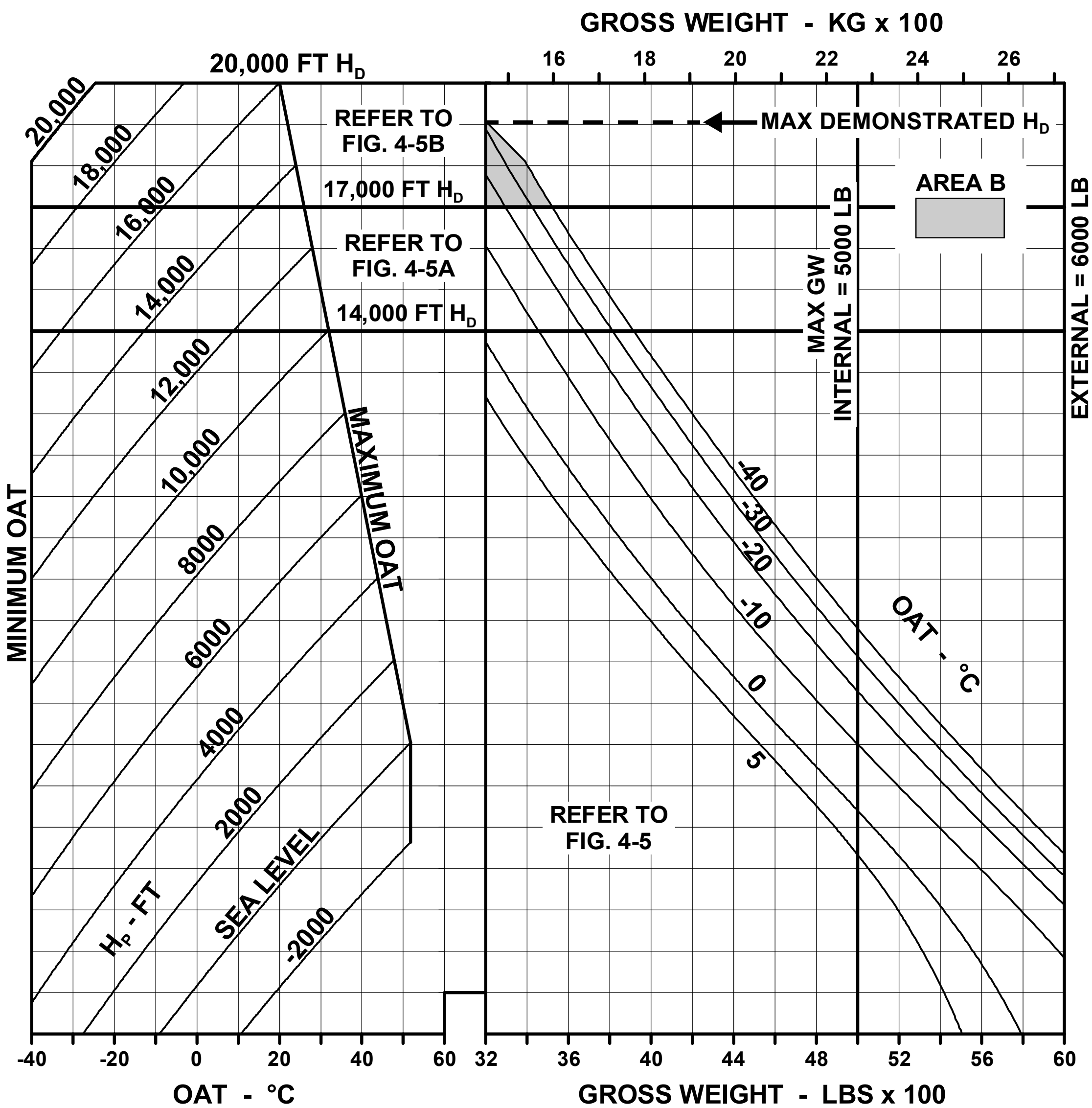


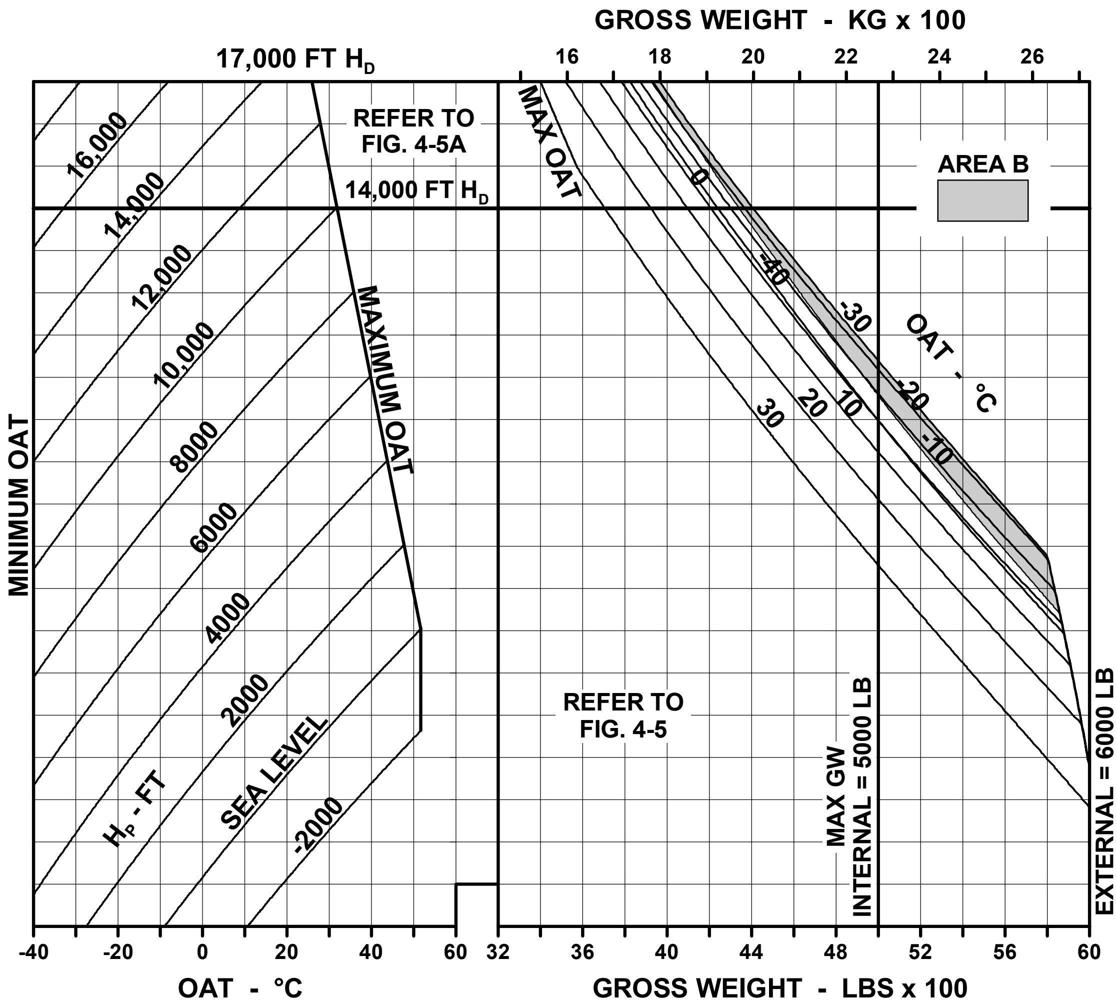
Figure 4-3. Hover ceiling IGE – maximum continuous power (sheet 8 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-4_(1_OF_8).WMF

Figure 4-4. Hover ceiling OGE – takeoff power (sheet 1 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

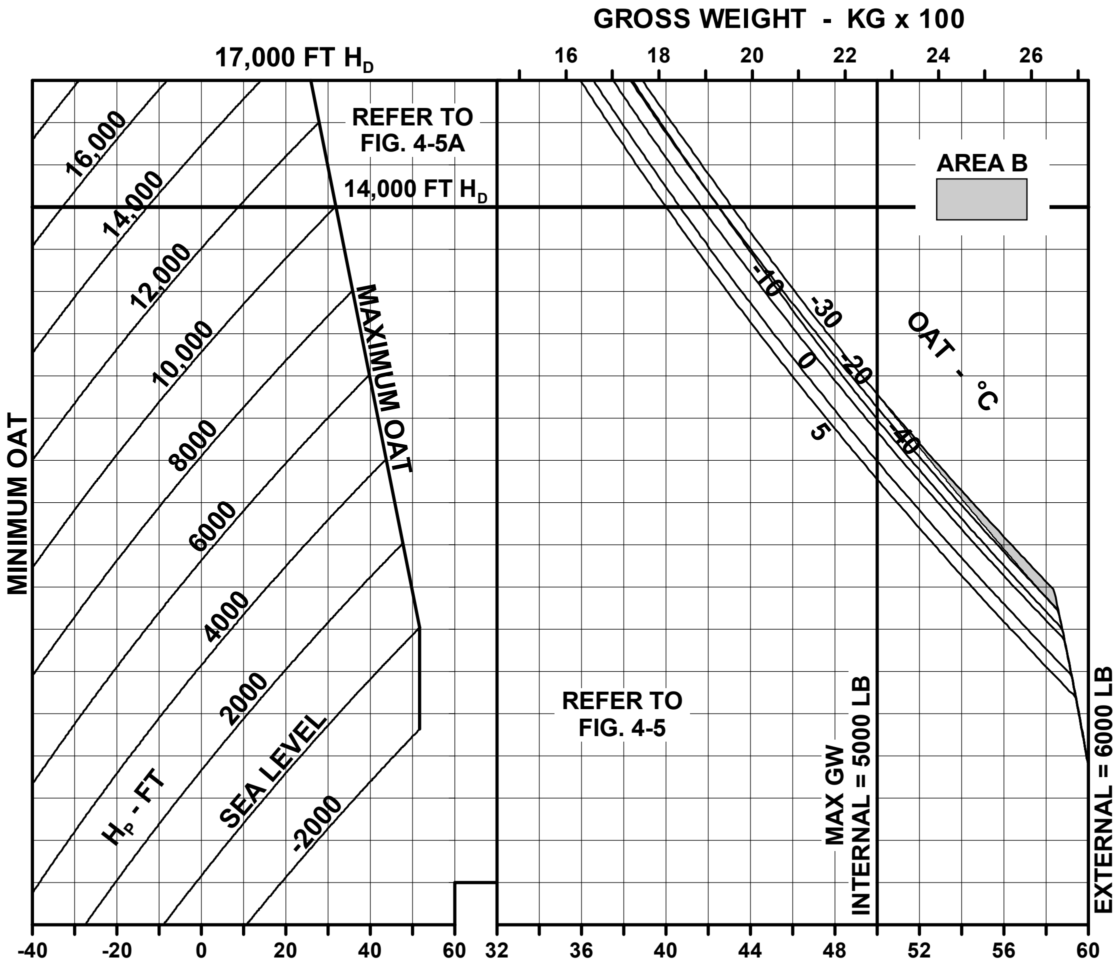


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 2 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

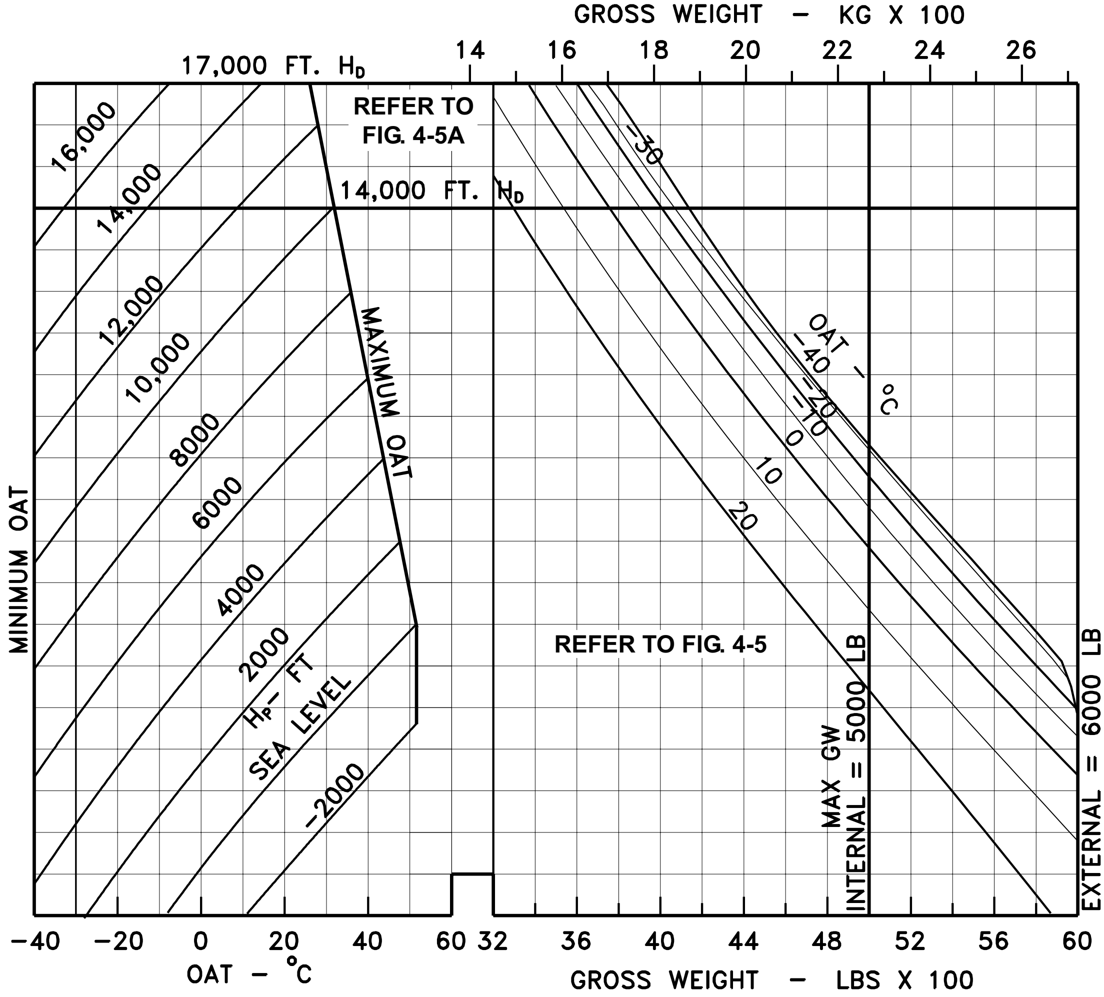


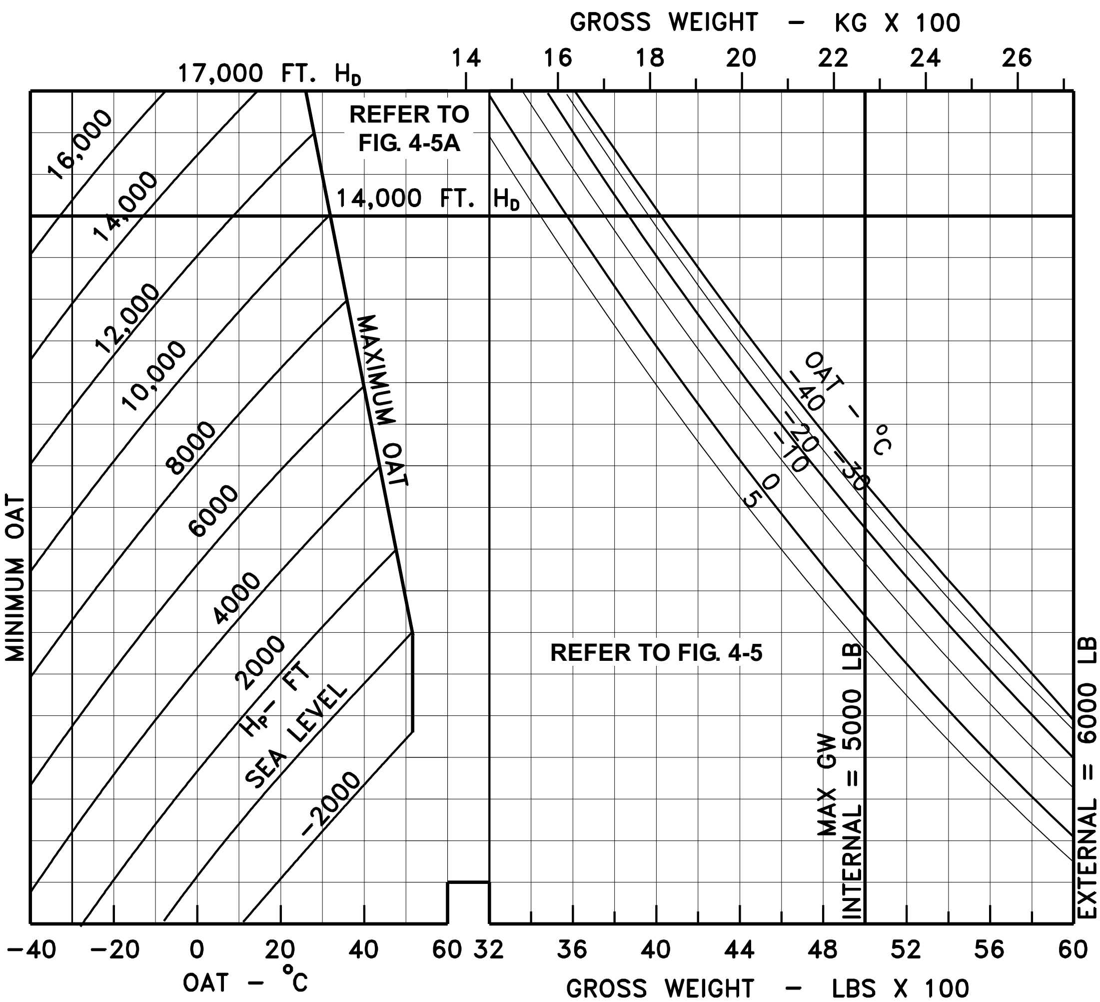
Figure 4-4. Hover ceiling OGE – takeoff power (sheet 3 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-4_(4_OF_8).EPS

Figure 4-4. Hover ceiling OGE – takeoff power (sheet 4 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

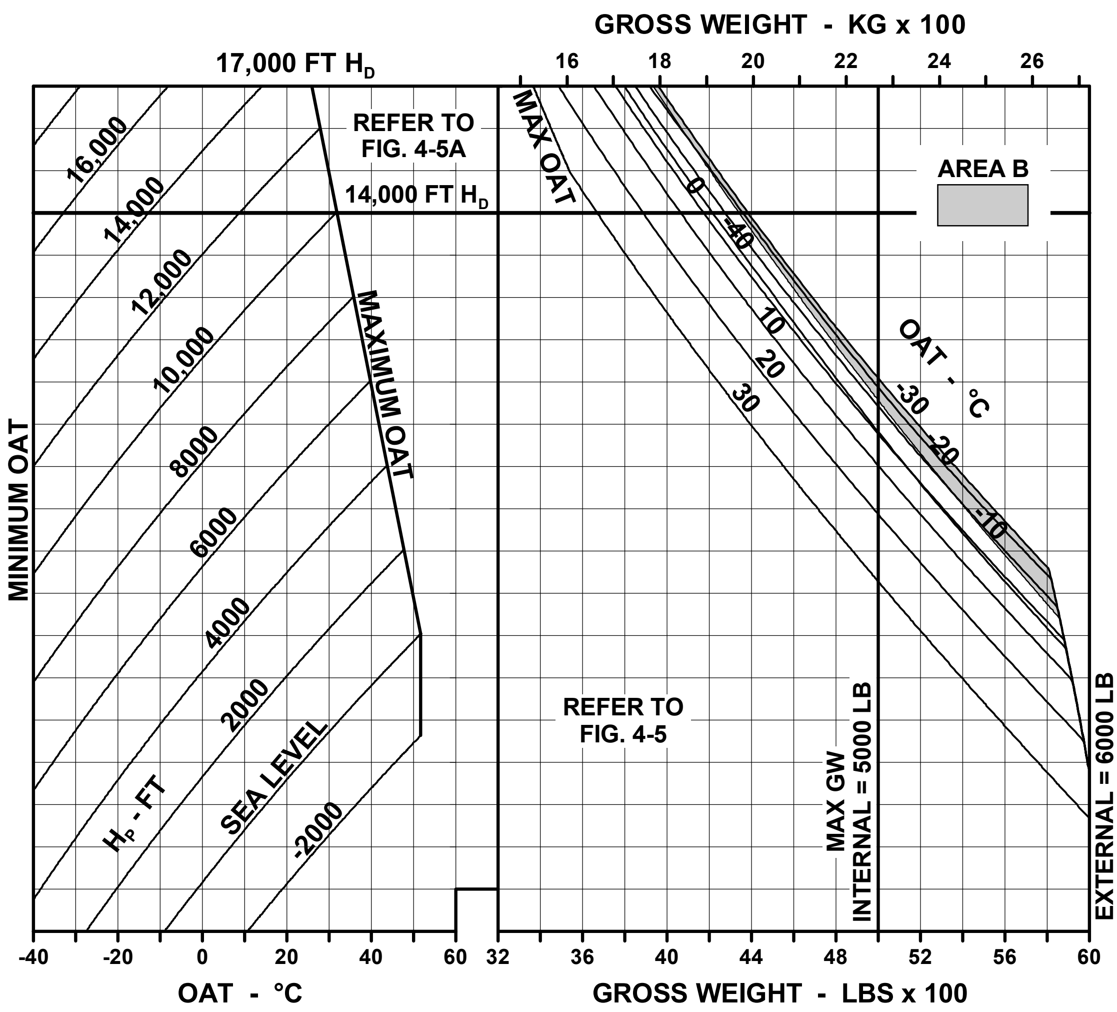


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 5 of 8)

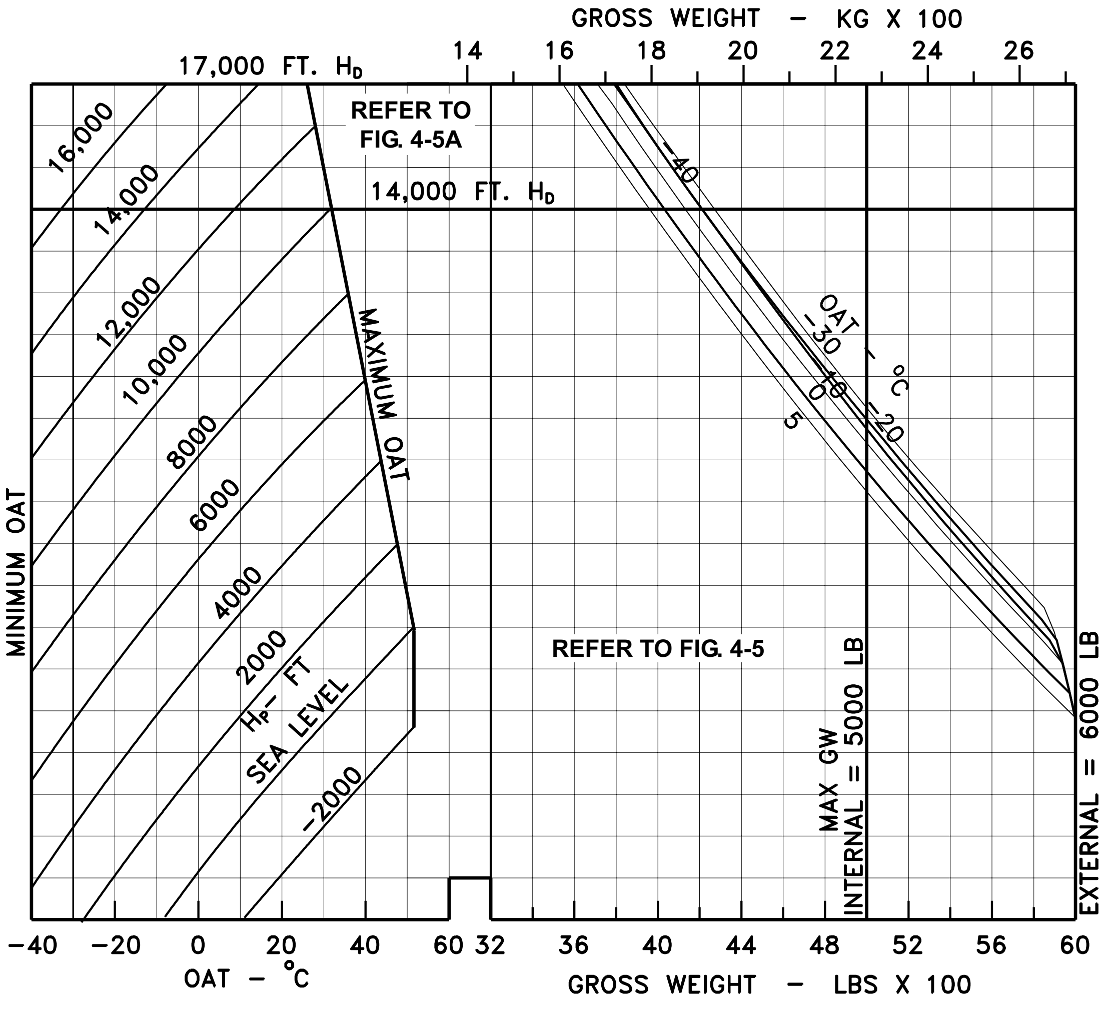
HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-4_(SHEET_6).EPS

Figure 4-4. Hover ceiling OGE – takeoff power (sheet 6 of 8)

HOVER CEILING

OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

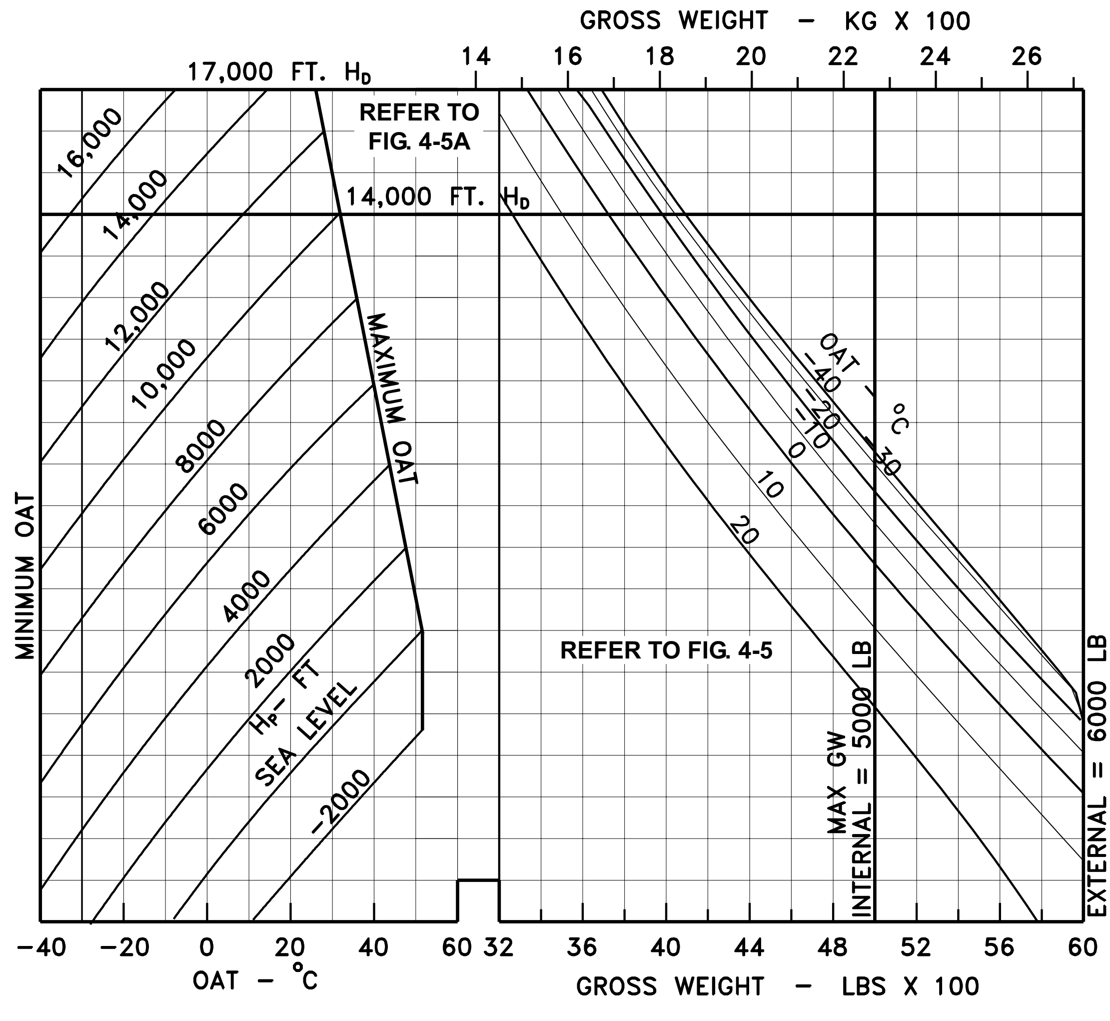


Figure 4-4. Hover ceiling OGE – takeoff power (sheet 7 of 8)

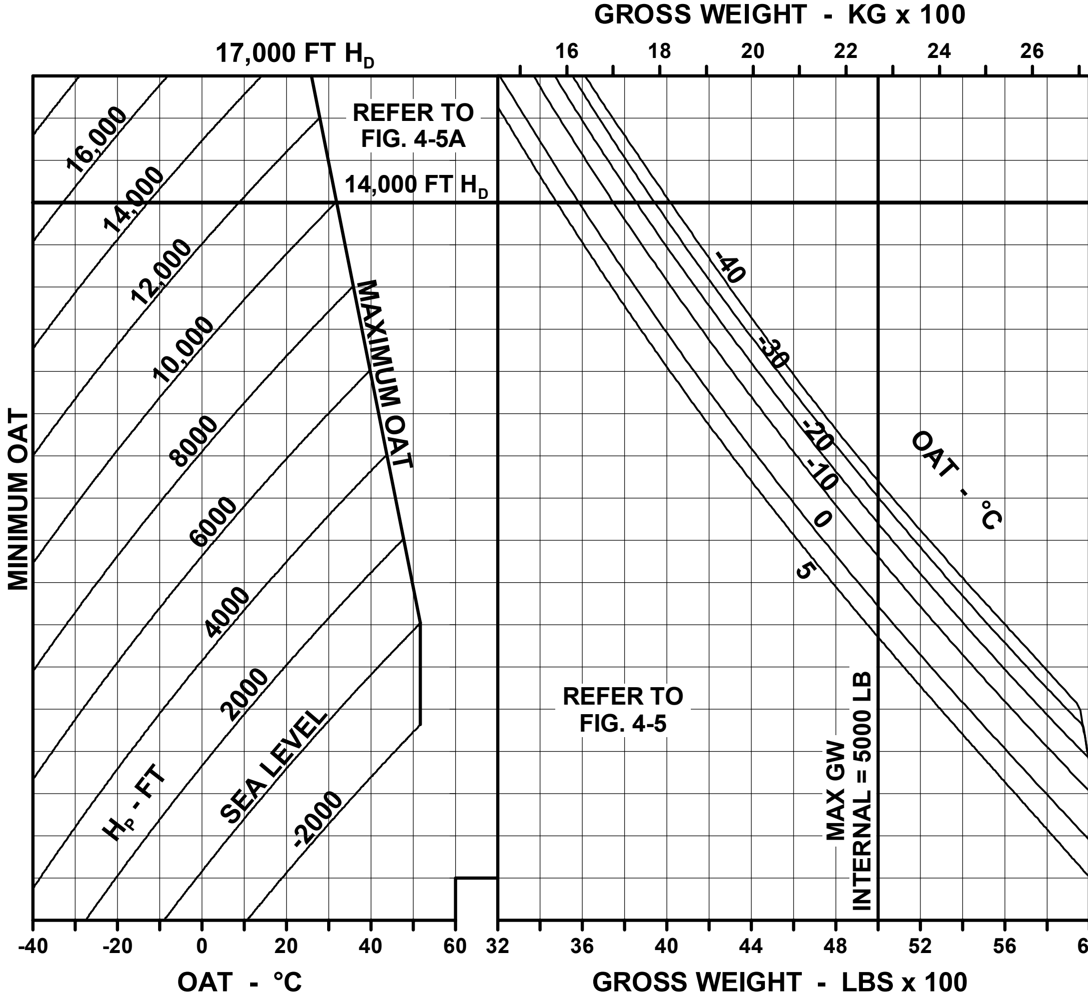
HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-4_(8_OF_8).WMF

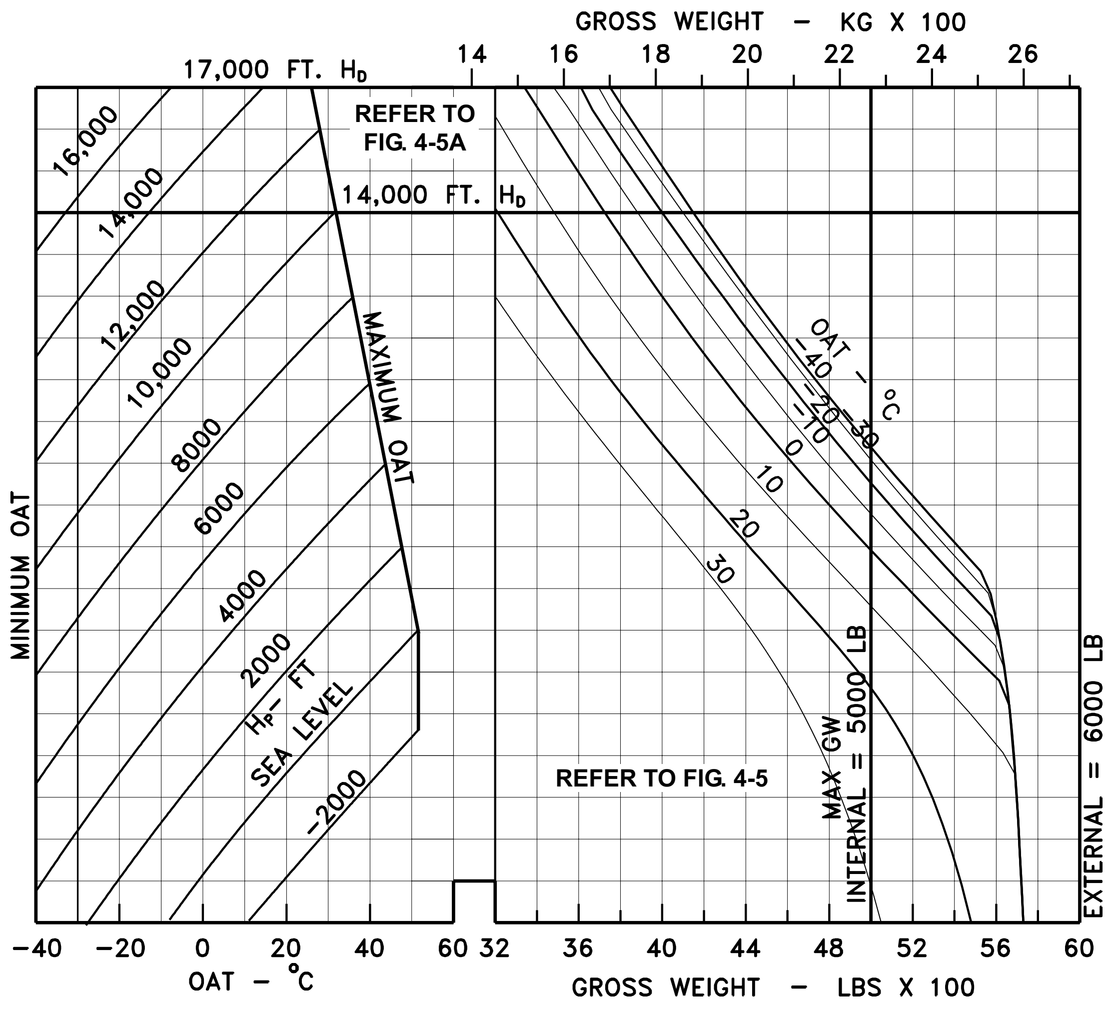
Figure 4-4. Hover ceiling OGE – takeoff power (sheet 8 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-5_(SHEET_1).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 1 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

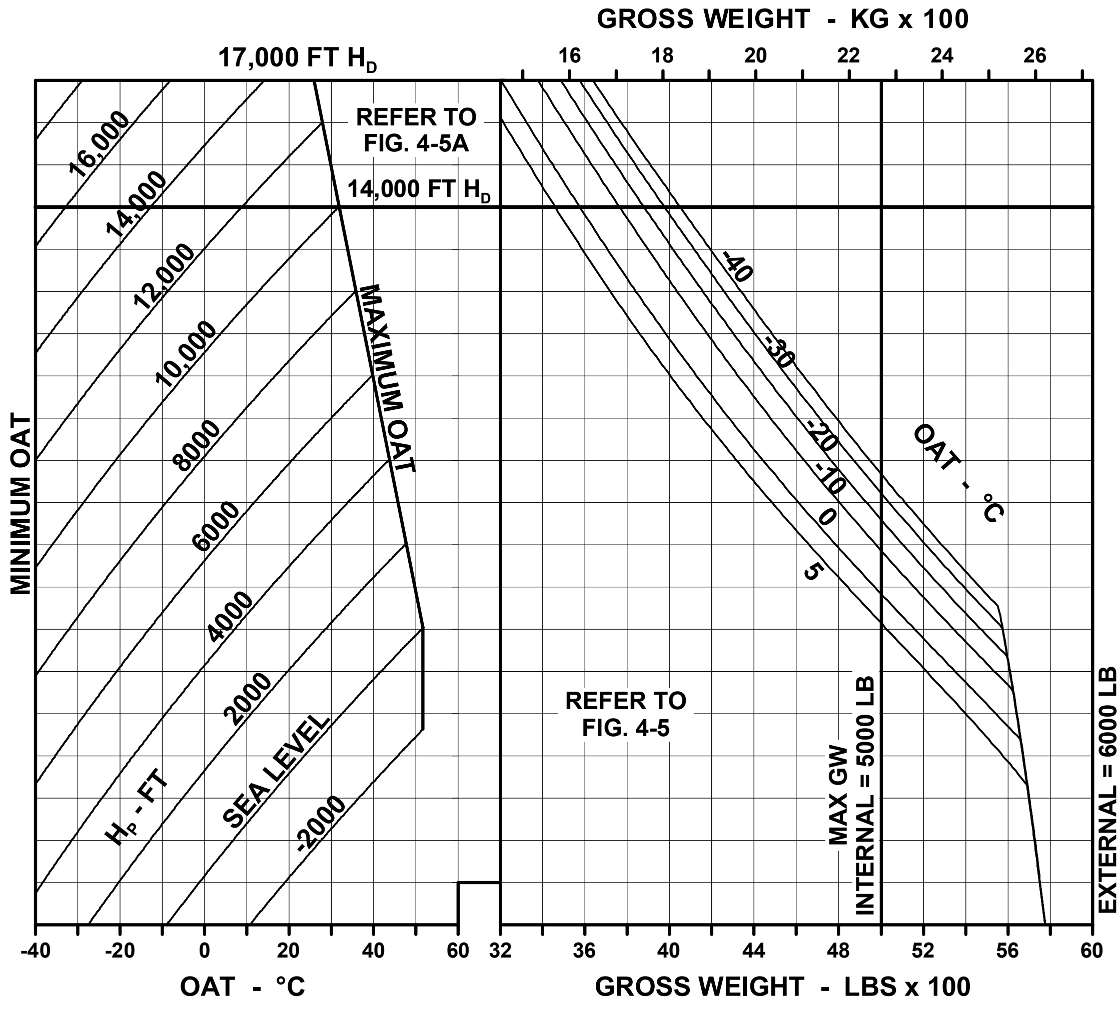


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 2 of 8)

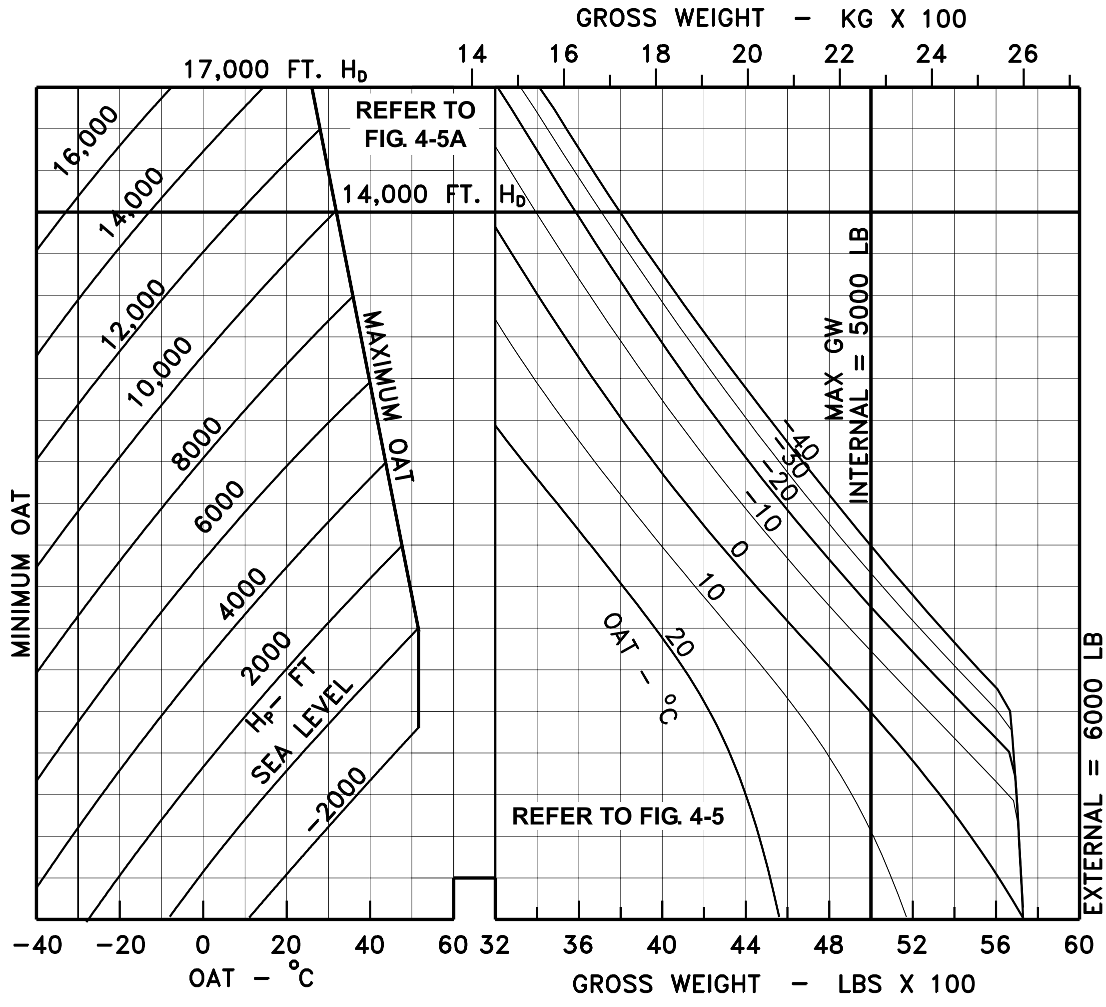
HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-5_(SHEET_3).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 3 of 8)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW DEFLECTOR

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

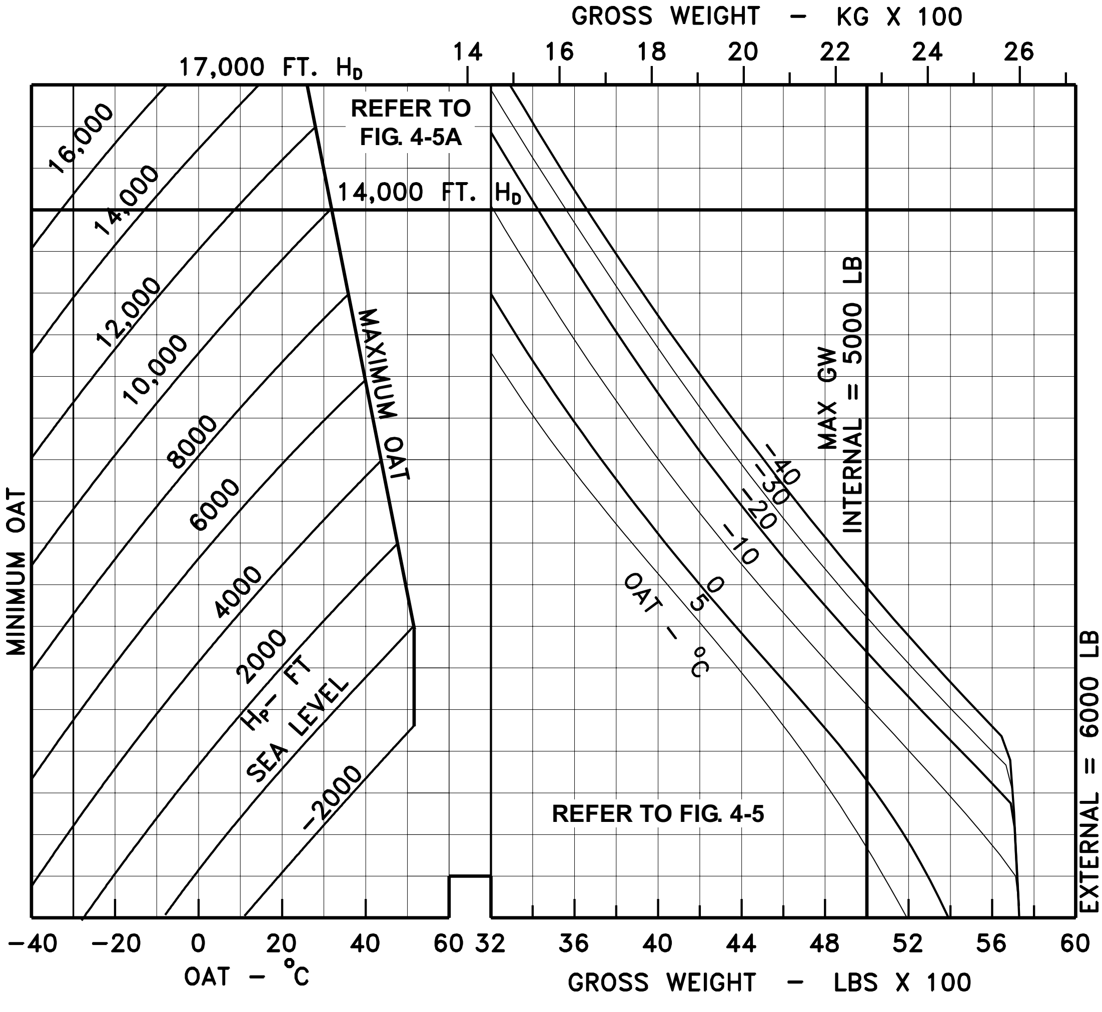


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 4 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

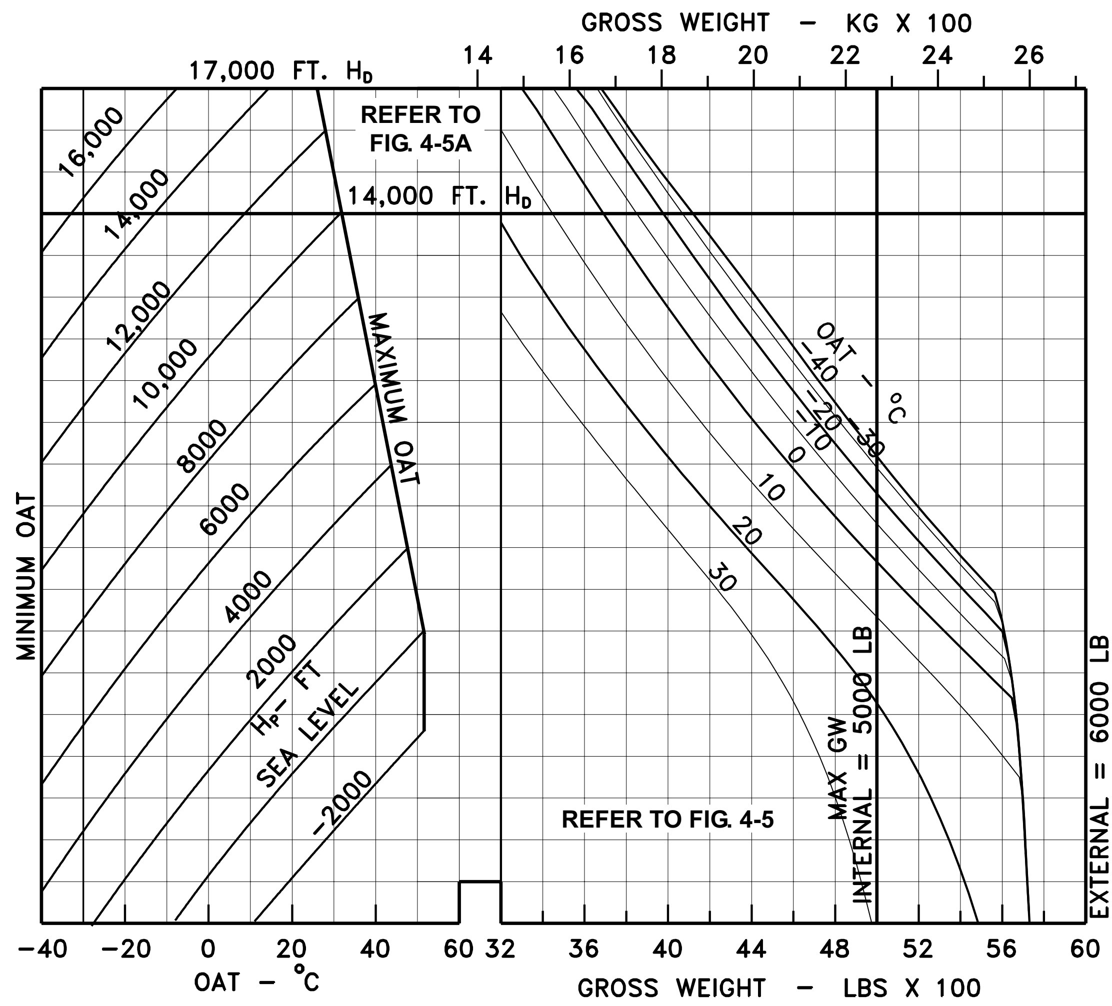


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 5 of 8)

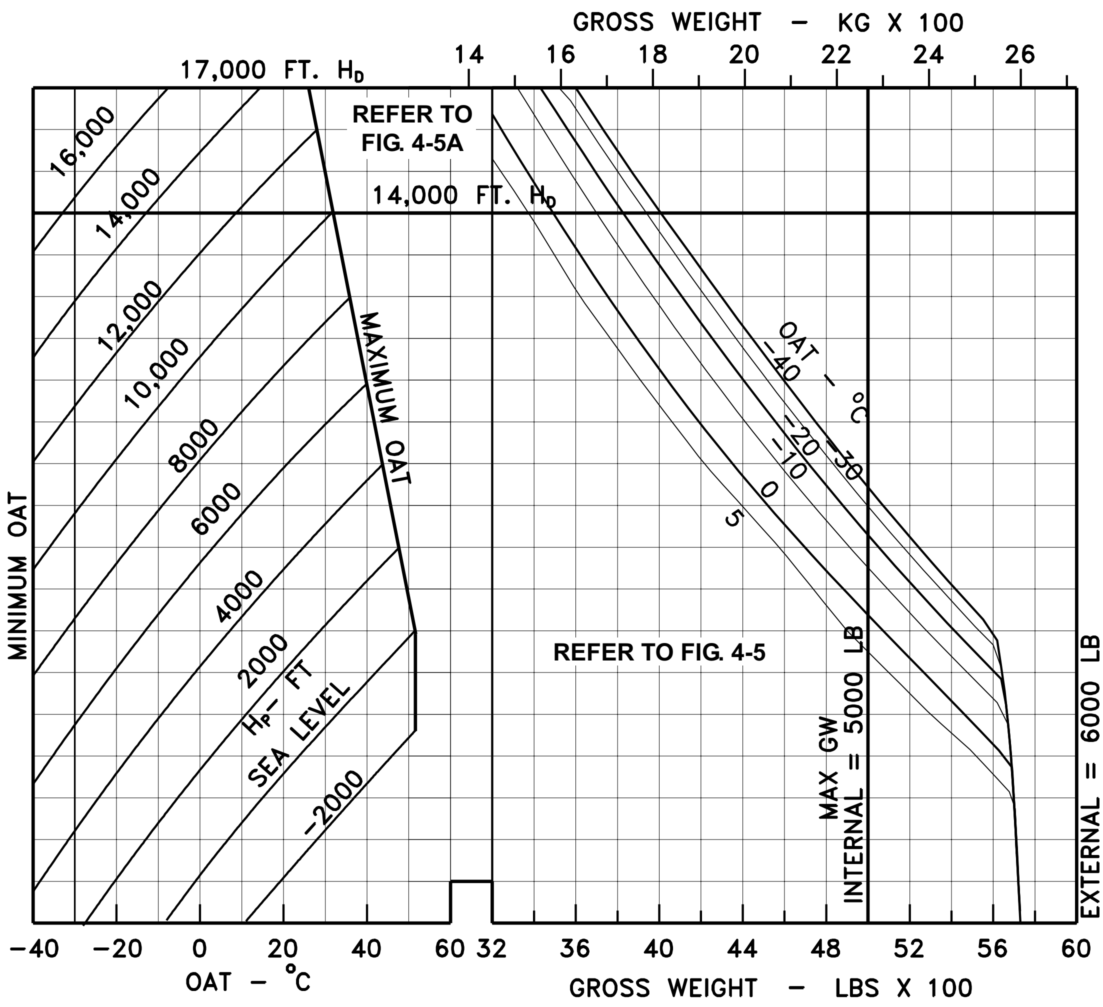
HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-5_(SHEET_6).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 6 of 8)

HOVER CEILING

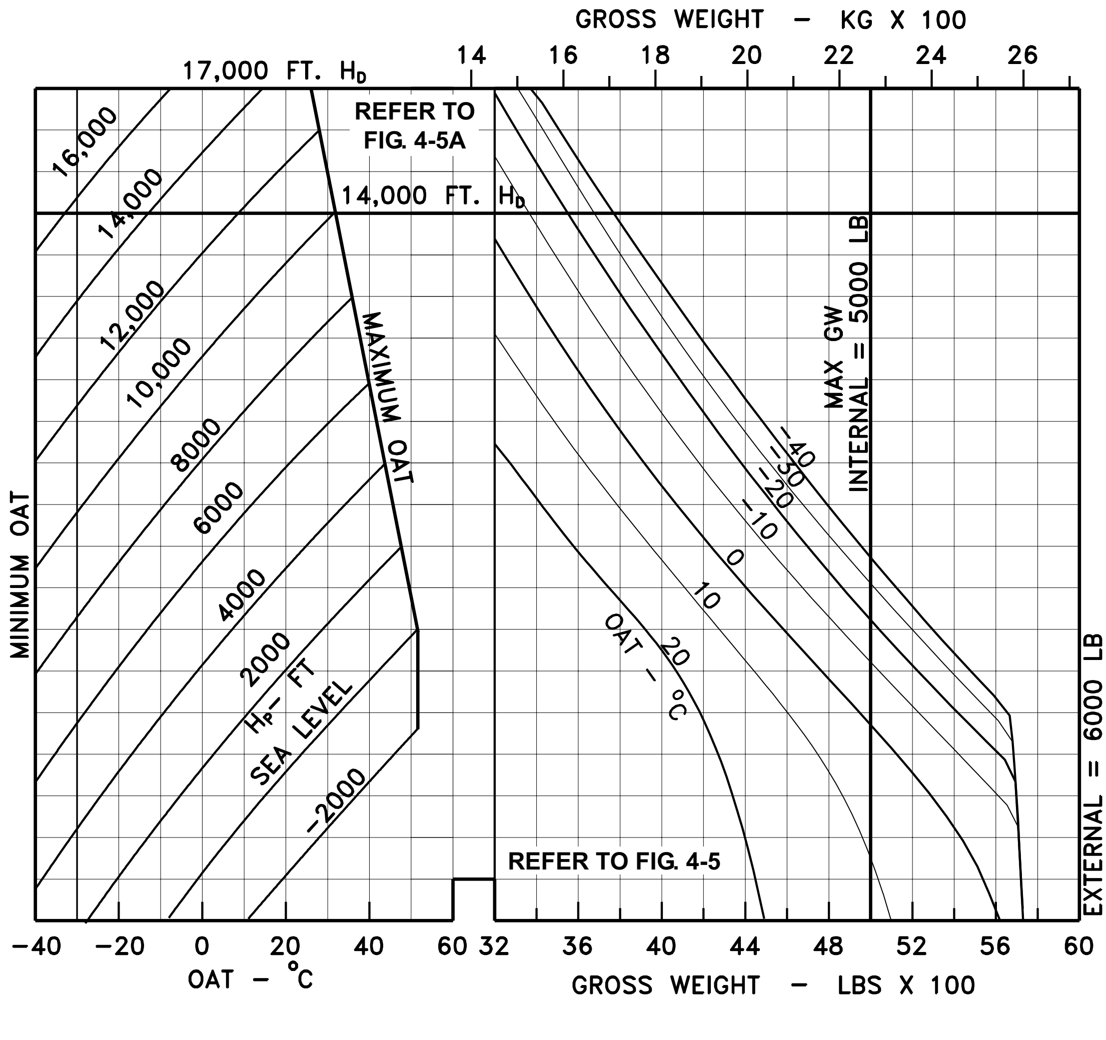
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)



M407_FMS-4__FIG_4-5_(SHEET_7).EPS

Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 7 of 8)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW DEFLECTOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

NOTE: REFER TO APPROPRIATE HOVER CEILING WIND ACCOUNTABILITY CHART IN BASIC FLIGHT MANUAL (FIGURE 4-5 OR 4-5A IN BHT-407-FM-1)

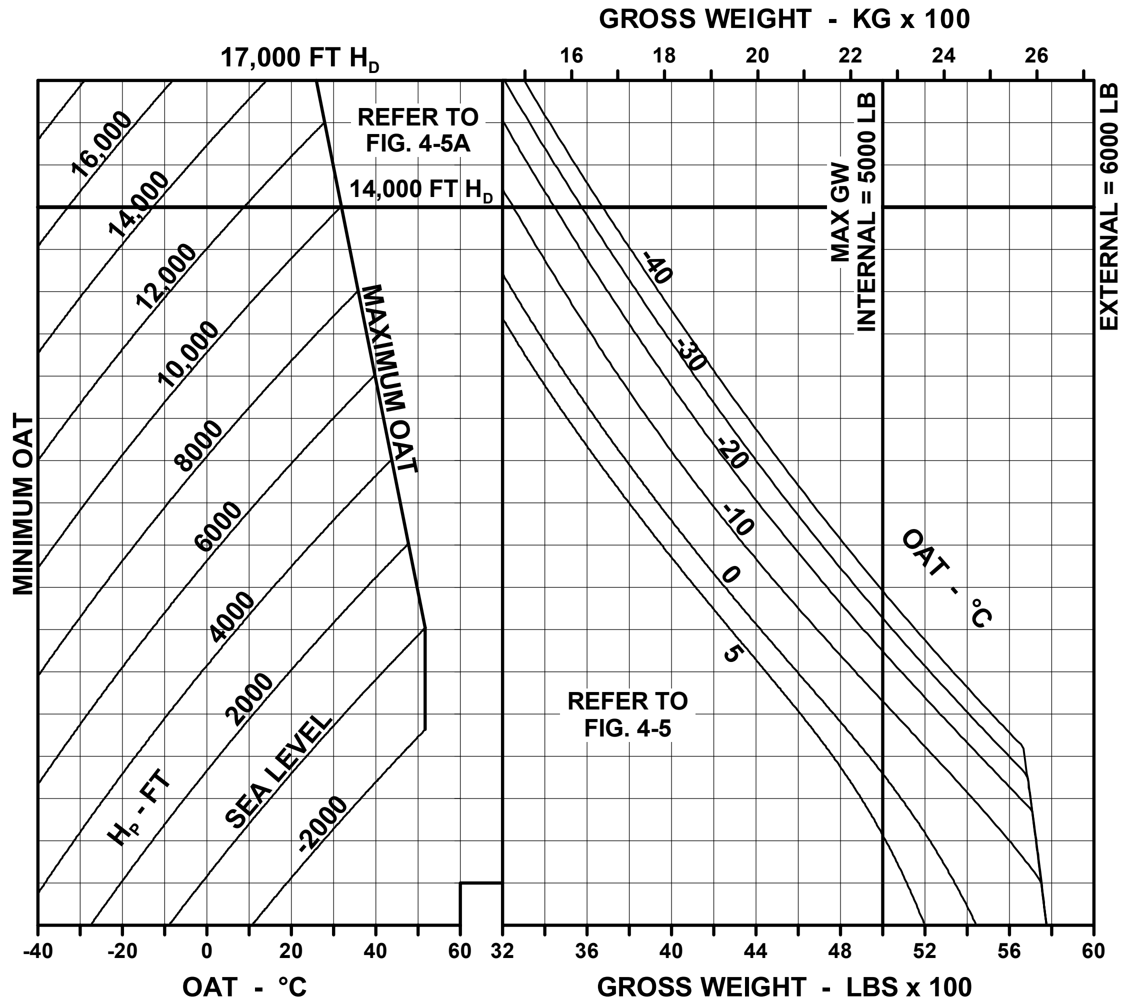


Figure 4-5. Hover ceiling OGE – maximum continuous power (sheet 8 of 8)

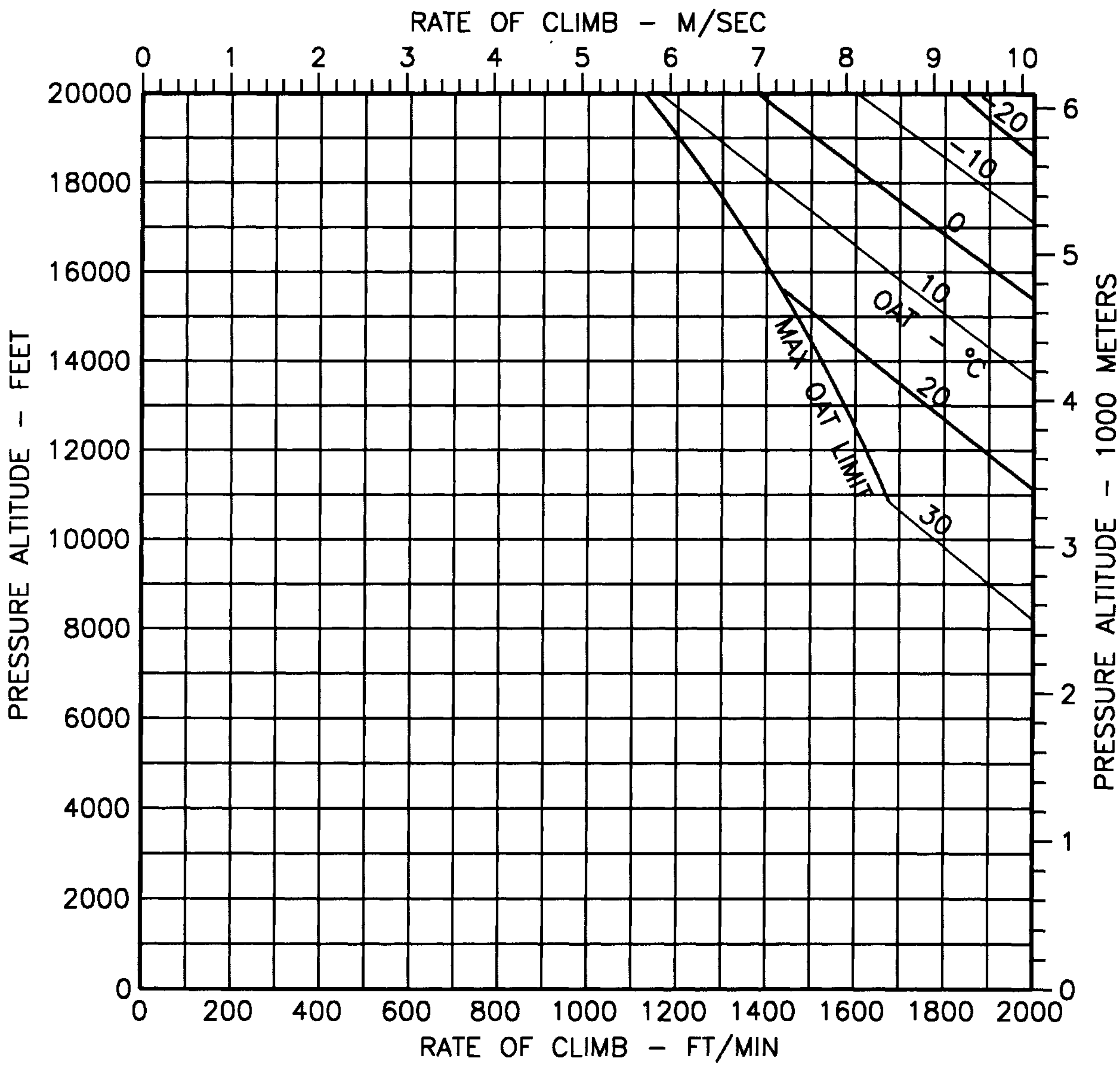
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
13,000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)



407FMS-4-4-6-1

Figure 4-6. Rate of climb (takeoff power) (sheet 1 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
8500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

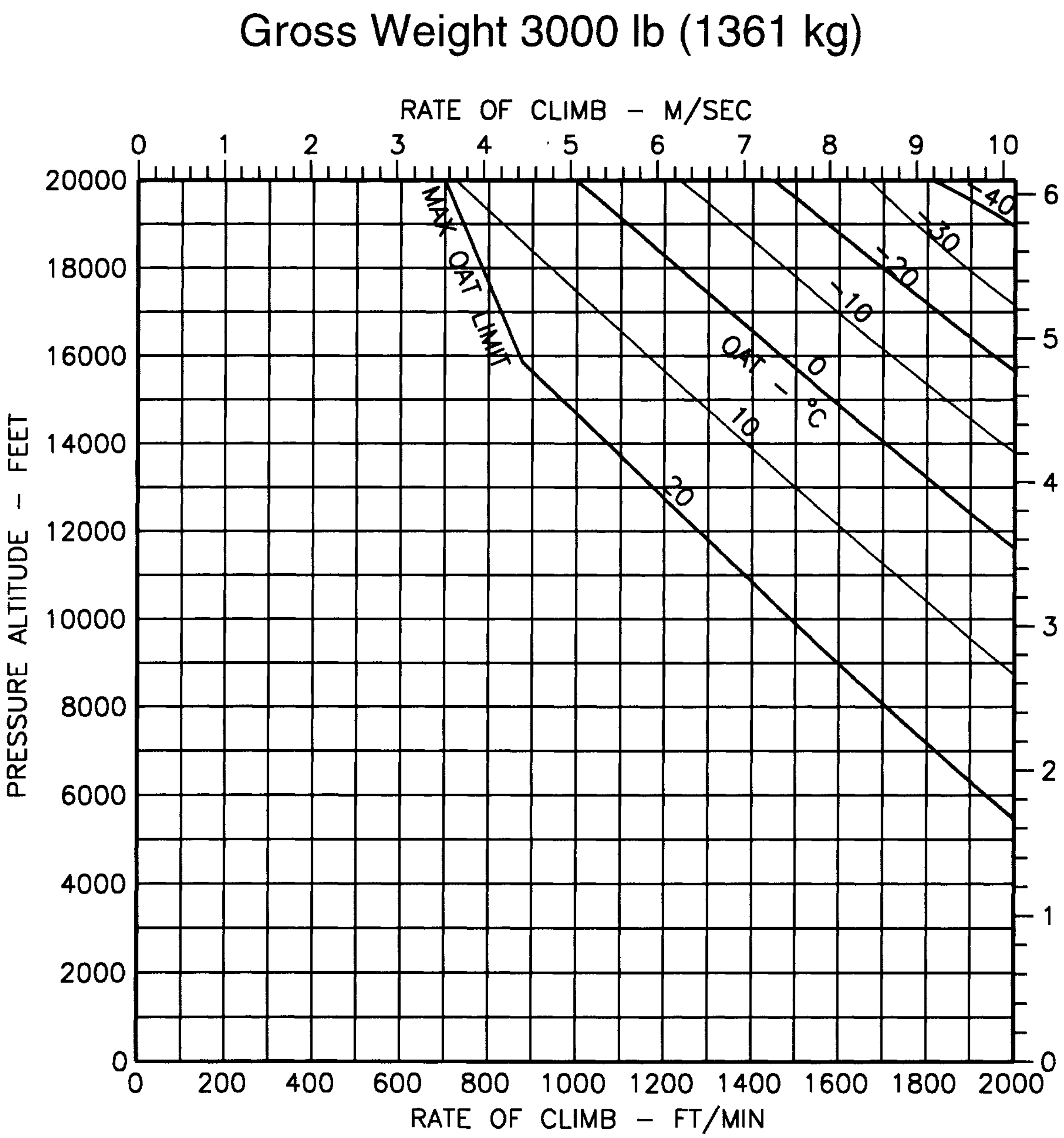


Figure 4-6. Rate of climb (takeoff power) (sheet 2 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
10,000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

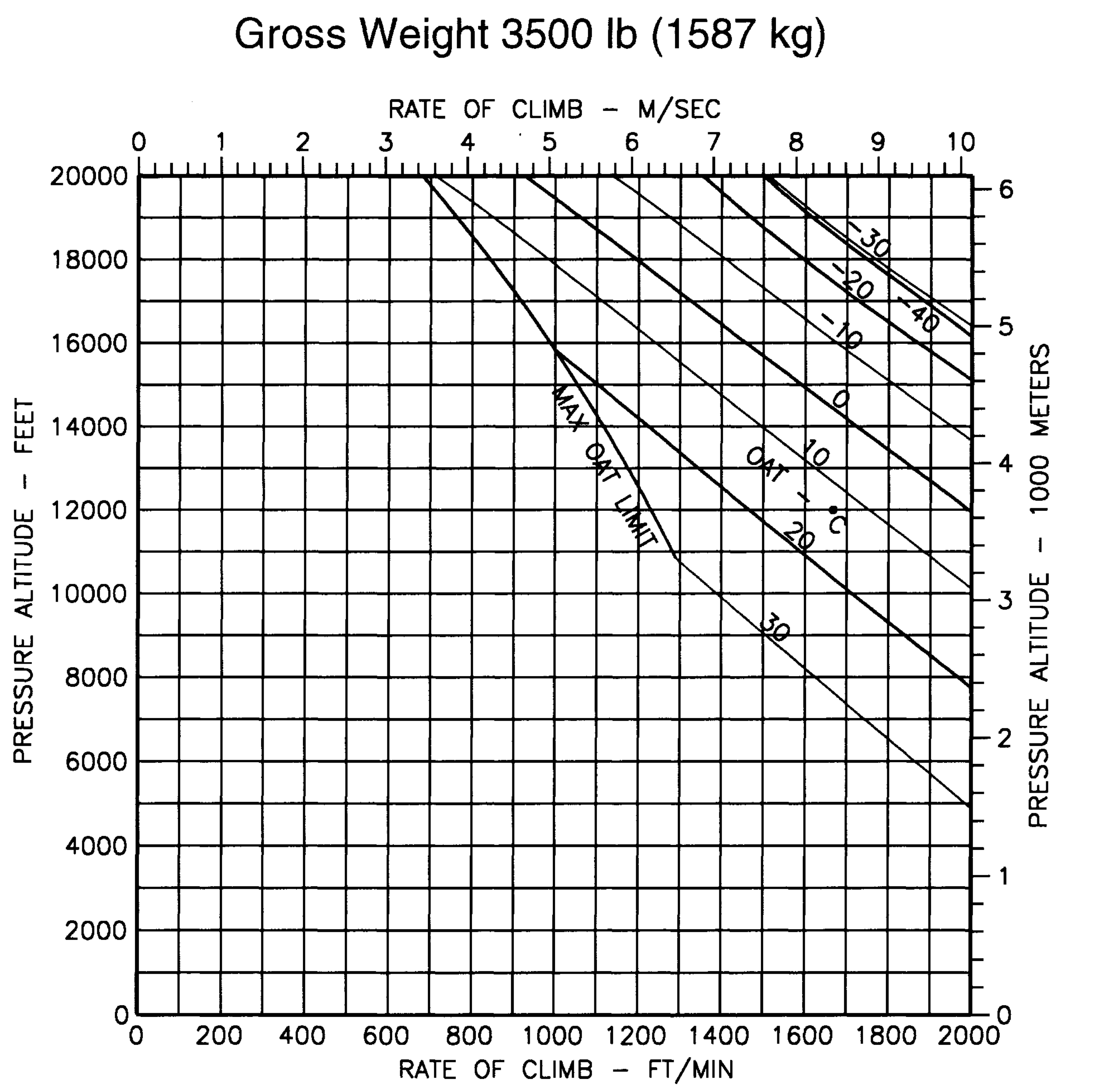


Figure 4-6. Rate of climb (takeoff power) (sheet 3 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
5500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

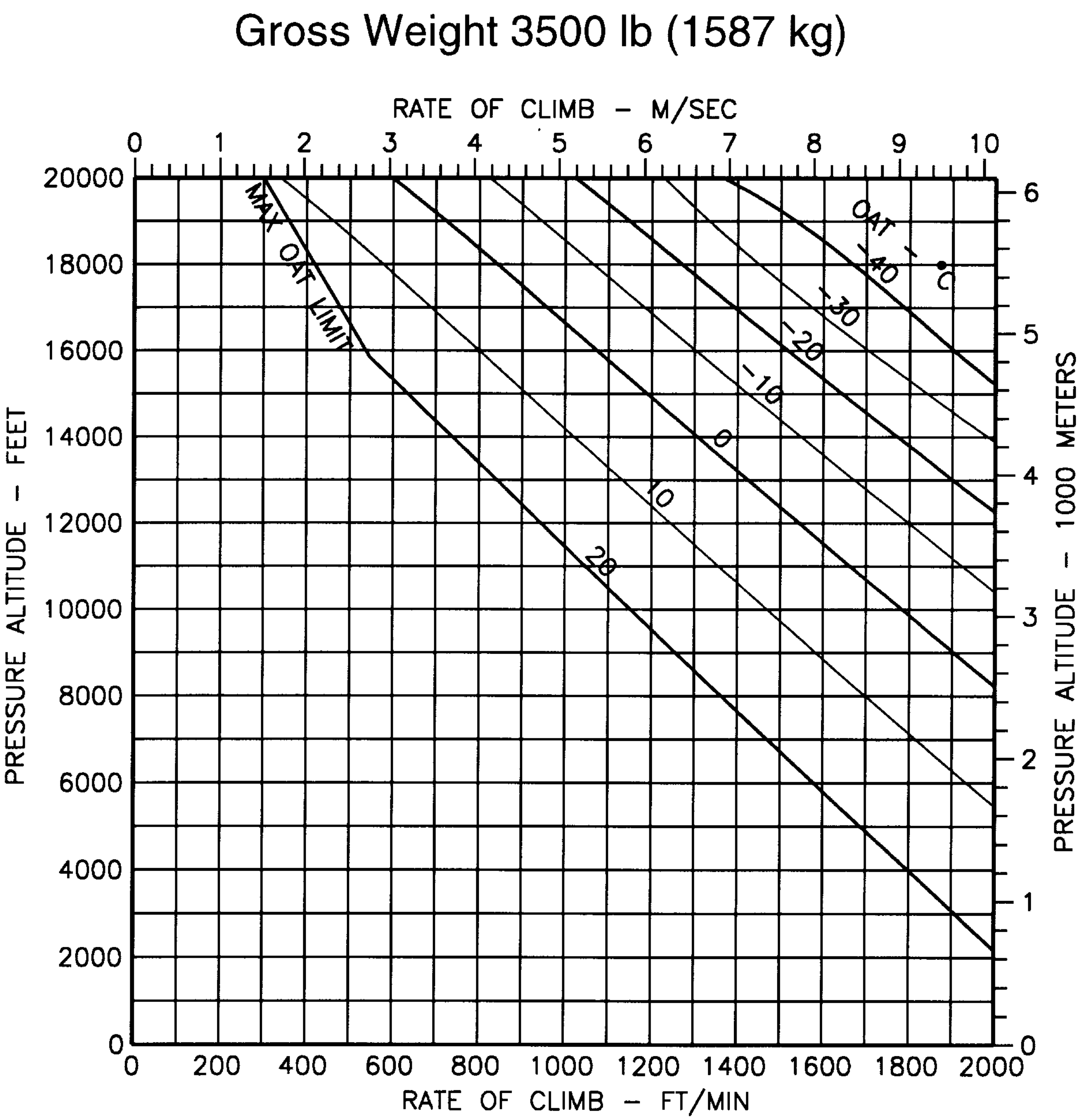


Figure 4-6. Rate of climb (takeoff power) (sheet 4 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE 7000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

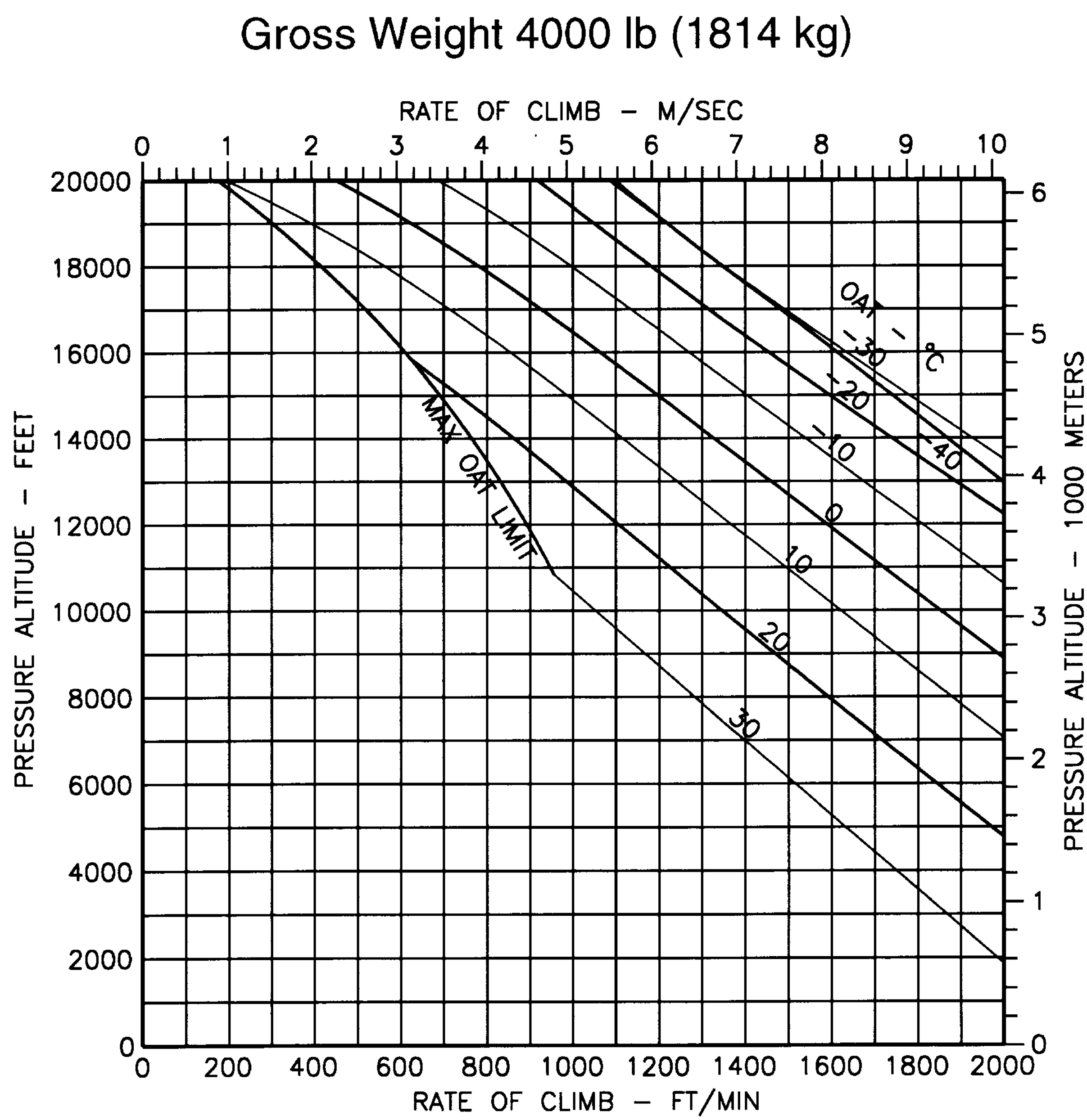


Figure 4-6. Rate of climb (takeoff power) (sheet 5 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
2500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

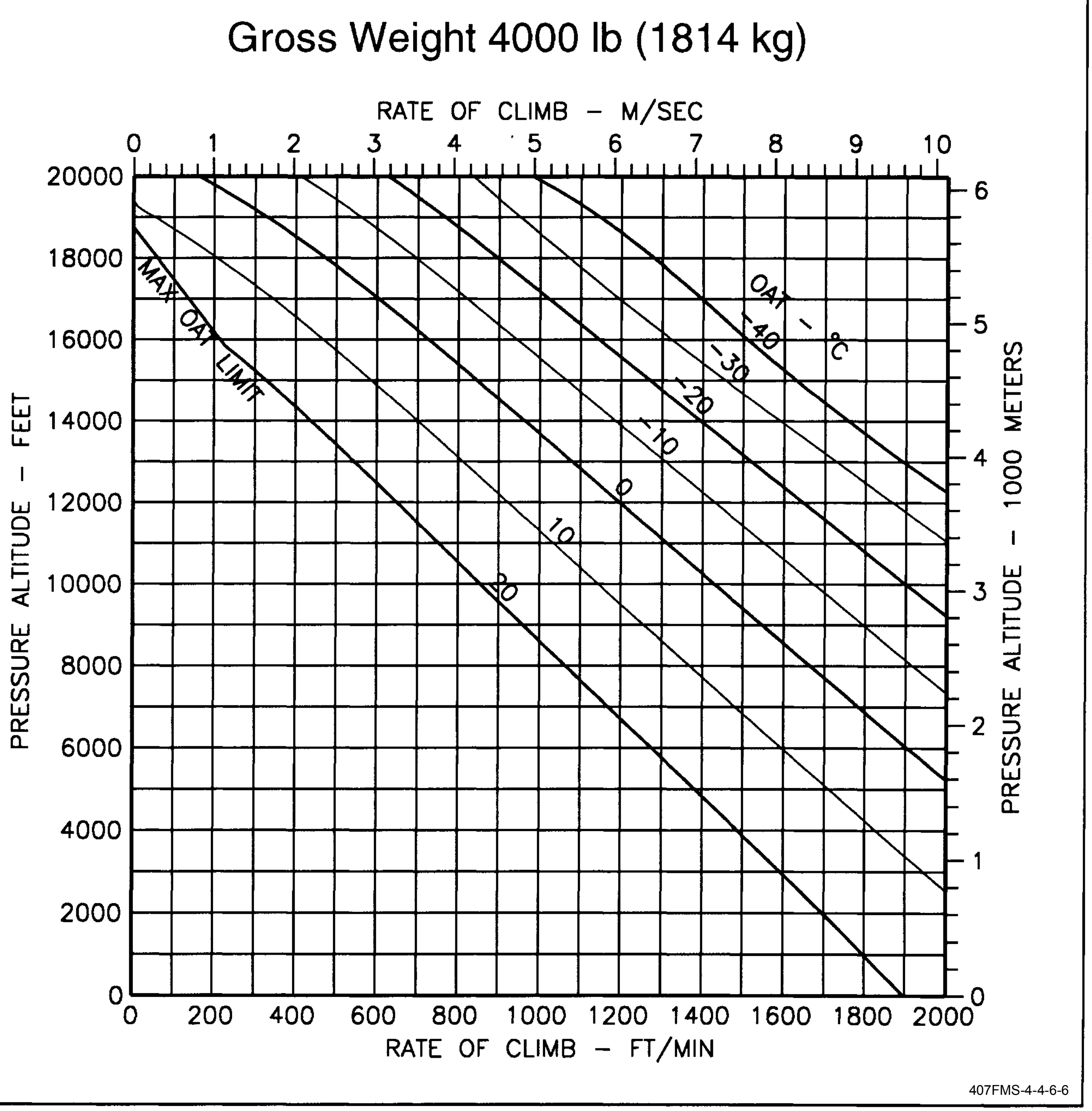


Figure 4-6. Rate of climb (takeoff power) (sheet 6 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
4500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

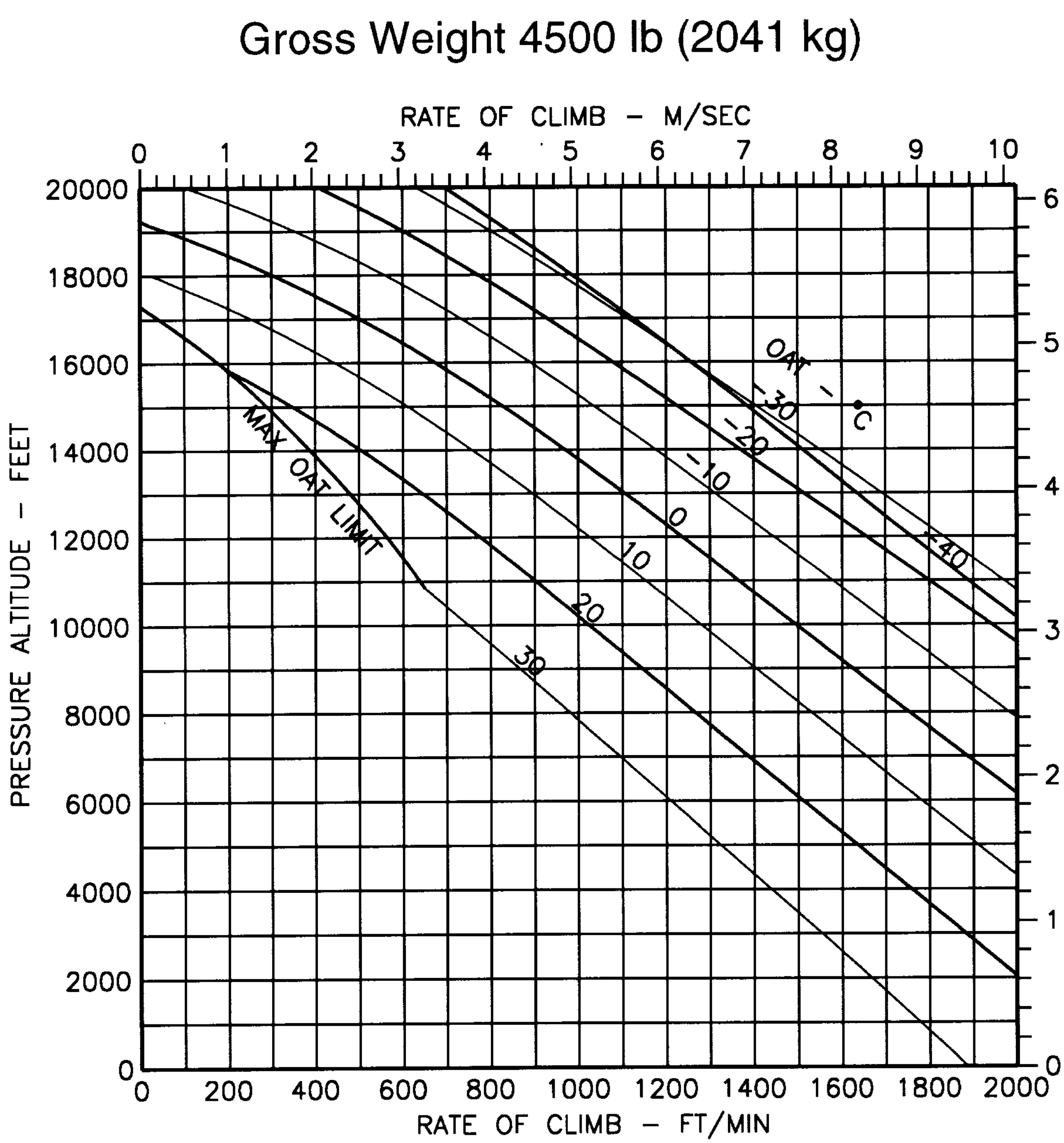


Figure 4-6. Rate of climb (takeoff power) (sheet 7 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

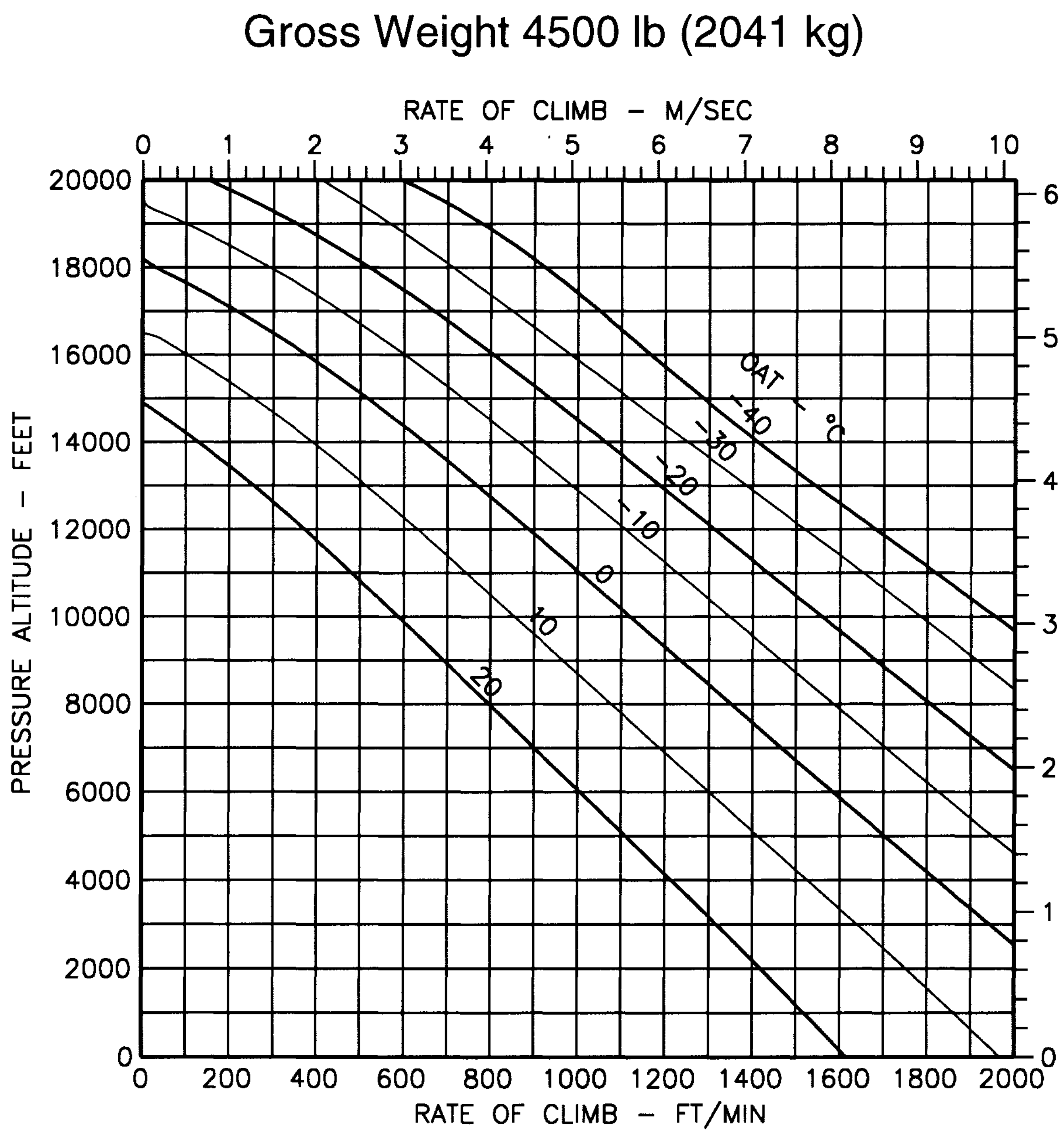


Figure 4-6. Rate of climb (takeoff power) (sheet 8 of 10)

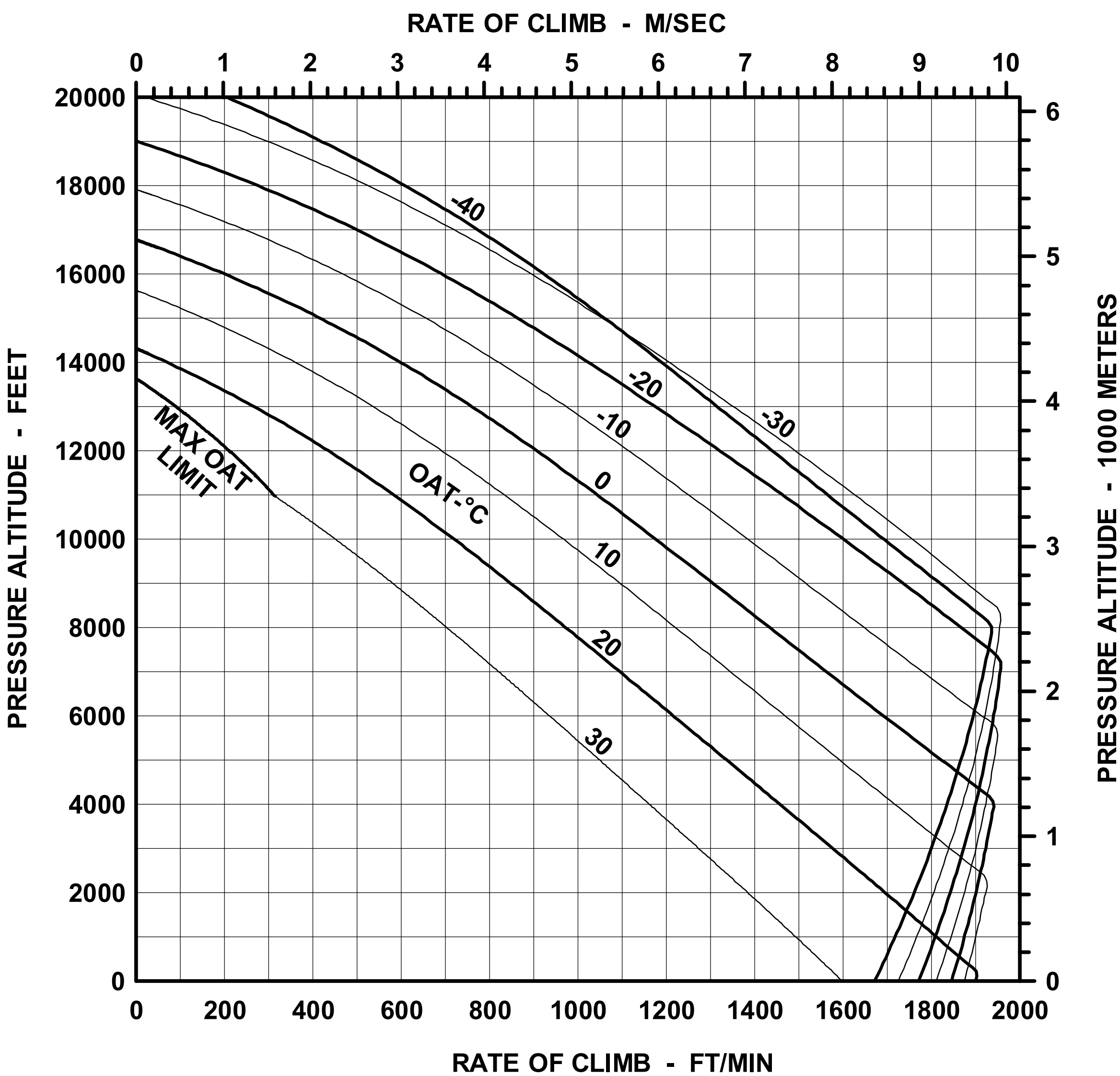
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
2500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5000 lb (2268 kg)



M407_FMS-4__FIG_4-6_(9_OF_10).WMF

Figure 4-6. Rate of climb (takeoff power) (sheet 9 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5000 lb (2268 kg)

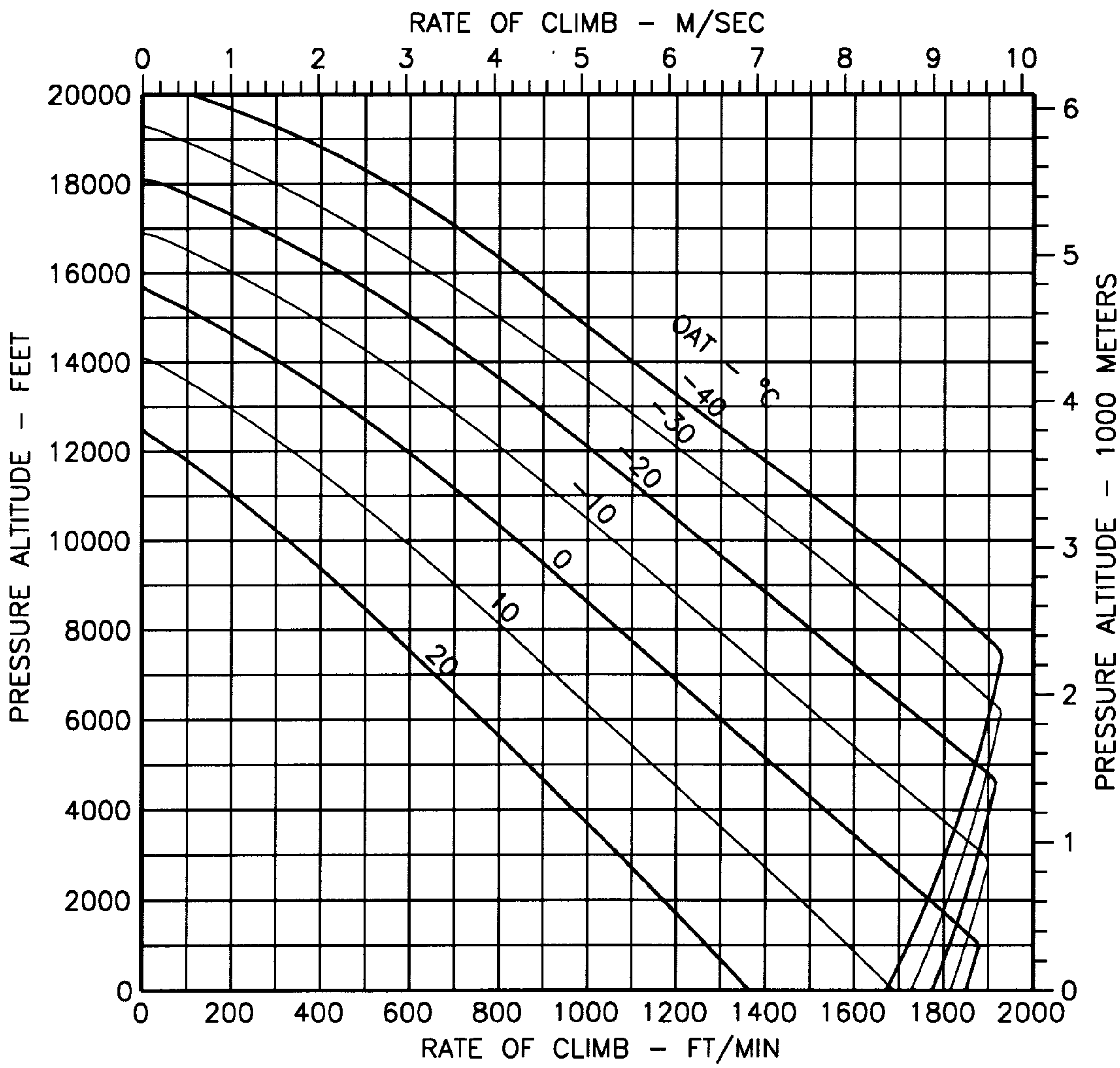


Figure 4-6. Rate of climb (takeoff power) (sheet 10 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
8000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

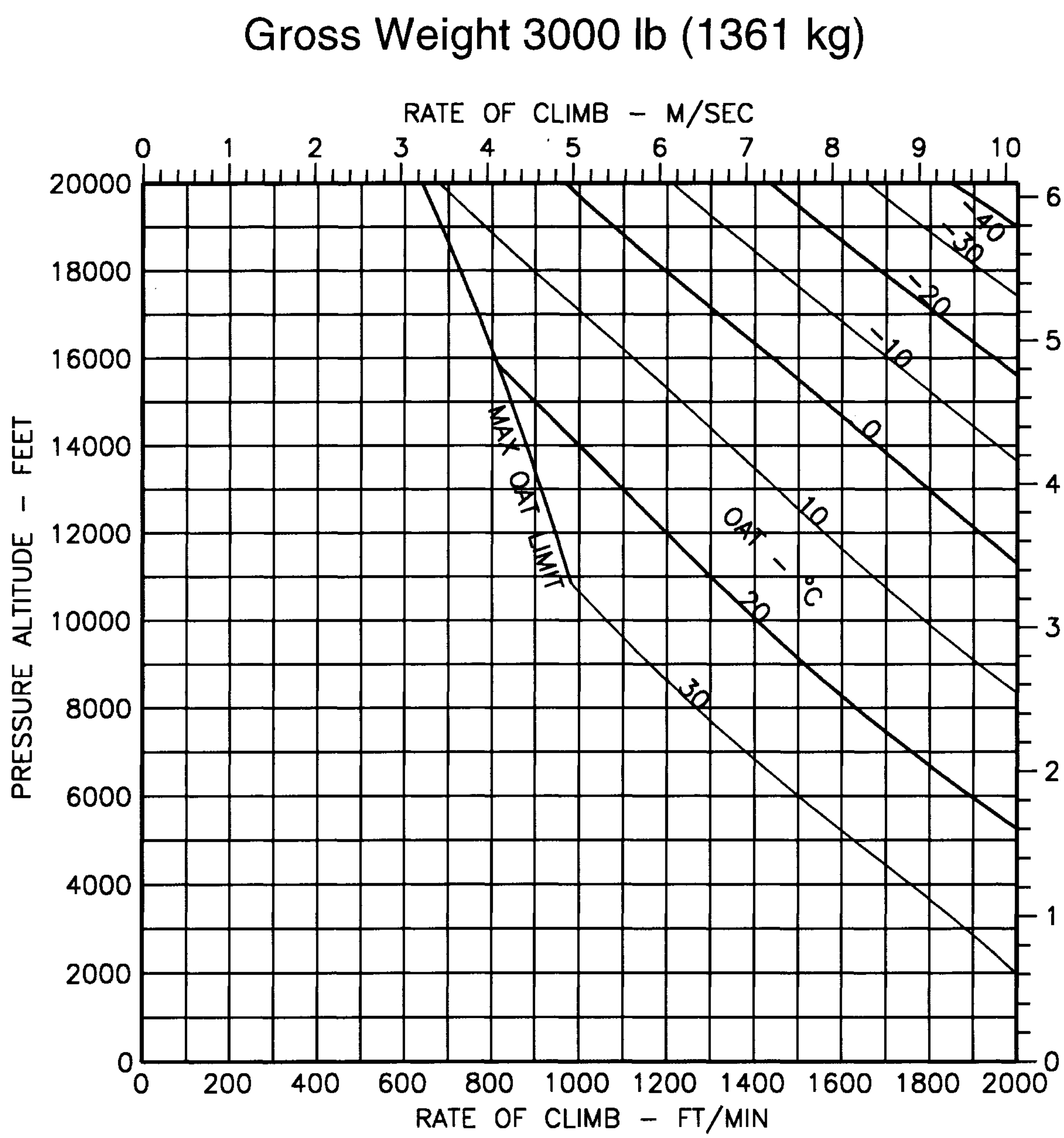


Figure 4-7. Rate of climb (maximum continuous power) (sheet 1 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE
3000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3000 lb (1361 kg)

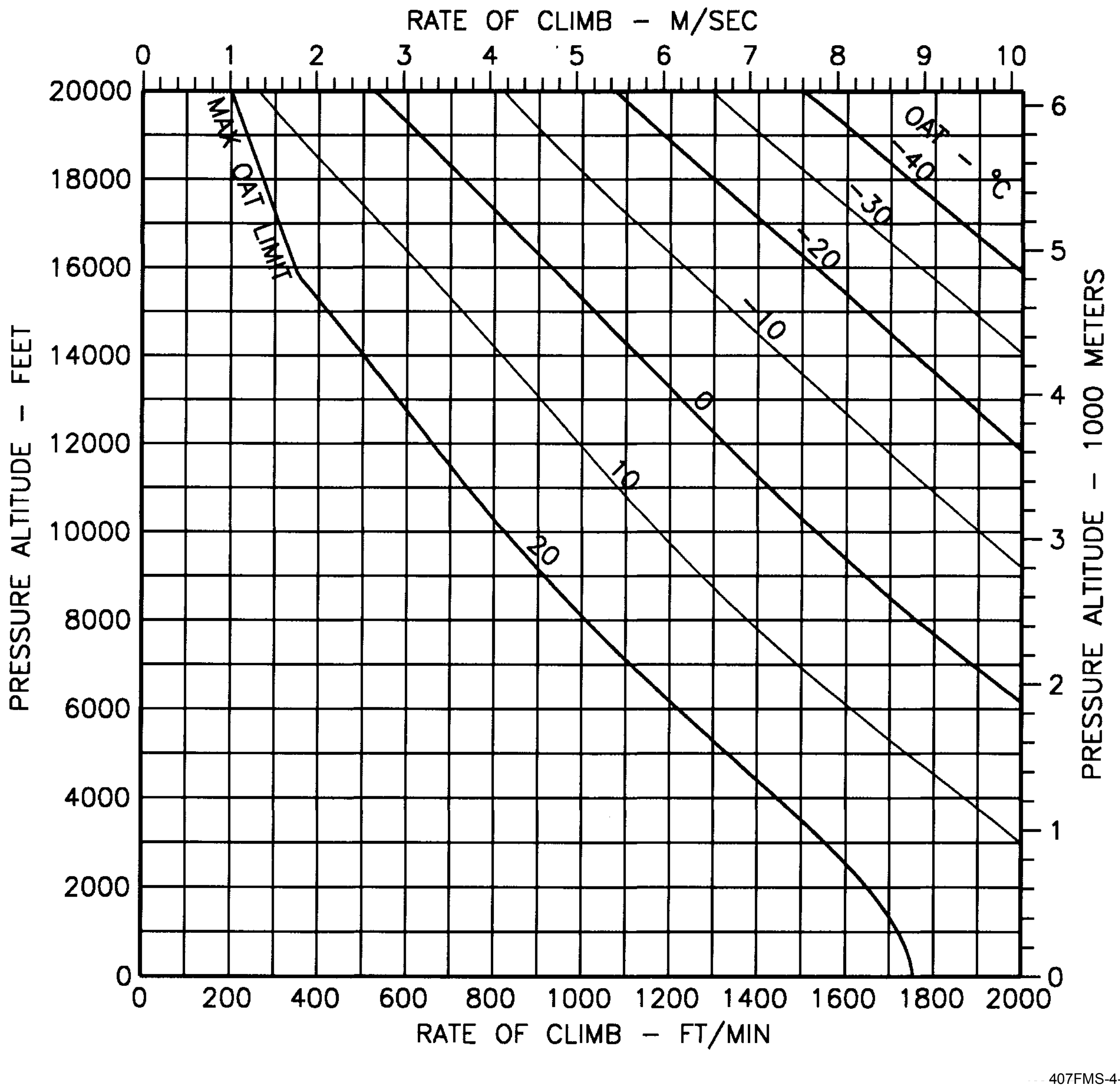


Figure 4-7. Rate of climb (maximum continuous power) (sheet 2 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE
6000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 3500 lb (1587 KG)

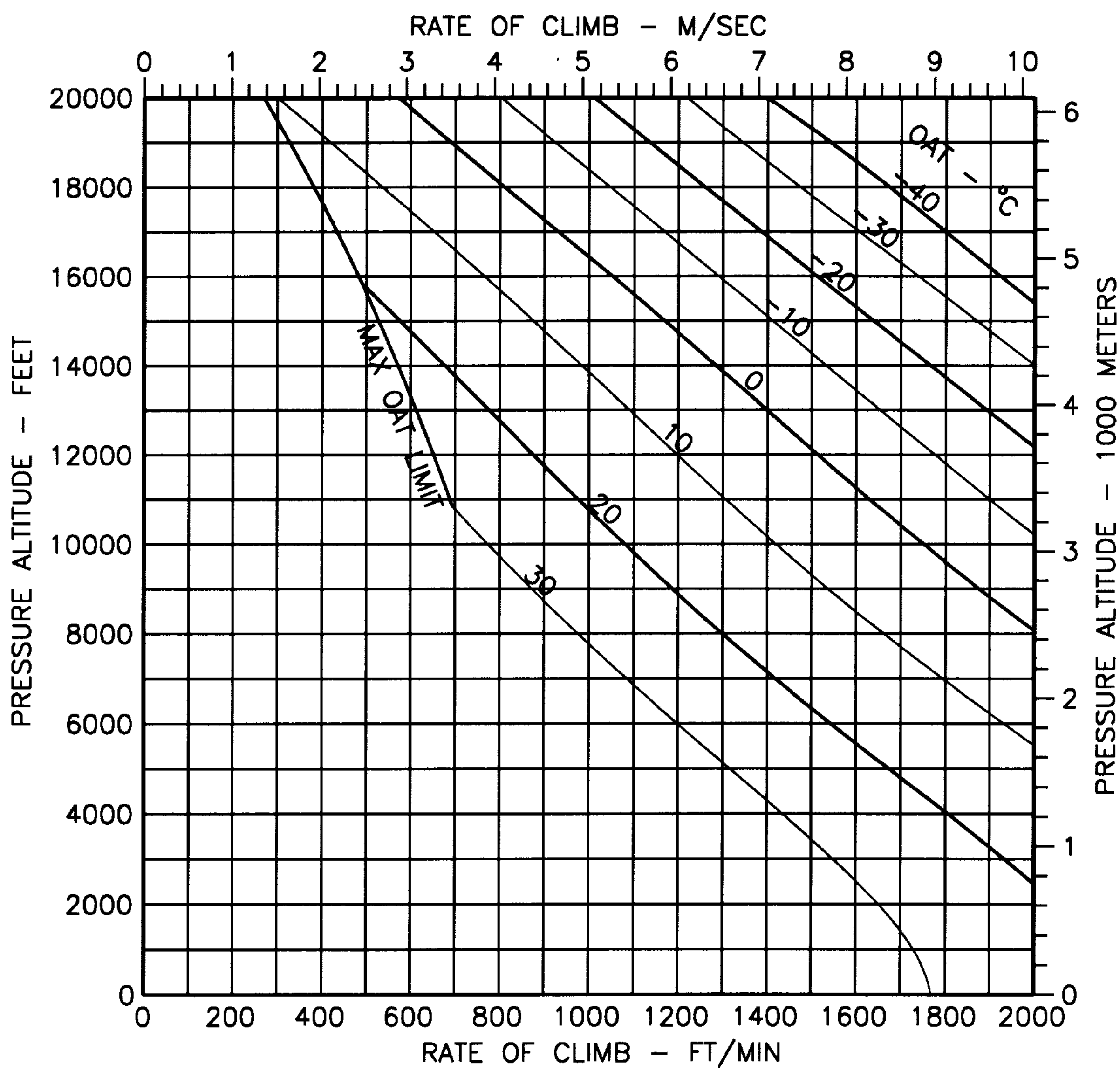


Figure 4-7. Rate of climb (maximum continuous power) (sheet 3 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

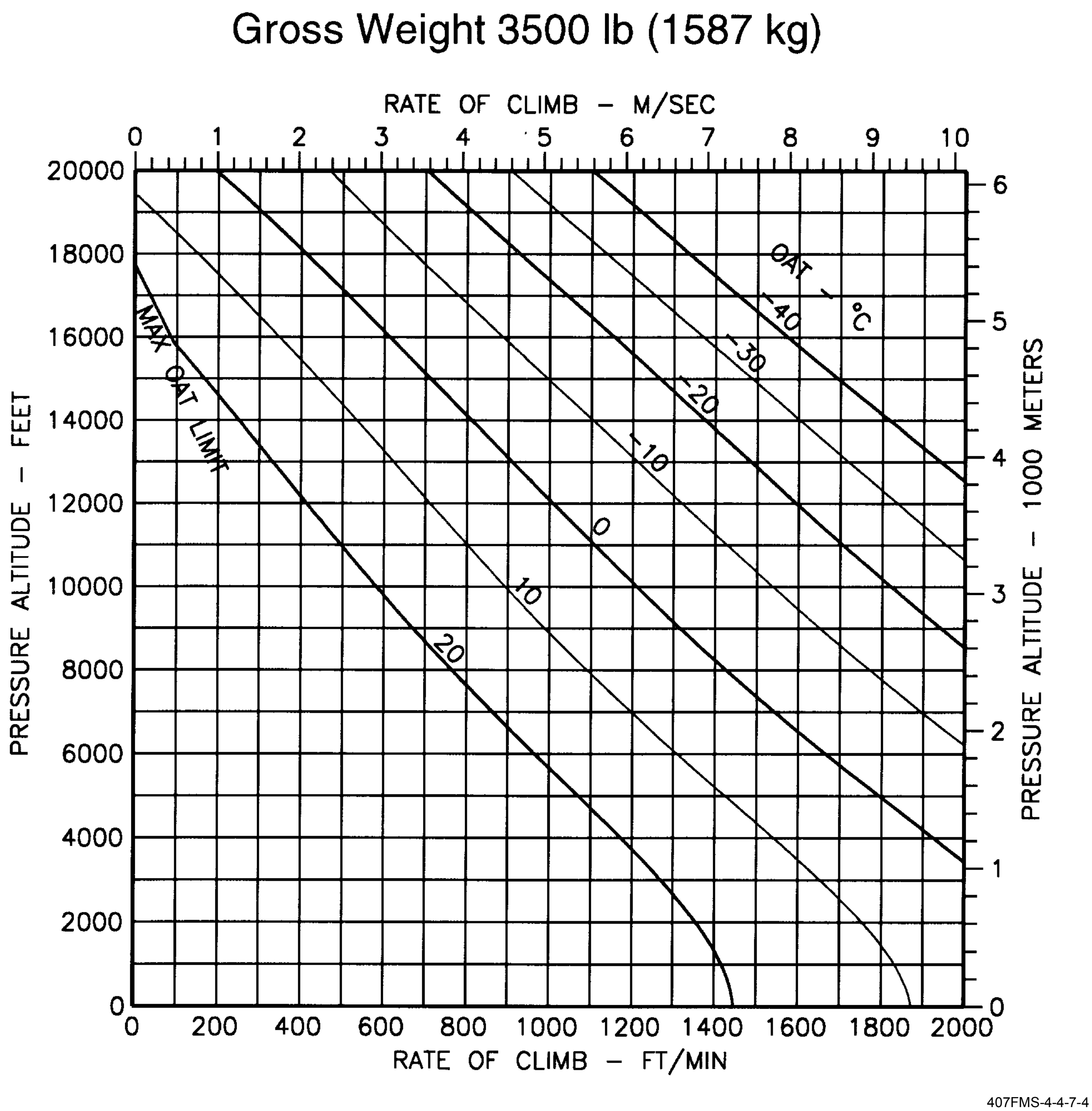


Figure 4-7. Rate of climb (maximum continuous power) (sheet 4 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE
3000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

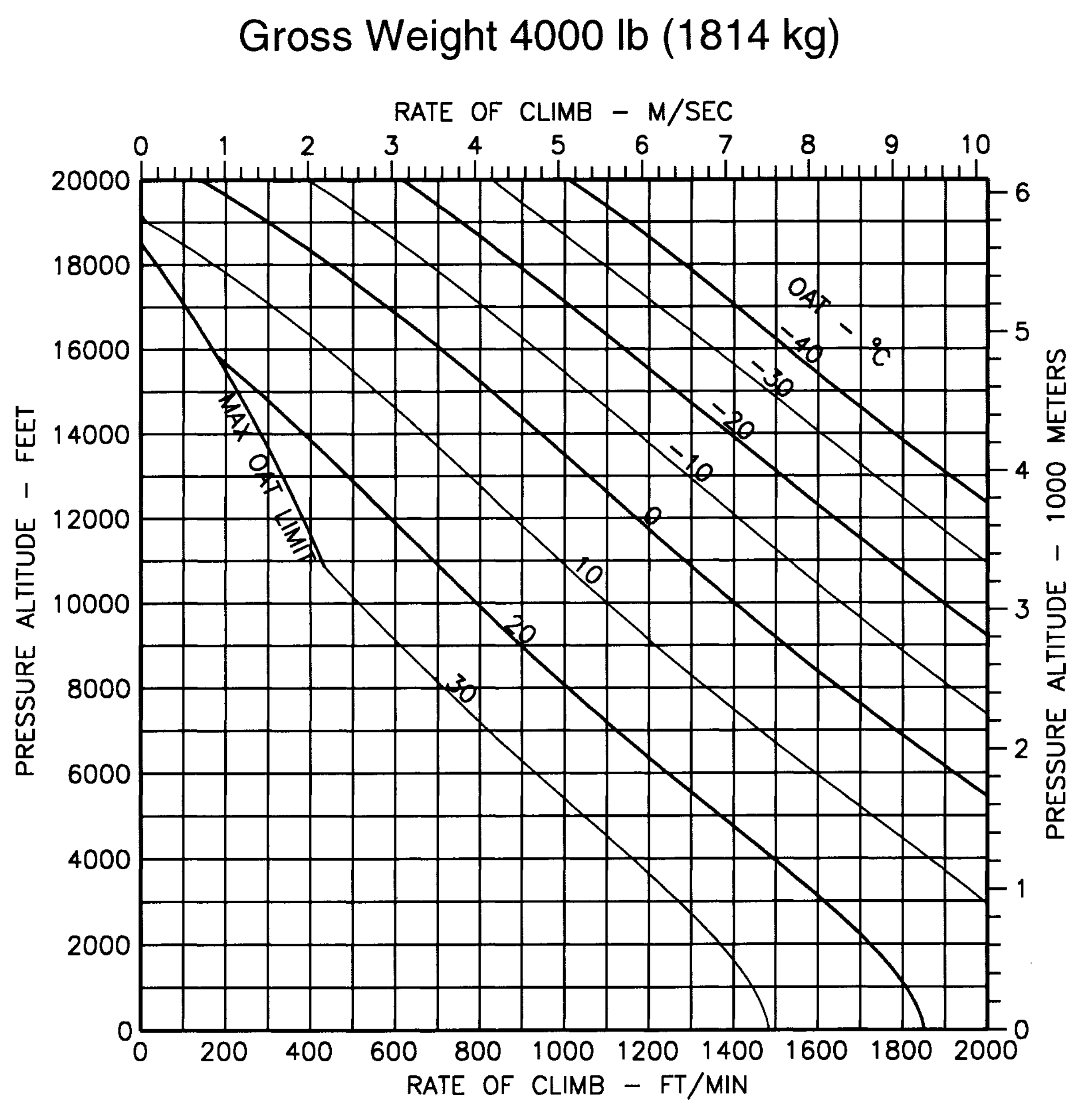


Figure 4-7. Rate of climb (maximum continuous power) (sheet 5 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

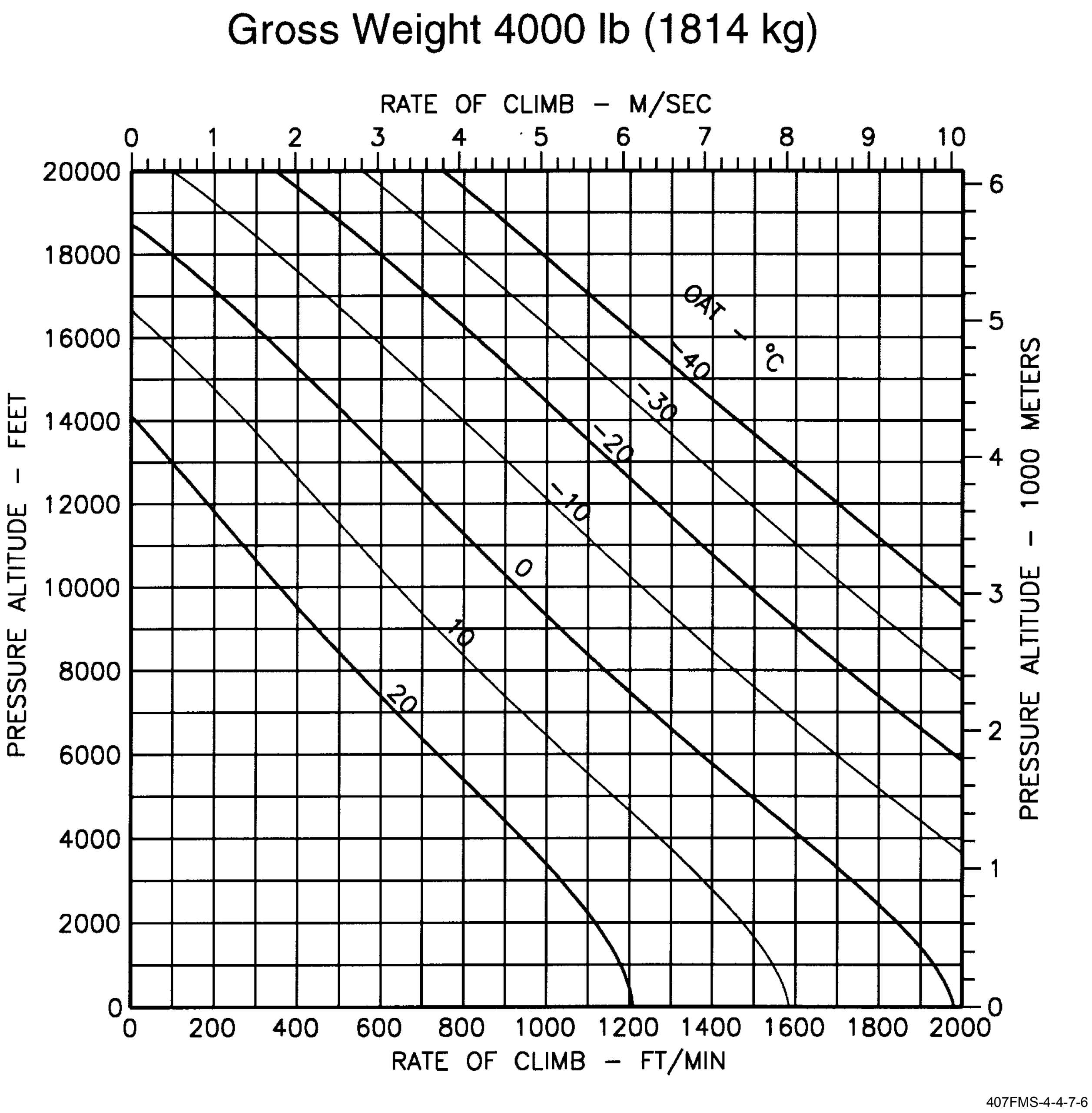


Figure 4-7. Rate of climb (maximum continuous power) (sheet 6 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE
1500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 4500 lb (2041 kg)

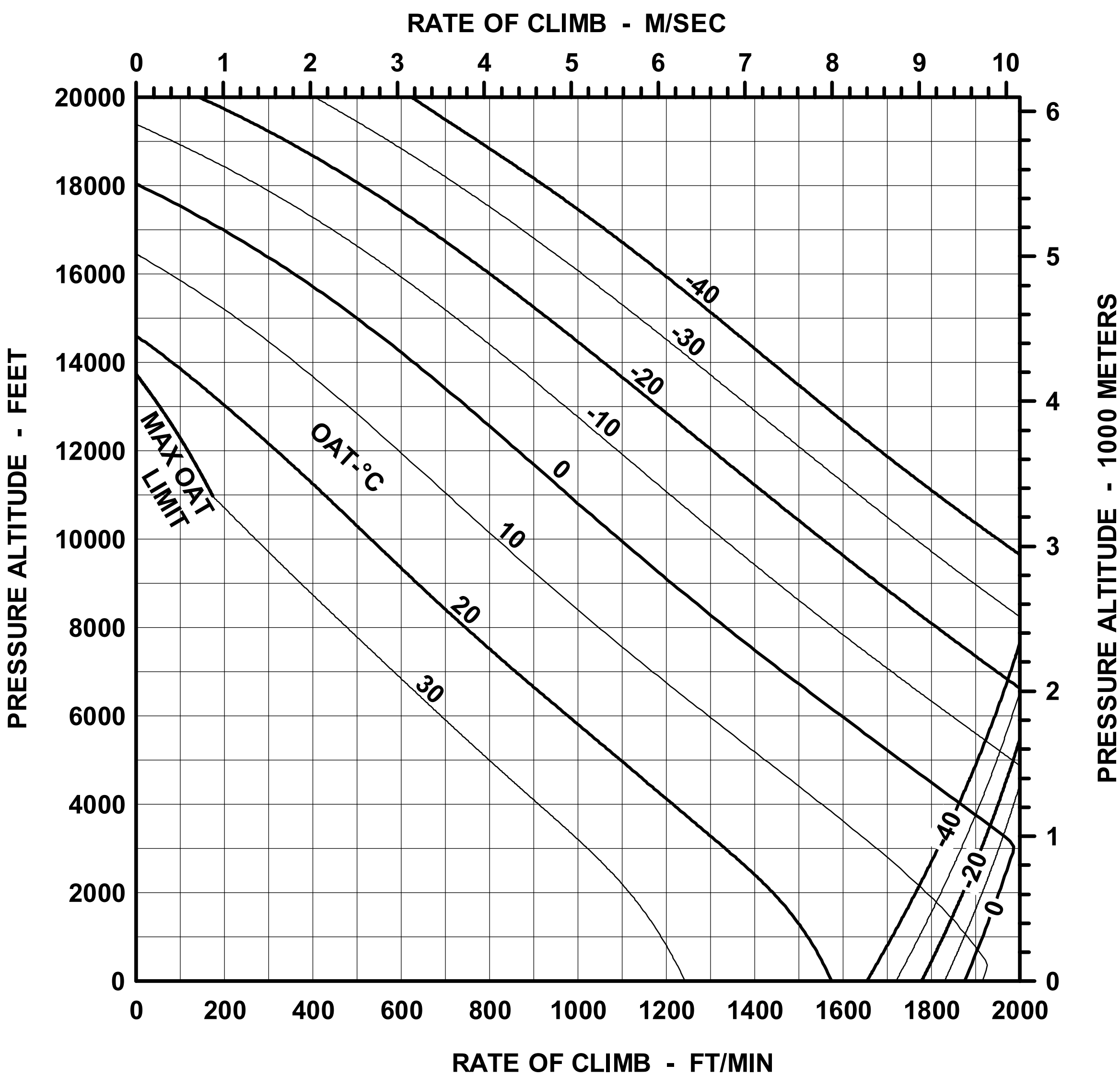


Figure 4-7. Rate of climb (maximum continuous power) (sheet 7 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

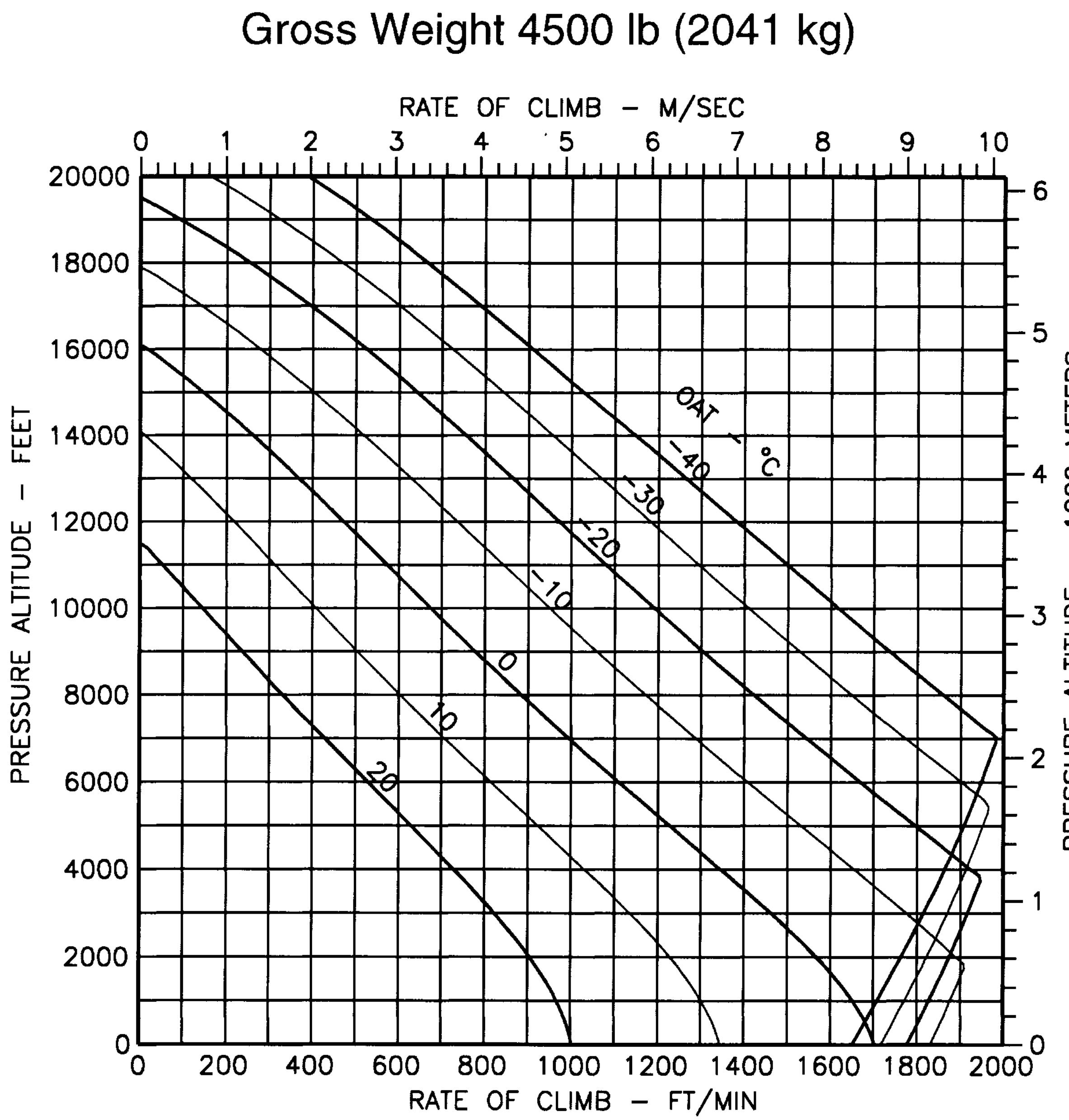


Figure 4-7. Rate of climb (maximum continuous power) (sheet 8 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE 1000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

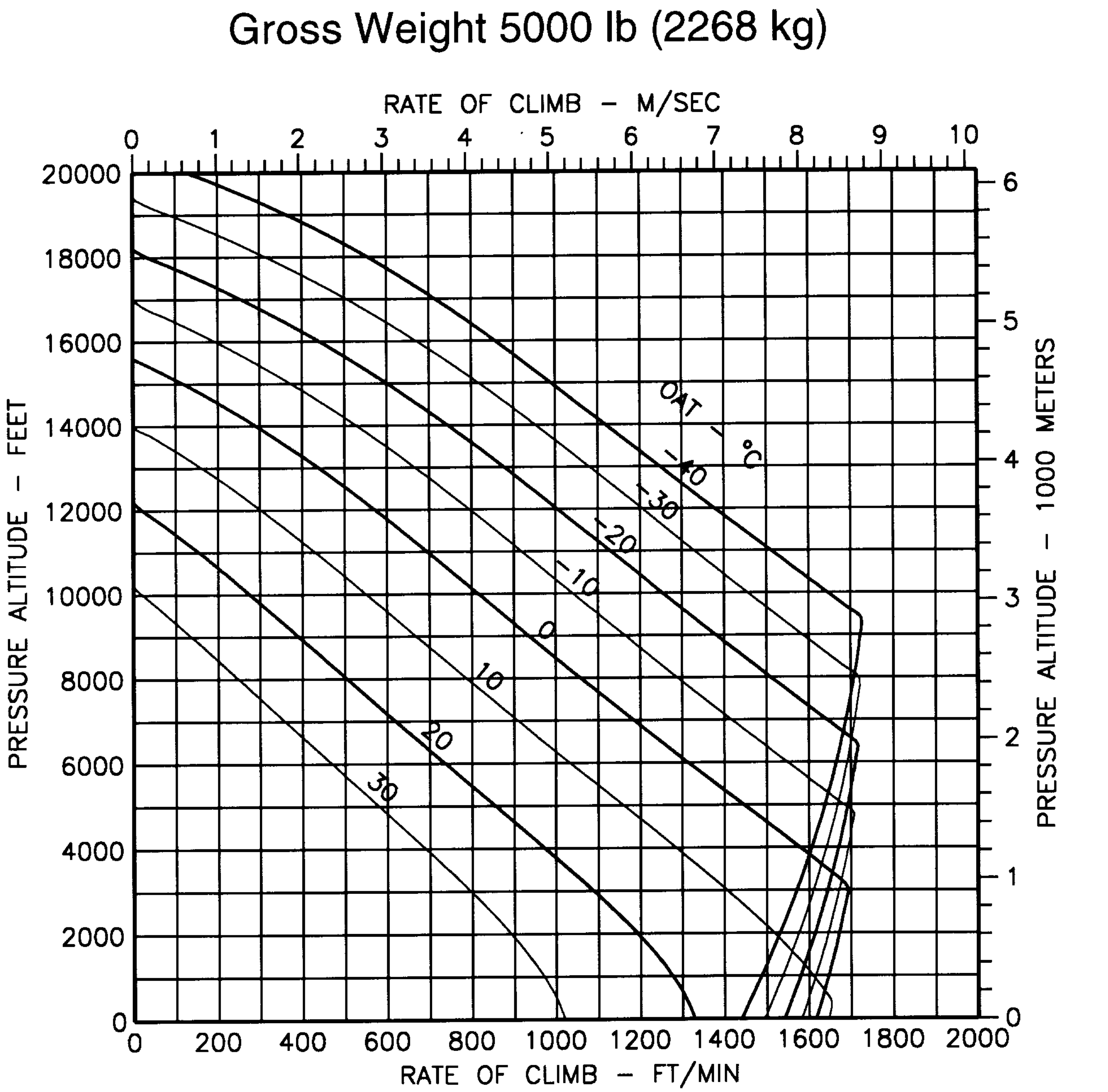


Figure 4-7. Rate of climb (maximum continuous power) (sheet 9 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

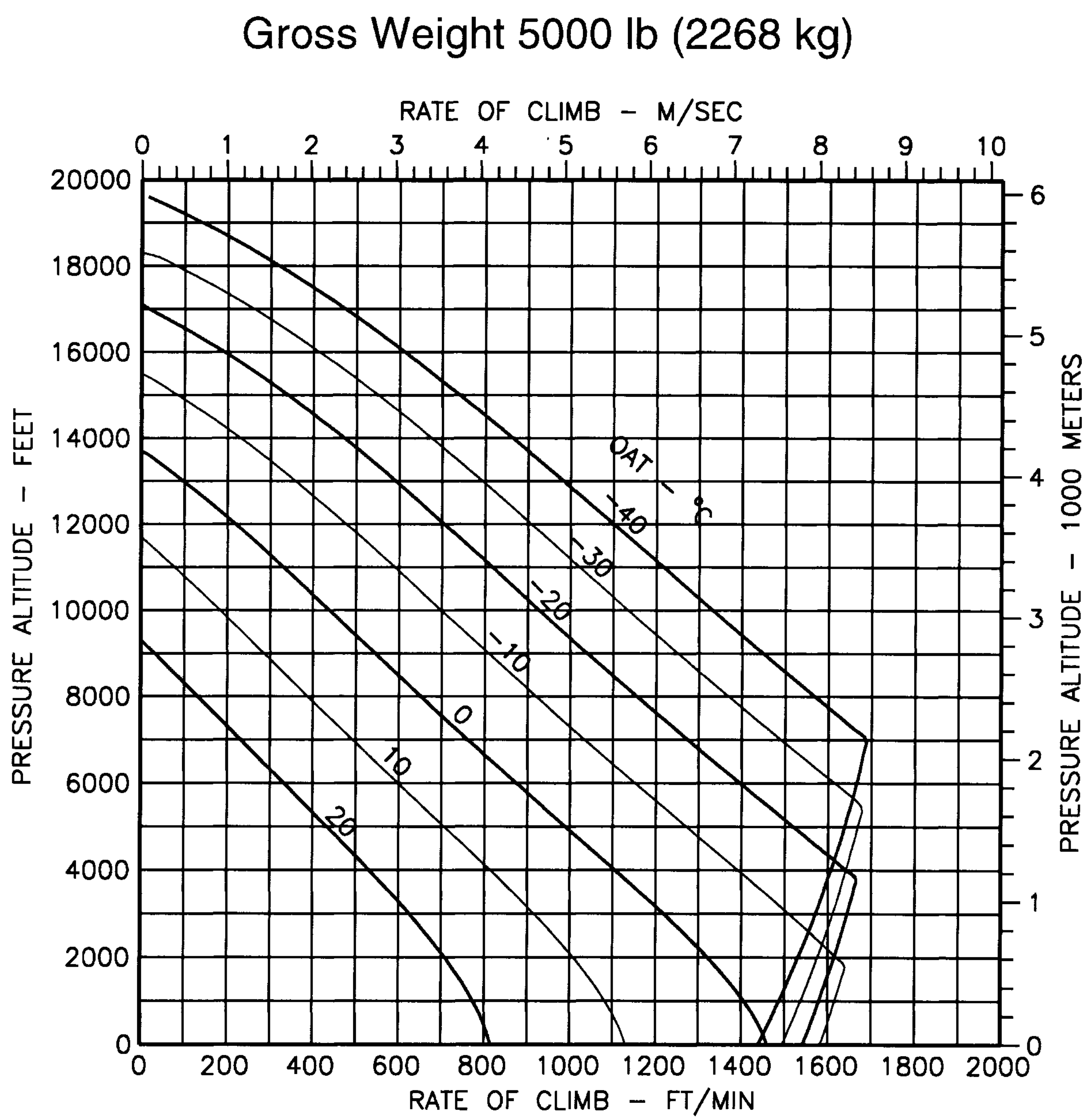


Figure 4-7. Rate of climb (maximum continuous power) (sheet 10 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 12,500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)

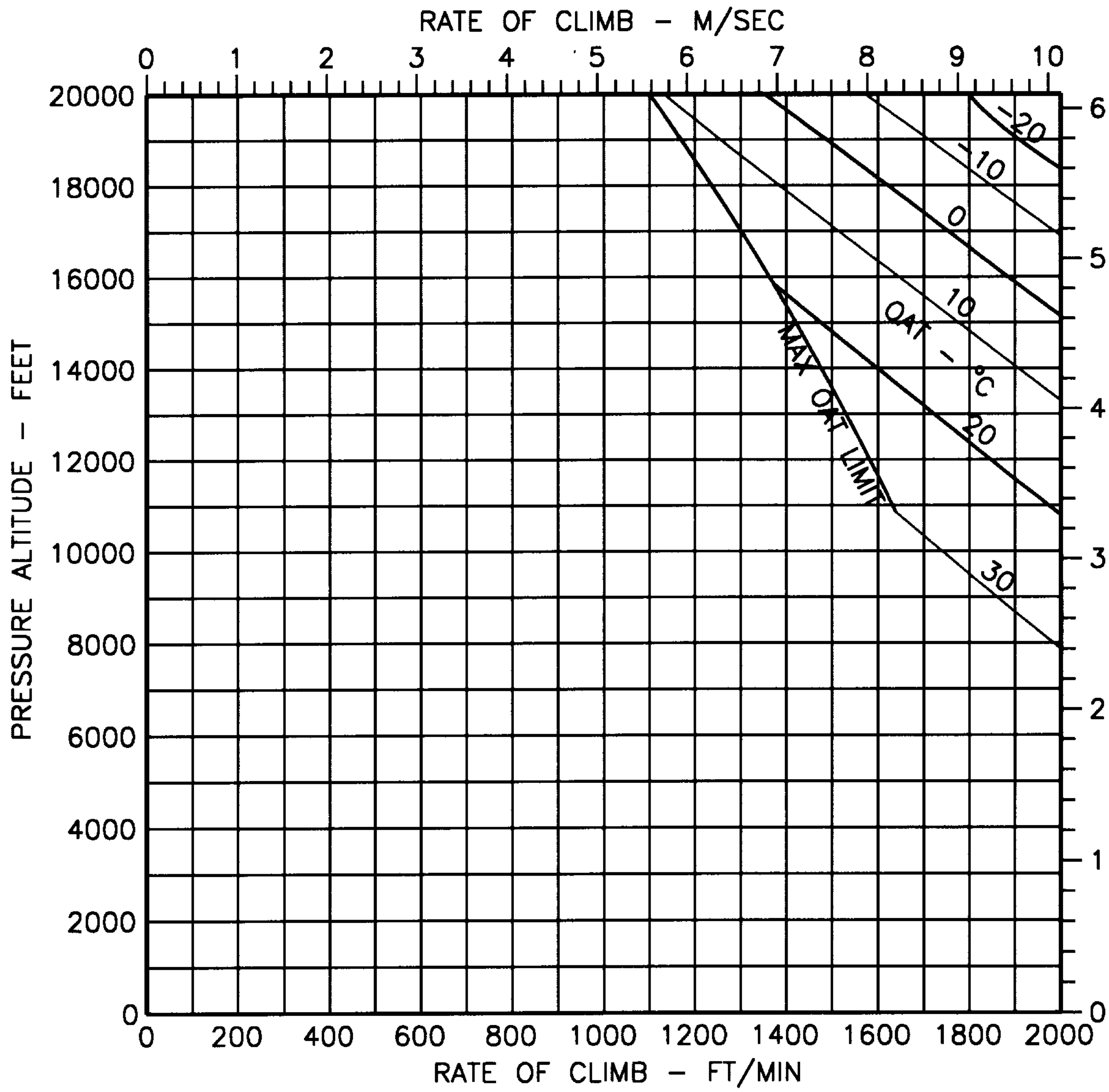


Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 1 of 10)

RATE OF CLIMB

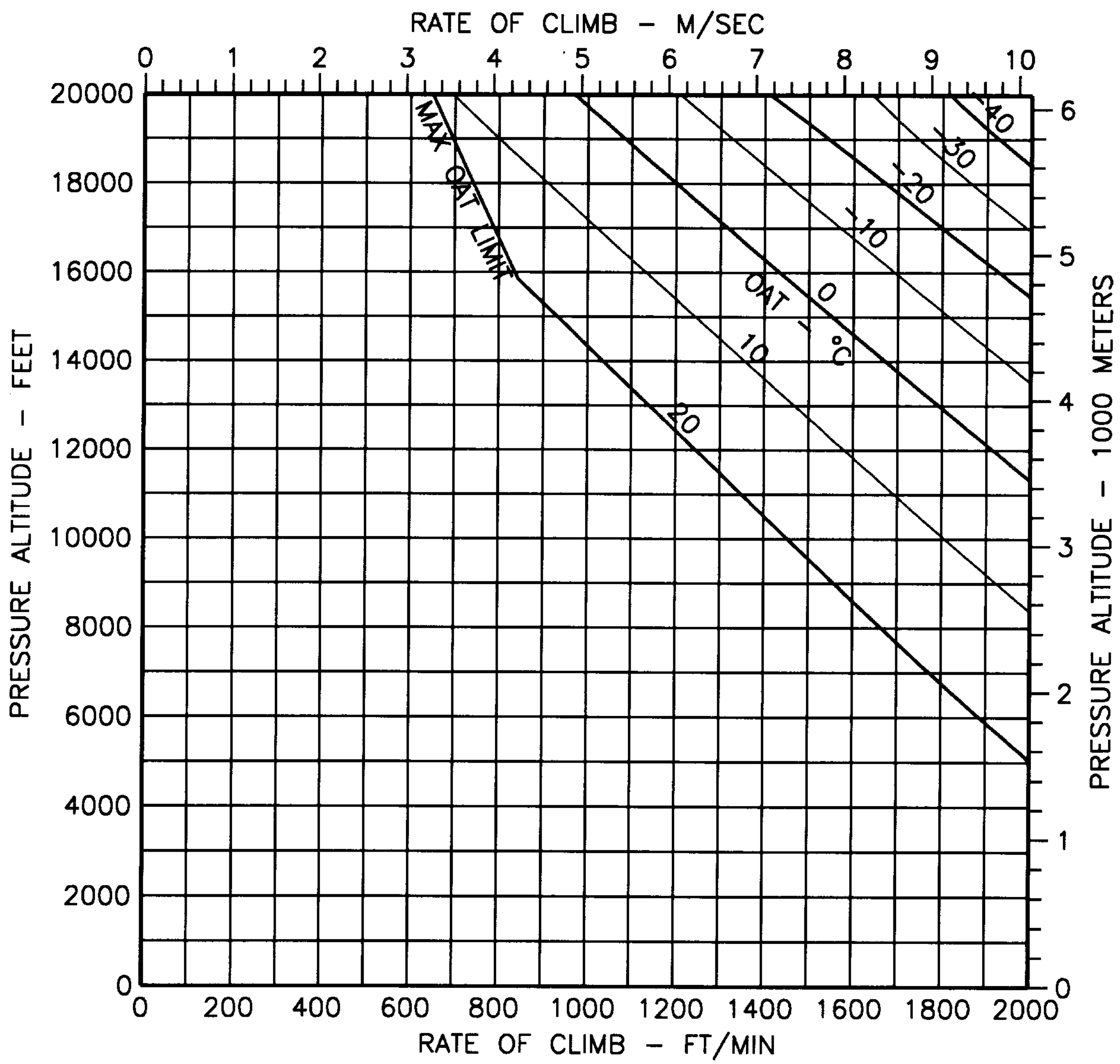
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 8500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)



407FMS-4-4-8-2

Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 2 of 10)

RATE OF CLIMB

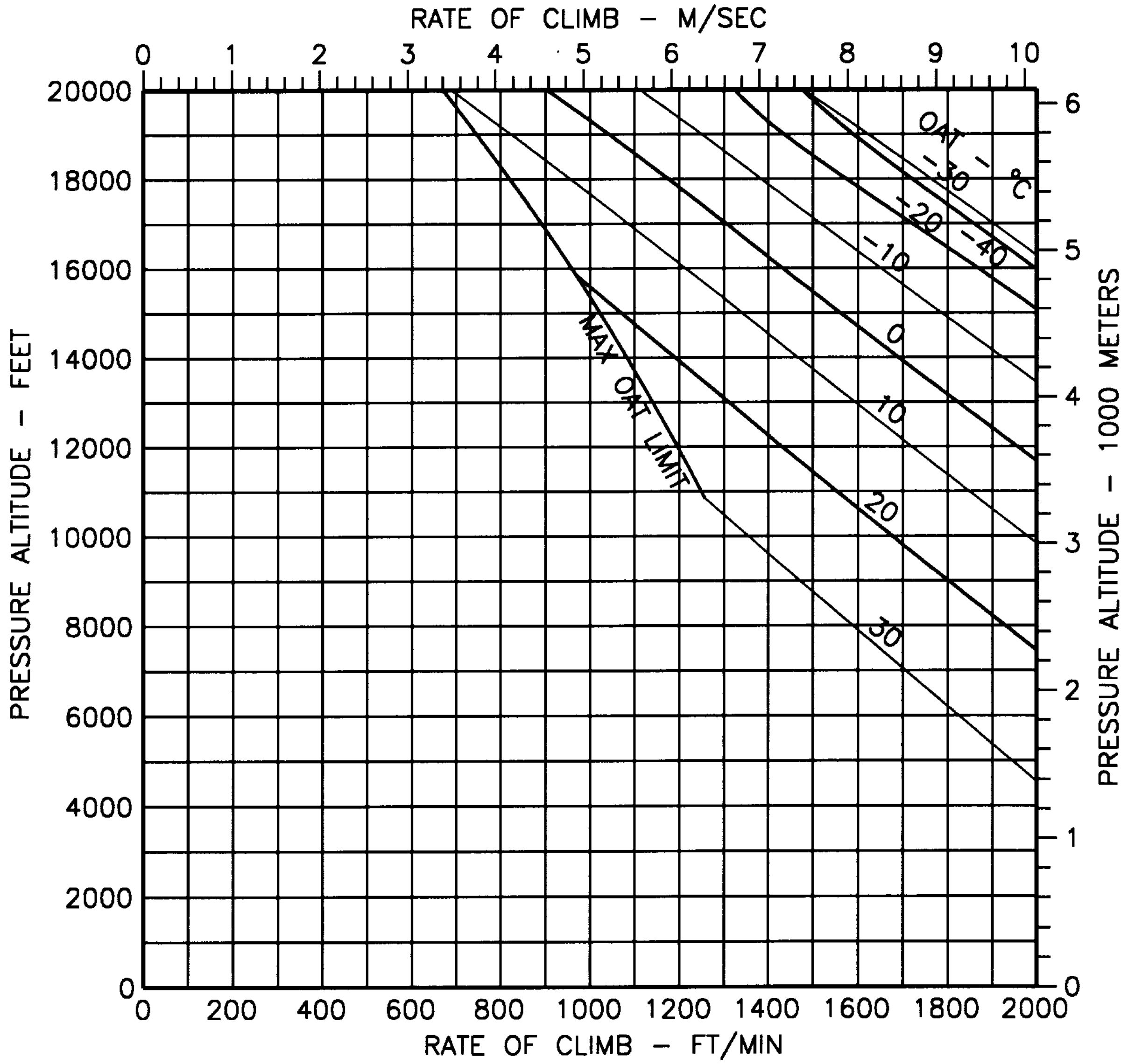
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE 9500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)



407FMS-4-4-8-3

Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 3 of 10)

RATE OF CLIMB

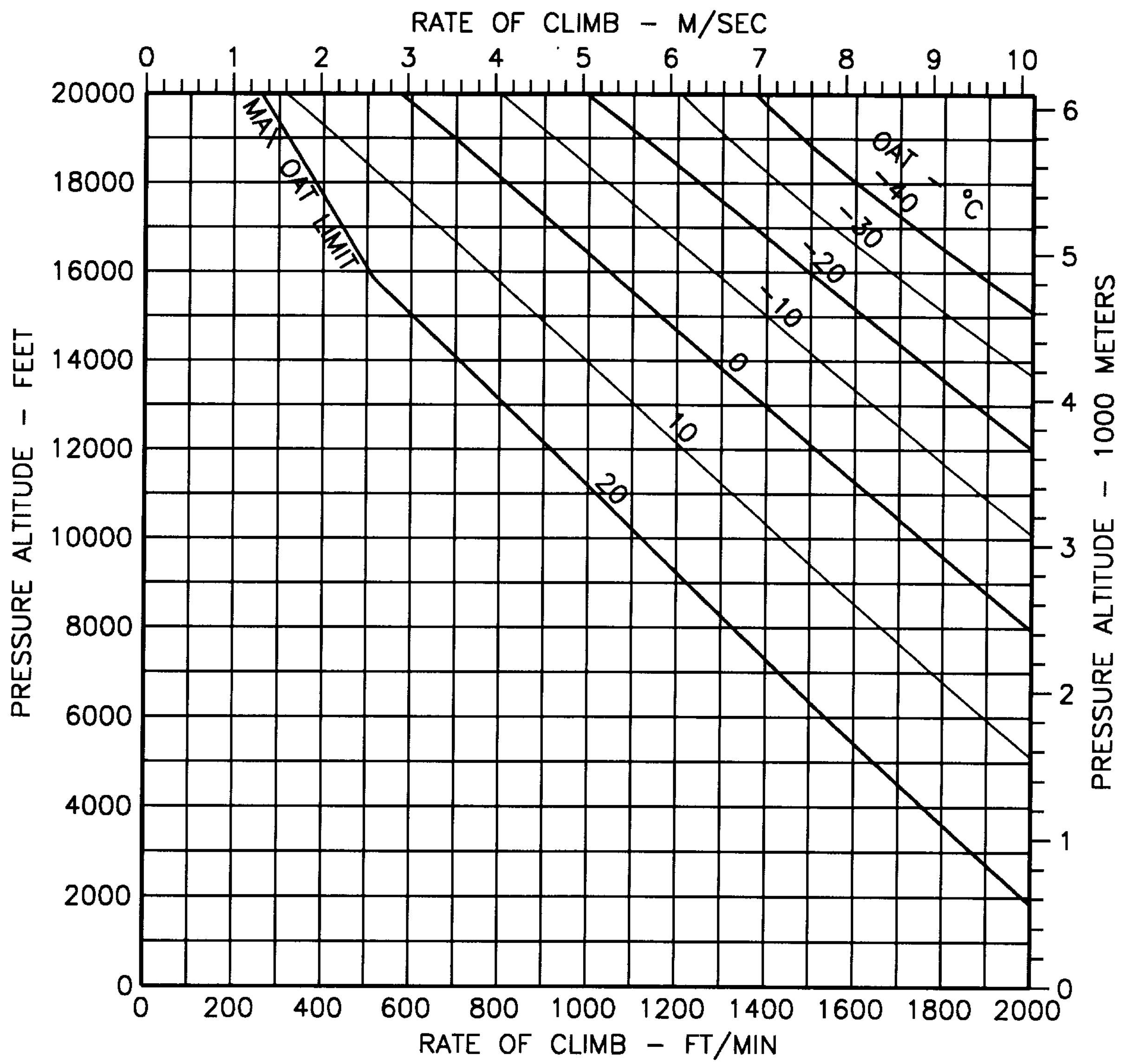
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE 5000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)



407FMS-4-4-8-4

Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 4 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE 6500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

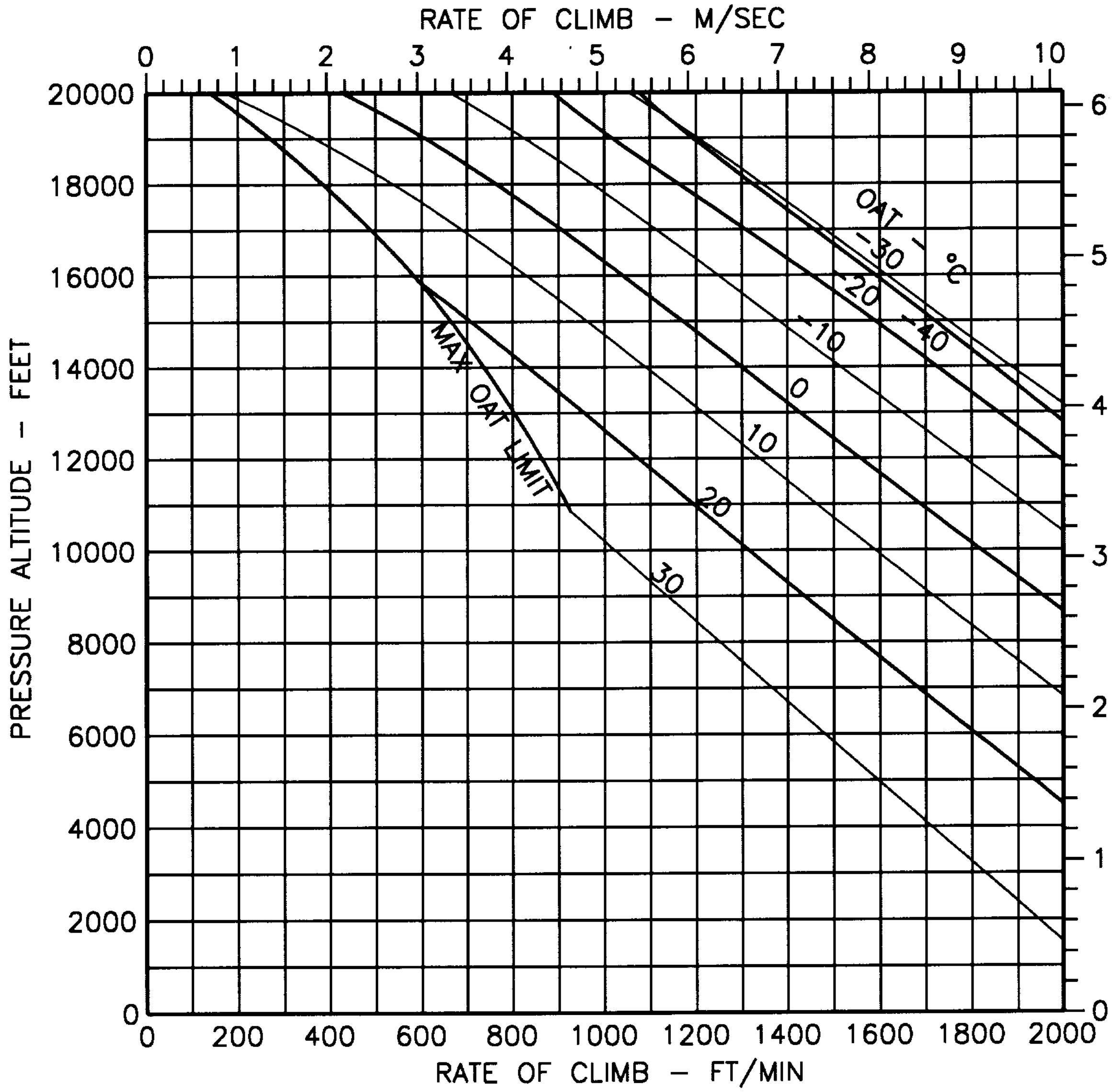


Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 5 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814)

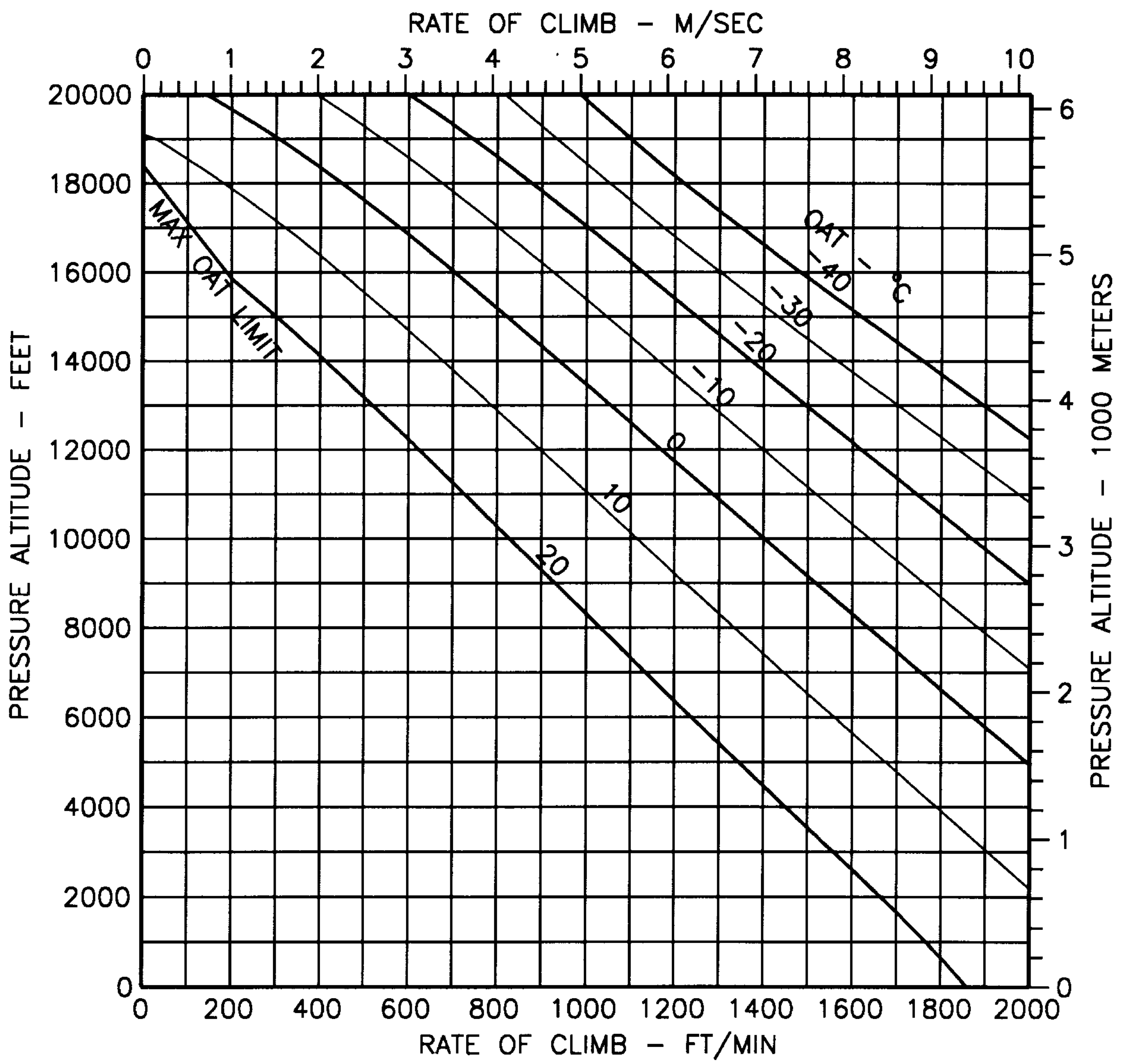


Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 6 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN ABOVE 4000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

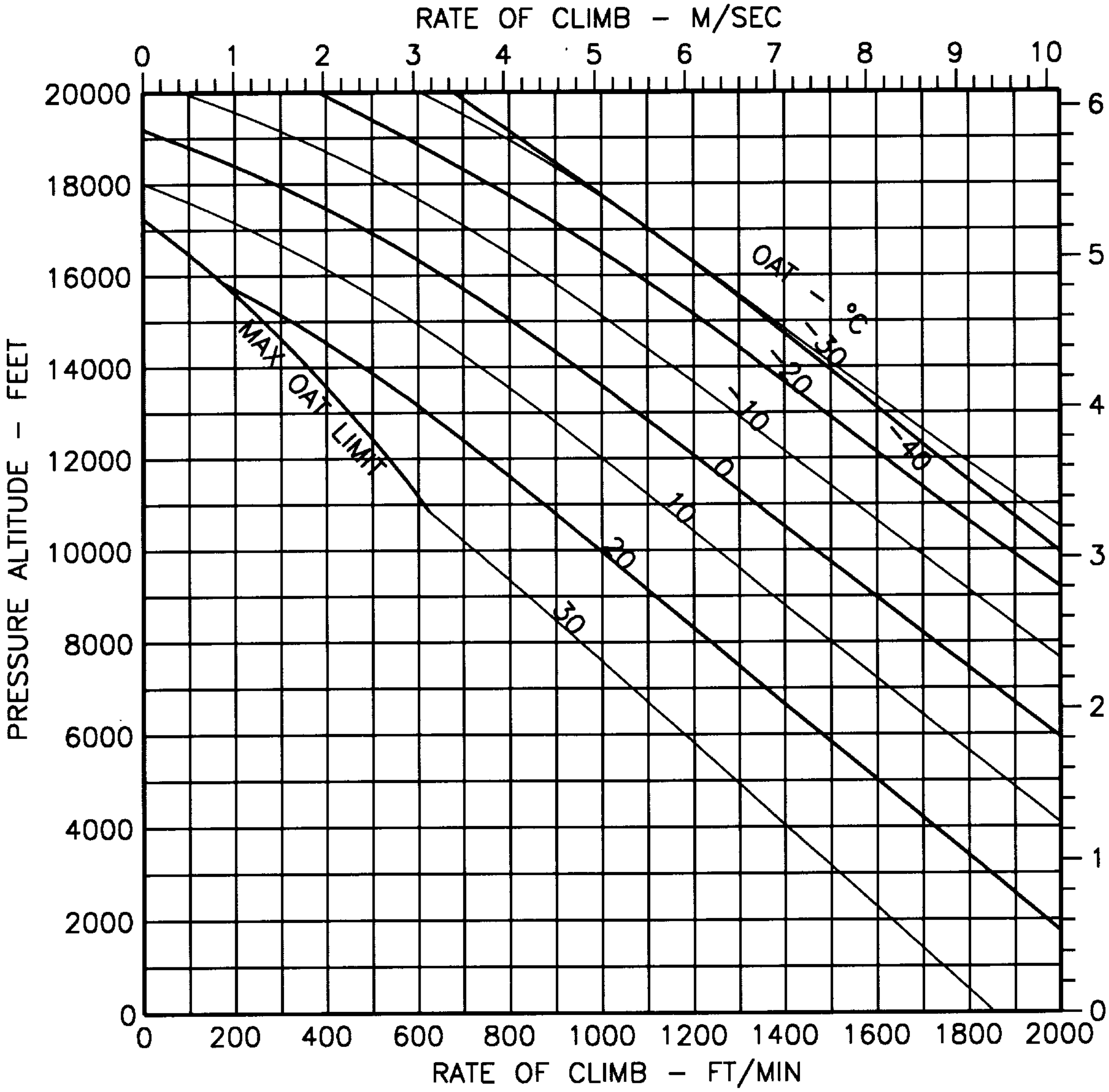


Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 7 of 10)

RATE OF CLIMB

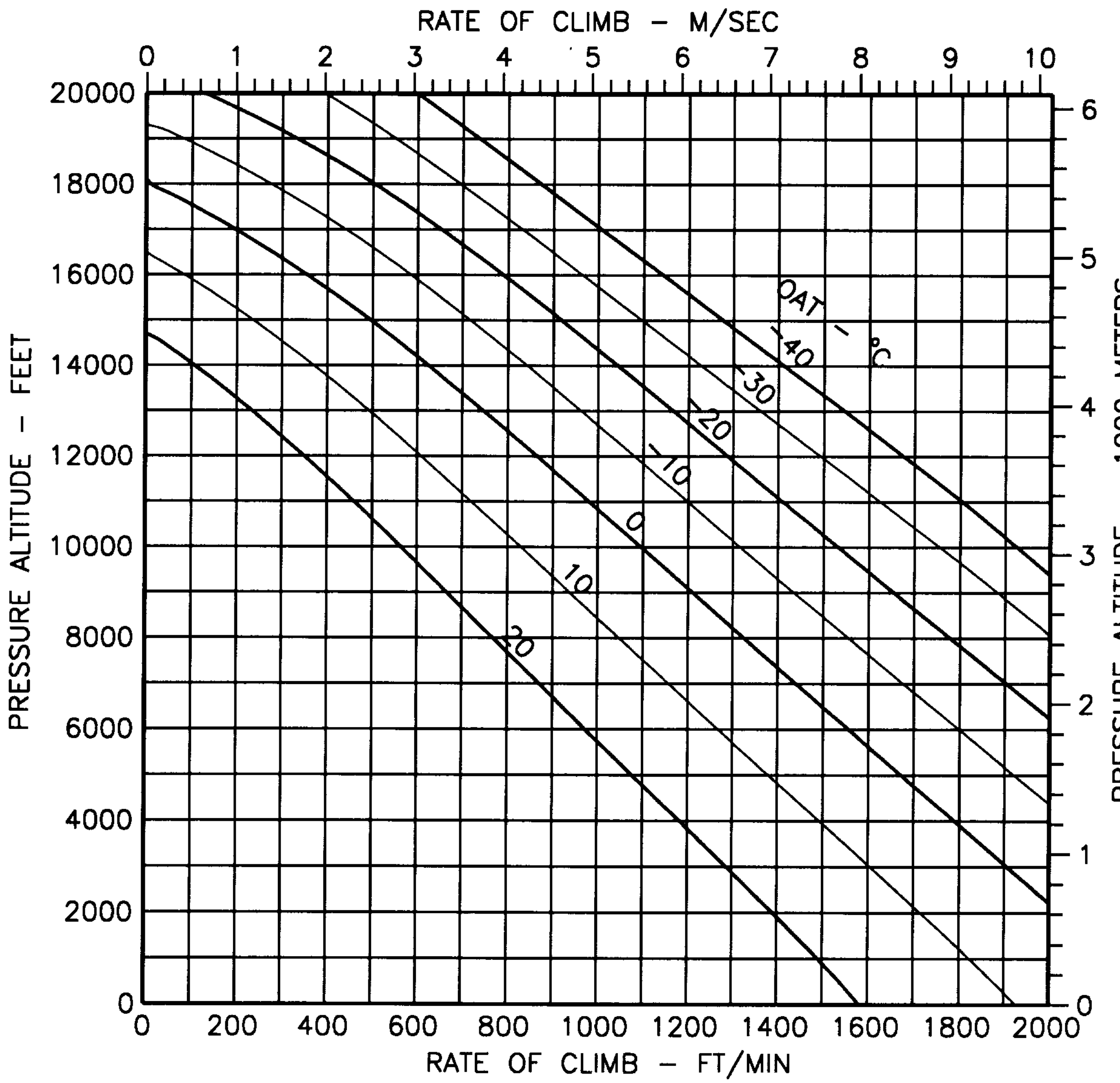
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)



407FMS-4-4-8-8

Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 8 of 10)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR - PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE
2000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)

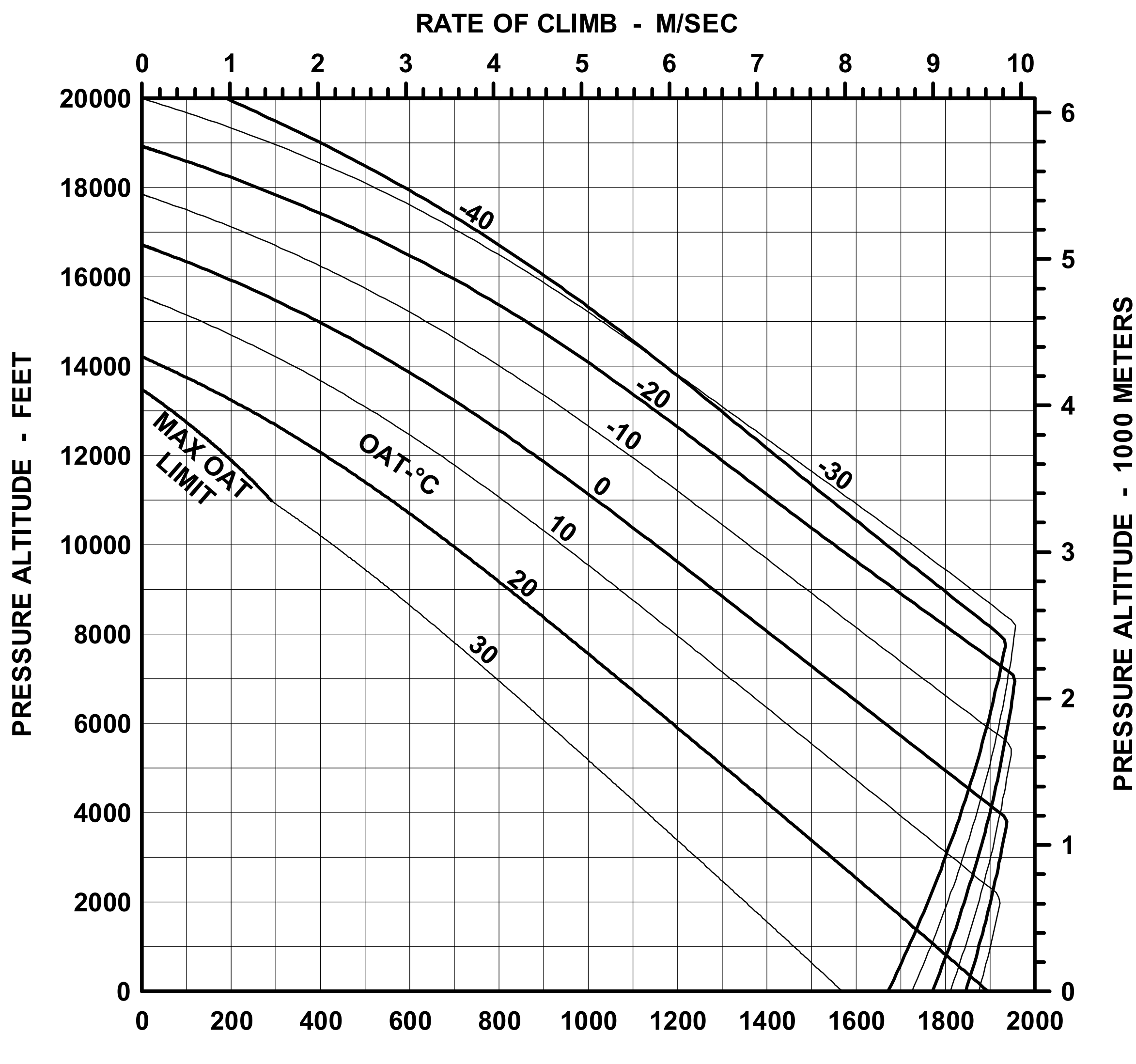


Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 9 of 10)

RATE OF CLIMB

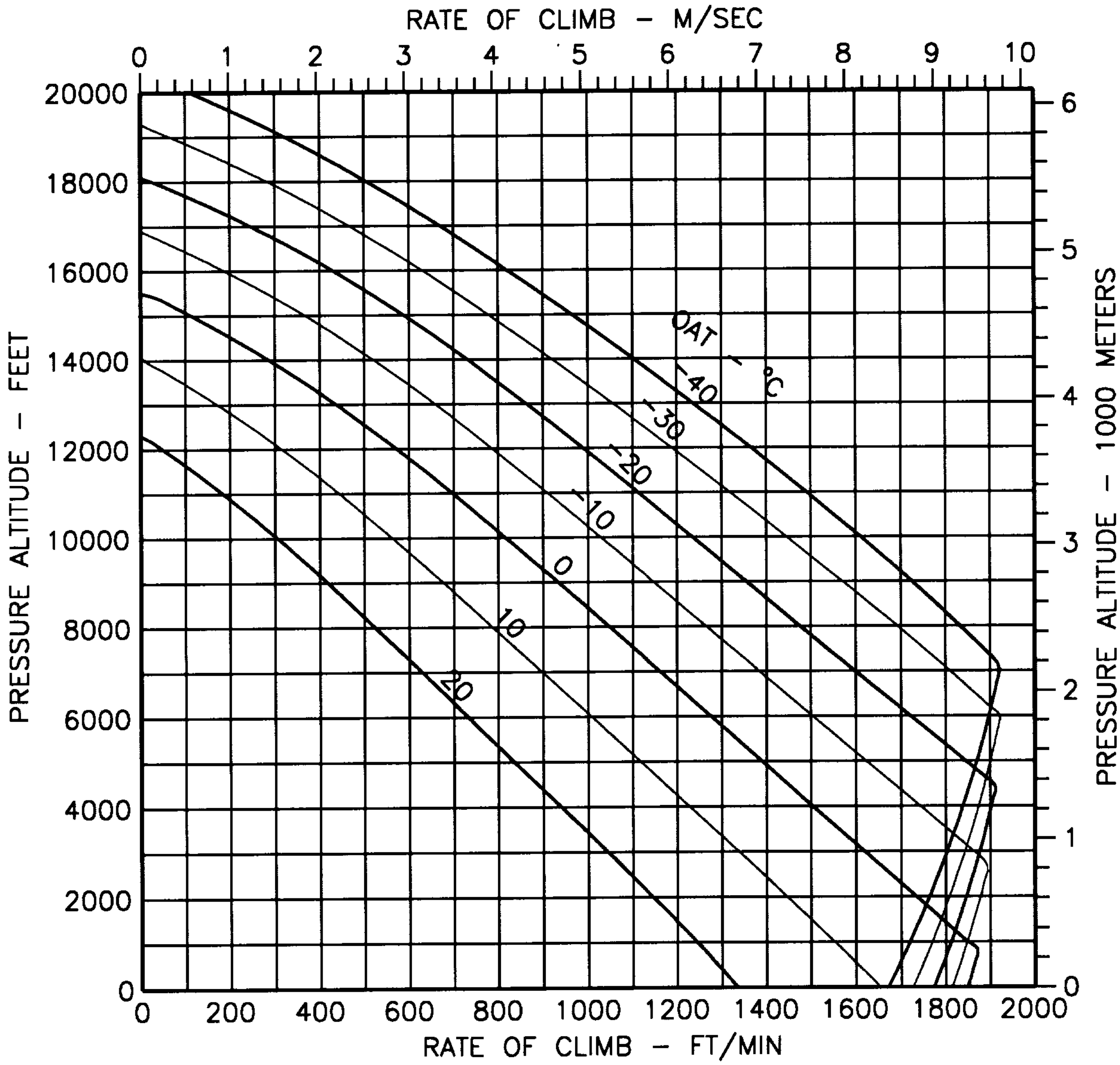
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)



407FMS-4-4-8-10

Figure 4-8. Rate of climb (takeoff power) (particle separator) (sheet 10 of 10)

RATE OF CLIMB

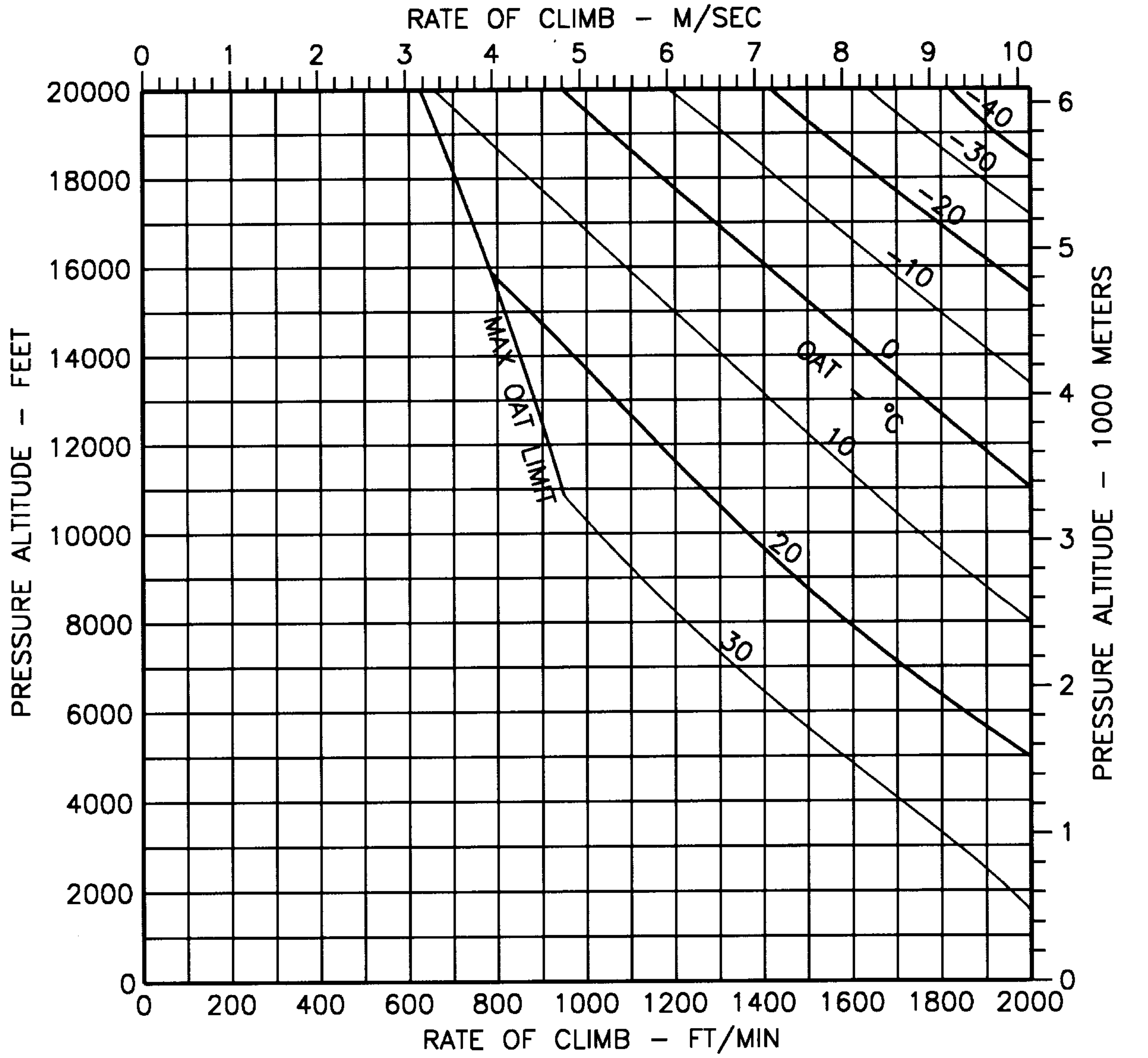
MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 7500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)



407FMS-4-4-9-1

Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 1 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 225 FT/MIN ABOVE 2500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 70 FT/MIN FOR PURGE ON

Gross Weight 3000 lb (1361 kg)

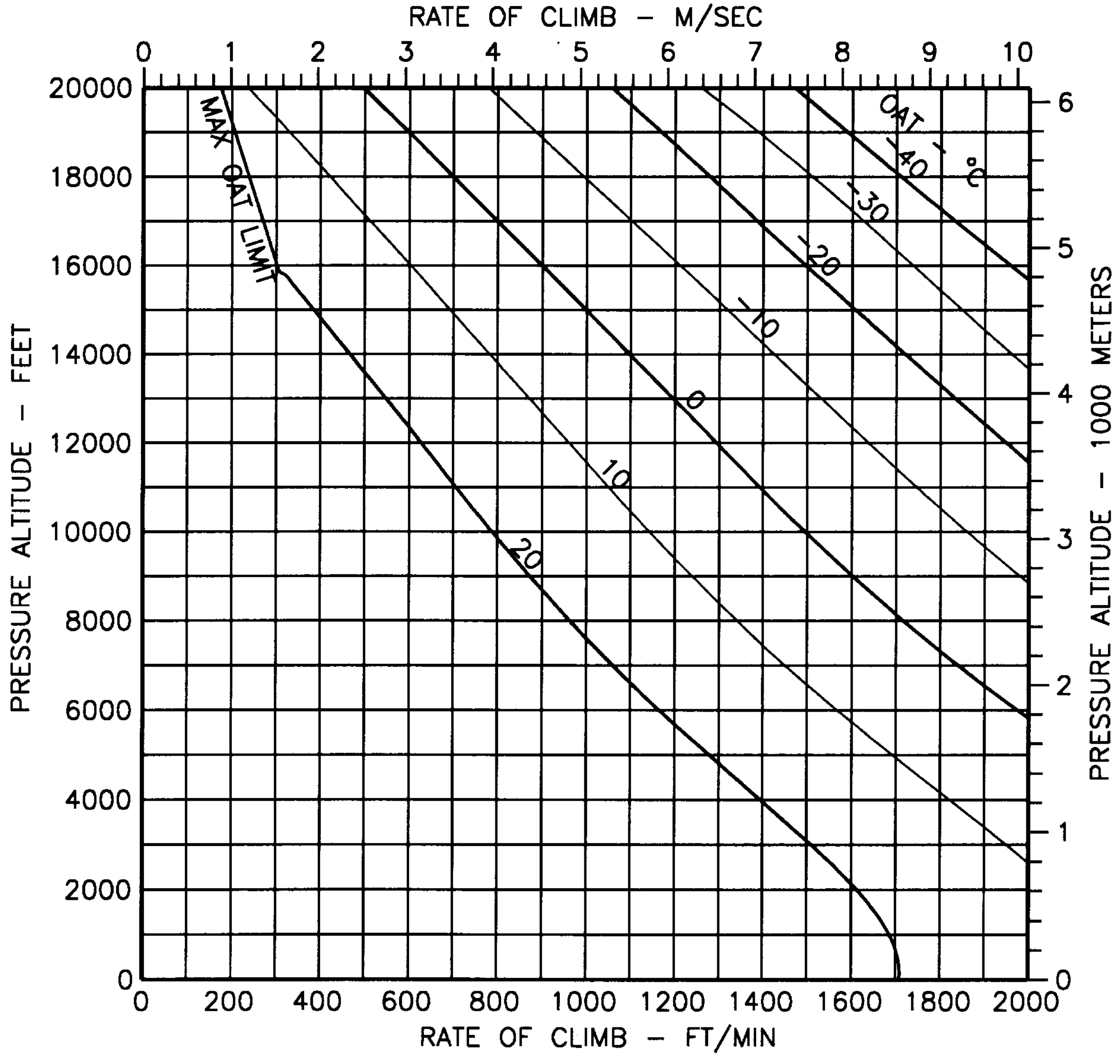


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 2 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN ABOVE 5500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

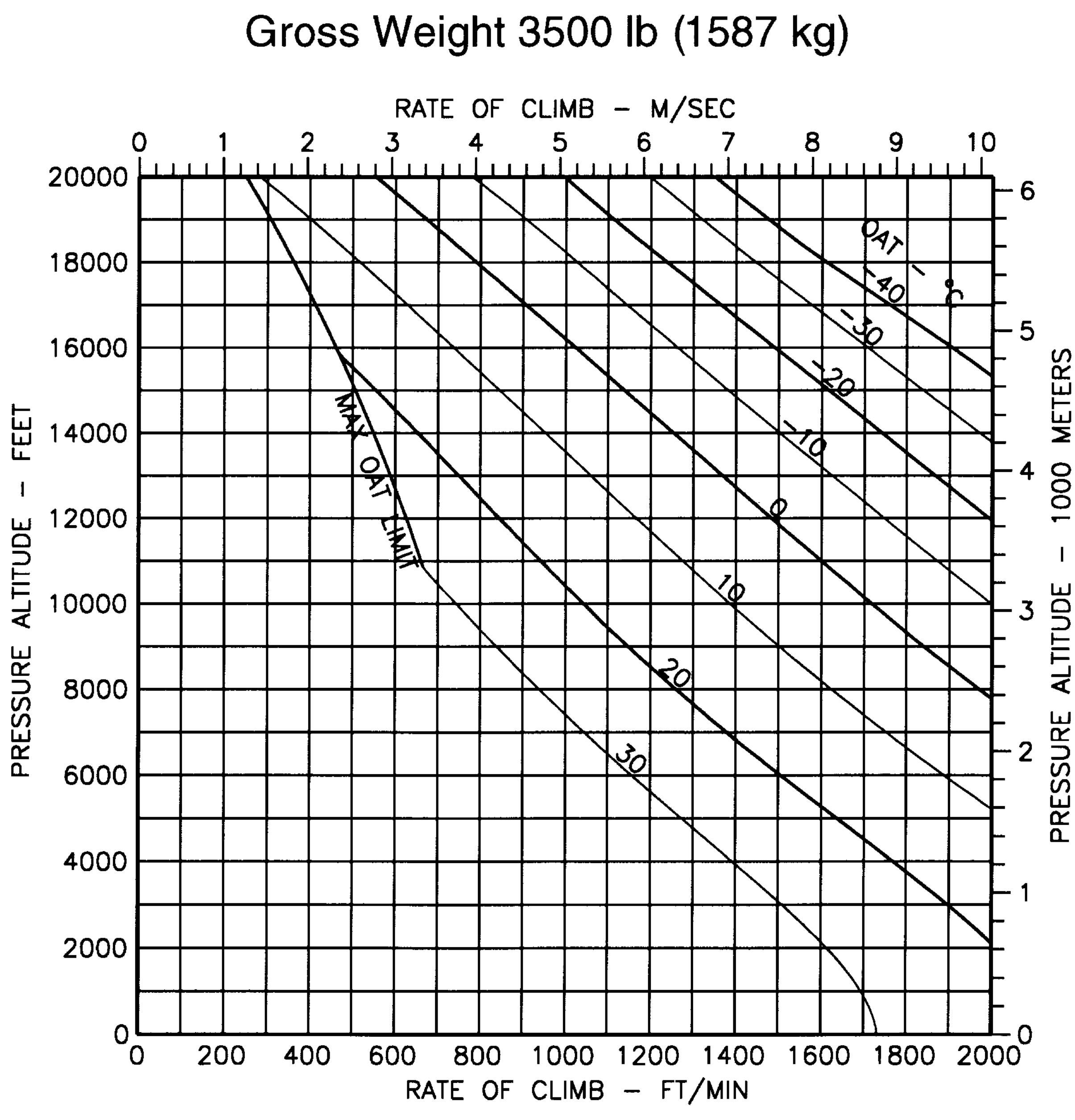


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 3 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 190 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 60 FT/MIN FOR PURGE ON

Gross Weight 3500 lb (1587 kg)

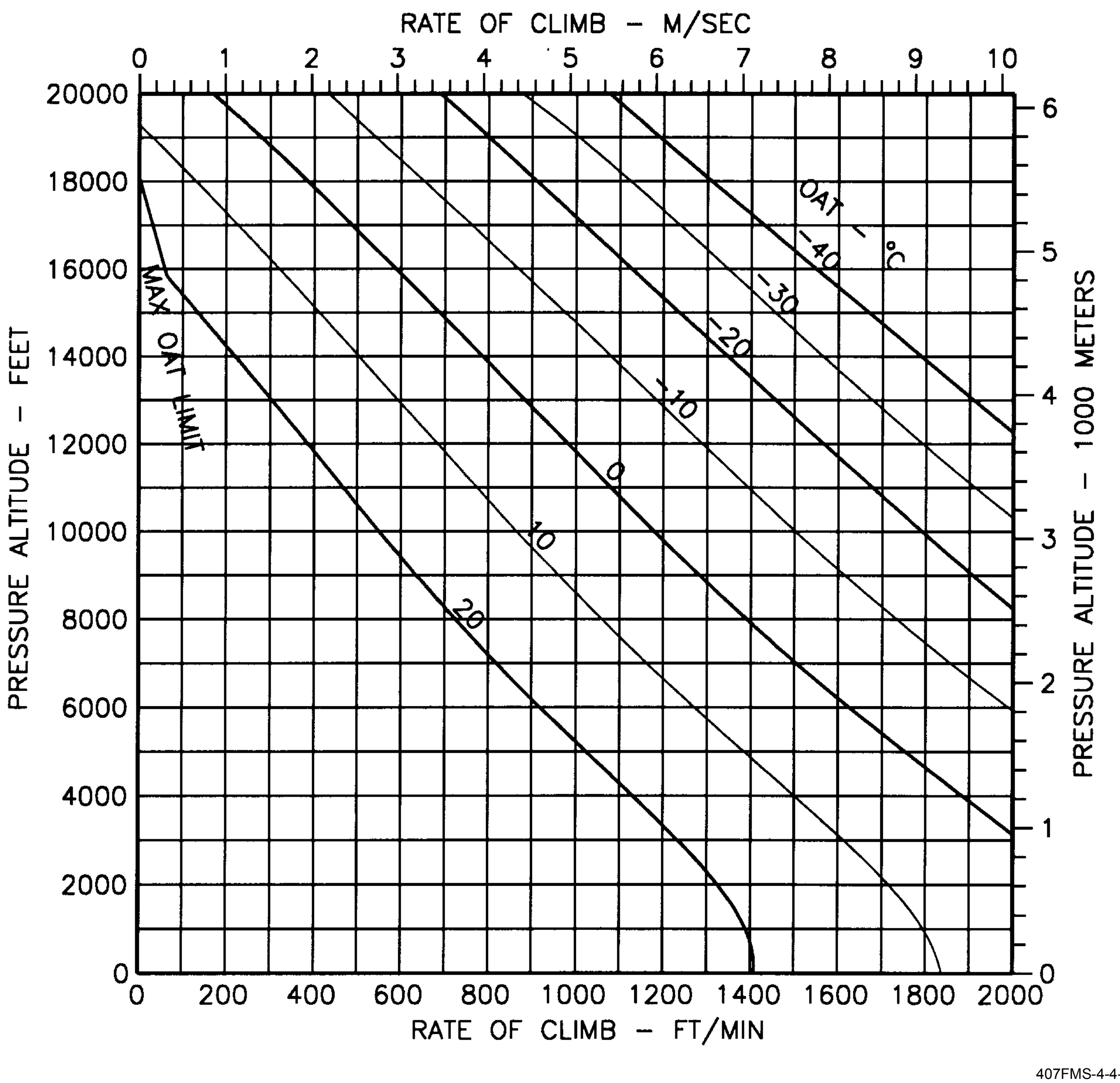


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 4 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN ABOVE 2500 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

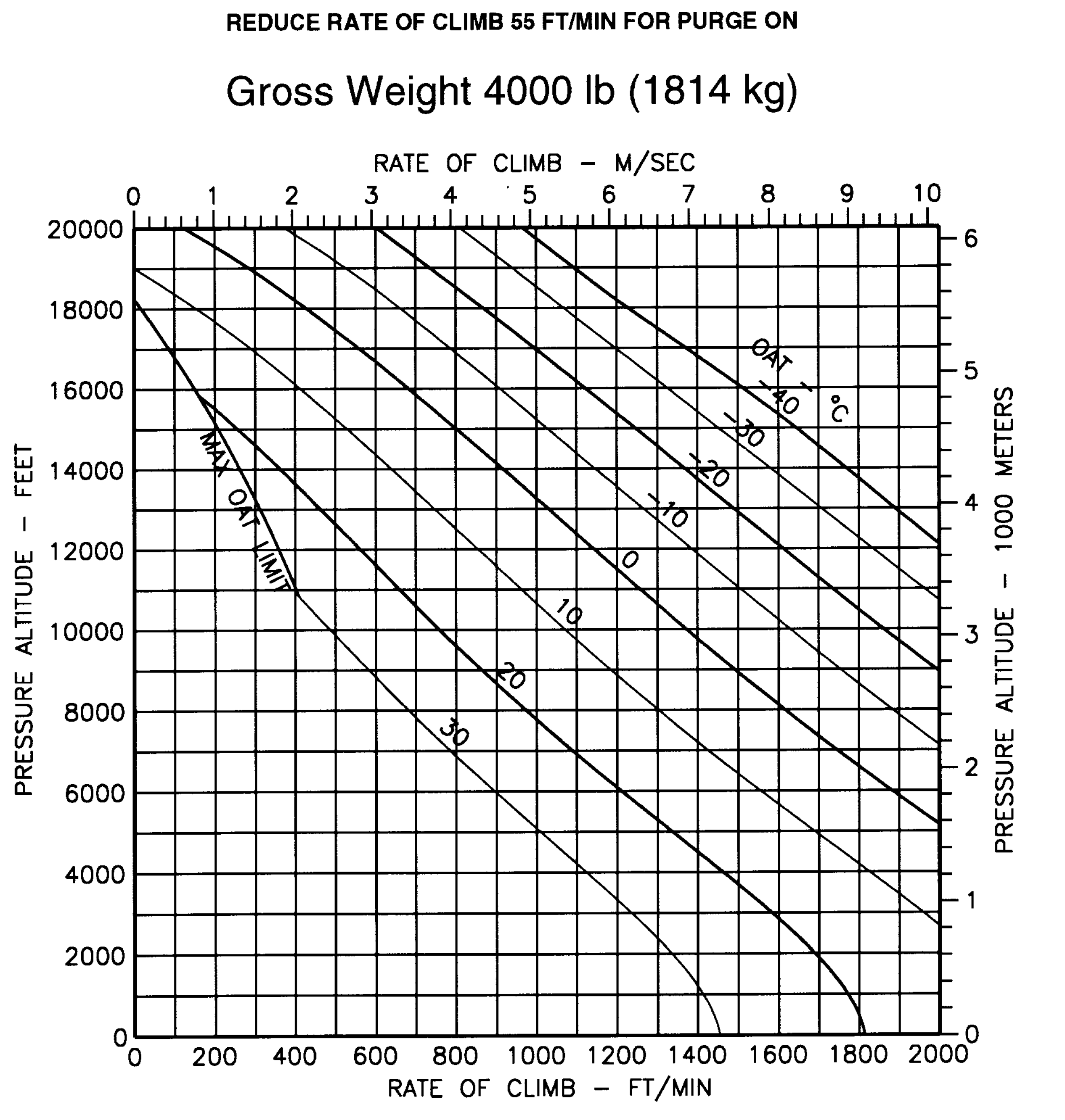


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 5 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 170 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 55 FT/MIN FOR PURGE ON

Gross Weight 4000 lb (1814 kg)

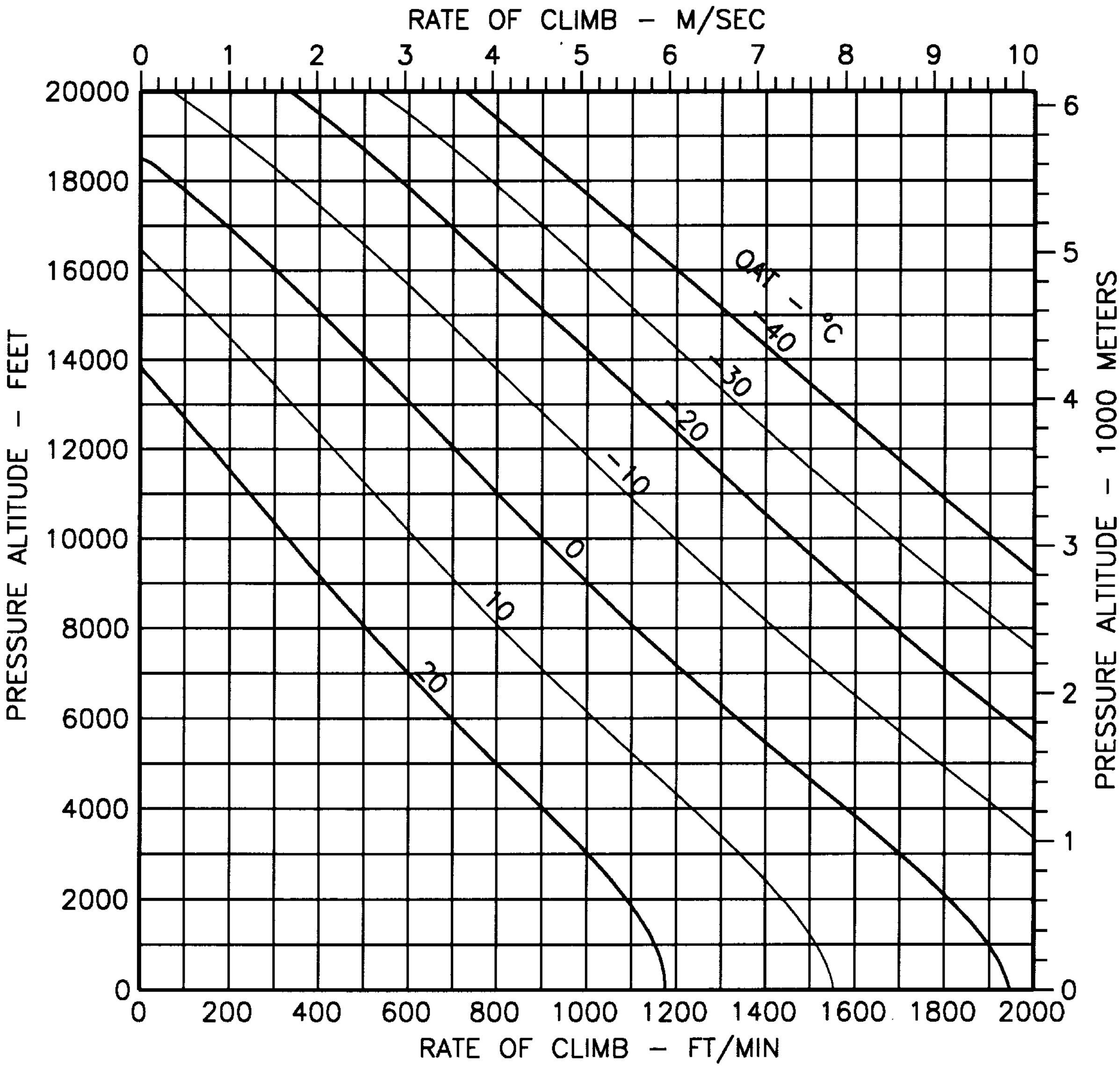


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 6 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN FOR ABOVE 1000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

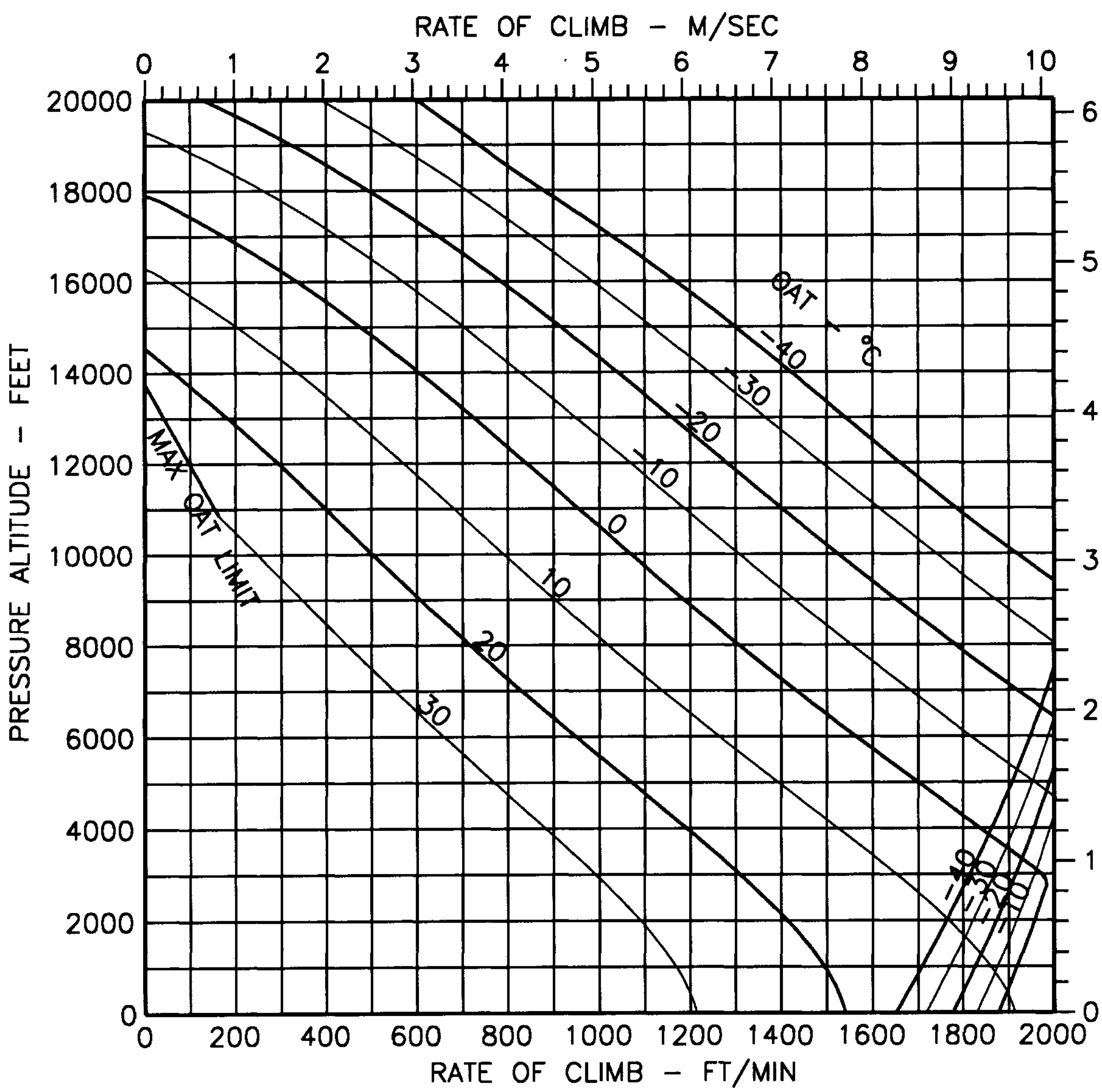


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 7 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 150 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 50 FT/MIN FOR PURGE ON

Gross Weight 4500 lb (2041 kg)

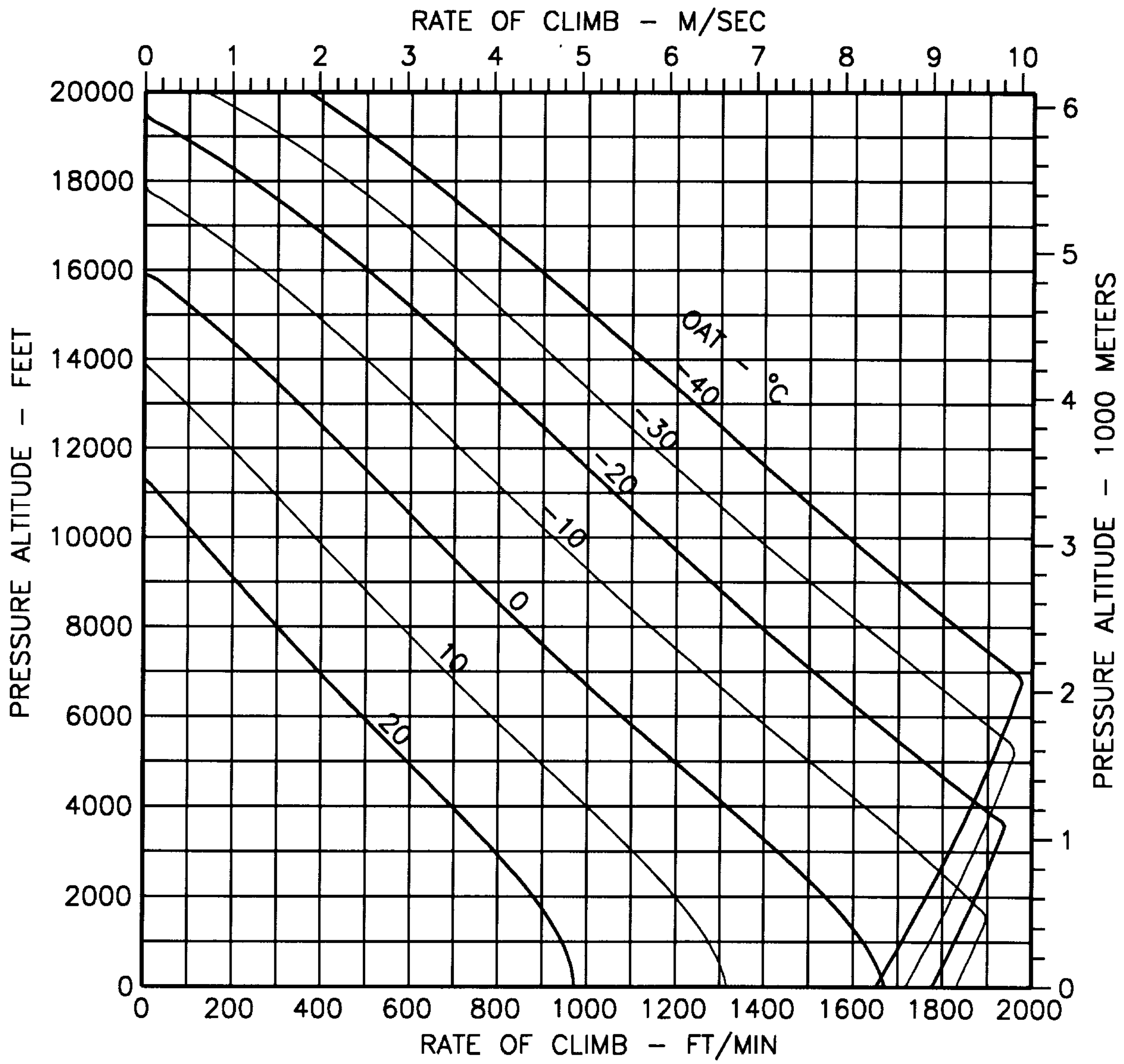


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 8 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN ABOVE 1000 FT H_P FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

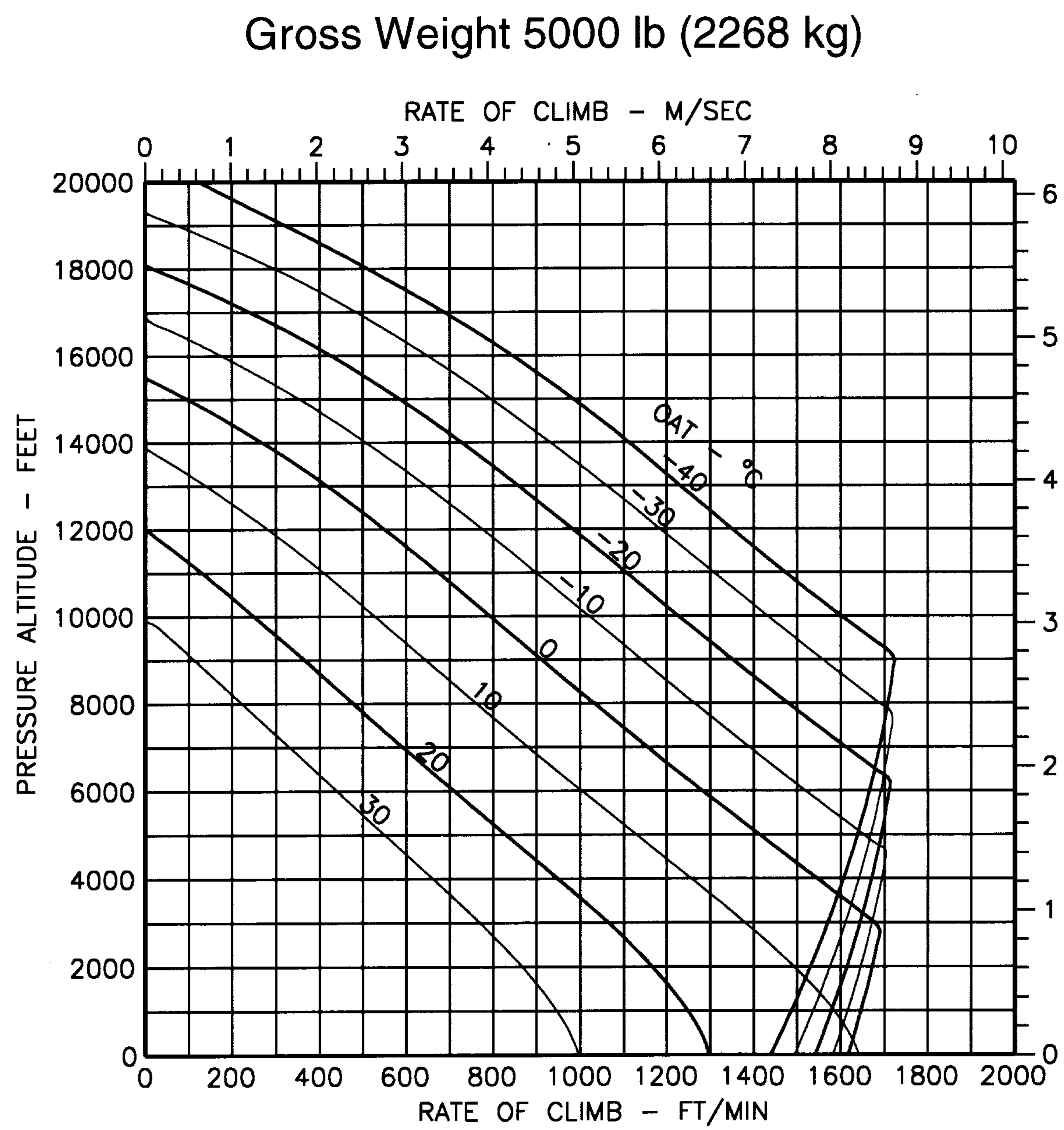


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 9 of 10)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR
PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 135 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5000 lb (2268 kg)

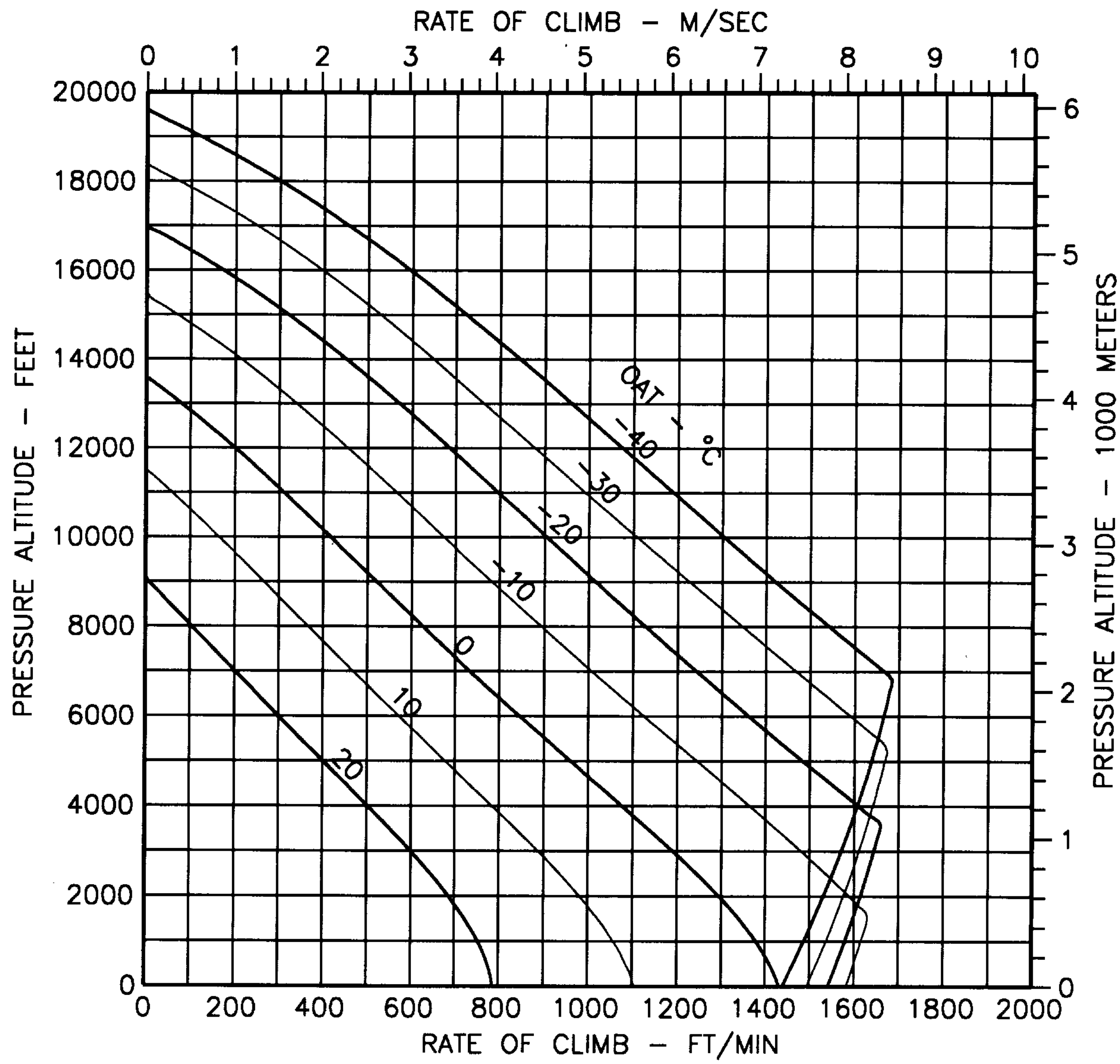


Figure 4-9. Rate of climb (maximum continuous power) (particle separator) (sheet 10 of 10)

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

CARGO HOOK

206-706-341

CERTIFIED
14 FEBRUARY 1996

This supplement shall be attached to Model 407 Flight Manual when CARGO HOOK kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, or other applicable supplements, consult basic Flight Manual.

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14 FEBRUARY 1996
REVISION 1 — 04 SEPTEMBER 1998

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CHIEF, FLIGHT TEST
FOR
DIRECTOR — AIRCRAFT CERTIFICATION BRANCH
DEPARTMENT OF TRANSPORT

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GENERAL INFORMATION

Installation of cargo hook (407-706-341) adds capability of transporting external cargo. Kit contains electrical and manual releases, both operated from the pilot seat. Cargo hook is located at FS 121.0 (3073 mm).

Cargo hook kit will permit operator to use helicopter for transportation of external cargo.

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Operation of helicopter with no load on external cargo suspension hook is authorized under standard airworthiness certificate without removing unit from helicopter.

With a load attached to suspension assembly, operations shall be conducted in accordance with appropriate operating rules for external loads.

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after cargo hook is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

CAUTION

LOADS THAT RESULT IN GROSS WEIGHTS ABOVE 5000 POUNDS (2268 KILOGRAMS) SHALL BE CARRIED ON CARGO HOOK AND SHALL BE JETTISONABLE.

Maximum gross weight of helicopter and external load operations is
6000 pounds (2724 kilograms)

Maximum cargo hook load is 2650 pounds (1202 kilograms).

Refer to BHT-407-FM-1 for Gross weight center of gravity limits chart for external cargo operations.

1-7. AIRSPEED

V_{NE} with external cargo load is 100 KIAS.

CAUTION

AIRSPEED WITH EXTERNAL CARGO IS LIMITED BY CONTROLLABILITY. CAUTION SHOULD BE EXERCISED WHEN CARRYING EXTERNAL CARGO, AS HANDLING CHARACTERISTICS MAY BE AFFECTED BY SIZE, WEIGHT, AND SHAPE OF CARGO LOAD.

Light weight, high drag loads require a swivel connector between cargo hook and sling to prevent unstable oscillations in flight above 20 KIAS.

1-20. INSTRUMENT MARKINGS AND PLACARDS

CARGO LOAD LIMIT 2650 POUNDS

Location: On cargo hook roller beam.

Section 2

NORMAL PROCEDURES

2-2. FLIGHT PLANNING

2-2-A. GROUND CREW INSTRUCTIONS

Instruct ground crewmember to discharge helicopter static electricity before attaching cargo by touching airframe with ground wire; or, if a metal sling is used, hookup ring can be struck against cargo hook. If contact has been lost after initial grounding, helicopter shall be electrically regrounded and, if possible, contact maintained until hookup is completed.

1. Cargo hook — Condition and security. Instruct ground personnel to check primary load ring and secondary load ring for condition and proper size (Table 2-1). Check for correct rigging (figure 2-1).

WARNING

USE OF INAPPROPRIATELY SIZED LOAD RINGS MAY RESULT IN LOAD HANG-UP WHEN LOAD RING IS TOO SMALL OR INADVERTENT LOAD RELEASE IF LOAD RING IS TOO LARGE.

2. Check that only one primary ring is captured in the load beam and only one secondary ring with correct cross-section dimension is captured in the primary ring. Additional rings, slings, or shackles shall be attached to the secondary load ring. See figure 2-1.

Table 2-1. RING SIZES - CARGO HOOK P/N 17149-6

PRIMARY RING INSIDE DIAMETER	PRIMARY RING CROSS SECTION	MAXIMUM CROSS SECTION OF SECONDARY RING
1.50 TO 1.68 in. (38.10 to 42.67 mm)	0.75 in. (19.05 mm)	0.438 in. (11.12 mm)

2-3. PREFLIGHT CHECK

2-3-A. EXTERIOR CHECK

Cargo suspension assembly — Condition and security.

Cargo sling — Condition, proper length.

2-4. INTERIOR AND PRESTART CHECK

2-4-A. INTERIOR CHECK

1. CARGO HOOK circuit breaker — in.
2. Cyclic CARGO RELEASE switch — Press and release; pull down on cargo hook; hook should open. Release cargo hook; hook should close and lock.

3. EMERG CARGO RELEASE PULL handle — Pull and hold; pull down on cargo hook; hook should open. Push handle in; hook should close and lock.

2-7. BEFORE TAKEOFF

CARGO HOOK circuit breaker — In.

EMERG CARGO RELEASE PULL handle — In.

2-8. TAKEOFF

1. Hover helicopter at sufficient height to allow ground crewmember to discharge static electricity and attach cargo sling to cargo hook.
2. Ascend vertically, directly over load, then slowly lift load from surface.
3. Pedals — Check for adequate directional control.
4. Hover power — Check TORQUE required to hover with external load.
5. Take off into wind, if possible, allowing adequate sling load clearance over obstacles.

2-9. IN-FLIGHT OPERATIONS

NOTE

Control movements should be made smoothly and kept to a minimum to prevent oscillation of sling load.

EMER CARGO RELEASE PULL handle will function regardless of CARGO RELEASE switch position.

1. AIRSPEED — Within limits for adequate controllability of helicopter load combination.
2. Flight path — As planned to avoid flight with external load over any person, vehicle, or structure.

2-10. DESCENT AND LANDING

1. Flight path and approach angle — As required for wind direction and obstacle clearance.
2. Execute approach to a hover with load clear of surface. When stabilized at a hover, descend slowly until load contacts surface. Maintain tension on sling.
3. Cyclic CARGO RELEASE switch — Press to release sling from hook.

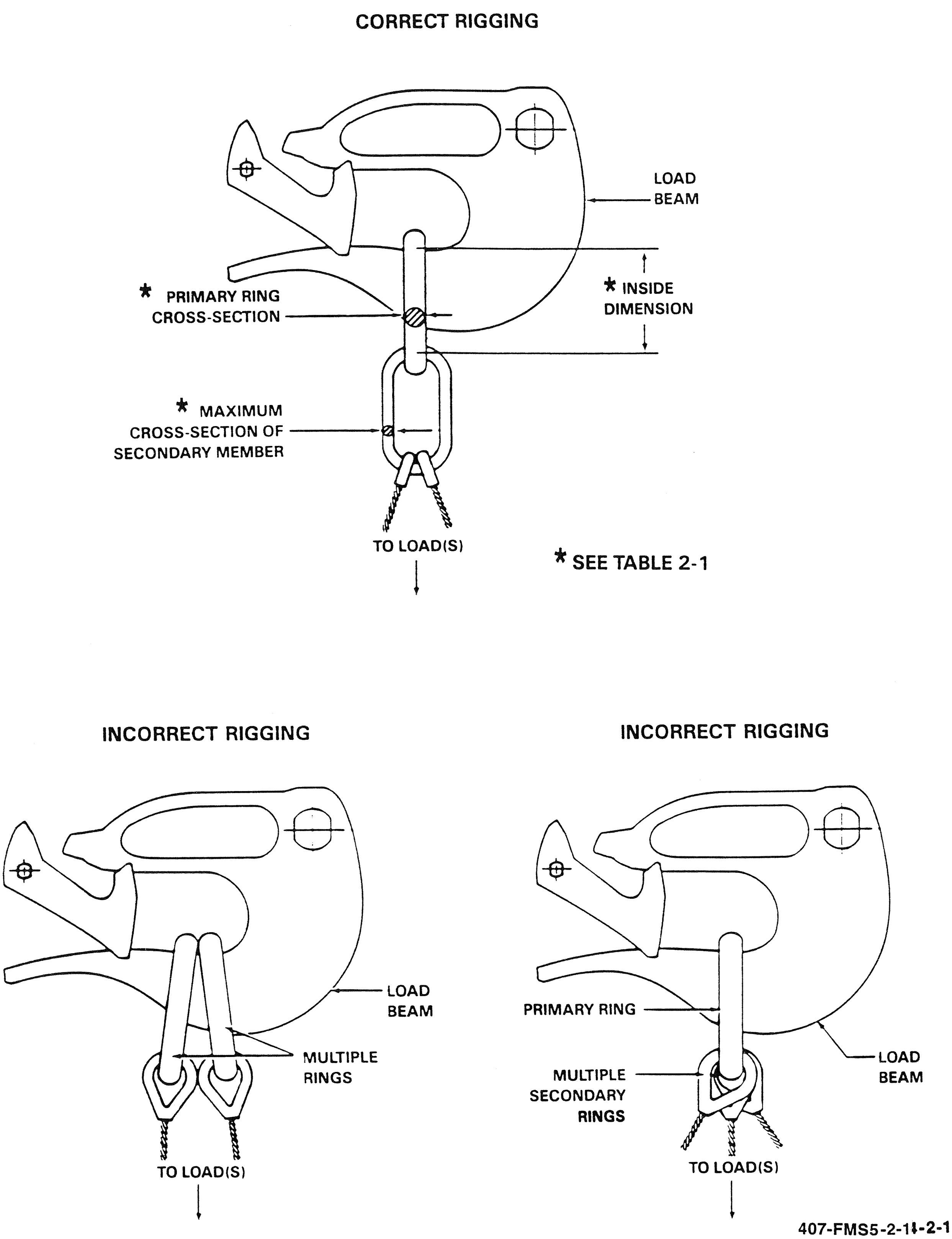

Figure 2-1. External load rigging

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-13. CARGO FAILS TO RELEASE ELECTRICALLY

WARNING

EMER CARGO RELEASE PULL handle will function regardless of CARGO RELEASE switch position.

In event cargo hook will not release sling when cyclic CARGO RELEASE switch is pressed, proceed as follows:

1. Maintain tension on sling.
2. Pull EMER CARGO RELEASE PULL handle to release load.

Section 4

PERFORMANCE

4-5. HOVER CEILING

Refer to BHT-407-FM-1 for out of ground effect hover performance.

There is no change from BHT-407-FM-1 performance with no load attached to cargo hook.

Performance may be affected by size and shape of external load.

Section 5

WEIGHT AND BALANCE

5-2. EMPTY WEIGHT CENTER OF GRAVITY

Load on hook is at FS 121.0 (3073 MM).

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT
AUXILIARY FUEL KIT

407-706-011

CERTIFIED
20 MARCH 1996

This supplement shall be attached to Model 407 Flight Manual when AUXILIARY FUEL KIT kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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for CHIEF, FLIGHT TEST
FOR
DIRECTOR — AIRWORTHINESS BRANCH
DEPARTMENT OF TRANSPORT

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Original ....0 .... 20 MAR 96

GENERAL INFORMATION

Auxiliary fuel kit (407-706-011) consists of fuel tank, tubing, electrical wiring, micro-switch and hardware for installation. Removable 19 U.S. gallons (71.9 liters) fuel tank is mounted in baggage compartment to aft bulkhead. Fuel transfers between main aft fuel cell and auxiliary fuel cell for filling and emptying by gravity.

Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight changes shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

Section 2

NORMAL PROCEDURES

2-2. FLIGHT PLANNING

With auxiliary fuel tank installed, full fuel indication is approximately 1005 lbs. (146.9 U.S. gallons/556 liters) of Jet A.

2-3. PREFLIGHT CHECK

Baggage compartment — Check auxiliary fuel tank security and condition.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

No change from basic manual.

Section 5

WEIGHT AND BALANCE

5-7. FUEL LOADING

Longitudinal center of gravity of fuel shifts as it is consumed (Figure 5-1). Extreme effects of fuel consumption on helicopter center of gravity for standard fuel system are as follows:

1. Critical fuel for computing most forward useful load is 74.5 U.S. gallons (282.0 liters).

2. Critical fuel for computing most aft useful load is 146.9 U.S. gallons (556 liters).

Fuel loading tables (figure 5-2) list usable fuel quantities, weight, and moments in both U.S. and metric units.

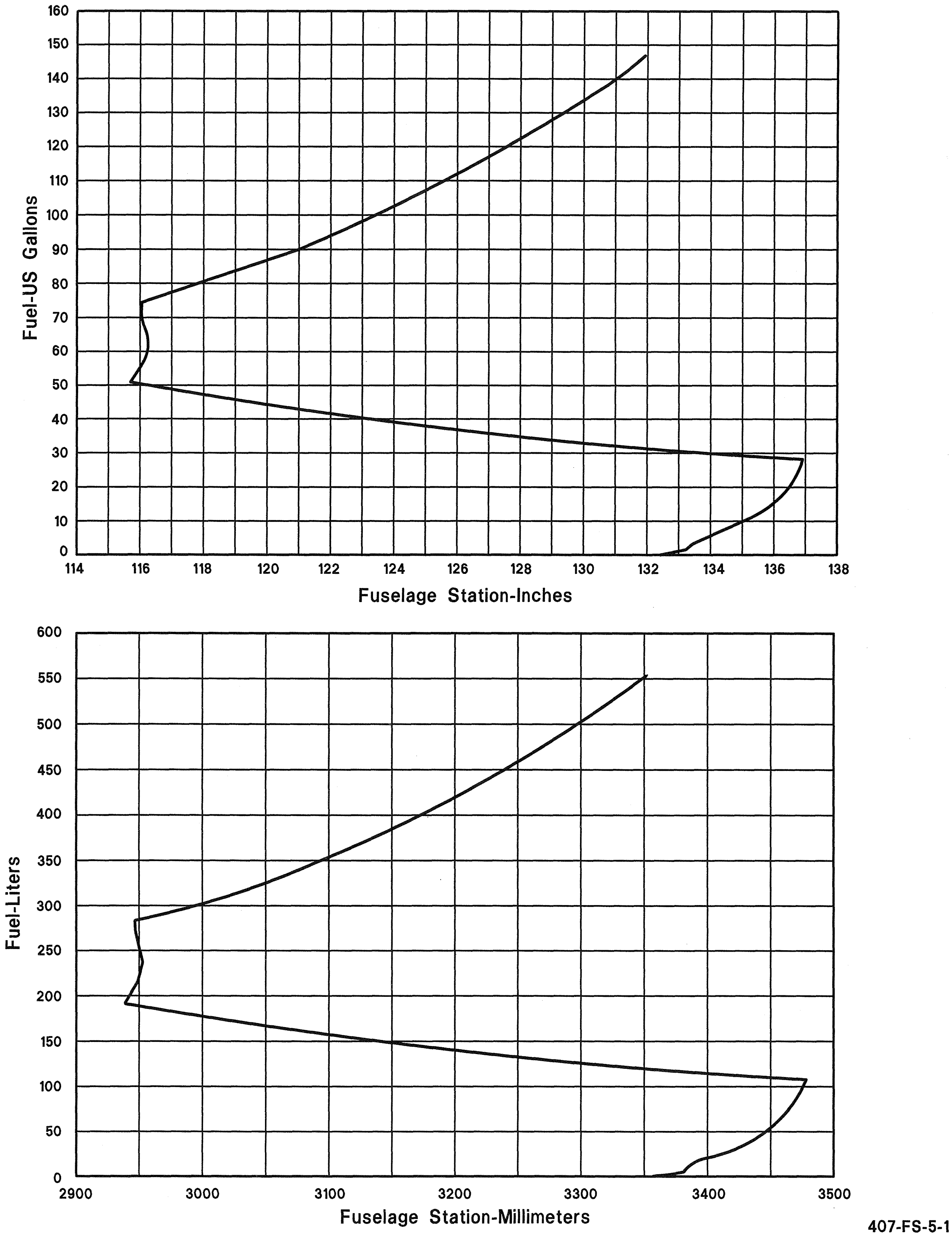

Figure 5-1. Fuel Center of Gravity - Auxiliary Fuel.

AUXILIARY FUEL LOADING (U.S.)

FUEL LOADING TABLE (U.S.)

QUANTITY (U.S. GAL)	JP-4 WEIGHT (LBS)	LONGITUDINAL C.G. (IN)	MOMENT (IN-LBS)	QUANTITY (U.S. GAL)	JP-5, JP-8 WEIGHT (LBS)	LONGITUDINAL C.G. (IN)	MOMENT (IN-LBS)
5	32.5	133.7	4345	5	34.0	133.7	4546
10	65.0	135.0	8,775	10	68.0	135.0	9,180
15	97.5	135.9	13,250	15	102.0	135.9	13,862
20	130.0	136.4	17,732	20	136.0	136.4	18,550
25	162.5	136.7	22,214	25	170.0	136.7	23,239
28.4	184.6	137.0	25,290	28.4	193.1	137.0	26,455
30	195.0	134.3	26,189	30	204.0	134.3	27,397
35	227.5	127.8	29,075	35	238.0	127.8	30,416
40	260.0	122.9	31,954	40	272.0	122.9	33,429
45	292.5	119.1	34,837	45	306.0	119.1	36,445
50	325.0	116.0	37,700	50	340.0	116.0	39,440
✱ 50.6	328.9	115.7	38,054	✱ 50.6	344.1	115.7	39,812
55	357.5	116.1	41,506	55	374.0	116.1	43,421
60	390.0	116.2	45,318	60	408.0	116.2	47,410
65	422.5	116.2	49,095	65	442.0	116.2	51,360
70	455.0	116.1	52,826	70	476.0	116.1	55,264
□ 74.5	484.3	116.1	56,227	□ 74.5	506.6	116.1	58,816
75	487.5	116.3	56,696	75	510.0	116.3	59,313
80	520.0	118.0	61,360	80	544.0	118.0	64,192
85	552.5	119.6	66,079	85	578.0	119.6	69,129
90	585.0	121.0	70,785	90	612.0	121.0	74,052
95	617.5	122.3	75,520	95	646.0	122.3	79,006
100	650.0	123.4	80,210	100	680.0	123.4	83,912
105	682.5	124.5	84,971	105	714.0	124.5	88,893
110	715.0	125.5	89,733	110	748.0	125.5	93,874
115	747.5	126.5	94,559	115	782.0	126.5	98,923
120	780.0	127.5	99,450	120	816.0	127.5	104,040
125	812.5	128.5	104,406	125	850.0	128.5	109,225
130	845.0	129.4	109,343	130	884.0	129.4	114,390
135	877.5	130.2	114,251	135	918.0	130.2	119,524
140	910.0	131.0	119,210	140	952.0	131.0	124,712
145	942.5	131.7	124,127	145	986.0	131.7	129,856
△ 146.9	954.9	132.0	126,047	△ 146.9	998.9	132.0	131,855

✱ MOST FORWARD FUEL C.G.

□ CRITICAL FUEL FOR MOST FORWARD C.G. CONDITION

△ FULL FUEL— CRITICAL FUEL FOR MOST AFT C.G. CONDITION

Figure 5-2. Auxiliary Fuel Loading - Sheet 1 of 2

AUXILIARY FUEL LOADING (METRIC)

FUEL LOADING TABLE (METRIC)							
QUANTITY (LITERS)	JP-4 WEIGHT (kg)	LONGITUDINAL C.G. (mm)	MOMENT (kg-mm/100)	QUANTITY (LITERS)	JP-5, JP-8 WEIGHT (kg)	LONGITUDINAL C.G. (mm)	MOMENT (kg-mm/100)
15	11.7	3389	397	15	12.2	3389	413
30	23.4	3415	799	30	24.4	3415	833
45	35.0	3439	1204	45	36.7	3439	1262
60	46.7	3455	1613	60	48.9	3455	1689
75	58.4	3465	2024	75	61.1	3465	2117
90	70.1	3472	2434	90	73.3	3472	2545
105	81.8	3478	2845	105	85.6	3478	2977
107.5	83.7	3479	2912	107.5	87.6	3479	3048
120	93.5	3352	3134	120	97.8	3352	3278
135	105.1	3228	3393	135	110.0	3228	3551
150	116.8	3129	3655	150	122.2	3129	3824
165	128.5	3049	3918	165	134.4	3049	4098
180	140.2	2982	4181	180	146.7	2982	4375
✱191.6	149.2	2938	4383	✱191.6	156.1	2938	4586
195	151.9	2940	4466	195	158.9	2940	4672
210	163.6	2949	4825	210	171.1	2949	5046
225	175.2	2951	5170	225	183.3	2951	5409
240	186.9	2953	5519	240	195.6	2953	5776
255	198.6	2950	5859	255	207.8	2950	6130
270	210.3	2948	6200	270	220.0	2948	6486
□ 282.0	219.7	2949	6479	□ 282.0	229.8	2949	6777
285	222.0	2956	6562	285	232.2	2956	6864
300	233.7	2991	6990	300	244.5	2991	7313
315	245.3	3024	7418	315	256.7	3024	7763
330	257.0	3054	7849	330	268.9	3054	8212
345	268.7	3082	8281	345	281.1	3082	8664
360	280.4	3107	8712	360	293.3	3107	9113
375	292.1	3130	9143	375	305.6	3130	9565
390	303.8	3152	9576	390	317.8	3152	10017
405	315.4	3172	10004	405	330.0	3172	10468
420	327.1	3192	10441	420	342.2	3192	10923
435	338.8	3213	10886	435	354.5	3213	11390
450	350.5	3234	11335	450	366.7	3234	11859
465	362.2	3253	11782	465	378.9	3253	12326
480	373.9	3272	12234	480	391.1	3272	12797
495	385.5	3290	12683	495	403.3	3290	13269
510	397.2	3306	13131	510	415.6	3306	13740
525	408.9	3322	13584	525	427.8	3322	14212
540	420.6	3337	14035	540	440.0	3337	14683
555	432.3	3351	14486	555	452.2	3351	15153
△556.1	433.1	3352	14518	△556.1	453.1	3352	15188

✱ MOST FORWARD FUEL C.G.

□ CRITICAL FUEL FOR MOST FORWARD C.G. CONDITION

△ FULL FUEL— CRITICAL FUEL FOR MOST AFT C.G. CONDITION

Figure 5-2. Auxiliary Fuel Loading - Sheet 2 of 2

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

LITTER(S)

407-706-631
OR
407-799-100
AND
407-799-001

CERTIFIED
14 FEBRUARY 1996

This supplement shall be attached to Model 407 Flight Manual when LITTER(S) kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

Litter kit (407-706-631) provides helicopter with capability to carry one patient on litter with room and access for medical attendants. The principal configuration consists of two parts, basic provisions kit and litter assembly kit. Basic provisions contain structural brackets and all necessary hardware for supporting a litter. Litter assembly contains a folding aluminum litter with patient restraints. In addition, an optional injured skier provisions kit is available. In this configuration, horizontal support bar located behind copilot seat is moveable and may be secured with quick release pins in either normal or an upper location. This feature provides an additional 6 inches (15.24 cm) of clearance above patient when support bar is installed in upper position. Basic litter provisions with litter assembly adds 27 pounds (12.3 kilograms) to empty weight of helicopter. Injured skier provisions kit adds an additional 1.5 pounds (0.7 kilograms) to empty weight.

Customized litter kit (407-799-100) is same as basic litter kit installation with injured skier provisions, except that support bar is bolted in place which may be desired for a permanent EMS configured helicopter.

Dual Litter Kit (407-799-001) provides helicopter with capability to carry two litter patients. This kit contains structural supports and all necessary hardware to install a second litter above standard litter. Basic litter kit provisions (407-706-631) must be installed in conjunction with this kit. If helicopter is equipped with injured skier provisions kit, dual litter kit allows upper litter patient to be placed in elevated foot position.

Section 1

LIMITATIONS

1-5. CONFIGURATION

Copilot cyclic and collective controls shall be removed and stowed when litter is installed.

Patient(s) shall be restrained by litter straps.

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

1-20. INSTRUMENT MARKINGS AND PLACARDS

This placard applicable with basic Litter Kit installed.

STRUCTURAL SUPPORT MUST BE INSTALLED IN THE UPPER POSITION OR LOWER POSITION FOR FLIGHT.

Location: On copilot seat back support assembly and on forward side of vertical tunnel.

This placard applicable only with Auxiliary Litter Kit with Injured Skier Provisions installed.

CO-PILOT SEAT SHALL NOT BE OCCUPIED UNLESS PROTECTIVE COVERS ARE INSTALLED ON UPPER LITTER SUPPORT BRACKETS

TYPICAL

Location: On forward side of interior trim panel centered on door post between upper and lower litter support brackets.

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT
CARGO TIE-DOWN PROVISIONS KIT

407-705-201

CERTIFIED
1 APRIL 1996

This supplement shall be attached to Model 407 Flight Manual when CARGO TIE-DOWN PROVISIONS KIT kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

Cargo tie-down provisions kit (407-705-201) provides forward bulkhead tie-down provisions using four (4) shackle/eyebolt assemblies and floor mounted provisions using four (4) anchor plates. These provisions allow cargo to be secured with a tie-down assembly.

Section 1

LIMITATIONS

1-20. INSTRUMENT MARKINGS AND PLACARDS

CAUTION

WHEN AFT FACING SEAT AREA IS USED FOR CARGO:
-DO NOT REMOVE SEAT CUSHIONS.
-MAXIMUM ALLOWABLE CARGO WEIGHT - 100 LBS.
-CARGO MUST BE SECURED TO PREVENT IN FLIGHT MOVEMENT.
-CARGO WEIGHT TO BE UNIFORMLY DISTRIBUTED.

Location: Each side of center post.

NO CARGO ABOVE THIS LINE

W.L. 55

Location: Each side of center post.

Bell MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT
KLN 89B GPS NAVIGATOR

407-705-001

CERTIFIED
14 FEBRUARY 1996

This supplement shall be attached to Model 407 Flight Manual when KLN 89B GPS NAVIGATOR kit has been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

The KLN 89B GPS Navigator is a navigator's aid for use in ICAO defined worldwide geographic regions as defined in the King KLN Pilots Guide.

The system consists of a combined GPS receiver and navigational computer, an antenna, and associated wiring. Visual Navigation data is presented on the GPS unit. If GPS is coupled to the KCS 55A gyrocompass with KI 525A HSI Kit 407-705-002 the system will additionally include a NAV/GPS Switch/Annunicator.

Visual navigation data, when selected, is presented on the pilot HSI in the form of L/R steering, bearing-to-waypoint and TO/FROM indications.

Section 1

LIMITATIONS

1-1. INTRODUCTION

A KLN 89B Pilots Guide (King p/n 006-08786-0000, Operational Revision Status 01) shall be accessible by the flight crew at all times during flight.

The GPS navigator shall be operated in accordance with the manufactures instruction with the following exceptions:

1. There is no air data or fuel management data available in this installation.
2. It is the responsibility of the pilot to verify that any navigation data used is correct.

1-20. INSTRUMENT MARKINGS AND PLACARDS

GPS LIMITED TO VFR USE ONLY

Section 2

NORMAL PROCEDURES

2-3. PREFLIGHT CHECK

2-3-A. CABIN TOP

GPS antenna — Condition and security.

2-4. INTERIOR AND PRESTART CHECK

2-4-A. PRESTART CHECK

GPS and CAUTION LIGHTS circuit breakers — In.

GPU unit — Verify off.

2-7. BEFORE TAKEOFF

2-7-A. GPS

GPS unit — Turn on, verify operational revision status on initial page is identical to that of available KLN 89B Pilot's Guide.

Pilots HSI course pointer (if installed) — Align to desired course shown on GPS display.

NAV/GPS switch-annunciator (if installed) — Press, verify GPS segment illuminated and NAV segment extinguished.

Pilot HSI deviation bar (if installed) — Verify centered and TO indication displayed.

NOTE

For additional normal procedures, except air data and fuel management data, refer to KLN 89B Pilot's Guide.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-1. INTRODUCTION

NOTE

If GPS navigation system becomes inoperative, continue basic VFR navigation procedures.

MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

FIRE DETECTION SYSTEM

407-799-004
OR
407-706-015
OR
407-706-025

CERTIFIED
2 MAY 1996

This supplement shall be attached to Model 407 Flight Manual when FIRE DETECTION SYSTEM has been installed.

Information contained herein supplements information in the basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, refer to the basic Flight Manual.

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GENERAL INFORMATION

Bell Fire Detection System (407-799-004, 407-706-015 or 407-706-025) will illuminate ENGINE FIRE warning light on instrument panel if an excessive temperature or fire develops in engine compartment.

Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after system is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits.

Section 2

NORMAL PROCEDURES

2-4. INTERIOR AND PRESTART CHECK

FIRE DET TEST switch — Press, ENGINE FIRE light illuminates, release, ENGINE FIRE light extinguishes.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

Table 3-1.

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
ENGINE FIRE	Excessive temperature condition in engine compartment	Immediately enter autorotation. Throttle — Close. FUEL VALVE switch — OFF. If time permits, FUEL BOOST/XFR circuit breaker switches — OFF Execute a normal autorotation and landing BATT switch — OFF.

NOTE

Do not restart engine until cause of fire has been determined and corrected.

Bell MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

AUXILIARY VERTICAL FIN STROBE LIGHTS

407-899-023

CERTIFIED
10 MAY 1996

This supplement shall be attached to Model 407 Flight Manual when AUXILIARY VERTICAL FIN STROBE LIGHTS have been installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

Auxiliary vertical fin strobe lights installation (407-899-023) consist of power supply unit and two strobe lights installed on left and right auxiliary vertical fins.

Section 1

LIMITATIONS

1-5. CONFIGURATION

1-5-A. OPTIONAL EQUIPMENT

Auxiliary vertical fin strobe lights are not approved for night operations.

NOTE

High intensity strobe lights should not be used inflight when there is an adverse reflection from clouds or other weather phenomena.

1-20. INSTRUMENT MARKINGS AND PLACARDS

NIGHT OPERATION OF AUXILIARY VERTICAL FIN STROBE LIGHTS IS PROHIBITED

(Located on inst. panel - typical)

Section 2

NORMAL PROCEDURES

2-1. INTRODUCTION

NOTE

Both auxiliary vertical fin strobe lights are controlled by AUX VERT FIN LT on/off CCT BKR/switch located on overhead console.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-7. ELECTRICAL SYSTEM

NOTE

For emergency or malfunction conditions, auxiliary vertical fin strobe lights may be disabled by selecting OFF at AUX VERT FIN LT CCT BKR/switch. If auxiliary vertical fin strobe lights become inoperative, continue basic flight procedures.

BELL MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

RYAN TRAFFIC COLLISION AVOIDANCE DEVICE

407-899-022

CERTIFIED
15 MAY 1996

This supplement shall be attached to Model 407 Flight Manual when RYAN TRAFFIC COLLISION AVOIDANCE DEVICE ATS9000 has been installed in accordance with 407-899-022.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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GENERAL INFORMATION

RYAN ATS9000 Traffic and Collision Avoidance Device (TCAD) (407-899-022) consists of display unit, processor unit, transponder coupler, dual antenna module, two antennas, wiring and hardware necessary for installation. A digital display is mounted in instrument panel and contains all controls required to operate TCAD. Processor unit, transponder coupler and dual antenna module are at various locations throughout helicopter, depending on configuration. Antenna locations are on cabin top and underside of helicopter.

RYAN TCAD is an on-board air traffic display used to identify potential collision threats. TCAD computes relative altitude and distance of threats using transponder replies from nearby Mode C equipped aircraft. Aircraft with non-Mode C transponders can provide distance information. TCAD will not detect aircraft without operating transponders. Within certain limits system creates a shield of airspace around helicopter, whereby detected traffic cannot penetrate without generating an alert. Shield size is selectable for various phases of flight and is adjustable by pilot.

Display is a bright, alphanumeric character. Distance is displayed in nautical miles (NM) and relative altitude is displayed in 100 foot increments. TCAD is capable of displaying multiple threats.

For familiarization of all ATS9000 TCAD features and operation, refer to Pilots Handbook, P/N 32-2102 Revision 1 or later.

Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-1.

Section 2

NORMAL PROCEDURES

2-4. INTERIOR AND PRESTART CHECK

MUTE/PWR button — Push (on).

2-11. ENGINE SHUTDOWN

MUTE/PWR button — Pull (off)

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-7. ELECTRICAL SYSTEM

3-7-A. TCAD MALFUNCTION

TCAD malfunction is annunciated by words Signal Fail, SgnlFail, Link Failure or Interface Fail displayed on TCAD display.

1. MUTE/PWR button — Pull (off) and continue flight.

Table 3-1.

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
TRAFFIC (advisory)	Proximate traffic detected.	Locate intruder aircraft using see and avoid concept.

NOTE

TCAD is advisory only. Operations shall be conducted in accordance with operational regulations in effect at helicopter location.

Section 4

PERFORMANCE

No change from basic manual.

Section 5

WEIGHT AND BALANCE

No change from basic manual.

Section 1

SYSTEMS DESCRIPTION

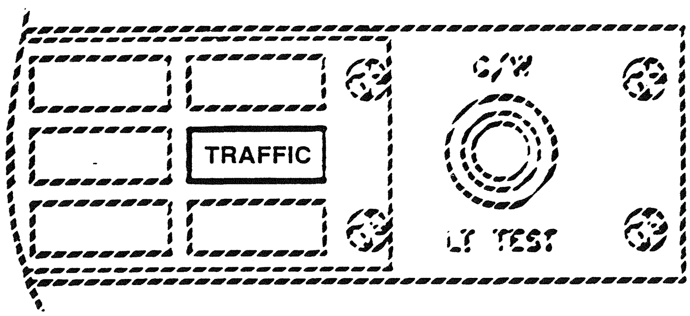

Figure 1-1. Caution and waring panel

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

QUIET CRUISE MODE

407-706-016

CERTIFIED
8 MAY 1998

This supplement shall be attached to Model 407 Flight Manual when QUIET CRUISE MODE kit is installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, or other applicable supplements, consult basic Flight Manual.

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GENERAL INFORMATION

Installation of Quiet Cruise Mode kit (407-706-016) permits flight operations at 92% NR when above 50 KIAS and 200 feet AGL. Flyover noise level is reduced by 3.8 dBA SEL when in Quiet Cruise Mode. Kit consists of electrical selector switch on collective, annunciator on instrument panel and additional markings on dual tachometer.

Section 1

LIMITATIONS

1-3. TYPES OF OPERATION

Quiet cruise mode is approved for VFR operations only.

1-5. CONFIGURATION

1-5-A. REQUIRED EQUIPMENT

FADEC system software 5.201 or higher is required for Quiet Cruise Mode operations.

1-5-B. OPTIONAL EQUIPMENT

Helicopters S/N 53000 – 53074 shall be in compliance with Technical Bulletin 407-96-2 (Increase in V_{NE}).

1-5-D. CARGO HOOK

Cargo hook operations while in Quiet Cruise Mode is not approved.

1-6. WEIGHT AND CENTER OF GRAVITY

Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty CG to within allowable limits. Refer to Center of gravity vs weight empty chart in BHT-407-MM-2.

1-6-A. WEIGHT

Maximum GW for Quiet Cruise Mode operation is 5000 pounds (2268 kilograms).

1-6-B. CENTER OF GRAVITY — QUIET CRUISE MODE OPERATION

For longitudinal CG limits refer to Gross weight longitudinal center of gravity limits chart (Figure 1-1).

For lateral CG limits refer to Gross weight lateral center of gravity limits chart (Figure 1-2).

1-7. AIRSPEED

1-7-A. QUIET CRUISE MODE

NOTE

Refer to Section 4, HEIGHT – VELOCITY ENVELOPE.

Minimum airspeed is 50 KIAS.

V_{NE} is 100 KIAS.

1-8. ALTITUDE

NOTE

Refer to Section 4, HEIGHT – VELOCITY ENVELOPE.

Minimum altitude is approximately 200 feet AGL.

Maximum altitude is 6,000 feet H_D.

1-13. POWER PLANT

1-13-B. POWER TURBINE RPM (NP)

1-13-B-1. QUIET CRUISE MODE

Minimum	91.5%
Continuous operation	91.5 to 92.5%
Maximum continuous	92.5%

1-13-D. ENGINE TORQUE

Engine torque is restricted to maximum continuous power (93.5%) while in Quiet Cruise Mode.

1-15. ROTOR

1-15-A. ROTOR RPM – POWER ON

1-15-A-1. QUIET CRUISE MODE

Continuous operation	91.5 to 92.5%
Maximum continuous	92.5%

1-20. INSTRUMENT MARKINGS AND PLACARDS

Refer to Figure 1-3 for Placards and decals.

Refer to Figure 1-4 for Instrument markings.

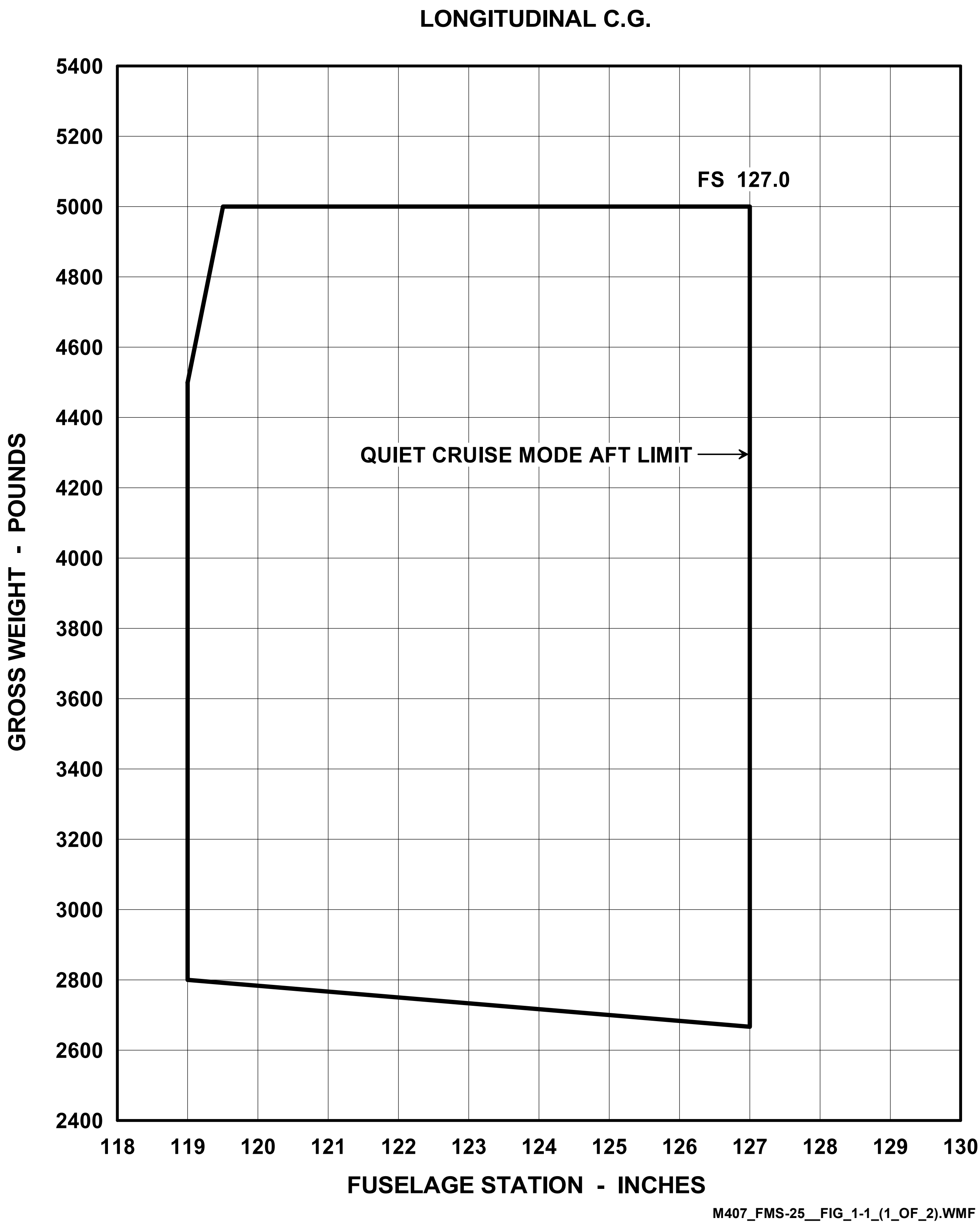


Figure 1-1. Gross weight longitudinal center of gravity limits (Sheet 1 of 2)

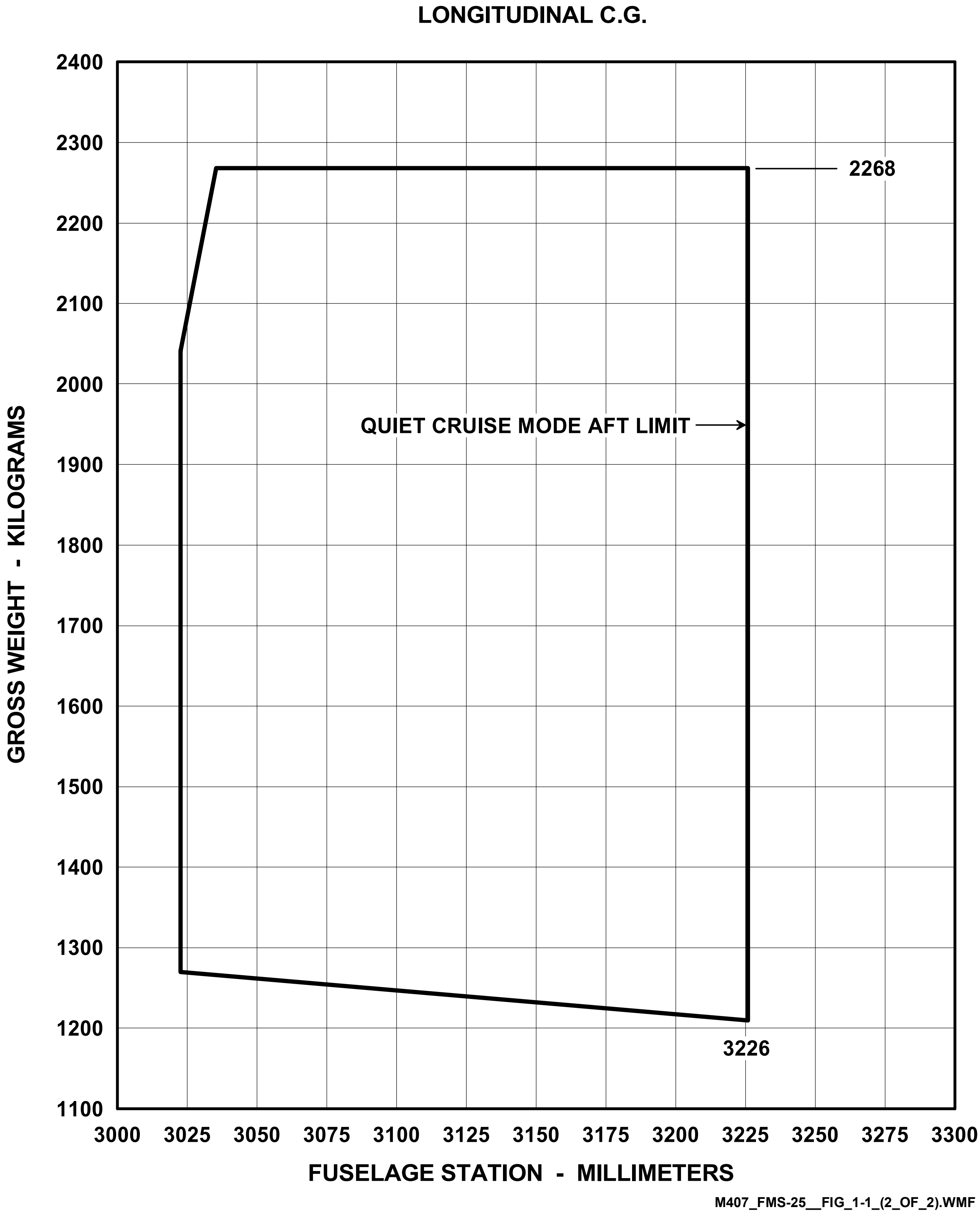


Figure 1-1. Gross weight longitudinal center of gravity limits (Sheet 2 of 2)

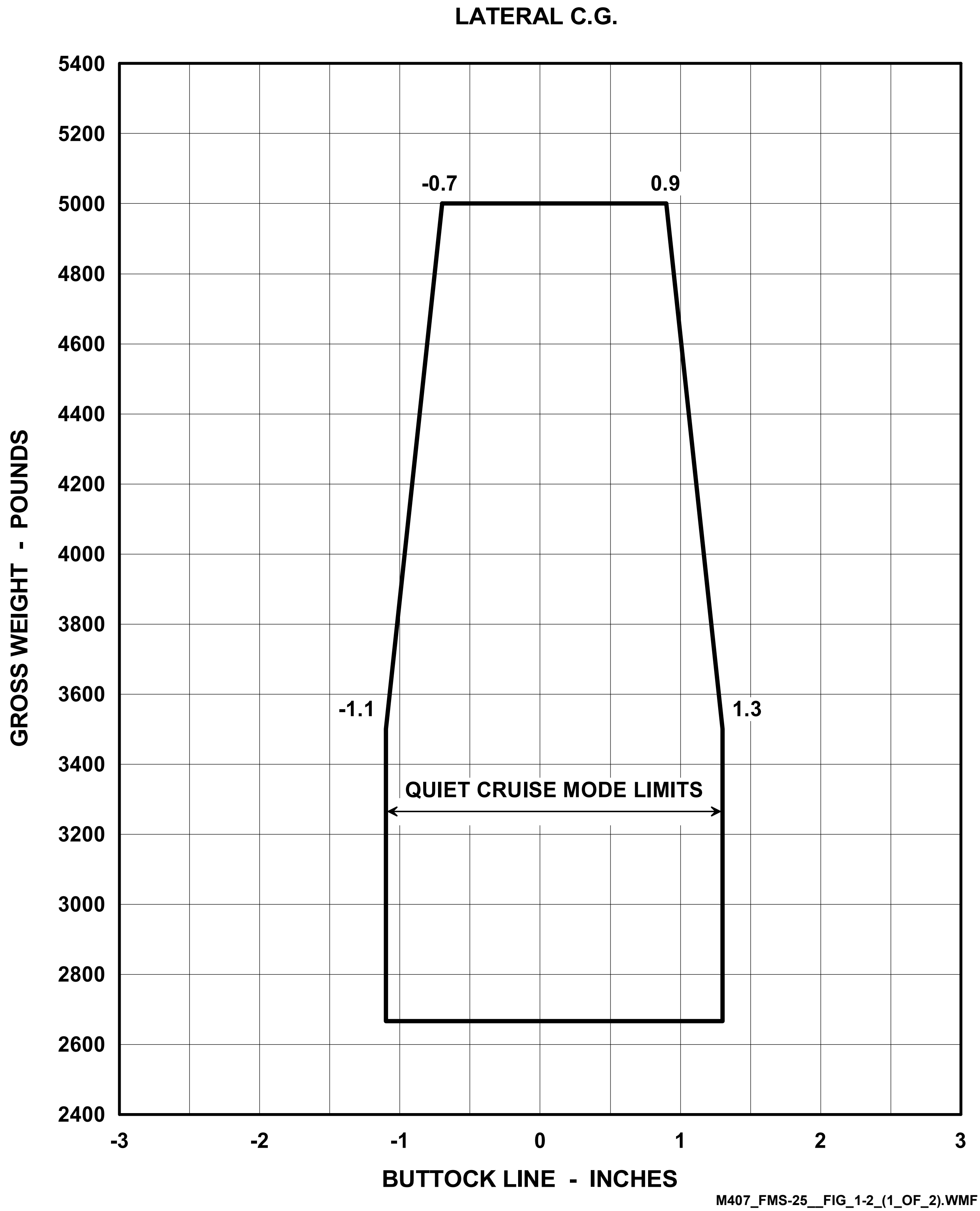


Figure 1-2. Gross weight lateral center of gravity limits (Sheet 1 of 2)

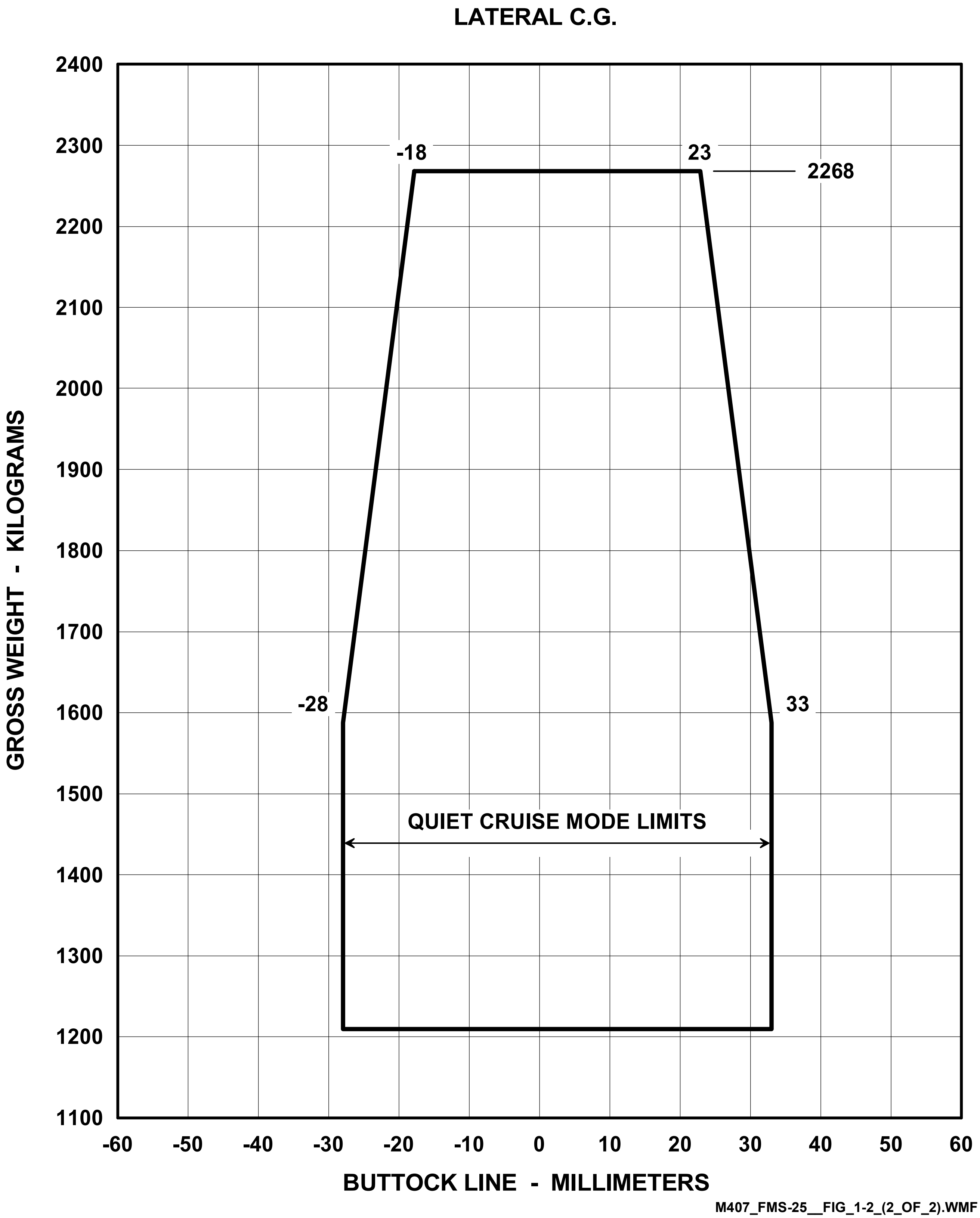


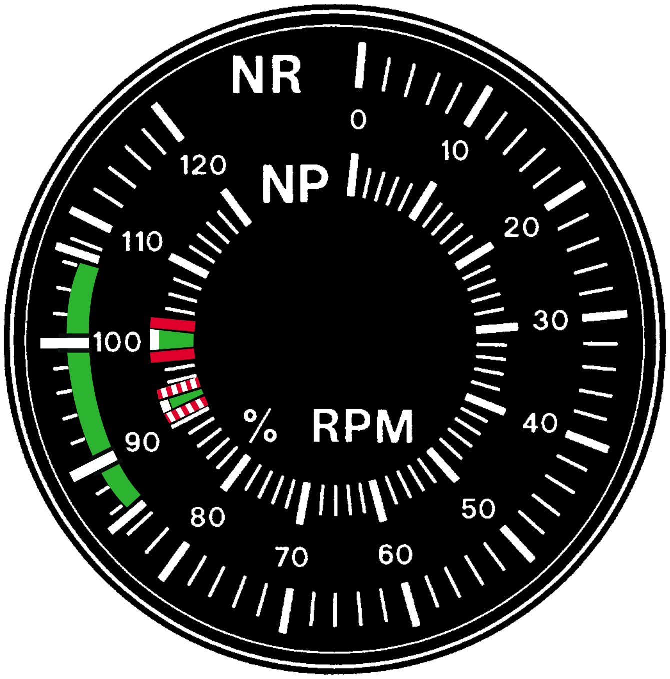
Figure 1-2. Gross weight lateral center of gravity limits (Sheet 2 of 2)

407 AIRSPEED LIMITATIONS - KIAS											
OAT °C	PRESSURE ALTITUDE FT x 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137										
45	139	132	125								
40	140	133	126	119							
35	140	135	128	120	113						
30	140	137	129	122	115	108					
25	140	138	131	124	116	109	102	95			
20	140	140	133	125	118	111	103	96	89		
0	140	140	140	132	125	117	110	103	95	88	
-25	140	140	140	135	130	125	119	111	104	97	89
-40	137	133	128	123	118	114	110	105	101	97	93
MAXIMUM AUTOROTATION VNE 100 KIAS											
QUIET MODE VNE 100 KIAS											
MAXIMUM QUIET MODE ALTITUDE IS 6000 FT HD											

Airspeed limits shown are valid only for corresponding altitudes and temperatures. Hatched areas indicate conditions which exceed approved temperature or density altitude limitations.

407FS25-1-3

Figure 1-3. Placards and decals (typical)



NP (POWER TURBINE RPM)

Quiet Cruise Mode

91.5%	Minimum
91.5 to 92.5%	Continuous operation
92.5%	Maximum continuous

Normal Operations

99%	Minimum
99 to 100%	Continuous operation
100%	Maximum continuous

NR (ROTOR RPM)

85%	Minimum (power off)
85 to 107%	Continuous operation (power off)
107%	Maximum (power off)

407FS25-1-4

Figure 1-4. Instrument markings

Section 2

NORMAL PROCEDURES

2-4. INTERIOR AND PRESTART CHECK

QUIET NORMAL mode switch — NORMAL.

QUIET and ON annunciators illuminate and extinguish with FADEC lights.

2-6. SYSTEMS CHECK

2-6-E. QUIET CRUISE MODE CHECK

NOTE

If QUIET NORMAL mode switch is cycled at less than 92% NR, increase throttle to 100% NR to reset QUIET, ON annunciator.

1. NR — 100% RPM.
2. QUIET NORMAL mode switch — QUIET.
3. QUIET and ON annunciators — Illuminated.
4. NR — 92% RPM.
5. Throttle — Retard below 88% NR. Confirm RPM warning illuminates with audio.
6. Throttle — FLY detent position.
7. QUIET NORMAL mode switch — NORMAL.
8. NR — 100% RPM.
9. QUIET and ON annunciators — Extinguished.

2-9. IN-FLIGHT OPERATIONS

2-9-A. IN QUIET CRUISE MODE

Flight at altitudes above 200 AGL and at airspeeds above 50 KIAS:

QUIET NORMAL mode switch — QUIET.

QUIET and ON annunciator — Illuminated.

NR — 92%RPM.

2-10. DESCENT AND LANDING

2-10-B. IN QUIET CRUISE MODE

Prior to descending below 200 AGL or 50 KIAS:

QUIET NORMAL mode switch — NORMAL. Monitor engine parameters.

NR — 100% RPM

QUIET and ON annunciators — Extinguished.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

3-14. QUIET CRUISE MODE OPERATION

NOTE

In Quiet Cruise Mode, low rotor audio and RPM caution light activated at 88% NR.

If Quiet Cruise Mode fails engaged, plan landing into wind. Transient torque excursions up to 100% during landing is permitted.

NOTE

Landings into winds up to 35 knots from azimuths of ± 45 degrees off nose of helicopter have been demonstrated.

Use of FADEC MAN mode will immediately deselect Quiet Cruise Mode and reset low rotor audio and RPM light activation point to 95% NR. To insure smooth transition to FADEC MAN mode, match throttle position to NG indication.

If either QUIET or ON segment is not illuminated, return QUIET MODE switch to NORMAL position.

Table 3-1. Warning (red) lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
Warning (red) lights		
RPM(with low RPM audio)	NR below 88%.	Reduce collective and ensure throttle is in FLY detent position. Light will extinguish and audio will cease when NR increases above 88%.
	NR above 88%, QUIET light not illuminated.	Return to NORMAL mode.

Table 3-2. Caution (amber) and advisory (white/green) lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
HYDRAULIC SYSTEM	Hydraulic pressure below limit.	Exit Quiet Cruise Mode, returning to 100% NR. Verify HYD SYS switch position. Accomplish hydraulic system failure procedure.

Section 4

PERFORMANCE

4-4. HEIGHT – VELOCITY ENVELOPE

The Height-velocity diagram (Figure 4-1) defines conditions from which a safe landing can be made on a smooth, level, firm surface, following an engine failure. Limitations respecting minimum airspeed and minimum height above ground for Quiet Cruise Mode operation are marked on the Height-velocity diagram for clarity. The Height-velocity diagram is valid only when helicopter gross weight does not exceed limits of the Altitude versus gross weight for height-velocity diagram (Figure 4-2)

CAUTION

IF ENGINE FAILURE OCCURS DURING FLIGHT CONDITIONS WITHIN HEIGHT-VELOCITY DIAGRAM “AVOID AREA”, SAFE LANDING MAY NOT BE POSSIBLE.

4-7. CLIMB AND DESCENT

4-7-A. CLIMB

Reduce rate of climb data 100 feet per minute when operating in Quiet Cruise Mode.

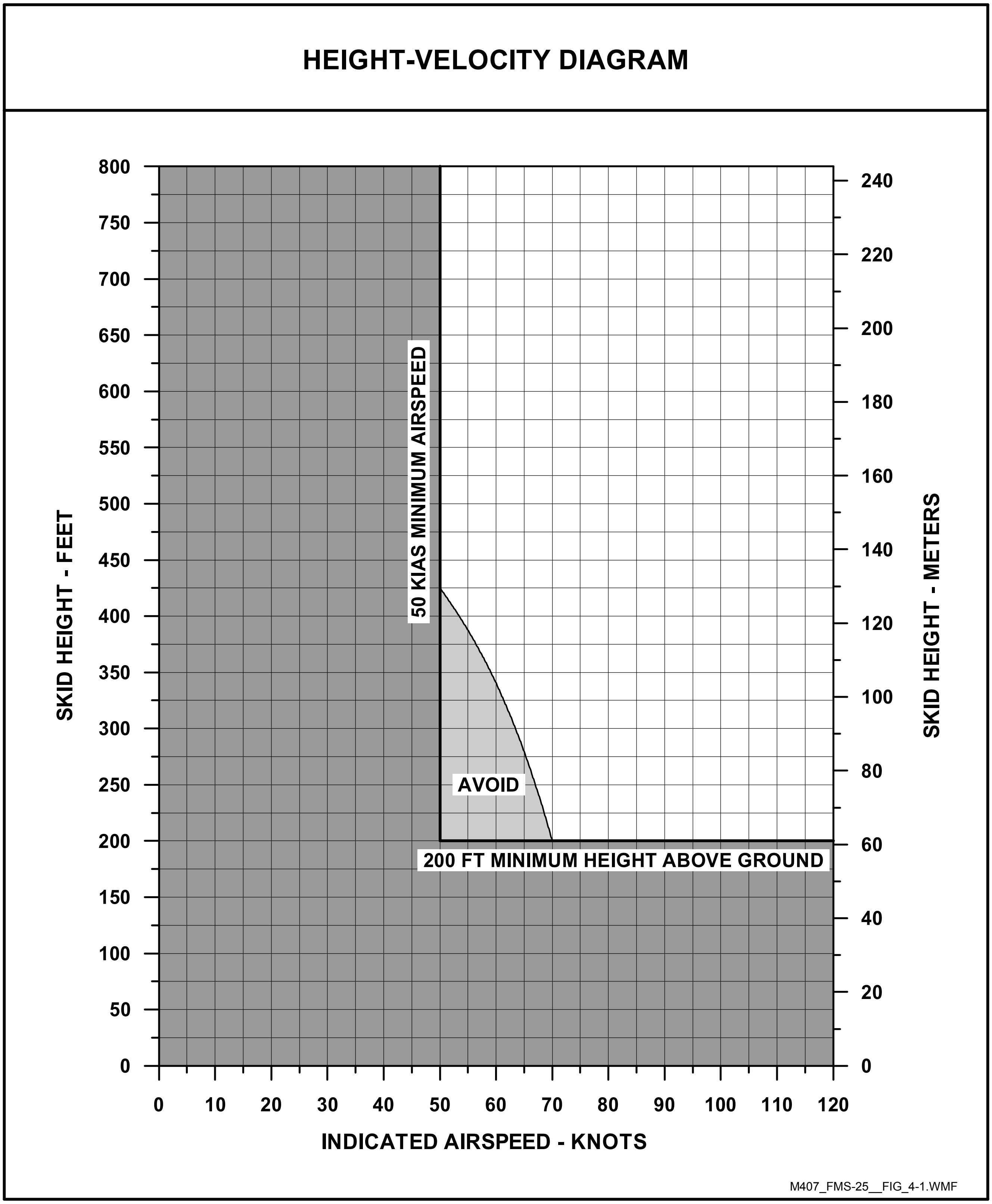


Figure 4-1. Height – velocity diagram

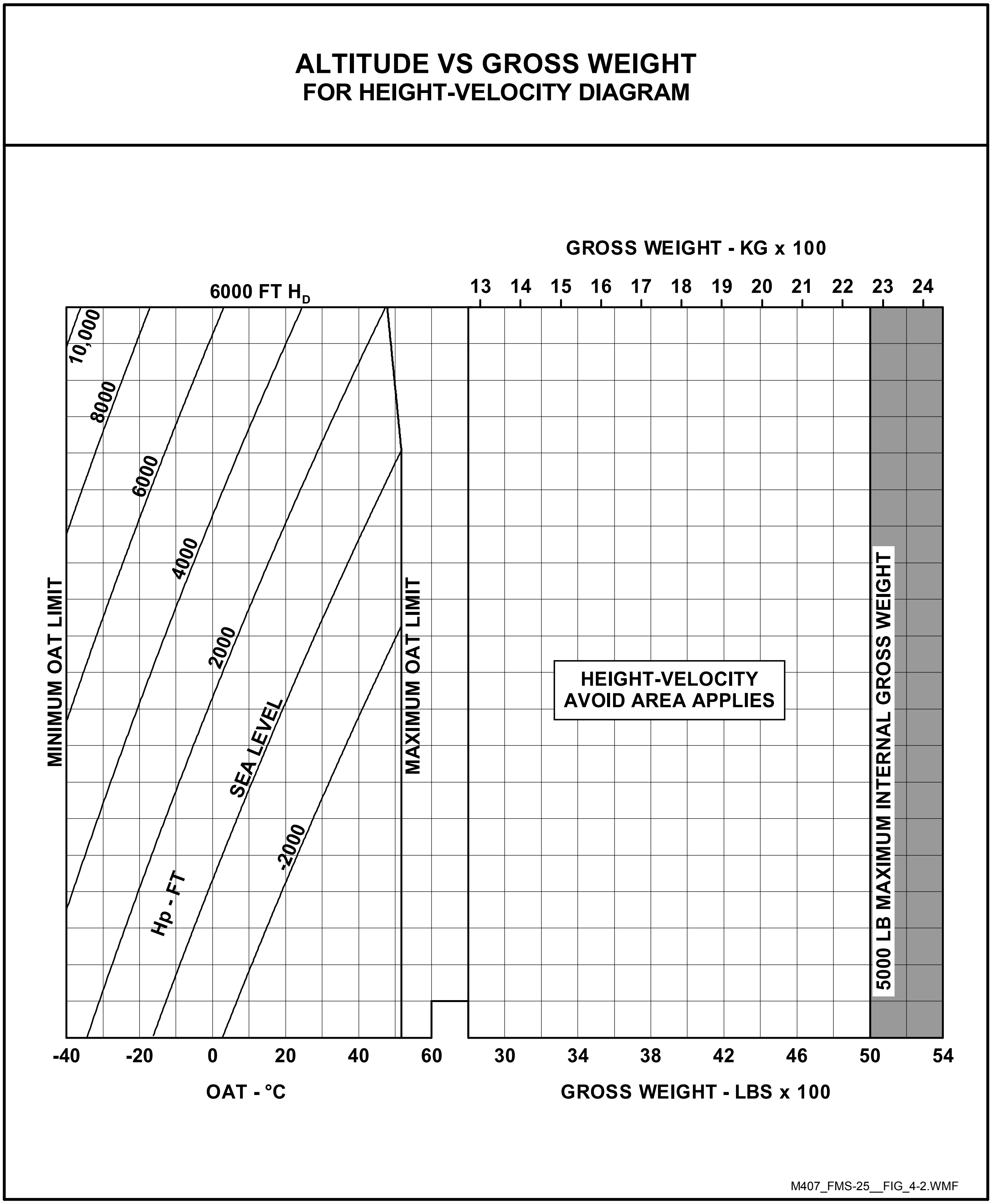


Figure 4-2. Altitude vs gross weight for height – velocity diagram

Section 5

WEIGHT AND BALANCE

5-1. INTRODUCTION

This section presents loading information and instructions necessary to ensure that flight can be performed within approved gross weight and center of gravity limitations as defined in Section 1.

5-3. GROSS WEIGHT CENTER OF GRAVITY

5-3-B. CENTER OF GRAVITY

Gross weight longitudinal center of gravity and Gross weight lateral center of gravity charts for Quiet Cruise operations are in Limitations Section 1 .

For Quiet Cruise operations maintaining longitudinal CG within limits can be achieved by the following:

> With helicopter Weight empty within envelope (BHT-407-MM-2) the helicopter will stay within Quiet Cruise limits provided both pilot and co-pilot seats are occupied. This assumes a standard crew/passenger weight of 170 pounds (77.1 kilograms) and that fuel and payload are adjusted to stay within Maximum Gross Weight limit.
>
> If co-pilot/forward passenger seat is unoccupied then cabin payload must be adjusted to maintain flight envelope.

For helicopters operating without respect to Weight empty envelope the pilot is responsible for ensuring that when operating in Quiet Cruise mode, helicopter weight and CG are within limits.

For Quiet Cruise operations maintaining Lateral CG within limits can be achieved by the following:

> Seats should be occupied such that maximum asymmetric loading is no more than one person (170 pounds (77.1 kilograms)).

With this arrangement, a helicopter whose basic lateral CG is ±0.3 inch (7.62 mm), will remain within lateral limits.

Section 1

SYSTEM DESCRIPTION

This kit incorporates a two position switch on collective (Figure 1-1) permitting pilot selection of operation at 100% NR or 92% NR (Quiet Cruise Mode). A two (2) segment annunciator located on instrument panel (Figure 1-2), when illuminated, displays QUIET and ON. QUIET light is illuminated when low rotor audio and RPM light activation point is reset to 88% NR. ON light is illuminated when FADEC is not in 100% NR mode. Both segments are green and will denote operation at 92% NR has been selected. Dual tachometer has additional markings to reflect permissible operation at 92% NP.

NOTE

Selection of FADEC switch to MAN mode, for training purposes, while in Quiet Cruise Mode, will immediately deselect Quiet Cruise Mode and reset low rotor audio and RPM light activation point to 95% NR (triggering low rotor audio and RPM light). QUIET and ON segments will also extinguish. Transition back to AUTO mode should be accomplished at approximately 100% NP to reduce engine power transients.

A FADEC system failure (FADEC FAIL light with FADEC fail audio), while in Quiet Cruise Mode, will retain activation point of low rotor audio and RPM light at 88%. QUIET segment will remain illuminated and ON segment will extinguish. Selection of FADEC MAN mode will immediately deselect Quiet Cruise Mode and reset low rotor audio and RPM activation point to 95% NR, extinguishing the QUIET segment.

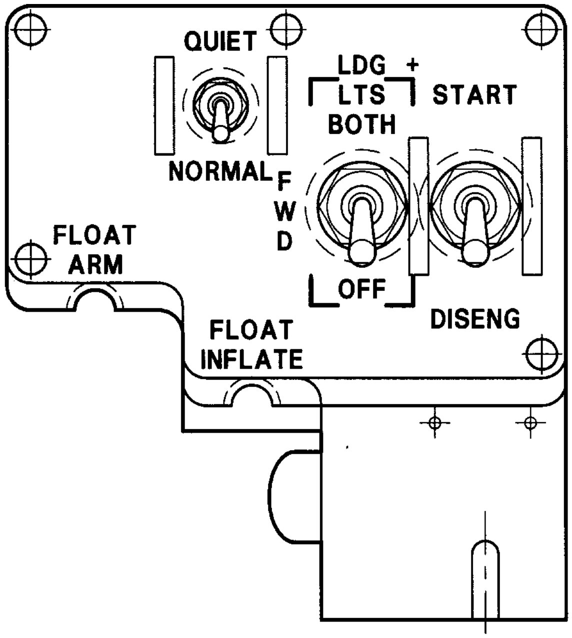
1-55. NOISE LEVELS

1-55-A. FAR PART 36 STAGE 2 NOISE LEVEL

Flyover noise level in Quiet Cruise Mode for the Model 407 is 81.3 dBA SEL.

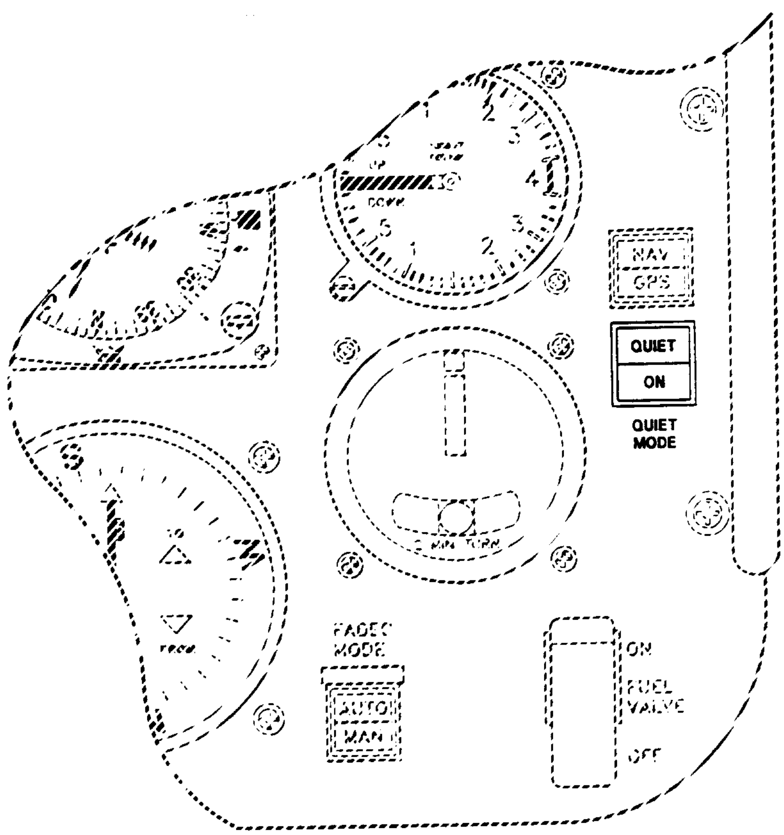
1-55-B. CANADIAN AIRWORTHINESS MANUAL CHAPTER 516 AND ICAO ANNEX 16 NOISE LEVEL

Flyover noise level in Quiet Cruise Mode for the Model 407 is 81.3 dBA SEL.



407FSMD-25-1-1

Figure 1-1. Pilot collective stick



407FSMD-25-1-2

Figure 1-2. Quiet mode annunciator

BHT-407-FMS-28

MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

INCREASED INTERNAL GROSS WEIGHT

407-706-020

CERTIFIED
16 MARCH 1999

This supplement shall be attached to Model 407 Flight Manual when INCREASED INTERNAL GROSS WEIGHT kit is installed.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, or other applicable supplements, consult basic Flight Manual.

Bell Helicopter
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NOTE

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Section 1

LIMITATIONS

1-6. WEIGHT AND CENTER OF GRAVITY

1-6-A. WEIGHT

Maximum approved internal gross weight for takeoff and landing is 5250 pounds (2381 kilograms) or as shown in IGE hover performance charts, Section 4.

CAUTION

LOADS THAT RESULT IN GW ABOVE 5,250 POUNDS (2381 KILOGRAMS) SHALL BE CARRIED ON THE CARGO HOOK.

1-6-B. CENTER OF GRAVITY

For longitudinal CG limits, refer to Gross Weight Longitudinal center of gravity limits charts (Figure 1-1).

For lateral CG limits, refer to Gross Weight Lateral center of gravity limits chart (Figure 1-2).

1-7. AIRSPEED

V_{NE} is 140 KIAS, sea level to 3000 feet H_D. Decrease V_{NE} for ambient conditions in accordance with AIRSPEED LIMITATIONS Placards and decals (Figure 1-3).

1-8. ALTITUDE

1-8-A. DENSITY

Maximum H_D for takeoff, landing, and in ground effect manuevers is 11,000 feet (3353 meters).

1-8-B. DELETED

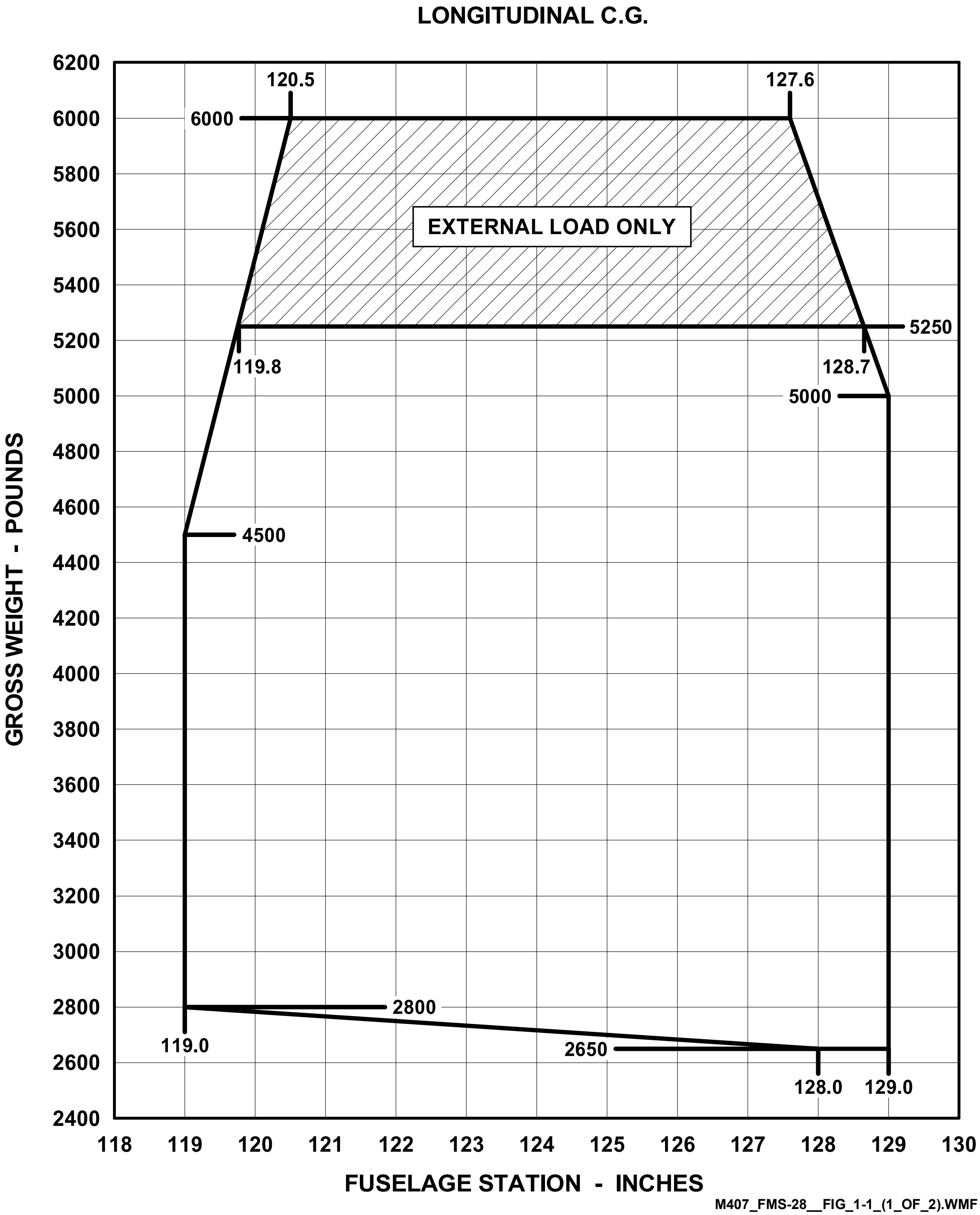


Figure 1-1. Gross Weight Longitudinal center of gravity limits (sheet 1 of 2)

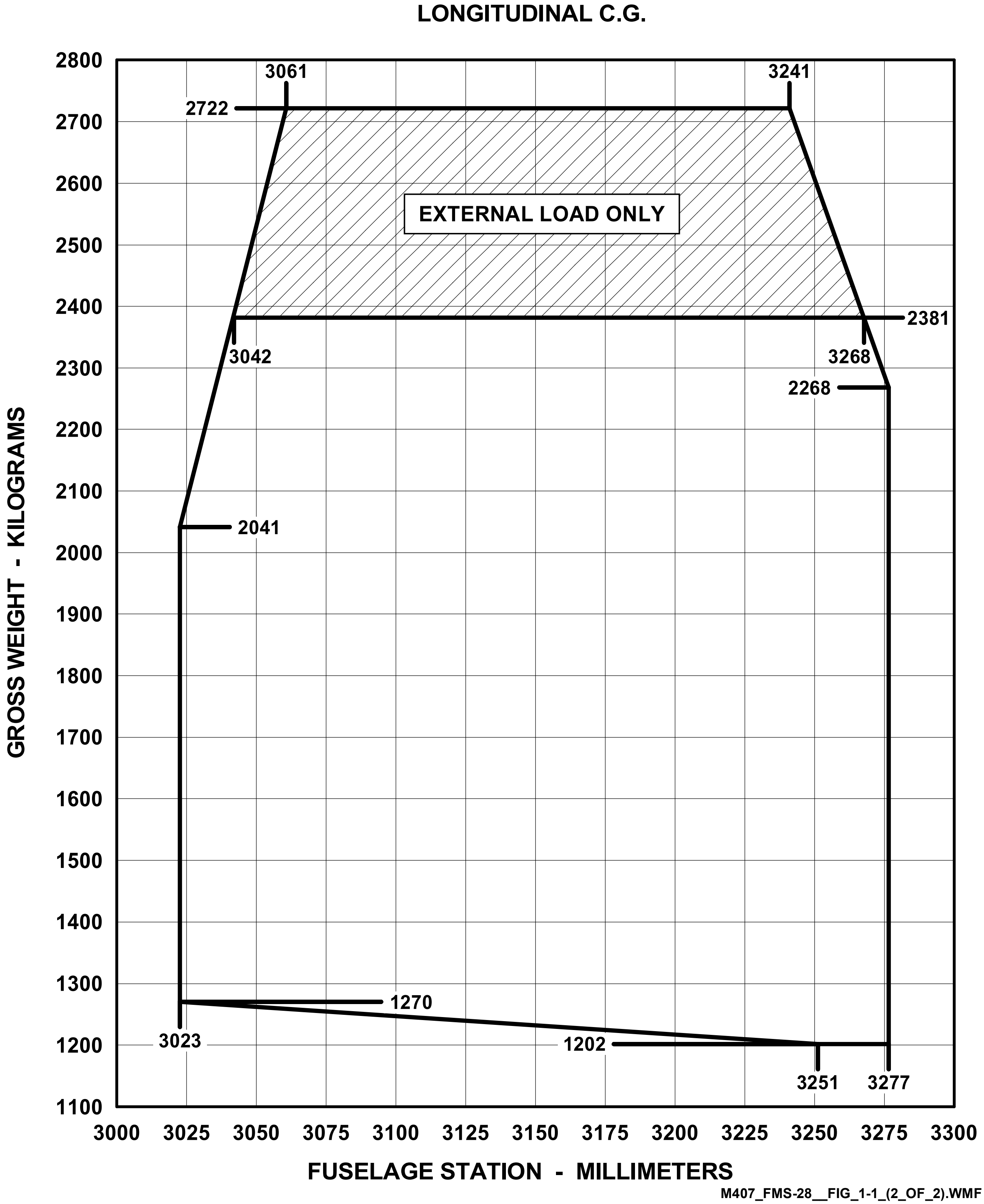


Figure 1-1. Gross Weight Longitudinal center of gravity limits (sheet 2 of 2)

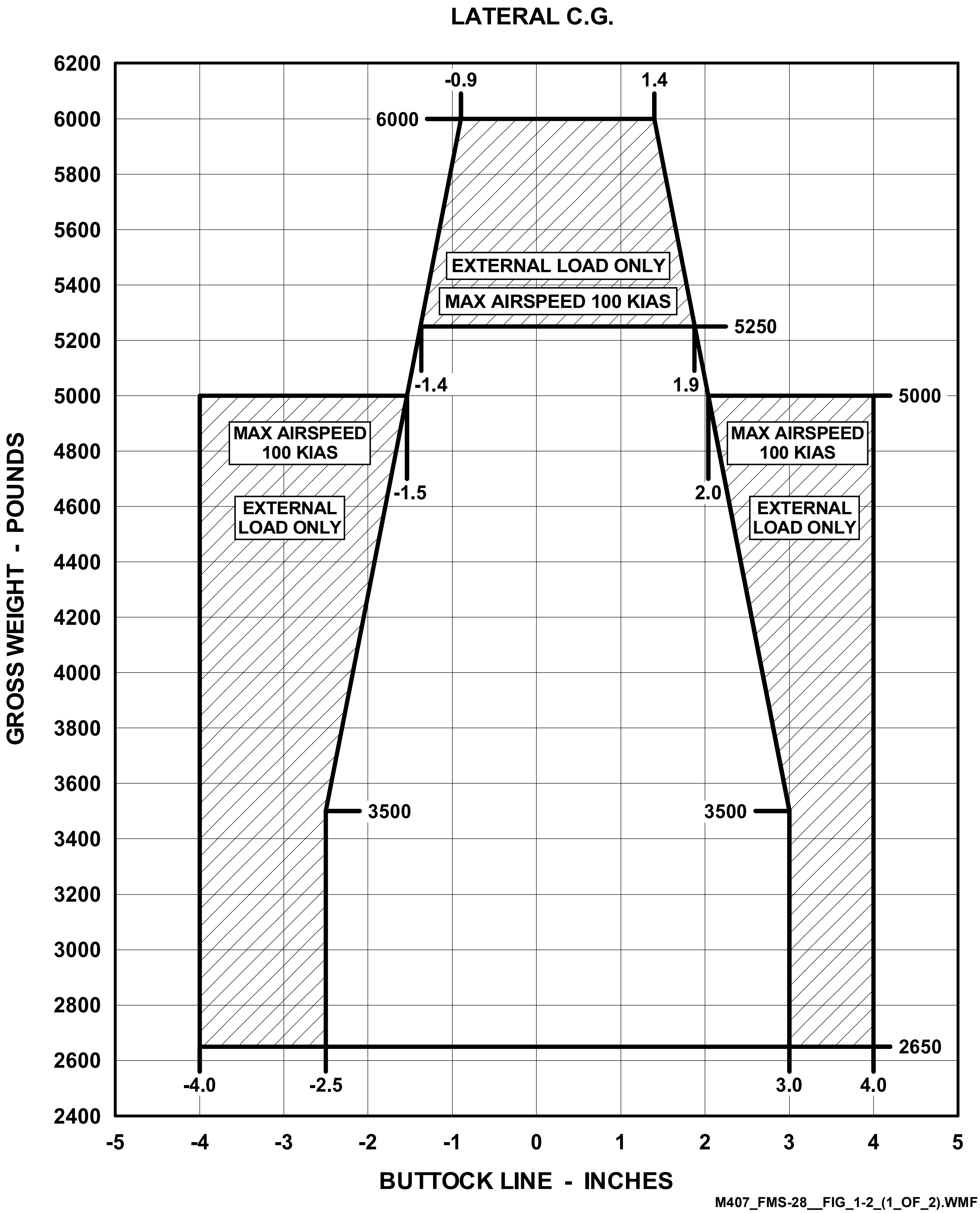


Figure 1-2. Gross Weight Lateral center of gravity limits (sheet 1 of 2)

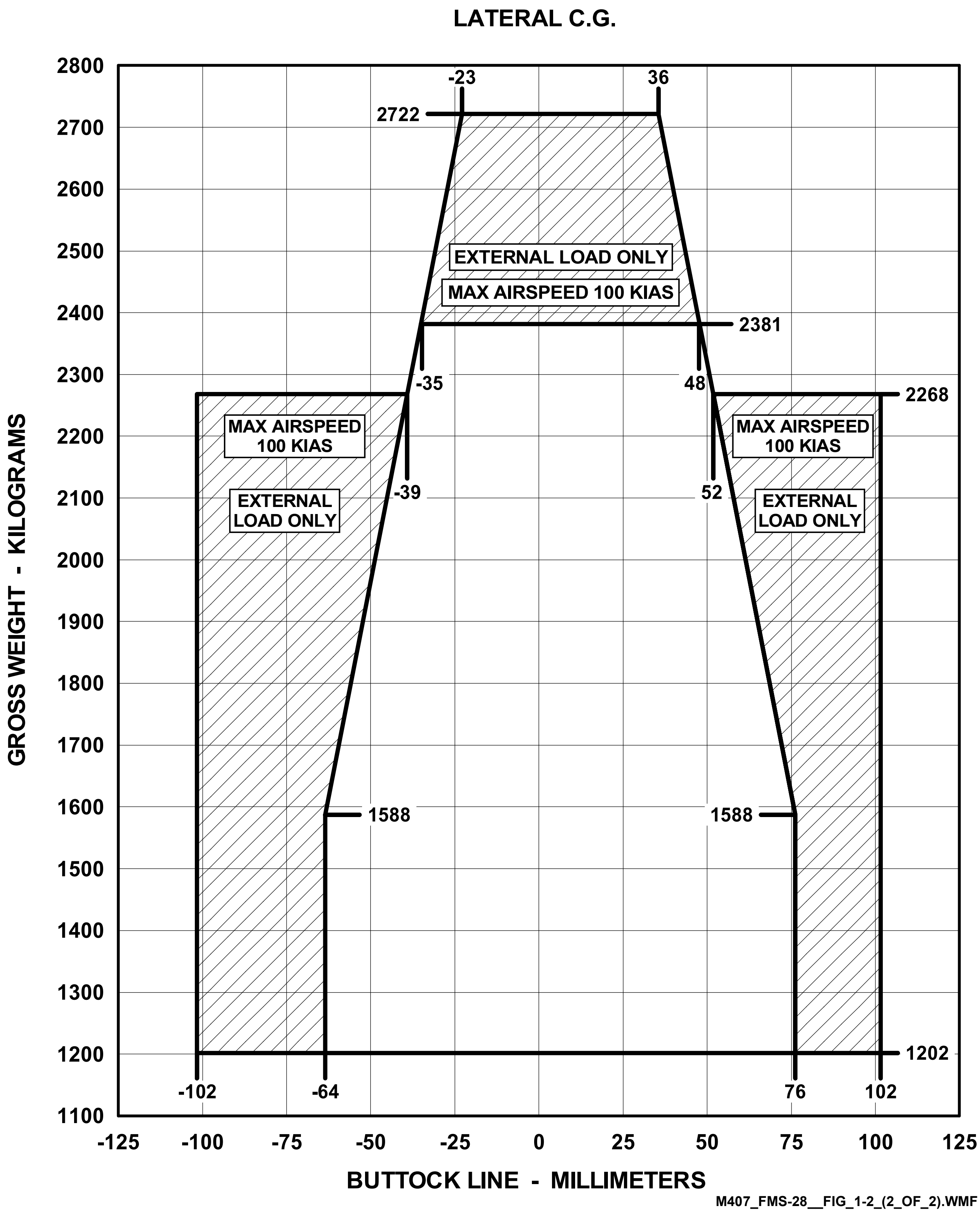


Figure 1-2. Gross Weight Lateral center of gravity limits (sheet 2 of 2)

407 (5250 LB) AIRSPEED LIMITATIONS - KIAS											
OAT °C	PRESSURE ALTITUDE FT x 1000										
	0	2	4	6	8	10	12	14	16	18	20
52	137										
45	139	132	123								
40	140	133	125	113							
35	140	135	128	116	104						
30	140	137	129	118	106	99					
25	140	138	131	121	109	100	93	86			
20	140	140	133	124	112	102	94	87	80		
0	140	140	140	132	123	111	101	94	86	79	
-25	140	140	140	135	130	125	114	102	95	88	80
-40	137	133	128	123	118	114	110	105	101	93	86
MAXIMUM AUTOROTATION VNE 100 KIAS											

Location: Adjacent to existing airspeed limitations placard (typical).

Airspeed limits shown are valid only for corresponding altitudes and temperatures. Hatched areas indicate conditions which exceed approved temperature or density altitude limitations.

407FS28-1-3

Figure 1-3. Placards and Decals (typical)

Section 2

NORMAL PROCEDURES

No change from basic manual.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

4-1. INTRODUCTION

Refer to appropriate performance charts in accordance with optional equipment installed.

4-4. HEIGHT – VELOCITY ENVELOPE

Altitude vs gross weight for height-velocity diagram (Figure 4-1) and Height-velocity (Figure 4-2) diagrams define conditions from which a safe landing can be made on a smooth, level, firm surface following an engine failure. Height velocity diagram is valid only when helicopter gross weight does not exceed limits of the Altitude vs Gross Weight diagram.

4-5. HOVER CEILING

NOTE

Hover performance charts are based on 100% ROTOR RPM.

Satisfactory stability and control have been demonstrated in each area of the Hover ceiling charts with winds as depicted on Hover ceiling wind accountability chart (refer to Basic Flight Manual).

Hover ceiling – in ground effect charts (Figures 4-3 and 4-4) and Hover ceiling – out of ground effect charts (Figures 4-5 and 4-6) present hover performance as allowable gross weight for conditions of H_P and OAT. These hovering weights are obtainable in zero wind conditions. Each chart is divided into two areas. Area A (non shaded area) of hover ceiling charts presents hover performance (relative to GW) for conditions where adequate control margins exist for all relative wind conditions up to 35 knots, for lateral CG not exceeding ±2.5 inches (±63 mm); and up to 17 knots, for lateral CG to ±4.0 inches (±102 mm); for hover, takeoff, and landing. Area B (shaded area) of hover ceiling charts presents hover performance (relative to GW) where adequate control margins exist for relative winds within ± 45° of nose of helicopter up to 35 knots, for lateral CG not exceeding ±2.5 inches (±63 mm); and up to 17 knots, for lateral CG to ±4.0 inches (±102 mm); for hover, takeoff, and landing.

4-7. CLIMB AND DESCENT

4-7-A. RATE OF CLIMB

Rate of climb (takeoff power) charts are presented in Figure 4-7, and Rate of climb (maximum continuous power) charts are presented in Figure 4-8.

4-10. NOISE LEVELS

4-10-A. FAR PART 36 STAGE 2 NOISE LEVEL

Model 407 is certified as a Stage 2 helicopter as prescribed in FAR Part 36, Subpart H, for gross weights up to and including certificated maximum takeoff and landing weight of 5250 pounds (2382 kilograms).

Certified flyover noise level for Model 407 is 85.5 dBA SEL.

4-10-B. CANADIAN AIRWORTHINESS MANUAL CHAPTER 516 AND ICAO ANNEX 16 NOISE LEVEL

Model 407 complies with noise emission standards applicable to helicopter as set out by International Civil Aviation Organization (ICAO) in Annex 16, Volume 1, Chapter 11, for gross weights up to and including certified maximum takeoff and landing weight of 5250 pounds (2382 kilograms).

Flyover noise level for Model 407 is 85.5 dBA SEL.

ALTITUDE VS GROSS WEIGHT
FOR HEIGHT-VELOCITY DIAGRAM

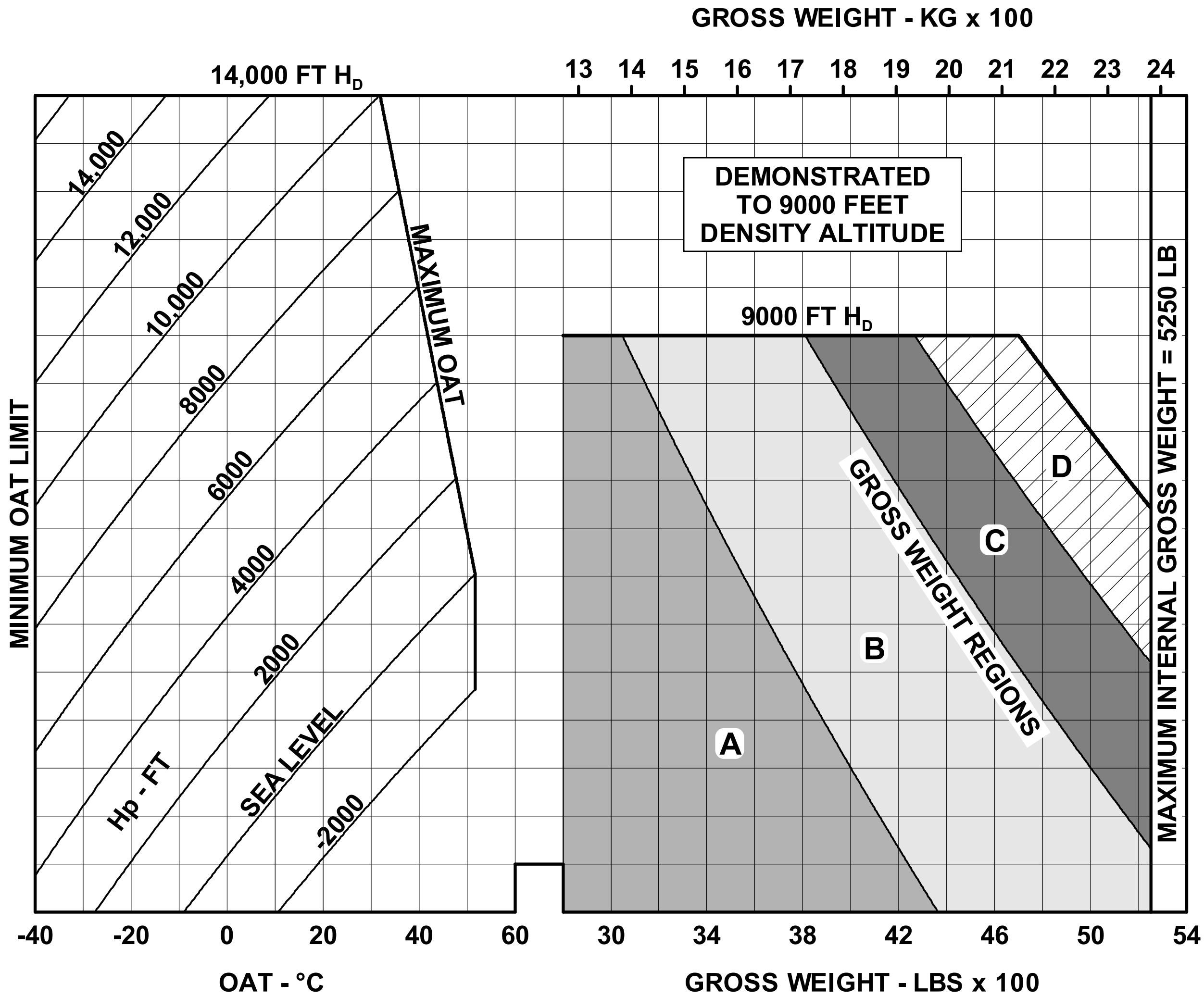


Figure 4-1. Altitude vs gross weight for height – velocity diagram

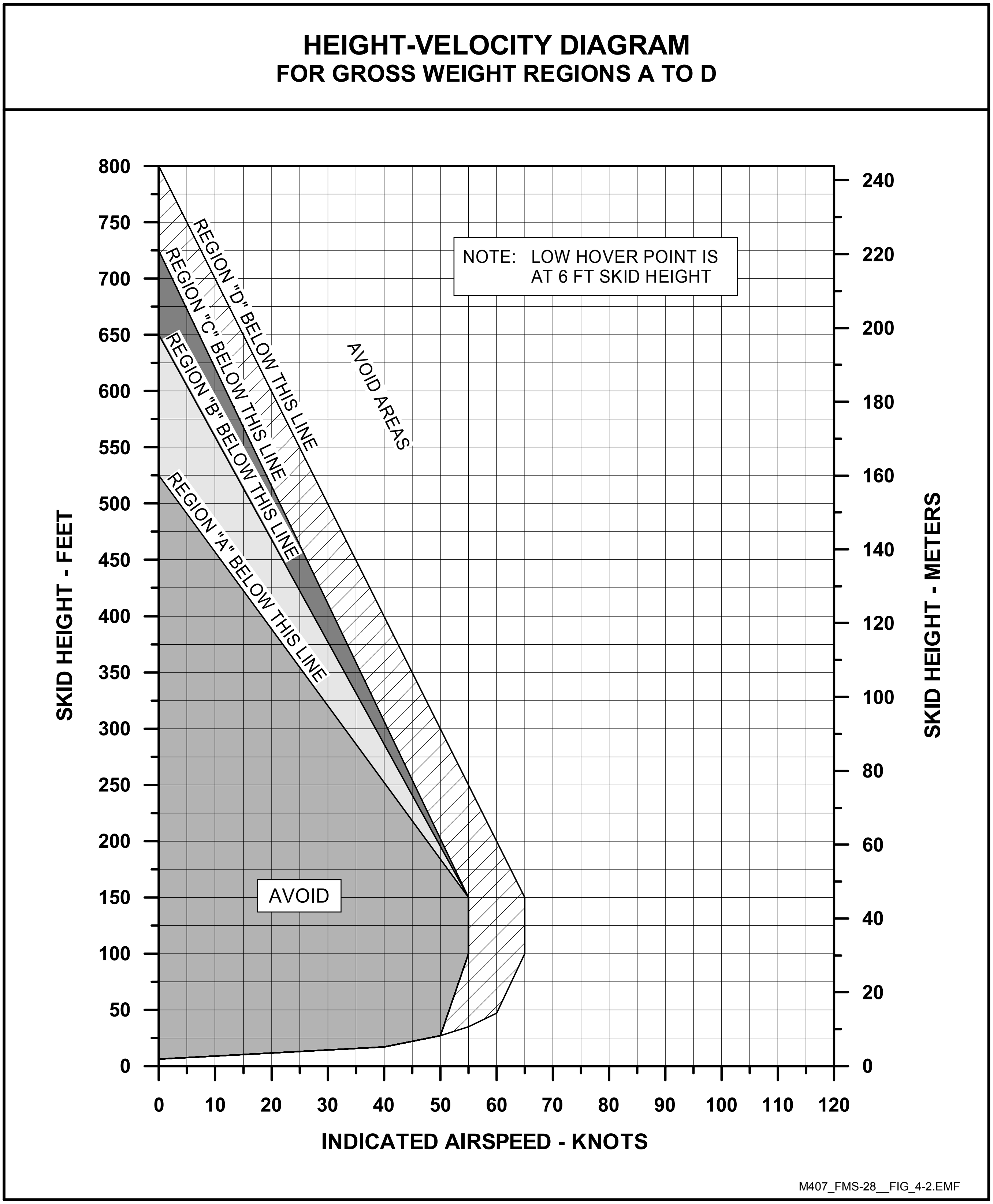
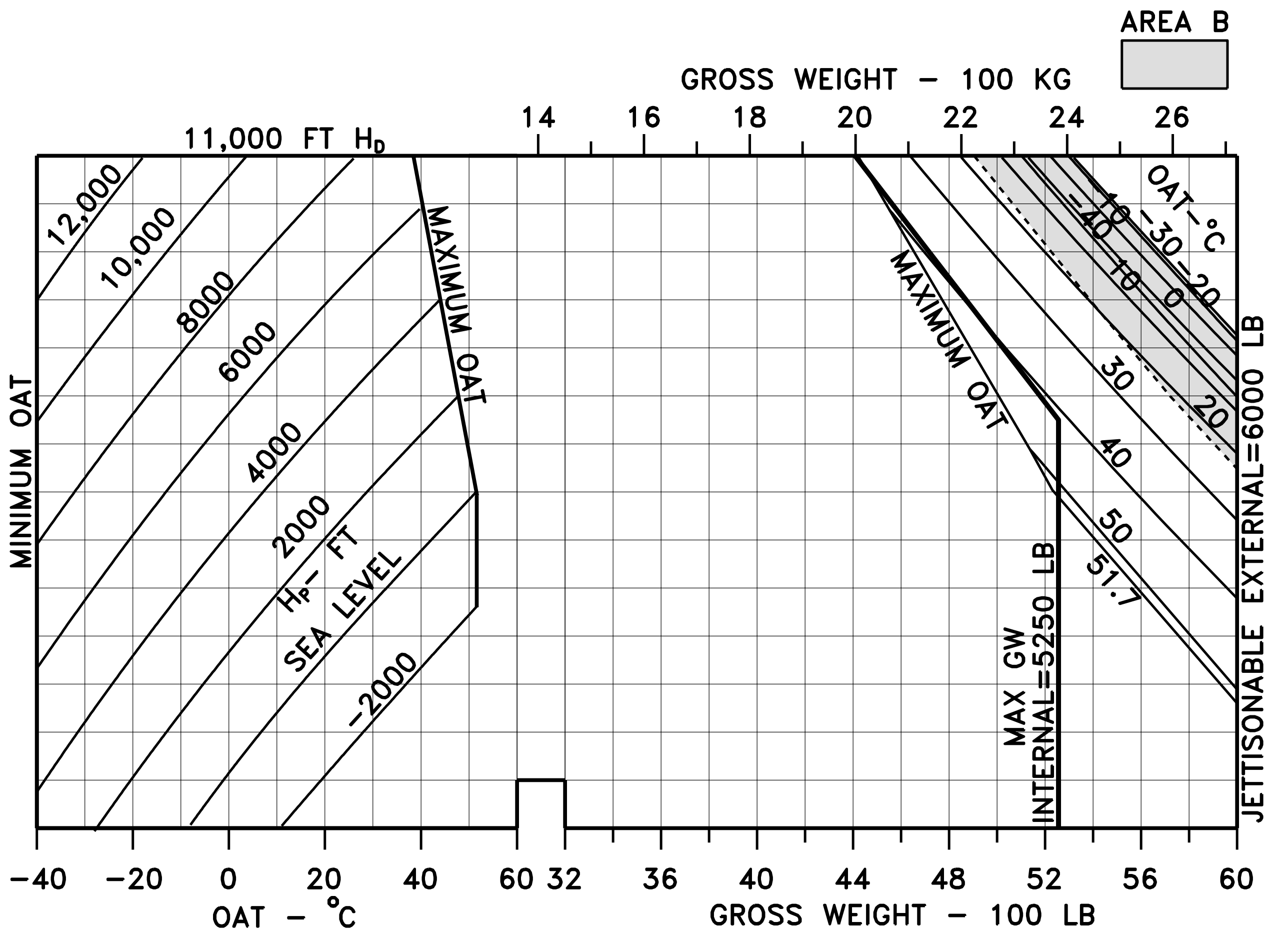


Figure 4-2. Height – velocity diagram

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET



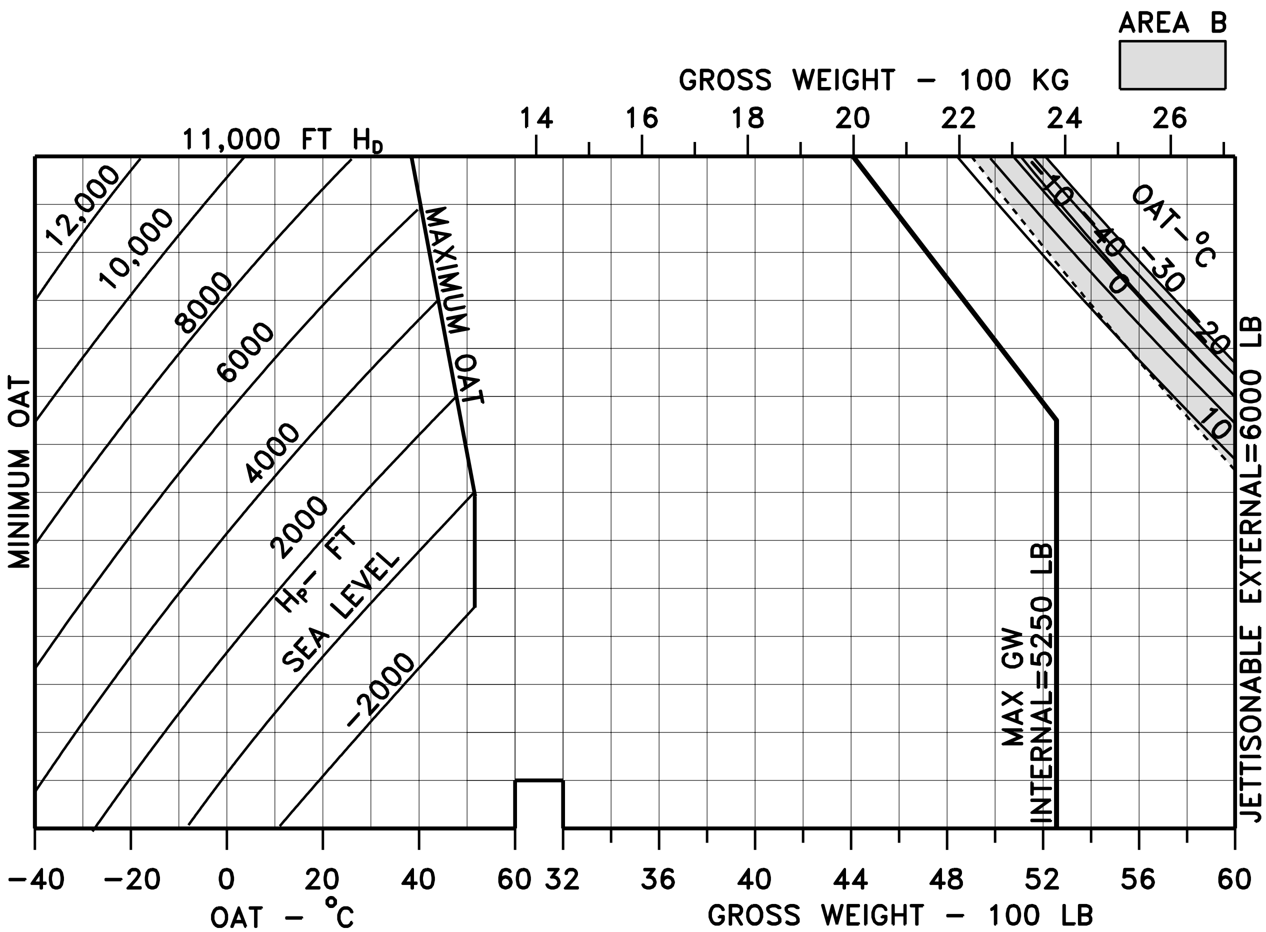
M407_FMS-28__FIG_4-3_(1_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 1 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET



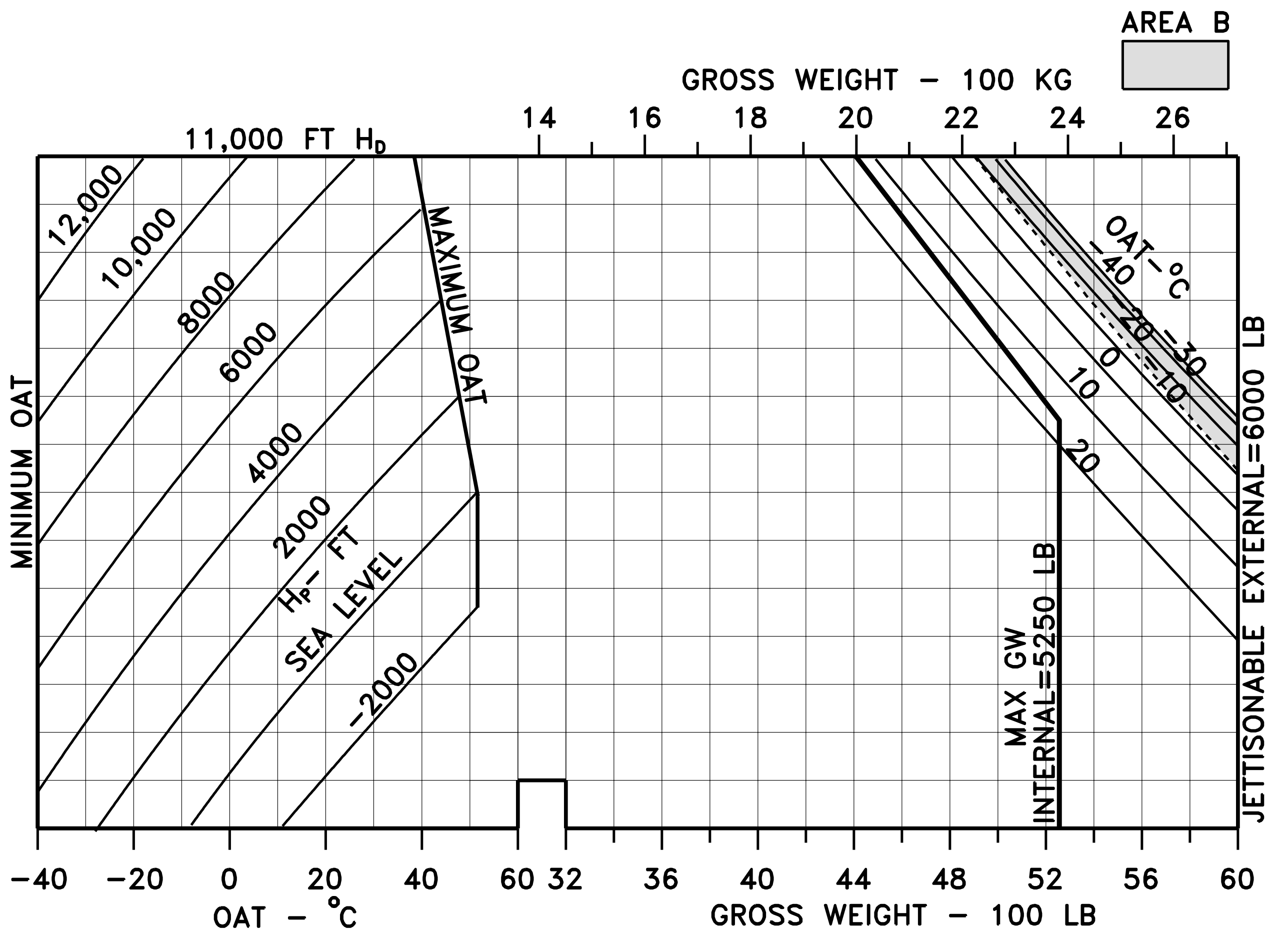
M407_FMS-28__FIG_4-3_(2_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 2 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET



M407_FMS-28__FIG_4-3_(3_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 3 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

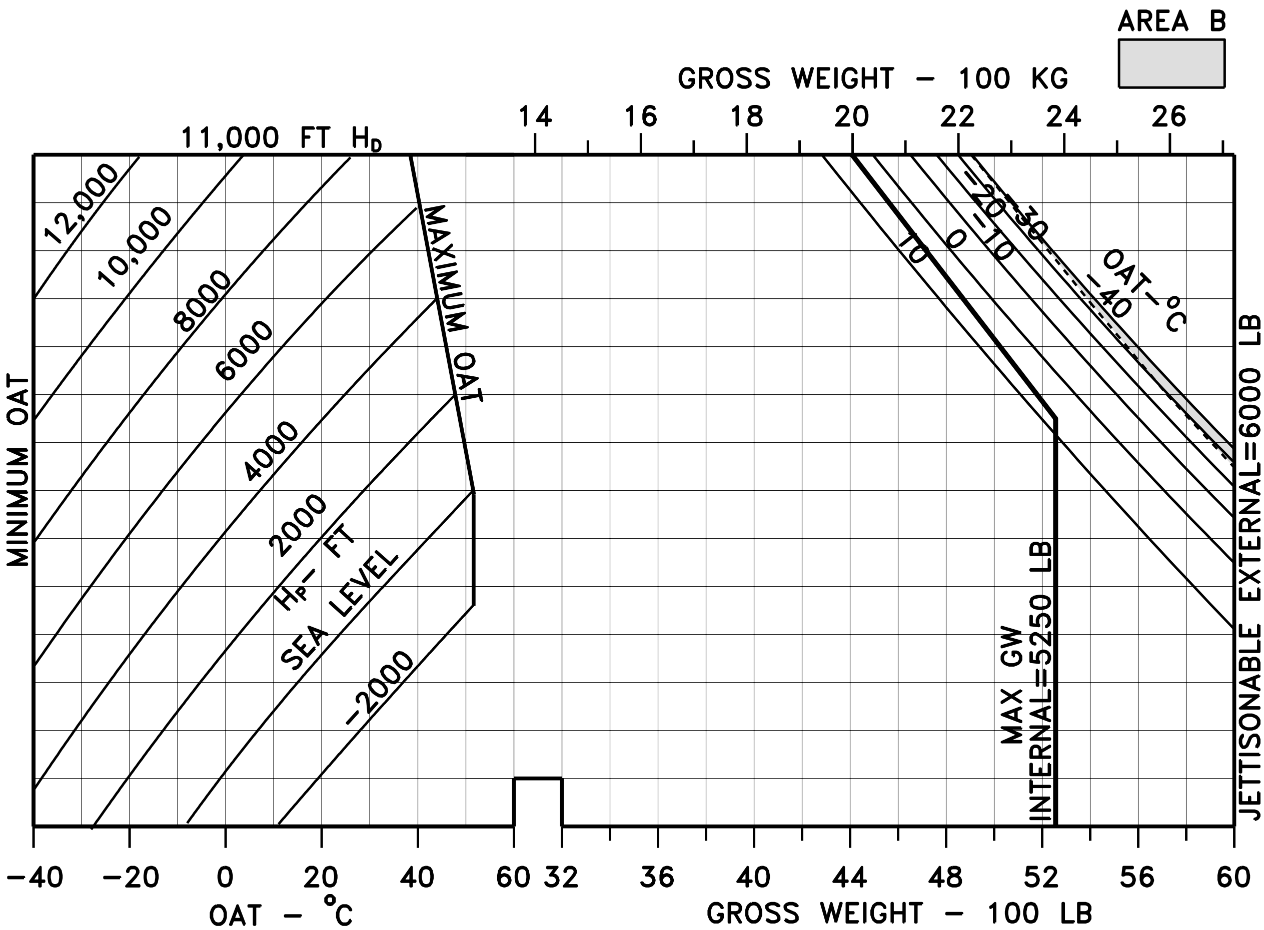


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 4 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

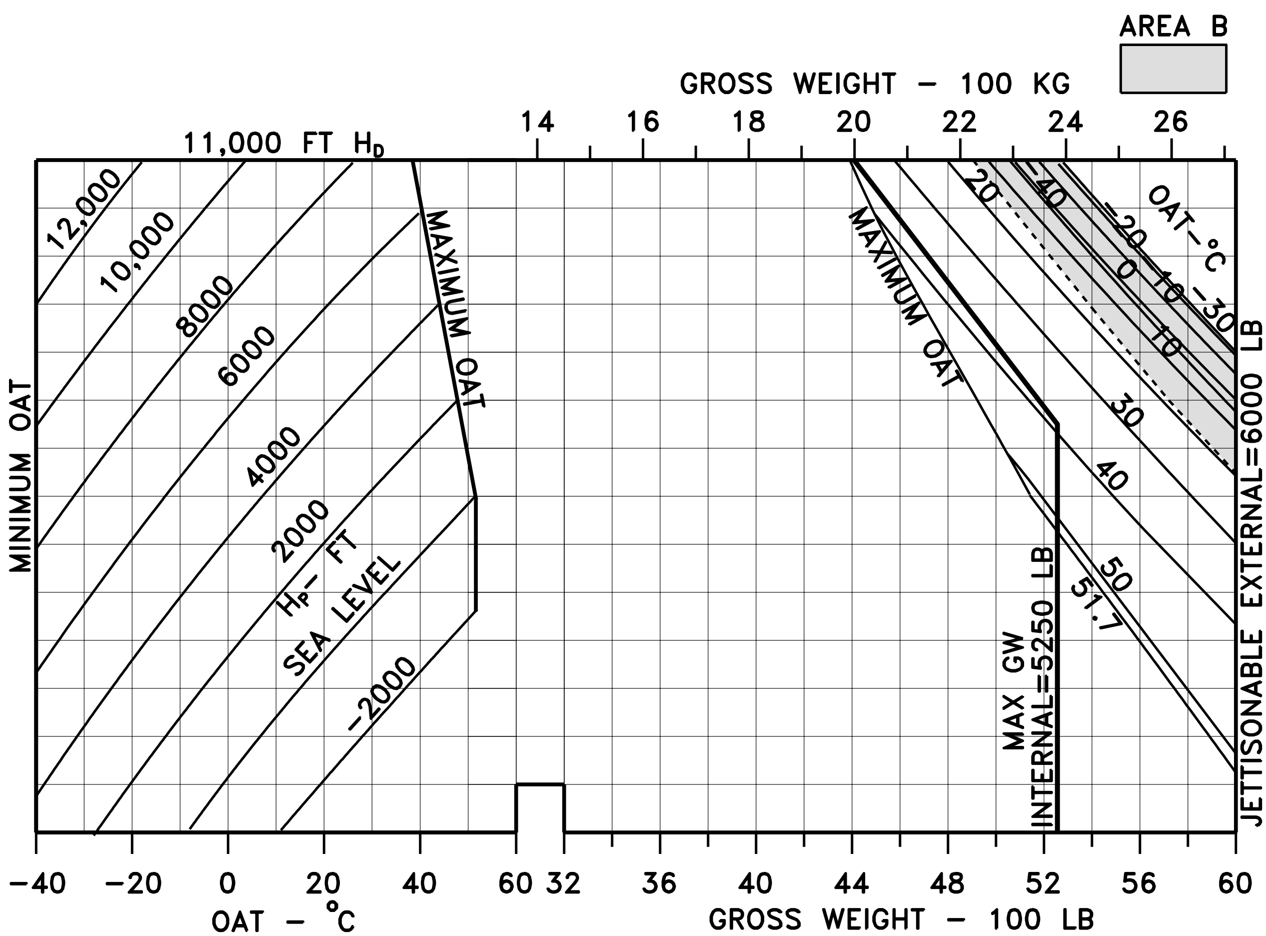


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 5 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

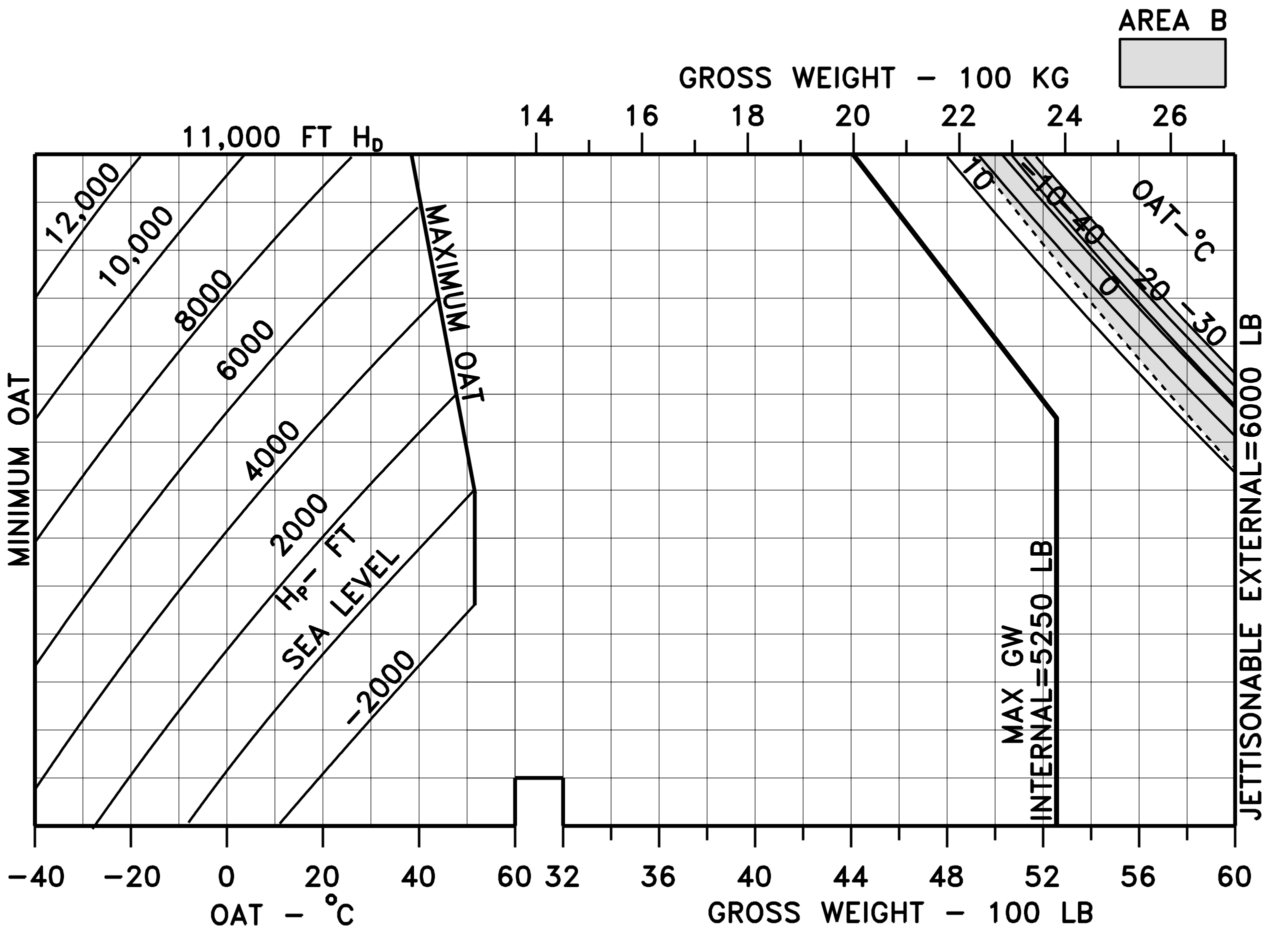


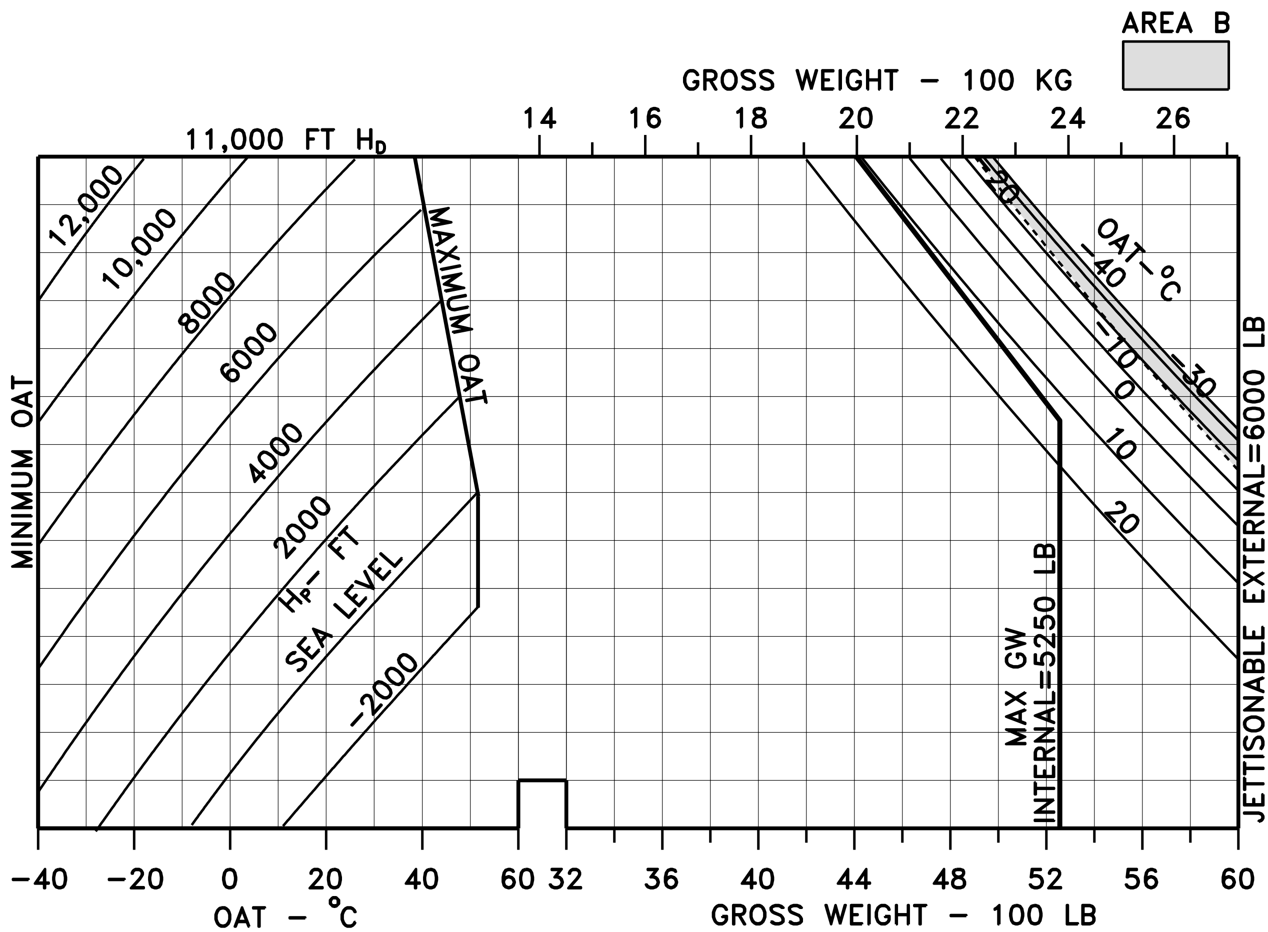
Figure 4-3. Hover ceiling IGE – takeoff power (sheet 6 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-3_(7_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 7 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

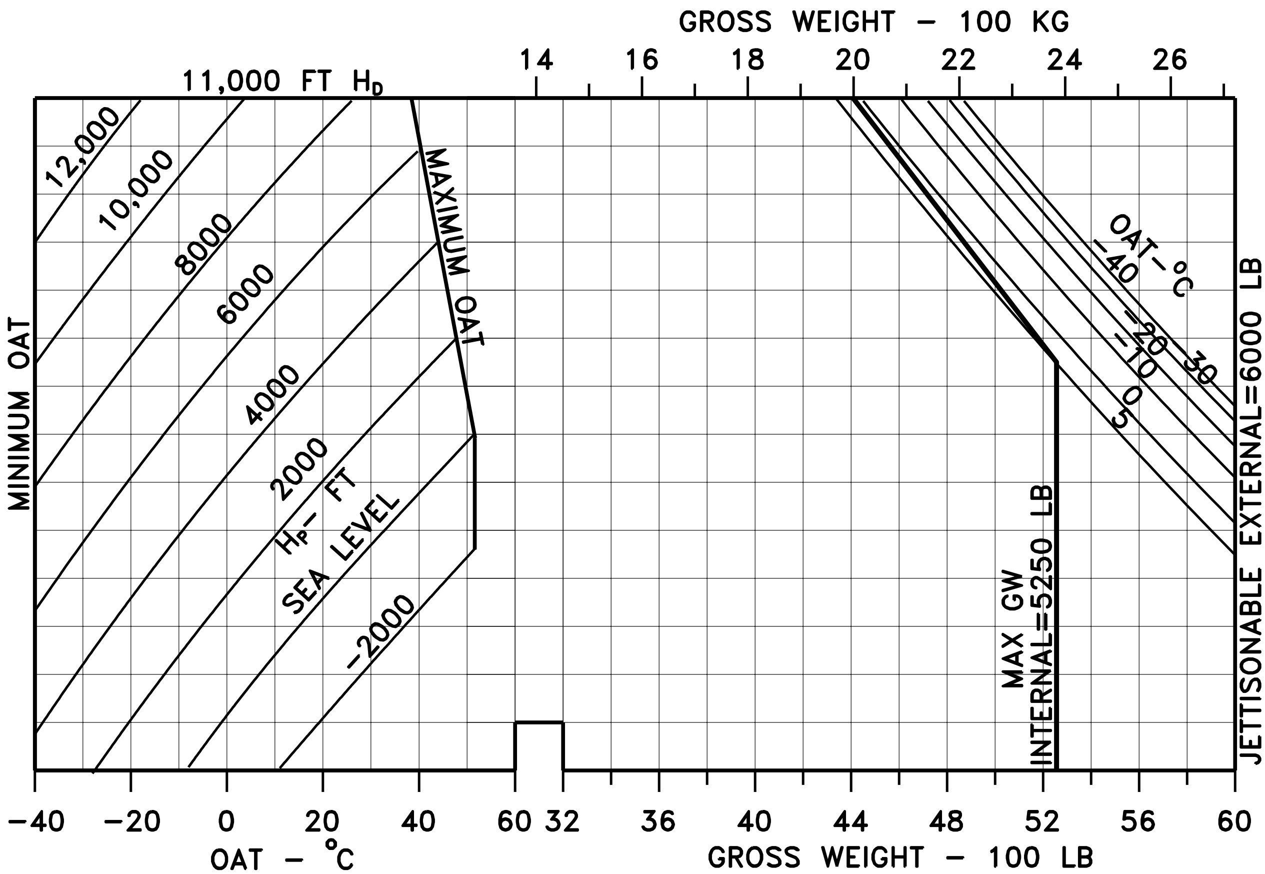


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 8 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW BAFFLES

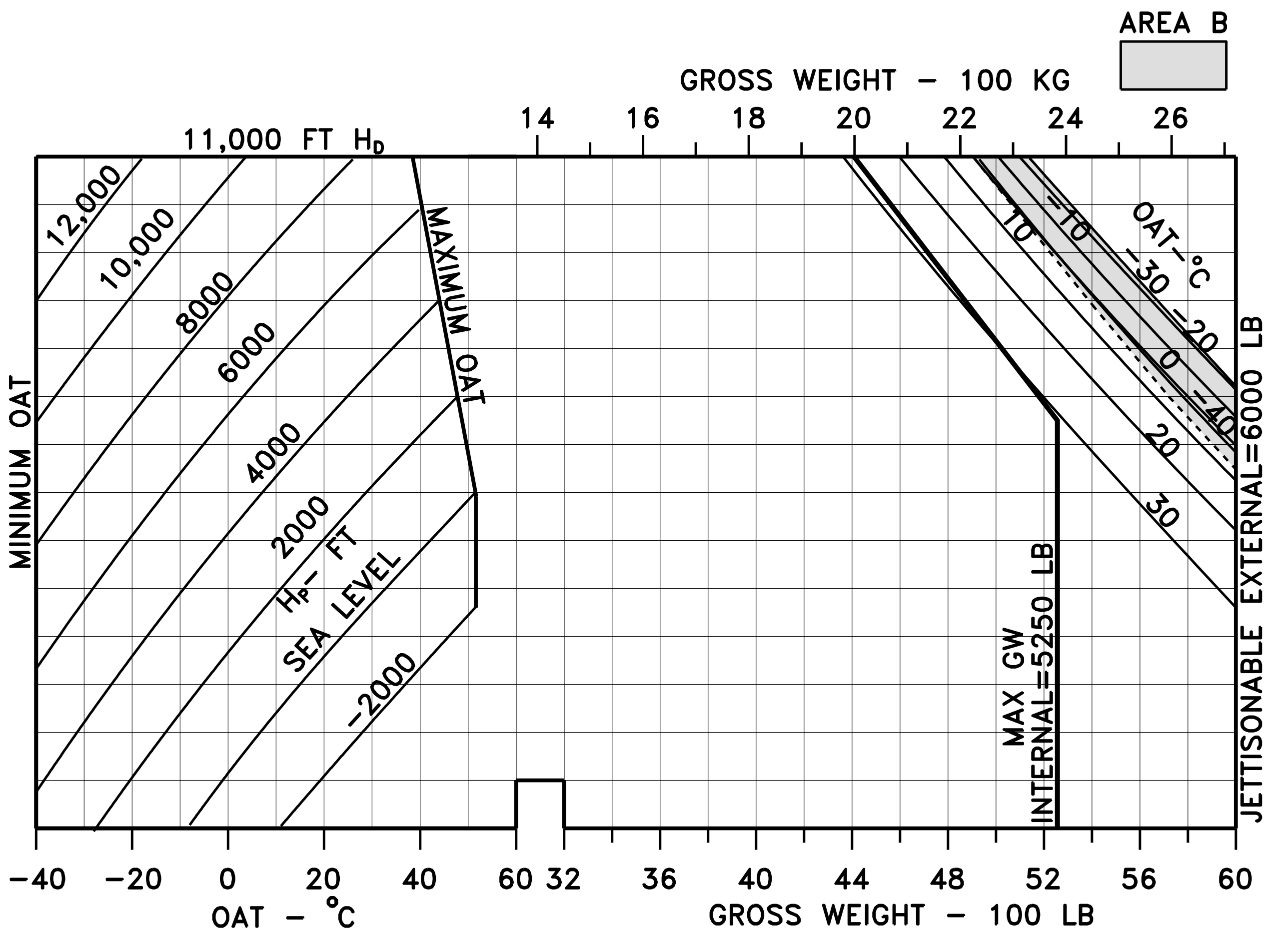
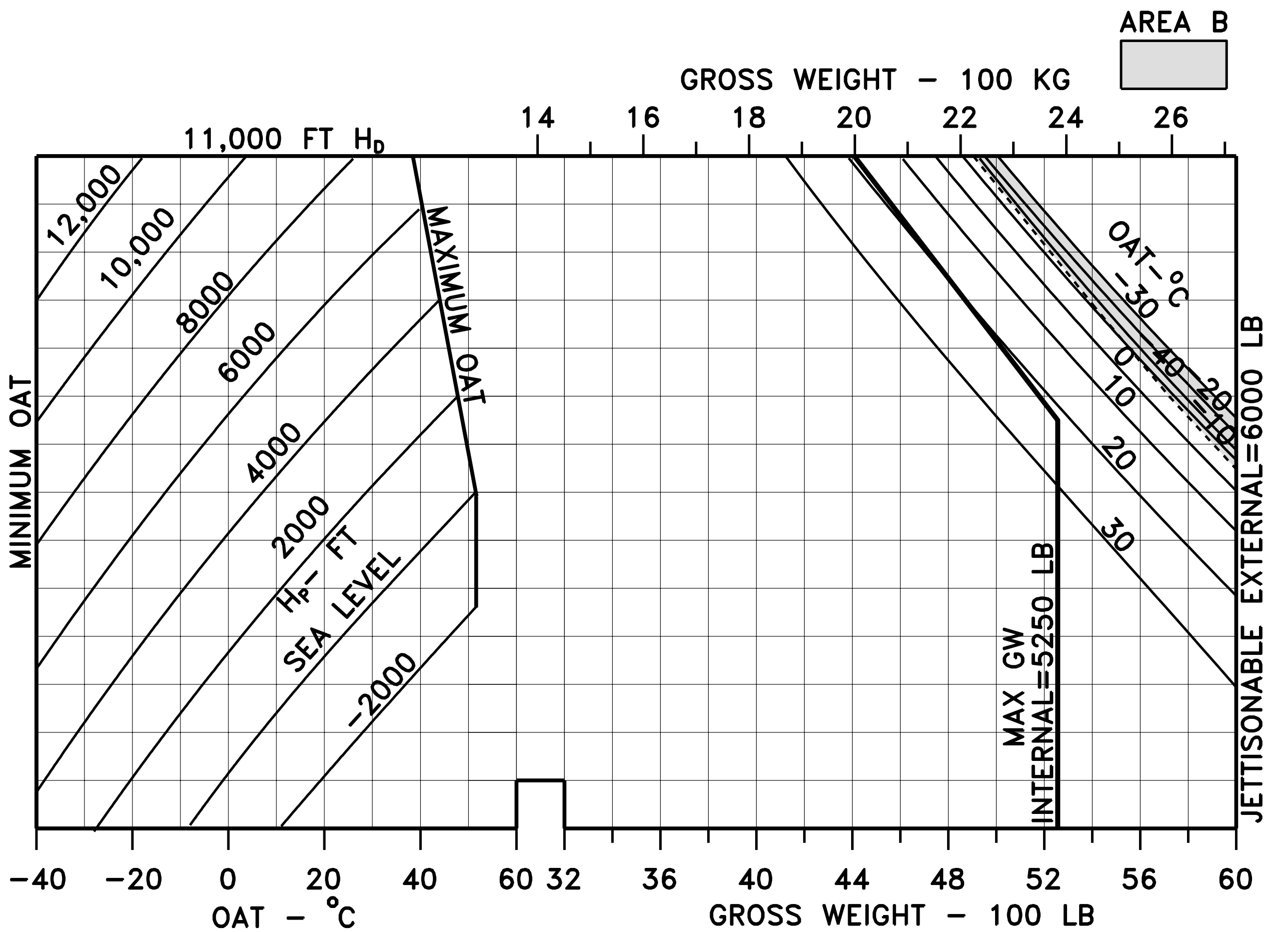


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 9 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



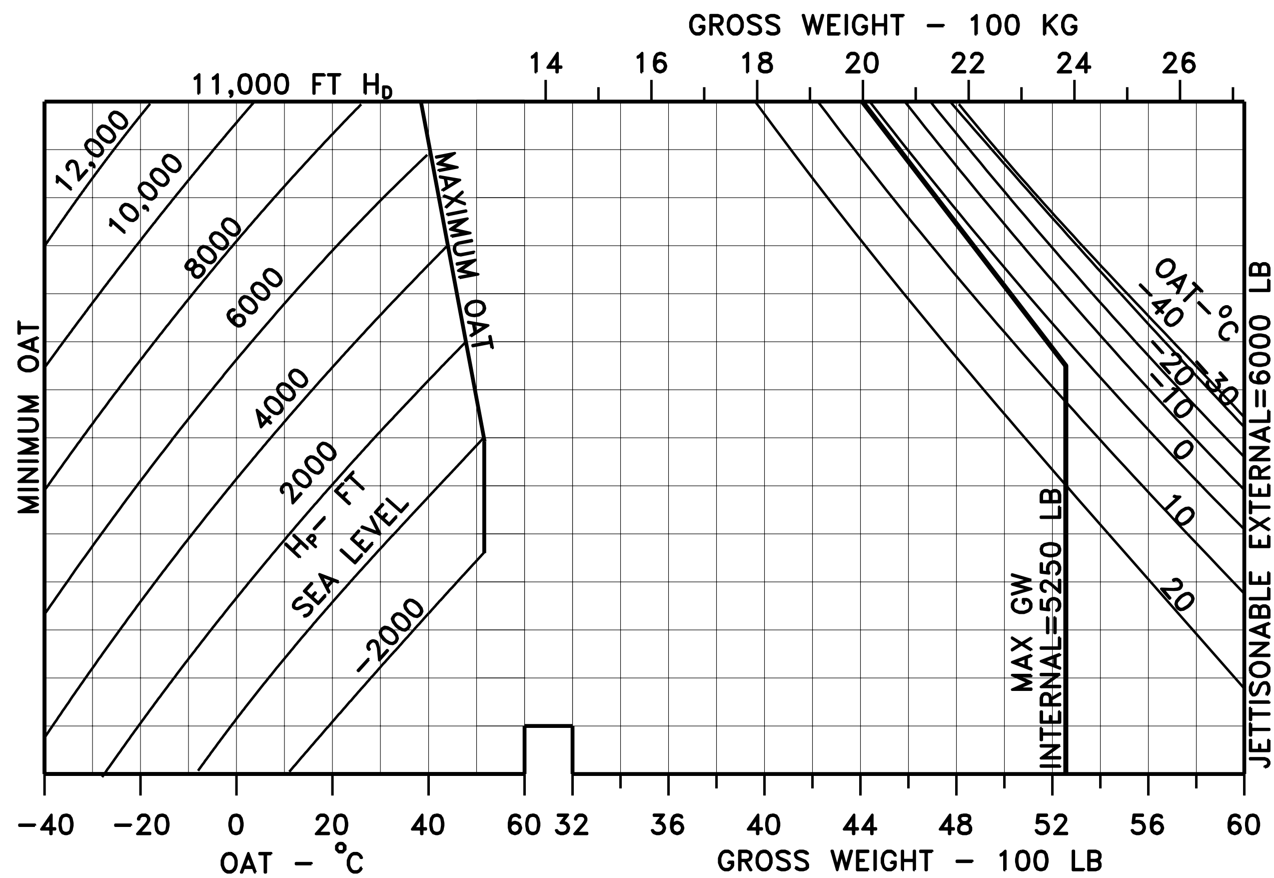
M407_FMS-28__FIG_4-3_(10_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 10 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET
SNOW BAFFLES



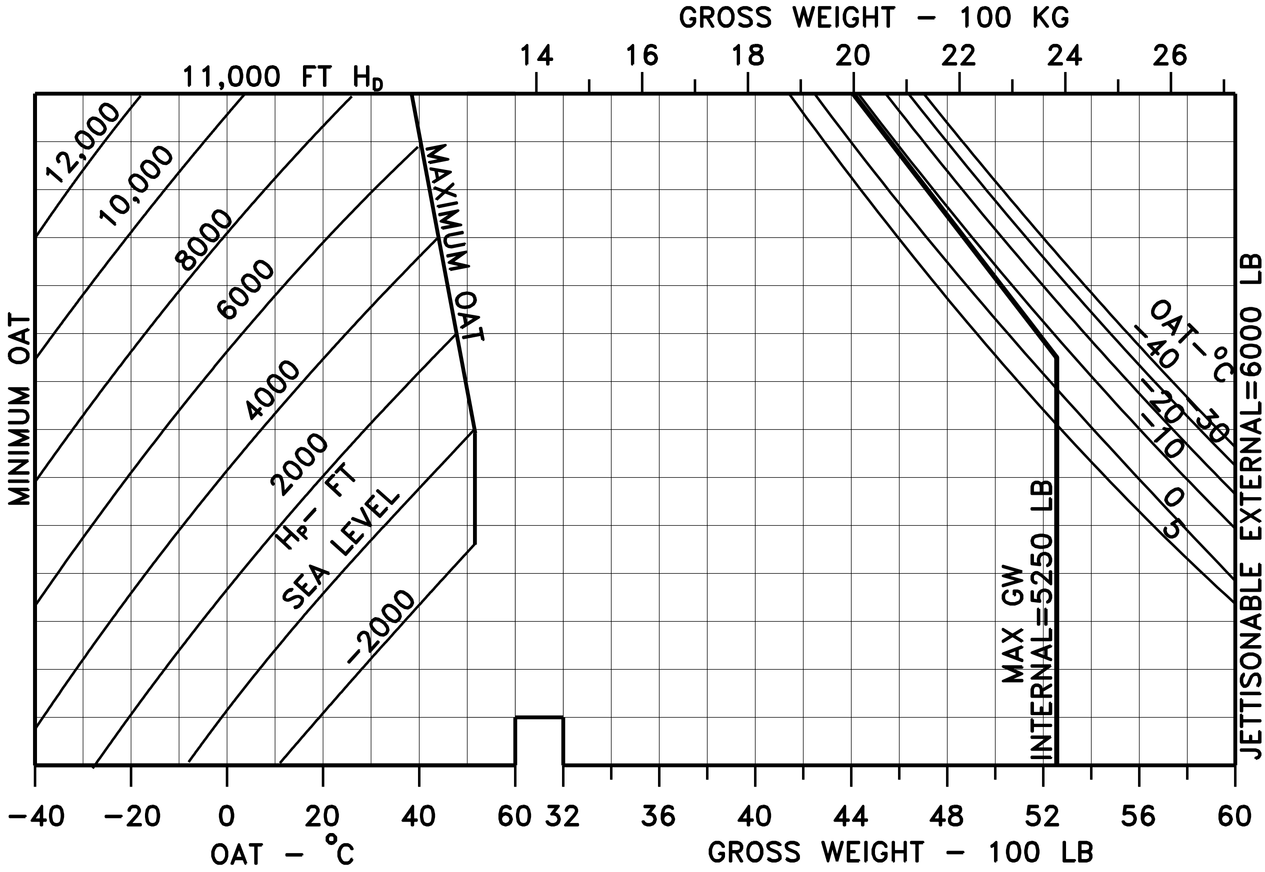
M407_FMS-28__FIG_4-3_(11_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 11 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



M407_FMS-28__FIG_4-3_(12_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 12 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

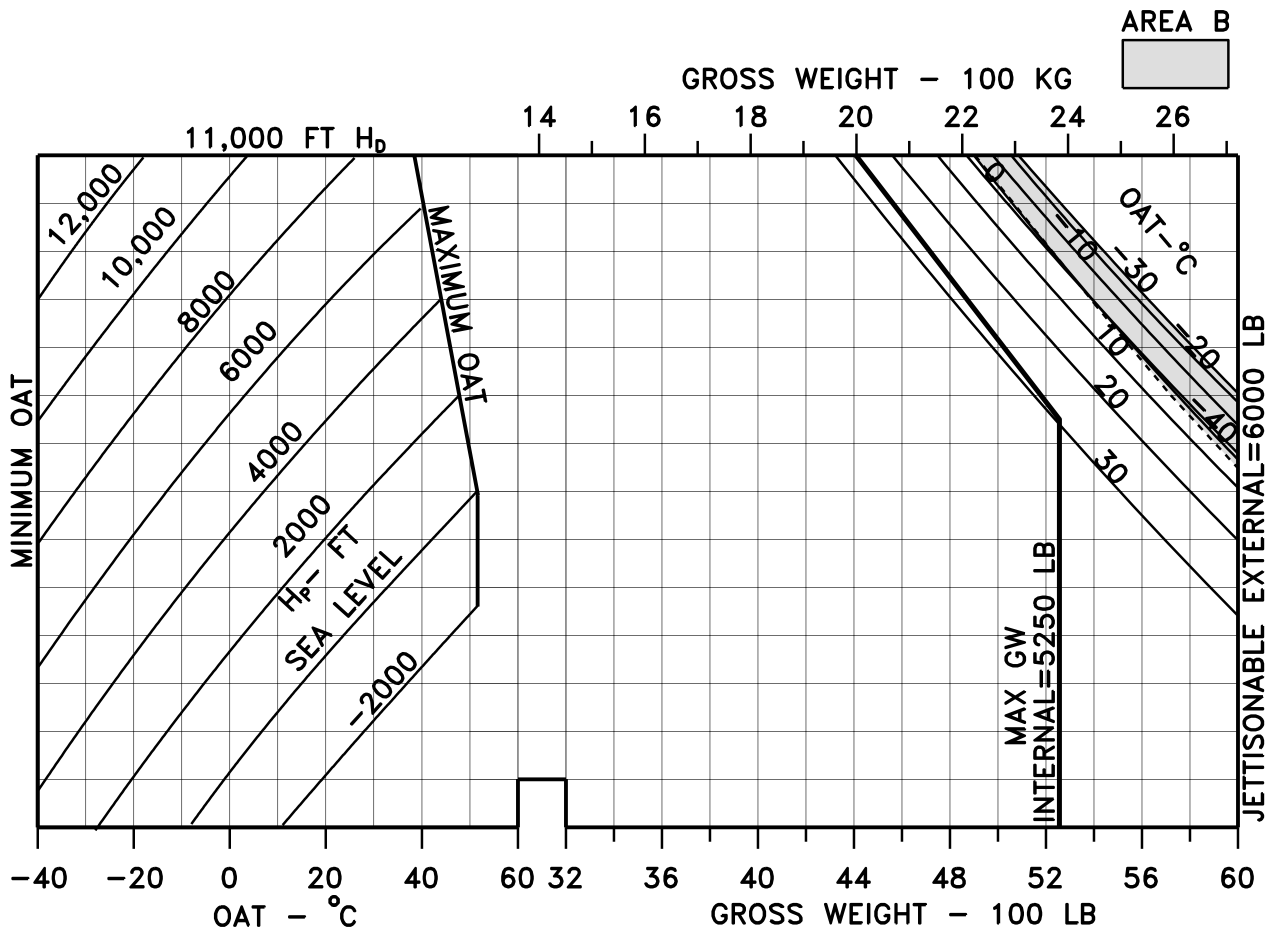


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 13 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

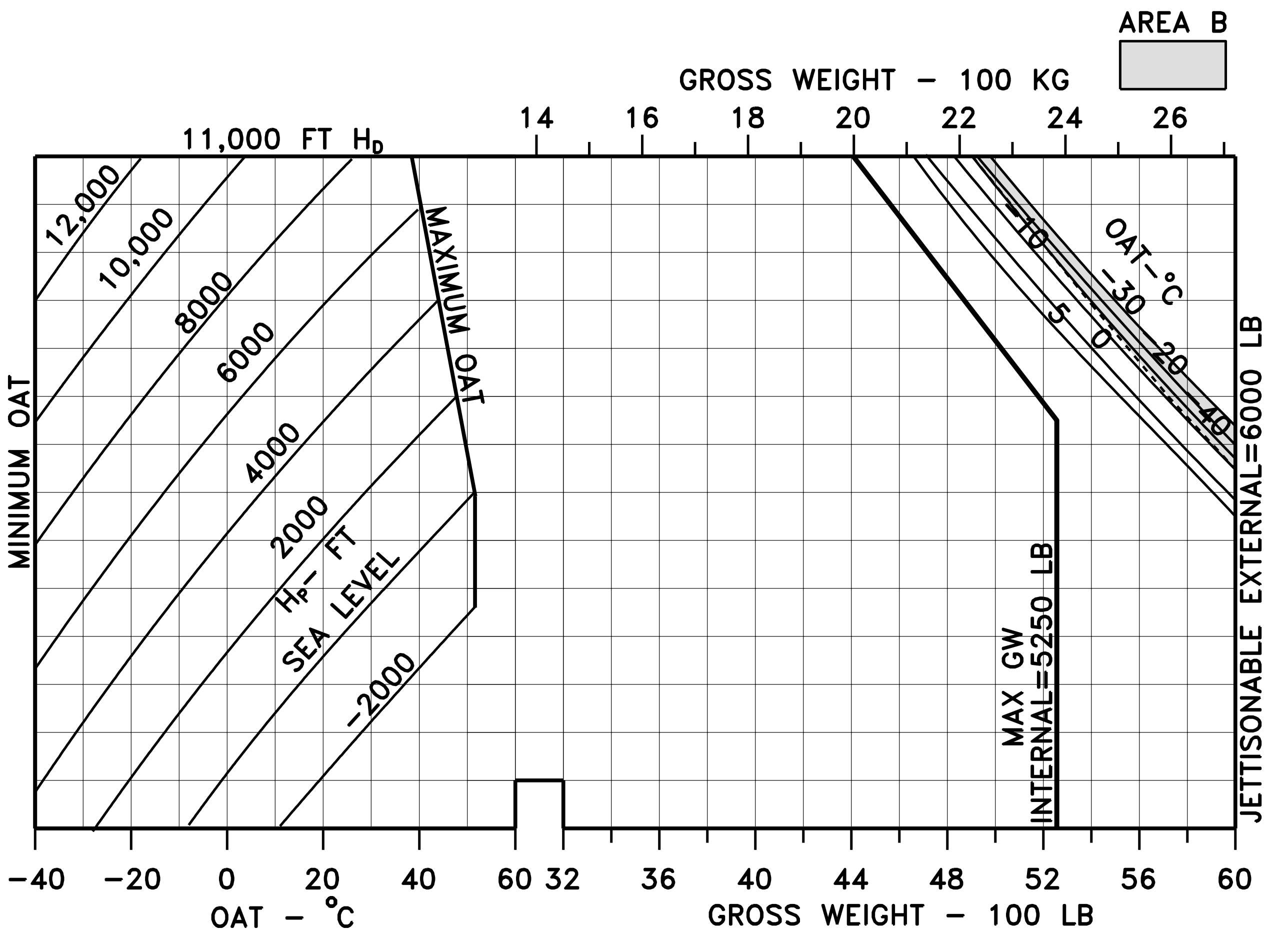


Figure 4-3. Hover ceiling IGE – takeoff power (sheet 14 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

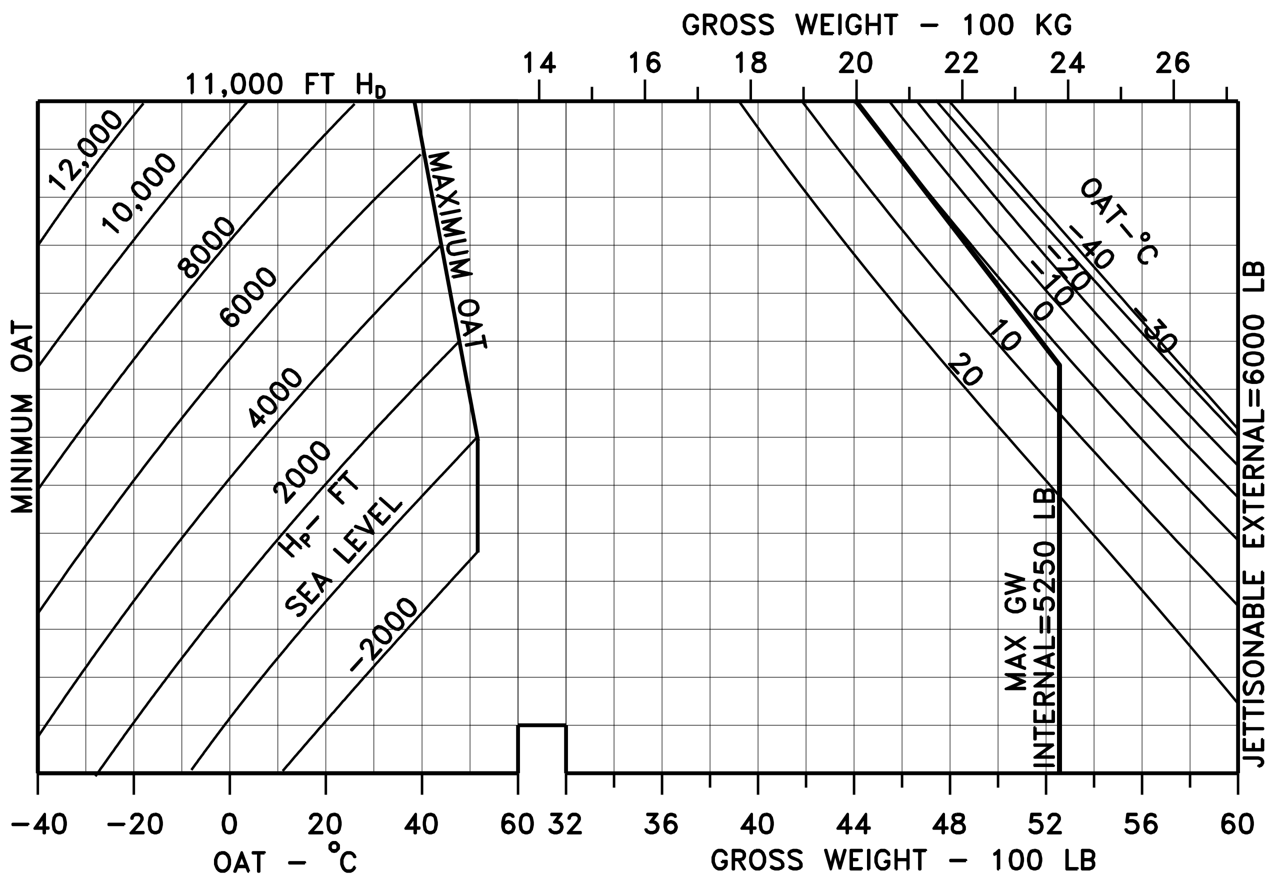


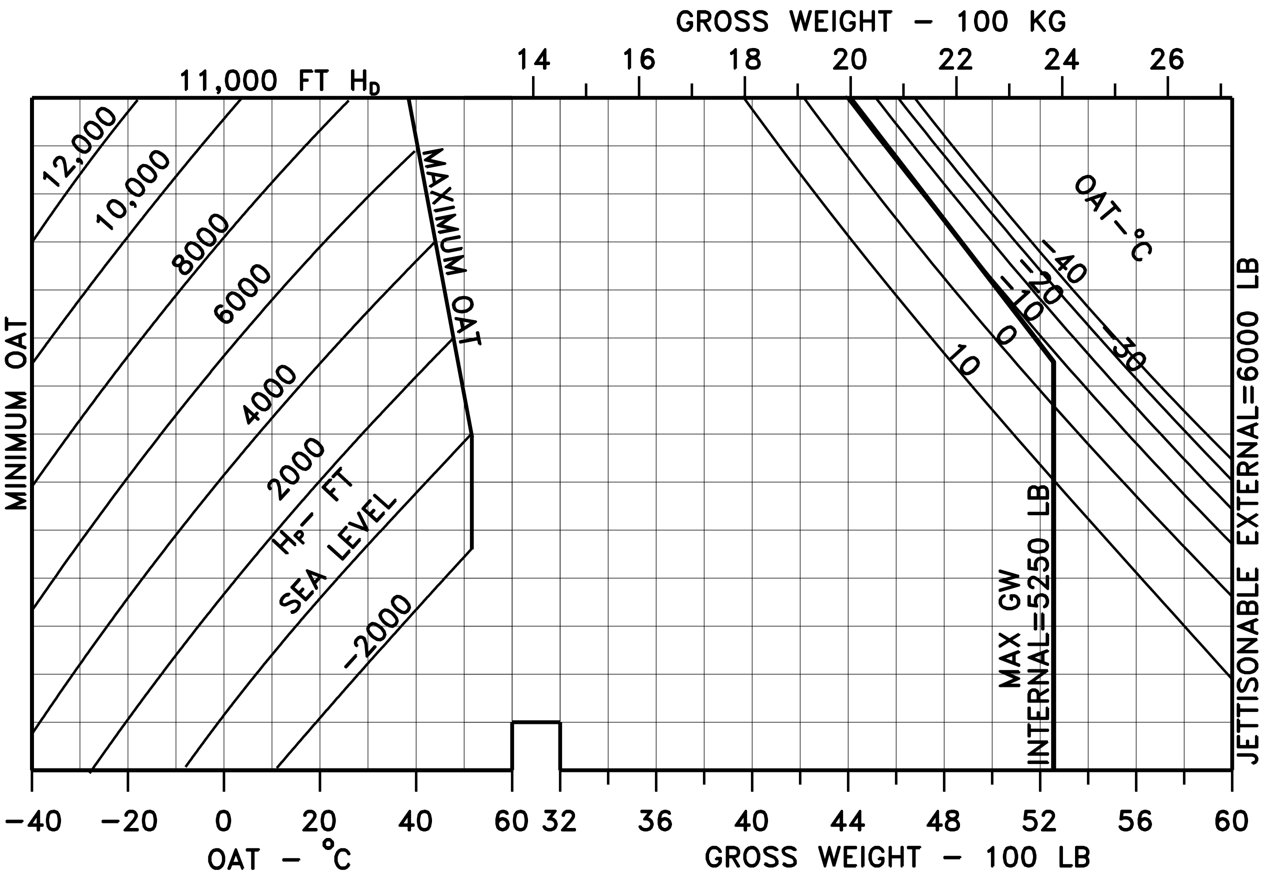
Figure 4-3. Hover ceiling IGE – takeoff power (sheet 15 of 16)

HOVER CEILING
IN GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



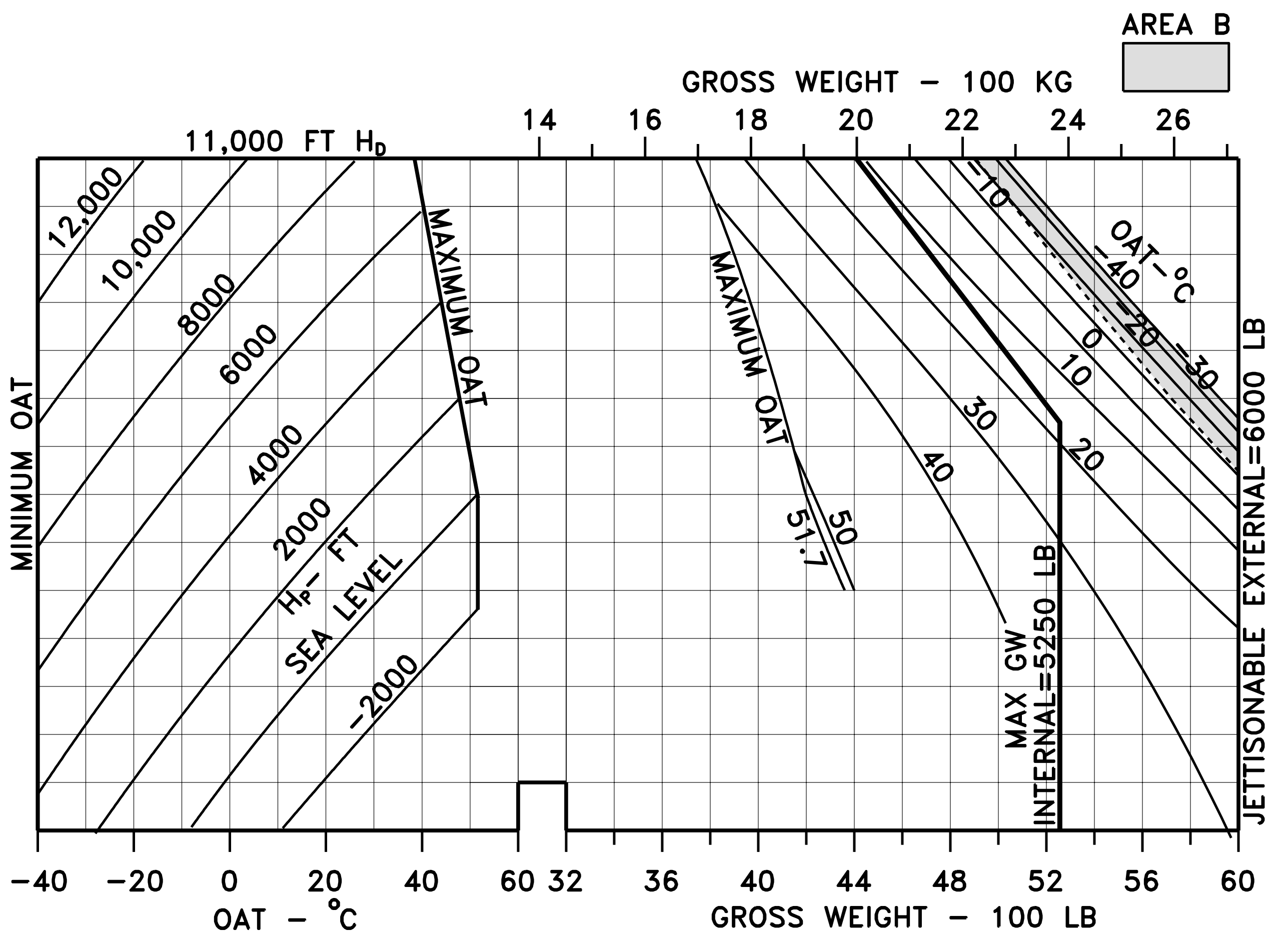
M407_FMS-28__FIG_4-3_(16_OF_16).EPS

Figure 4-3. Hover ceiling IGE – takeoff power (sheet 16 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET



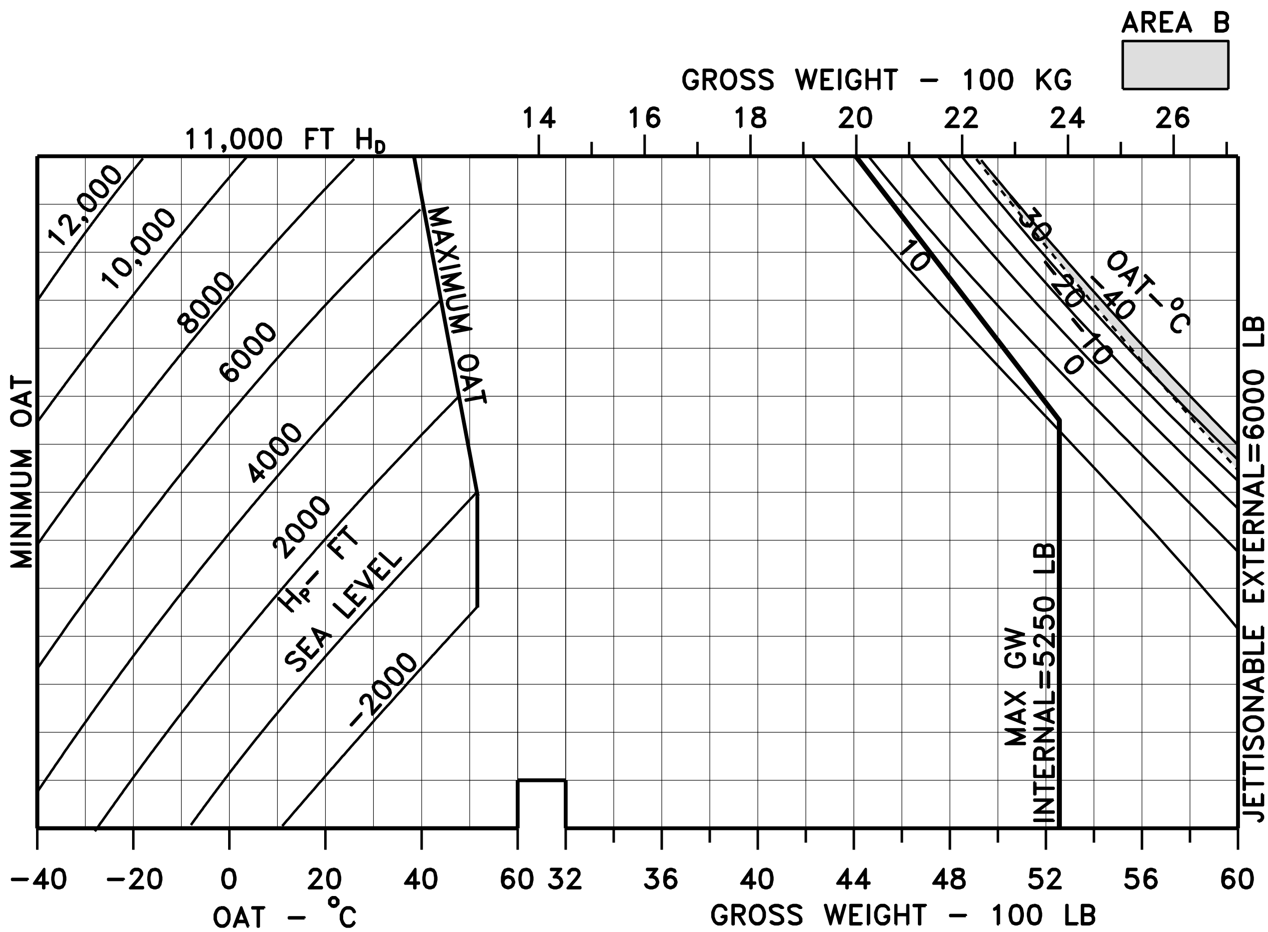
M407_FMS-28__FIG_4-4_(1_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 1 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET



M407_FMS-28__FIG_4-4_(2_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 2 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET

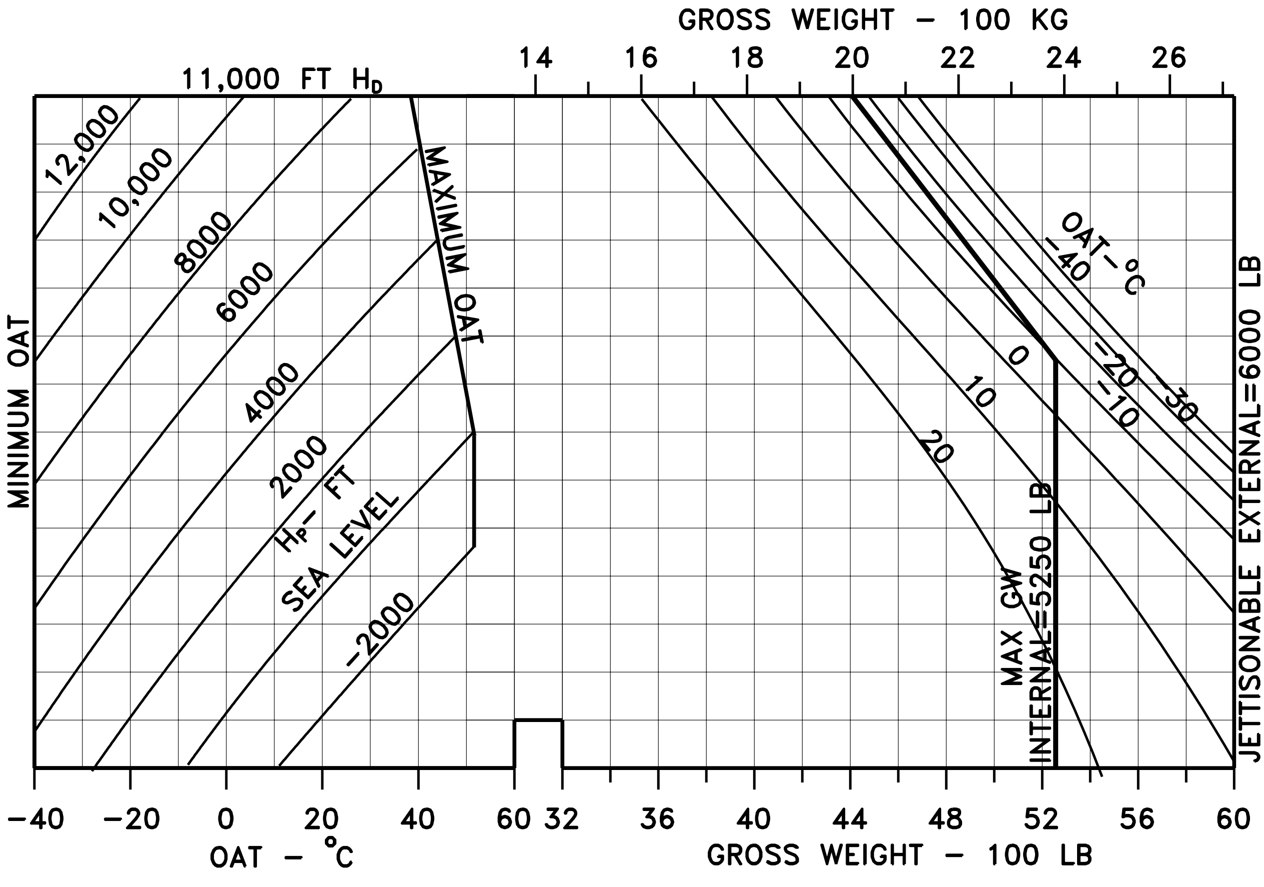


Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 3 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

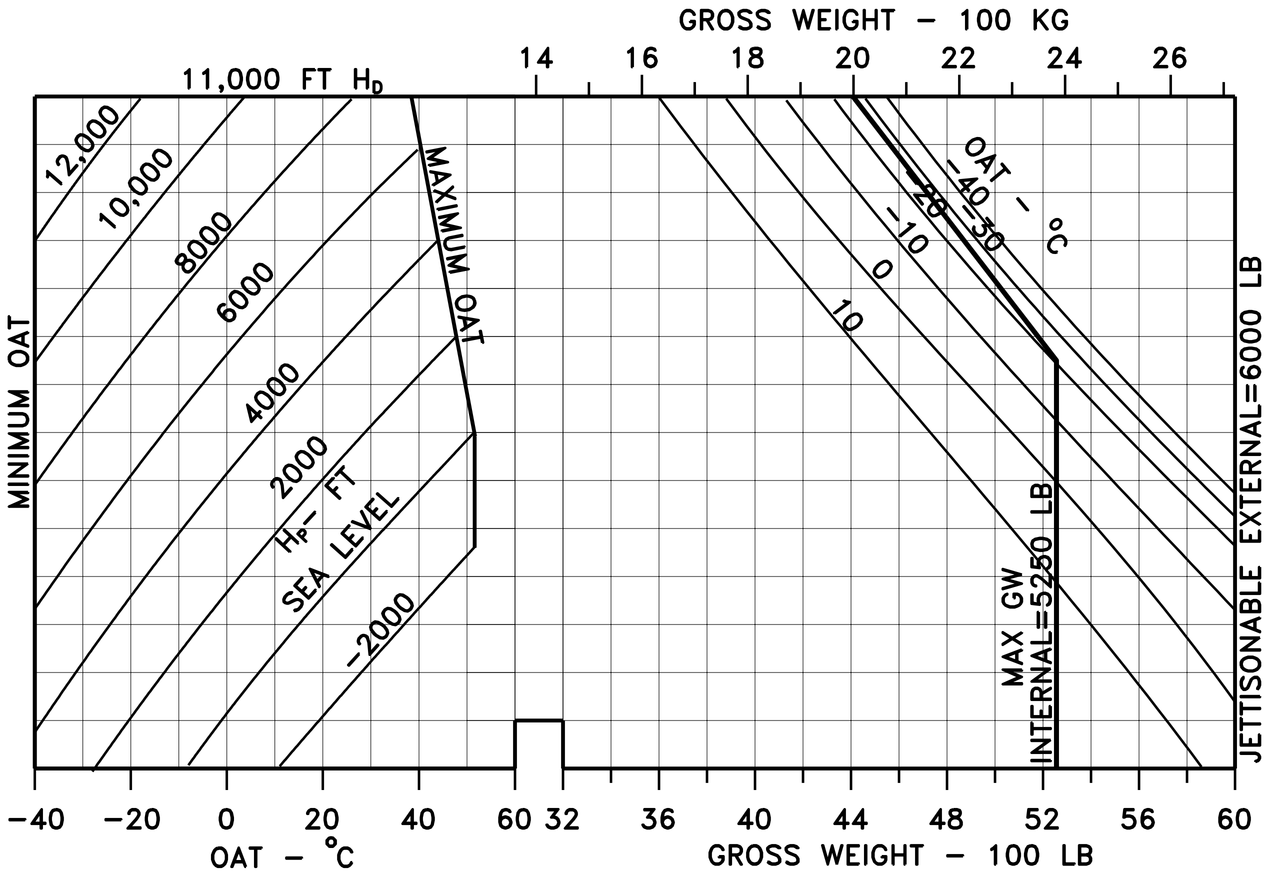


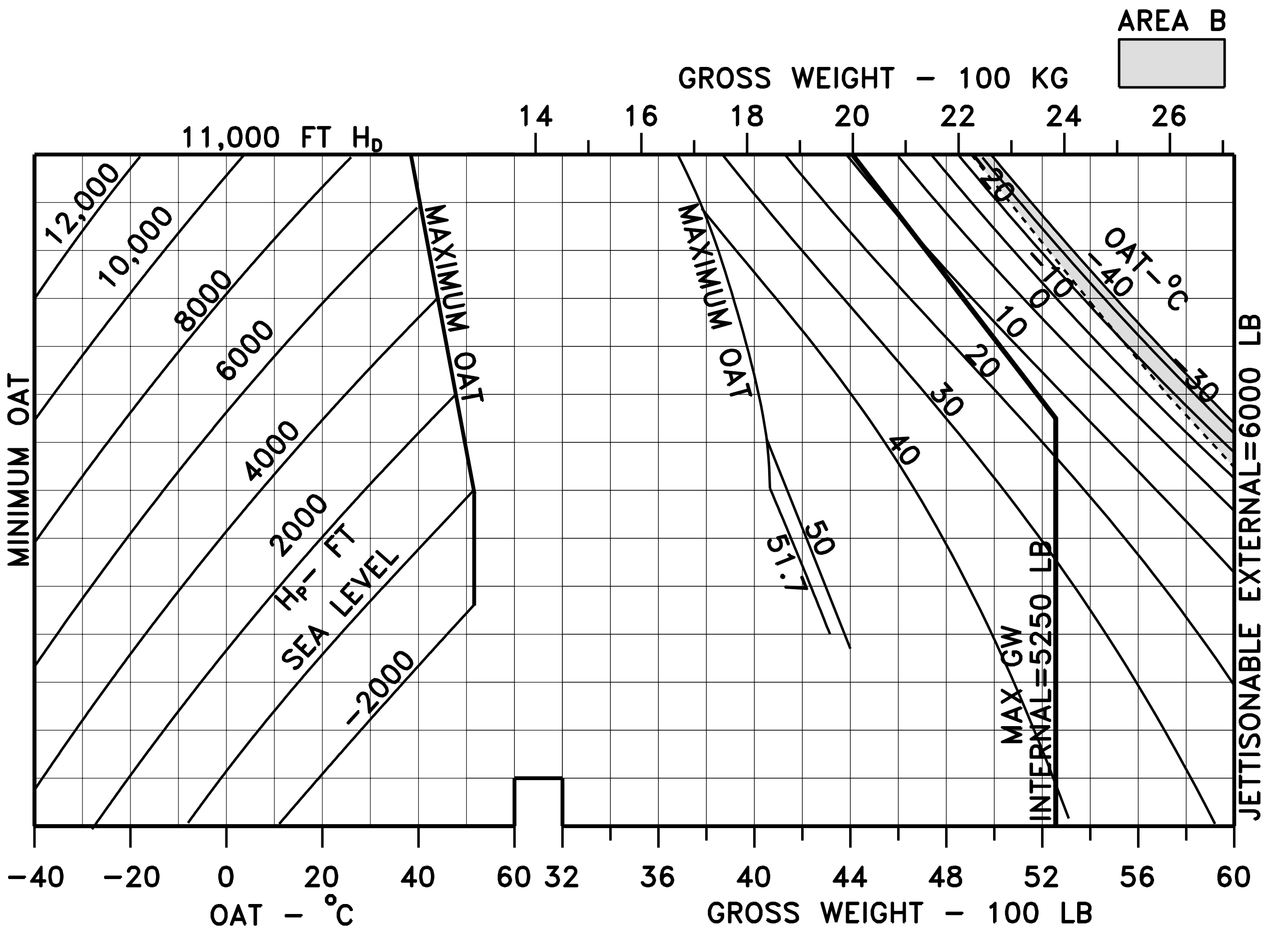
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 4 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(5_OF_16).EPS

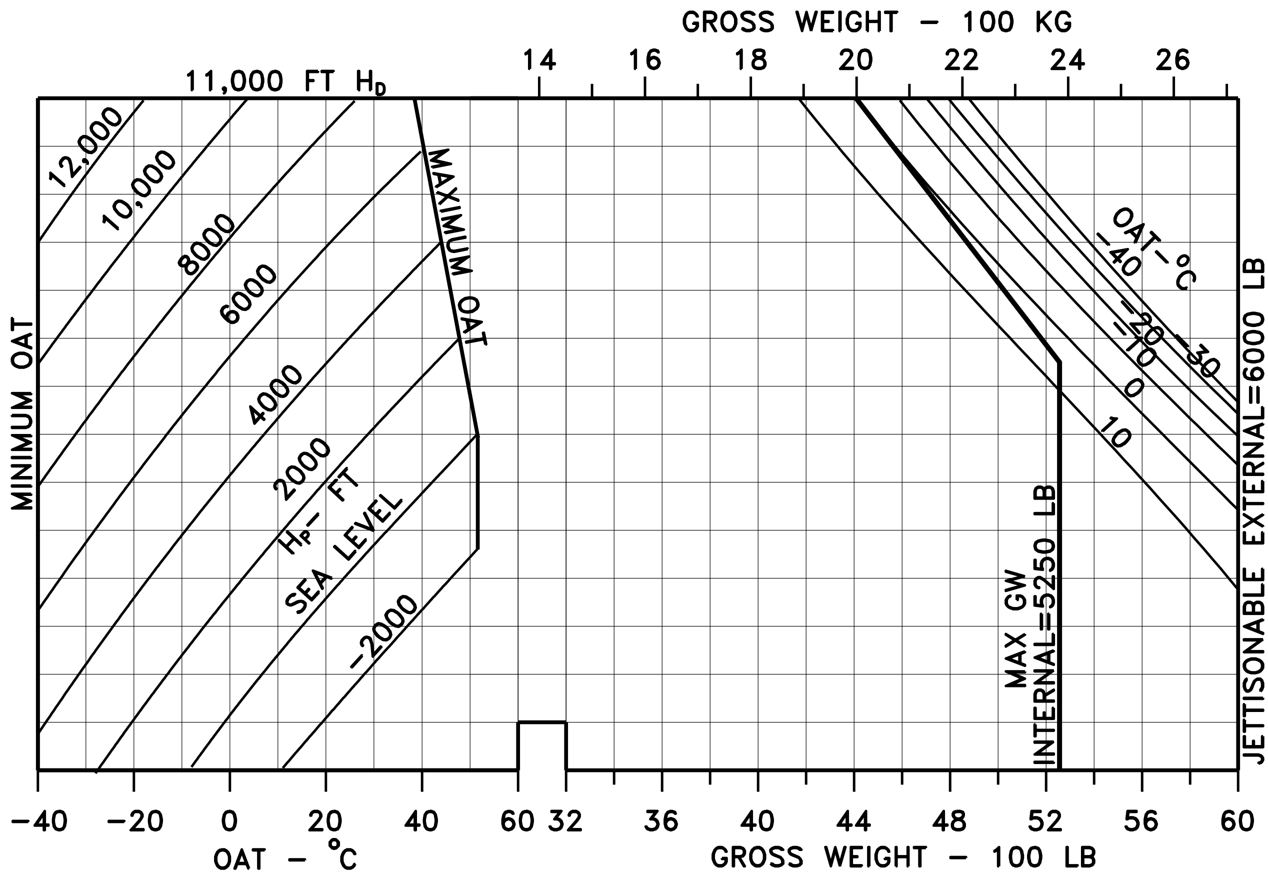
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 5 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(6_OF_16).EPS

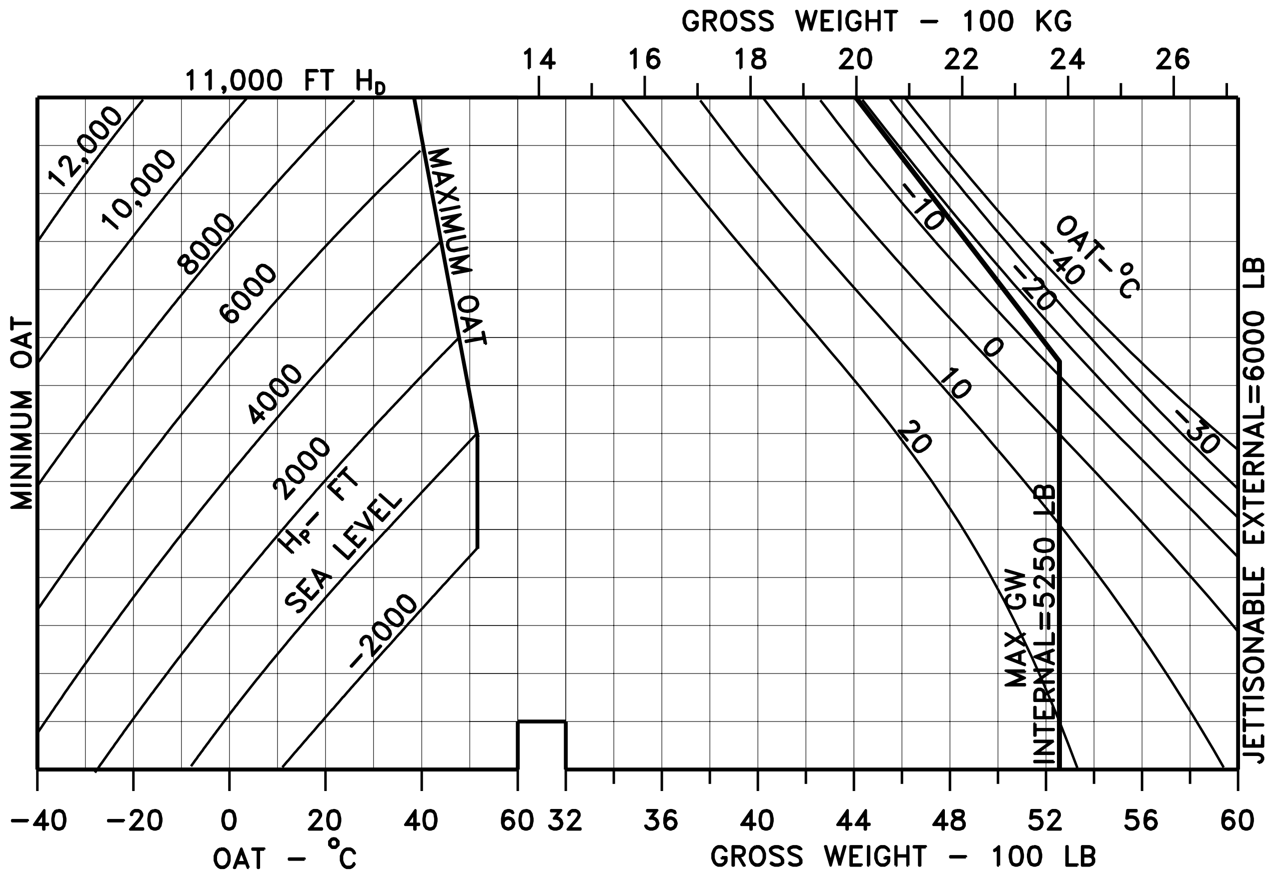
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 6 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(7_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 7 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

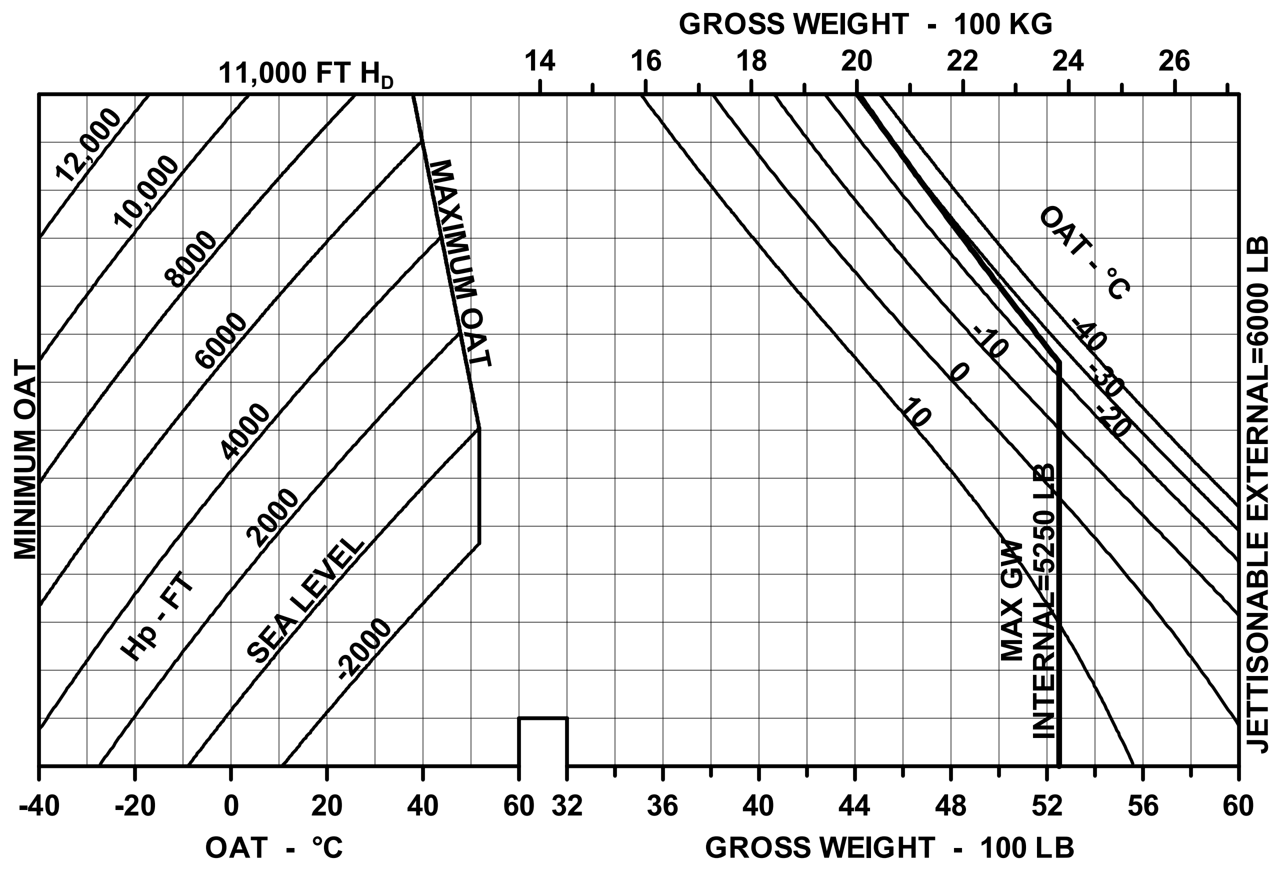
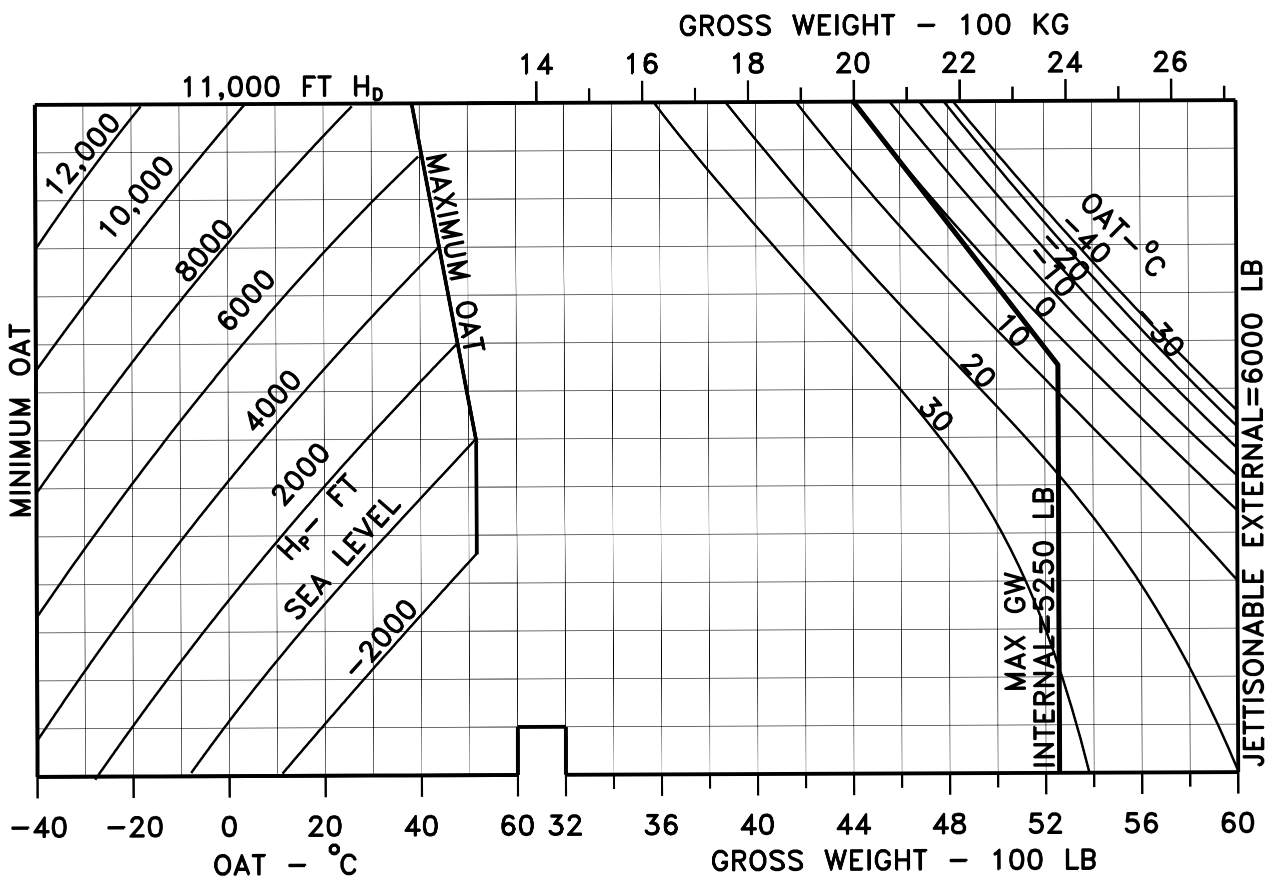


Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 8 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW BAFFLES



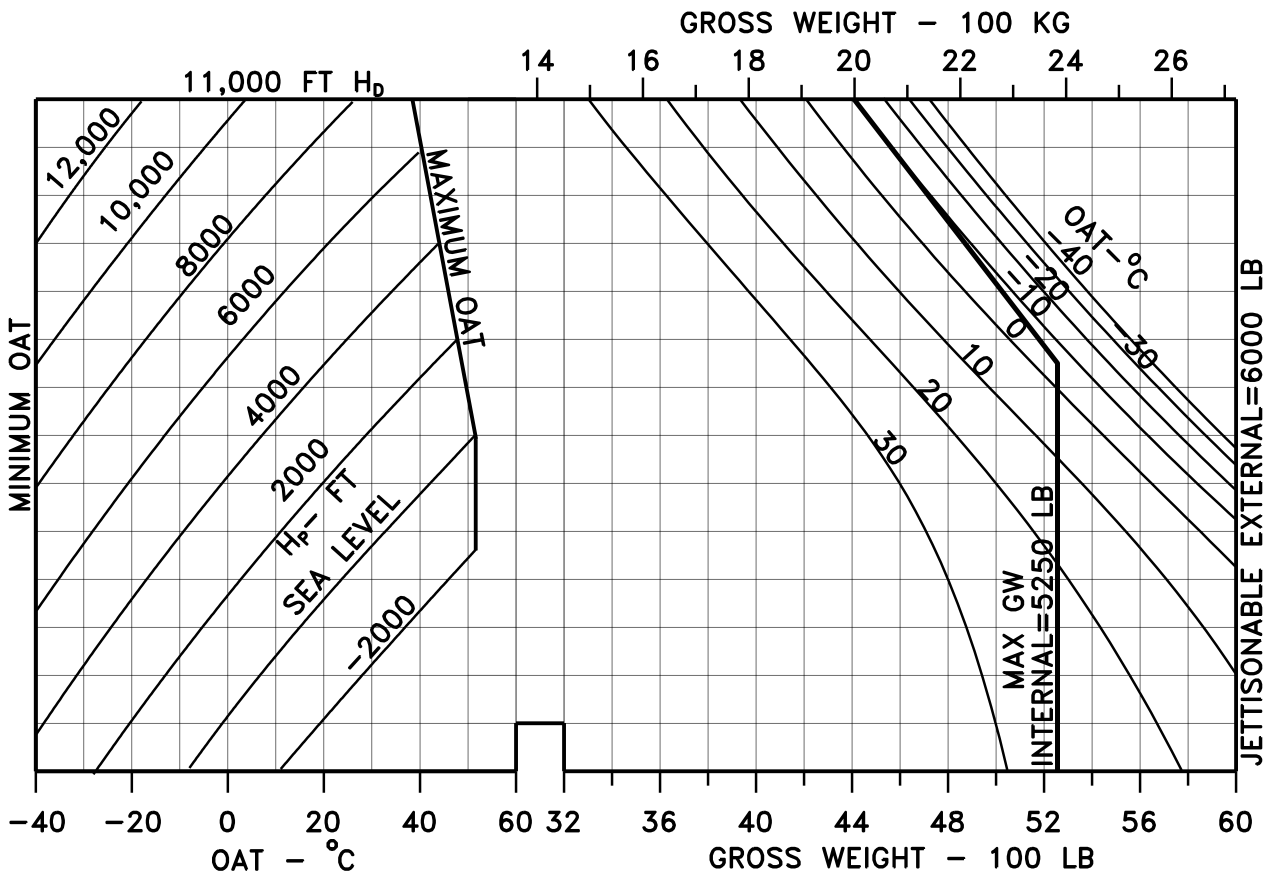
M407_FMS-28__FIG_4-4_(9_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 9 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



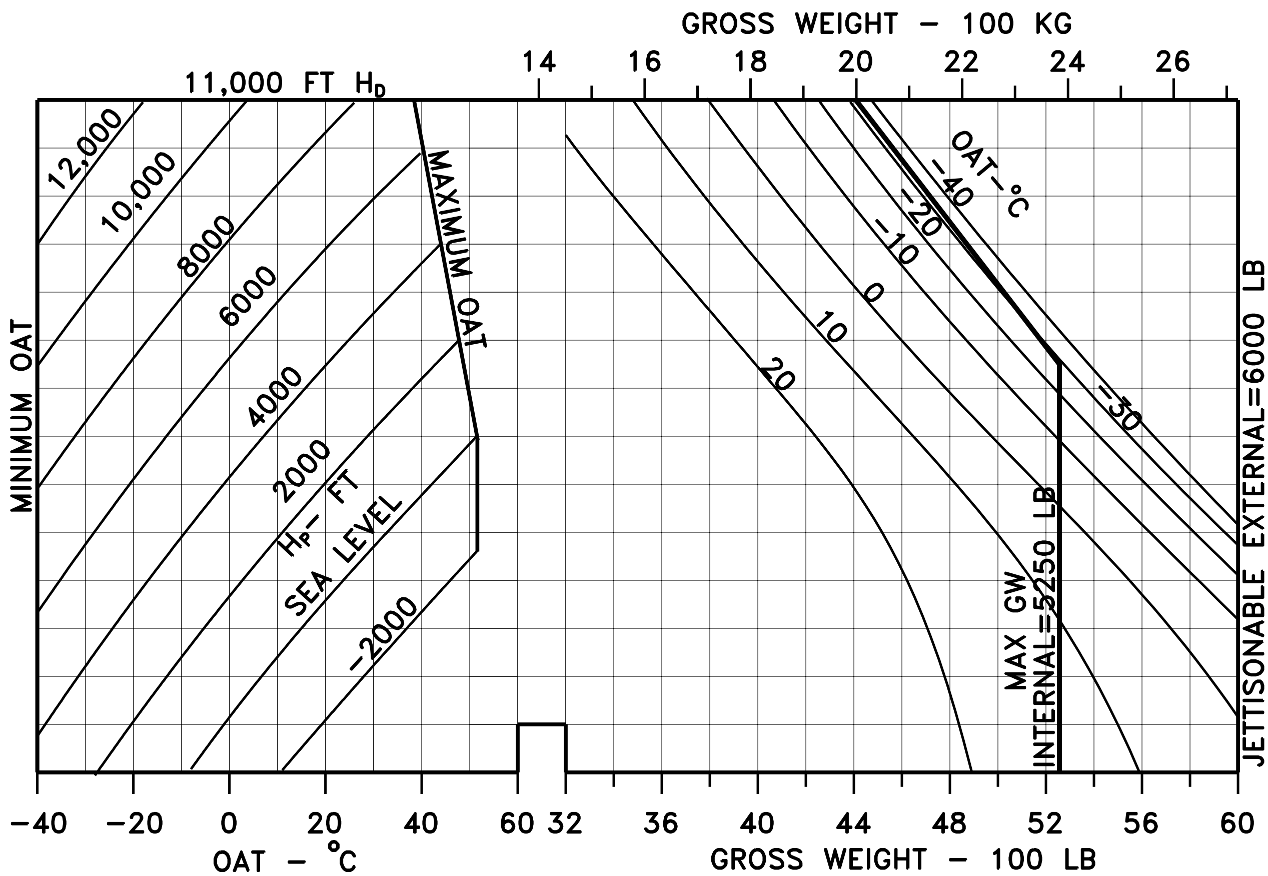
M407_FMS-28__FIG_4-4_(10_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 10 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
BASIC INLET
SNOW BAFFLES



M407_FMS-28__FIG_4-4_(11_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 11 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW BAFFLES

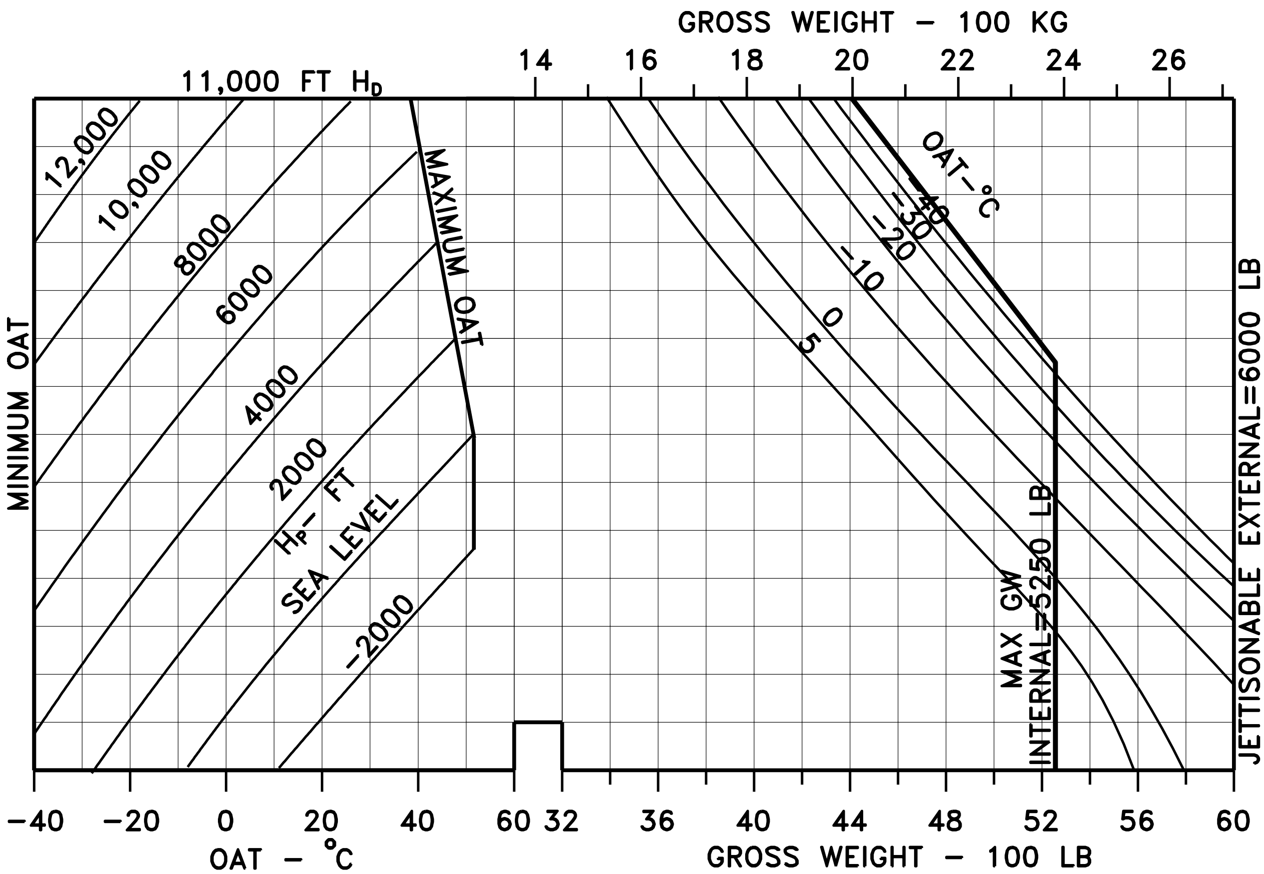


Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 12 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS

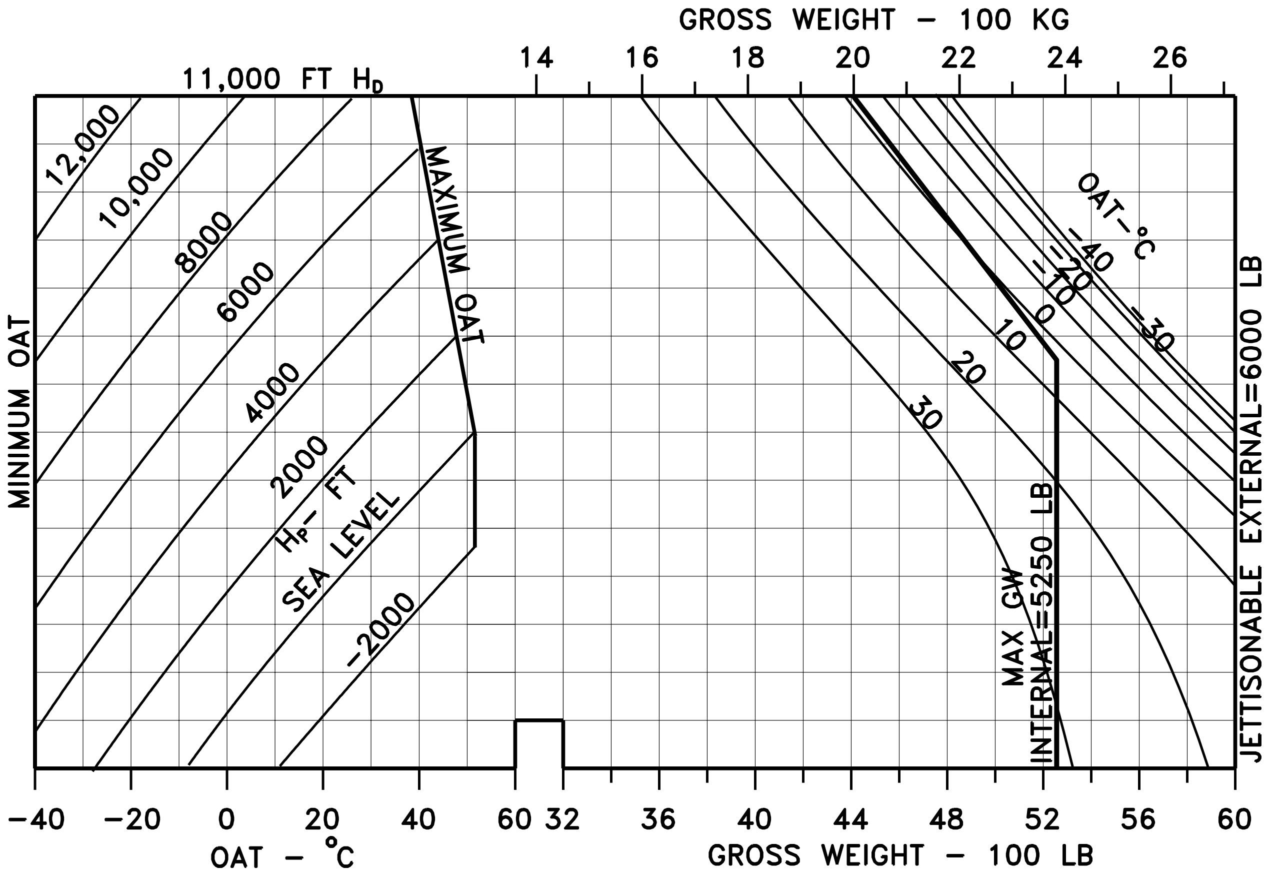


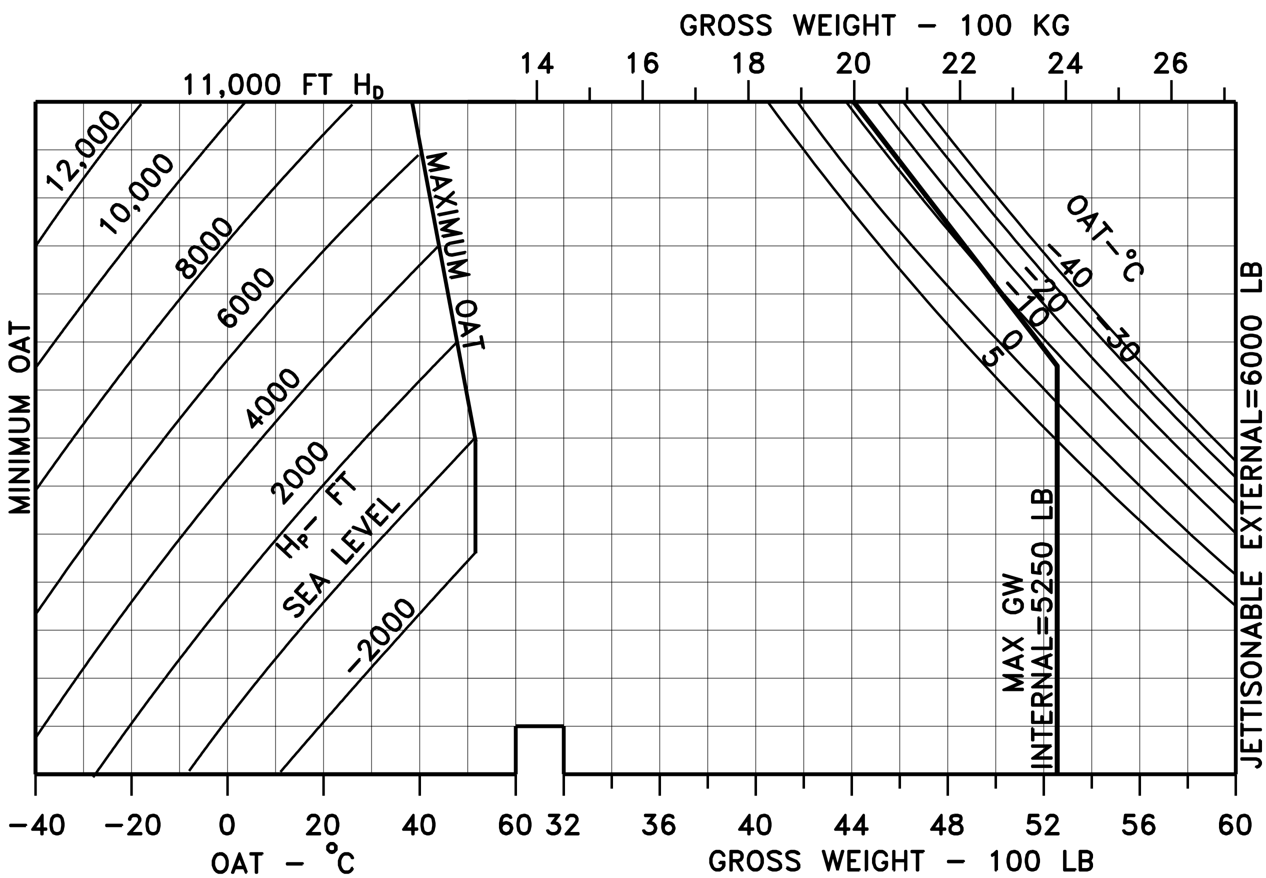
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 13 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(14_OF_16).EPS

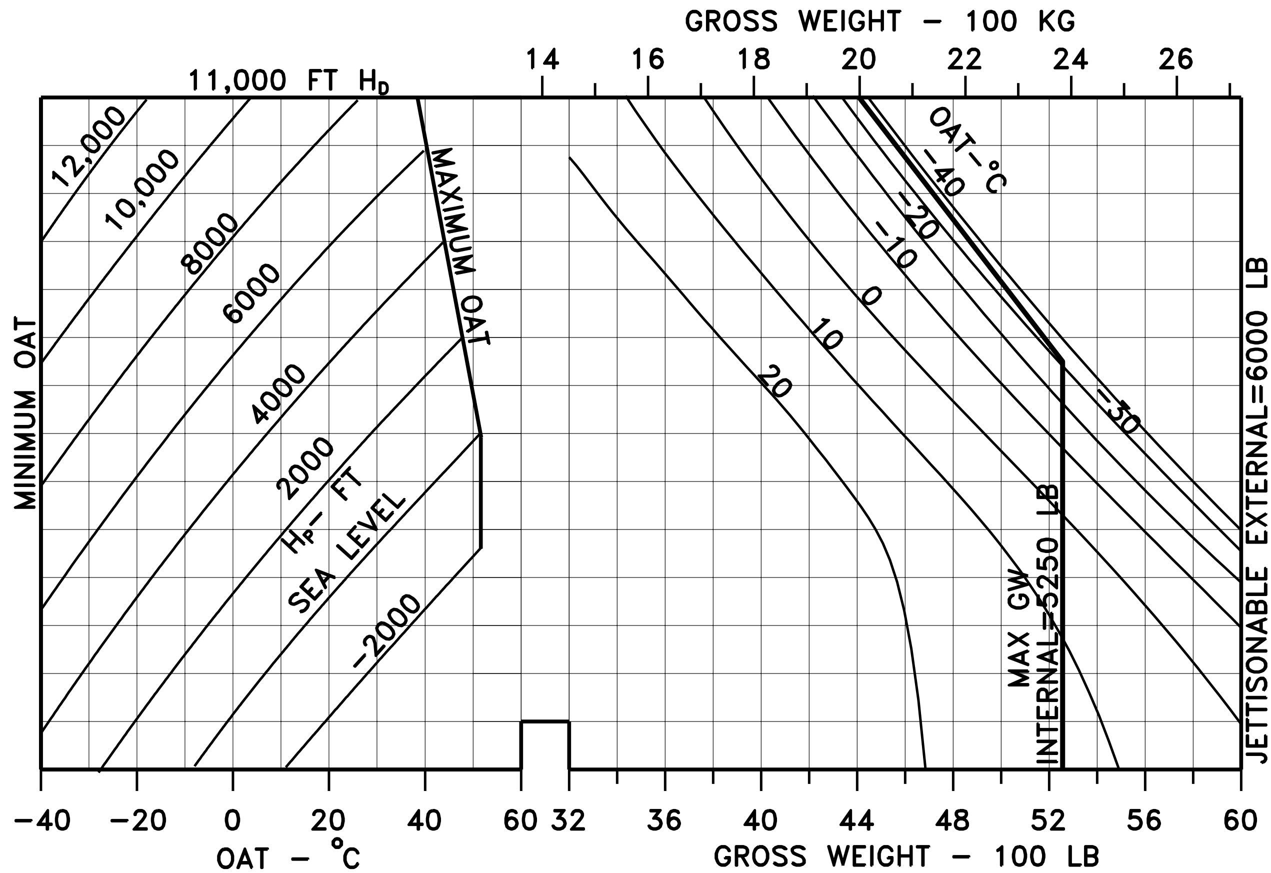
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 14 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(15_OF_16).EPS

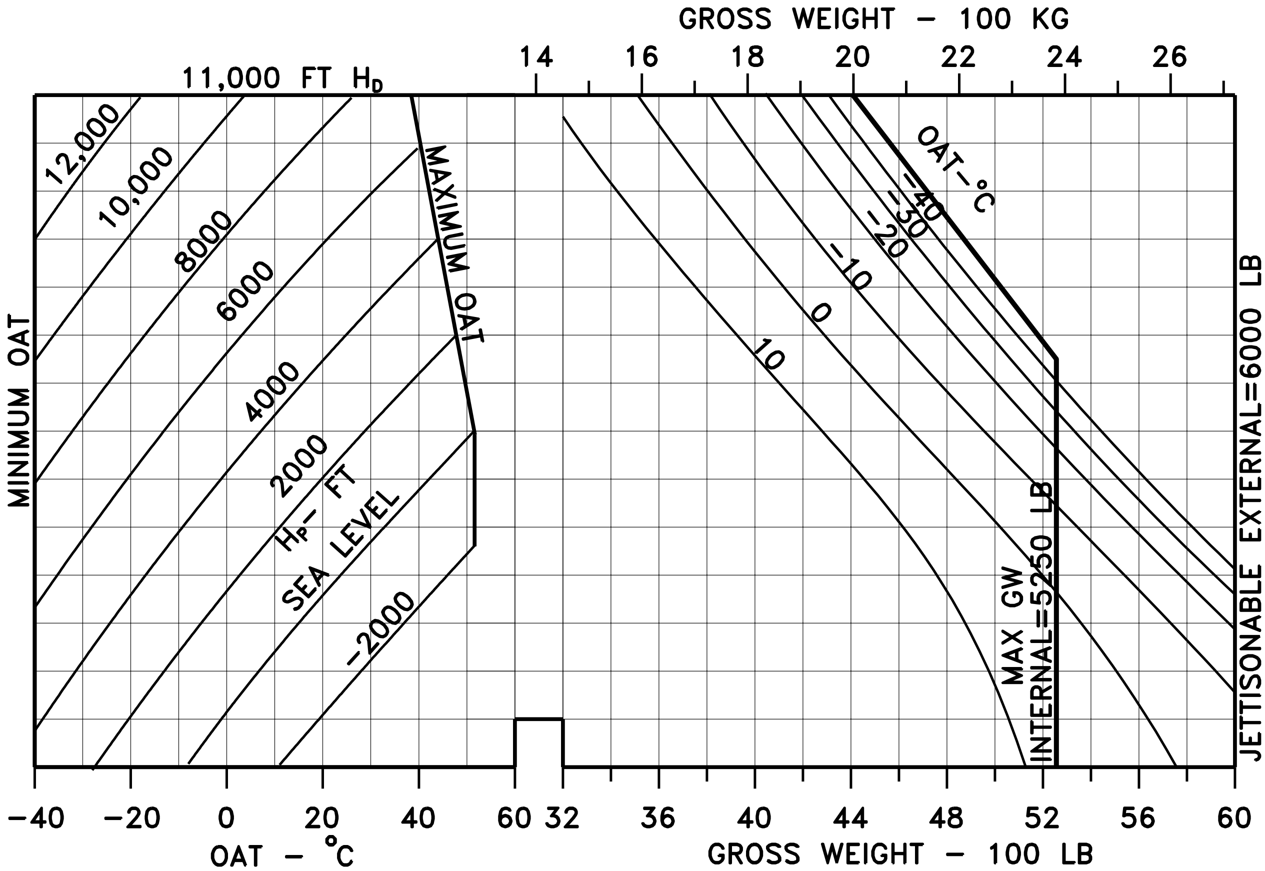
Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 15 of 16)

HOVER CEILING
IN GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 4 FT (1.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 55 LBS



M407_FMS-28__FIG_4-4_(16_OF_16).EPS

Figure 4-4. Hover ceiling IGE – maximum continuous power (sheet 16 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

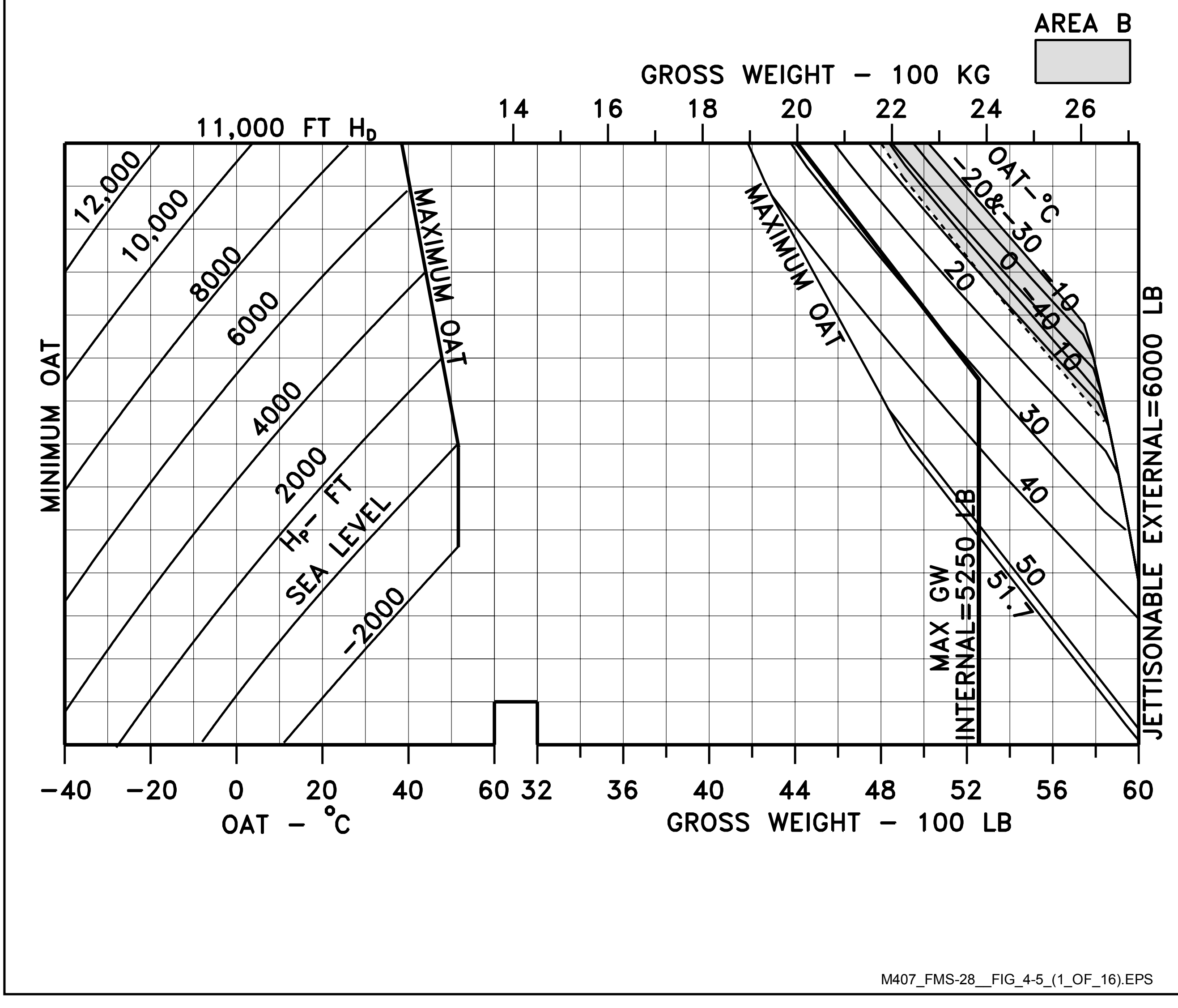
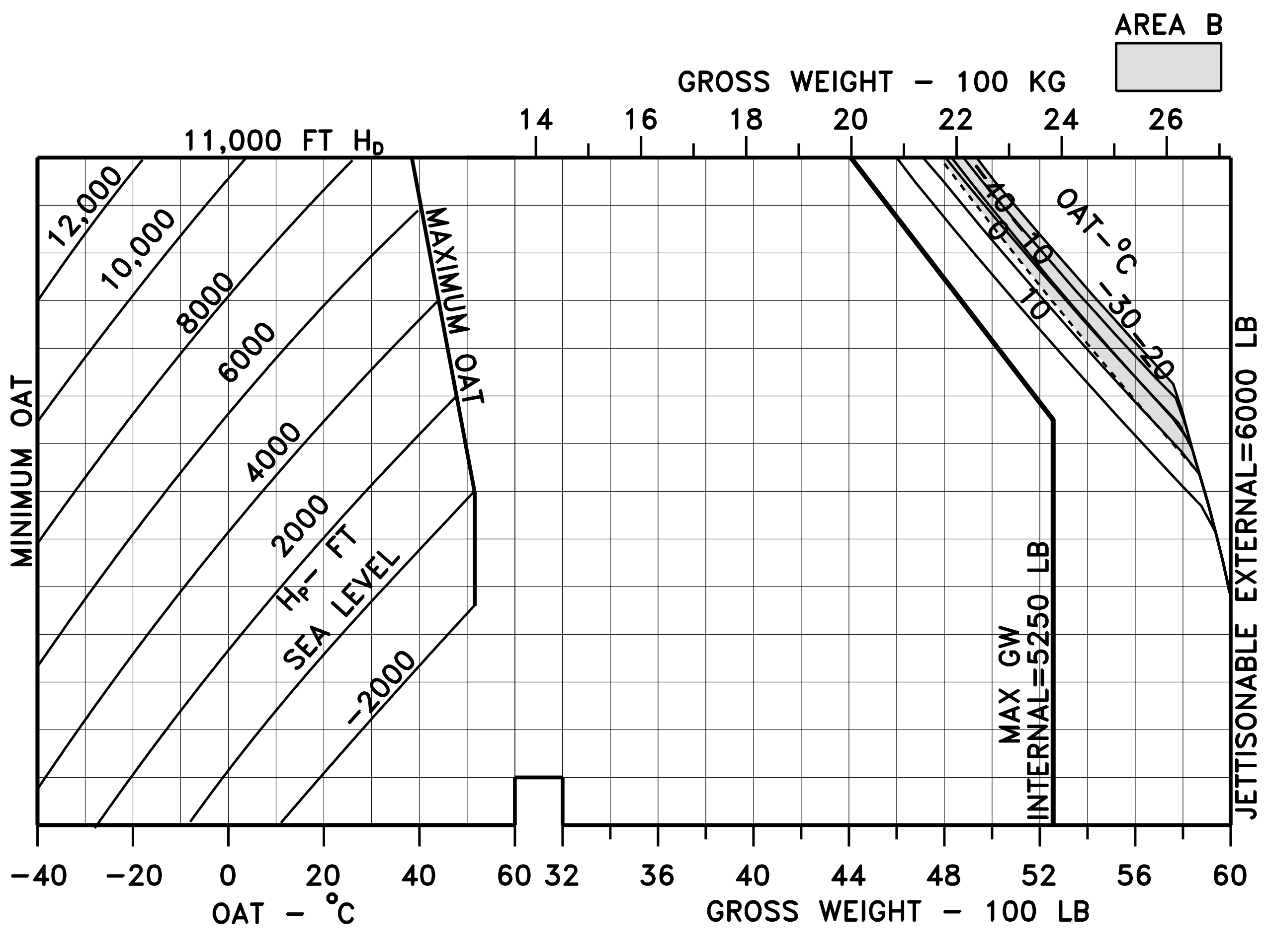


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 1 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET



M407_FMS-28__FIG_4-5_(2_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 2 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET

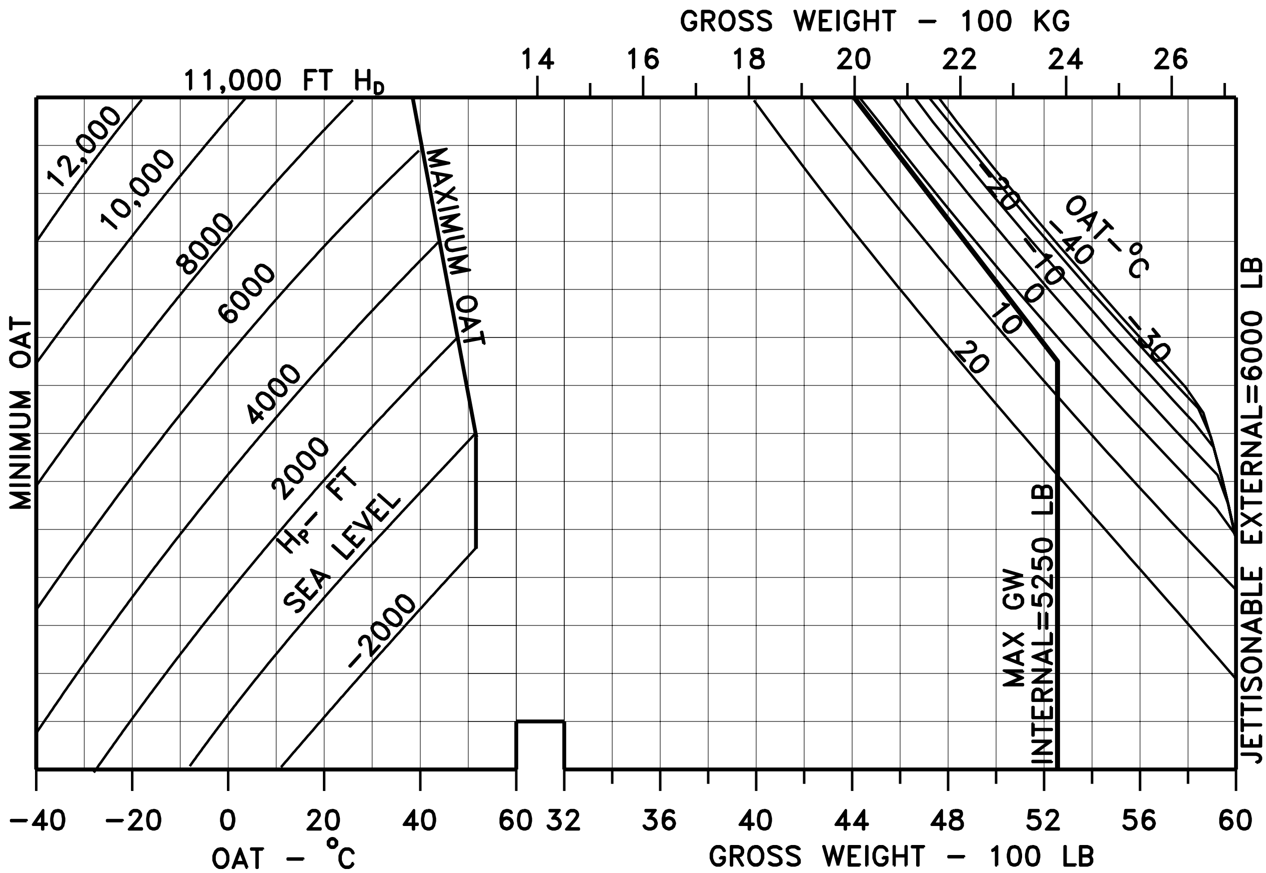


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 3 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

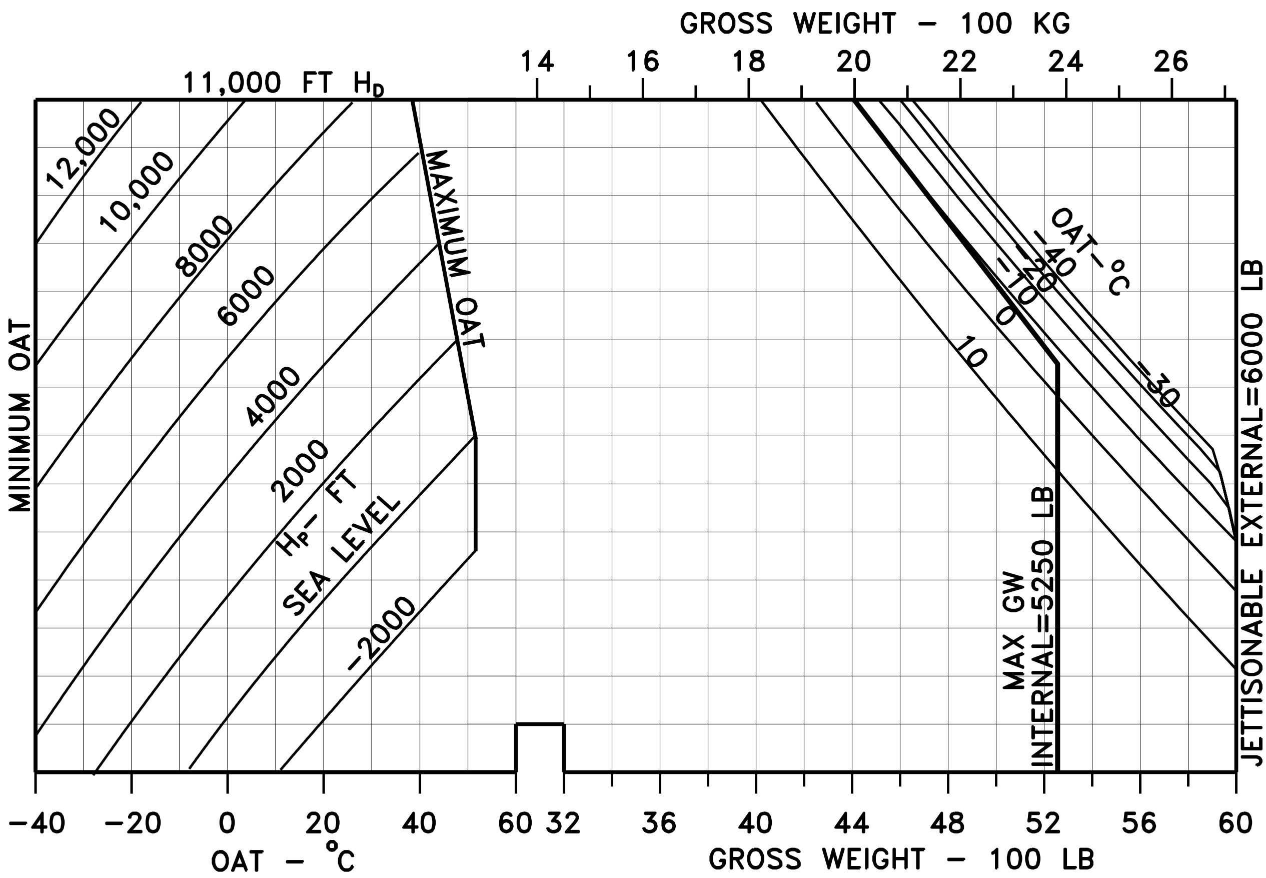


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 4 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

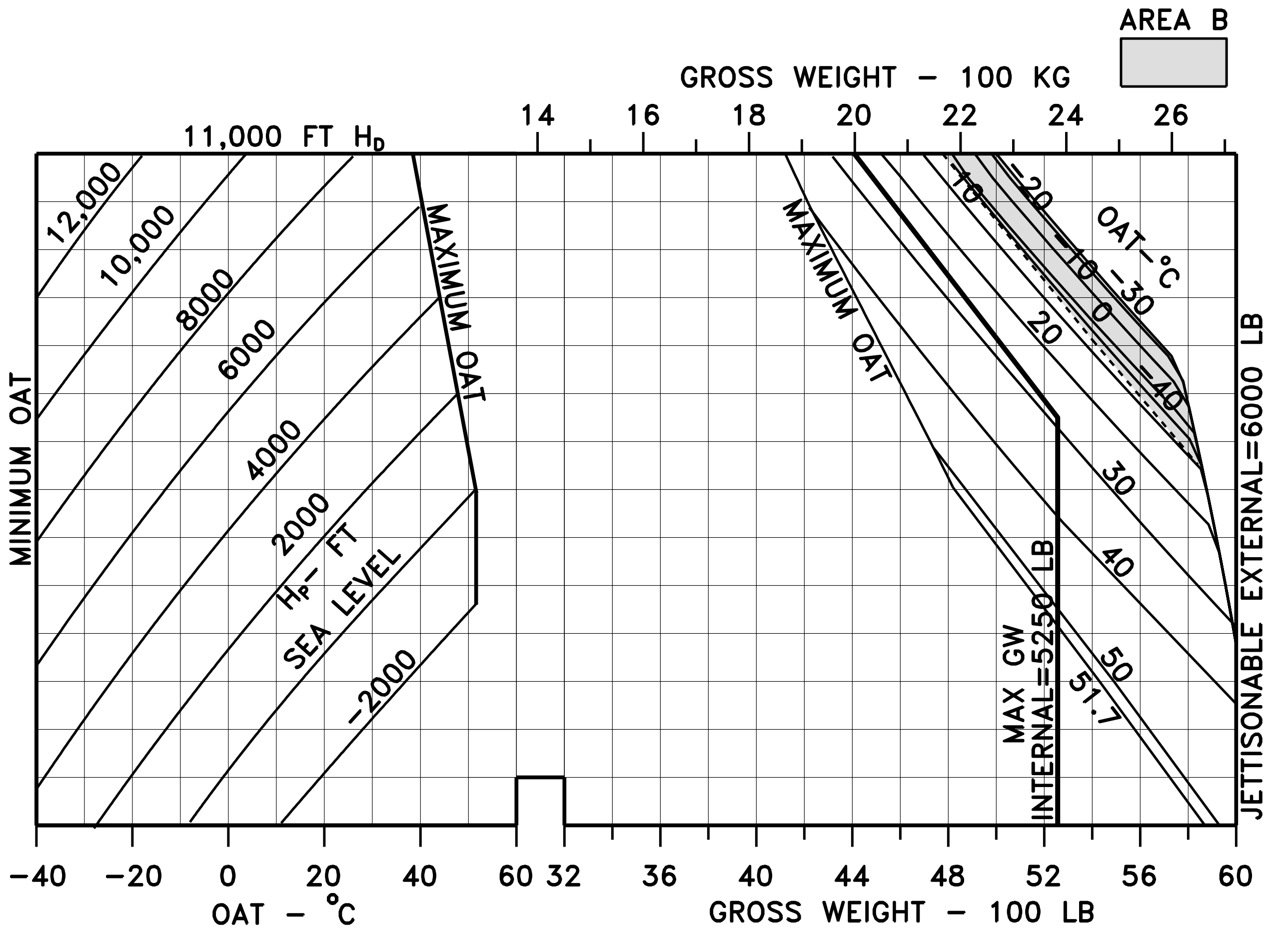


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 5 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

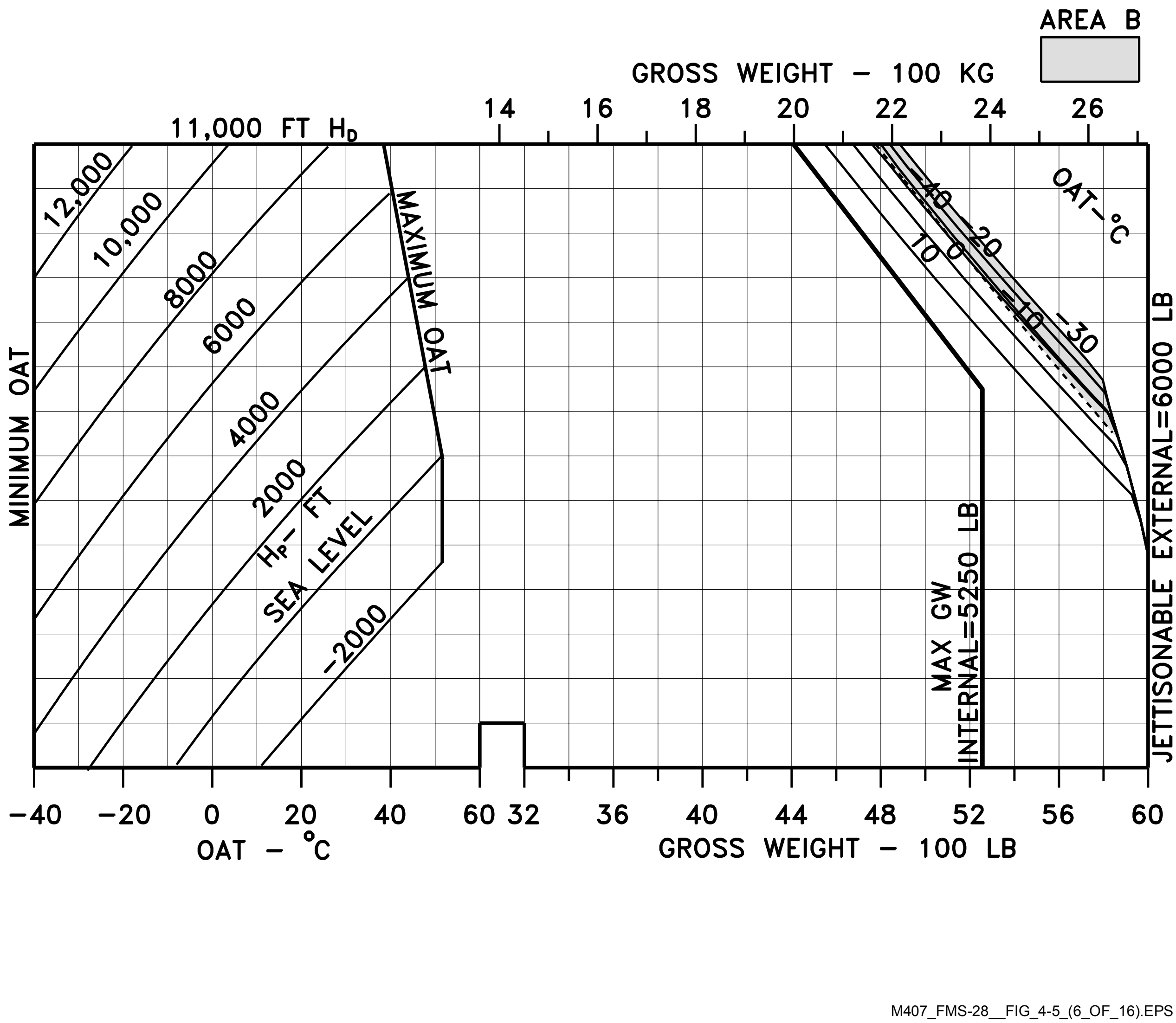


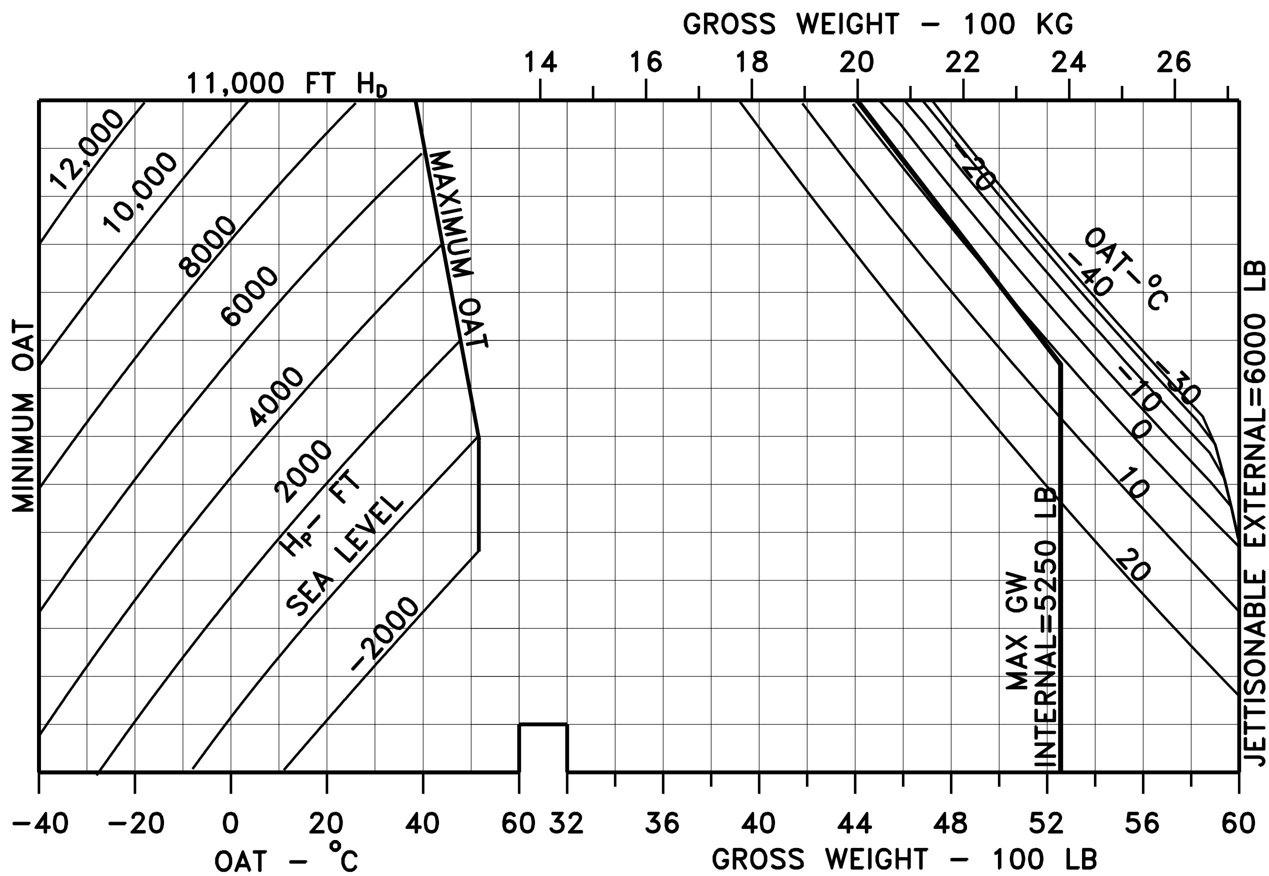
Figure 4-5. Hover ceiling OGE – takeoff power (sheet 6 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-5_(7_OF_16).EPS

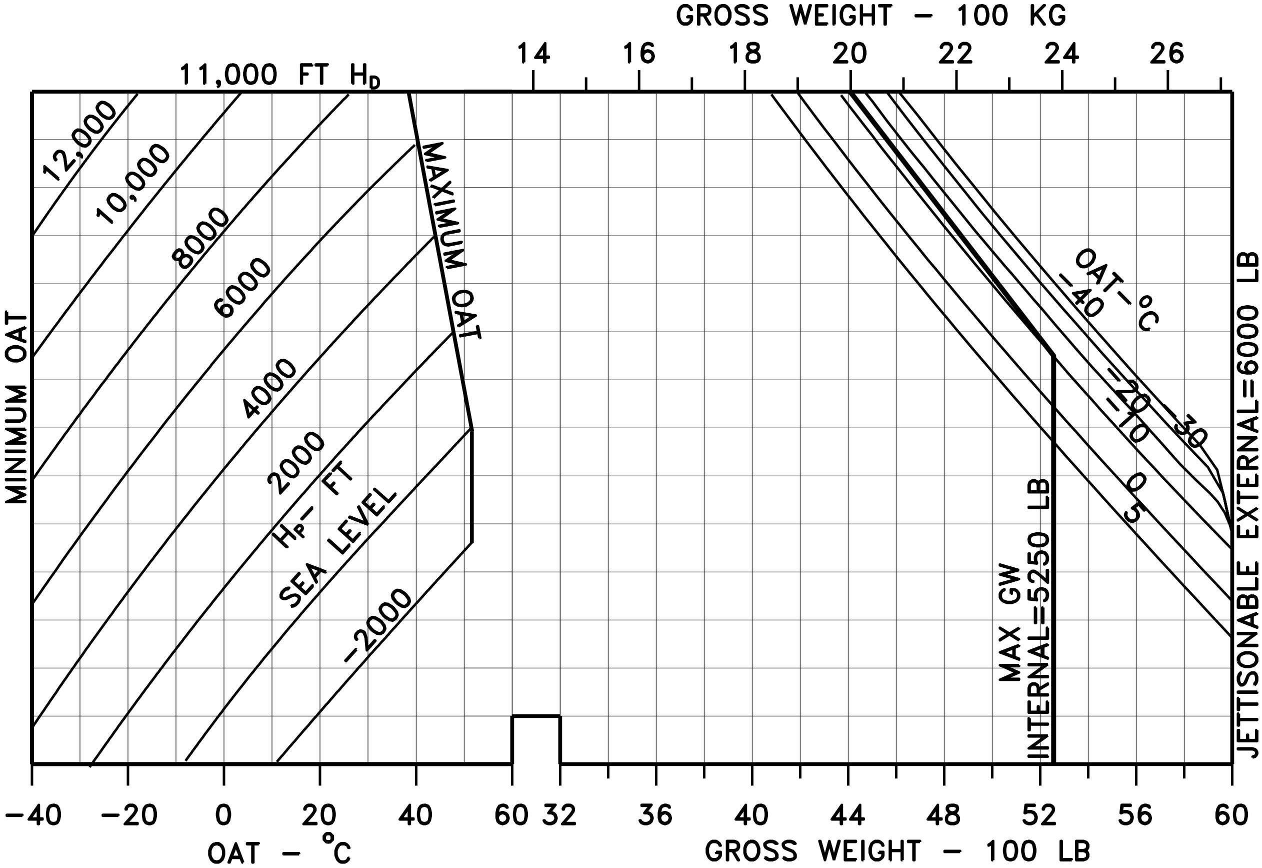
Figure 4-5. Hover ceiling OGE – takeoff power (sheet 7 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



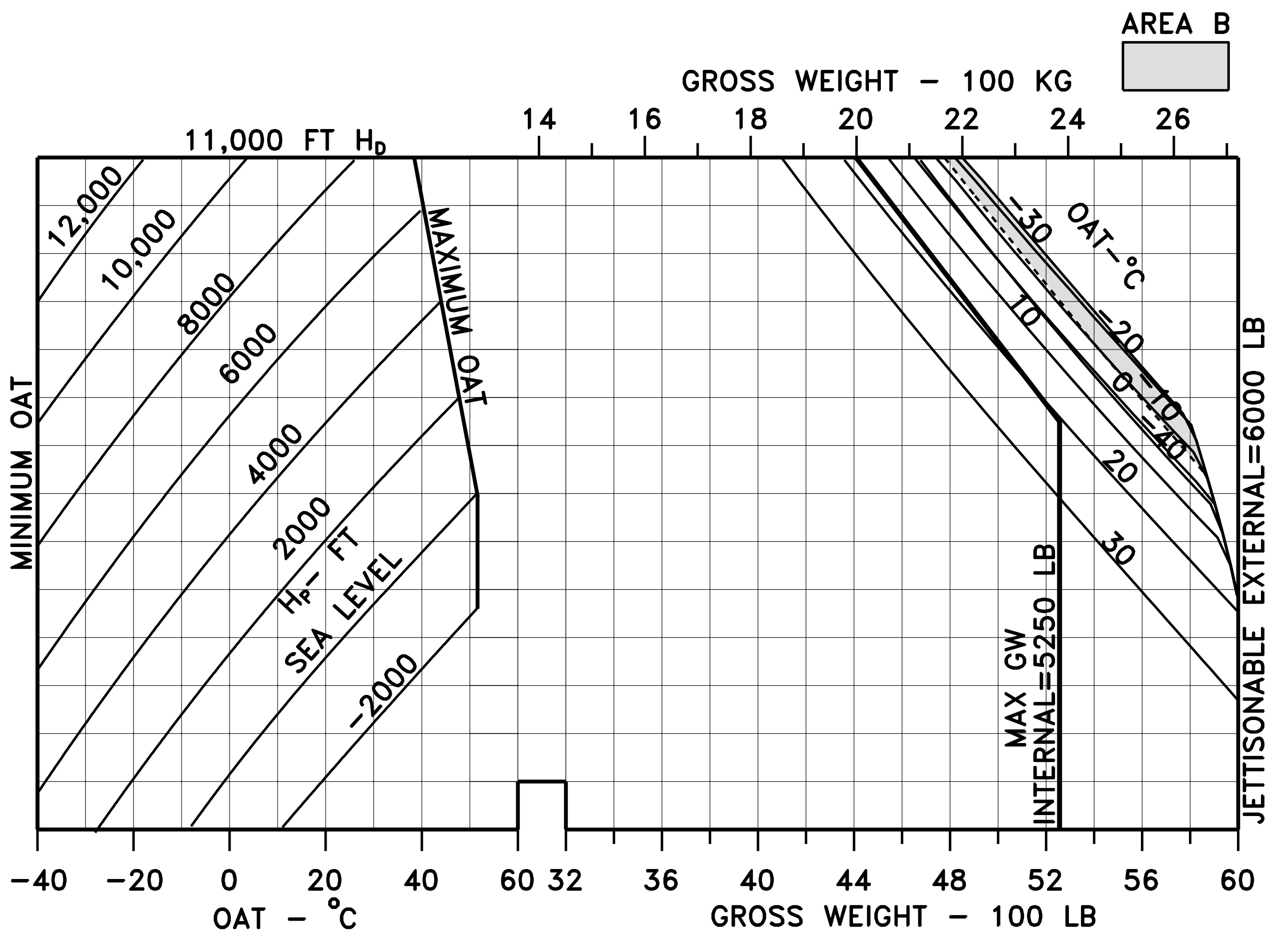
M407_FMS-28__FIG_4-5_(8_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 8 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW BAFFLES



M407_FMS-28__FIG_4-5_(9_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 9 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW BAFFLES

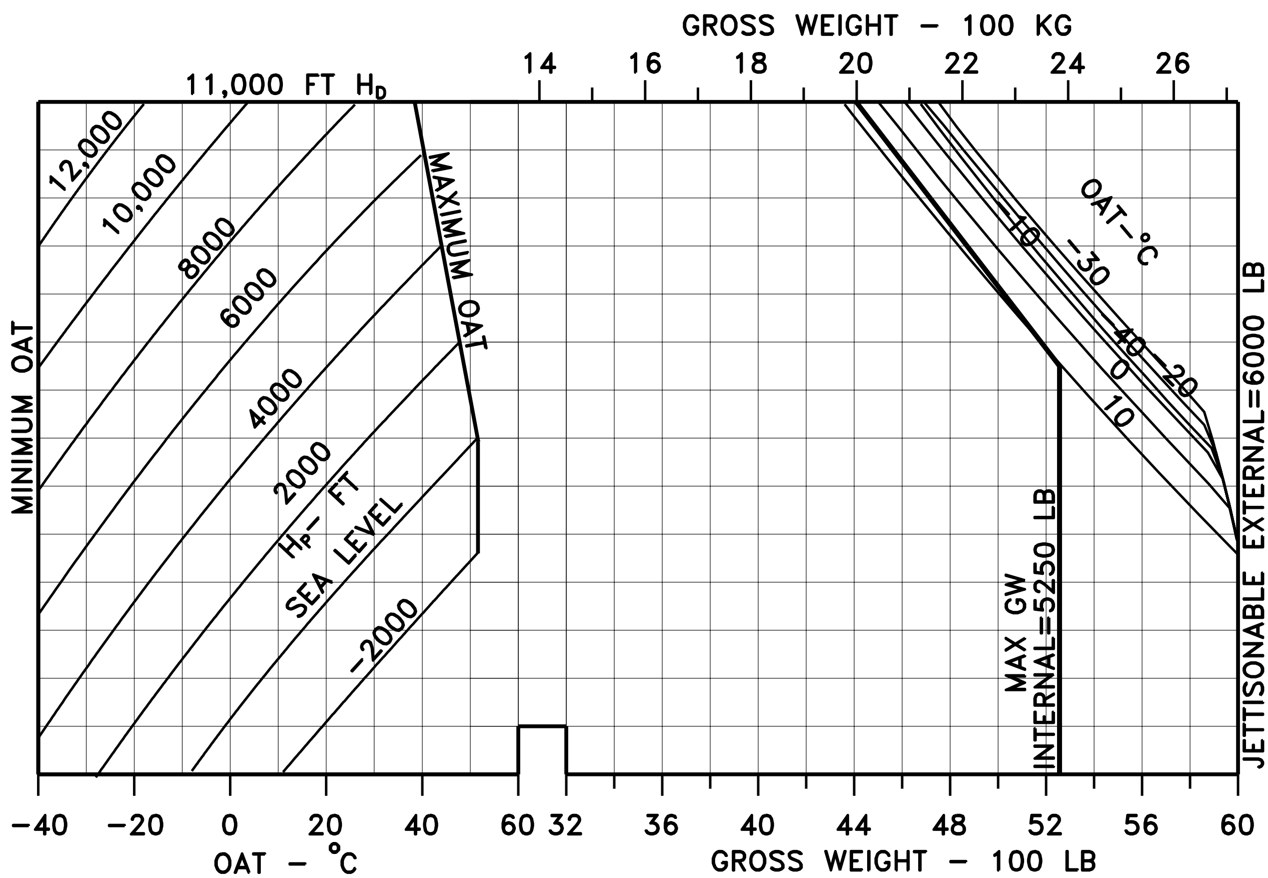
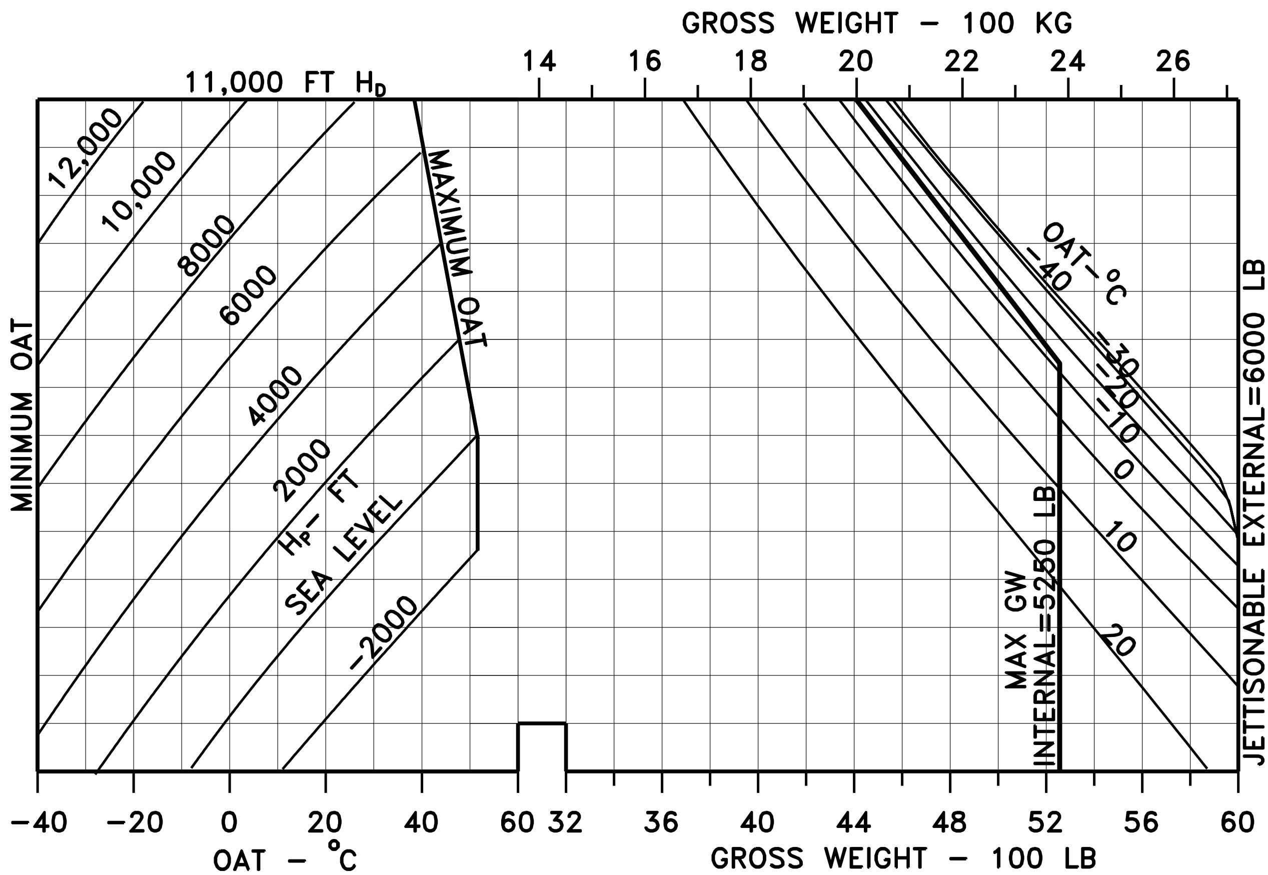


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 10 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET
SNOW BAFFLES



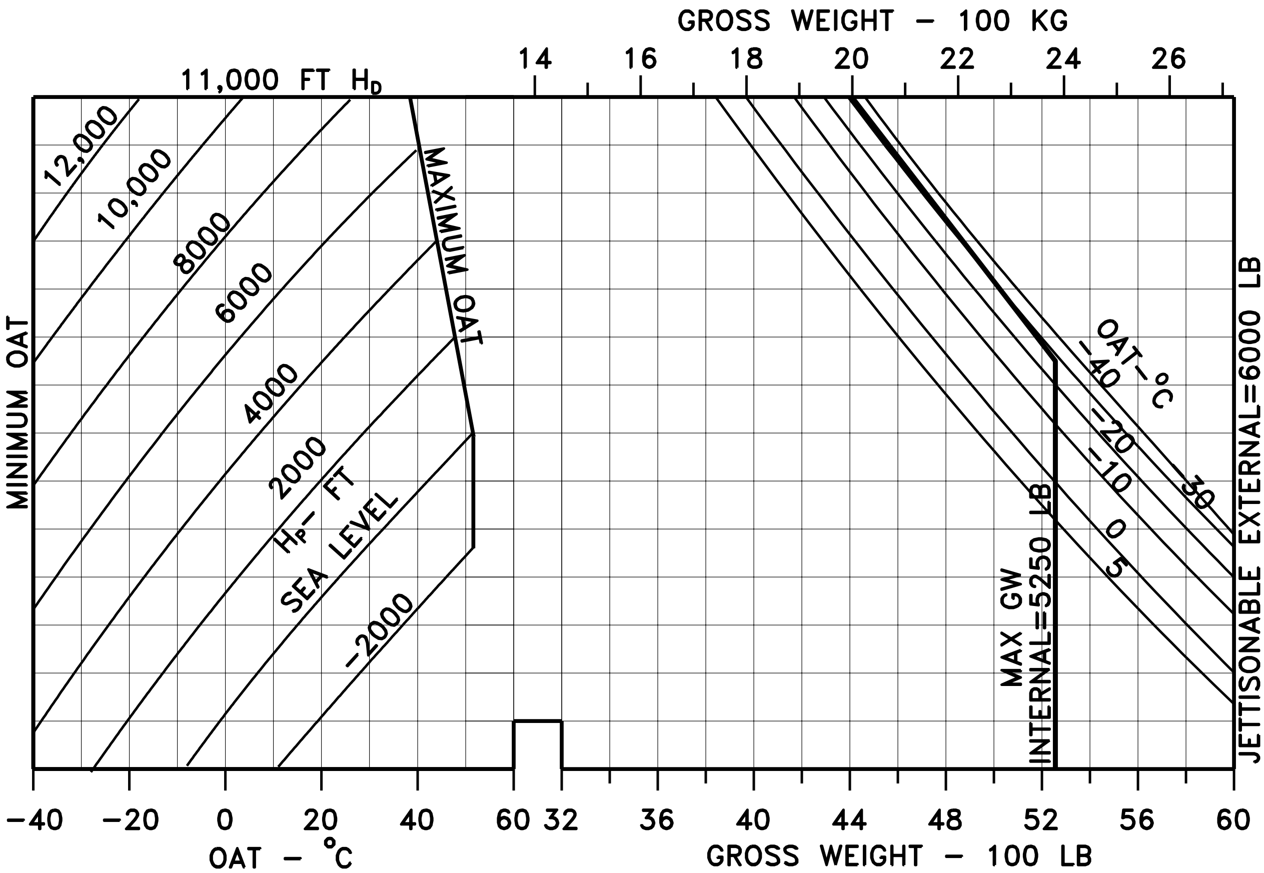
M407_FMS-28__FIG_4-5_(11_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 11 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



M407_FMS-28__FIG_4-5_(12_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 12 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

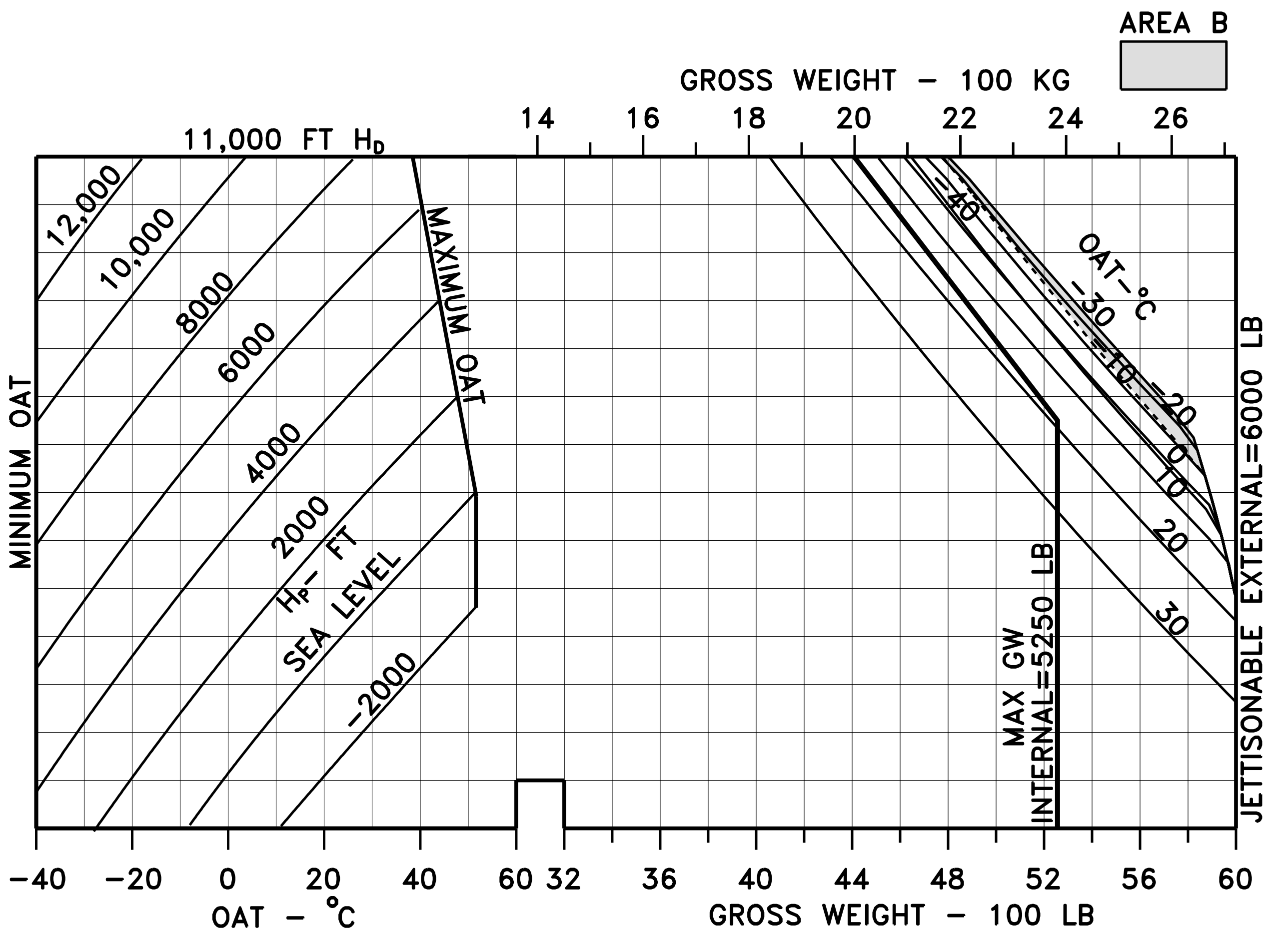


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 13 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

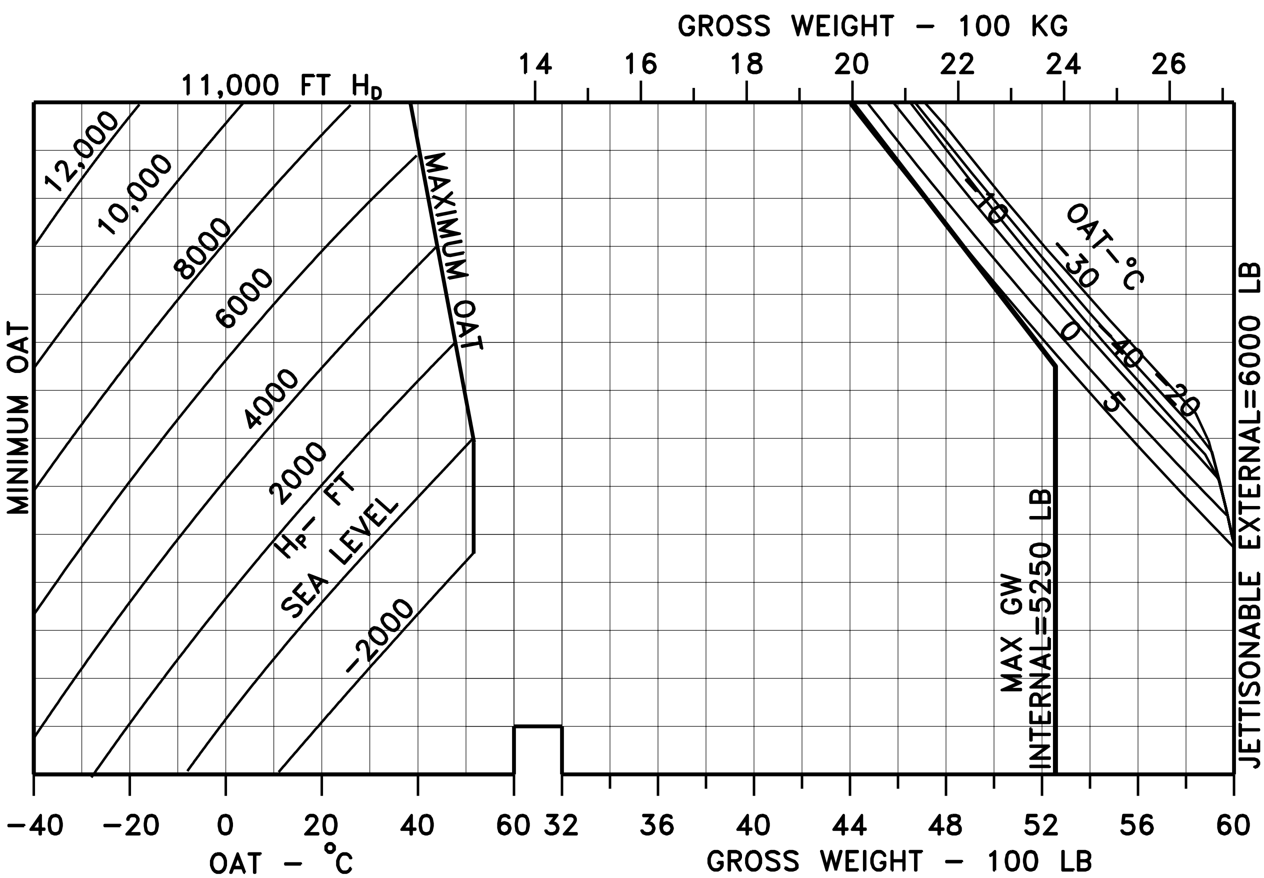


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 14 of 16)

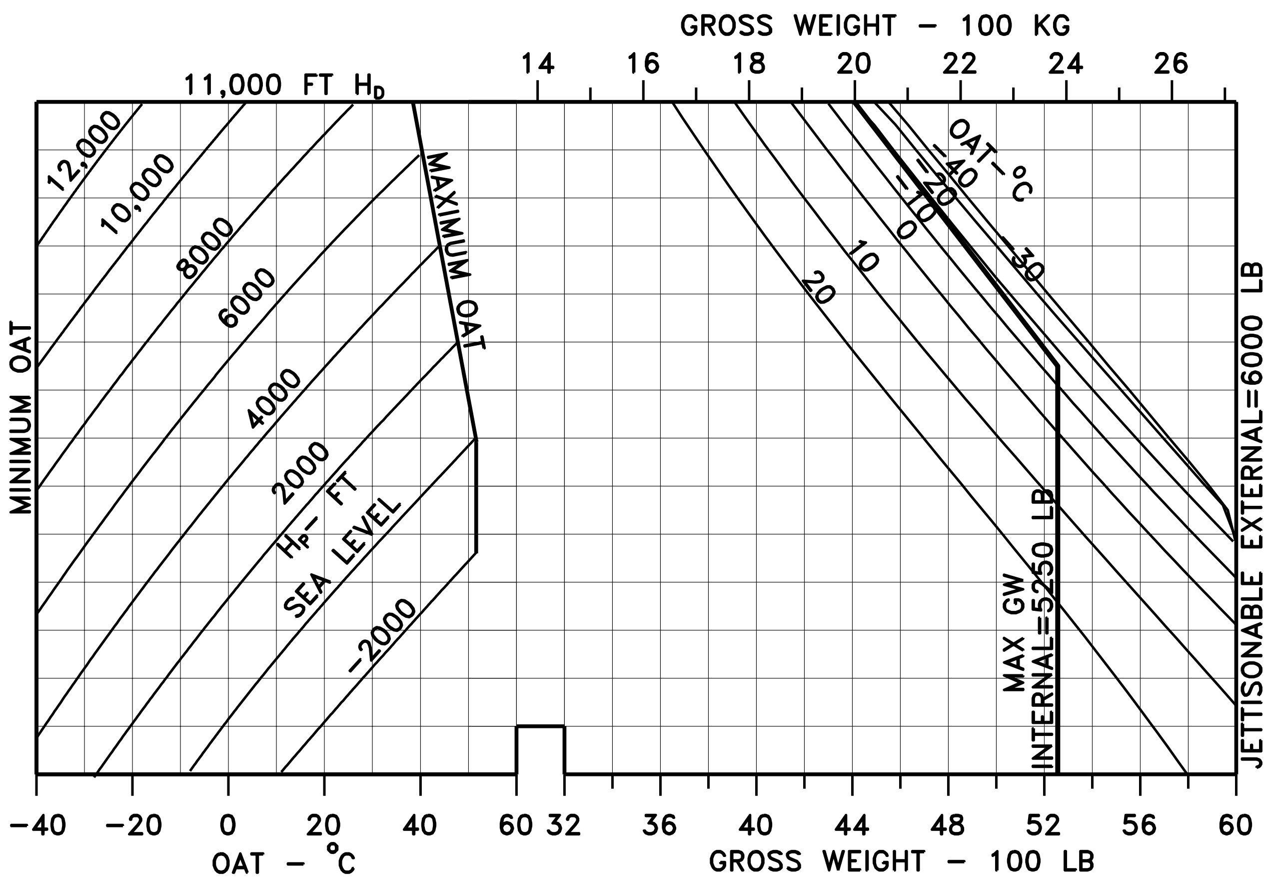
HOVER CEILING

OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-5_(15_OF_16).EPS

Figure 4-5. Hover ceiling OGE – takeoff power (sheet 15 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

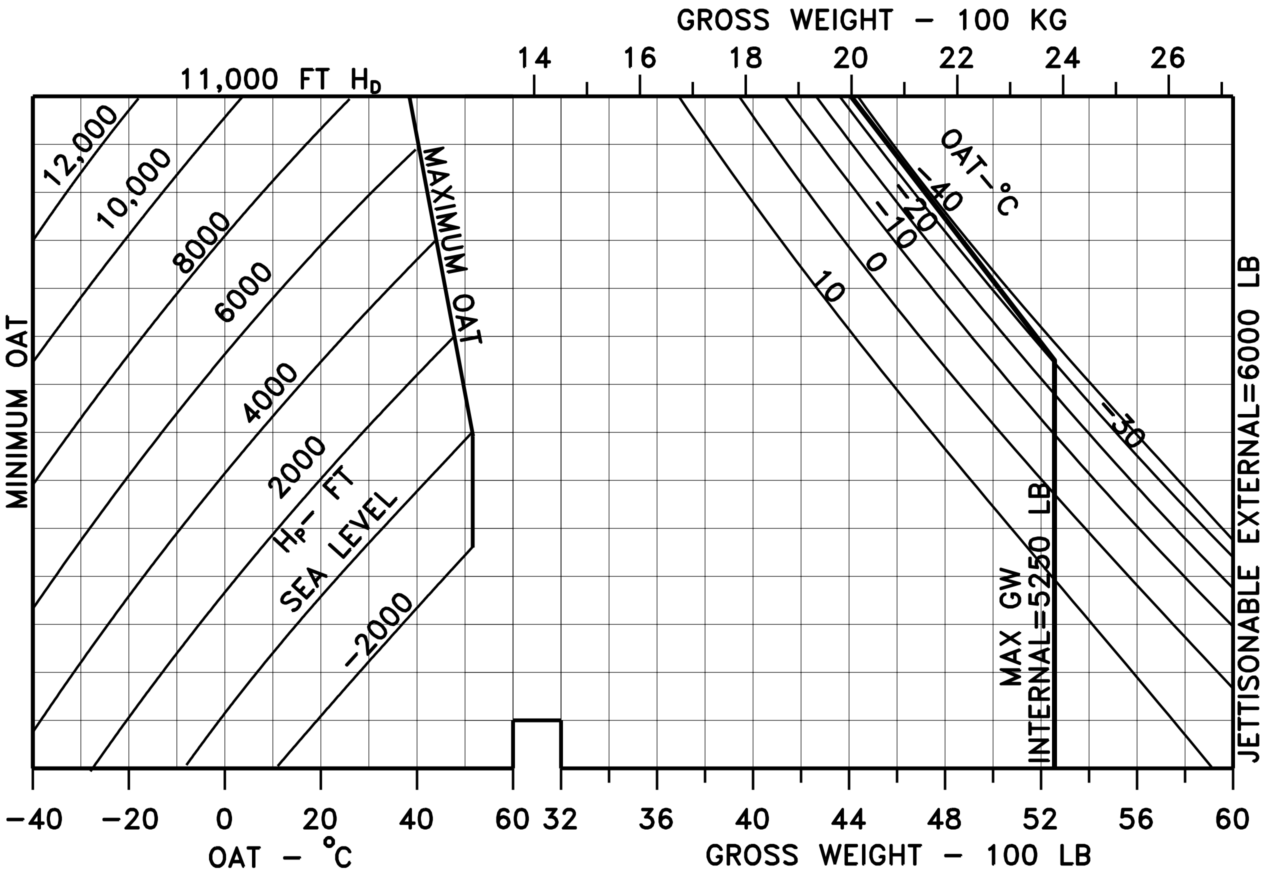


Figure 4-5. Hover ceiling OGE – takeoff power (sheet 16 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET

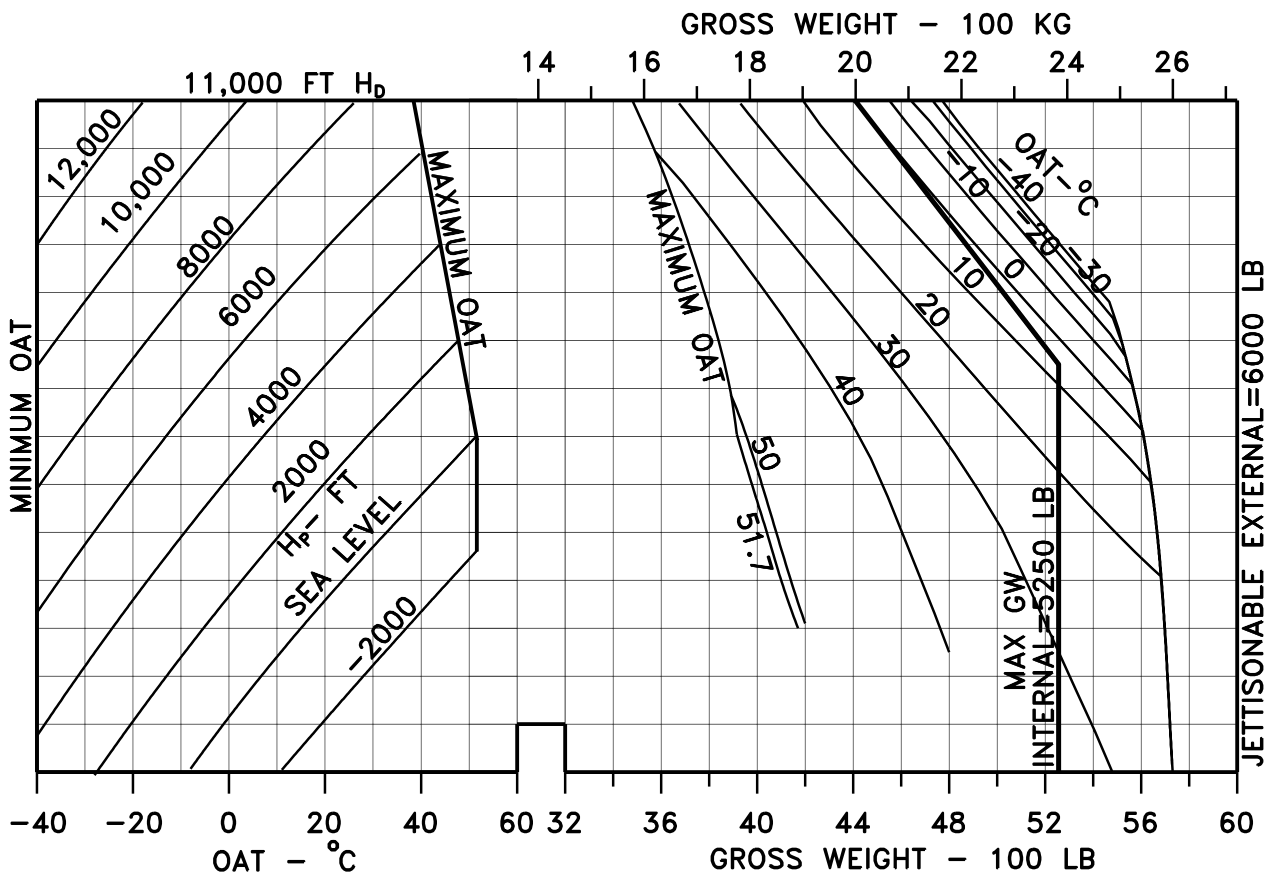
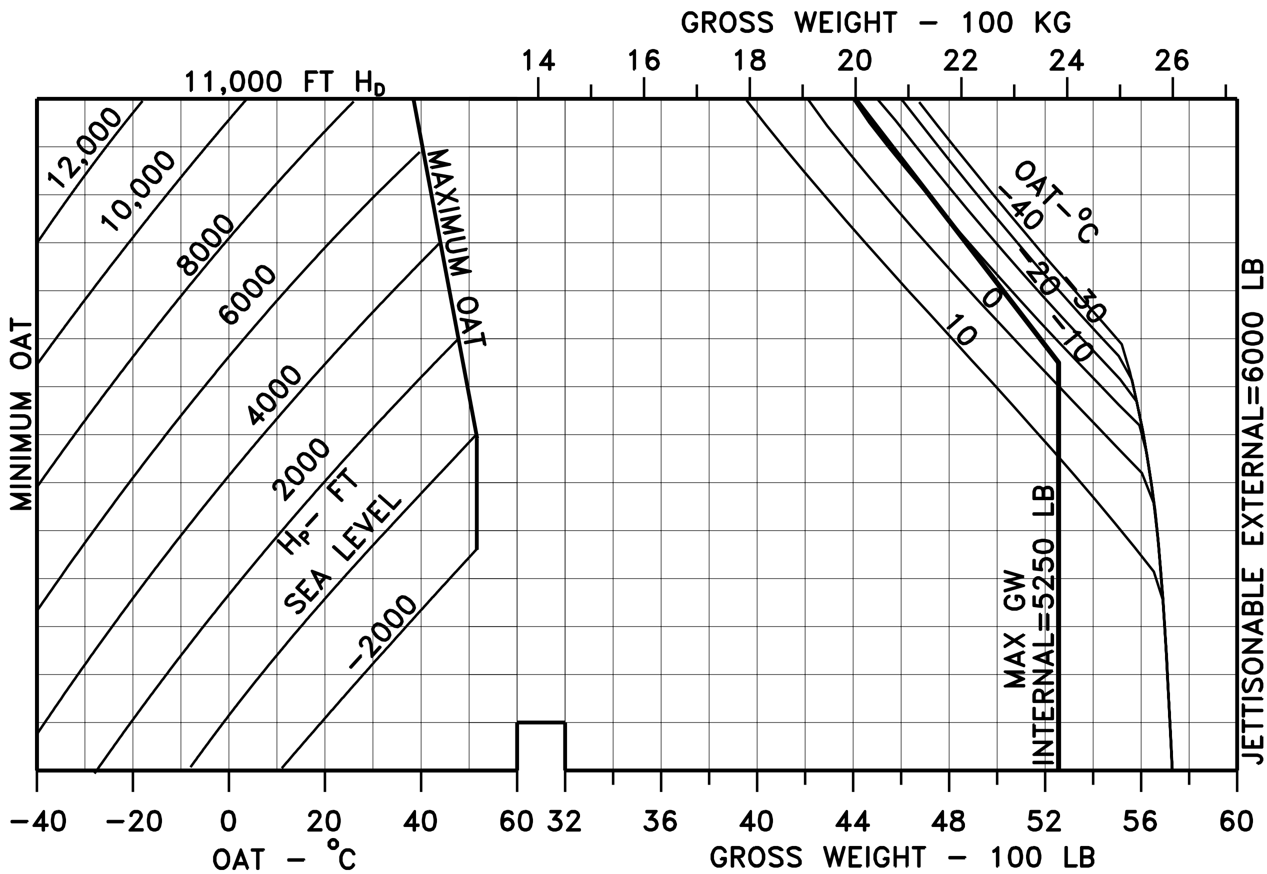


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 1 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET



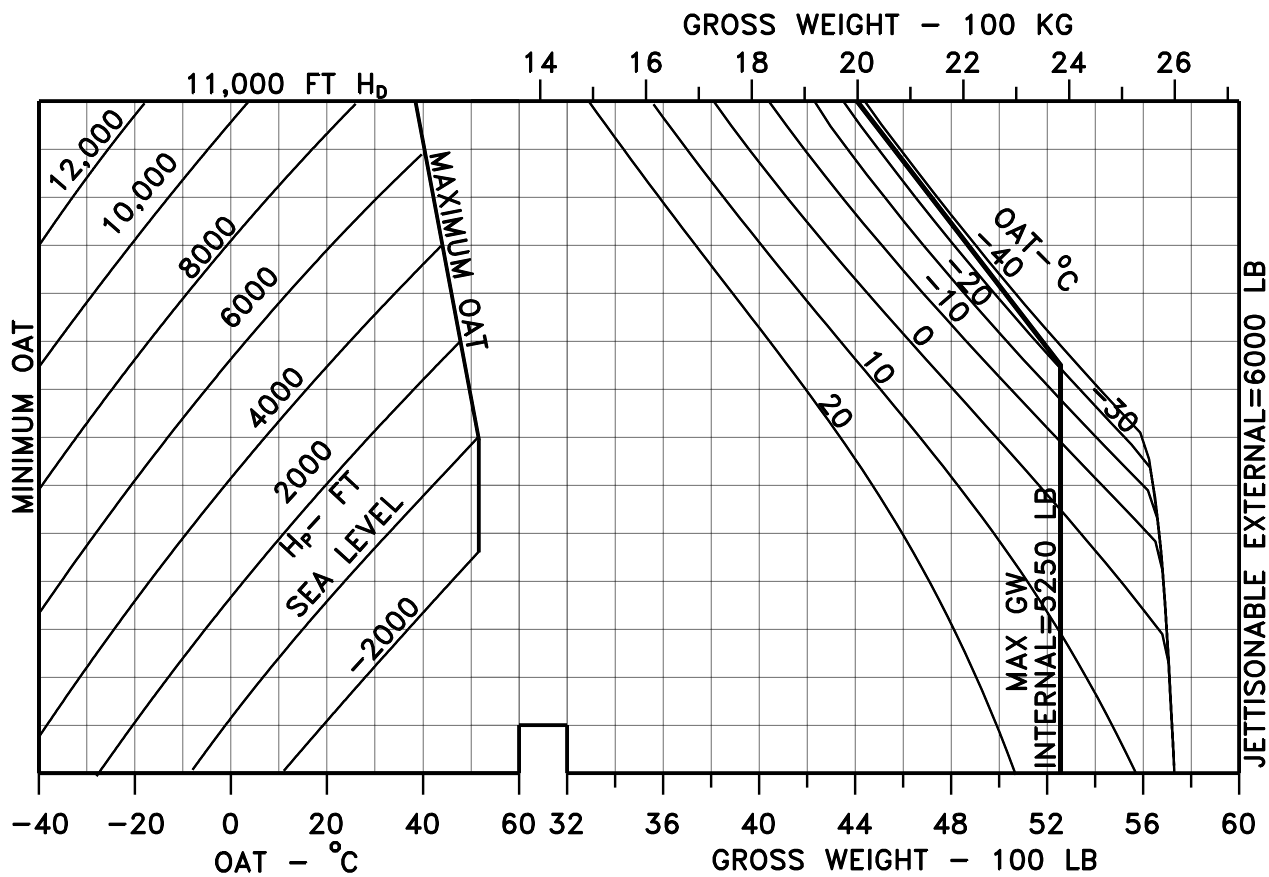
M407_FMS-28__FIG_4-6_(2_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 2 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET



M407_FMS-28__FIG_4-6_(3_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 3 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET

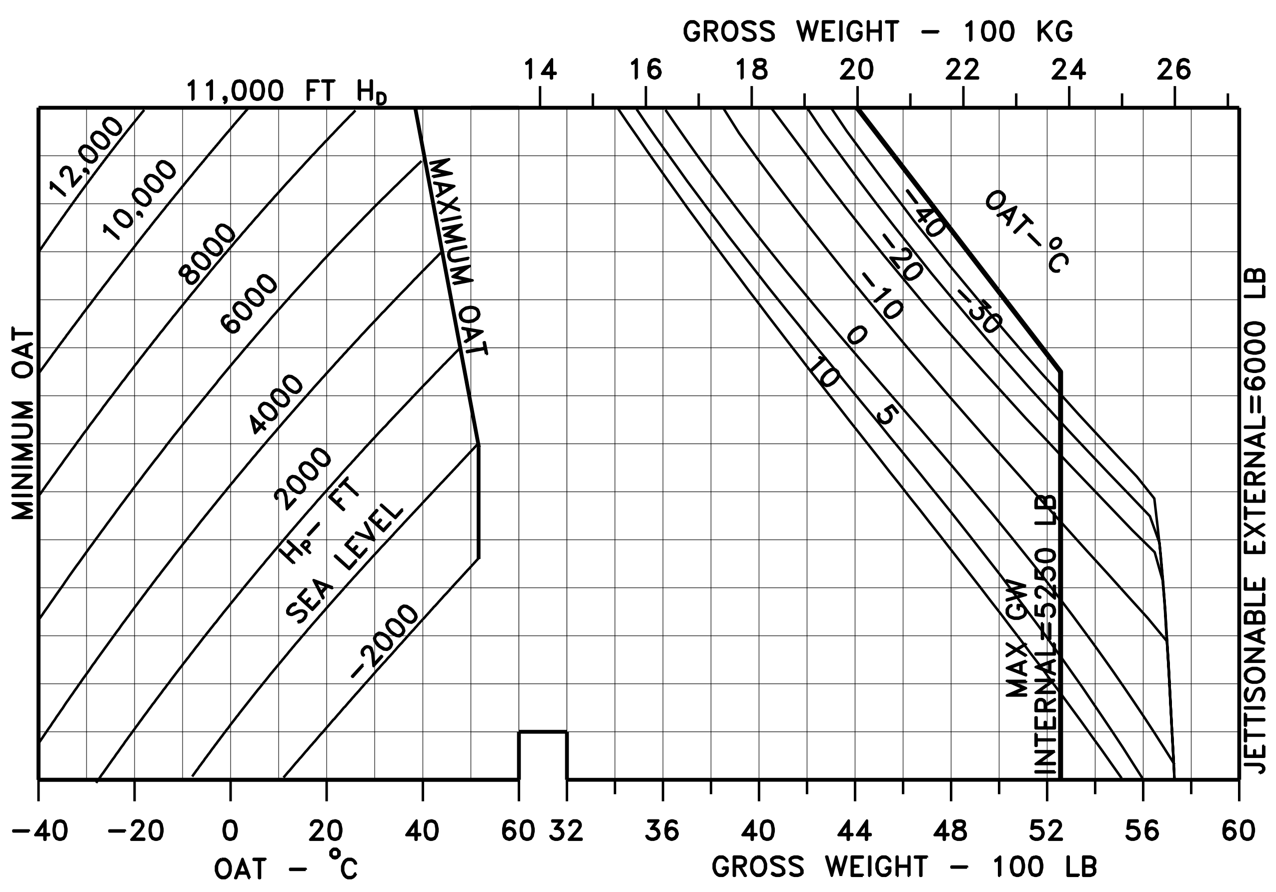


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 4 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER	SKID HEIGHT 40 FT (12.2 METER)
ENGINE RPM 100%	HEATER AND ANTI-ICE OFF
GENERATOR 180 AMPS	PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

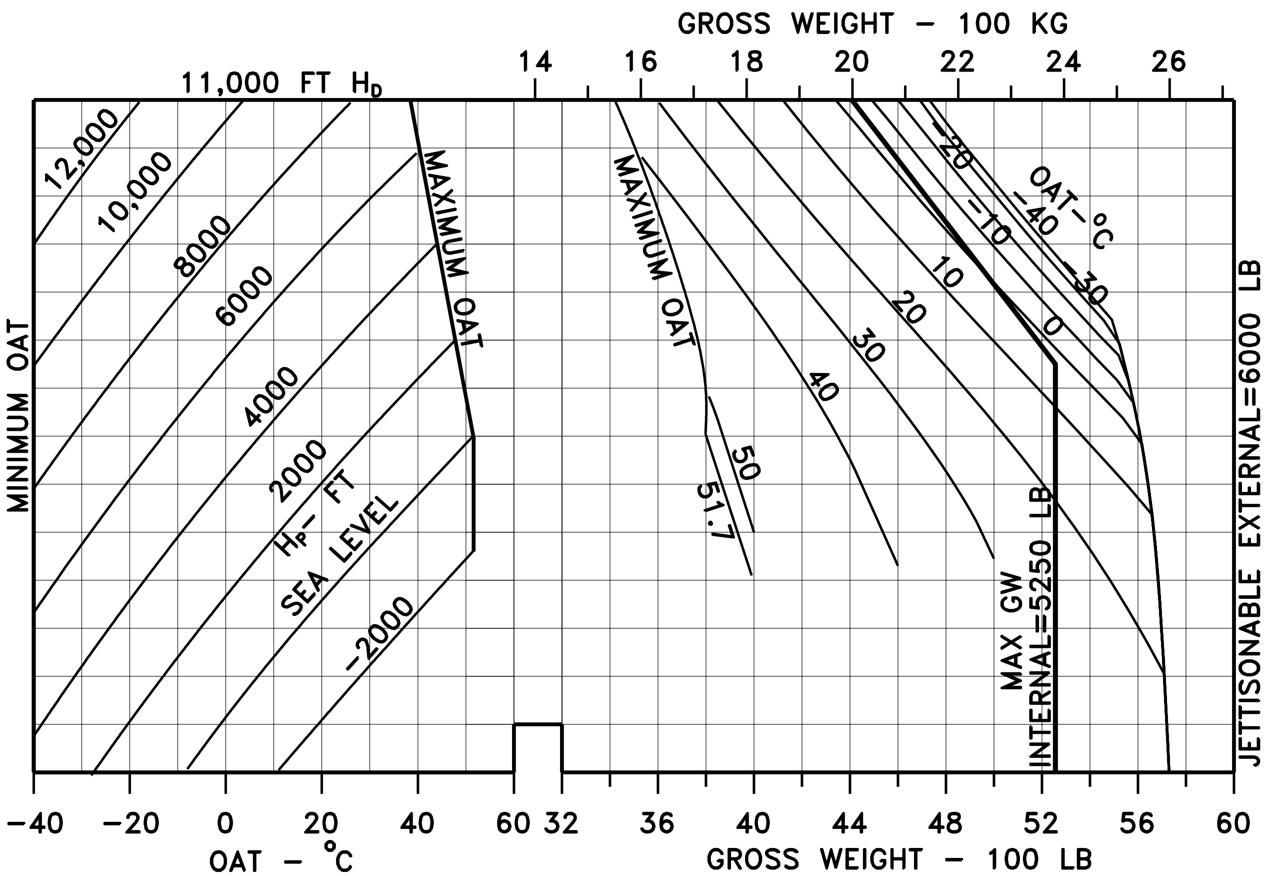


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 5 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

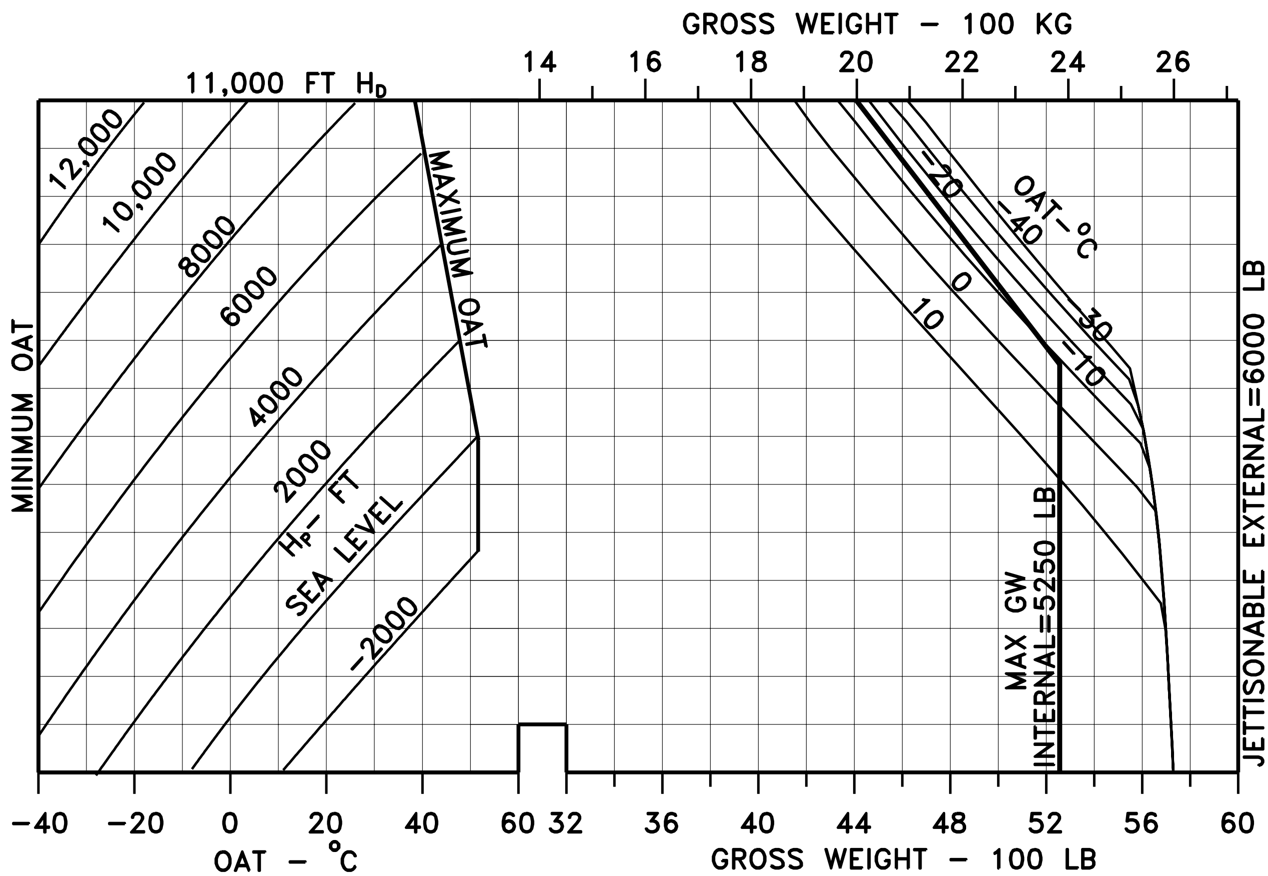


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 6 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

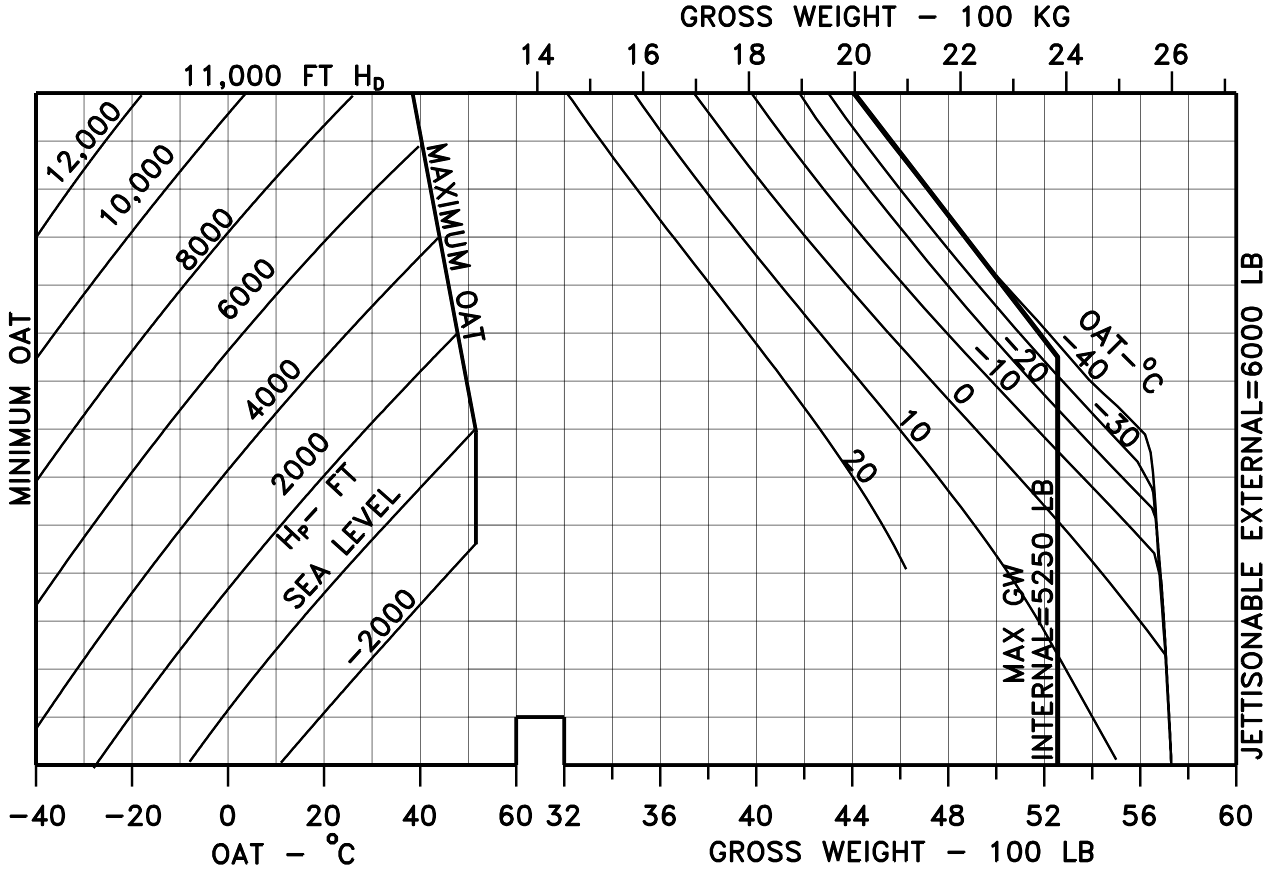


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 7 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS

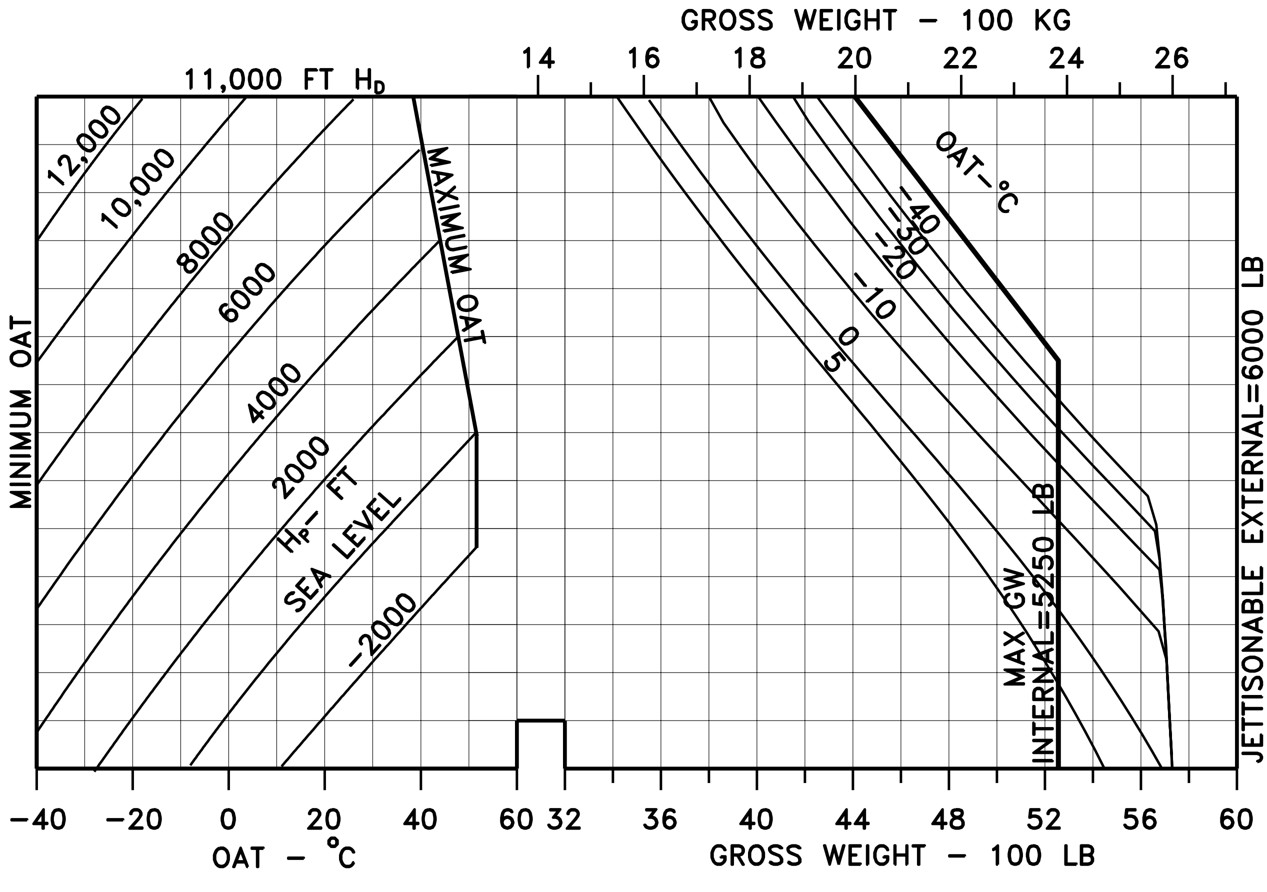


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 8 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
BASIC INLET
SNOW BAFFLES

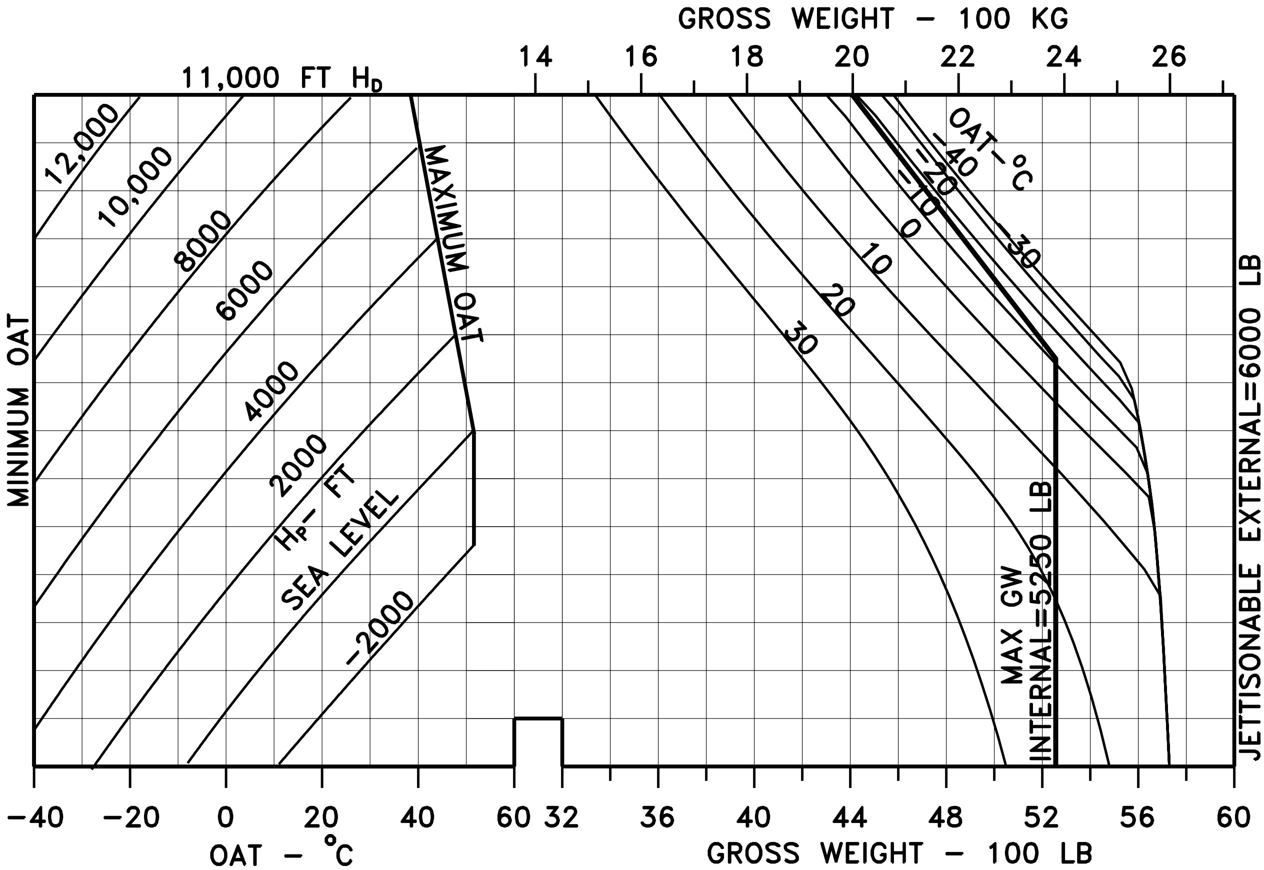
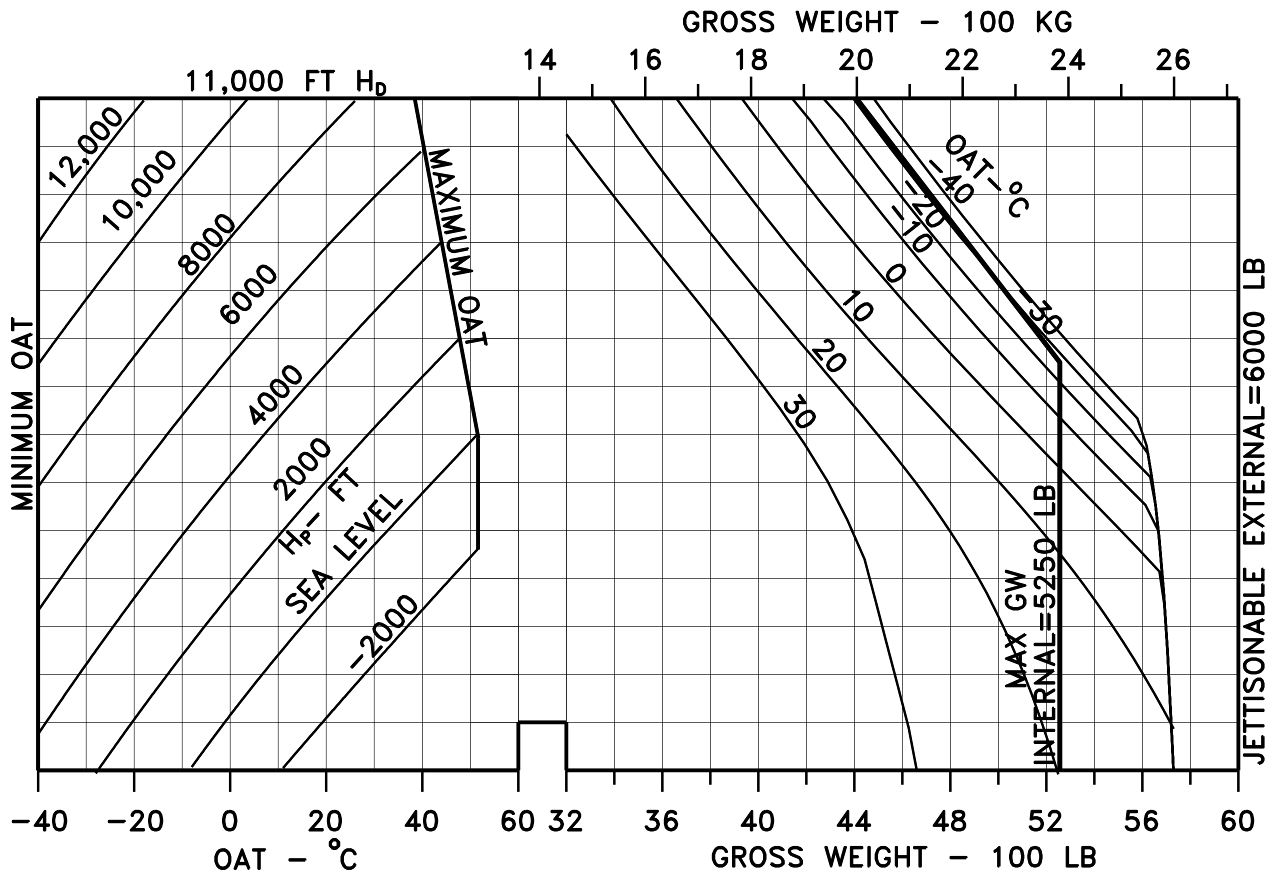


Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 9 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



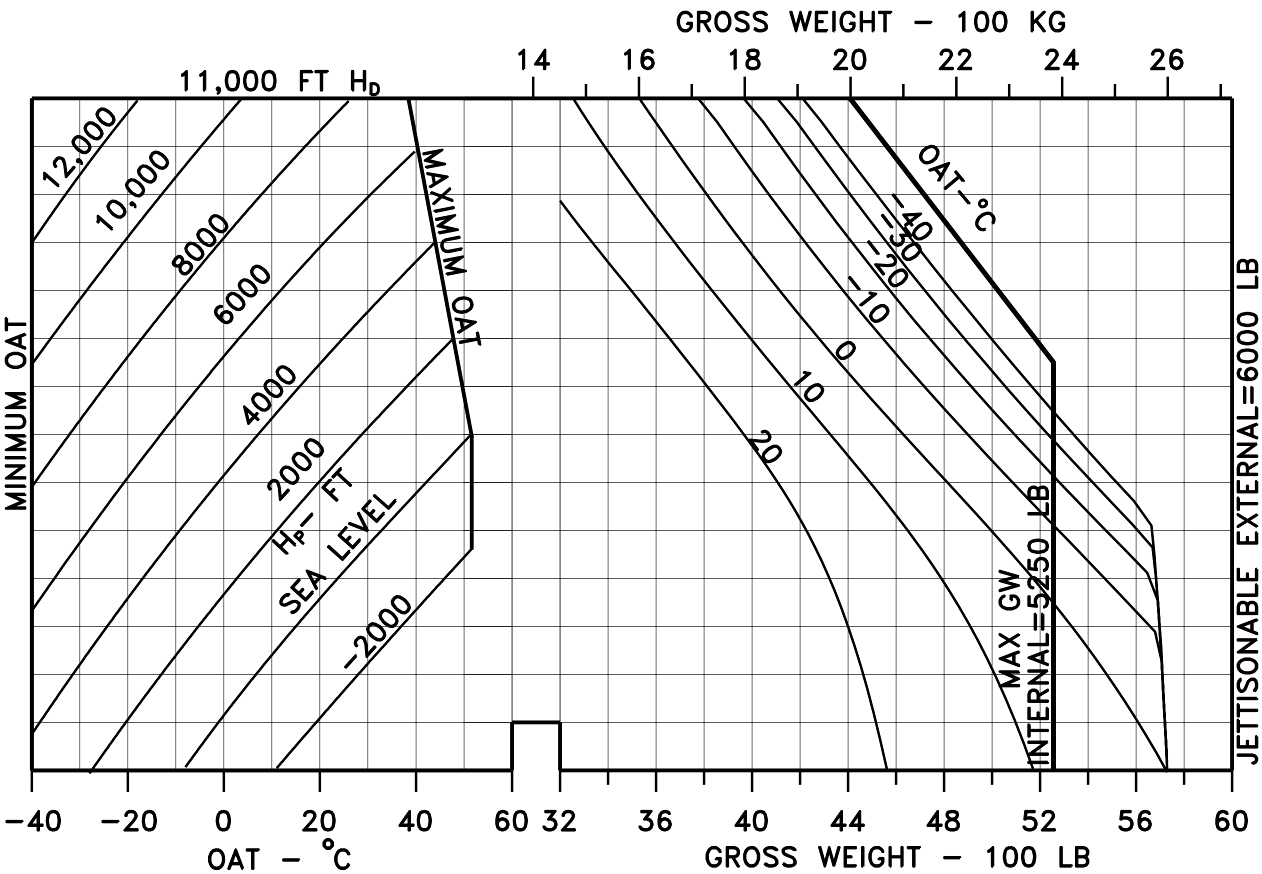
M407_FMS-28__FIG_4-6_(10_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 10 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
BASIC INLET
SNOW BAFFLES



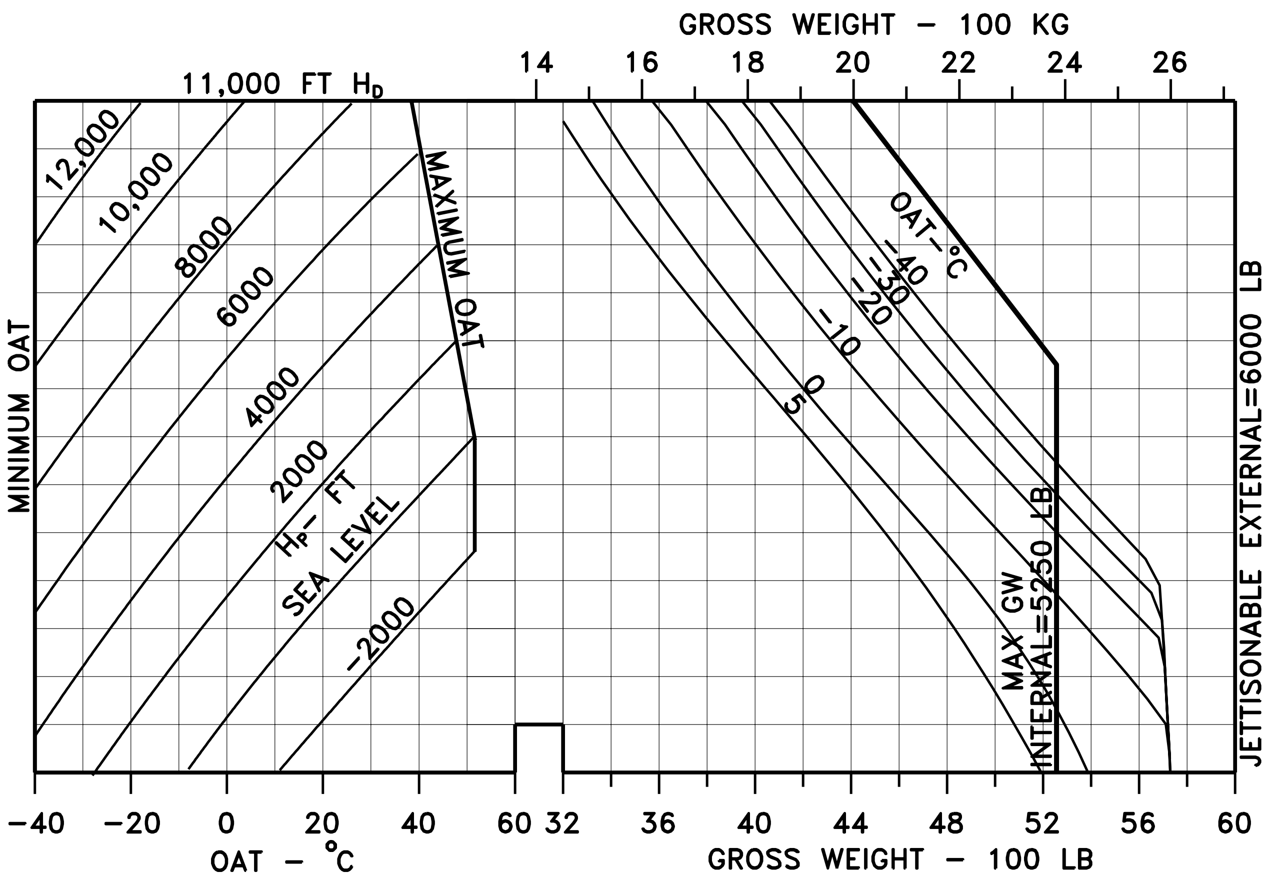
M407_FMS-28__FIG_4-6_(11_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 11 of 16)

HOVER CEILING
OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
BASIC INLET
SNOW BAFFLES



M407_FMS-28__FIG_4-6_(12_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 12 of 16)

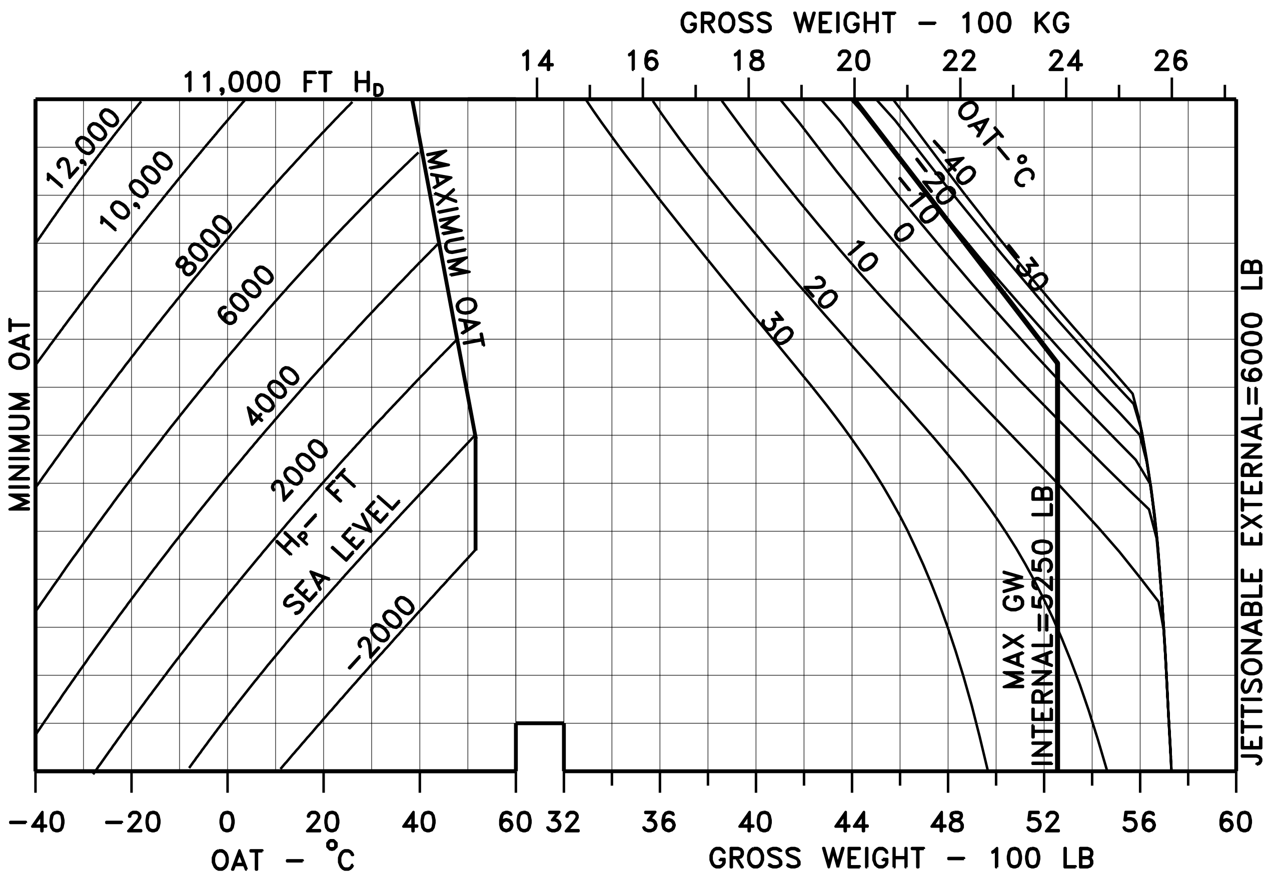
HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE OFF
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-6_(13_OF_16).EPS

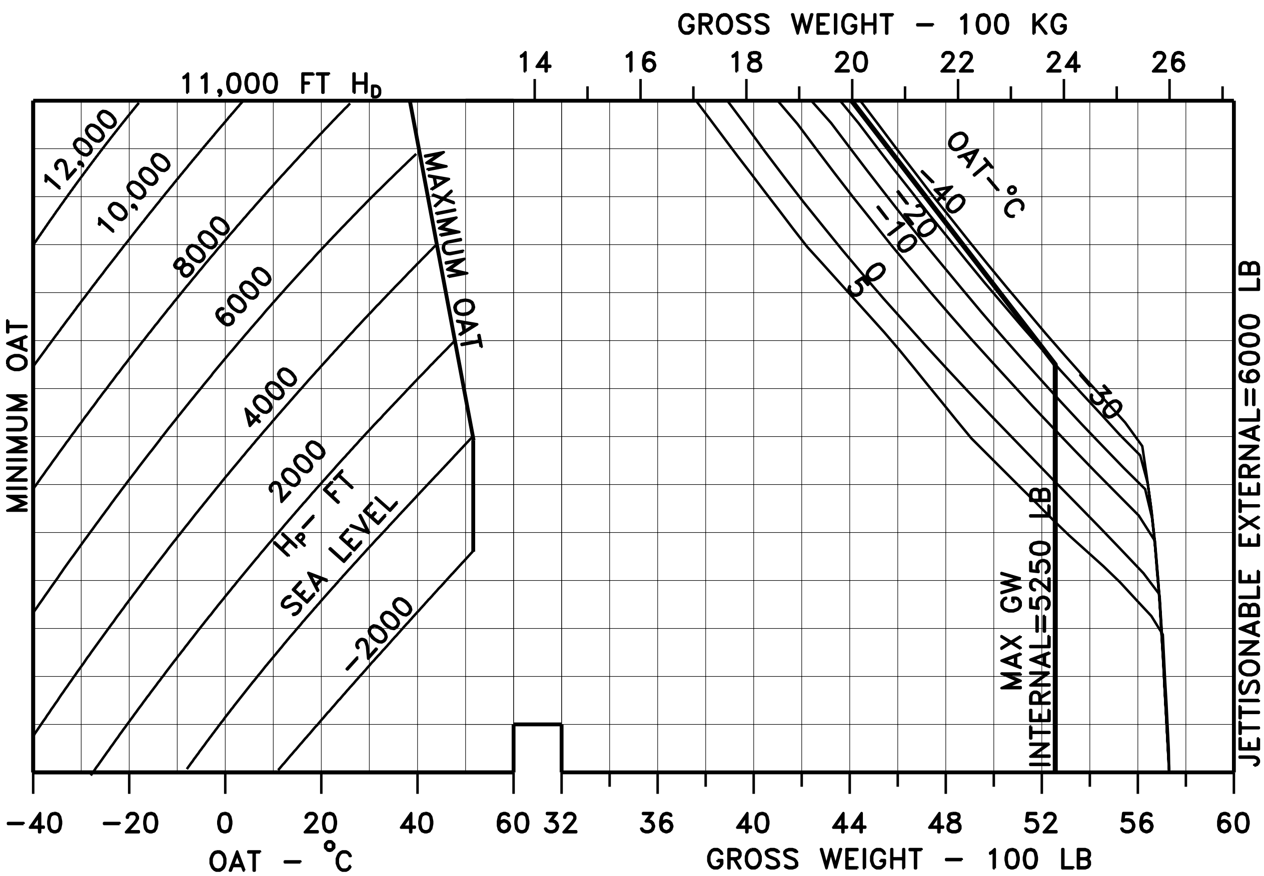
Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 13 of 16)

HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER	SKID HEIGHT 40 FT (12.2 METER)
ENGINE RPM 100%	ANTI-ICE ON
GENERATOR 180 AMPS	PARTICLE SEPARATOR
	SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-6_(14_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 14 of 16)

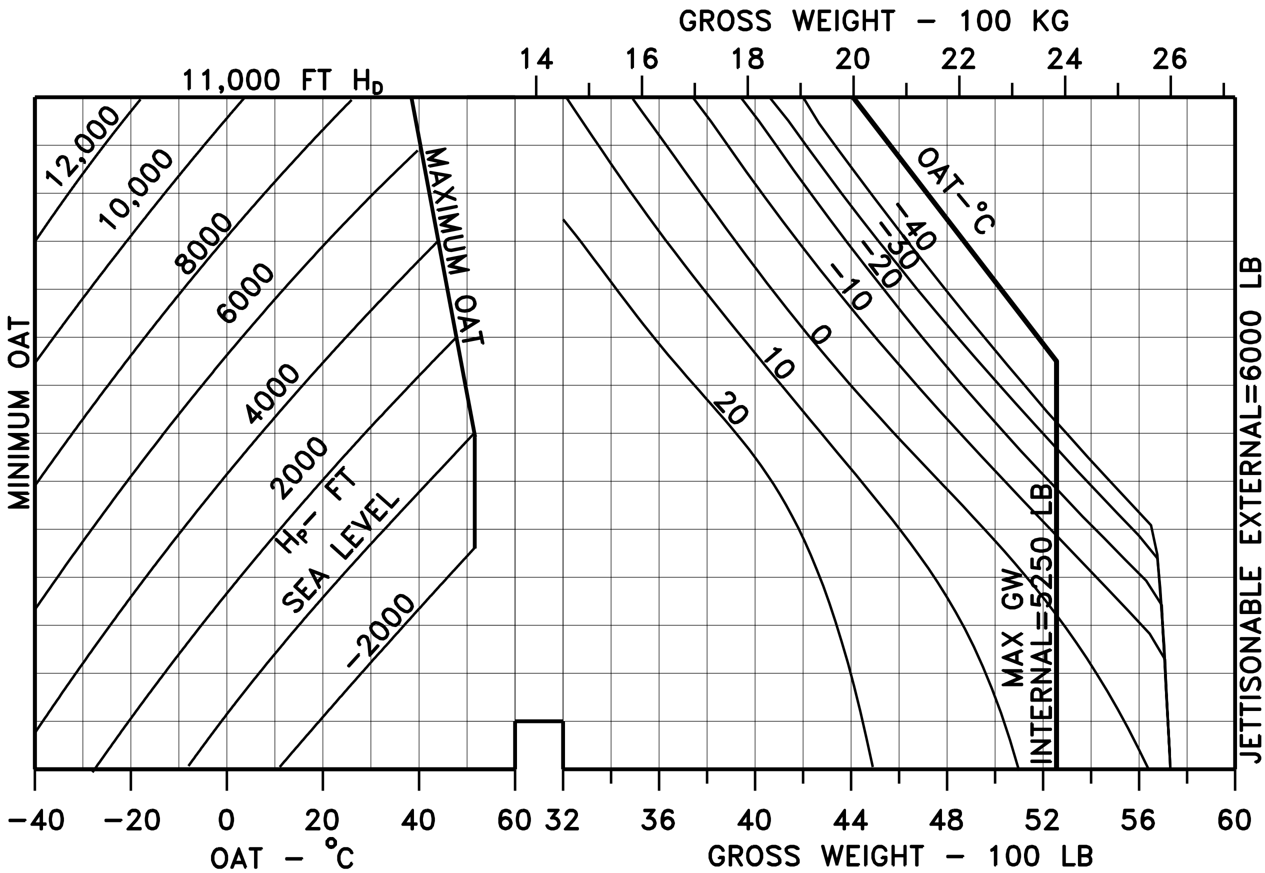
HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-6_(15_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 15 of 16)

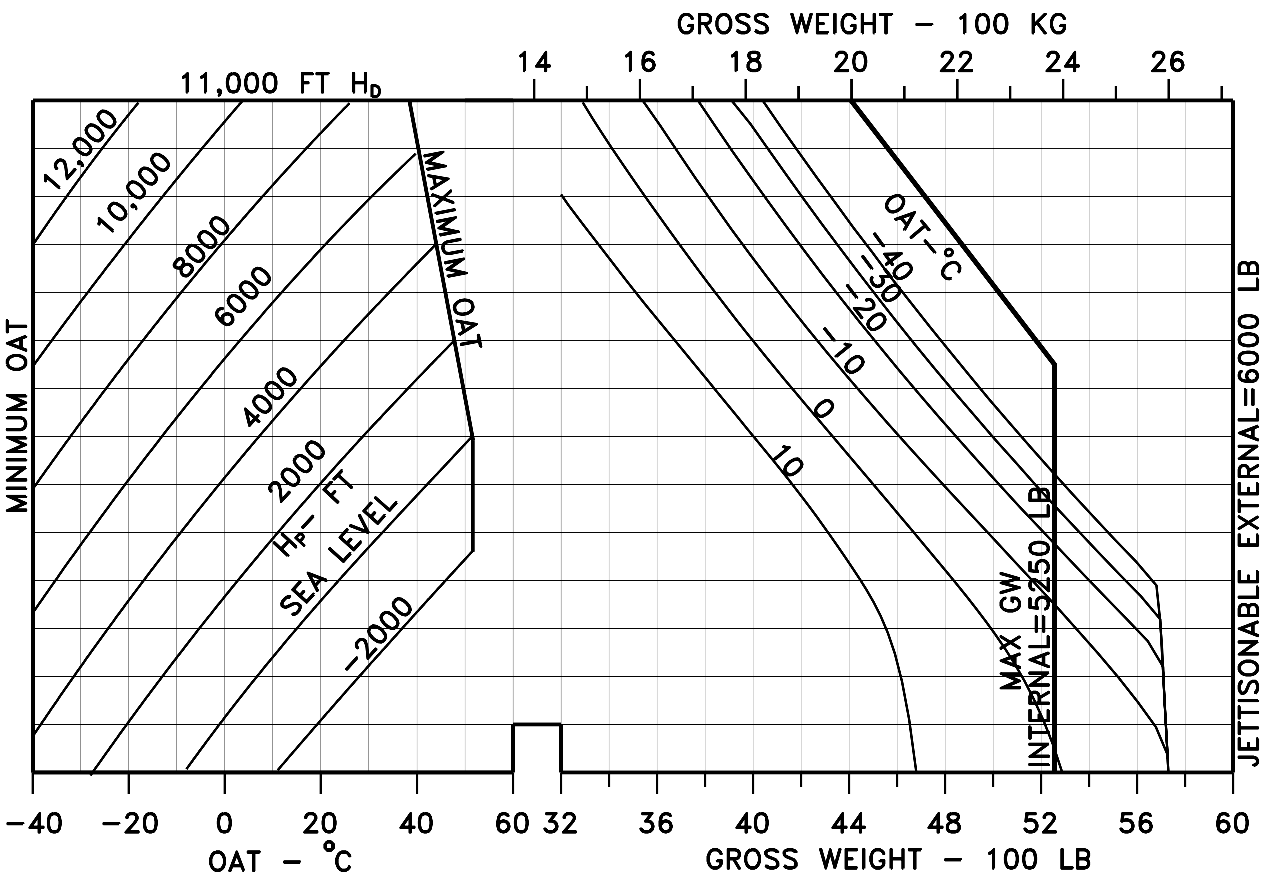
HOVER CEILING

OUT OF GROUND EFFECT

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

SKID HEIGHT 40 FT (12.2 METER)
HEATER AND ANTI-ICE ON
PARTICLE SEPARATOR
SNOW BAFFLES

WITH PARTICLE SEPARATOR PURGE ON, REDUCE GROSS WEIGHT BY 50 LBS



M407_FMS-28__FIG_4-6_(16_OF_16).EPS

Figure 4-6. Hover ceiling OGE – maximum continuous power (sheet 16 of 16)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
4000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)

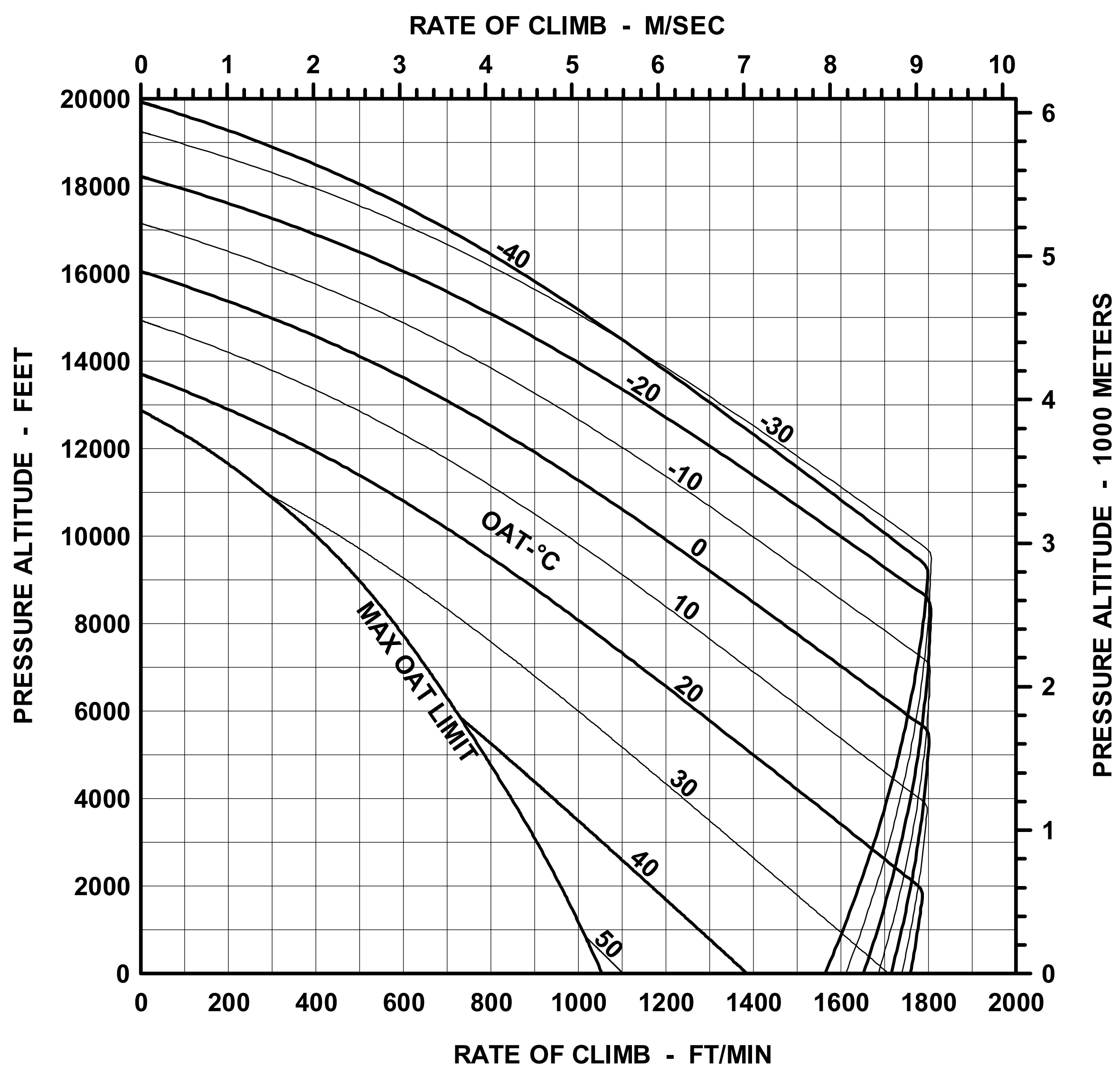


Figure 4-7. Rate of climb – takeoff power (sheet 1 of 8)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
1000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)

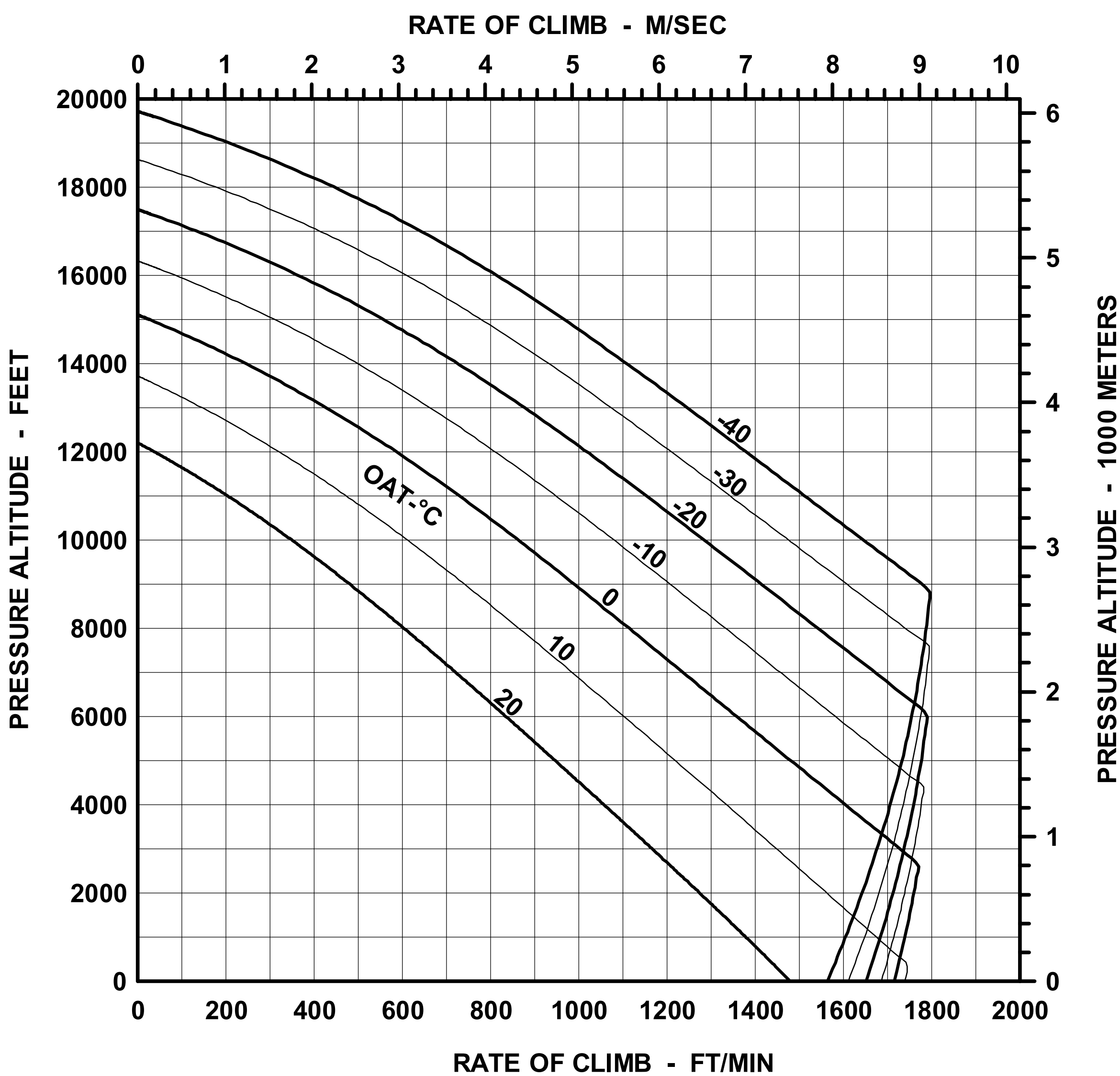


Figure 4-7. Rate of climb – takeoff power (sheet 2 of 8)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR - PURGE OFF

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
3500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)

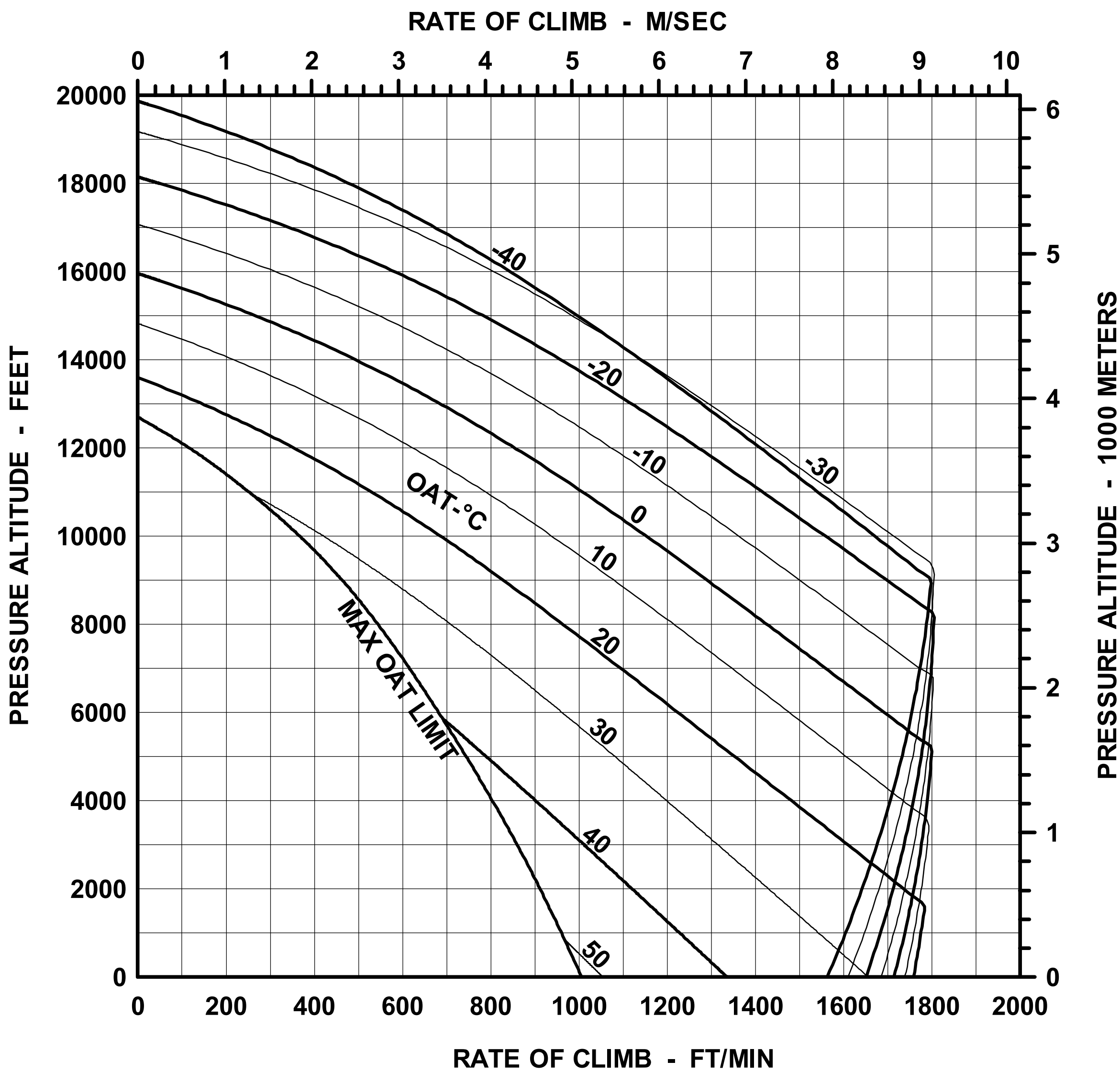


Figure 4-7. Rate of climb – takeoff power (sheet 3 of 8)

RATE OF CLIMB

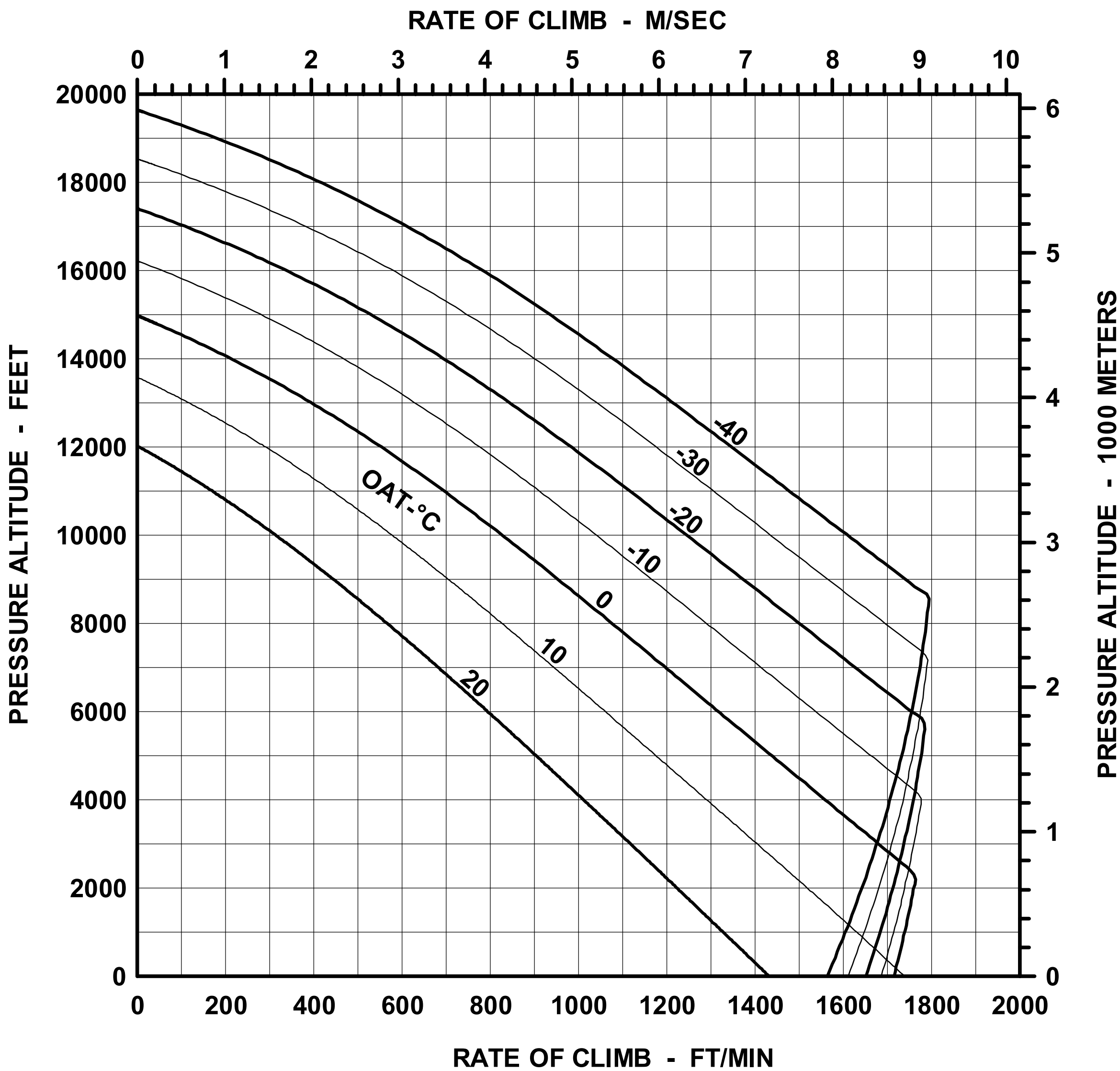
TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR - PURGE OFF

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-7_(4_OF_8).WMF

Figure 4-7. Rate of climb – takeoff power (sheet 4 of 8)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
2500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)

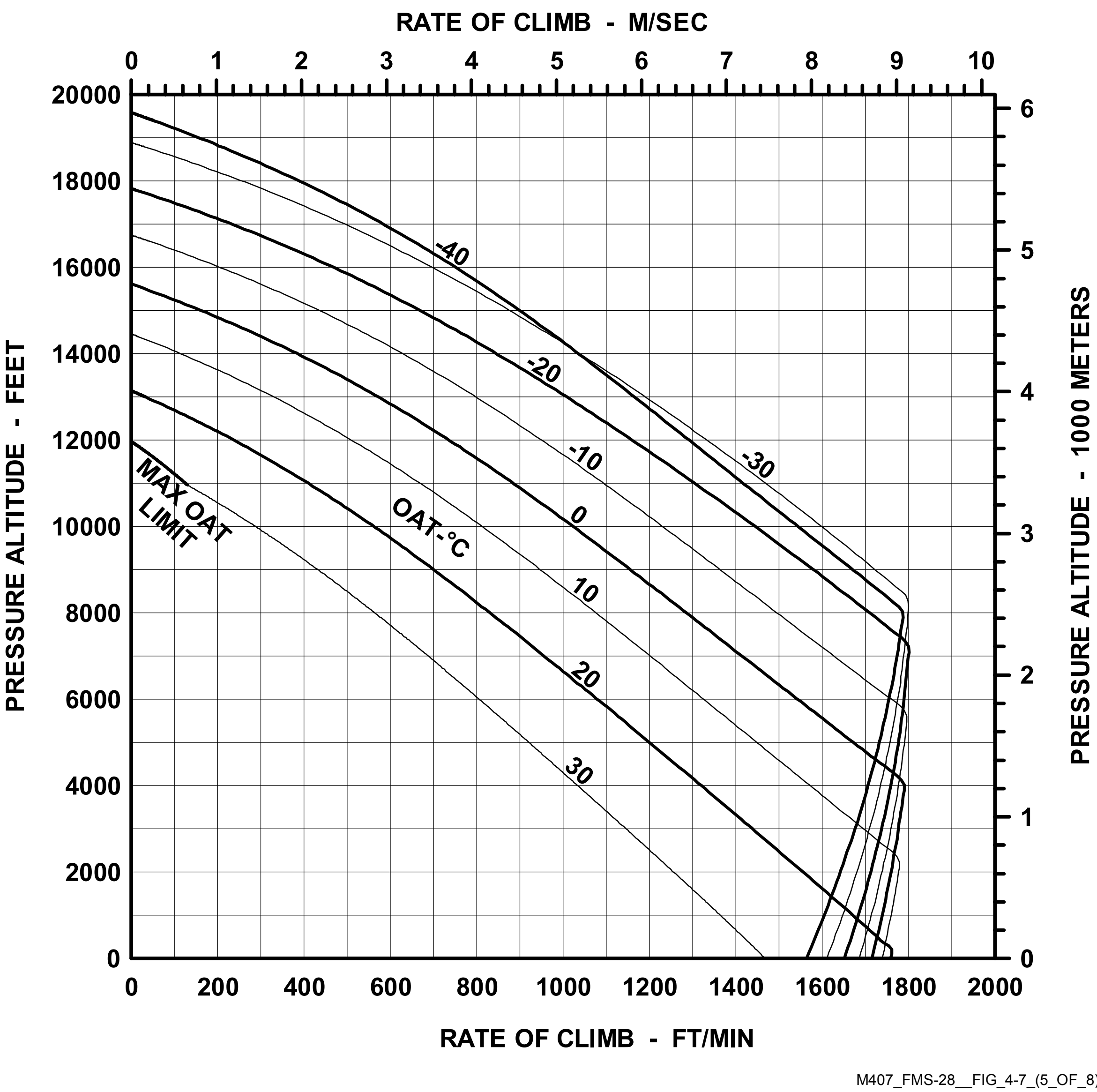


Figure 4-7. Rate of climb – takeoff power (sheet 5 of 8)

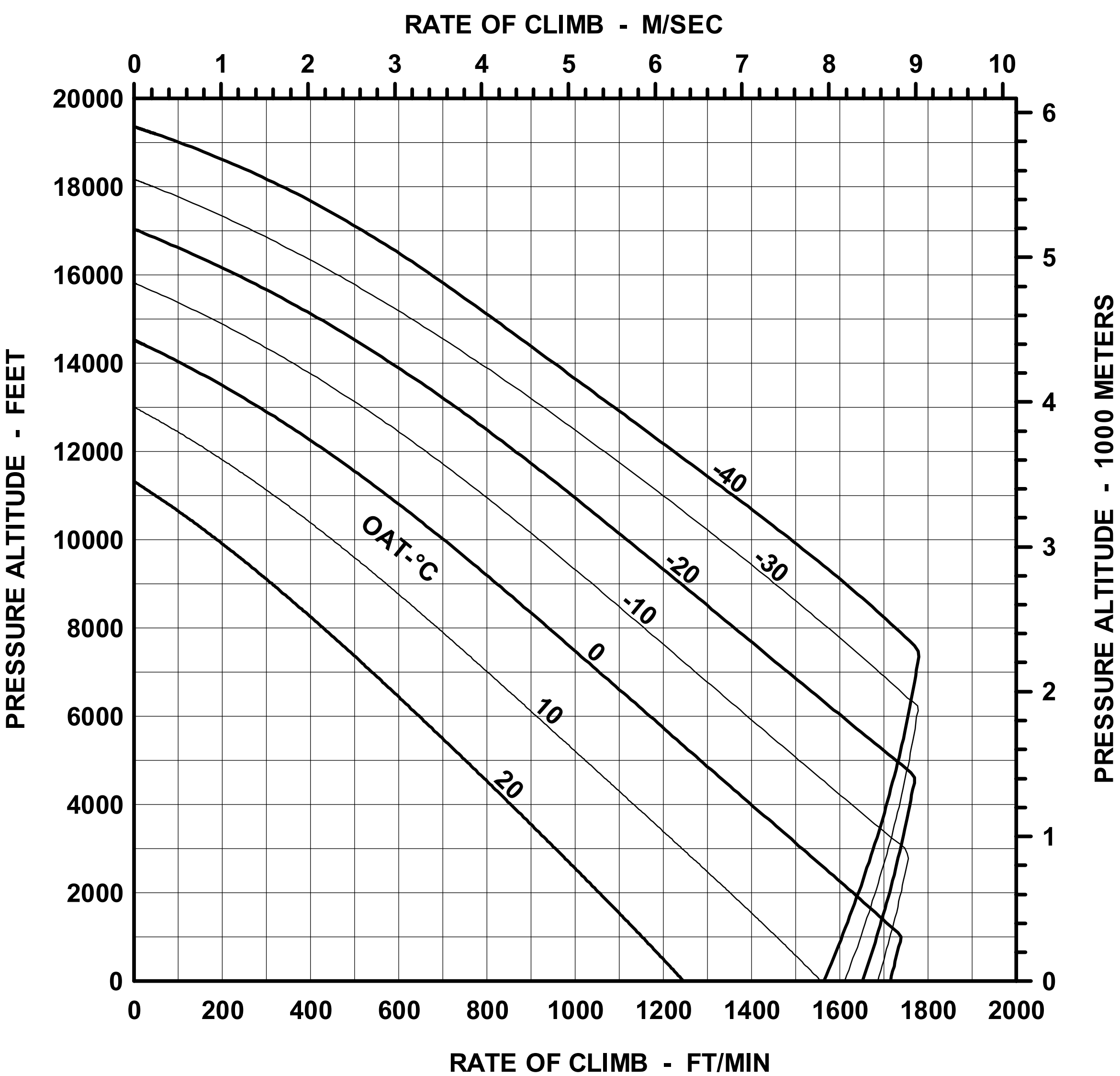
RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-7_(6_OF_8).WMF

Figure 4-7. Rate of climb – takeoff power (sheet 6 of 8)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR - PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
2000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)

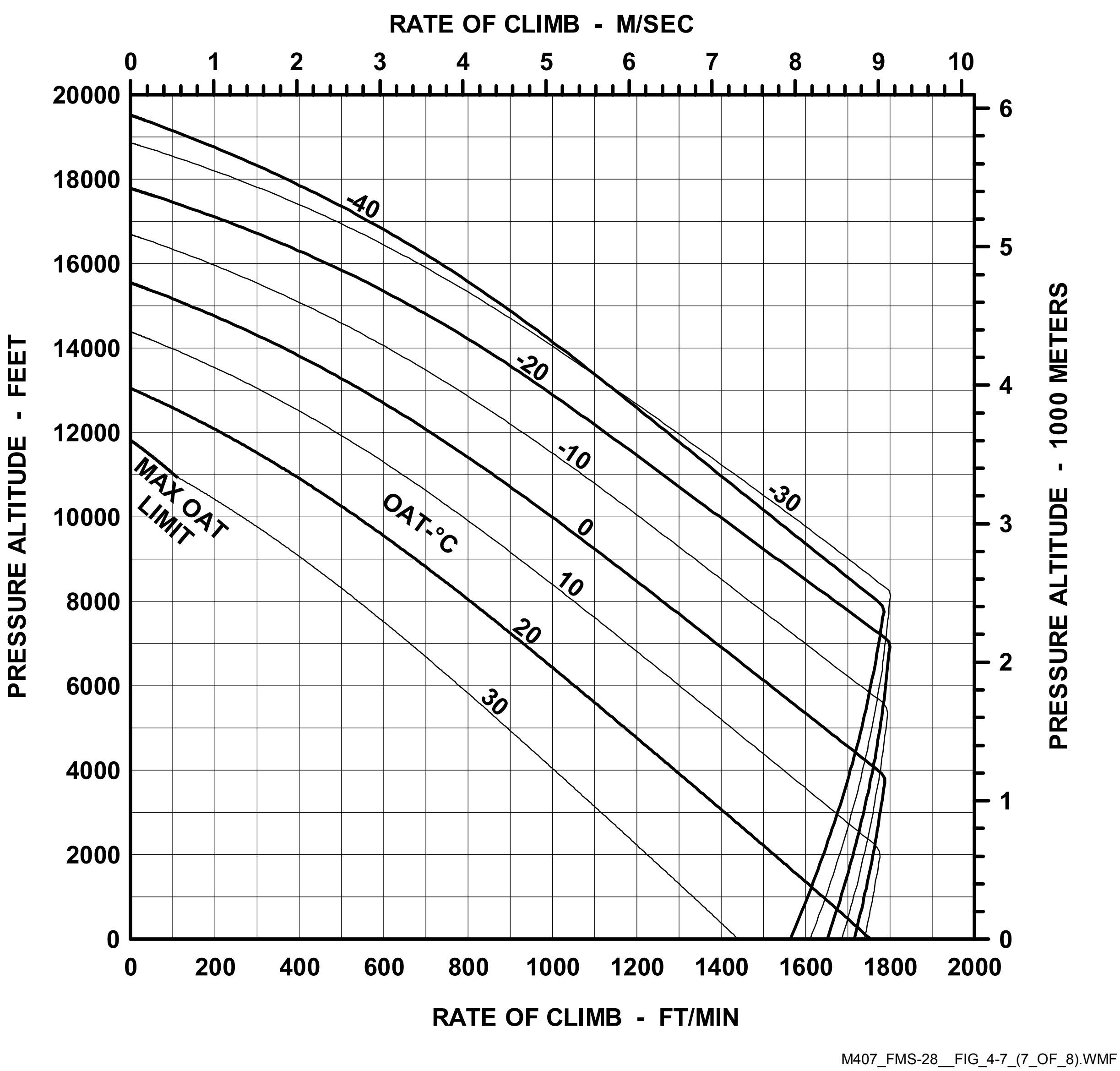


Figure 4-7. Rate of climb – takeoff power (sheet 7 of 8)

RATE OF CLIMB

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR - PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)

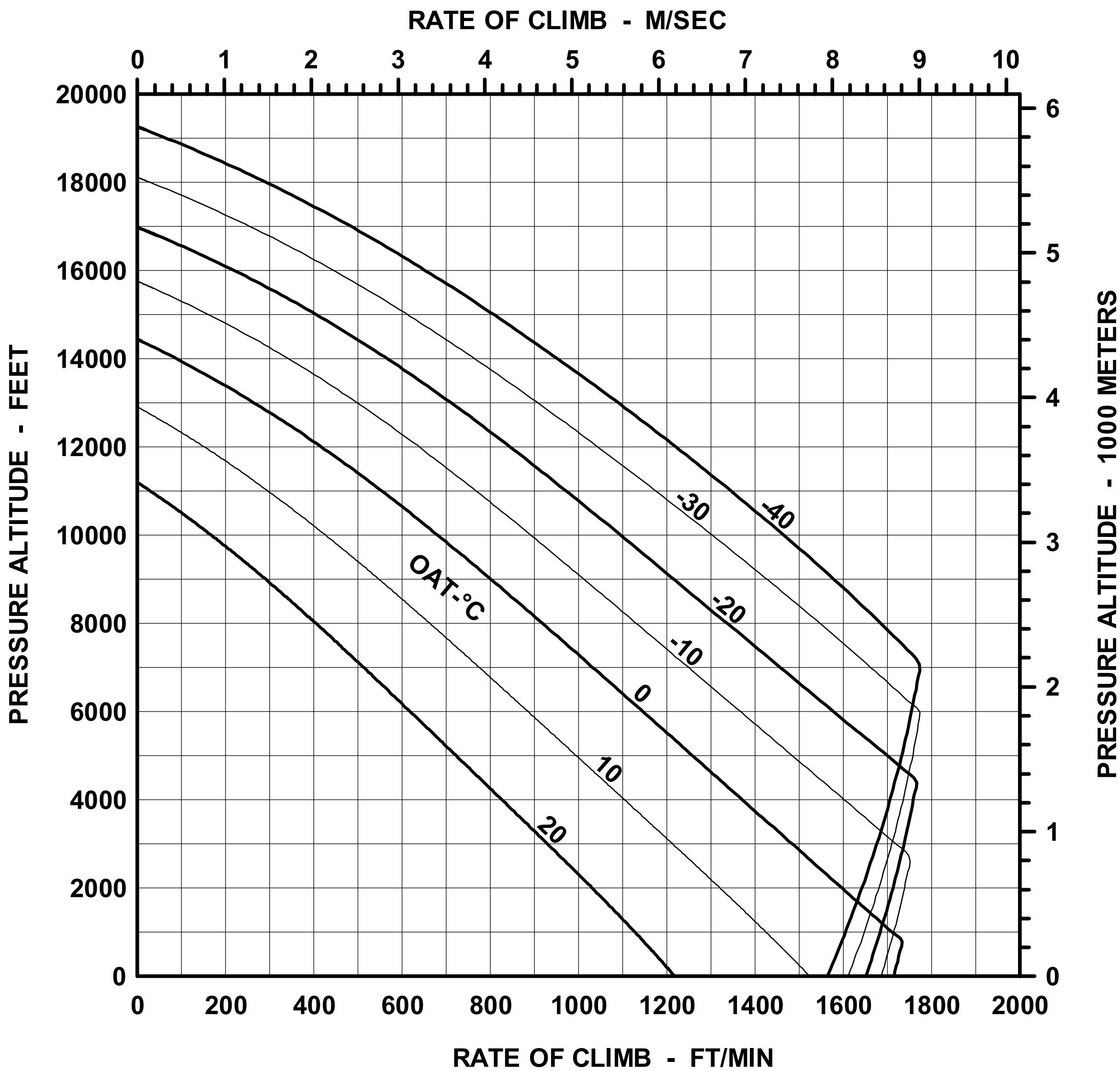


Figure 4-7. Rate of climb – takeoff power (sheet 8 of 8)

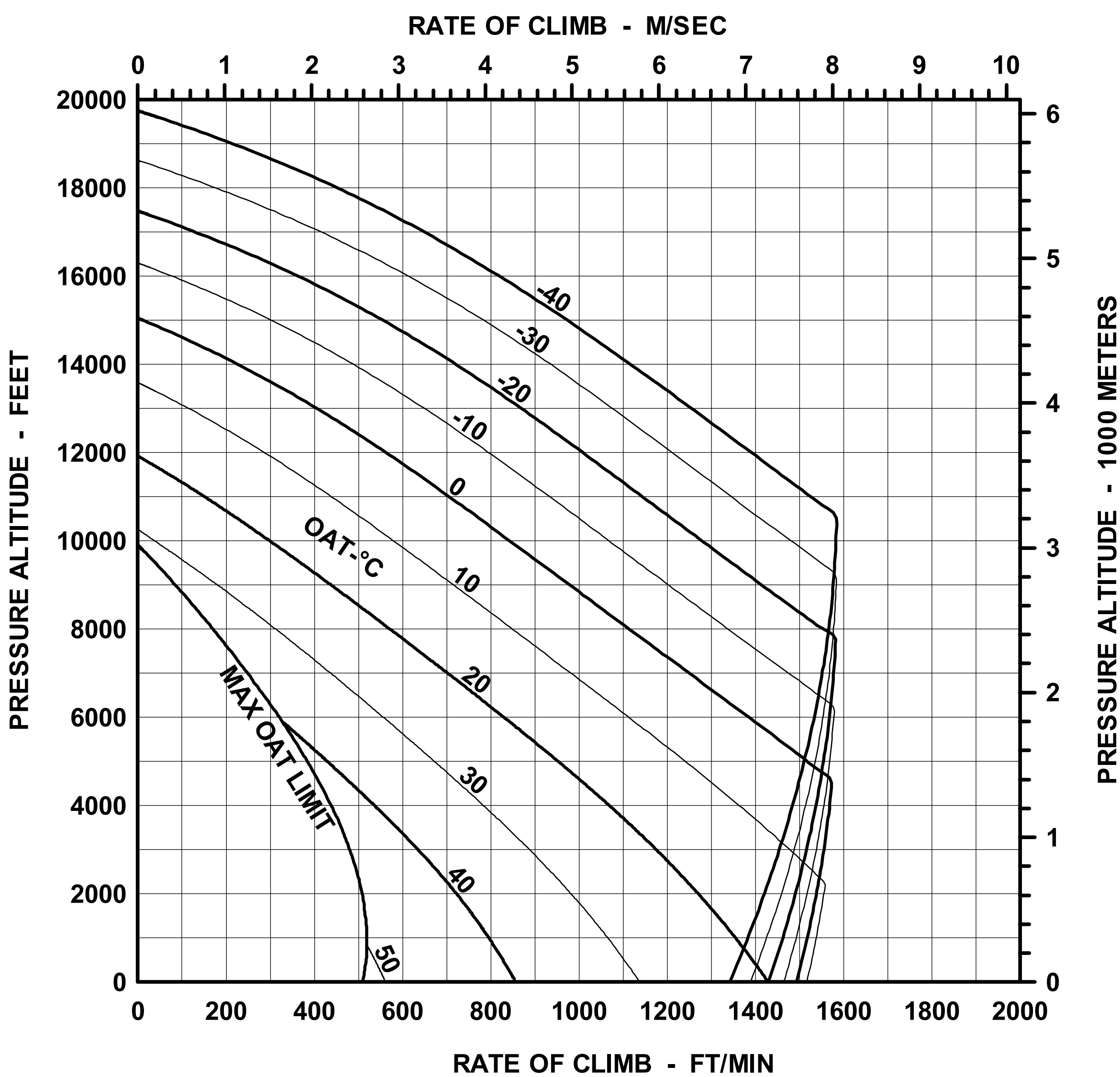
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
2500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-8_(1_OF_8).WMF

Figure 4-8. Rate of climb – maximum continuous power (sheet 1 of 8)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)

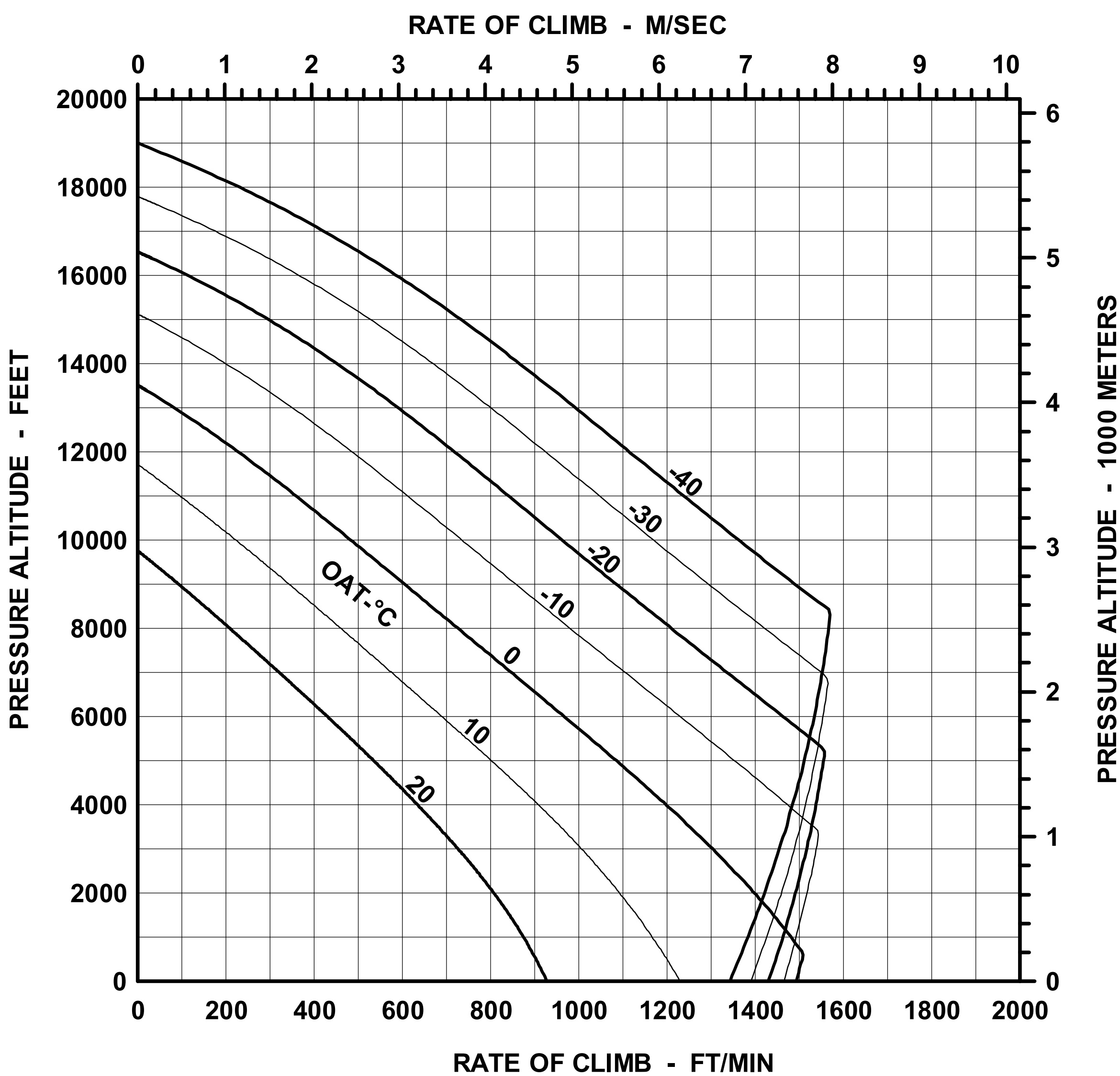


Figure 4-8. Rate of climb – maximum continuous power (sheet 2 of 8)

RATE OF CLIMB

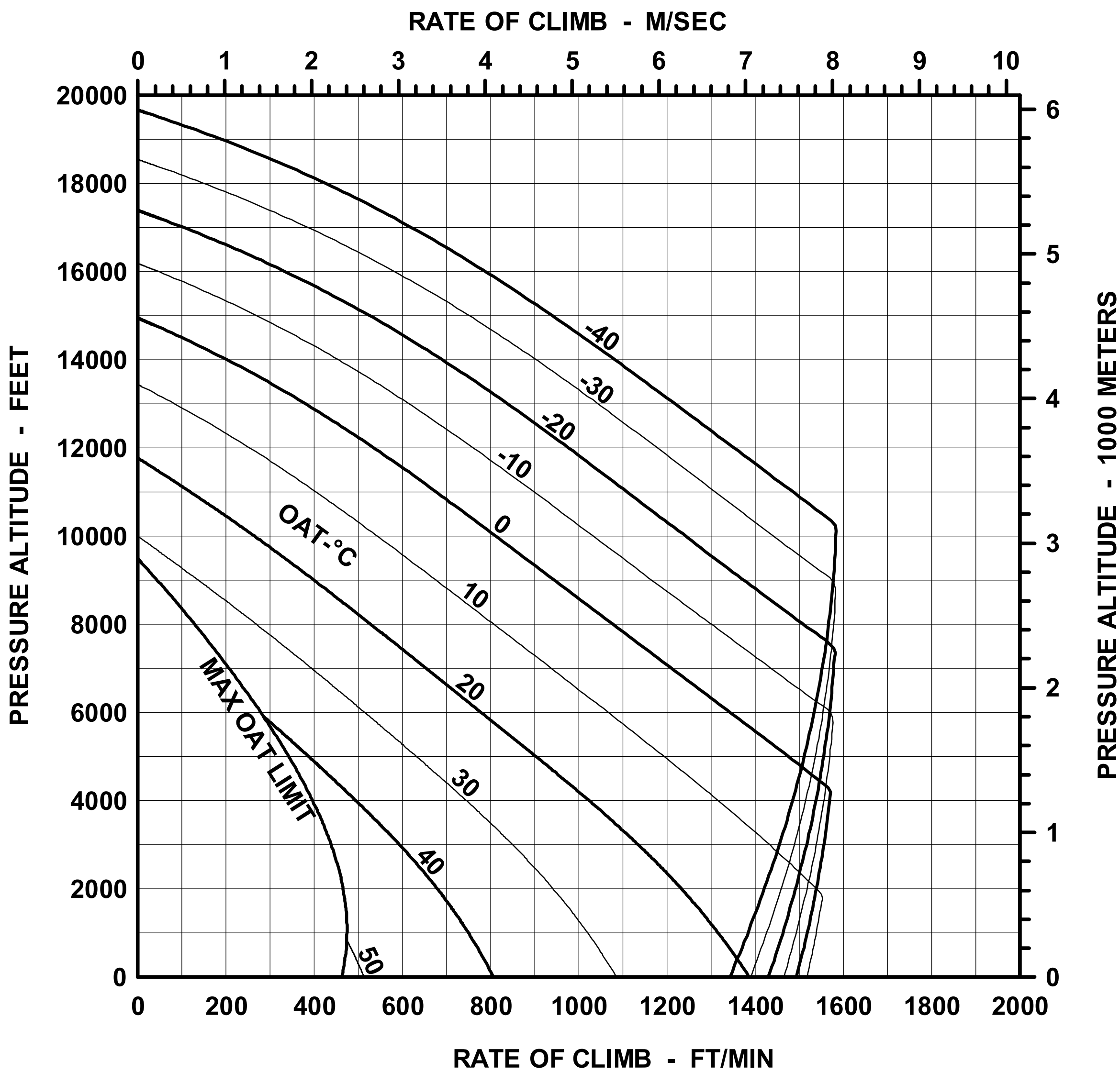
MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR - PURGE OFF

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
2000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-8_(3_OF_8).WMF

Figure 4-8. Rate of climb – maximum continuous power (sheet 3 of 8)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR - PURGE OFF

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)

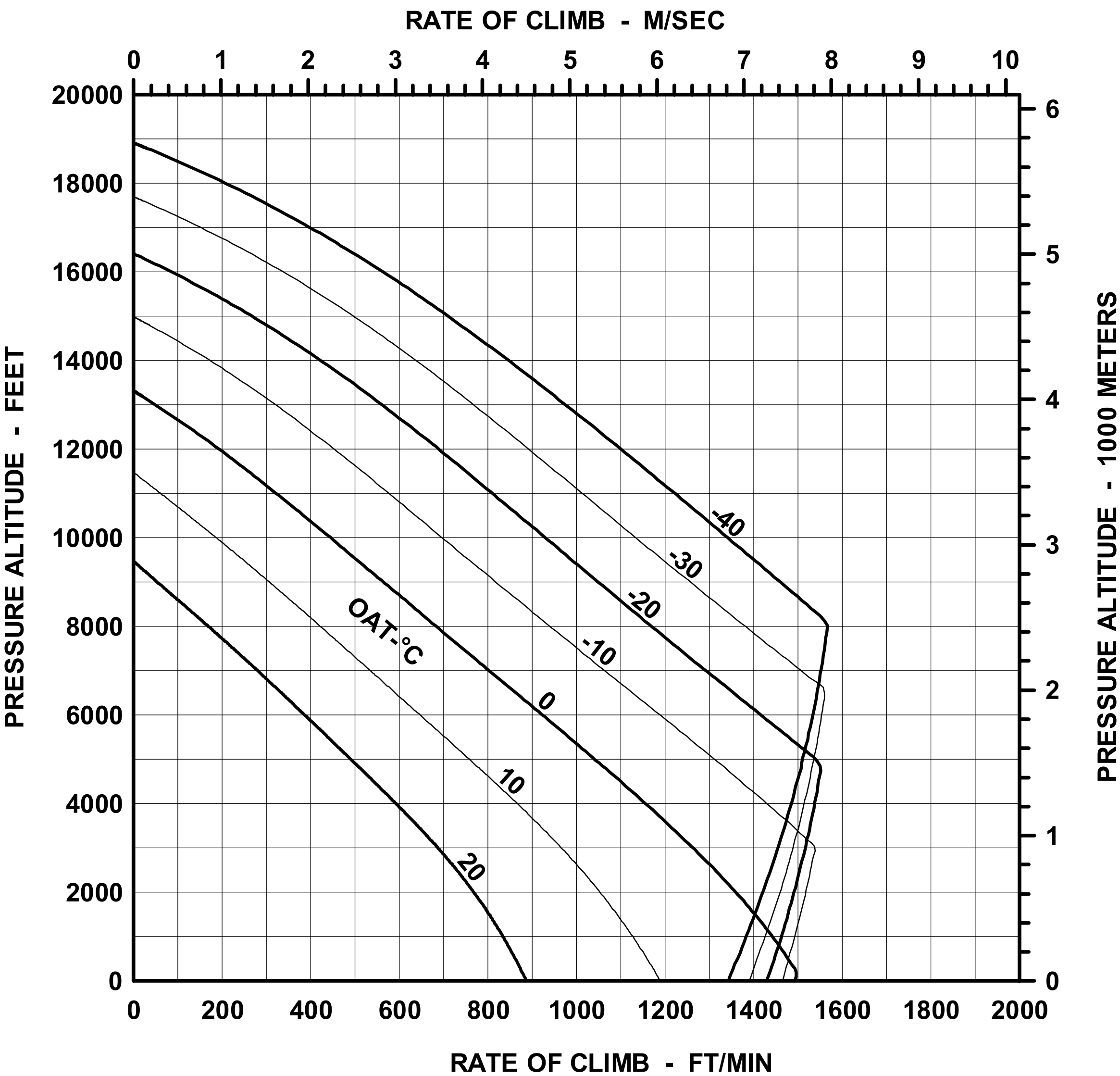


Figure 4-8. Rate of climb – maximum continuous power (sheet 4 of 8)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE
1000 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)

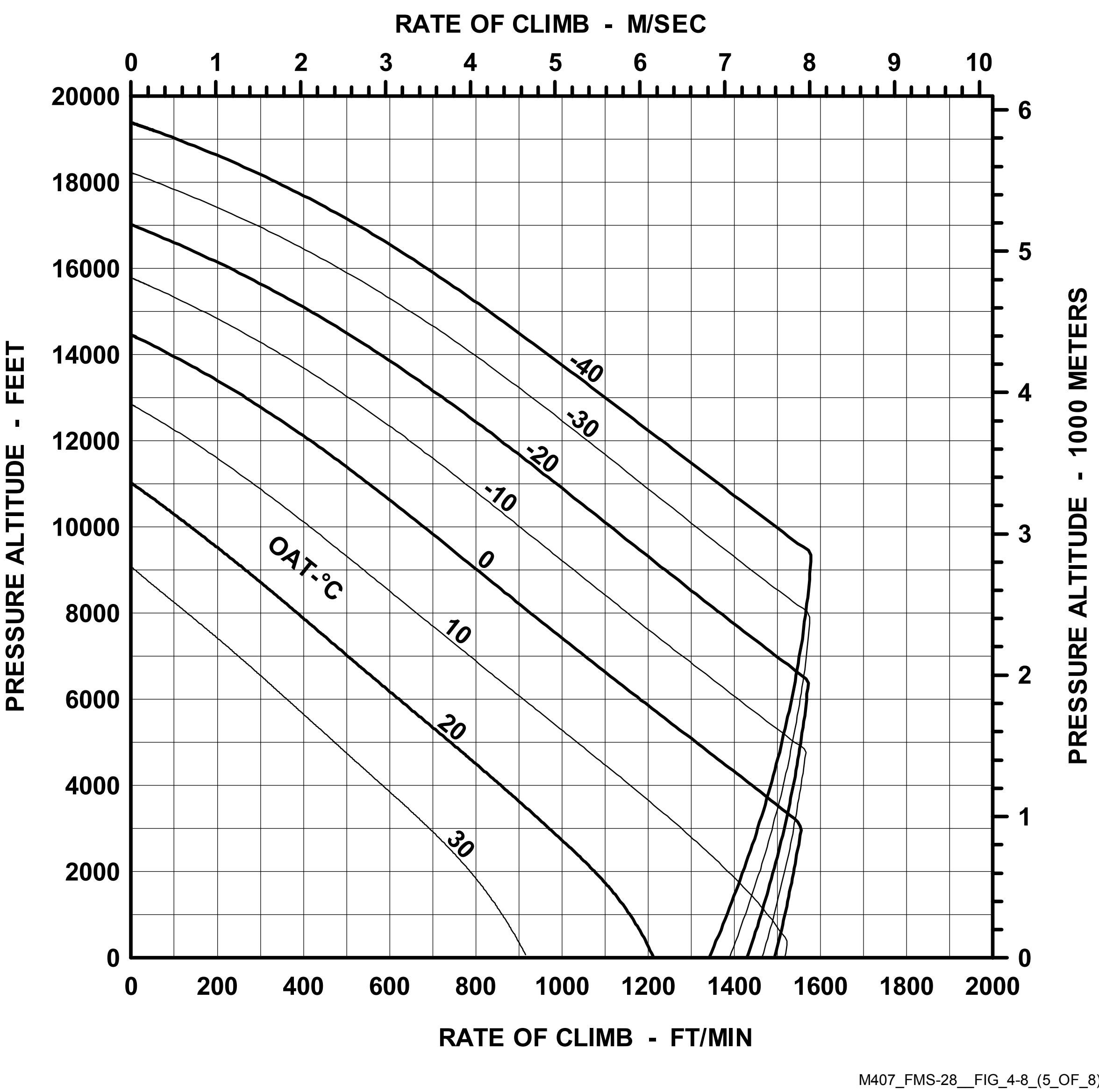


Figure 4-8. Rate of climb – maximum continuous power (sheet 5 of 8)

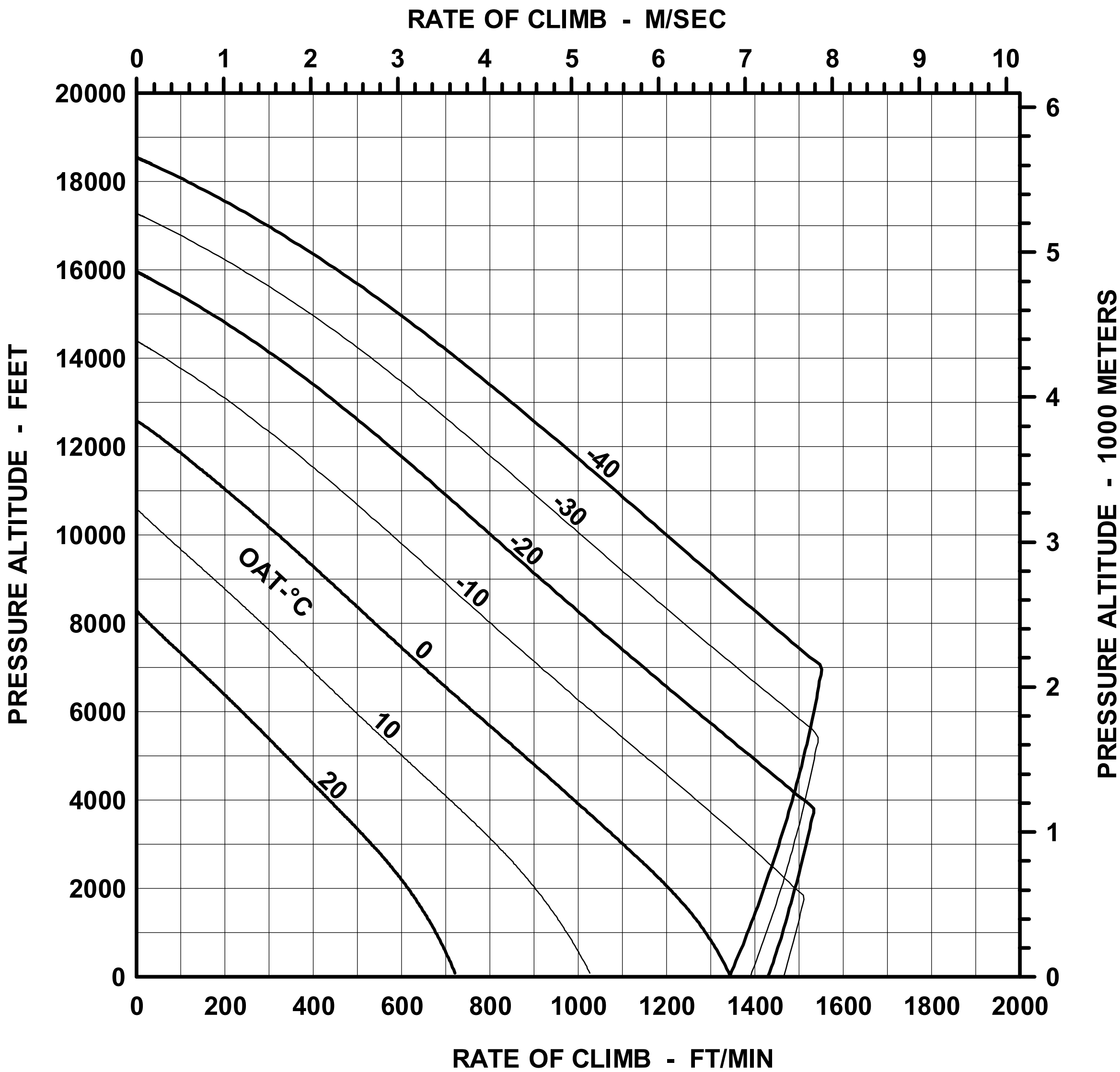
RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
BASIC INLET
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-8_(6_OF_8).WMF

Figure 4-8. Rate of climb – maximum continuous power (sheet 6 of 8)

RATE OF CLIMB

MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER OFF
PARTICLE SEPARATOR - PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN ABOVE 500 FT Hp FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)

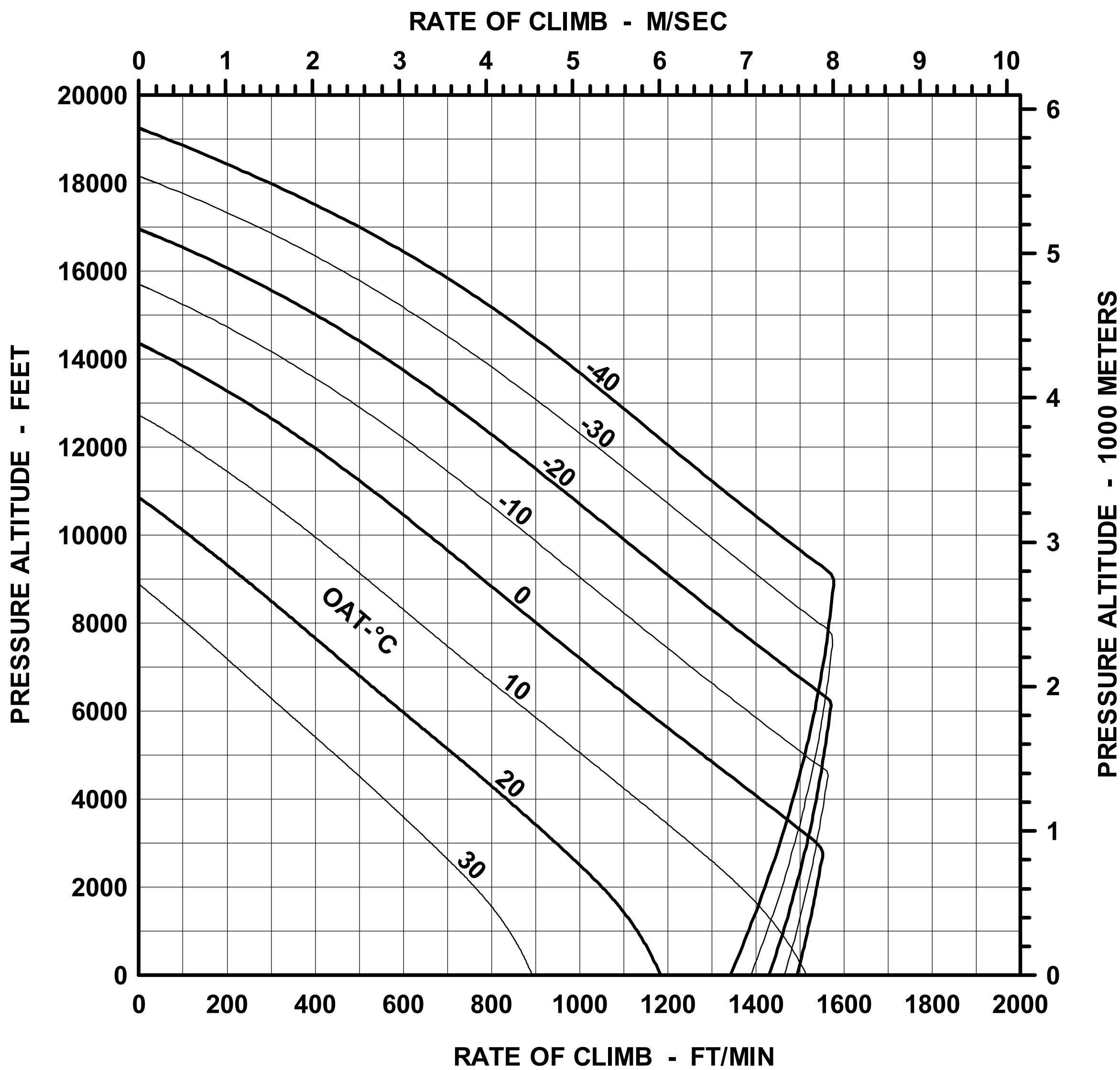


Figure 4-8. Rate of climb – maximum continuous power (sheet 7 of 8)

RATE OF CLIMB

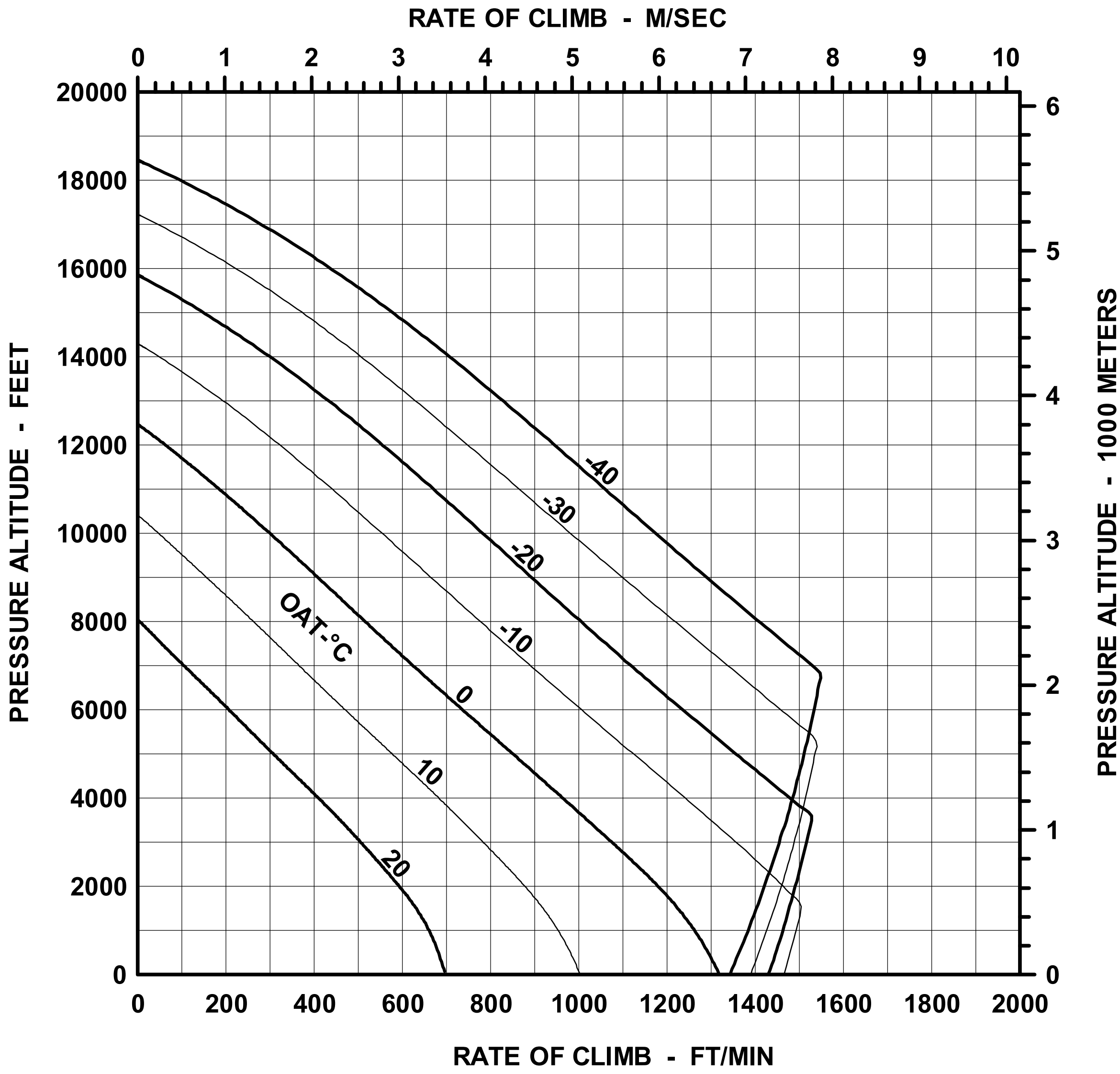
MAXIMUM CONTINUOUS POWER
ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER ON
PARTICLE SEPARATOR - PURGE OFF
SNOW DEFLECTOR

REDUCE RATE OF CLIMB 130 FT/MIN
FOR ANTI-ICE ON (5°C AND COLDER)

REDUCE RATE OF CLIMB 45 FT/MIN FOR PURGE ON

Gross Weight 5250 lb (2381 kg)



M407_FMS-28__FIG_4-8_(8_OF_8).WMF

Figure 4-8. Rate of climb – maximum continuous power (sheet 8 of 8)

MODEL 407

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

UNITED KINGDOM REGISTERED HELICOPTERS

CAA CERTIFIED
TBD XX, 2001

This supplement shall be attached to the Bell Helicopter Model 407 Flight Manual when the helicopter is registered in the United Kingdom.

Information contained herein supplements information of basic Flight Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult basic Flight Manual.

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08 JANUARY 2002

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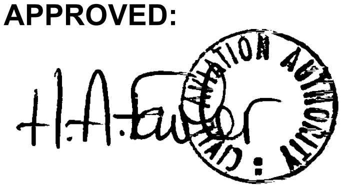

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Section 4

PERFORMANCE

4-1. TAKEOFF DISTANCE OVER 100-FOOT OBSTACLE

The Takeoff Distance Over 100-Foot Obstacle chart (Figure 4-1) provides takeoff performance data. The takeoff is initiated from a stabilized 4-foot (1.2 meter) skid height hover. Increase power smoothly to hover power plus 20% torque or Takeoff Power, whichever is less, and simultaneously start nosedown pitch rotation so that the aircraft accelerates along a flight path within the takeoff corridor defined by the Height-Velocity diagram (Figure 4-4 in Basic Manual). As the helicopter goes through 50 KIAS, start nose up rotation while increasing power to Takeoff Power. With the aircraft starting to climb, continue accelerating up to 65 KIAS. Engine power limitations are imposed to preclude unsafe nosedown attitude while in the flight path required to remain clear of critical height-velocity limitations. Good pilot technique is required to achieve the published takeoff performance. Wind factors are not considered.

NOTE

Downwind takeoffs are not recommended because the published takeoff distance performance cannot be achieved.

The power should be applied at a rate sufficient to expedite the manoeuver but not so rapid as to overshoot the torque value (approximately 6 seconds). Once power is set, it should not be further adjusted until the aircraft goes through 50 KIAS. At this airspeed, start nose up rotation while increasing power to Takeoff Power. While starting to climb, continue accelerating up to 65 KIAS.

EXAMPLE:

What takeoff distance is required to clear a 100-foot obstacle under the following conditions:

OAT	20°C
HP	1500 feet
GW	4500 pounds

SOLUTION:

Enter the Takeoff Distance Over 100-Foot Obstacle chart (Figure 4-1) at a pressure altitude of 1500 feet, proceed horizontally to the 20°C temperature line. Drop down vertically to the 4500 lb gross weight line and move horizontally again to read a takeoff distance of 1010 feet.

4-2. PARTIAL POWER CLIMB

Torque limited partial power rate of climb charts are presented for an aircraft with basic inlet installed and with the heater and engine anti-ice both OFF (Figure 4-2).

The recommended best rate of climb airspeed is 60 KIAS.

EXAMPLE:

Find the maximum rate of climb that can be attained using 65% torque under the following conditions:

HEATER	OFF
ENGINE ANTI-ICE	OFF
OAT	-10°C
HP	7000 feet
GW	4000 pounds

SOLUTION:

Enter the appropriate gross weight chart, 4000 lbs (Figure 4-2, Sheet 1 of 2). Starting at a pressure altitude of 7000 feet, proceed horizontally to the -10°C temperature line. Drop down vertically and read a rate of climb of 1225 feet per minute.

TAKEOFF DISTANCE
OVER 100-FOOT OBSTACLE

CONDITIONS:

ROTOR RPM 100%
ROTATION AIRSPEED 50 KIAS
CLIMB AIRSPEED 65 KIAS
ZERO WIND

TECHNIQUE:

LEVEL ACCELERATION FROM 4-FT (1.2 M) SKID HEIGHT USING HOVER POWER + 20% TORQUE (NOT TO EXCEED 100%) UP TO 50 KIAS AND CLIMB AT TAKEOFF POWER THEREAFTER

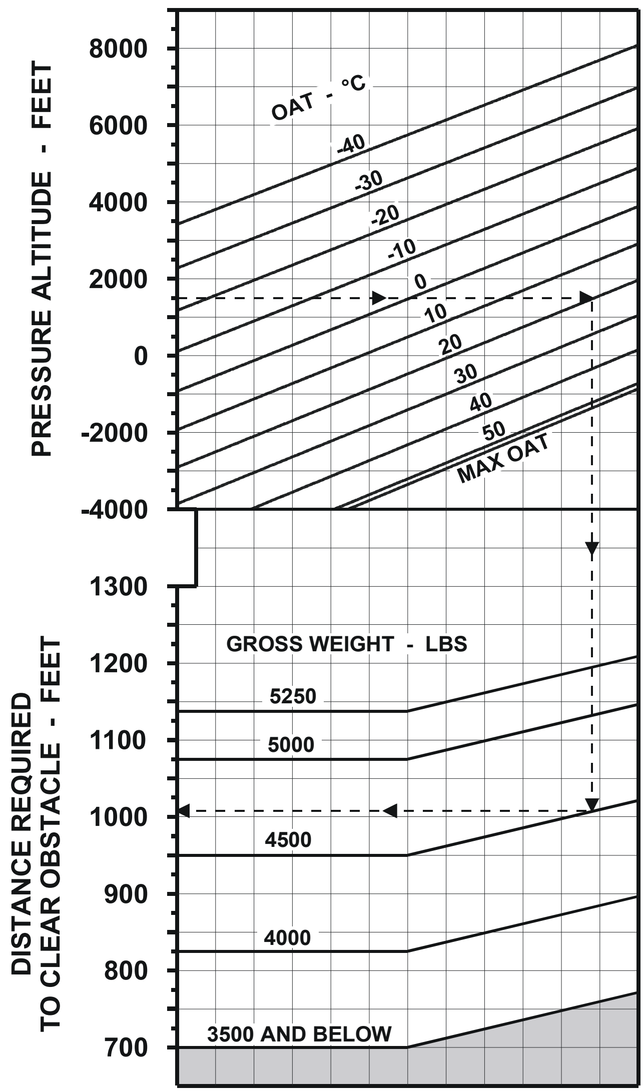

Figure 4-1. Takeoff Distance Over 100-Foot Obstacle

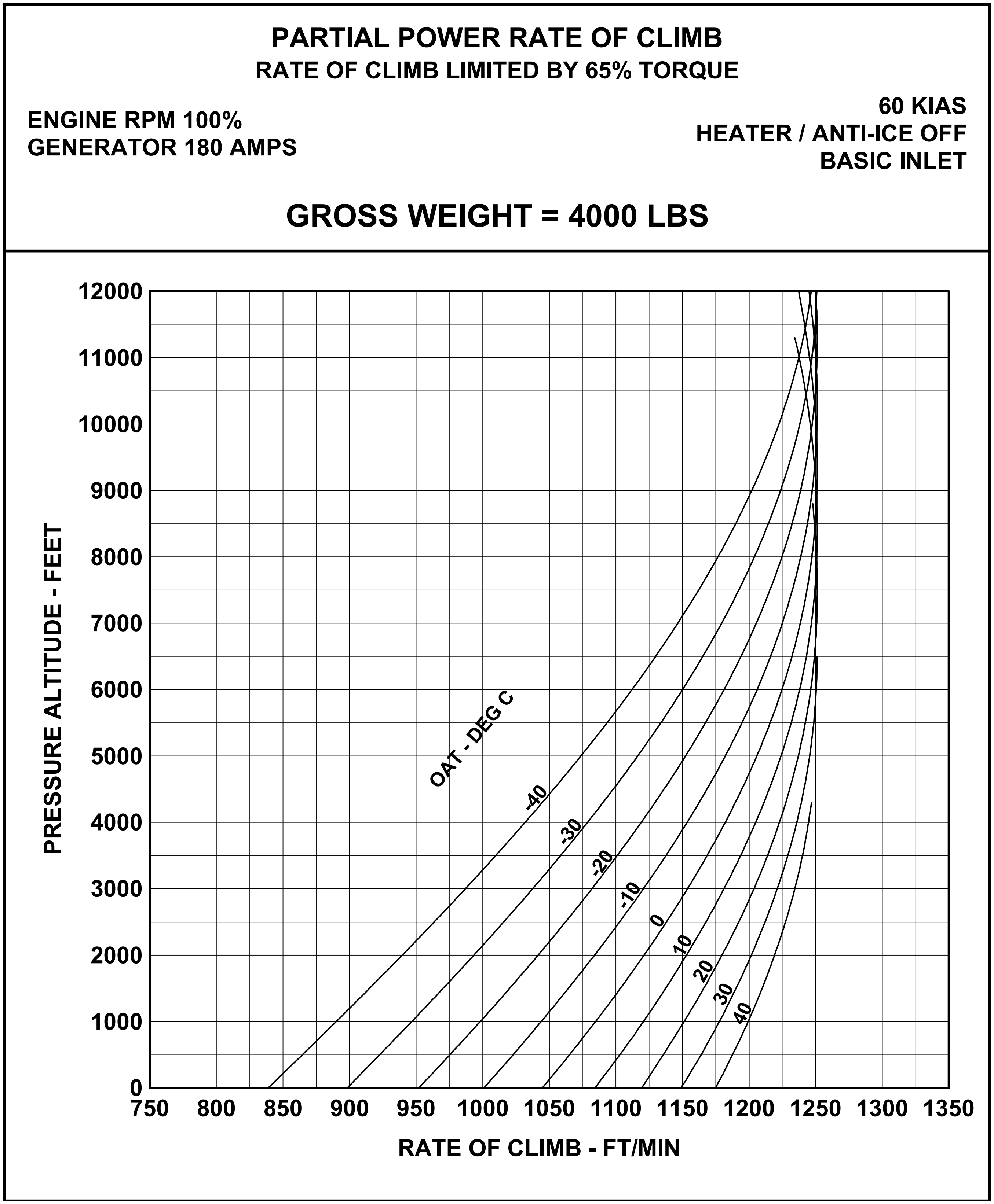

Figure 4-2. Rate of Climb — Partial Power (Sheet 1 of 2)

PARTIAL POWER RATE OF CLIMB

RATE OF CLIMB LIMITED BY 65% TORQUE

ENGINE RPM 100%
GENERATOR 180 AMPS

60 KIAS
HEATER / ANTI-ICE OFF
BASIC INLET

GROSS WEIGHT = 5000 LBS

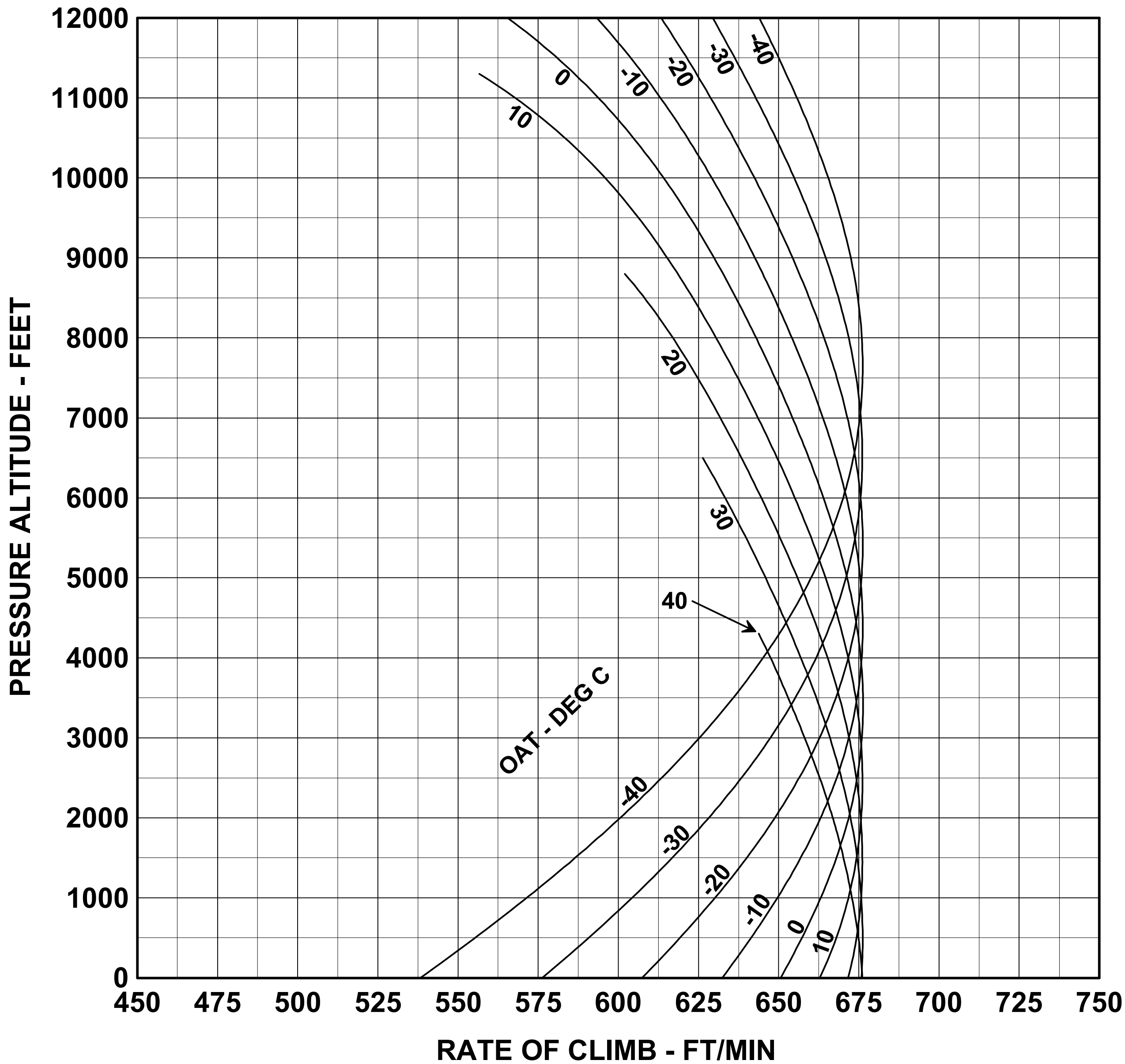

Figure 4-2. Rate of Climb — Partial Power (Sheet 2 of 2)

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TEMP. REV. NO.	TITLE	DATE ISSUED	DATE CANCELED
BHT-407-FM-1	FADEC Fault Annunciation Interpretation	Revision 1 03 December 1996	15 June 2000
BHT-407-FM-1	NP Overspeed Trip Increase	03 December 1996	15 June 2000
BHT-407-FM-1	Airspeed Change to 125 KIAS and Temporary Pedal Stop	16 December 1998	10 March 1999
BHT-407-FM-1	FADEC Software Version 5.202	22 December 1998	17 December 2002
BHT407-FM-1	Hover Performance Correction for Temporary Tail Rotor Pedal Stop	10 March 1999	17 December 2002
BHT-407-FM-1	V_{NE} Increase to 130 KIAS	Reissue 3 June 1999	17 December 2002
BHT-407-FM-1	FADEC Direct Reversion to Manual System, ASB 407-99-31	4 June 1999	17 December 2002
BHT-407-FM-1	V_{NE} Increase to 140 KIAS	Revision 1 27 June 2000	17 December 2002
BHT-407-FM-1 (TR-9)	Sustained Hover and Vertical Takeoff/ Landing Operations with Tailwind	15 January 2002	
BHT-407-FM-1 (TR-10)	Incorporation of Oil Cooler Blower Inlet Ducts and Bearing Airflow Shields	Revision 1 25 July 2002	

For tracking purposes, Temporary Revisions are now being numbered.

This Log of Temporary Revisions provides the current status of each Temporary Revision issued against the basic Flight Manual. It should be inserted at the back of the Flight Manual binder for quick and easy reference.