



**ROTORCRAFT
FLIGHT MANUAL
SUPPLEMENT**

**IMPROVED HOVER PERFORMANCE WITH
ABOVE MINIMUM SPECIFICATION POWER**

STC NO. SR09531RC-D

**CERTIFIED
18 FEBRUARY 2010**

This supplement shall be attached to the BHT-407-FM when Improved Hover Performance with Above Minimum Specification Power STC is 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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NOTE

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FEB. 18, 2010

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GENERAL INFORMATION

The information in this supplement provides a means for operators to take advantage of engine power margin to predict improved performance for both internal and external load operations for hot/high operations when engine power available is limited by MGT. The approved IGE/OGE improved hover performance charts allow the helicopter to hover, take off, and land with a greater load within the approved performance envelope (not to exceed maximum gross weight). Basic helicopter operating procedures and limits remain unchanged.

Section 1

LIMITATIONS

1-5. CONFIGURATION

Use of performance charts presented in Section 4 is not authorized with Snow Deflector Kit (BHT-407-FMS-4) installed.

1-20. INSTRUMENT MARKINGS AND PLACARDS

Refer to [Figure 1-3](#).

**GEN LOAD MUST BE REDUCED
BELOW 50A TO USE BHT-407-FMS-8
HOVER PERFORMANCE CHARTS**

Location: Instrument panel

407_FMS_8_0003

Figure 1-3. Placards and Decals

Section 2

NORMAL PROCEDURES

No change from basic manual.

Section 3

EMERGENCY AND MALFUNCTION PROCEDURES

No change from basic manual.

Section 4

PERFORMANCE

4-1. INTRODUCTION

The performance data presented in this section permits performance credit to be taken for engines that deliver above minimum specification power (i.e., demonstrate positive power margin) as determined from the power assurance procedure defined in [paragraph 4-2](#). The data are applicable to the basic helicopter inlet and the Particle Separator kit (BHT-407-FMS-3).

The power assurance check in [Figure 4-1](#) is conducted with a generator load of 35A or less. Hover performance charts ([Figure 4-6](#) and [Figure 4-7](#)) are based on engine power available with a 50A generator load.

4-2. POWER ASSURANCE CHECK (PAC)

The following requirements apply when opting to claim hover performance credit for an above minimum specification engine:

- PAC must be conducted daily per the climb PAC procedure shown in this section.
- Data from the 10 most recent PAC events will be averaged to establish the engine power available margin.
- Engine power available margin and associated increased performance is valid for all altitudes up to 2000 feet H_p above the average PAC altitude obtained from the 10 most recent PAC events (i.e., if performance credit is desired at 10,000 feet H_p , the PAC performance margin must be determined using an average H_p of 8000 feet or higher).

Performance margin shall be determined using the following climb PAC procedure:

1. Set OAT indicator to display degrees C.
2. Set altimeter to 29.92 to display pressure altitude.

NOTE

Minimum recommended MGT for performance margin determination is 700°C.

3. Establish stable 85 KIAS climb using the highest practical engine power, not to exceed helicopter takeoff limits (TRQ/MGT/NG), or 2000 FPM rate of climb limitations. Record MGT, engine torque, and pressure altitude as the helicopter passes through a 1000-foot H_p increment (altimeter indicates 4000 feet, 5000 feet, 6000 feet, etc.).
4. Reduce power, descend to pressure altitude recorded in [step 3](#), and record OAT.

Use the appropriate helicopter inlet configuration chart ([Figure 4-1](#)) to calculate engine plus power margin.

4-2-A. POWER ASSURANCE CHECK EXAMPLE PROBLEM

The following example is shown on the top of [Figure 4-1](#), Sheet 1, Basic Inlet.

The term takeoff power, in this section, refers to the theoretical torque a minimum specification engine would produce with MGT at 779°C. In some cases, it may exceed 100%.

EXAMPLE:

Observed conditions: 92% torque, 740°C MGT, 10°C OAT, and 6000 feet pressure altitude. Determine the engine plus power margin for this PAC.

1. Determine minimum specification torque at observed OAT and altitude as follows:
 - a. Enter chart at the upper left corner at observed MGT (740°C).
 - b. Proceed down to observed OAT (10°C).
 - c. Proceed to the right to pressure altitude (6000 feet).
 - d. Proceed down to read minimum specification torque (86.6%).

2. Determine takeoff power torque at observed OAT and altitude as follows:
 - a. Enter chart at takeoff MGT limit (779°C).
 - b. Proceed down to observed OAT (10°C).
 - c. Proceed to the right to pressure altitude (6000 feet).
 - d. Proceed down to read takeoff power torque for a minimum specification engine (95.6%).

3. Calculate Plus Power Margin as follows:
 - a. Margin =

$$\frac{\text{Observed Torque} - \text{Min Specification Torque}}{\text{Takeoff Torque}}$$

- b. Margin = $(92 - 86.6) / 95.6 = 0.056$.
Multiply by 100 for percentage (+5.6%)

To determine the average power available margin:

- Sum the 10 most recent power available margins and divide the result by 10. This value is the 10-point average power available margin.

To determine the average pressure altitude:

- Sum the 10 most recent PAC pressure altitudes and divide by 10. This value is the average pressure altitude. The helicopter may use the appropriate hover performance chart up to 2000 feet above this average value.

To determine the correct performance charts to be used, compare the latest measured PAC margin to the previous 10-point average margin:

- If the latest power available margin is 2.0% or more below the previous 10-point average, use of hover performance charts in this FMS is not authorized. The PAC must be repeated and/or maintenance action performed to determine the cause for the reduction in power available margin. The repeated PAC and the PAC that was 2.0% or more below the previous 10-point average shall both be used to calculate a new 10-point average power available margin. If the latest PAC is more than 2.0% below the new 10-point average, use of the performance charts in this FMS is not authorized. The PAC and/or maintenance action must be repeated until the following criterion is met.
- If the latest power available margin is less than 2.0% below the previous 10-point average margin, it is a valid point and will be used to calculate the new 10-point average margin for use with the performance charts in this FMS.
- Reduce the new 10-point average margin to the next lower, even integer to determine the correct performance

charts to be used (i.e., a 7.99% average margin would authorize use of +6% charts).

4-3. HOVER CEILING

The hover ceiling charts ([Figure 4-6](#) and [Figure 4-7](#)) present IGE and OGE hover performance (allowable gross weight) for conditions of pressure altitude and outside air temperature.

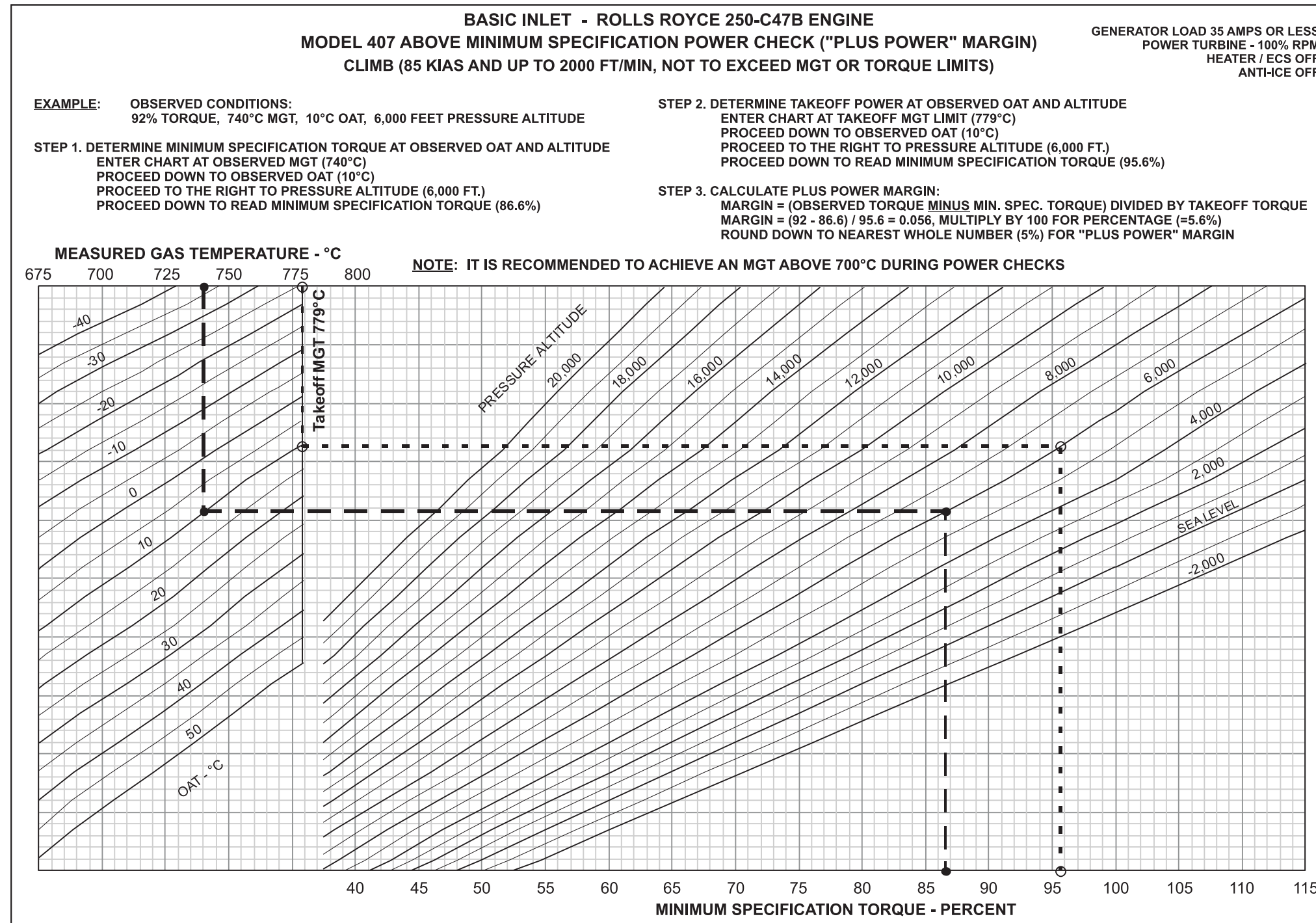


Figure 4-1. Power Assurance Check (Sheet 1 of 2)

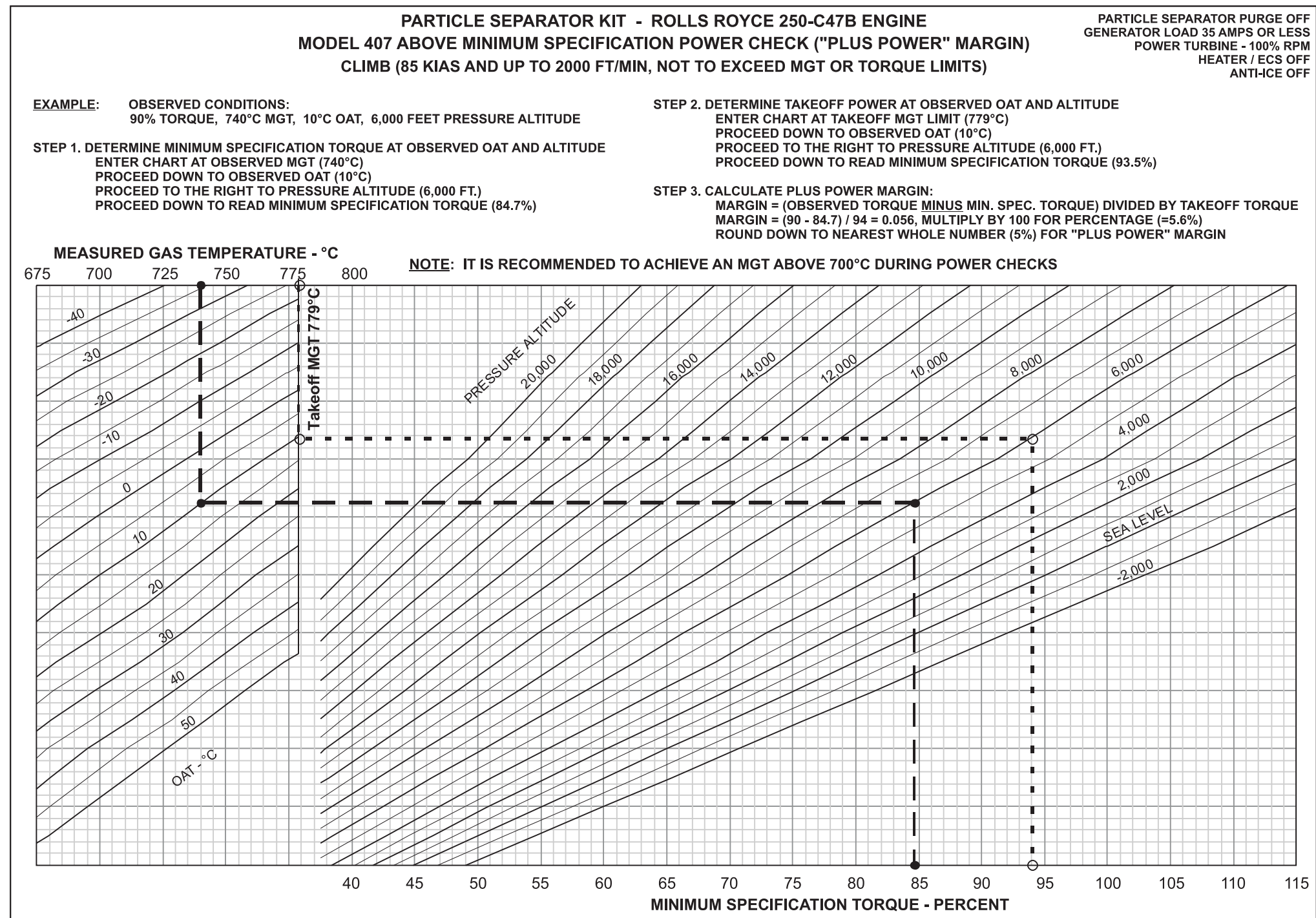


Figure 4-1. Power Assurance Check (Sheet 2 of 2)

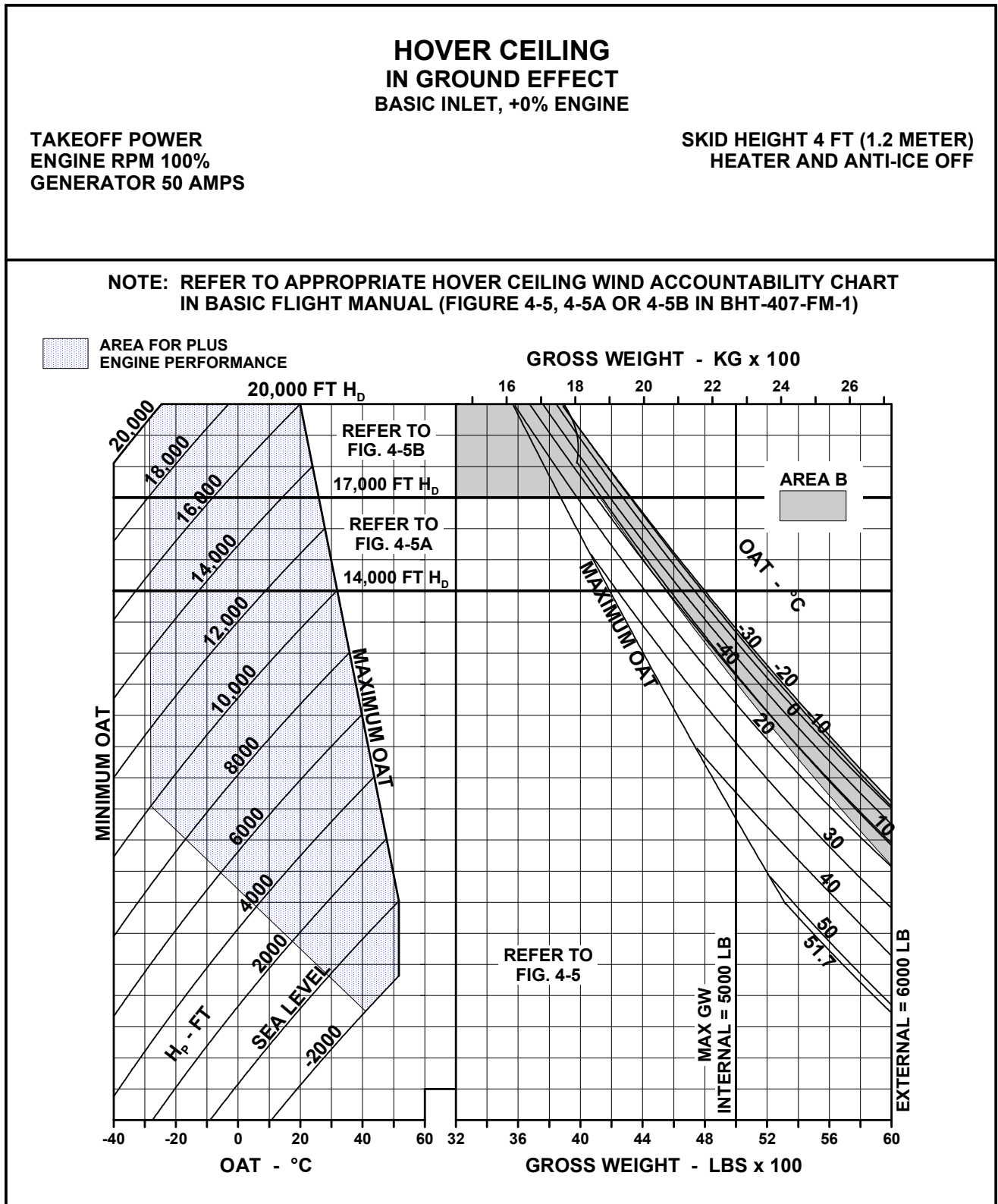


Figure 4-6. Hover Ceiling IGE (Sheet 1 of 12)

HOVER CEILING IN GROUND EFFECT BASIC INLET, +2% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

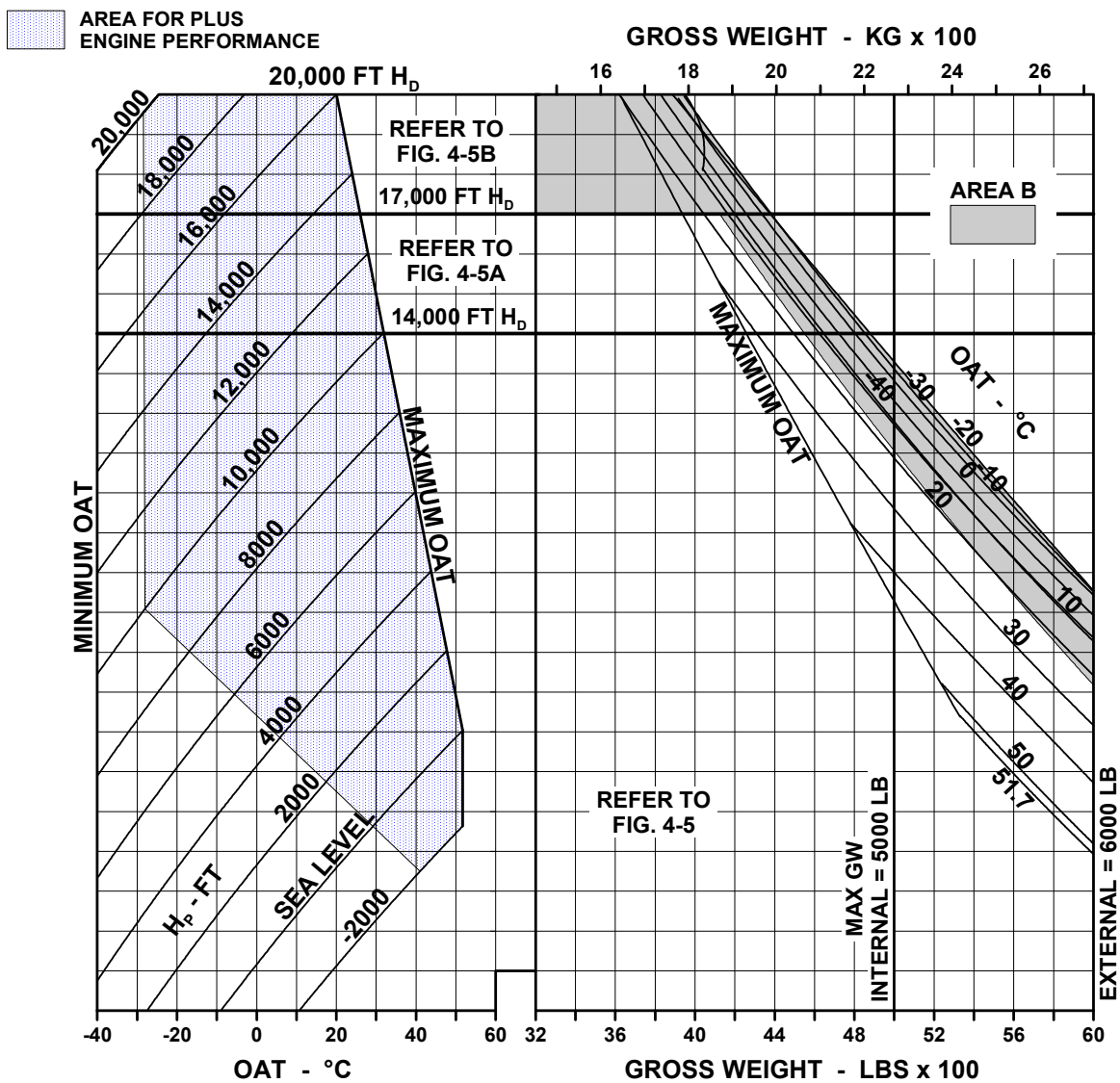


Figure 4-6. Hover Ceiling IGE (Sheet 2 of 12)

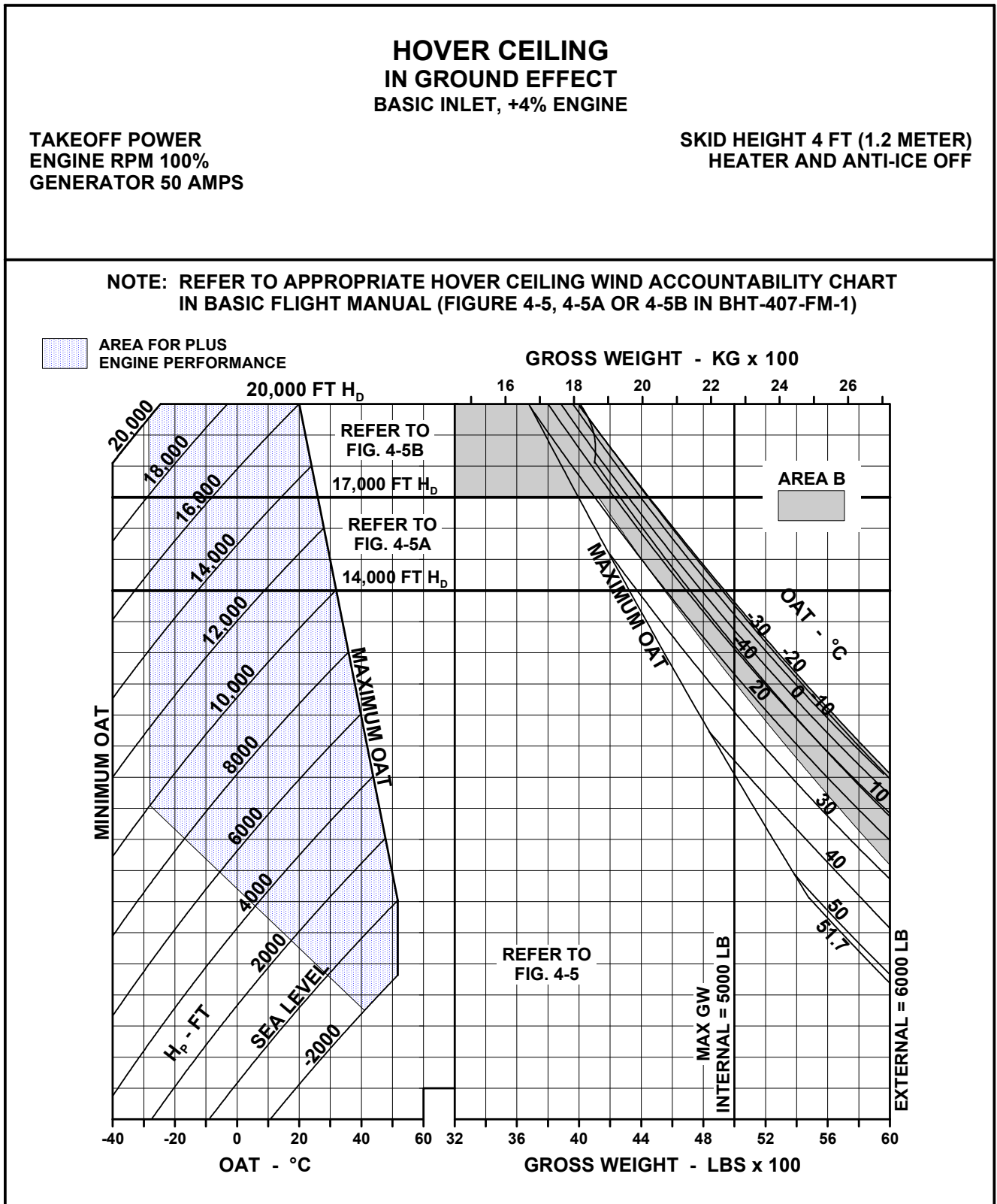


Figure 4-6. Hover Ceiling IGE (Sheet 3 of 12)

HOVER CEILING IN GROUND EFFECT BASIC INLET, +6% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

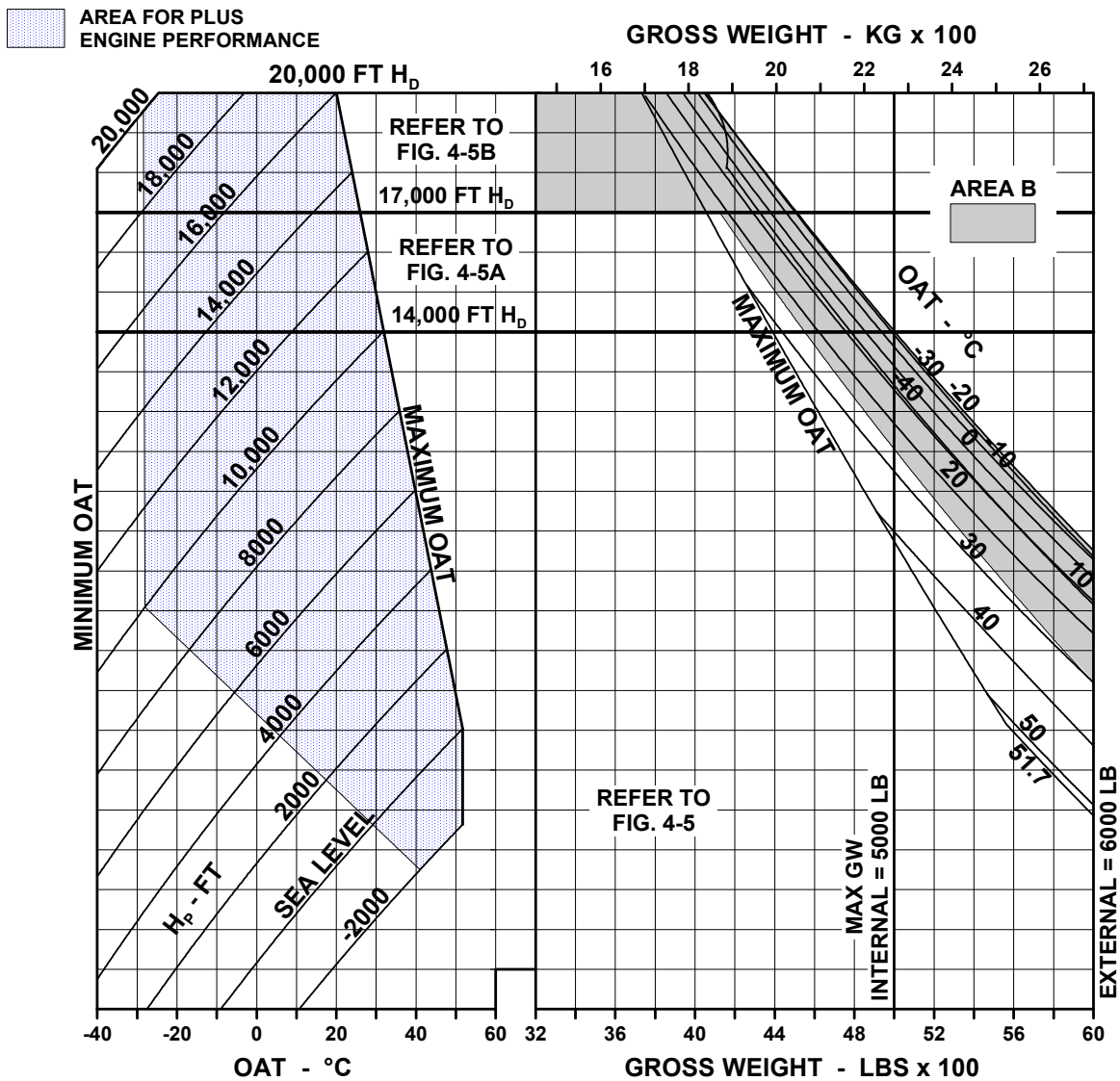


Figure 4-6. Hover Ceiling IGE (Sheet 4 of 12)

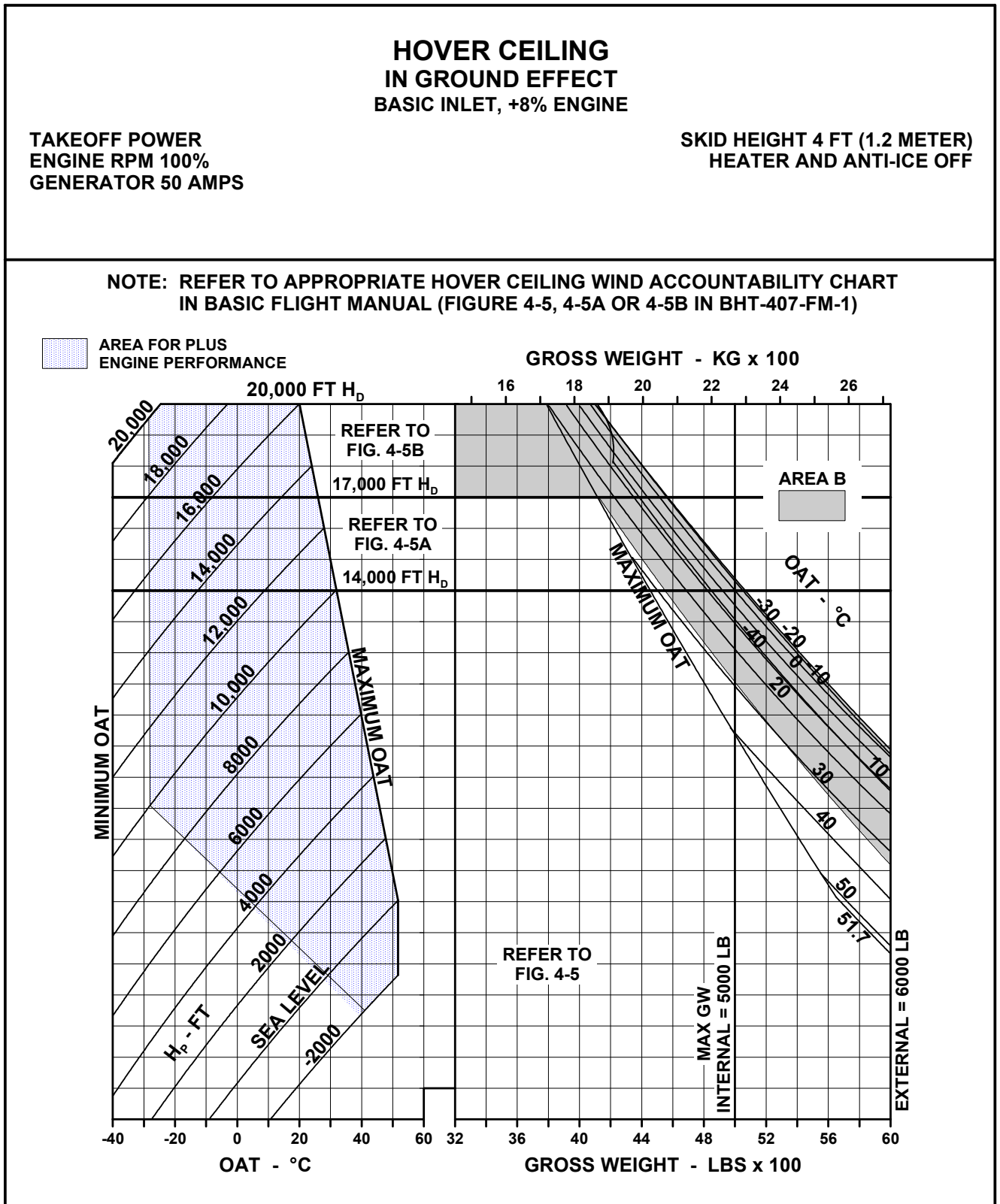


Figure 4-6. Hover Ceiling IGE (Sheet 5 of 12)

HOVER CEILING IN GROUND EFFECT BASIC INLET, +10% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

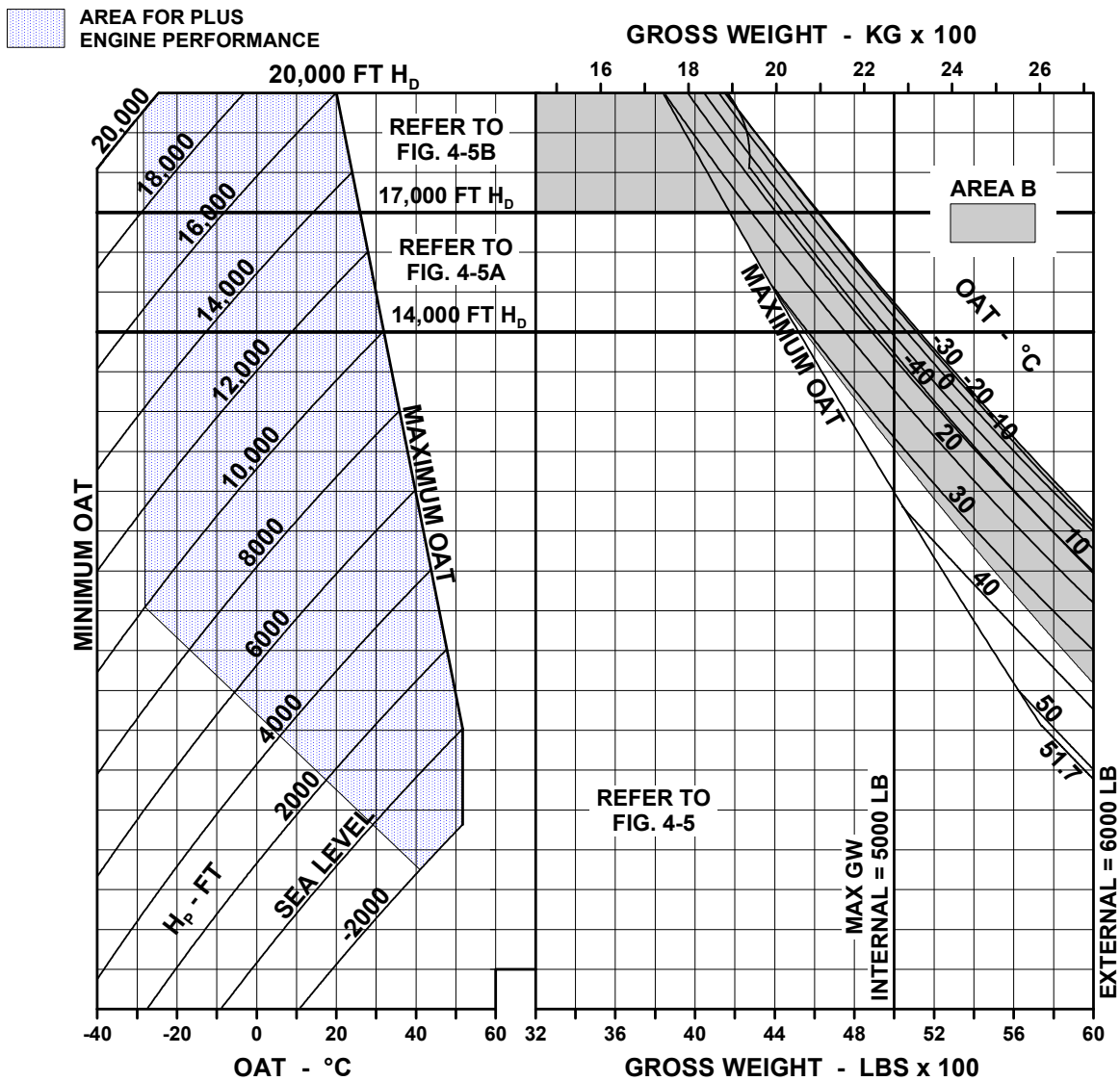


Figure 4-6. Hover Ceiling IGE (Sheet 6 of 12)

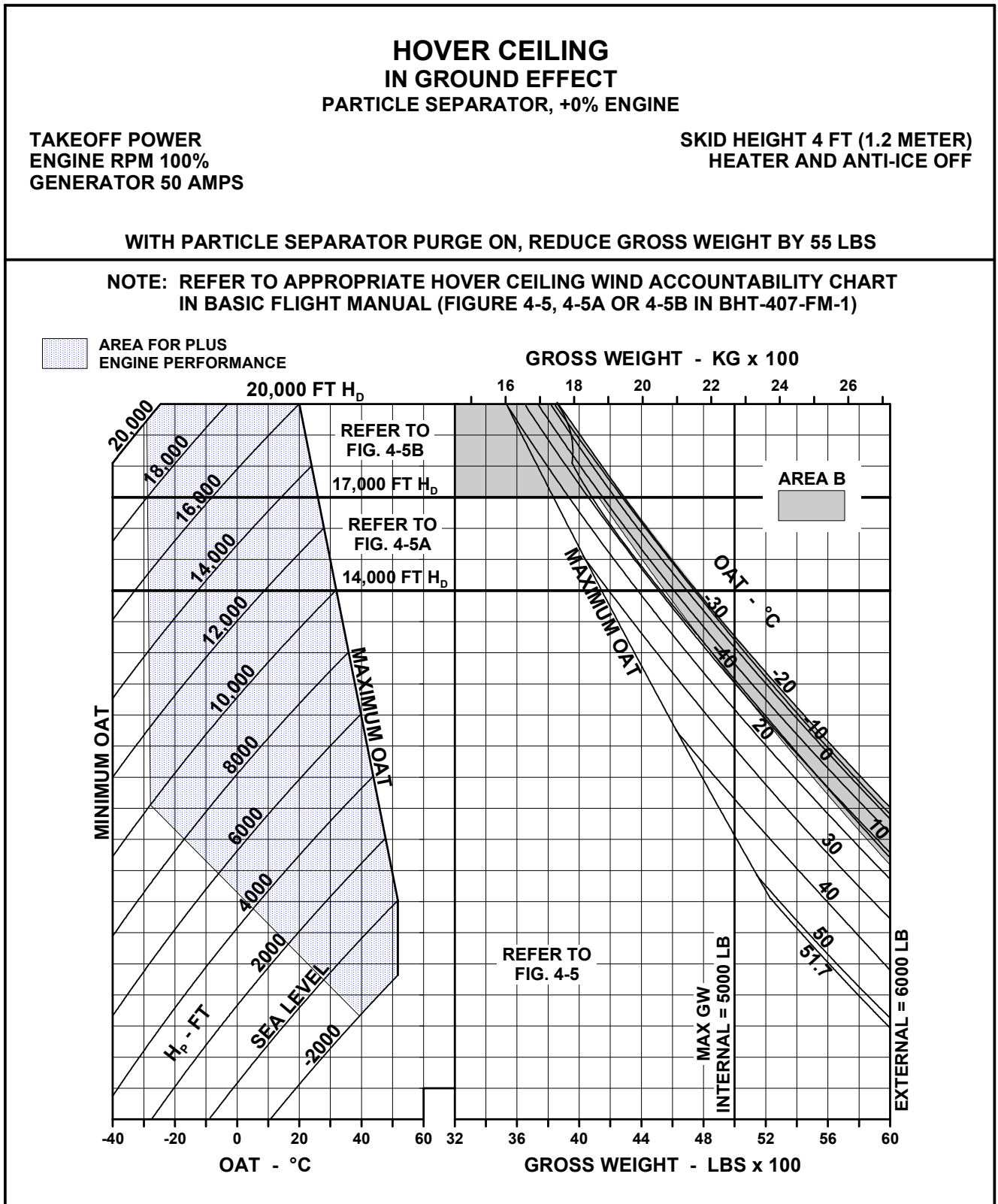


Figure 4-6. Hover Ceiling IGE (Sheet 7 of 12)

HOVER CEILING IN GROUND EFFECT PARTICLE SEPARATOR, +2% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

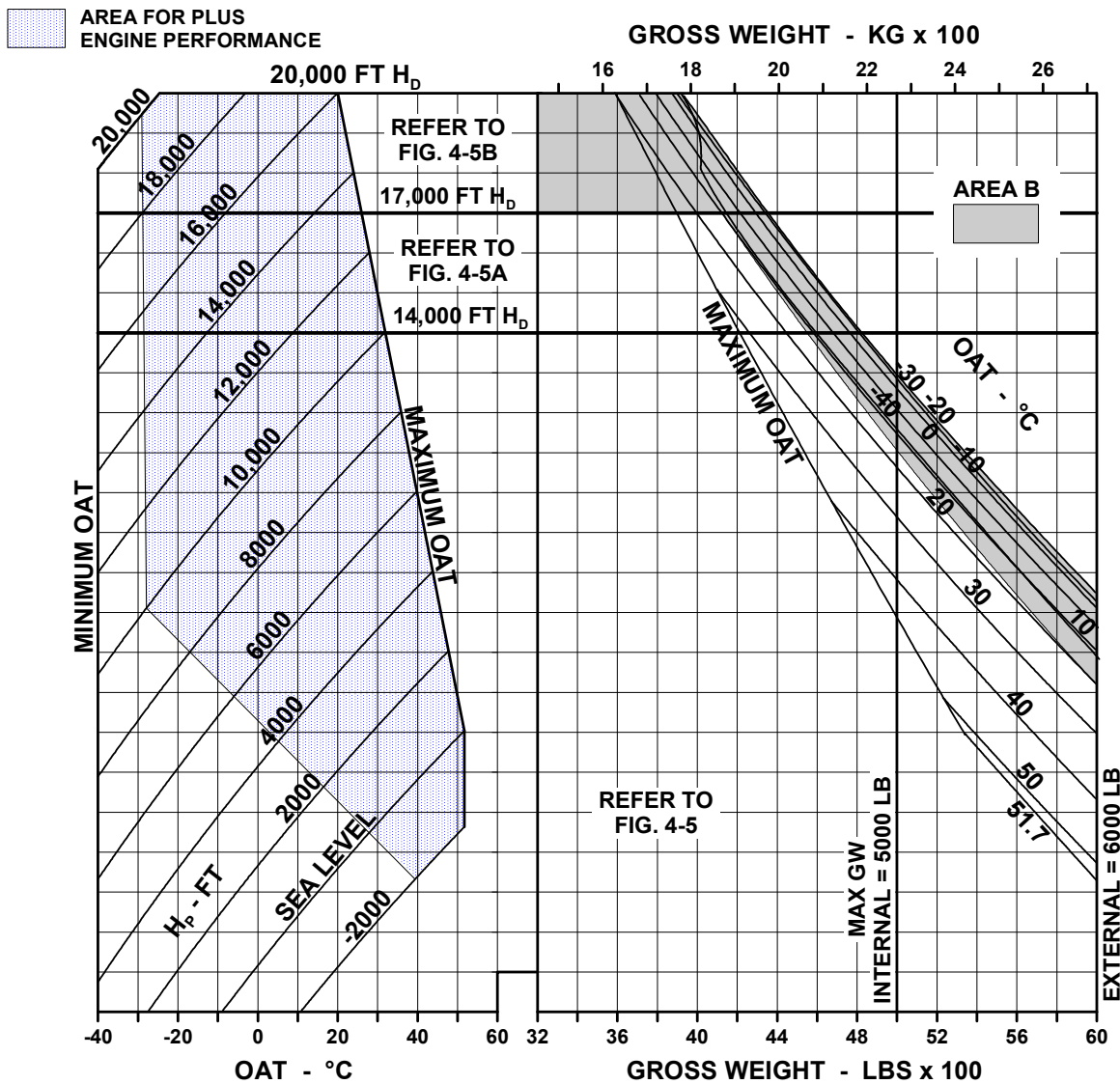


Figure 4-6. Hover Ceiling IGE (Sheet 8 of 12)

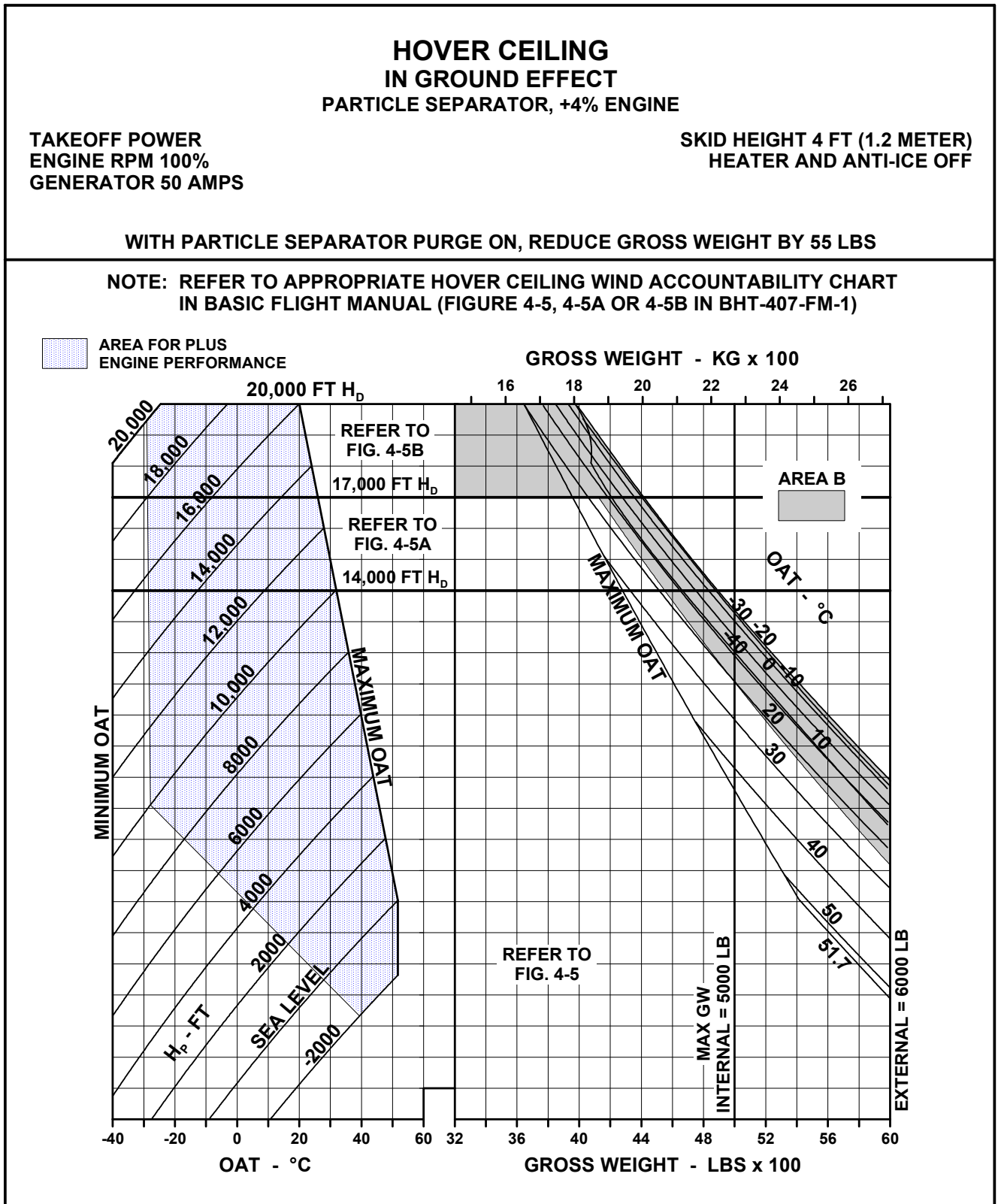


Figure 4-6. Hover Ceiling IGE (Sheet 9 of 12)

HOVER CEILING IN GROUND EFFECT PARTICLE SEPARATOR, +6% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

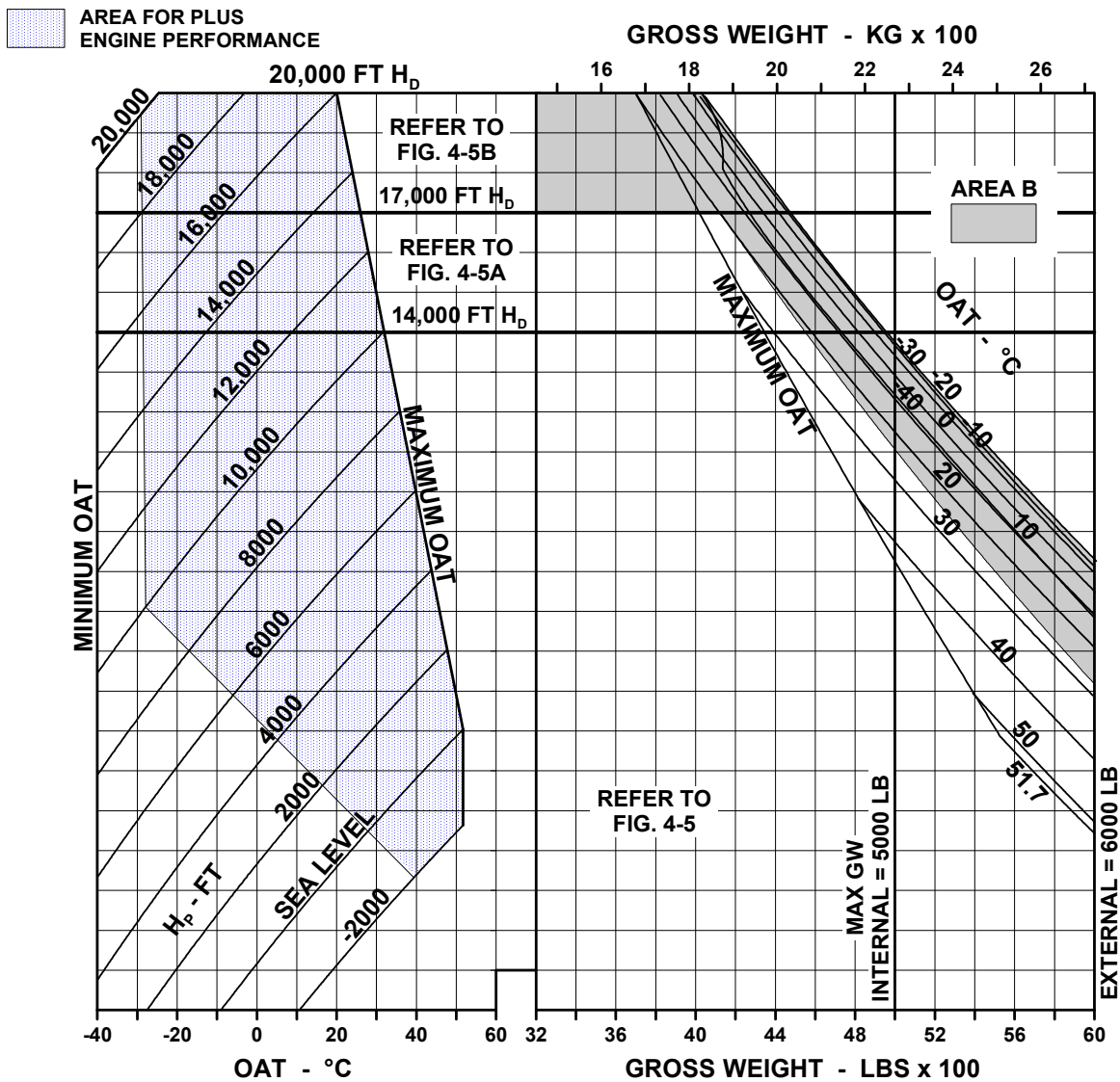


Figure 4-6. Hover Ceiling IGE (Sheet 10 of 12)

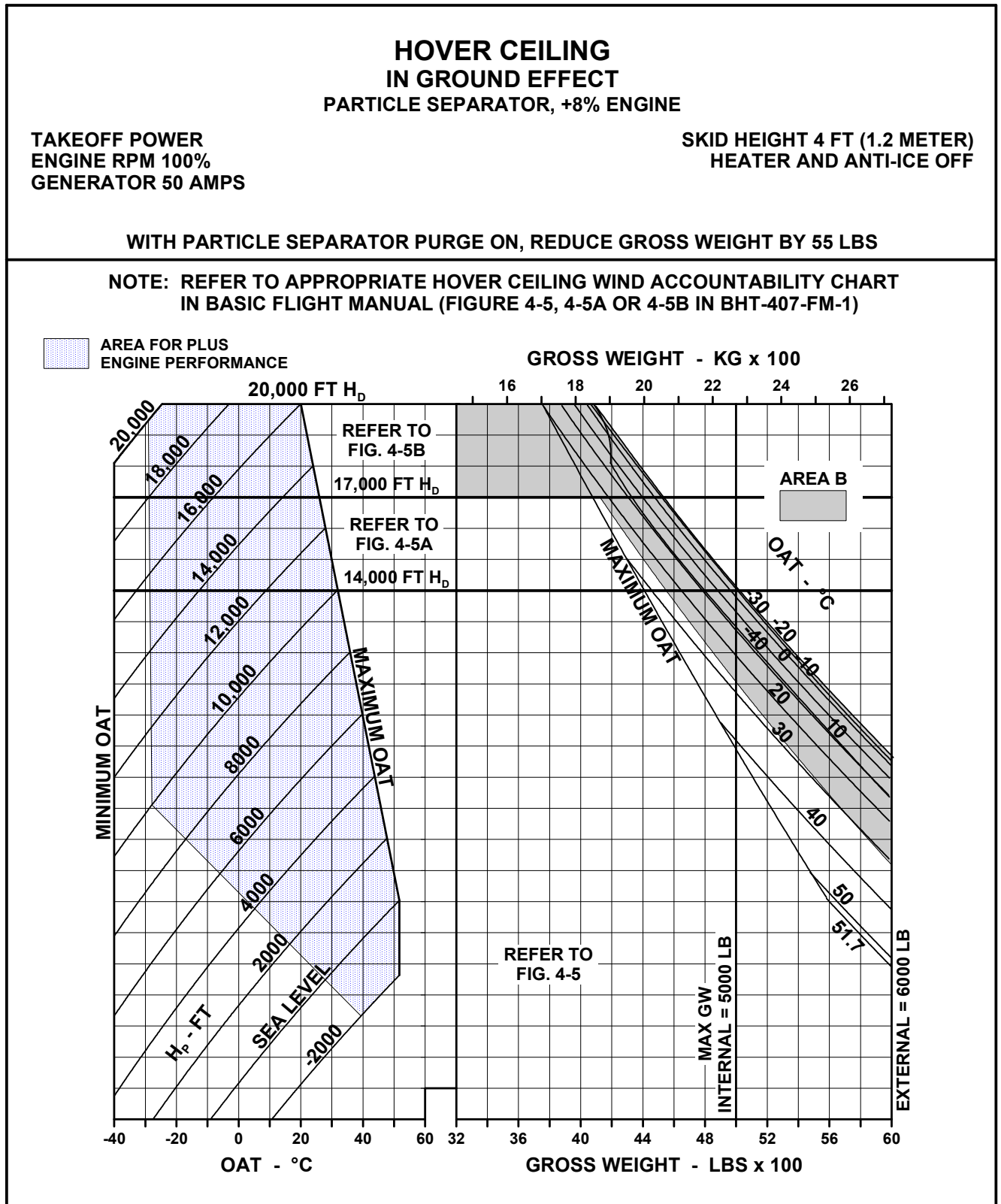


Figure 4-6. Hover Ceiling IGE (Sheet 11 of 12)

HOVER CEILING IN GROUND EFFECT PARTICLE SEPARATOR, +10% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

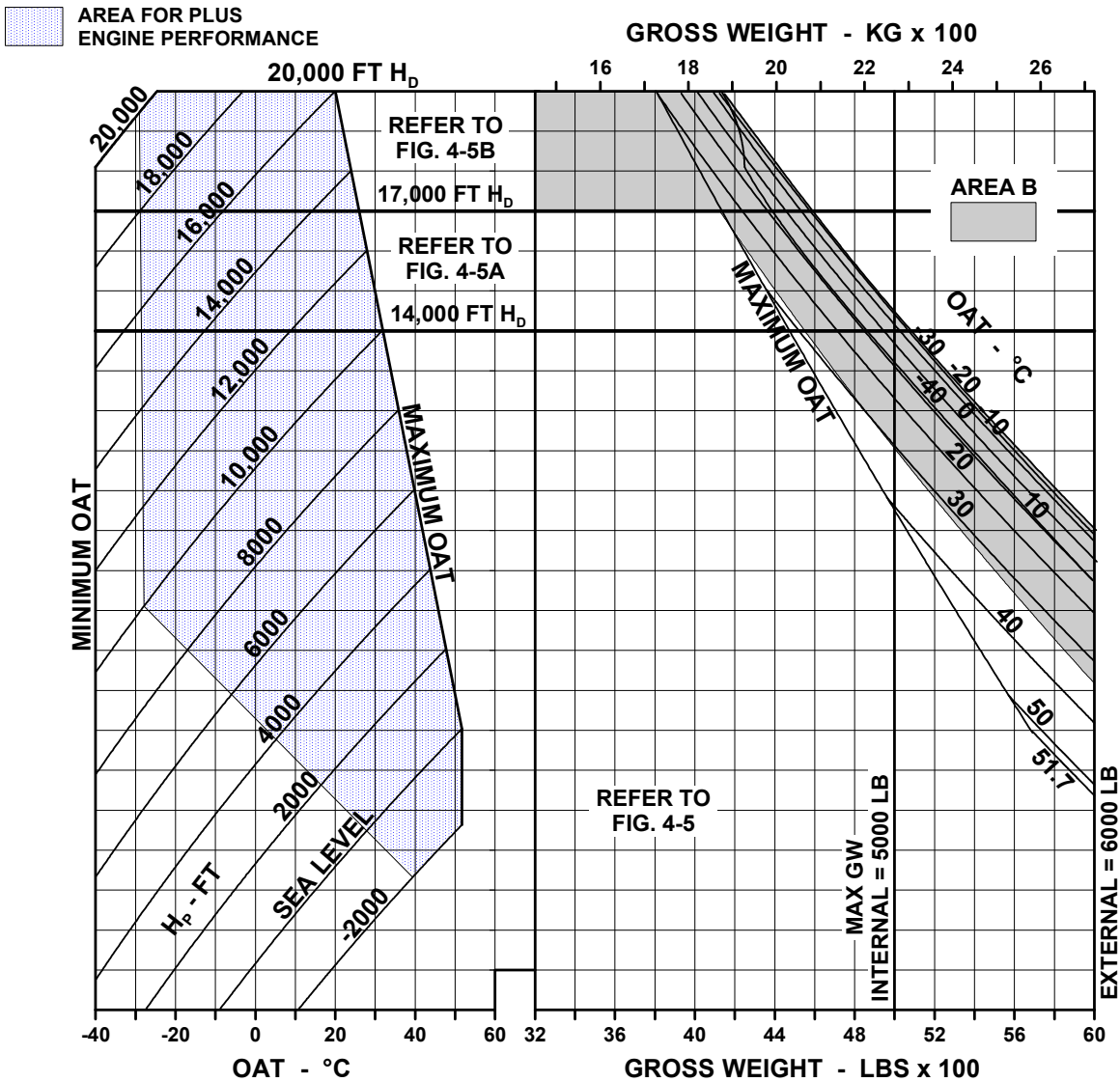


Figure 4-6. Hover Ceiling IGE (Sheet 12 of 12)

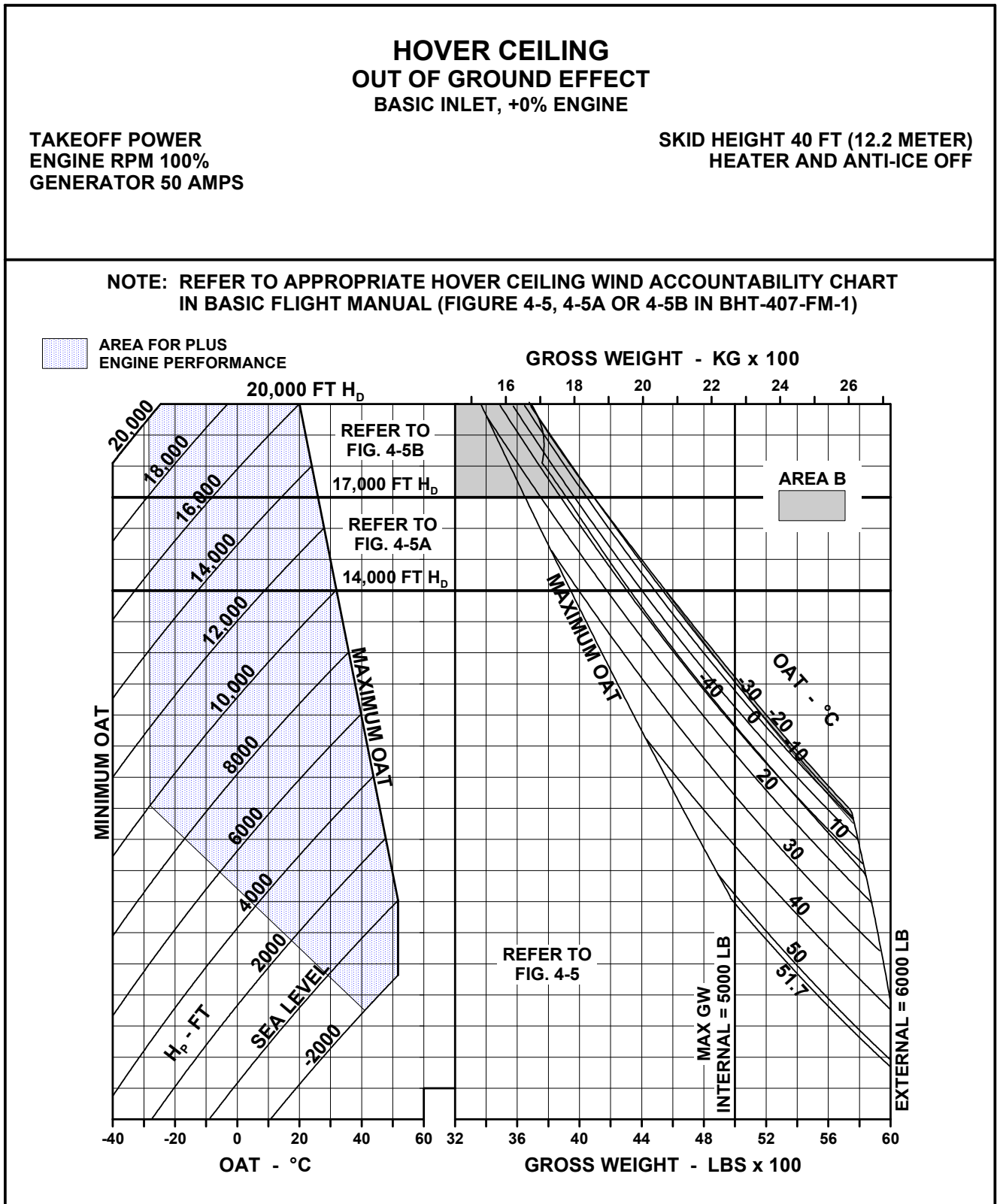


Figure 4-7. Hover Ceiling OGE (Sheet 1 of 12)

HOVER CEILING OUT OF GROUND EFFECT BASIC INLET, +2% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

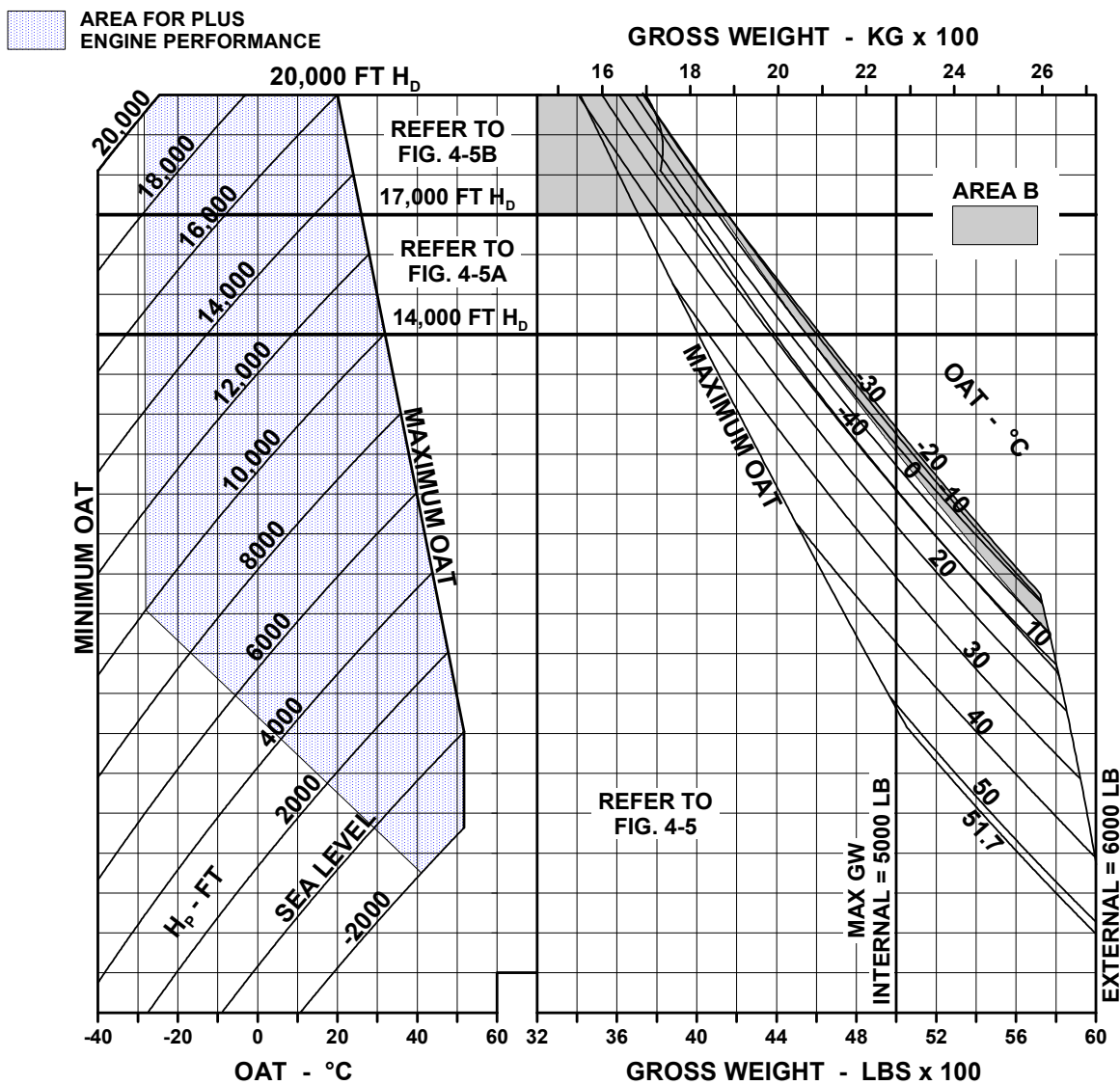


Figure 4-7. Hover Ceiling OGE (Sheet 2 of 12)

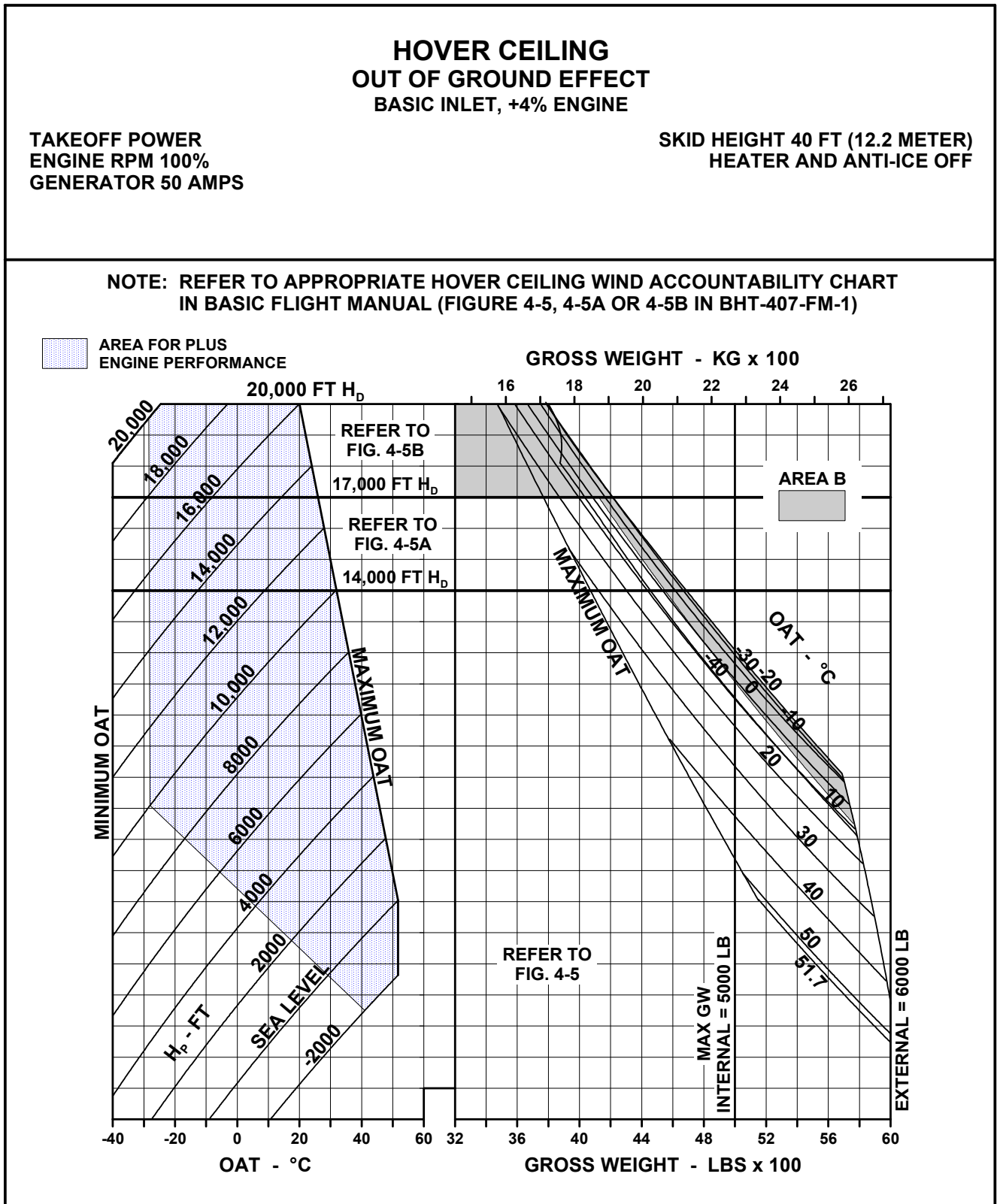


Figure 4-7. Hover Ceiling OGE (Sheet 3 of 12)

HOVER CEILING OUT OF GROUND EFFECT BASIC INLET, +6% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

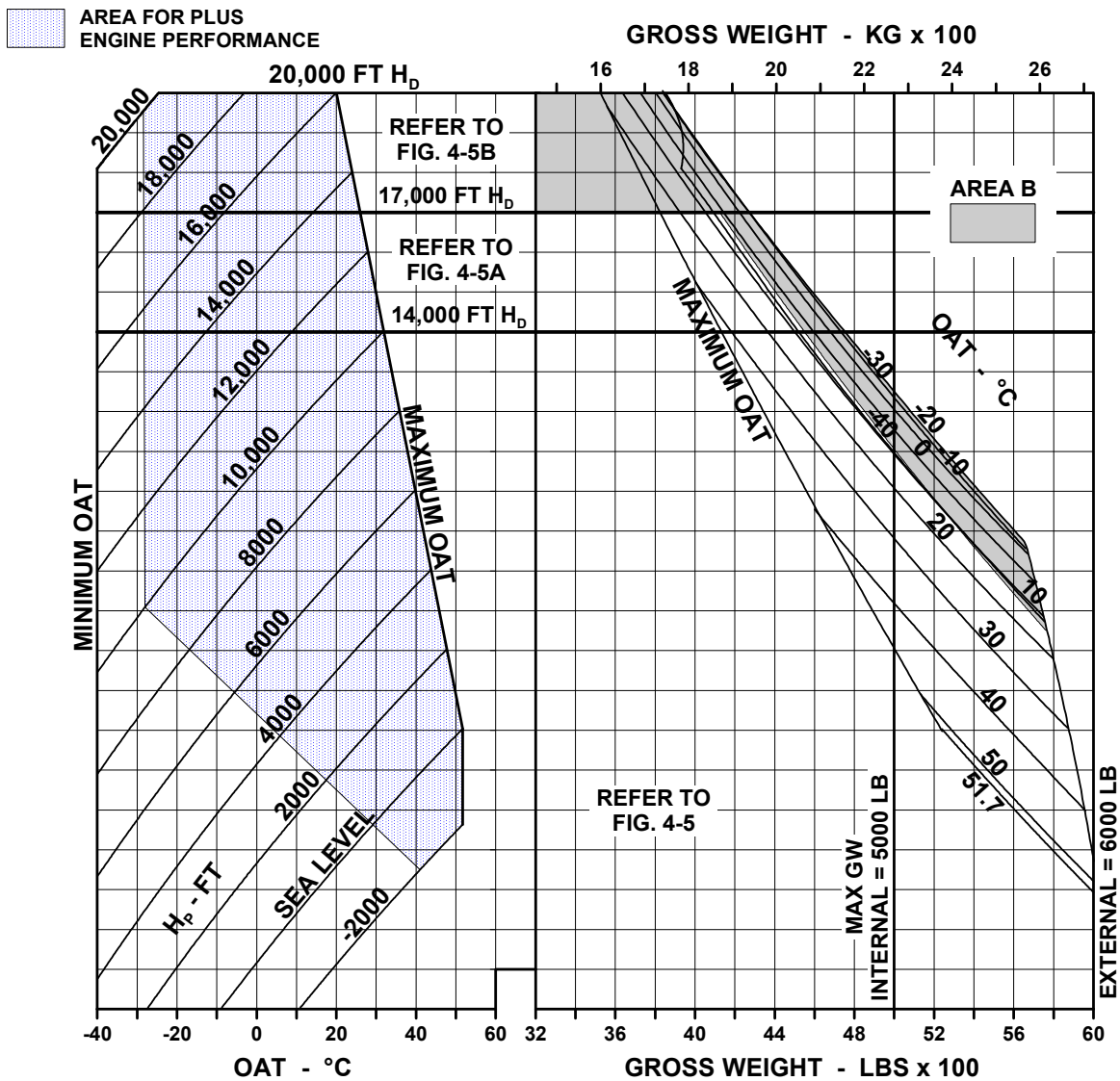


Figure 4-7. Hover Ceiling OGE (Sheet 4 of 12)

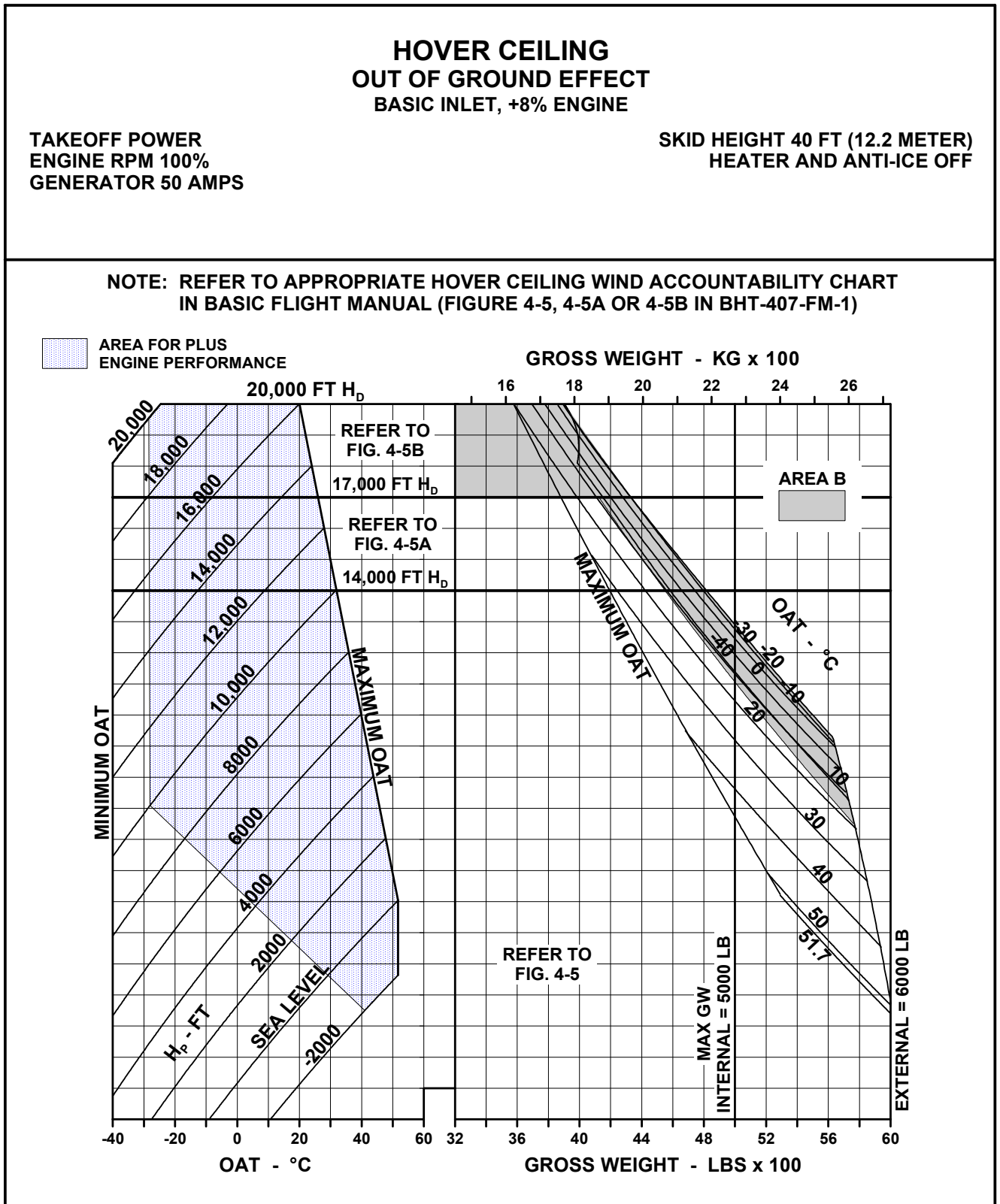


Figure 4-7. Hover Ceiling OGE (Sheet 5 of 12)

HOVER CEILING OUT OF GROUND EFFECT BASIC INLET, +10% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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)

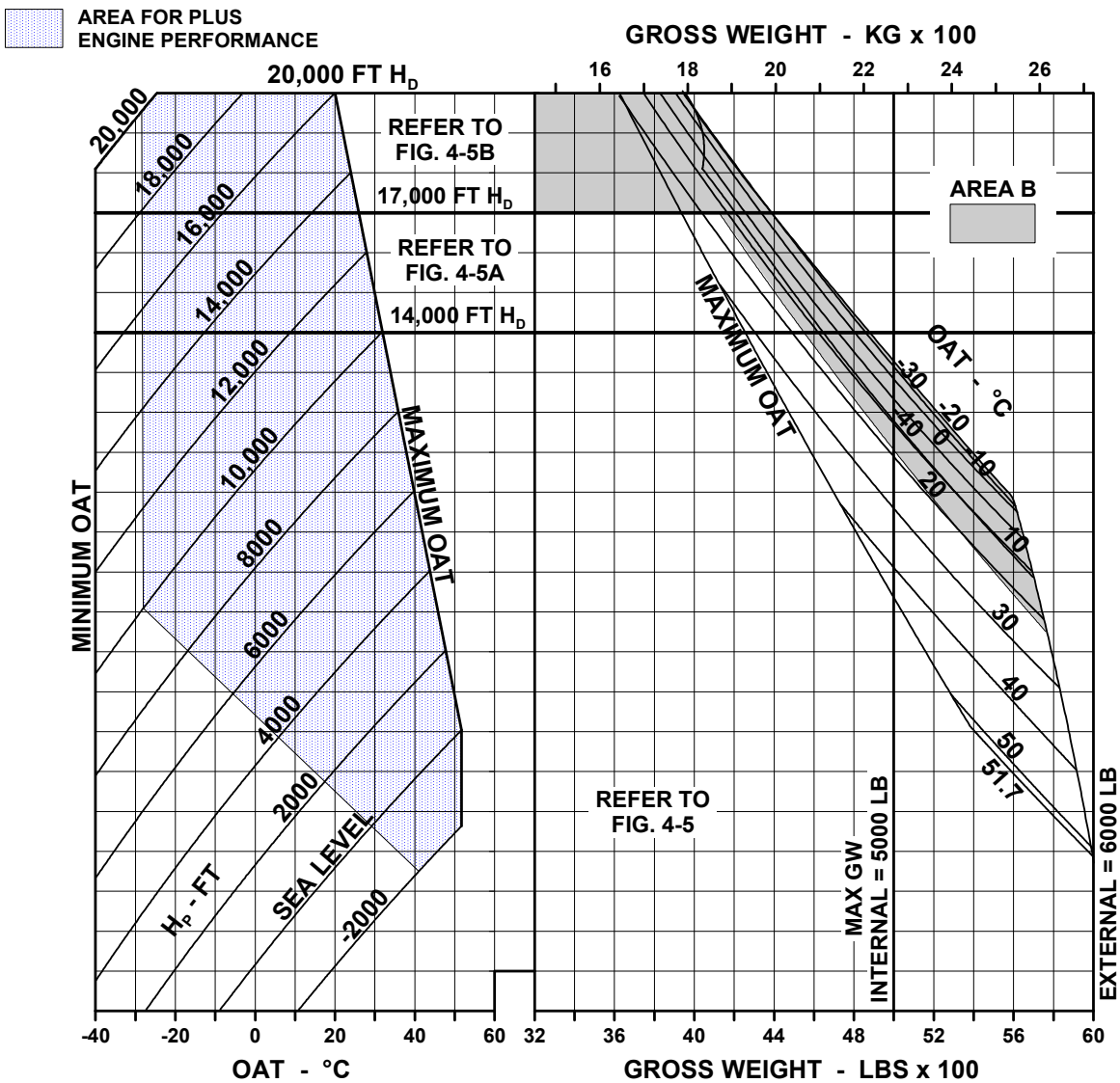


Figure 4-7. Hover Ceiling OGE (Sheet 6 of 12)

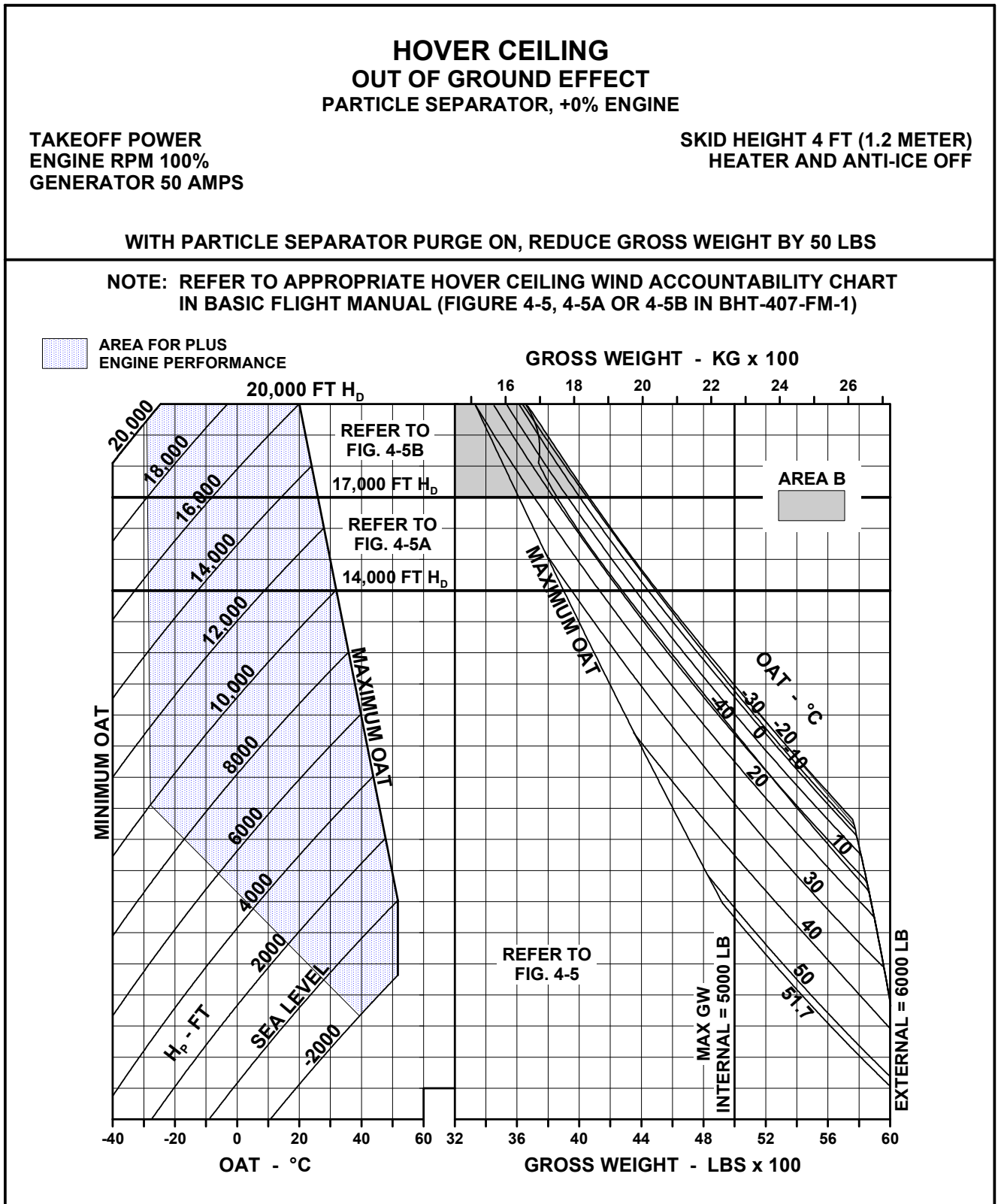


Figure 4-7. Hover Ceiling OGE (Sheet 7 of 12)

HOVER CEILING OUT OF GROUND EFFECT PARTICLE SEPARATOR, +2% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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, 4-5A OR 4-5B IN BHT-407-FM-1)



AREA FOR PLUS
ENGINE PERFORMANCE

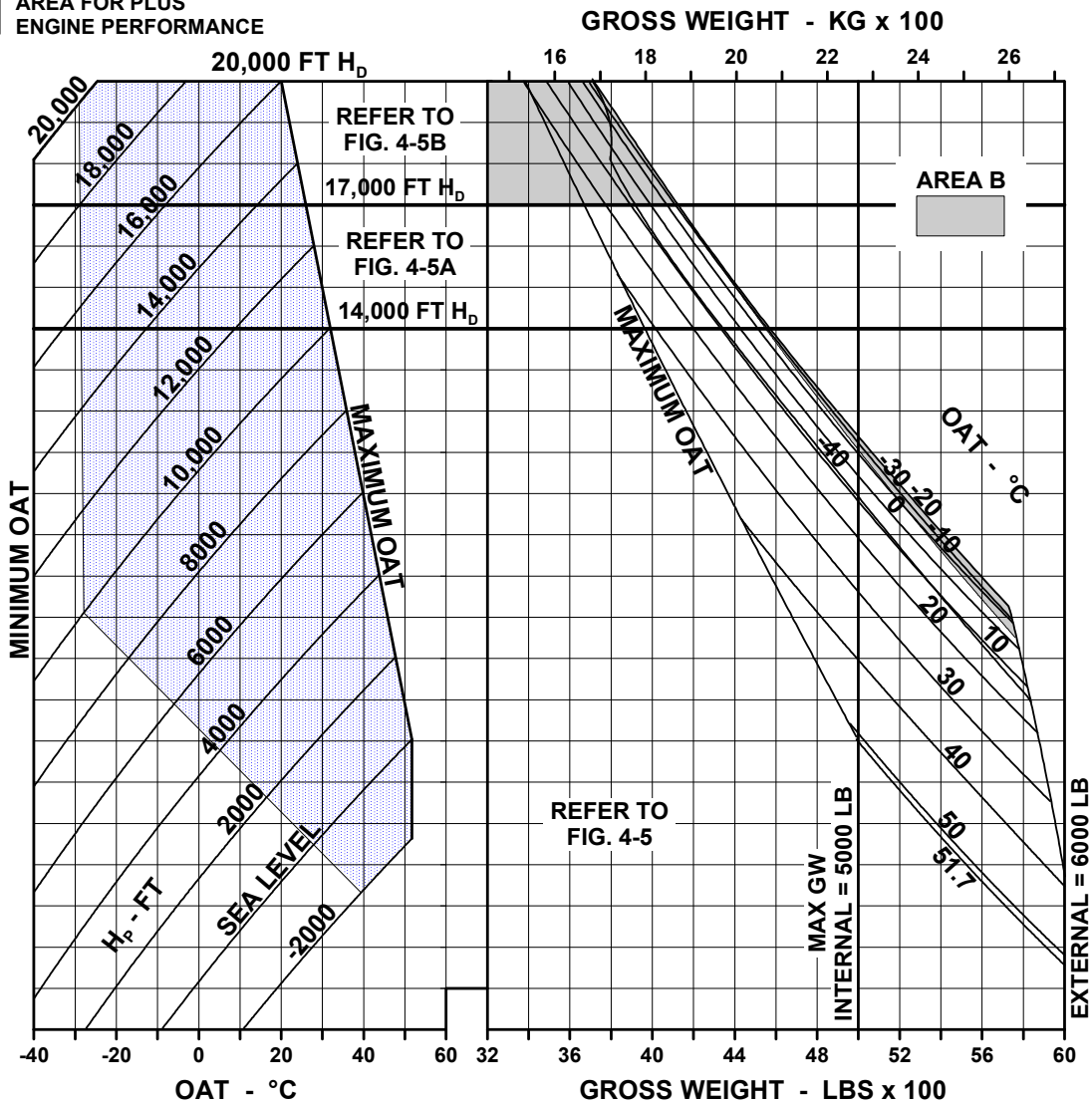


Figure 4-7. Hover Ceiling OGE (Sheet 8 of 12)

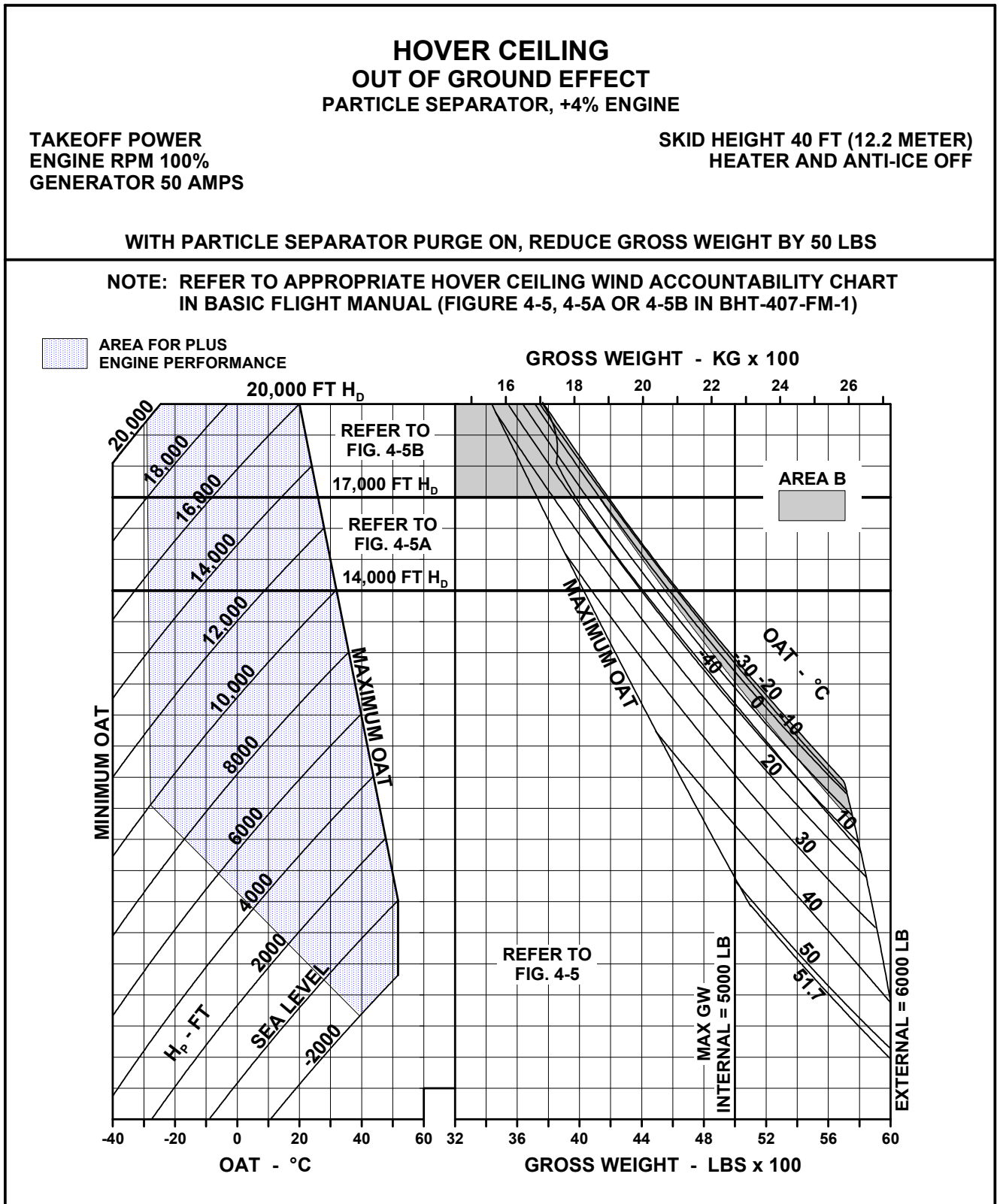


Figure 4-7. Hover Ceiling OGE (Sheet 9 of 12)

HOVER CEILING OUT OF GROUND EFFECT PARTICLE SEPARATOR, +6% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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, 4-5A OR 4-5B IN BHT-407-FM-1)

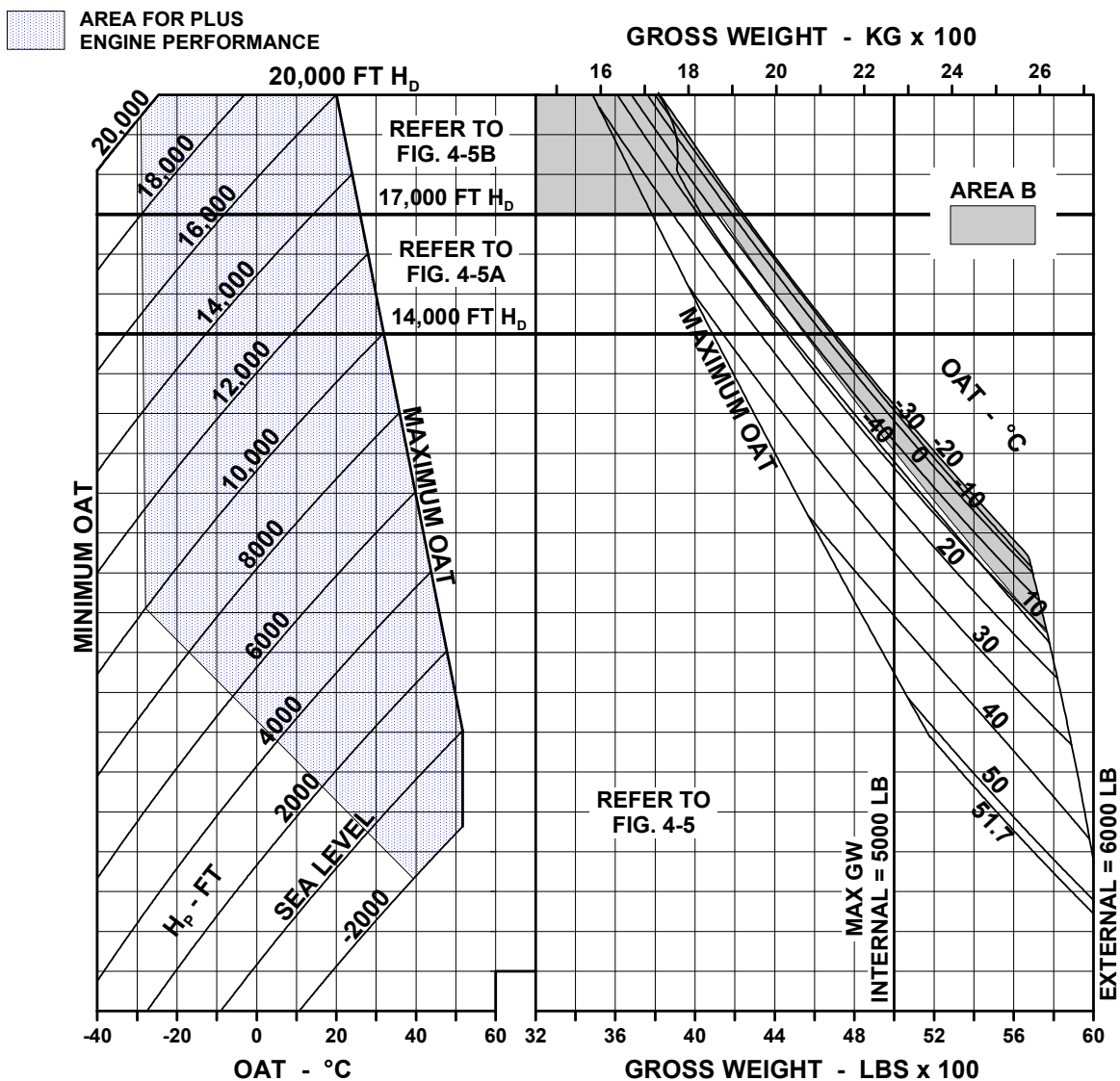


Figure 4-7. Hover Ceiling OGE (Sheet 10 of 12)

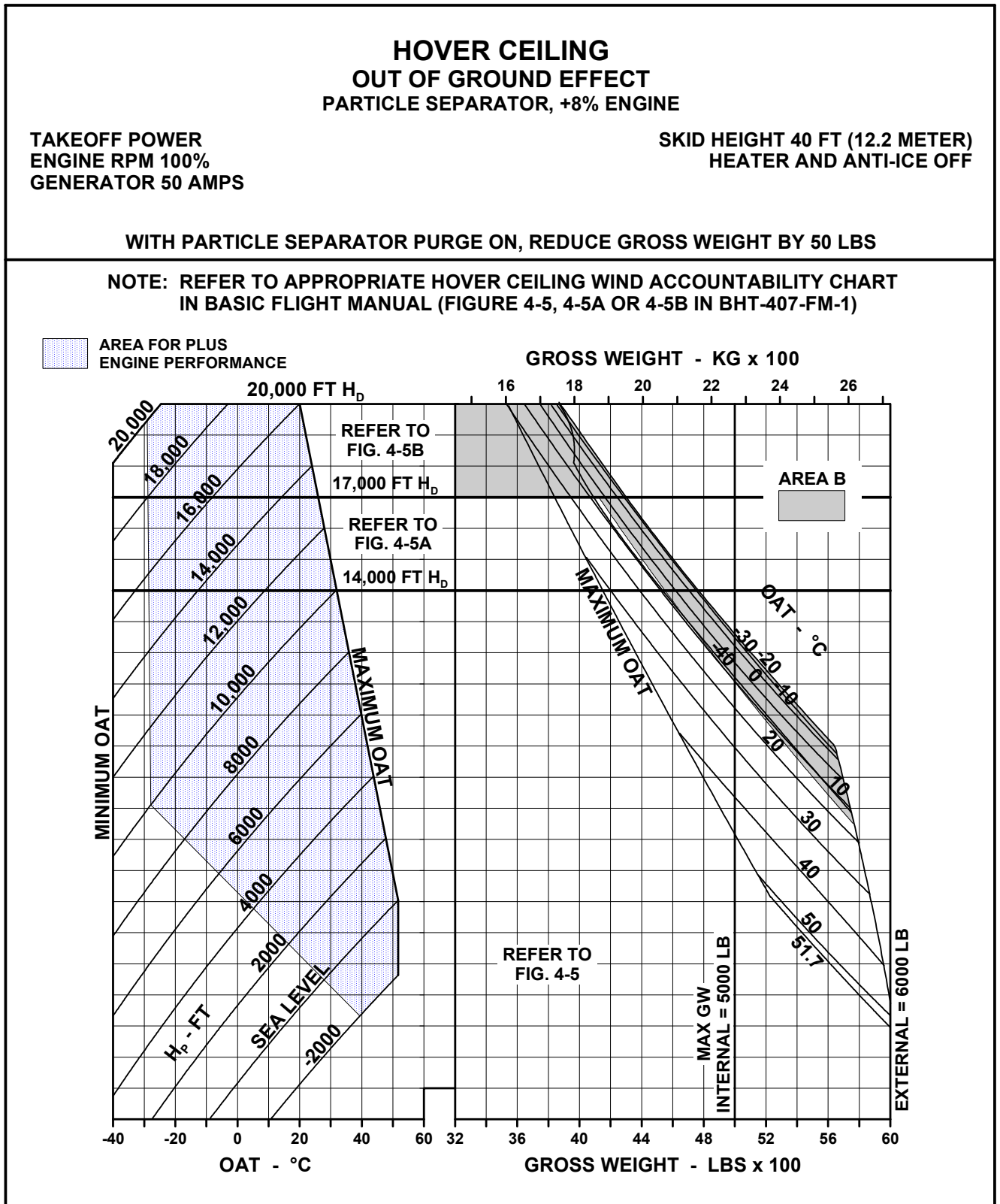


Figure 4-7. Hover Ceiling OGE (Sheet 11 of 12)

HOVER CEILING OUT OF GROUND EFFECT PARTICLE SEPARATOR, +10% ENGINE

TAKEOFF POWER
ENGINE RPM 100%
GENERATOR 50 AMPS

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

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, 4-5A OR 4-5B IN BHT-407-FM-1)

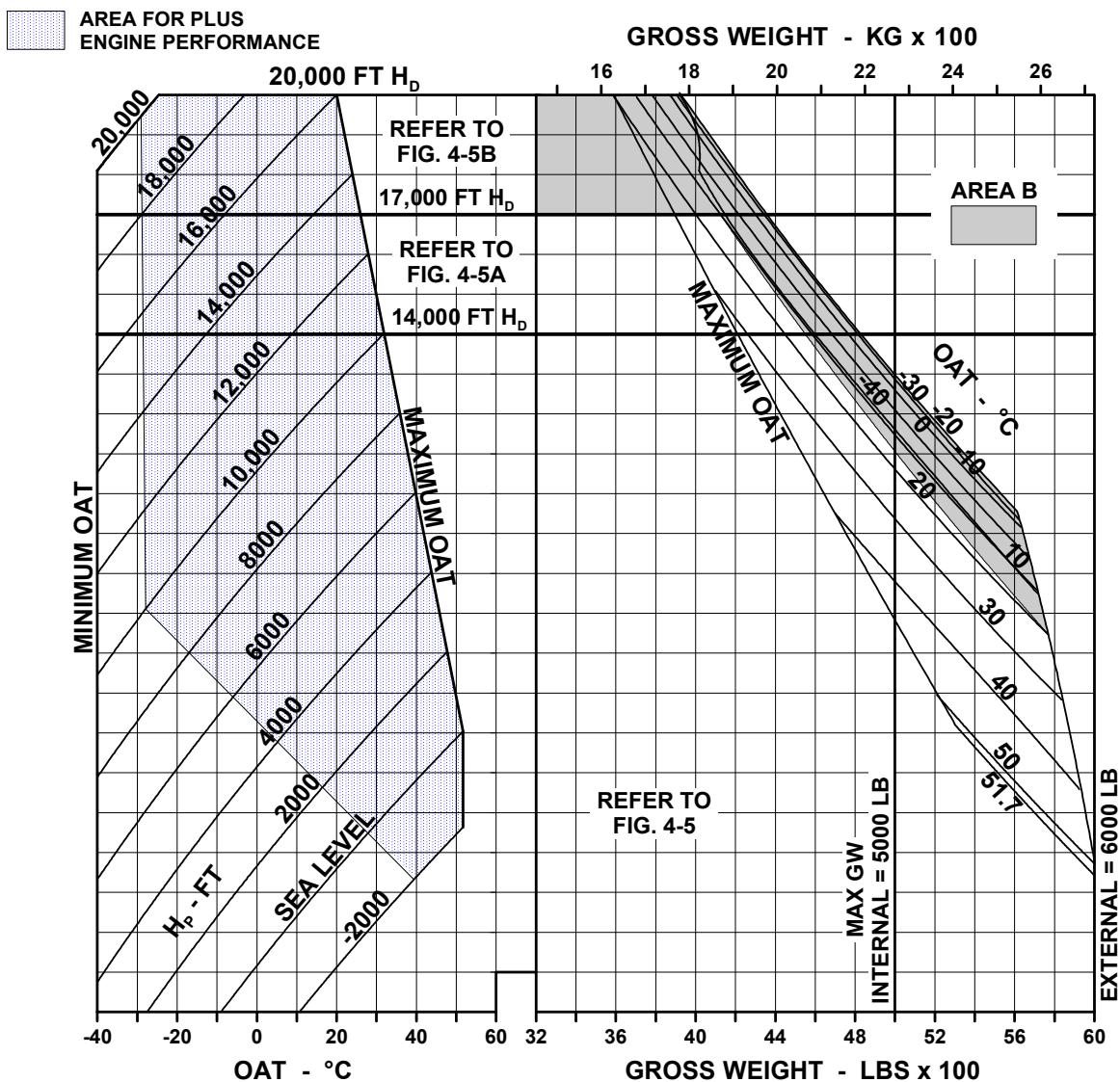


Figure 4-7. Hover Ceiling OGE (Sheet 12 of 12)

Section 5

WEIGHT AND BALANCE

No change from basic manual.

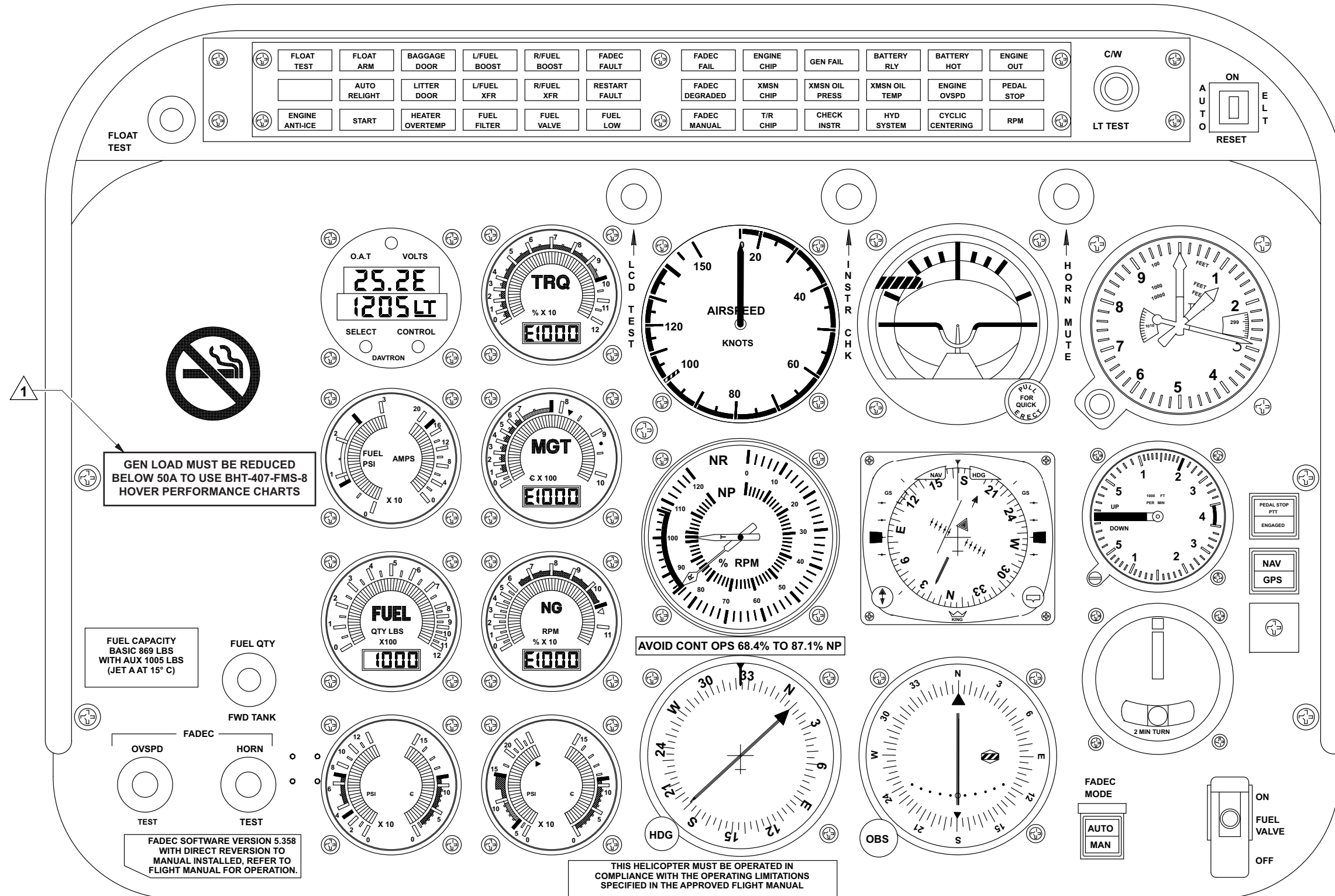
Section 1

SYSTEM DESCRIPTION

1-6. INSTRUMENT PANEL, CONSOLE, AND PEDESTAL

1-6-A. INSTRUMENT PANEL

Refer to [Figure 1-4](#) for the location of the decal.



NOTE
 1 Alternate location authorized. Refer to BHT-407-II-24.

TYPICAL

Figure 1-4. Instrument Panel and Pedestal

407_FMS_8_0004