Carson Helicopters, Inc.
Perkasie, PA 18944

FAA Approved
Rotorcraft Flight Manual Supplement No. 7
For Sikorsky S61 L, N, NM Model Helicopters.

Registration Number _____

Serial Number _____

This supplement must be attached to the FAA Approved S61L/ N and NM Rotorcraft Flight Manual SA4045-100, S61L and SA4045-82, S61N and NM, when operating at or below 20,500 pounds gross weight Category A operations and at or below 20,000 pounds gross weight Category B operations in accordance with STC SR02487NY dated 12/05/07. This Supplement is applicable to S61L/N, and NM model aircraft modified by STC SR1585NY, (Composite Main Rotor Blades). The information contained herein supplements or supersedes the basic S61L/N and NM flight manuals and Sikorsky Supplements only in those areas listed herein. For Limitations, Procedures, and Performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

[redacted]
FAA Approved
for Anthony Socias, Manager
New York Aircraft Certification Office

Date: DEC - 5 2007

Revision: IR

SECTION I

OPERATING LIMITATIONS

Note

The observance of these limitations is required by law.

Note

Section I of this supplement completely replaces Section I of the basic manual.

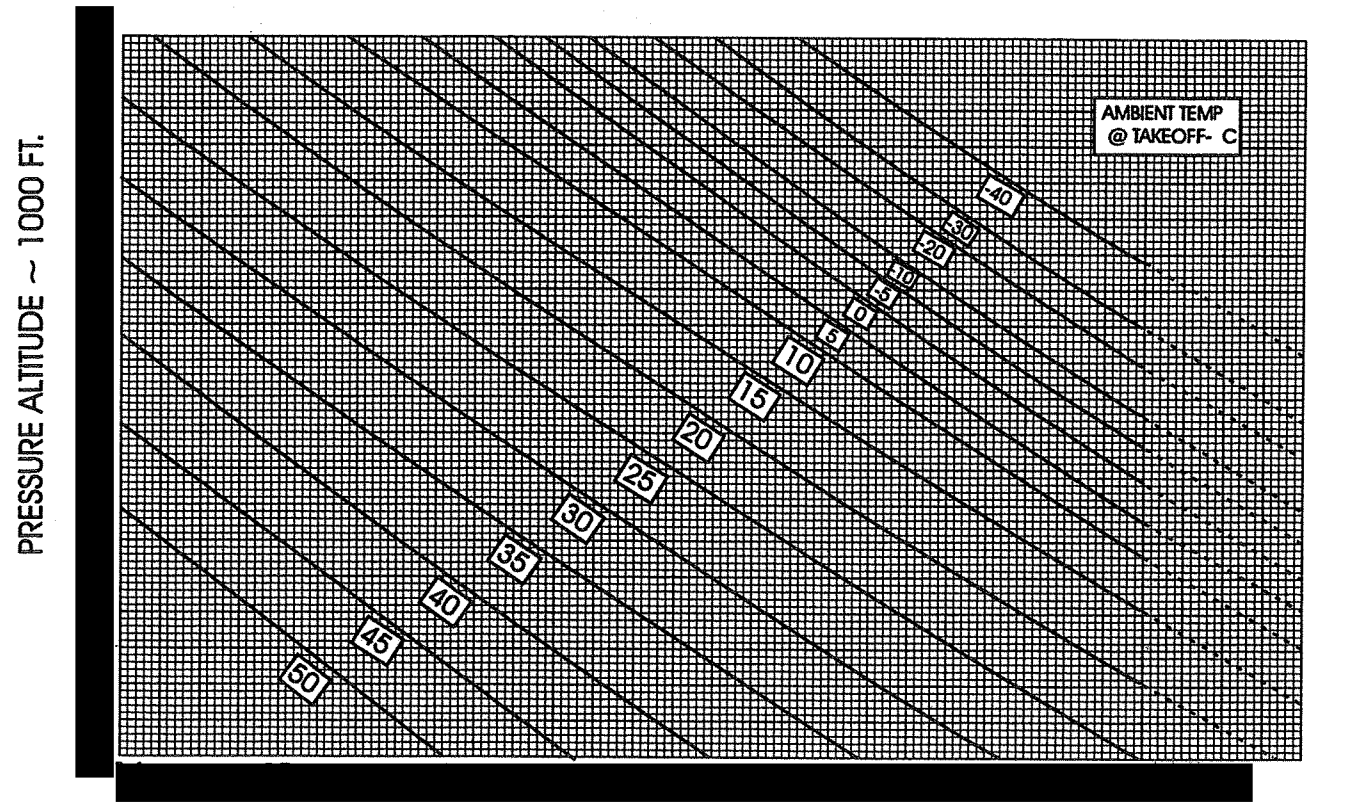
AIRCRAFT CONFIGURATION.

To be eligible for operation at gross weights up to 20,500 pounds, the helicopter configuration is defined as that presently approved for 19,000 pounds, except for the following mandatory items which are FAA approved.

Component	**Part Number**	**Description**
Main Rotor Blades	Carson # 163-101-1	Carson Composite Main Rotor Blades.
Tail Rotor Blade	S6117-30101-043 and subsequent	10 foot, 7-¼ inch diameter ribbed pocket configuration.
Engines	GE CT58-140-1 and 140-2	OEI 2-½ minute rating of 1500 SHP and 1400 SHP takeoff rating.
Main Gear Box	S6135-20600-039 and subsequent	Twin engine takeoff rating of 2500 SHP
Bifilar Assembly	S6112-23039-017 or S6112-23039-018	
Beam Pitch Control Tail Gear Box	S6135-66705-1 and subsequent	
Fixed Landing Gear Instl.	S6125-50300	
Sponson Gear Instl.	S6125-50202	

CATEGORY "A"
MAXIMUM TAKEOFF
AND LANDING GROSS WEIGHT

CT58-140-1, -2 ENGINE
COMPOSITE BLADES



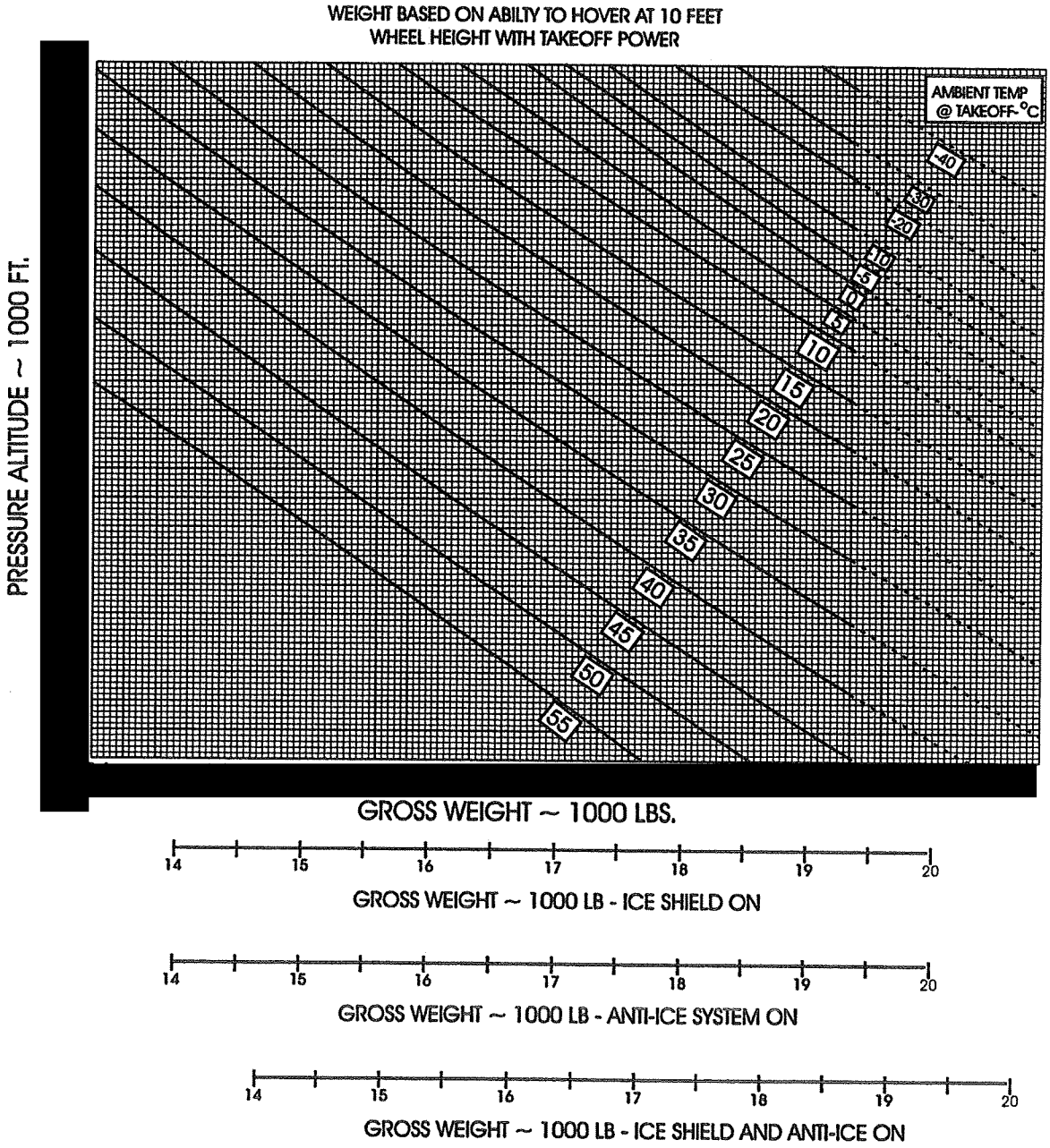
NOTES:

1. MAXIMUM WEIGHTS ARE BASED ON 150 FPM SINGLE ENGINE CLIMB AT T.O. POWER AT 1000 FT. ABOVE THE T.O. POINT PER FAA REQUIREMENT AND INCORPORATE STANDARD LAPSE RATE
2. WEIGHTS SHOWN AT ANY GIVEN PRESSURE ALTITUDE INCLUDE THE 1000 FT REQUIREMENT OF NOTE (1) SO THAT NO ADJUSTMENT IS NECESSARY.
3. USE APPROPRIATE GROSS WEIGHT SCALE FOR ICE SHIELD AND / OR ANTI-ICE
4. MAXIMUM TAKEOFF OR LANDING GROSS WEIGHT CANNOT EXCEED 20,500 LB.

Figure 7-1-1

FAA APPROVED Date DEC - 5 2007

CATEGORY "B"
MAXIMUM TAKEOFF
AND LANDING GROSS WEIGHT
CT58-140-1, -2 ENGINE 103%Nr
COMPOSITE BLADES



NOTES:

1. USE APPROPRIATE SCALE FOR ICE SHIELD AND / OR ANTI-ICE
2. MAXIMUM TAKEOFF GROSS WEIGHT CANNOT EXCEED 20,000 LB.

Figure 7-1-2

FAA APPROVED Date DEC - 5 2007

Empty Weight.

The empty weight includes the weight of fixed ballast, unusable fuel supply, undrainable oil, and total quantity of hydraulic fluid, but excludes the weight of the crew, payload, and fuel.

CENTER OF GRAVITY LIMITS.

The datum is 267.4 inches forward of the centerline of the main rotor hub. The forward and aft center of gravity limits are shown on ***Figure 7-1-3***.

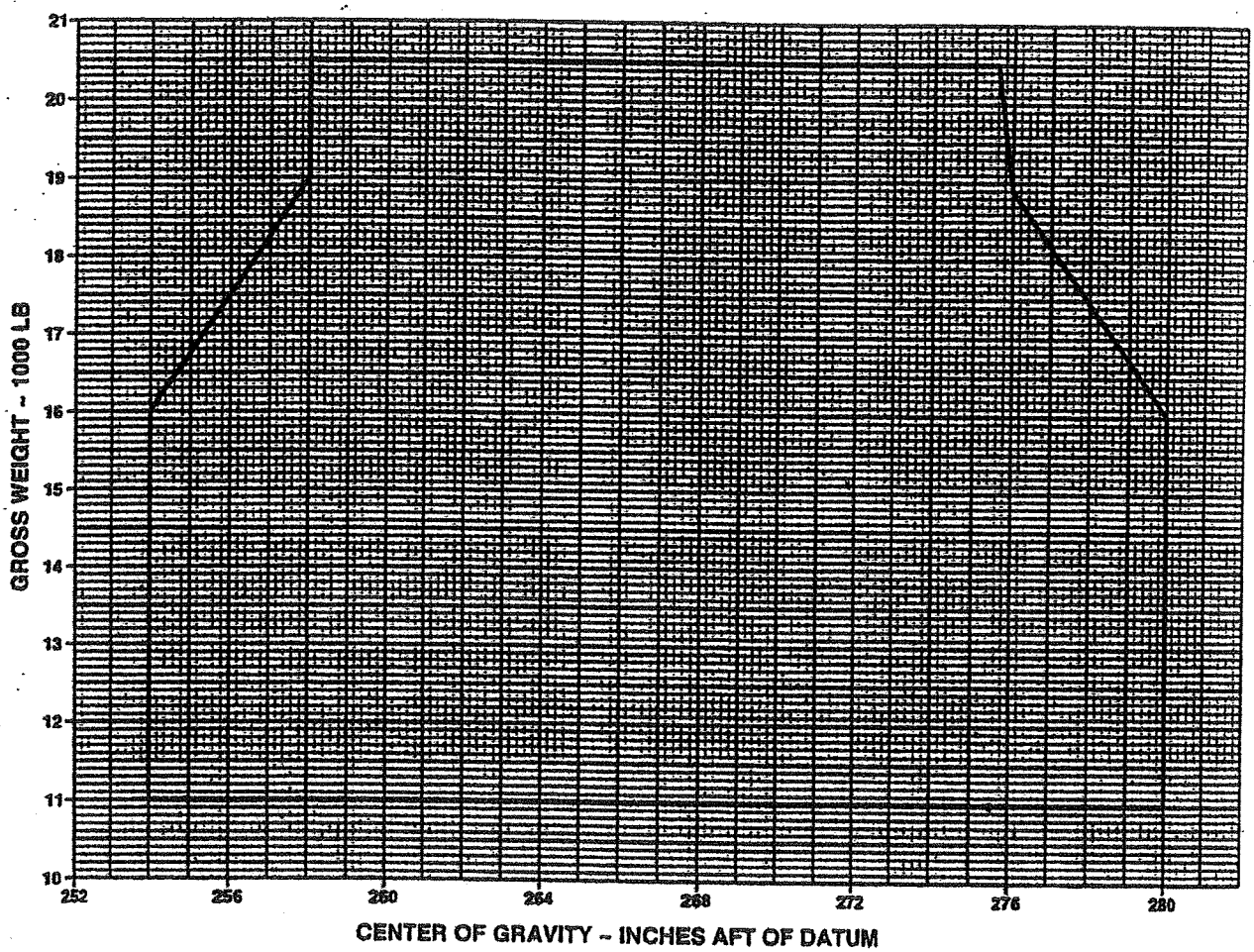
TYPES OF OPERATION.

Category "A" and "B".

1. Transport
   a. Land.
   b. S61N Amphibian at gross weights of 19,000 pounds and below. Above 19,000 pounds the helicopter is approved for overwater flights and emergency water landings only, provided that life saving equipment is installed that meets the requirements of FAR 29.1411, 29.1415 and 29.1561.
2. Day, night, Helicopter Visual Rules (VFR).
3. Day, night, Helicopter Instrument Rules (IFR). The helicopter is not considered eligible for operation under Helicopter Instrument Rules unless:
   a. The AFCS (6155-60155) is installed and operative.
   b. An operative navigation and communication system is installed that has demonstrated compliance with the pertinent airworthiness (CAR 7) and operational requirements of the certification stated upon the cover of this manual and any FAA supplements, revisions or conditions of approval associated with the nav-comm system.
   c. The compatibility of modifications and supplements of revisions made to the Rotorcraft Flight Manual, by individuals / organizations other than Sikorsky Aircraft must be established by the proponent.

CENTER OF GRAVITY LIMITS AT VARIOUS GROSS WEIGHTS

THIS CHART NOT TO BE USED FOR OPERATING WEIGHT DETERMINATION



NOTE

DATUM IS 257.4 INCHES FORWARD OF ROTOR CENTROID.

SS0156
SA

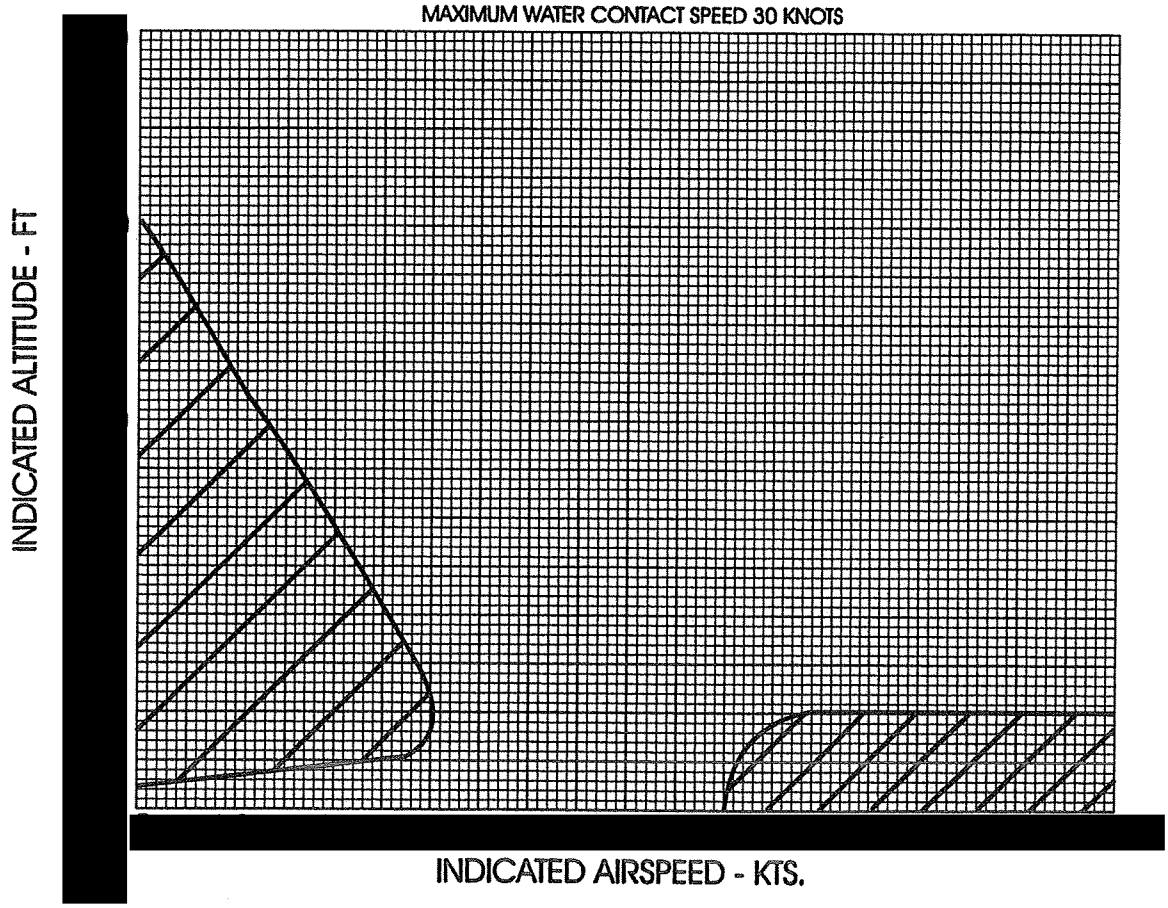
Figure 7-1-3

CATEGORY "A"
LIMITING HEIGHTS AND
CORRESPONDING SPEEDS FOR SAFE LANDING
AFTER AN ENGINE SUDDENLY BECOMES INOPERATIVE

THE CURVES ARE APPLICABLE TO ALL ALTITUDES AND TEMPERATURES AT THE CORRESPONDING MAXIMUM ALLOWABLE TAKEOFF GROSS WEIGHT AS DETERMINED FROM FIGURE 7-1-1

INFORMATION ON TEST CONDITIONS:

1. HARD SURFACE RUNWAY
2. WINDS -5 KTS OR LESS
3. STRAIGHT TAKEOFF AND CLIMBOUT PATH



NOTE

AVOID FLIGHT WITHIN SHADED AREA EXCEPT TO EXECUTE A SAFE LANDING AFTER AN ENGINE SUDDENLY BECOMES INOPERATIVE OR AFTER INITIATING FLARE FOR A NORMAL LANDING

Figure 7-1-6

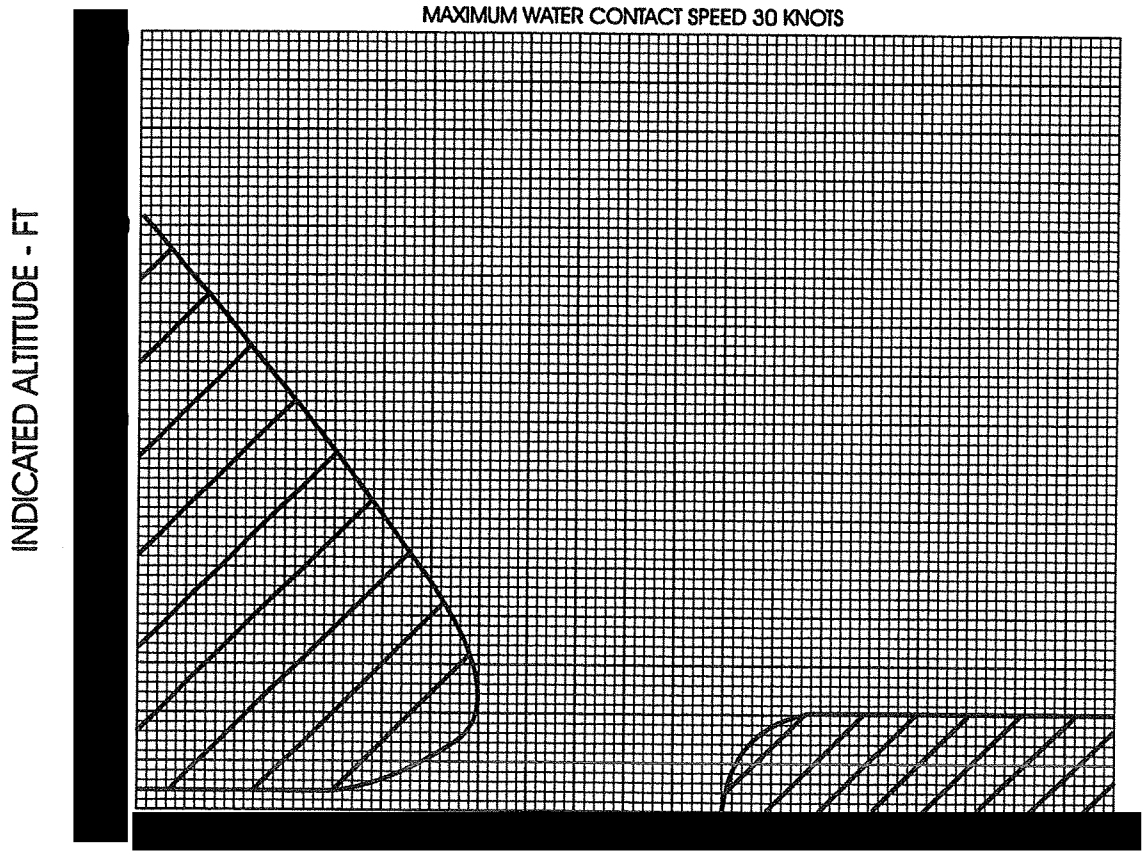
FAA APPROVED Date DEC - 5 2007

CATEGORY "B"
LIMITING HEIGHTS AND
CORRESPONDING SPEEDS FOR SAFE LANDING
AFTER AN ENGINE SUDDENLY BECOMES INOPERATIVE

THE CURVES ARE APPLICABLE TO ALL ALTITUDES AND TEMPERATURES AT THE CORRESPONDING MAXIMUM ALLOWABLE TAKEOFF GROSS WEIGHT AS DETERMINED FROM FIGURE 7-1-2

INFORMATION ON TEST CONDITIONS:

1. HARD SURFACE RUNWAY
2. WINDS -5 KTS OR LESS
3. STRAIGHT TAKEOFF AND CLIMBOUT PATH



NOTE

AVOID FLIGHT WITHIN SHADED AREA EXCEPT TO EXECUTE A SAFE LANDING AFTER AN ENGINE SUDDENLY BECOMES INOPERATIVE OR AFTER INITIATING FLARE FOR A NORMAL LANDING

Figure 7-1-7

FAA APPROVED Date DEC - 5 2007

Precautionary Range: 660°C to 721°C - Yellow arc. (CT58-140-1).

660°C to 758°C - Yellow arc. (CT58-140-2).

Normal Operating Range: 300°C to 660°C - Green arc.

GAS GENERATOR TACHOMETER.

Maximum: 102% - Red radial line (2-½ minutes). (CT58-140-1).

103.4% - Red radial line (2-½ minutes). (CT58-140-2).

100% - Red radial line (takeoff).

Precautionary Range: 100% to 102% - Yellow arc. (CT58-140-1).

100% to 103.4% - Yellow arc. (CT58-140-2).

Normal Operating Range: 56% to 100% - Green arc.

Minimum: 53% - Red radial line.

TORQUEMETER.

Maximum: Single Engine: 123% - Red radial line.

Dual Engine: 103% - Red radial line.

Precautionary Range: 86% to 103% - Yellow arc.

Normal Operating Range: 0% to 86% - Green arc.

FUEL PRESSURE GAGE.

Maximum: 995 psi - Red radial line.

Precautionary Range: 795 to 995 psi - Yellow arc.

Normal Operating Range: 210 to 795 psi - Green arc.

Minimum: 160 psi - Red radial line.

ENGINE OIL TEMPERATURE GAGE.

Maximum: 121°C - Red radial line.

Normal Operating Range: 0°C to 121°C - Green arc.

Minimum: minus 54°C - Red radial line.

ENGINE OIL PRESSURE GAGE.

Maximum: 75 psi - Red radial line.

Precautionary Range: 60 to 75 psi - Yellow arc.

Normal Operating Range: 20 to 60 psi - Green arc.

Minimum: 8 psi - Red radial line.

TRANSMISSION OIL TEMPERATURE GAGE.

Maximum: 145°C - Red radial line.

Precautionary Range: 120°C to 145°C - Yellow arc.

Normal Operating Range: 40°C to 120°C - Green arc.

Minimum: minus 15°C - Red radial line.

TRANSMISSION OIL PRESSURE GAGE.

Maximum: 120 psi - Red radial line.

Precautionary Range: 90 to 120 psi - Yellow arc.

Normal Operating Range: 35 to 90 psi - Green arc.

Minimum: 25 psi - Red radial line.

Emergency Lube System Operation: 8 to 25 psi - Red/ yellow barber pole arc.

Emergency Lube System Minimum: 8 psi - Red radial line.

PRIMARY SERVO HYDRAULIC PRESSURE GAGE.

Maximum: 1600 psi - Red radial line.

Normal Operating Range: 1300 to 1600 psi - Green arc.

Minimum: 1300 psi - Red radial line.

AUXILIARY SERVO HYDRAULIC PRESSURE GAGE.

Maximum: 1600 psi - Red radial line.

Normal Operating Range: 1300 to 1600 psi - Green arc.

Minimum: 1300 psi - Red radial line.

SECTION II

NORMAL PROCEDURES

Note

The normal procedures in the basic manual should be followed unless superseded by the procedures contained in this section and supplement. Procedures in the basic manual for normal S61N water operations apply only at gross weights of 19000 pounds or below.

Note

Procedures to retract main landing gear apply to sponson equipped configuration only.

HOVER TAKEOFF (CATEGORY "A")

1. Hover at 5 feet wheel height with engine control levers fully forward to set at least 103% Nr but not more than 106% Nr with matched torques. Note: stabilized hover torque required.
2. Increase collective to achieve 5-7% torque greater than hover and lower the nose as required to accelerate forward at 5 feet wheel height.
3. Upon passing the point of effective translational lift or 20 KIAS, increase collective up to an additional 10% torque within limits (now as much as 15-17% greater than hover), lower the nose further as needed to continue a level acceleration forward at 10 to 15 feet wheel height to the CDP, 45 KIAS. The other pilot may assist in identifying and announcing the CDP as "V1" or "45 knots" as briefed.

4. Upon passing the CDP, adjust pitch attitude to initiate a climb at 57 KIAS.
5. With 57 KIAS established in a positive climb and clear of obstacles, retract the landing gear and gradually accelerate to best rate of climb airspeed (Vbroc).
6. Readjust Nr as desired and reduce power to maximum continuous limits.

HOVER TAKEOFF (CATEGORY "B")

1. Hover at 5-foot wheel clearance.
2. Engine control levers – Fully forward to produce at least 103% Nr but not to exceed 106% Nr with matched torques.
3. Accelerate forward at constant height to 38 knots IAS while applying collective up to twin engine take-off power.
4. Maintain 38 KIAS and take-off power and transition to climb out observing limitations on the height-velocity diagram.
5. Retract landing gear during the climb out.
6. Readjust Nr as desired and reduce power to maximum continuous limits.

APPROACH AND LANDING

CATEGORY "A" PROCEDURE

1. Establish a descent profile to the intended landing point so that the aircraft is stabilized at 45 KIAS with 700-800 fpm descent when reaching the LDP, a point 150 feet above the landing surface.

2. At the LDP, increase pitch attitude to approximately 10° nose up while reducing collective as required to maintain the same approach path profile

POWER AVAILABLE

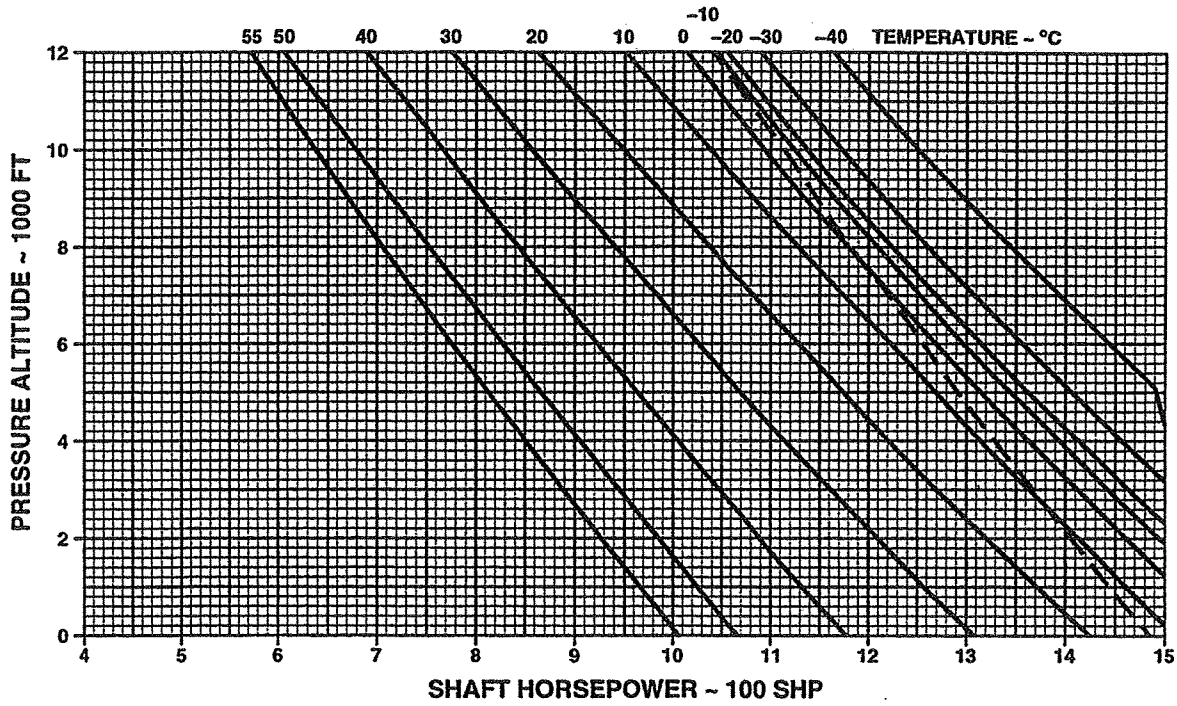
2 ½ MINUTE POWER

CT58-140-1 ENGINE

100% NR

SPECIFICATION POWER

ENGINE ANTI-ICE SYSTEMS OFF



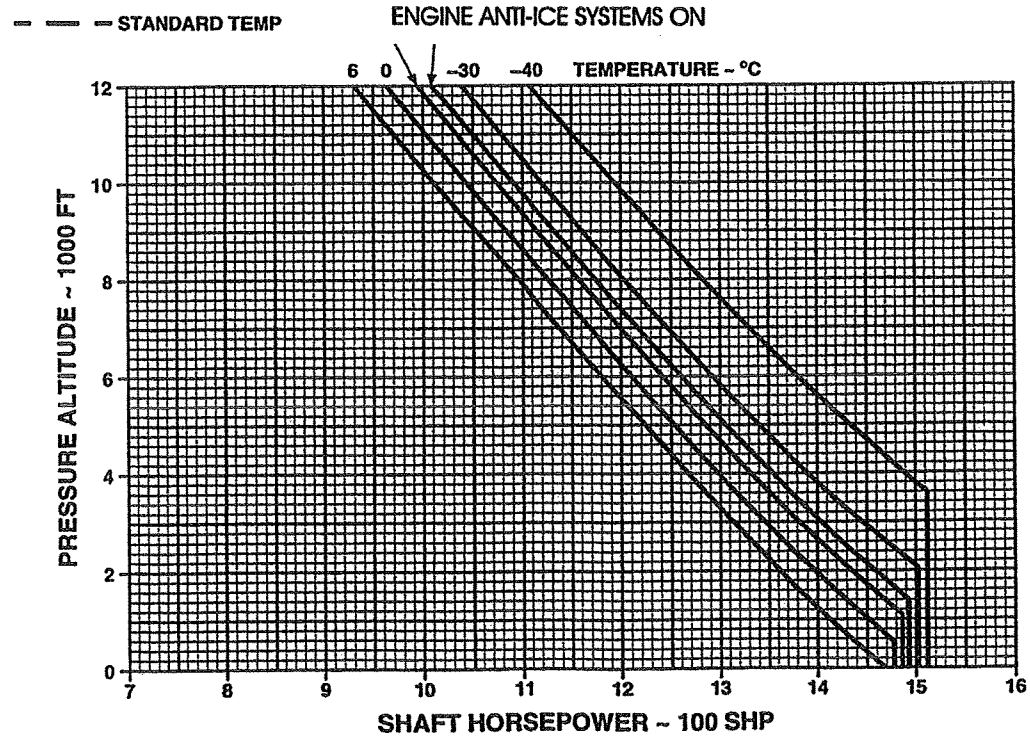


Figure 7-4-8

FAA APPROVED Date DEC - 5 2007

POWER AVAILABLE

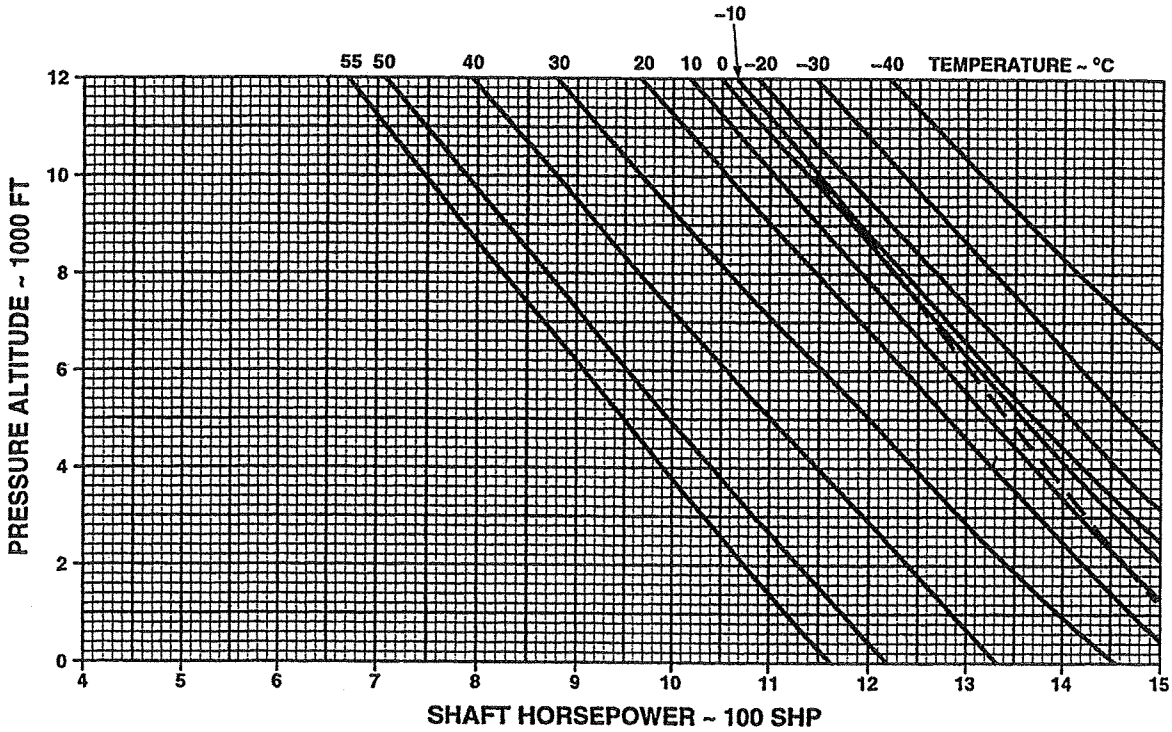
2 ½ MINUTE POWER

CT58-140-2 ENGINE

100% NR

SPECIFICATION POWER

ENGINE ANTI-ICE SYSTEMS OFF



ENGINE ANTI-ICE SYSTEMS ON

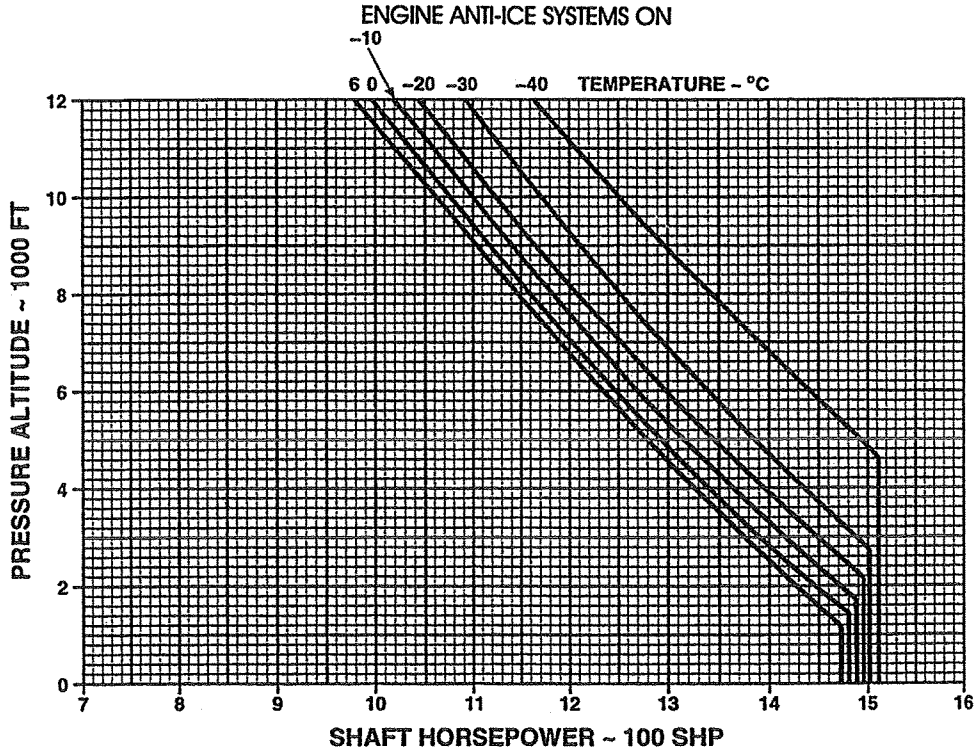


Figure 7-4-9

FAA APPROVED Date DEC - 5 2007

POWER AVAILABLE

CT58-140-1,-2 ENGINE(S)
100% NR

SPECIFICATION POWER

ENGINE ANTI-ICE SYSTEMS OFF

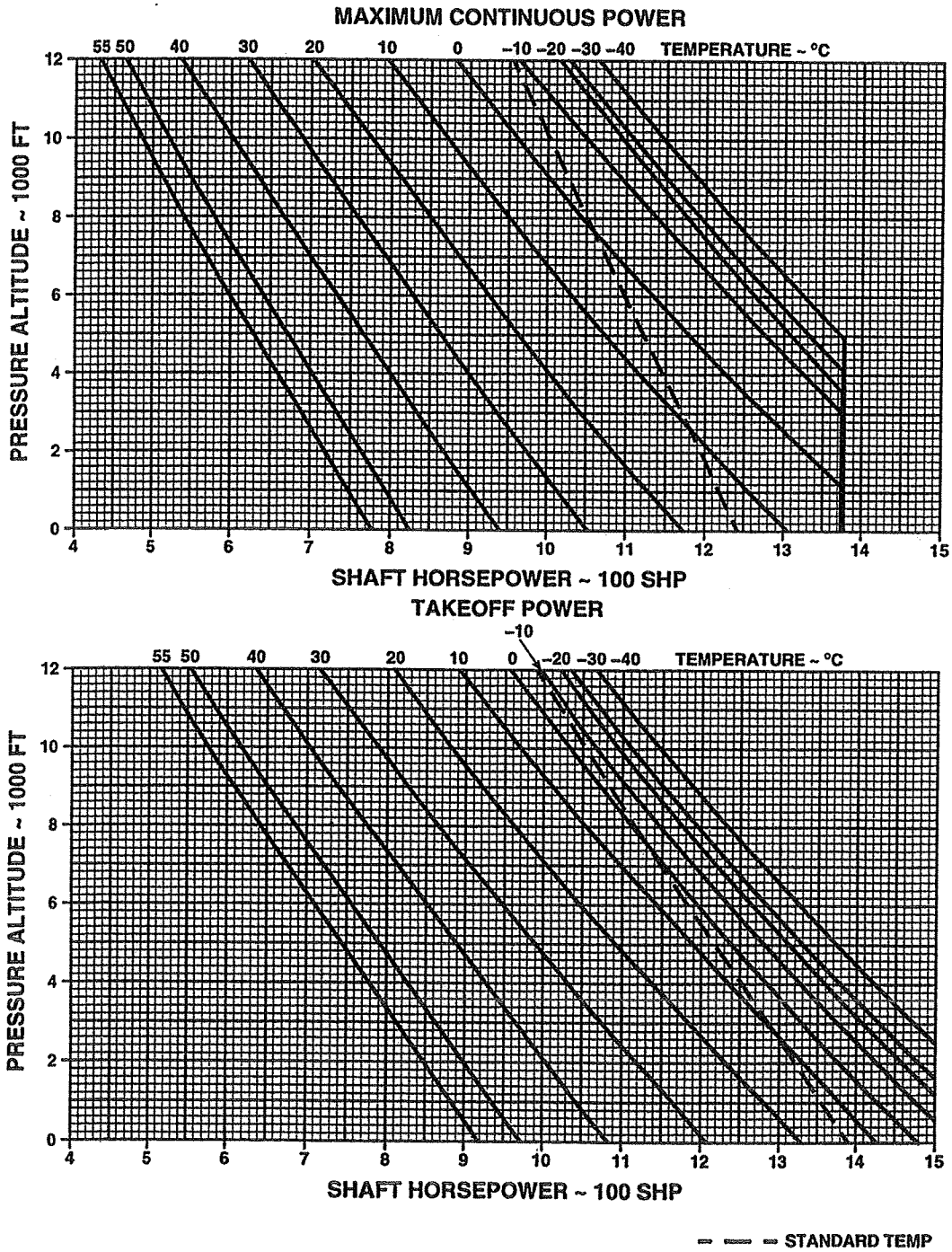
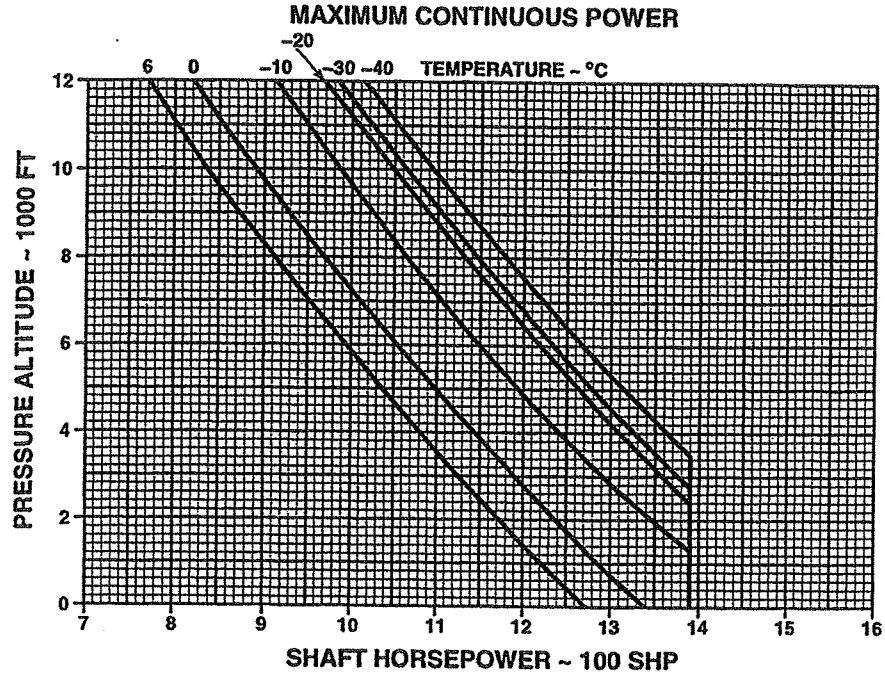


Figure 7-4-10

FAA APPROVED Date DEC - 5 2007

POWER AVAILABLE

CT58-140 ENGINE(S)
100% NR
SPECIFICATION POWER
ENGINE ANTI-ICE SYSTEMS ON



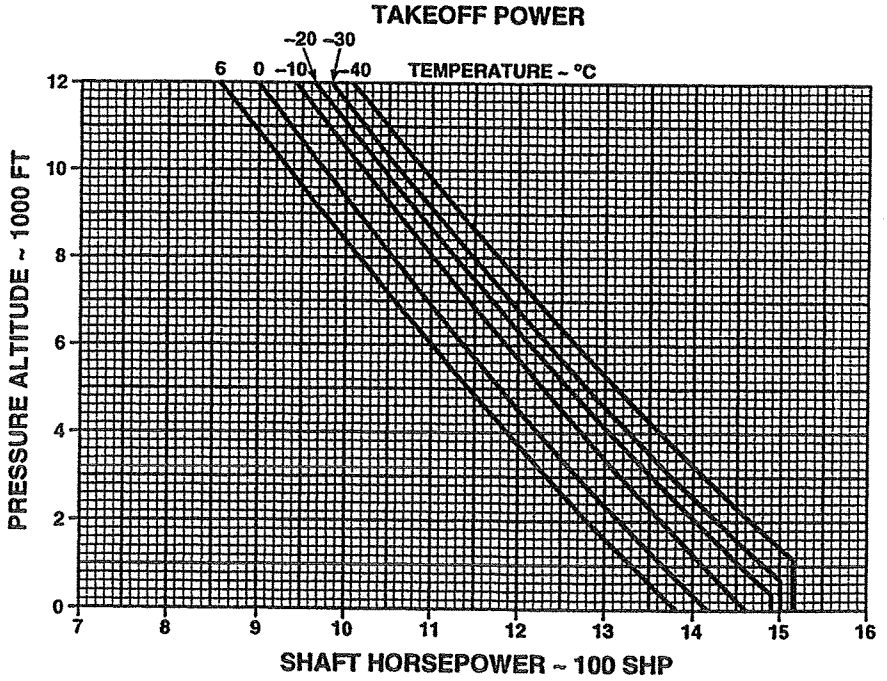


Figure 7-4-11

FAA APPROVED Date DEC - 5 2007

INDICATED TORQUE VS ENGINE SHAFT HORSEPOWER

CT58-140 ENGINES

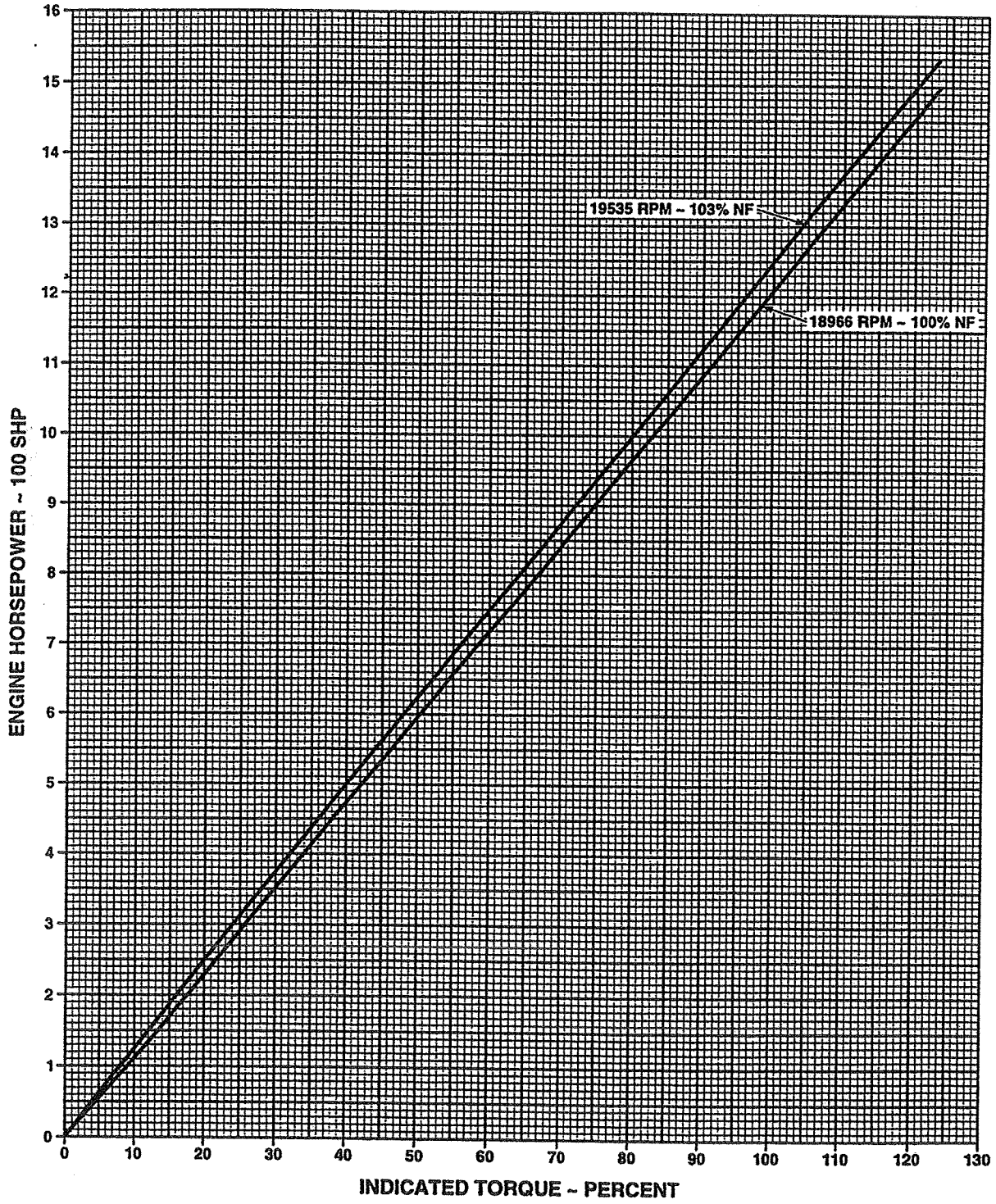


Figure 7-4-13

FAA APPROVED Date DEC - 5 2007

MAXIMUM GROSS WEIGHT FOR HOVER OGE
TAKEOFF POWER 100% NR

CT58-140-1,-2 ENGINES
ICE SHIELD OFF ANTI-ICE SYSTEM OFF
COMPOSITE BLADES

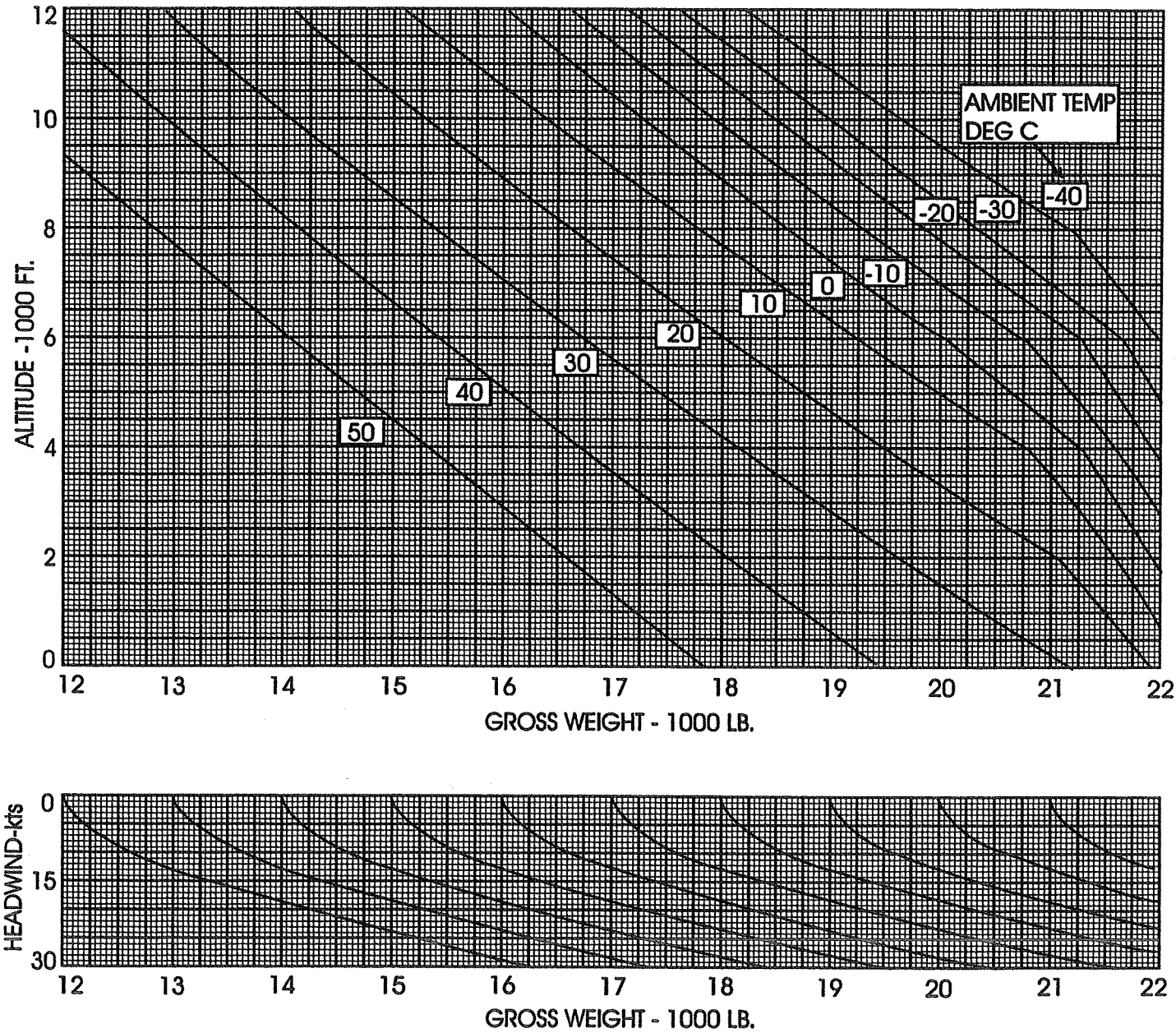


Figure 7-4-26