

**SUMMARY DATA FOR ATP REVIEW**

The following document is a summary of data pertaining to the Schweizer 300CB/CBi Helicopter. This information is organized by the categories used in the Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Helicopter FAA-S-8081-20. Sources for this information, include, but are not limited to the following:

- Aircraft POH/RFM
- Schweizer 269 Series Type Certificate Data Sheet
- Schweizer Maintenance Manual

If the information is the same for both models of helicopter, there will be only one entry. If the information is different between the models, such differences will be identified.

**OVERVIEW**

The Schweizer 300CB/CBi helicopter is a light, piston-driven helicopter primarily used for training. The helicopter has a three-bladed, fully-articulated main rotor system, with anti-torque provided by a semi-rigid, two-bladed tail rotor. The drive train is provided by a four-cylinder, 180 horse-power, Textron Lycoming Engine.

The origin of the 300CB was the Hughes TH-55. The TH-55 was used as the primary training helicopter for the Army from 1969-1988. The design was purchased and produced by Schweizer for several years. The type certificate was sold to Sikorsky in 2004. In 2018, the type certificate was sold to Schweizer RSG and returned to production in 2019.

**LANDING GEAR**

The landing gear on the Schweizer 300CB and 300CBi helicopter is the same for both models. The landing gear is a skid type system made of skid tubes, skid struts, dampers, cross beams, stabilizers, drag struts and optional ground handling wheels.

<b>Item</b>	<b>Description/Purpose/Notes</b>
Skid Tube	A long tube that provides ground contact for the helicopter. <ul style="list-style-type: none"><li>• Skid tube length: 8.25 ft</li><li>• Width between skid tubes: 6.54 ft</li></ul>
Skid Strut	The skid struts attached the skid to the crossbeam using the dampers.
OLEO Dampers	Nitrogen and oil-based strut used to cushion landing and minimize the possibility of ground resonance.

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	<p>The front and rear dampers are not the same. The rear dampers have more pressure, due to the increased landing forces. They are identified with a rounded top.</p> <ul style="list-style-type: none"> <li>• Front 350 psi (squared off top)</li> <li>• Rear 725 psi (rounded top)</li> </ul>
Cross Beams	<p>The skid struts attached the skid to the crossbeam using the OLEO dampers.</p>
Stabilizers	<p>A flat-topped aluminum channel that ties the two cross beams together and provides a step for pilot and passengers. It also houses the strobes and position lights. The latter portion is susceptible to damage if a pilot jumps down on it during a preflight (such as after inspecting the main rotor mast. If optional ground handling wheels are installed, the right stabilizer houses the handle for the wheels.</p>
Drag Strut	<p>The purpose of the drag strut is to align the skids, provide rigidity to the gear, and transfer landing loads from the frame to the skids.</p>
<b>Optional Equipment</b>	
Ground Handling Wheels	<p>Flyable over-center ground handling wheels are operational equipment. If installed, these wheels must be locked in the up position during flight. When up and locked on the ground, care should be taken not to step on the wheel as it will likely rotate under the user, causing a fall. The handle for the ground handling wheels can be installed in the right-hand stabilizer.</p>
Heavy Duty Skid Shoes	<p>There are several different skid shoe options for the Schweizer helicopter. All versions contain four rear shoes, two on each skid tube. However, only some helicopters have a large skid shoe on the toe of each skid. In addition, there are some different options in material of the shoe, with some being harder and lasting longer.</p> <p>There is an after-market vendor that makes a full length, bolt-on skid shoe.</p>

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**POWERPLANT**

The 300CB and 300CBi use a very similar engine. The primary difference between the two engines is the fuel delivery system. The 300CB is carbureted while the 300CBi is fuel injected. Both engines are 360 cubic inches and provide 180 horsepower at 2700 RPM. Other than the fuel delivery system, the other parts are the same.

300CB	300CBi
<ul style="list-style-type: none"> <li>• Lycoming HO-360-C1A</li> <li>• Carbureted</li> <li>• 360 Cubic Inches</li> <li>• 180HP at 2700RPM</li> <li>• Operating RPM 2530-2700</li> <li>• NO momentary overspeed allowed*</li> <li>• Cylinder Head Temperature (CHT) 230-450F (Redline 500F)</li> <li>• Oil Pressure: 55-95psi (redline 115psi)</li> <li>• Oil Temp: 100-245F (redline 245F)</li> </ul>	<ul style="list-style-type: none"> <li>• Lycoming HIO-360-G1A</li> <li>• Fuel Injected</li> <li>• 360 Cubic Inches</li> <li>• 180HP at 2700RPM</li> <li>• Operating RPM 2530-2700</li> <li>• NO momentary overspeed allowed*</li> <li>• Cylinder Head Temperature (CHT) 230-450F (Redline 500F)</li> <li>• Oil Pressure: 55-95psi (redline 115psi)</li> <li>• Oil Temp: 100-245F (redline 245F)</li> </ul>
<b>Optional Equipment</b>	
<ul style="list-style-type: none"> <li>• Cabin Heat</li> </ul>	<ul style="list-style-type: none"> <li>• Cabin Heat</li> </ul>

\* An overspeed has occurred when the engine speed is greater than 2700RPM. If the overspeed is less than 5% (2835) no specific inspections need to be performed, but the cause of the overspeed should be determined. At 5-10 percent overspeed (2835-2970 RPM), there are several inspections needed. A full teardown inspection is required if above 10% (2970 RPM).

**FUEL SYSTEM**

Both models of helicopters run on 100 low lead (LL) aviation gasoline. The primary tank is located on the left side of the helicopter. The capacity is slightly different for the two different models. The fuel vent is also located on the tank for the 300CB and is piped to the center mast for the 300CBi. Both models can have an auxiliary fuel tank installed. Like the primary tank, the capacity of the auxiliary tank is the slightly different between the models.

300CB	300CBi
<ul style="list-style-type: none"> <li>• Carbureted</li> <li>• Gravity Feed</li> </ul>	<ul style="list-style-type: none"> <li>• Fuel Injected</li> <li>• Mechanical Fuel Pump</li> <li>• Electric boost pump</li> </ul>

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Fuel Type	
• 100 LL	• 100 LL
Capacity	
• 35.2 US Gal (35.0 usable)	• 32.5 US Gal (32.0 usable)
Optional Equipment	
• Auxiliary Fuel Tank Std+Aux: 65.2 US Gal (63.0 usable)	• Auxiliary Fuel Tank Std+Aux: 66.0 US Gal (64.0 usable)
<ul style="list-style-type: none"> <li>STC to move the PIC to the left side which requires the primary fuel tank to be moved to the right side of the helicopter. This modification is rare, but is often used at operations that use the 300CB/CBi for long-line training.</li> </ul>	

**OIL SYSTEMS**

There are several different oil systems on the Schweizer 300CB/CBi helicopters. The primary oil systems are the engine, main rotor transmission, and the tail rotor transmission. Other systems with oil are the landing gear OLEO dampers, and the free-wheeling unit. Key information about each system is outlined below.

Item	Description/Purpose/Notes
Engine Oil System	<p>Wet Sump System                      8 quarts Maximum                      2 quart minimum for starting                      Oil Type: Philips XC 20-50, Aeroshell 100W                      Operating Pressure: 55-95 psi, redline 115 psi                      Operating Temperature: 100-245, redline 245F</p> <p>Within the instrument panel, there is an oil temperature and oil pressure gauge. There are no other engine oil system warnings.</p> <p>Preflight Check: Confirm at least 6 quarts available. If less than 6 quarts, add one quart.</p>
Main Rotor Oil System	<p>Quantity: 3 quarts                      Type: Shell oil, Spirax HD 80W90 preferred.                      Recirculates every 30 seconds                      Operating Temperature: not to exceed 235F</p>

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Main Rotor Oil System (cont)	<p>Temperature Sensor located in oil sump Operating Pressure: 6-7psi</p> <p>Within the instrument panel, there is a M/R XSMN warning light. This warning light illuminates when:</p> <ul style="list-style-type: none"><li>• Pressure &lt; 2 psi</li><li>• Temperature &gt; 235F.</li></ul> <p>Some helicopters have an optional M/R chip detector warning light installed.</p> <p>Preflight Check: Confirm transmission is at the full level. Some transmission models (usually on a 300CB) have a dip stick while others have a sight-glass (usually on a 300CBi)</p>
Tail Rotor Oil System	<p>Quantity: .4 pints Type: Shell oil, Spirax HD 80W90 preferred.</p> <p>Within the instrument panel, there is a T/R Chips warning light. This warning light illuminates when metal contamination is detected in the TR transmission.</p> <p>Preflight Check: Confirm the transmission level is full. There is a sight glass on the transmission. Depending on the model of tail rotor, this sight glass may be on the rear or side of the transmission.</p> <p>Additional oil is filled through the breather vent. A safety wire must be removed to fill. Once filled, reinstall the safety wire. If filled too much, oil may seep from the vent.</p>
OELO Dampers	<p>The OLEO dampers contain hydraulic fluid, but this level is not accessible in the field. Only an authorized Schweizer service center may service or overhaul the OLEO dampers.</p>
Free-Wheeling Unit.	<p>The free-wheeling unit contains a small amount of oil. However, the unit is sealed, and the level of oil is not checked by the pilot. Only leaks could be identified. The level of fluid is check by mechanics during specific scheduled maintenance intervals.</p>

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**HYDRAULIC SYSTEMS**

Outside of the OELO dampers, there are no hydraulic systems on the Schweizer 300 series helicopters, including the 300CB and 300CBi. The OLEO dampers contain hydraulic fluid, but is a serviceable item for the pilot.

**ELETRICAL SYSTEM**

The electrical system for all 300 series helicopters are the same, including the 300CB and 300CBi models. Below is some basis information on the electrical system.

- 24-volt single wire system (the airframe structure is the ground)
- Charging system: Engine driven, direct current, 28-volt alternator.
- Battery: 24 volt, located under the right-side cowling.

Optional: External power port, normally installed on the left rear side of the frame.

**ENVIRONMENTAL SYSTEMS**

The environmental systems on the Schweizer 300 series helicopters are few. Without optional equipment, the primary environmental system is the installation or removal of the doors. If the doors are removed, the VNE is reduced to 90KTS and unoccupied seat cushions and other items must be secured. Optionally, the Schweizer helicopters may have a heater installed.

<b>300CB</b>	<b>300CBi</b>
<ul style="list-style-type: none"><li>• Doors On (window vents)</li><li>• Doors Off*</li></ul>	<ul style="list-style-type: none"><li>• Doors On (window vents)</li><li>• Doors Off*</li></ul>
<b>Optional Equipment</b>	
<ul style="list-style-type: none"><li>• Cabin Heat</li></ul>	<ul style="list-style-type: none"><li>• Cabin Heat</li></ul>

\* Reduces VNE to 90KTS with doors off.

Cabin Heat Description: Although there a few different versions, the primary heater version uses air from engine cowling, that is then circulated around a muff around the exhaust. This heated air is then directed into the cabin with a control valve that is used to direct any unwanted heat overboard. The heaters are generally removed during summer operations to limit wear and increase useful load as the heater system weighs approximately 30 lbs.

**AVIONIC AND COMMUCATIONS**

The avionics and communications will vary with installation of a specific helicopter. Refer to your aircraft’s documentation for specifics.

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**ICE PROTECTION**

There is very little for ice protection on the Schweizer 300 series helicopters. Both models have an alternate air source that provides unfiltered air to the induction system should the front air filter become clogged, such as with ice or other debris. Because the 300CB is carbureted, it has Carburetor heat in order to prevent icing in the fuel system during icing condition, or low power settings. Optionally, either model may be installed with a heated pitot tube or cabin heat. The cabin heat is beneficial in winter time to defrost the windshield and keep occupants warm.

<b>300CB</b>	<b>300CBi</b>
<ul style="list-style-type: none"> <li>• Alternate Induction Air</li> <li>• Carburetor Heat</li> </ul>	<ul style="list-style-type: none"> <li>• Alternate Induction Air</li> <li>• No additional items</li> </ul>
<b>Optional Equipment</b>	
<ul style="list-style-type: none"> <li>• Pitot Heat</li> </ul>	<ul style="list-style-type: none"> <li>• Pitot Heat</li> </ul>
<ul style="list-style-type: none"> <li>• Cabin Heat</li> </ul>	<ul style="list-style-type: none"> <li>• Cabin Heat</li> </ul>

**CREWMEMBER AND PASSENGER EQUIPMENT**

There is little crewmember or passenger equipment available for the Schweizer 300 series helicopter, including the 300CB and 300CBi. Optional equipment available is listed below.

- Fire Extinguisher: If installed, usually installed on the left or right door post.
- First Aid Kit: If installed, between the pilot and copilot on the top canopy (inside).

**ROTOR SYSTEMS**

The Schweizer 300 series helicopters have a three-bladed, fully-articulated main rotor system with anti-torque provided by a two-bladed semi-rigid tail rotor. The rotor systems are the same for all of the 300 series helicopters, except the RPMs for the 300CB/CBi are lower than the “C” models.

Power is transmitted to the main rotor from the engine via a belt-drive system. This belt drive system provides a manual clutch to engage the rotor. Optionally, there is an automatic rotor engagement system, but the process must be initiated by the pilot. The belt system also reduces the RPMs and drives the input shaft of the main rotor. It also drives the tail rotor driveshaft. The connection to the main rotor and tail rotor is through the free-wheeling unit. The freewheeling unit allows the drive train to disengage from the engine in the event of an engine failure. Key information on the rotor systems is below.

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<p>Main Rotor</p>	<p><b>Rotor System:</b> 3-bladed, fully articulated  <b>Operating RPM (power Off):</b> 390-504  <b>Operating RPM (power ON):</b> 442-471  <b>Elastomeric dampers</b> (part of the ground resonance prevention)  <b>Blade construction:</b> extruded aluminum spar with a wrap around skin bonded to the spar, and a bonded trailing edge.  <b>Airfoil type:</b> Symmetrical (NACA 0015) with a blade twist of -8°39'  <b>MR diameter:</b> 26.83 ft  <b>MR solidity ratio:</b> .04  <b>MR blade area:</b> 22.64 ft<sup>2</sup>  <b>MR geometric disc area:</b> 565.49 ft<sup>2</sup>  <b>Belt drive tension fully engaged:</b> 230lbs.  Collective Trave: 12 +/- 1 degree.</p> <p>Other Information</p> <ul style="list-style-type: none"> <li>• Stainless steel abrasion Strip located outboard 18 inches. Some rotor blades may have abrasion strip along the entire blade. This strip reduces performance.</li> <li>• MR Transmission Gear Reduction: 4.454 to 1.</li> <li>• Controlled via mechanical linkage, no hydraulics.</li> <li>• <b>NO</b> rotor brake option for the Schweizer 300 series helicopter.</li> </ul> <p>As noted earlier, the oil system for the main rotor transmission contains 3 quarts of 80W90 oil. The level is checked via a sight glass or dip stick depending on the model of transmission. There is a pressure and temperature warning light in the instrument panel. This light illuminates if the pressure is below 2 psi or the temperature is above 235f. The normal operating pressure is 6-7psi and the normal operating temperature is less than 235F.</p>
<p>Tail Rotor</p>	<p><b>Rotor System:</b> 2-bladed, semi rigid  <b>Hinge Type:</b> Delta-three  <b>Elastomeric bearings</b> (older version may have conical bearings)  <b>Operating RPM (power Off):</b> 2558-3306  <b>Operating RPM (power ON):</b> 2901-3094  <b>Airfoil type:</b> Symmetrical (NACA 0014) with a blade twist of 8°00'  <b>TR diameter:</b> 4.25ft  <b>TR blade cord:</b> 4.81 inches (constant)  <b>TR solidity ratio:</b> 0.116  <b>TR blade area:</b> 1.69 ft<sup>2</sup>  <b>TR geometric disc area:</b> 14.19 ft<sup>2</sup></p>



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Tail Rotor (cont)	<p><b>TR travel:</b> +26 +/- 1 degree, -12 +/- 1 degree  <b>TR transmission ratio:</b> Increase of 1 to 1.471. An input speed of 2151 results in an output of 3175.</p> <p>OTHER INFORMATION</p> <p>MR to TR RPM comparison: TR rotates 6.57 times faster than the MR. During autorotation, the MR drives the TR.                  Controlled via cables and pushrods, no hydraulics</p>
Tailboom and TR Driveshaft	<p><b>Tailboom construction:</b> aluminum monocoque  <b>TR driveshaft:</b> one piece  <b>TR driveshaft damper:</b> suppresses excessive oscillation of the drive shaft, located in the center of the tailboom.  <b>TR driveshaft RPM (power ON):</b> 1965-2097  <b>TR driveshaft RPM (power OFF):</b> 1733-2240  <b>Freewheeling unit:</b> located on the upper portion of the belt drive system  <b>Lower pulley to upper pulley reduction ratio:</b> 1 to 0.655.</p>

NOTE: During rotor engagement, if the engine RPM exceeds 2000 RPM with the rotor not fully engaged, the lower coupling shaft must be sent in for inspections per the HMI.

**PITOT STATIC SYSTEM**

The Schweizer 300CB/CBi has a basic pitot static system. The pitot tube is installed on the front left cowling of the helicopter. The static source is from a tube installed on the tailboom, with the opening between the aft tailboom supports.

There is no vacuum system installed, so all gyroscopic instruments installed will be electrically powered. The following table lists key instrument or indicators and their source.

Instrument/Indicator	Source
Airspeed Indicator	Pitot-Static System
Vertical Speed	Pitot-Static System
Altitude	Pitot-Static System
Attitude Indicator (if installed)	Electric
Heading Indicator (if installed)	Electric
Turn Coordinator (if installed)	Electric
Main Rotor RPM	Mechanical Linkage

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Engine RPM	Mechanical Linkage
Engine Oil Temp:	Variable probe in accessory case
Low voltage light	Main bus < 24.5 volts
Clutch Disengaged Light	Clutch actuator not fully retracted and clutch switch in the Engage or Release position
Compass	Magnetic
Manifold Pressure	Sensor installed #3 Cylinder
Cylinder Head Temperature	Sensor installed #3 Cylinder
Fuel Quantity Indication	Sensor installed inside tank, may be resistant or float type.
Fuel Pressure (300CBi only)	Electric
M/R Transmission Pressure/Temperature	Pressure sensor on outside of the transmission on the pilot side. Temperature sensor on the bottom of the transmission.

The instrumentation in the helicopter may vary for each specific aircraft. Refer to your specific helicopter for instrumentation.

**PERFORMANCE AND LIMATIIONS**

There are very few performance charts available within the flight manual for the Schweizer 300 series helicopters. The primary performance chart available is the out-of-ground effect hover chart. The two charts that follow are for the 300CB and 300CBi. There are some optional parameters noted in the top right of the charts. Ensure that you review the correct chart for your specific helicopter.

**Performance  
 Pilot's Flight Manual**

**SCHWEIZER  
 Model 269C-1 Helicopter**

°F	°C
0	-18
20	-7
40	4
60	16
80	27
100	38
120	49

- THIS CHART BASED ON:
- Full Throttle at 2700 RPM.
  - Mixture Full Rich
  - Carburetor Heat Off.
  - 2-Foot Skid Height
  - Upstack Exhaust Pipe Installed
  - No M/R Blade Abrasion Tape.

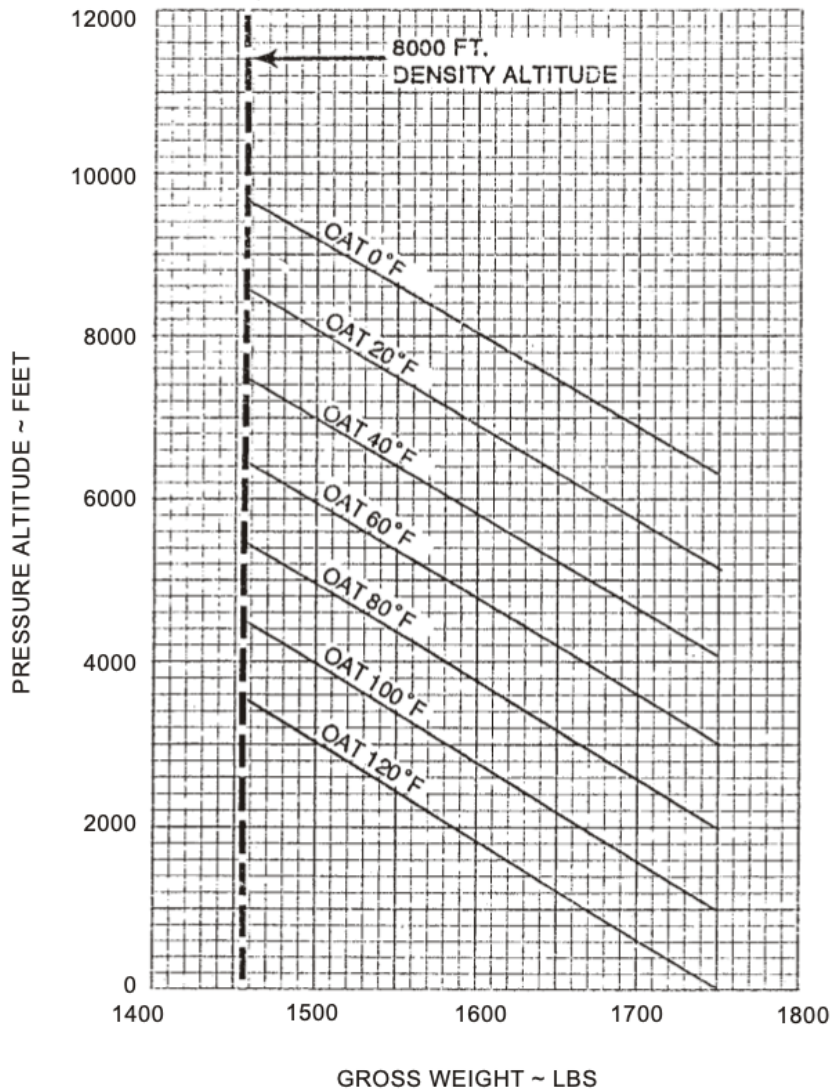


Figure 5-3. In Ground Effect Hover Ceiling Versus Gross Weight  
 (Helicopters with carbureted engine - HO-360-C1A)

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**SCHWEIZER**  
**Model 269C-1 Helicopter**

**Performance**  
**Pilot's Flight Manual**

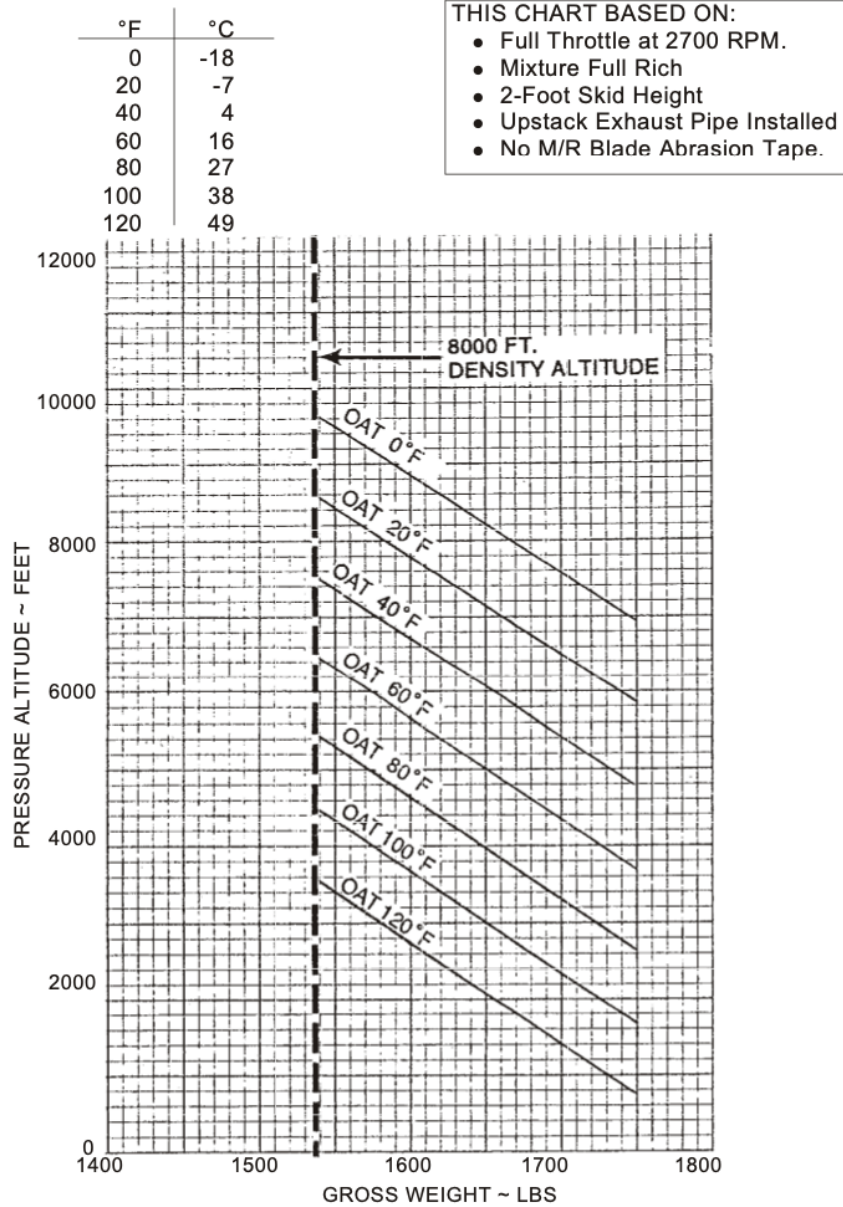


Figure 5-4A. In Ground Effect Hover Ceiling Versus Gross Weight  
 (Helicopters with fuel injected engine - HIO-360-G1A)

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There is fuel consumption, range, or endurance performance published in the flight manual. However, in practice, you can use 10.5 gallons per hour of fuel used to estimate performance. This information is based on our operational estimates.

The following are some additional key speeds and limitations for the 300CB/CBi helicopter.

**Maximum Operating Altitude:**

- Hovering ceiling: 4600ft density altitude
- Takeoff/landing: 8,000ft density altitude
- Enroute: 10,000ft density altitude

**Rotor Speed Limitations (Power OFF)**

- Minimum rotor speed: 390 RPM
- Maximum rotor speed: 504 RPM

**Rotor Speed Limitations (Power ON)**

- Minimum rotor speed: 442 RPM
- Maximum rotor speed: 471 RPM

**Engine – Rotor Disengaged**

- Engine idle speed: 1200-1600 RPM
- With rotor disengaged, do not exceed 1600 RPM.
- Initial clutch engagement 1500-1600 RPM

**Engine – Rotor Engaged**

- Minimum engine RPM: 2530
- Maximum engine RPM: 2700
- NO momentary overspeed allowed
- Maximum continuous power: 180 horsepower at 2700 RPM
- Oil pressure operating range: 55-95 psi (redline 115)
- Oil temperature operating range: 100-245 degrees F (redline 245)
- Cylinder Head Temperature Operating range: 230-450 degrees F (redline 500)

**Key Speeds**

- Autorotation speed: 52 knts
- Best rate of climb (Vy): 41kts
- Run on landing speed: 36 kts maximum
- Normal approach: 53 knts

**Never Exceed Speed (Vne)**

- Maximum Vne 94kts
- Doors off operations Vne: 90kts IAS

**Other Items**

- Solo from the right seat only
- Operation in IFR conditions prohibited
- Controllability demonstrated in 17kts winds (any direction)
- No leaning of mixture in flight
- Fuel consumption: 10.5 (not in POH/RFM)
- Max range: 230NM (not in POH/RFM)
- Best range cruise speed: 63 kts (not in POH/RFM)
- Maximum gross weight: 1750lbs