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TO

, FTE, AIR-713 for,

Manager, Flight Test & Human Factors Branch, AIR-710
Federal Aviation Administration

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SECTION 1

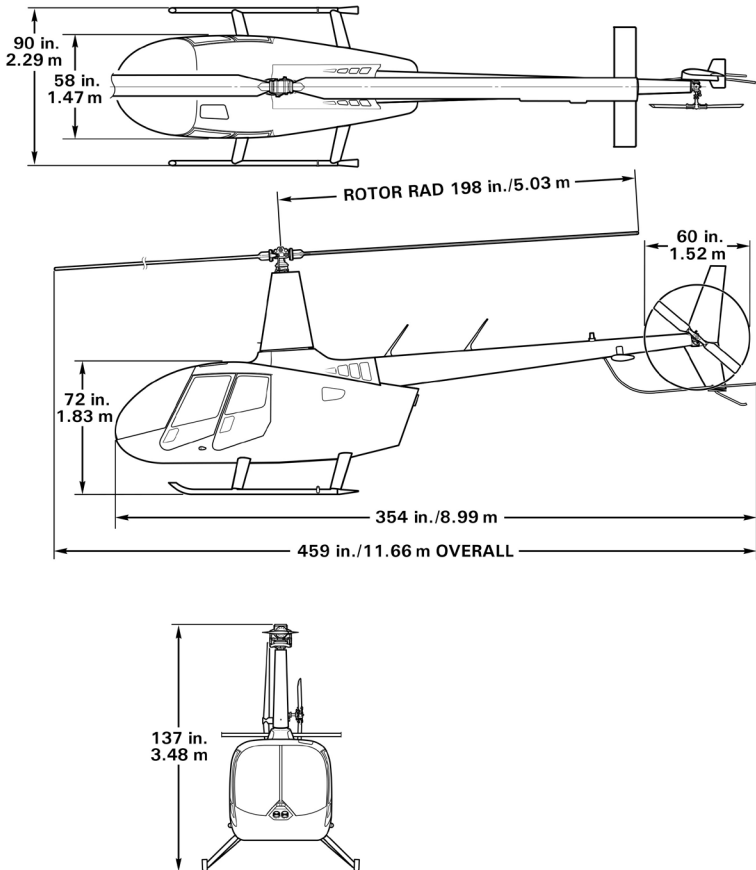
GENERAL

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EXTERNAL DIMENSIONS



**R66 EXTERNAL DIMENSIONS
(LATER AIRCRAFT SHOWN)**

DESCRIPTIVE DATA

MAIN ROTOR

Articulation	Free to teeter and cone, rigid in plane
Number of Blades	2
Diameter	33 feet
Blade Chord	11.5 inches inboard, 12.2 inches outboard
Blade Twist	-4 Degrees
Tip Speed at 100% RPM	705 feet per second

TAIL ROTOR

Articulation	Free to teeter, rigid in plane
Number of Blades	2
Diameter	60 inches
Blade Chord	5.5 inches (constant)
Blade Twist	0
Precone Angle	1 Degree
Tip Speed at 100% RPM	635 feet per second

DRIVE SYSTEM

Engine to Drive Line	Sprag type overrunning clutch, spiral-bevel gears with 13:37 speed reducing ratio
Drive Line to Main Rotor	Spiral-bevel gears with 11:57 speed reducing ratio
Drive Line to Tail Rotor	Spiral-bevel gears with 31:27 speed increasing ratio

FLIGHT AND MANEUVER LIMITATIONS

Aerobatic flight prohibited.

CAUTION

Abrupt control inputs may produce high fatigue stresses and cause catastrophic failure of a critical component.

Low-G cyclic pushovers prohibited.

CAUTION

A pushover (forward cyclic maneuver) performed from level flight or following a pull-up causes a low-G (near weightless) condition which can result in catastrophic loss of lateral control. To eliminate a low-G condition, immediately apply gentle aft cyclic. Should a roll commence during a low-G condition, apply gentle aft cyclic to reload rotor before applying lateral cyclic to stop roll.

Maximum operating density altitude 14,000 feet.

Maximum operating altitude 9000 feet AGL to allow landing within 5 minutes in case of fire.

Closing throttle (twist grip) in flight prohibited above 10,000 feet density altitude to avoid possible engine flameout.

Closing throttle (twist grip) in flight prohibited with cabin heat ON to avoid possible engine flameout.

Minimum crew is one pilot in the right front seat. A flight instructor may act as pilot in command from the left front seat. Solo flight from right seat only.

Forward left seat belt must be buckled.

Operation up to 100 KIAS approved with any combination of cabin doors removed. All seat belts must be buckled and loose items in cabin must be properly secured during doors-off flight.

A functioning headset must be worn by each pilot.

KINDS OF OPERATION LIMITATIONS

VFR day and night operations are approved.

VFR operation at night is permitted only when landing, navigation, instrument, and anti-collision lights are operational. Orientation during night flight must be maintained by visual reference to ground objects illuminated solely by lights on the ground or adequate celestial illumination.

NOTE

There may be additional requirements in countries outside the United States.

ENVIRONMENTAL LIMITATIONS

Maximum ambient temperature for operation is ISA plus 35°C (ISA plus 63°F), limited to 50°C (122°F).

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

NOTE

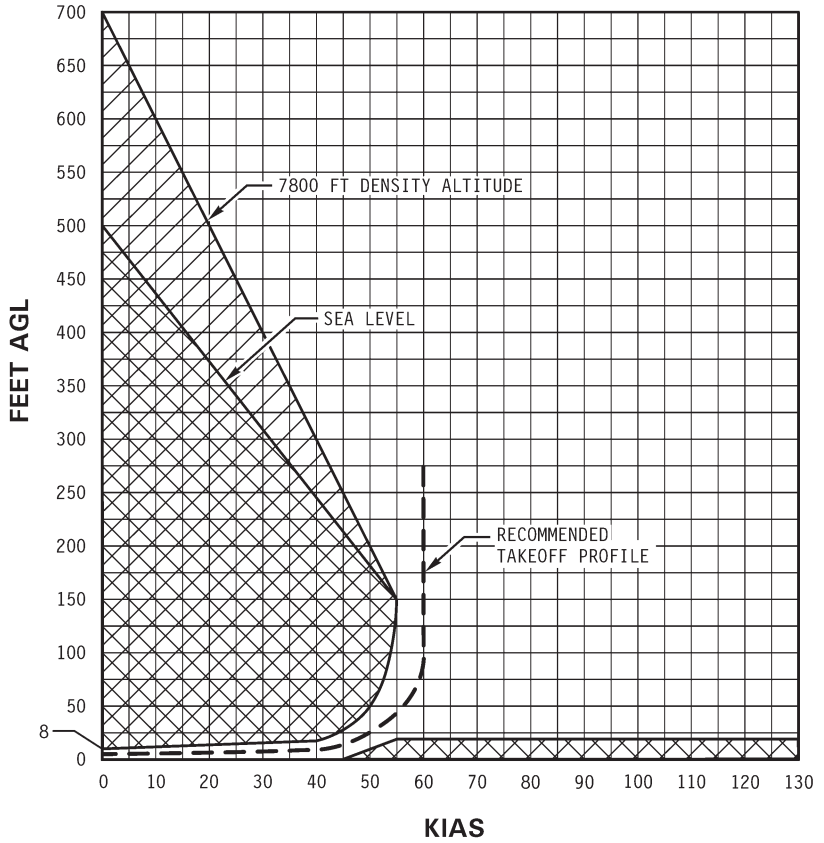
See fuel limitations for temperature restrictions.

Flight in known icing conditions prohibited.

Engine anti-ice must be on for operation in visible moisture in ambient temperatures at or below 4°C (40°F).

DEMONSTRATED CONDITIONS:
SMOOTH HARD SURFACE
WIND CALM
2700 LB GROSS WEIGHT
HOVER POWER + 10% TORQUE FOR TAKEOFF

AVOID OPERATION IN CROSS-HATCHED AREAS



HEIGHT - VELOCITY DIAGRAM

NOISE CHARACTERISTICS

The following noise levels comply with 14 CFR Part 36, Appendix H and ICAO Annex 16, Volume 1, Chapter 8 noise requirements and were obtained from FAA-approved data from actual noise tests.

Model: R66
 Engine: Rolls-Royce Model 250-C300/A1
 Gross Weight: 2700 lb (1225 kg)

Configuration		V _h KTAS	Noise Level (EPNdB)		
			Flyover	Takeoff	Approach
Earlier Version	Clean	117	84.5	87.8	87.8
	Dirty	108	84.8	87.8	88.6
Later Version	Clean	117	84.2	86.2	86.1
	Dirty	109	84.6	87.1	89.5

Notes:

- Configurations are:
 Earlier version - Horizontal Stabilizer is mounted adjacent to tail gear box.
 Later version - Horizontal Stabilizer is mounted under tailcone forward of tailrotor.
- The dirty configuration has air conditioning and four doors with bubble windows installed, and landing gear strut fairings removed.

These noise levels meet the requirements for a Stage 3 helicopter as defined in 14 CFR Part 36.

NOTE

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

ENGINE CONTROLS (cont'd)

The governor controls RPM under normal conditions. It may not prevent over- or under-speed conditions generated by aggressive flight maneuvers or rapid power changes.

Other engine controls include a push-pull fuel cutoff control on the console face, a start button on pilot's collective, a key-type igniter switch, and an anti-ice switch.

ENGINE ANTI-ICE

A solenoid-actuated valve controlled by the anti-ice switch allows hot compressor discharge air to flow to the compressor nose bearing support. The green ANTI-ICE annunciator is activated by a pressure switch in the anti-ice air line, indicating when anti-ice is ON and functioning. Because compressor discharge air is used, some performance degradation occurs with anti-ice ON (see Section 5).

Switch anti-ice ON in conditions conducive to icing. Anti-ice must be ON for operation in certain conditions per Section 2.

NOTE

Electrical power to the anti-ice solenoid is required to switch anti-ice OFF (system is fail-safe ON).

STARTER AND IGNITION SYSTEM

A single starter-generator is used for engine starting and electrical power generation. A generator control unit (GCU) controls starter-generator function. During a start, the GCU latches the starter on until N_1 reaches 58 percent RPM. Therefore, the pilot is not required to hold the start button down throughout the start sequence. Above 58 percent N_1 RPM, the GCU automatically switches out of start mode, but the generator switch should not be switched ON until idle RPM stabilizes to prevent the generator load from bringing the RPM down.

When the igniter key switch is in the enable position, depressing the start button causes a normal start sequence with the starter latching on and the igniter firing. Above 58 percent N_1 RPM, the igniter will fire while the start button is depressed. The start button may be depressed any time while in flight to active the igniter. Note that the GEN annunciator will illuminate momentarily when the start button is depressed with N_1 above 58 percent.

When the igniter switch is OFF, the engine can be motored by the starter by depressing the start button without the starter latching or the igniter firing. This is useful for performing a compressor wash or rinse. If the igniter is switched OFF during a start, the starter will disengage. If the igniter is switched OFF while the engine is running, the engine will continue to run; however, this is not recommended.

NOTE

Do not engage starter with generator circuit breaker pulled. Starter will have reduced power and may overheat.

NOTE

Start button is active when battery switch is ON, even if igniter switch is OFF. Rotor brake may be left engaged after shutdown to disable start button.

PARKING

1. Place cyclic control in neutral position and apply friction.
2. Put collective full down and apply friction.
3. Align rotor blades approximately fore and aft. Apply rotor brake. Use blade tie-downs in windy conditions.

CAUTION

If using rotor blade tie-downs, do not overtighten tie-down straps (5 lb max tension). Do not pull down on blades to teeter rotor. To lower a blade, push up on opposite blade.

4. To prevent degradation of windshields (particularly impact-resistant windshields) due to UV light, use of a cabin cover is recommended when parked outside.
5. During storm conditions, helicopter should be hangared or moved to a safe area.

CABIN DOORS

All four cabin doors may be removed and installed by maintenance personnel or pilots. To remove a door, disconnect door strut by lifting inboard end of strut while holding door in full open position, remove cotter rings in upper and lower hinge pins, and then lift door off. To install doors, use reverse procedure. Adjust weight and balance as required when removing or installing doors.

ENGINE OIL AND FILTER

Full oil quantity is six quarts and minimum quantity for takeoff is four quarts. Quantity is indicated as follows:

Six quart indication is top of knurled section of dipstick.

Four quart indication is bottom of knurled section of dipstick or center of oil tank sight gage.

If shut down for more than 15 minutes, some oil may drain from the oil tank to the engine giving a false low oil quantity indication. If oil level appears low, motor the engine with the starter (ignition switch off) for 30 seconds and re-check level before adding oil.

Only turbine engine oil per specification AS 5780 HPC is approved. The following products are known to meet the specification and are approved by Rolls-Royce.

<u>Product</u>	<u>Manufacturer</u>
MJO 254 or MJO 387	Exxon Mobil Lubricants
BPTO 2197	Air BP Lubricants
ETO 2197	Eastman Chemical Company

The engine oil filter is located on top of the engine and is accessible via a right side cowl door. A red indicator pin (impending bypass indicator) extends from the end of the filter housing if the filter becomes contaminated. Operation with a contaminated filter may allow oil to bypass the filter element. Oil will still be supplied to the engine but will be unfiltered. If erroneous indication is suspected, the bypass indicator may be reset by pushing it back in. If the indicator extends during next engine run or flight, service the filter. Refer to RR300 Series Operation and Maintenance Manual for servicing instructions.

Recommended engine oil change intervals are every 400 hours or 12 months. See R66 Maintenance Manual.

SECTION 9

SUPPLEMENTS

OPTIONAL EQUIPMENT SUPPLEMENTS

Information contained in the following supplements applies only when the related equipment is installed.

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NON-U.S. SUPPLEMENTS

The following supplements contain additional information required by certain countries:

Argentine Supplement	IAC AR Supplement
Brazilian Supplement	Israeli Supplement
Canadian Supplement	UK CAA Supplement
EASA Supplement	Ukrainian Supplement
FATA Supplement (Russia)	Uruguayan Supplement

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