

**SECTION 2
LIMITATIONS
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**SECTION 2
LIMITATIONS**

GENERAL

This section includes operating limitations, instrument markings, and basic placards required for safe operation of the helicopter, its engine, and other standard systems. The R44 Cadet is approved as a normal category rotorcraft under FAA Type Certificate No. H11NM as Model R44 in the serial number range 30001 and subsequent.

COLOR CODE FOR INSTRUMENT MARKINGS

Red	Operating limit. Edge of red line indicates limit. Pointer should not enter red during normal operation.
Red Cross-hatch	Power-off V_{ne} .
Yellow	Precautionary or special operating procedure range.
Green	Normal operating range.

AIRSPEED LIMITS

NEVER-EXCEED AIRSPEED (V_{ne})

Power On	120 KIAS
Autorotation	100 KIAS

For V_{ne} reductions with altitude and temperature, see placard on page 2-9.

ADDITIONAL AIRSPEED LIMITS

100 KIAS maximum at power above MCP.

100 KIAS maximum with any combination of cabin doors removed.

ROTOR SPEED LIMITS

Power On	
Maximum	102% (408 RPM)
Minimum*	101% (404 RPM)
Power Off	
Maximum	108% (432 RPM)
Minimum	90% (360 RPM)

*Transient operation below 101% permitted for emergency procedures training.

POWERPLANT LIMITATIONS

ENGINE

One Lycoming Model O-540-F1B5

OPERATING LIMITS

Engine Speed	
Maximum continuous	102% (2718 RPM)
Maximum transient**	105% (2800 RPM)
Cylinder Head Max Temperature	500°F (260°C)
Oil Maximum Temperature	245°F (118°C)
Oil Pressure	
Minimum during idle	25 psi
Minimum during flight	55 psi
Maximum during flight	95 psi
Maximum during start & warm up	115 psi
Oil Quantity, minimum for takeoff	7 qt (6.6 liters)
Manifold Pressure:	See placard on page 2-9 for MAP schedule.

**Intentional operation above maximum continuous speed prohibited.

WEIGHT LIMITS

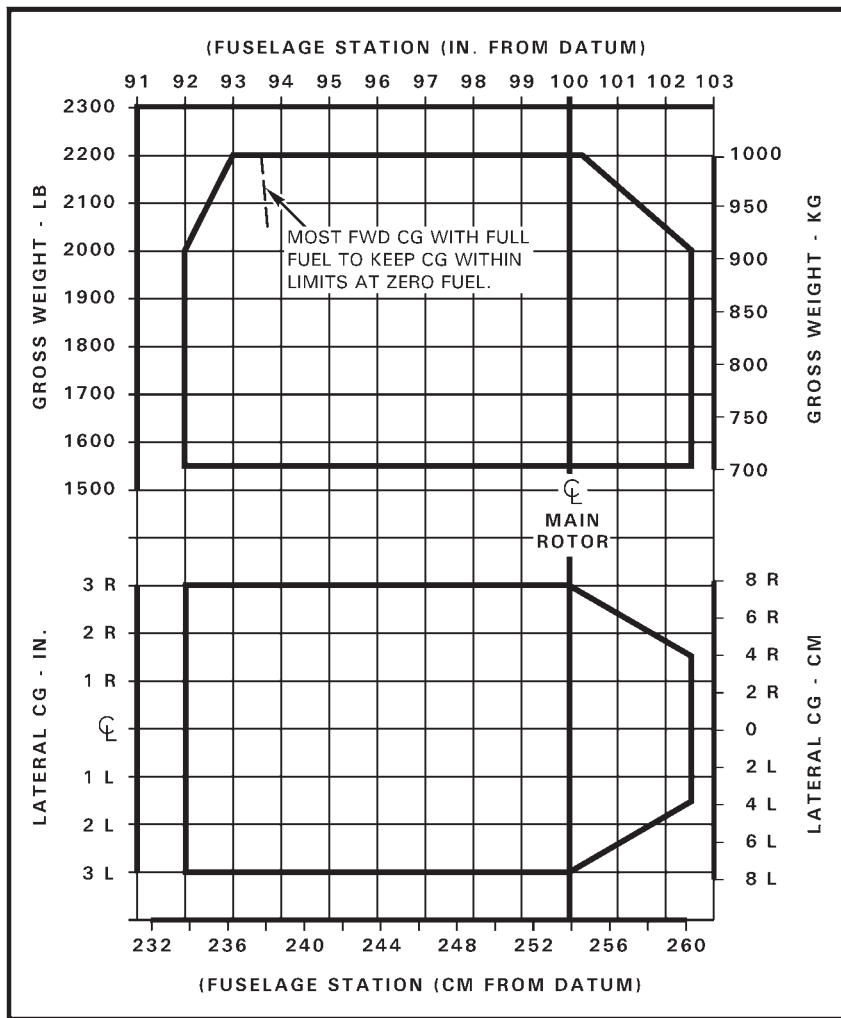
Maximum gross weight	2200 lb (998 kg)
Minimum gross weight	1550 lb (703 kg)
Maximum per seat including baggage compartment	300 lb (136 kg)
Maximum in any baggage compartment	50 lb (23 kg)
Maximum on deck above aft baggage compartments	50 lb (23 kg) each side

CENTER OF GRAVITY (CG) LIMITS

See figure on page 2-4. Reference datum is 100 inches forward of main rotor shaft centerline.

NOTE

With all doors installed, a solo pilot weight of 150 lb (68 kg) or greater will ensure CG within limits. For lower pilot weight, compute weight and balance; removable ballast may be required to obtain CG at or forward of aft limit. (See Loading Instructions in Section 6.)



CENTER OF GRAVITY LIMITS

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 pullup 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 right roll commence during a low-G condition, apply gentle aft cyclic to reload rotor before applying lateral cyclic to stop roll.

Flight prohibited with governor selected off, with exceptions for in-flight system malfunction or emergency procedures training.

Flight in known icing conditions prohibited.

Maximum operating density altitude 14,000 feet.

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

Alternator, RPM governor, low rotor RPM warning system, OAT gage, and hydraulic control system must be operational for dispatch.

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

Maximum occupancy is two people. Occupants in aft cabin prohibited.

Left seat belt must be buckled.

Operation up to 100 KIAS approved with any combination of cabin doors removed. 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.

FUEL LIMITATIONS

APPROVED FUEL GRADES

Grade	Color	Specification
100	Green	ASTM D910
100LL	Blue	
100VLL	Blue	
UL 91	Clear to Yellow (no dye)	ASTM D7547
UL 94		
HJELMCO 91/96 UL	Clear to Yellow (no dye)	Hjelmco Oil, Inc. Sollentuna, Sweden
91	Yellow	TU 38.5901481-96 Ukrainian National Standard
B91/115	Green	GOST 1012-72 Russian National Standard
B95/130	Amber	

FUEL CAPACITY

	Total Capacity US gallons (liters)	Usable Capacity US gallons (liters)
Main tank	30.5 (115)	29.5 (112)
Auxiliary tank	17.2 (65)	17.0 (64)
Combined capacity	47.7 (180)	46.5 (176)

INSTRUMENT MARKINGS

NOTE

Red lines offset so instrument pointer should not enter red. See color code on page 2-1.

AIRSPPEED INDICATOR

Green arc	0 to 110 KIAS
Yellow arc	110 to 120 KIAS
Red cross-hatch	100 KIAS
Red line	120 KIAS

ROTOR TACHOMETER

Lower red line	90%
Green arc	90 to 108%
Upper red line	108%

ENGINE TACHOMETER

Lower red line	101%
Green arc	101 to 102%
Upper red line	102%

OIL PRESSURE

Lower red line	25 psi
Lower yellow arc	25 to 55 psi
Green arc	55 to 95 psi
Upper yellow arc	95 to 115 psi
Upper red line	115 psi

OIL TEMPERATURE

Green arc	75 to 245°F (24 to 118°C)
Red line	245°F (118°C)

CYLINDER HEAD TEMPERATURE

Green arc	200 to 500°F (93 to 260°C)
Red line	500°F (260°C)

INSTRUMENT MARKINGS (cont'd)

MANIFOLD PRESSURE

Green arc	16.0 to 22.9 in. Hg
Yellow arc	19.5 to 24.9 in. Hg
Red line	24.9 in. Hg

Yellow arc denotes variable MAP limits. See placard on page 2-9.

CARBURETOR AIR TEMPERATURE

Yellow arc	-19°C to + 3°C
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PLACARDS

In clear view and readable by pilot in flight:

LIMIT MANIFOLD PRESSURE - IN. HG								
MAXIMUM CONTINUOUS POWER								
PRESS ALT-FT	OAT-°C							
	-30	-20	-10	0	10	20	30	40
SL	21.2	21.4	21.7	22.0	22.2	22.5	22.7	22.9
2000	20.7	21.0	21.3	21.5	21.8	22.0	22.2	22.5
4000	20.2	20.5	20.8	21.1	21.3	21.6	21.8	22.0
6000	19.8	20.1	20.4	20.7	20.9	21.1	21.4	21.6
8000	19.5	19.7	20.0	20.3	FULL THROTTLE			
FOR MAX TAKEOFF POWER (5 MIN), ADD 2.0 IN.								

NEVER EXCEED SPEED - KIAS								
PRESS ALT-FT	OAT-°C							
	-30	-20	-10	0	10	20	30	40
SL								
2000	120						117	113
4000					116	112	108	104
6000			116	112	107	103	98	93
8000	116	112	107	102	97	91	86	81
10000	107	102	96	91	85	80	75	
12000	97	91	85	79				
14000	85	79	NO FLIGHT					
FOR AUTOROTATION, SUBTRACT 20 KIAS								

PLACARDS (cont'd)

Near main fuel tank filler cap:

FUEL
100 OCT MIN GRADE AVIATION GASOLINE

or

FUEL
AVIATION GASOLINE – GRADE 100LL
OR SEE PILOT'S HANDBOOK

Near aux fuel tank filler cap:

AUX FUEL
100 OCT MIN GRADE AVIATION GASOLINE

or

AUX FUEL
AVIATION GASOLINE – GRADE 100LL
OR SEE PILOT'S HANDBOOK

Near fuel shut-off valve:

FUEL

On fuel shut-off valve:

ON OFF

Near main tank fuel gage:

29.5 US GAL (112 LITERS)

Near aux tank fuel gage:

AUX 17.0 US GAL (64 LITERS)

PLACARDS (cont'd)

In clear view of pilot:

SEE PILOT'S HANDBOOK FOR SOLO PILOT
WEIGHT LESS THAN 150 LB (68 KG)

THIS ROTORCRAFT APPROVED FOR
DAY AND NIGHT VFR OPERATIONS

LOW-G PUSHOVERS PROHIBITED

On removable cyclic grip:

SOLO FROM RIGHT SEAT ONLY

On or near collective controls:

NO STOWAGE
KEEP AREA CLEAR

In clear view of both occupants:

NO SMOKING

Inside forward baggage compartments:

CAUTION

DO NOT EXCEED THE FOLLOWING:

- COMPARTMENT CAPACITY: 50 LB (23 KG)
- COMBINED SEAT PLUS COMPARTMENT: 300 LB (136 KG)

SEE PILOT'S HANDBOOK FOR ADDITIONAL LOADING
INSTRUCTIONS.

PLACARDS (cont'd)

Inside aft baggage compartments:

COMPARTMENT LOAD LIMIT 50 LB (23 KG)

Near each aft baggage compartment cover:

DO NOT OCCUPY
CAUTION
ENSURE ALL ITEMS ARE PROPERLY SECURED
DECK LOAD LIMIT 50 LB (23 KG) EACH SIDE