

**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**

	TACHOMETER READING	ACTUAL RPM
Power On		
Maximum	102%	408
Minimum*	101%	404
Power Off		
Maximum	108%	432
Minimum	90%	360

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

**POWERPLANT LIMITATIONS**

**ENGINE**

One Lycoming Model O-540-F1B5

**OPERATING LIMITS**

Engine Maximum Speed                    2718 RPM (102%)

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.

**WEIGHT LIMITS**

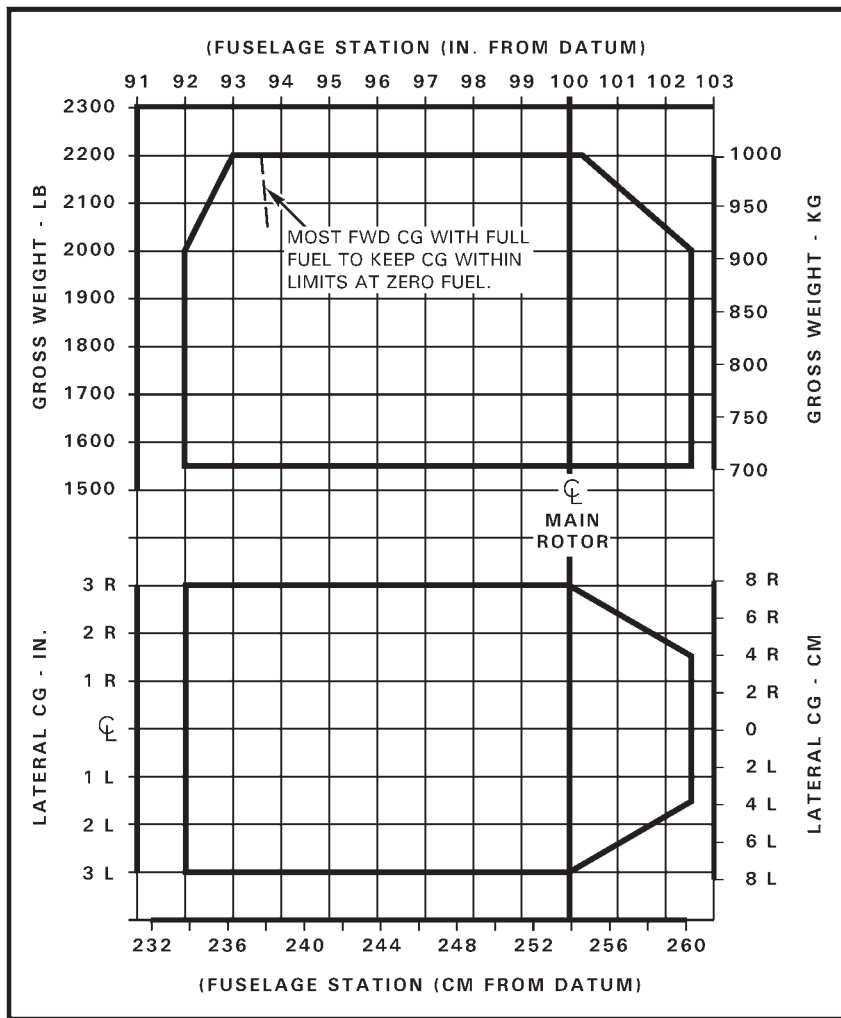
Maximum gross weight	2200 lb (998 kg)
Minimum gross weight	1550 lb (703 kg)
Maximum per seat including baggage compartment	300 lb (136 kg)
Maximum in any baggage compartment	50 lb (23 kg)
Maximum on deck above aft baggage compartments	50 lb (23 kg) each side

**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.

**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**

<b>Grade</b>	<b>Color</b>	<b>Specification</b>
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**

	<b>Total Capacity US gallons (liters)</b>	<b>Usable Capacity US gallons (liters)</b>
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:

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

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

**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**