

# SECTION 2 LIMITATIONS

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## INTRODUCTION

Section 2 includes operating limitations, instrument markings, and basic placards necessary for the safe operation of the airplane, its engine, standard systems and standard equipment. The limitations included in this section and in Section 9 have been approved by the Federal Aviation Administration. Observance of these operating limitations is required by Federal Aviation Regulations.

### NOTE

Refer to Section 9 of this Pilot's Operating Handbook for amended operating limitations, operating procedures, performance data and other necessary information for airplanes equipped with specific options.

### NOTE

The airspeeds listed in the Airspeed Limitations chart (figure 2-1) and the Airspeed Indicator Markings chart (figure 2-2) are based on Airspeed Calibration data shown in Section 5 with the normal static source, with the exception of the bottom of the green and white arcs on the airspeed indicator. These are based on a power-off airspeed calibration. If the alternate static source is being used, refer to the airspeed calibration variations between the normal and alternate static sources as shown in Section 5.

Your Cessna is certificated under FAA Type Certificate No. 3A17 as Cessna Model No. 172RG.

**AIRSPEED LIMITATIONS**

Airspeed limitations and their operational significance are shown in figure 2-1.

	SPEED	KCAS	KIAS	REMARKS
V <sub>NE</sub>	Never Exceed Speed	161	164	Do not exceed this speed in any operation.
V <sub>NO</sub>	Maximum Structural Cruising Speed	142	145	Do not exceed this speed except in smooth air, and then only with caution.
V <sub>A</sub>	Maneuvering Speed: 2650 Pounds 2250 Pounds 1850 Pounds	105 96 87	106 98 89	Do not make full or abrupt control movements above this speed.
V <sub>FE</sub>	Maximum Flap Extended Speed: To 10° Flaps 10° - 30° Flaps	130 101	130 100	Do not exceed these speeds with the given flap settings.
V <sub>LO</sub>	Maximum Landing Gear Operating Speed	138	140	Do not extend or retract landing gear above this speed.
V <sub>LE</sub>	Maximum Landing Gear Extended Speed	161	164	Do not exceed this speed with landing gear extended.
	Maximum Window Open Speed	161	164	Do not exceed this speed with windows open.

Figure 2-1. Airspeed Limitations

**AIRSPEED INDICATOR MARKINGS**

Airspeed indicator markings and their color code significance are shown in figure 2-2.

TEMPORARY REVISION FOR CESSNA PILOT'S OPERATING HANDBOOK  
AND FAA APPROVED AIRPLANE FLIGHT MANUAL

Publication Affected: Model 1980 172RG (172RG0001 thru 172RG0570) basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, D1174-2-13, Revision 2, dated 1 December 1983.

Airplane Serial Numbers Affected: Airplanes 172RG0001 thru 172RG0570.

Description of Change: Section 2, Operating Limitations, Change to Oil Pressure Limits.

Filing Instructions: Insert this temporary revision in the 1980 Model 172RG (172RG0001 thru 172RG0570) basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual D1174-2-13 adjacent to page 2-5.

Removal Instructions: This temporary revision must be removed and discarded when Revision 3 has been collated into the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

In Section 2, Operating Limitations, Power Plant Limitations, Replace the Oil Pressure Limits with the following:

**POWER PLANT LIMITATIONS**

Engine Operating Limits for Takeoff and Continuous Operations:

For airplanes 172RG0001 thru 172RG0570 not incorporating SK172-85.

Oil Pressure, Minimum: 25 psi  
Maximum: 100 psi

For airplanes 172RG0001 thru 172RG0570 incorporating SK172-85.

Oil Pressure, Minimum: 20 psi  
Maximum: 115 psi

**APPROVED BY**

FAA Approved Under 14 CFR Part 183 Subpart D  
Cessna Aircraft Company  
Organization Designation Authorization ODA-150129-CE  
*Ryan L. Sanchez*  
Ryan L. Sanchez, Asst. COA Administrator  
RLS

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TEMPORARY REVISION FOR CESSNA PILOT'S OPERATING HANDBOOK  
AND FAA APPROVED AIRPLANE FLIGHT MANUAL

Publication Affected: Model 1980 172RG (172RG0001 thru 172RG0570) basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, D1174-2-13, Revision 2, dated 1 December 1983.

Airplane Serial Numbers Affected: Airplanes 172RG0001 thru 172RG0570.

Description of Change: Section 2, Operating Limitations, Change to the Power Plant Instrument Markings for Oil Pressure Limits.

Filing Instructions: Insert this temporary revision in the Model 1980 172RG (172RG0001 thru 172RG0570) basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual D1174-2-13 adjacent to page 2-6.

Removal Instructions: This temporary revision must be removed and discarded when Revision 3 has been collated into the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

In Section 2, Operating Limitations, Power Plant Instrument Markings, Replace the Oil Pressure Limits with the following:

**POWER PLANT INSTRUMENT MARKINGS**

For airplanes 172RG0001 thru 172RG0570 not incorporating SK172-85.

INSTRUMENT	RED LINE	GREEN ARC	RED LINE
	MINIMUM LIMIT	NORMAL OPERATING	MAXIMUM LIMIT
Oil Pressure	25 psi	60-90 psi	100 psi

For airplanes 172RG0001 thru 172RG0570 incorporating SK172-85.

INSTRUMENT	RED LINE	GREEN ARC	RED LINE
	MINIMUM LIMIT	NORMAL OPERATING	MAXIMUM LIMIT
Oil Pressure	20 psi	50-90 psi	115 psi

APPROVED BY

FAA Approved Under 14 CFR Part 183 Subpart D  
Cessna Aircraft Company  
Organization Designation Authorization ODA-100129-CE  
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Ryan L. Schuber, Asst. ODA Administrator  
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MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White Arc	42 - 100	Full Flap Operating Range. Lower limit is maximum weight $V_{SO}$ in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Arc	50 - 145	Normal Operating Range. Lower limit is maximum weight $V_S$ at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Arc	145 - 164	Operations must be conducted with caution and only in smooth air.
Red Line	164	Maximum speed for all operations.

Figure 2-2. Airspeed Indicator Markings

## POWER PLANT LIMITATIONS

- Engine Manufacturer: Avco Lycoming.  
 Engine Model Number: O-360-F1A6.  
 Engine Operating Limits for Takeoff and Continuous Operations:  
     Maximum Power: 180 BHP rating.  
     Maximum Engine Speed: 2700 RPM.  
     Maximum Cylinder Head Temperature: 500°F (260°C).  
     Maximum Oil Temperature: 245°F (118°C).  
     Oil Pressure, Minimum: \* 25 psi.  
         Maximum: 100 psi.  
     Fuel Pressure, Minimum: 0.5 psi.  
         Maximum: 8.0 psi.
- Propeller Manufacturer: McCauley Accessory Division.  
 Propeller Model Number: B2D34C220/80VHA-3.5  
 Propeller Diameter, Maximum: 76.5 inches.  
     Minimum: 75.5 inches.  
 Propeller Blade Angle at 30 Inch Station, Low: 12.0°.  
     High: 26.5°.
- \* 20 psi on airplanes modified by Service Kit SK172-85.

1 July 1979  
 Revision 2 - 1 December 1983

## POWER PLANT INSTRUMENT MARKINGS

Power plant instrument markings and their color code significance are shown in figure 2-3.

INSTRUMENT	RED LINE	GREEN ARC	RED LINE
	MINIMUM LIMIT	NORMAL OPERATING	MAXIMUM LIMIT
Tachometer: S.L. to 7500 Ft	---	2100 - 2500 (inner arc)	2700 RPM
7500 ft. and above		2100 - 2700 (outer arc)	
Manifold Pressure	---	15 - 25 in. Hg	---
Oil Temperature	---	100° - 245°F	245°F
Cylinder Head Temperature	---	200° - 500°F	500°F
Fuel Pressure	0.5 psi	0.5 - 8.0 psi	8.0 psi
Oil Pressure	*25 psi	*60 - 90 psi	100 psi
Suction	---	4.5 - 5.4 in. Hg	---
Fuel Quantity	E (2 Gal. Unusable Each Tank)	---	---

Figure 2-3. Power Plant Instrument Markings

## WEIGHT LIMITS

Maximum Ramp Weight: 2658 lbs.

Maximum Takeoff Weight: 2650 lbs.

Maximum Landing Weight: 2650 lbs.

Maximum Weight in Baggage Compartment:

Baggage Area 1 - Station 82 to 108: 200 lbs. See note below.

\* 20 psi (red line) and 50-90 psi (green arc) on airplanes modified by Service Kit SK172-85.

1 July 1979

Revision 2 - 1 December 1983

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Oil Temperature	---	100° - 245°F	245°F
Cylinder Head Temperature	---	200° - 500°F	500°F
Fuel Pressure	0.5 psi	0.5 - 8.0 psi	8.0 psi
Oil Pressure	*25 psi	*60 - 90 psi	100 psi
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1 July 1979

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Baggage Area 2 - Station 108 to 124: 50 lbs. See note below.

**NOTE**

The maximum combined weight capacity for baggage areas 1 and 2 is 200 lbs.

## CENTER OF GRAVITY LIMITS

Center of Gravity Range:

Forward: 36.0 inches aft of datum at 1950 lbs. or less, with straight line variation to 39.5 inches aft of datum at 2650 lbs.

Aft: 46.5 inches aft of datum at all weights.

Moment Change Due To Retracting Landing Gear: +2424 lb.-ins.

Reference Datum: Front face of firewall.

## MANEUVER LIMITS

This airplane is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°.

Aerobatic maneuvers, including spins, are not approved.

## FLIGHT LOAD FACTOR LIMITS

Flight Load Factors:

\*Flaps Up: +3.8g, -1.52g

\*Flaps Down: +2.0g

\*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

## KINDS OF OPERATION LIMITS

The airplane is equipped for day VFR and may be equipped for night VFR and/or IFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operating limitations placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

## FUEL LIMITATIONS

- 2 Standard Tanks: 33 U.S. gallons each.
- Total Fuel: 66 U.S. gallons.
- Usable Fuel (all flight conditions): 62 U.S. gallons.
- Unusable Fuel: 4.0 U.S. gallons.

### NOTE

To ensure maximum fuel capacity when refueling and minimize cross-feeding when parked on a sloping surface, place the fuel selector valve in either LEFT or RIGHT position.

Takeoff and land with the fuel selector valve handle in the BOTH position.

Operation on either left or right tank is limited to level flight only.

With 1/4 tank or less, prolonged uncoordinated flight is prohibited when operating on either left or right tank in level flight.

Fuel remaining in the tank after the fuel quantity indicator reads empty (red line) cannot be safely used in flight.

- Approved Fuel Grades (and Colors):
  - 100LL Grade Aviation Fuel (Blue).
  - 100 (Formerly 100/130) Grade Aviation Fuel (Green).

## OTHER LIMITATIONS

### FLAP LIMITATIONS

- Approved Takeoff Range:
  - Above 2550 Pounds Takeoff Weight: 0°.
  - 2550 Pounds Takeoff Weight or Less: 0° to 10°.
- Approved Landing Range: 0° to 30°.

## PLACARDS

The following information must be displayed in the form of composite or individual placards.

1. In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped.)

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Normal Category. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

No acrobatic maneuvers, including spins, approved.

Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate:

DAY-NIGHT-VFR-IFR

2. Near airspeed indicator:

MAX SPEED - KIAS	
MANEUVER	. . 106
GEAR OPER	. . 140
GEAR DOWN	. . 164

3. On control lock:

CONTROL LOCK - REMOVE BEFORE STARTING ENGINE.

4. On the fuel selector valve:

OFF  
LEFT - 30 GAL. LEVEL FLIGHT ONLY  
BOTH - 62 GAL. ALL FLIGHT ATTITUDES  
BOTH ON FOR TAKEOFF AND LANDING  
RIGHT - 30 GAL. LEVEL FLIGHT ONLY

5. On the baggage door:

200 POUNDS MAXIMUM  
BAGGAGE  
FORWARD OF BAGGAGE DOOR LATCH  
50 POUNDS MAXIMUM  
BAGGAGE AFT OF BAGGAGE DOOR LATCH  
MAXIMUM 200 POUNDS COMBINED  
FOR ADDITIONAL LOADING INSTRUCTIONS  
SEE WEIGHT AND BALANCE DATA

6. On flap position indicator:

0° to 10°	(Partial flap range with blue color code and 130 kt callout; also, mechanical detent at 10°.)
10° to 30°	White color code and 100 kt callout; also, mechanical detent at 10° and 20°.)

7. Forward of fuel tank filler cap:

FUEL  
100LL/100 MIN GRADE AVIATION GASOLINE  
CAP. 33.0 U.S. GAL.  
CAP. 24.0 U.S. GAL. TO BOTTOM OF FILLER COLLAR

8. Near gear hand pump:

- MANUAL  
GEAR EXTENSION
1. SELECT GEAR DOWN
  2. PULL HANDLE FWD
  3. PUMP VERTICALLY

CAUTION  
DO NOT PUMP WITH  
GEAR UP SELECTED

9. A calibration card is provided to indicate the accuracy of the magnetic compass in 30° increments.

10. On oil filler cap:

OIL  
8 QTS

11. Near manifold pressure gage:

WITH LESS THAN 10" MANIFOLD  
PRESSURE, AVOID CONTINUOUS  
OPERATIONS BETWEEN  
1750-2050 RPM