

## OPERATION

During cold weather operations, no indication will be apparent on the oil temperature gage prior to take-off if outside air temperatures are very cold. After a suitable warm-up period (2 to 5 minutes at 1000 RPM), accelerate the engine several times to higher engine RPM. If the engine accelerates smoothly and the oil pressure remains normal and steady, the airplane is ready for take-off.

Rough engine operation in cold weather can be caused by a combination of an inherently leaner mixture due to the dense air and poor vaporization and distribution of the fuel-air mixture to the cylinders. The effects of these conditions are especially noticeable during operation on one magneto in ground checks where only one spark plug fires in each cylinder.

To operate the engine without a winterization kit in occasional outside air temperatures from 10° to 20° F, the following procedure is recommended:

- (1) Use full carburetor heat during engine warm-up and ground check.
- (2) Use minimum carburetor heat required for smooth operation in take-off, climb, and cruise.
- (3) Select relatively high manifold pressure and RPM settings for optimum mixture distribution, and avoid excessive manual leaning in cruising flight.
- (4) Avoid sudden throttle movements during ground and flight operation.

When operating in sub-zero temperatures, avoid using partial carburetor heat. Partial heat may raise the carburetor air temperature to the 32° to 70° range where icing is critical under certain atmospheric conditions.

Refer to Section VI for cold weather equipment and operating details for the OIL DILUTION SYSTEM.

## HOT WEATHER OPERATION.

The general warm temperature starting information on page 2-4 is appropriate. Avoid prolonged engine operation on the ground.



## OPERATING LIMITATIONS

### OPERATIONS AUTHORIZED.

Your Cessna, with standard equipment as certificated under FAA Type Certificate No. 3A13, is approved for day and night operation under VFR.

Additional optional equipment is available to increase its utility and to make it authorized for use under IFR day and night. An owner of a properly equipped Cessna is eligible to obtain approval for its operation on single engine scheduled airline service under VFR. Your Cessna Dealer will be happy to assist you in selecting equipment best suited to your needs.

### MANEUVERS—NORMAL CATEGORY.

The airplane exceeds the requirements for airworthiness of the Federal Aviation Regulations, Part 3, set forth by the United States Government. Spins and aerobatic maneuvers are not permitted in normal category airplanes in compliance with these regulations. In connection with the foregoing, the following gross weight and flight load factors apply:

Maximum Gross Weight . . . . .	2800 lbs.
Flight Load Factor* Flaps Up . . . . .	+3.8 -1.52
Flight Load Factor* Flaps Down . . . . .	+3.5

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

Your airplane must be operated in accordance with all FAA approved markings, placards and check lists in the airplane. If there is any information in this section which contradicts the FAA approved markings, placards and check lists, it is to be disregarded.

## AIRSPEED LIMITATIONS.

The following are the certificated calibrated airspeed limits for your Cessna:

Never Exceed (Glide or dive, smooth air) . . . . .	193 MPH (red line)
Caution Range . . . . .	160-193 MPH (yellow arc)
Maximum Structural Cruising Speed . . . . .	160 MPH
(Level flight or climb)	
Normal Operation Range . . . . .	67-160 MPH (green arc)
Maximum Speed, Flaps Extended . . . . .	110 MPH
Flap Operation Range . . . . .	60-110 MPH (white arc)
Maneuvering Speed* . . . . .	128 MPH

\*The maximum speed at which abrupt control travel can be used without exceeding the design load factor.

BEST ANGLE of Climb / Flaps - 60 MPH

" RATE " " " = 90 mph

" " " " - Full power - 88 decreasing 2 degrees for each 1000 ft

## ENGINE OPERATION LIMITATIONS.

Power and Speed . . . . .	230 BHP at 2600 RPM
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## ENGINE INSTRUMENT MARKINGS.

### OIL TEMPERATURE GAGE.

Normal Operating Range . . . . .	Green Arc
Do Not Exceed . . . . .	225° F (red line)

### OIL PRESSURE GAGE.

Idling Pressure . . . . .	10 psi (red line)
Normal Operating Range . . . . .	30-60 psi (green arc)
Maximum Pressure . . . . .	100 psi (red line)

### MANIFOLD PRESSURE GAGE.

Normal Operating Range . . . . .	.15-23 in. Hg (green arc)
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### CYLINDER HEAD TEMPERATURE GAGE.

Normal Operating Range . . . . .	275-450°F (green arc)
Do Not Exceed . . . . .	450°F (red line)

## TACHOMETER.

Normal Operating Range . . . . .	2200-2450 RPM (green arc)
Cautionary Range . . . . .	2450-2600 RPM
Do Not Exceed (Engine rated speed) . . . . .	2600 RPM (red line)

## CARBURETOR AIR TEMPERATURE GAGE (OPT).

Under possible icing conditions:	
Normal Operating Range . . . . .	5° to 20°C (green arc)
Cautionary Range . . . . .	0° to 5°C (yellow arc)
Icing Range . . . . .	-20° to 0°C (red arc)

## FUEL QUANTITY INDICATORS.

Empty . . . . .	E (red line)
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Best angle of climb - full power - 70 flaps up

CRAM  
or  
DRIP

## WEIGHT AND BALANCE.

The following information will enable you to operate your Cessna within the prescribed weight and center of gravity limitations. To figure the weight and balance for your particular airplane, use the Sample Problem, Loading Graph, and Center of Gravity Moment Envelope as follows:

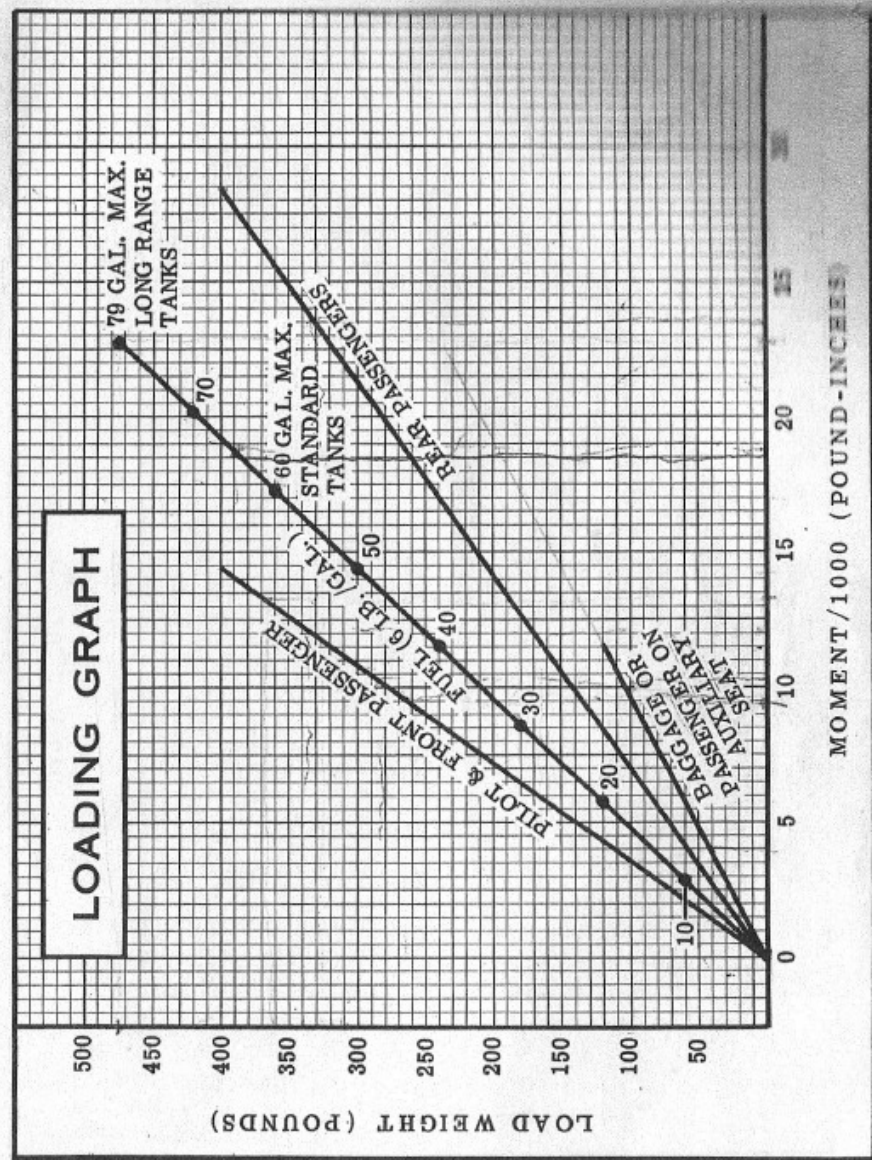
Take the licensed Empty Weight and Moment/1000 from the Weight and Balance Data sheet, plus any changes noted on forms FAA-337 carried in your airplane, and write them down in the proper columns. Using the Loading Graph, determine the moment/1000 of each item to be carried. Total the weights and moments/1000 and use the Center of Gravity Moment Envelope to determine whether the point falls within the envelope, and if the loading is acceptable.

*Book copy of chart full from 10  
page up*

SAMPLE LOADING PROBLEM	Sample Airplane		Your Airplane	
	Weight (lbs)	Moment (lb-ins./1000)	Weight	Moment
1. Licensed Empty Weight (Sample Airplane) ...	1660	57.9	1663	62.29
2. Oil - 12 Qts.* .....	22	-0.3	22	-0.3
3. Pilot & Front Passenger .....	340	12.2	365	13.50
4. Fuel. (60.0 Gal at 6#/Gal) .....	360	17.3	475	8.3000
5. Rear Passengers .....	340	24.1		
6. Baggage (or Passenger on Auxiliary Seat) ...	78	7.6		
7. Total Aircraft Weight (Loaded).....	2800	118.8		

8. Locate this point (2800 at 118.8) on the center of gravity envelope, and since this point falls within the envelope the loading is acceptable.

\*Note: Normally full oil may be assumed for all flights.



## CARE OF THE AIRPLANE

If your airplane is to retain that new-plane performance and dependability, certain inspection and maintenance requirements must be followed. It is wise to follow a planned schedule of lubrication and preventative maintenance based on climatic and flying conditions encountered in your locality.

Keep in touch with your Cessna Dealer, and take advantage of his knowledge and experience. He knows your airplane and how to maintain it. He will remind you when lubrications and oil changes are necessary, and about other seasonal and periodic services.

## GROUND HANDLING.

The airplane is most easily and safely maneuvered during ground handling by a tow-bar attached to the nosewheel.

## NOTE

When using the tow-bar, do not exceed the nosewheel turning angle of  $29^\circ$  either side of center.

## MOORING YOUR AIRPLANE.

Proper tie-down procedure is your best precaution against damage to your parked airplane by gusty or strong winds. To tie-down your airplane securely, proceed as follows:

- (1) Set the parking brake and install the control wheel lock.
- (2) Install a surface control lock over the fin and rudder.
- (3) Tie sufficiently strong ropes or chains (700 pounds tensile strength) to the wing, tail, and nose tie-down fittings and secure each rope to a ramp tie-down.
- (4) Install a pitot tube cover.

