OPERATING 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. Observance of these operating limitations is required by Federal Aviation Regulations.

NOTE

- Refer to Section 9, Supplements, of this Pilot's Operating Handbook for amended operating limitations, operating procedures, performance data and other necessary information for airplanes equipped with specific options.
- The airspeeds listed in Figure 2-1, Airspeed Limitations, are based on Airspeed Calibration data shown in Section 5.

The Cessna Model No. 162 is approved under ASTM standard F2245.

AIRSPEED LIMITATIONS

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

AIRSPEED LIMITATIONS

SYMBOL	SPEED	KCAS	KIAS	REMARKS
V_S	Stall Speed - Clean	44	41	Stall speed flap up.
V_{SO}	Stall Speed - Landing Configuration	40	37	Stall speed flaps full
V_{FE}	Maximum Flap Extended Speed: FLAPS 10° FLAPS 25° FLAPS FULL	 98 84 71	 100 85 70	Do not exceed this speed with flaps down.
V_O	Maximum Operating Maneuvering Speed 1320 Pounds 1200 Pounds 1100 Pounds	 88 84 81	 89 85 80	Maximum speed at which the airplane may be stalled without exceeding structural limitations.
V_A	Design Maneuvering Speed:	100	102	Do not make full or abrupt control movements above this speed. Does not provide protection from possible overstressing the airplane.
V_{NE}	Never Exceed Speed	143	148	Do not exceed this speed in any operation.
V_{NO}	Maximum Structural Cruising Speed	120	124	Do not exceed this speed except in smooth air, and then only with caution.

Figure 2-1

AIRSPEED INDICATOR MARKINGS

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

AIRSPEED INDICATOR MARKINGS

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Band	<37	Low airspeed warning.
White Band	37 - 70	Full Flap Operating Range. Lower limit is maximum weight V_{SO} in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Band	41 - 124	Normal Operating Range. Lower limit is maximum weight V_{S1} at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Band	124 - 148	Operations must be conducted with caution and only in smooth air.
Red Line	$\geq$149	Maximum speed for all operations.
Flaps 25° Tick Mark	85	Maximum Flaps 25° Operation
Flaps 10° Tick Mark	100	Maximum Flaps 10° Operation
Vx Tick Mark	57	Best Angle of Climb Air Speed
Vy Tick Mark	62	Best Rate of Climb Air Speed

Figure 2-2

POWERPLANT LIMITATIONS

Engine Manufacturer: Teledyne Continental Motors

Engine Model Number: O-200-D

Maximum Power: 100 BHP Rating

Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Engine Speed:. . . . . .2750 RPM

NOTE

The static RPM range at full throttle with carburetor heat off and mixture leaned to maximum RPM is 2375 - 2475 RPM. For allowable variations in static RPM at non-standard temperatures, refer to the 162 Maintenance Manual.

Maximum Oil Temperature: . . . . . .240°F (116°C)

Oil Pressure, Minimum: . . . . . .10 PSI

Oil Pressure, Maximum: . . . . . .100 PSI

CAUTION

ENGINE OPERATION WITH INDICATED OIL PRESSURE BELOW THE GREEN BAND RANGE WHILE IN CRUISE OR CLIMB CONFIGURATION IS CONSIDERED ABNORMAL. REFER TO SECTION 3, AMPLIFIED EMERGENCY PROCEDURES, "LOW OIL PRESSURE".

Fuel Grade: Refer to Fuel Limitations

Oil Grade (Specification):

SAE J1966 Aviation Grade Non-Dispersant Mineral Oil or SAE J1899 Aviation Grade Ashless Dispersant Oil. Oil must comply with the latest revision and/or supplement for Teledyne Continental Motors (TCM) Service Information Letter SIL99-2B or later revision, **must be used**.

Propeller Manufacturer: McCauley Propeller Systems

Standard Composite Propeller Model Number. 1L100/LSA6754

Maximum Propeller Diameter . . . . . 67.0 INCHES (1.70 m)

Minimum Propeller Diameter . . . . . 66.5 INCHES (1.69 m)

Optional Aluminum Propeller Model Number. 1A162/TCD6754

Maximum Propeller Diameter . . . . . 67.0 INCHES (1.70 m)

Minimum Propeller Diameter . . . . . 66.0 INCHES (1.68 m)

POWERPLANT AND ELECTRICAL INSTRUMENT MARKINGS

Powerplant and electrical instrument markings and their color code significance are shown in Figure 2-3. Operation with indications in the red range is prohibited. Avoid operating with indicators in the yellow range.

POWERPLANT AND ELECTRICAL INSTRUMENT MARKINGS

INSTRUMENT	RED (LOWER WARNING)	YELLOW (LOWER CAUTION)	GREEN (NORMAL OPERATING RANGE)	YELLOW (UPPER CAUTION)	RED (UPPER WARNING)
Tachometer (RPM)	----	----	2000 to 2750 RPM		2750* to 3500 RPM
Oil Temperature (OIL °F)	----	0 to 75°F	75 to 220°F	220 to 240°F	240* to 265°F
Oil Pressure (OIL PSI)	0 to 10 PSI	10 to 30 PSI	30 to 60 PSI	60 to 100 PSI	100* to 140 PSI
Exhaust Gas Temperature (if installed) (EGT °F)	----	----	1000 to 1600°F White Advisory		
Carburetor Temperature (CARB °F)		5 to 40°F			
Battery Current (AMPS)			-35 to 35 White Advisory		
Bus Voltage (VOLTS)	-30 to 12.5		12.5 to 15	15 to 16	16 to 30

*Maximum operating limit is lower end of red.

Figure 2-3

WEIGHT LIMITS

Maximum Ramp Weight: . . . . . 1324 POUNDS (600.6 kg)
Maximum Takeoff Weight . . . . . 1320 POUNDS (598.8 kg)
Maximum Landing Weight . . . . . 1320 POUNDS (598.8 kg)
Maximum Empty Weight . . . . . 894 POUNDS (405.5 kg)

MAXIMUM WEIGHT IN BAGGAGE COMPARTMENT
Baggage Area (Station 155 to 190) . . . . . 50 POUNDS (22.68 kg)

WARNING

AFT BULKHEAD CLOSEOUT NET REQUIRED FOR FLIGHT.

NOTE

Maximum baggage compartment loading must not exceed 8 pounds per square foot.

CENTER OF GRAVITY LIMITS

Center Of Gravity Range:

Forward: 134.46 inches (3415.28 mm) aft of datum at 1320 pounds (598.74 kg) or less, with straight line variation to 132.06 inches (3354.32 mm) aft of datum at 1050 pounds (476.27 kg).

Aft: 136.86 inches (3476.24 mm) aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

SERVICE CEILING: . . . . . 14,625 Feet (4457.7 m)

MANEUVER LIMITS

This airplane is approved under ASTM standard F2245 and is intended for recreational and instructional flight operations. In the acquisition of various pilot certificates certain maneuvers are required and these maneuvers are permitted in this airplane.

MANEUVERS AND RECOMMENDED ENTRY SPEED*

Chandelles	102 KIAS
Lazy Eights	102 KIAS
Steep Turns	102 KIAS
Stalls (Except Whip Stalls)	Slow Deceleration
Power On Stalls	Slow Deceleration (limit pitch to 30° nose up attitude)

*** Abrupt use of the controls is prohibited above 102 KIAS.**

WARNING

- **AEROBATIC MANEUVERS, INCLUDING SPINS, ARE PROHIBITED.**
- **INTENTIONAL FLIGHT WITH CABIN DOOR(S) OPEN IS PROHIBITED.**

LOAD FACTORS

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors (Maximum Takeoff Weight - 1320 POUNDS):

Flaps UP:	+4.0g, -2.0g
Flaps FULL:	+2.0g

KINDS OF OPERATIONS LIMITS

The Cessna 162 airplane is approved for DAY - NIGHT - VFR operations only. Flight into known icing conditions is prohibited.

The minimum equipment for approved operations required under the Operating Rules are defined by 14 CFR 91 and ASTM standard F2245, as applicable.

The following Kinds of Operations Equipment List (KOEL) identifies the equipment required to be operational for airplane airworthiness in the listed kind of operations.

KINDS OF OPERATIONS EQUIPMENT LIST

System, Instrument, Equipment and/or Function	KIND OF OPERATION		COMMENTS
	VFR DAY	VFR NIGHT	
PLACARDS AND MARKINGS			
1 - 162 POH/FTS - Garmin G300	0	0	Recommended to be accessible to pilot in flight.
2 - 162 Pilot's Checklist	1	1	Required to be accessible to pilot in flight.
3 - Garmin G300 Pilot's Guide	0	0	Recommended to be accessible to pilot in flight.
AIR CONDITIONING			
1 - Avionics Fan	1	1	
COMMUNICATIONS			
1 - VHF COM	0	0	
ELECTRICAL POWER			
1 - 12V Main Battery	1	1	
2 - 14V Alternator	1	1	
3 - Secondary Battery	0	1	
4 - Ammeter	0	1	
EQUIPMENT AND FURNISHINGS			
1 - Seat Belt Assembly	1	1	Each Seat Occupant
2 - Shoulder Harness	1	1	Each Seat Occupant
3 - Aft Bulkhead Closeout Net	1	1	
FLIGHT CONTROLS			
1 - Elevator Trim System	1	1	
2 - Elevator Trim Indicator	1	1	

(Continued Next Page)

KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System, Instrument, Equipment and/or Function	KIND OF OPERATION		COMMENTS
	VFR DAY	VFR NIGHT	
FUEL SYSTEM			
1 - Fuel Shutoff Control Valve	1	1	
2 - Cockpit Fuel Quantity Indicator - L Tank	1	1	
3 - Cockpit Fuel Quantity Indicator - R Tank	1	1	
INDICATING/RECORDING SYSTEM			
1 - Low Airspeed Alert and Stall Warning System	1	1	
2 - G300 System Annunciator and Warning Displays	1	1	
LANDING GEAR			
1 - Wheel Fairings	0	0	Removable
LIGHTING			
1 - PFD Bezel Lighting	0	0	
2 - PFD Display Backlighting	1	1	
3 - MFD Bezel Lighting (if installed)	0	0	
4 - MFD Display Backlighting (if installed)	1	1	
5 - Cockpit Overhead Panel Lighting	0	1	
6 - Aircraft Position (NAV) Lights	0	1	
7 - STROBE Light System	1	1	
8 - LAND (Landing) Light	0	1	
9 - Non-stabilized Magnetic Compass Internal Lighting (if installed)	0	0	

(Continued Next Page)

KINDS OF OPERATIONS EQUIPMENT LIST (Continued)

System, Instrument, Equipment and/or Function	KIND OF OPERATION		COMMENTS
	VFR DAY	VFR NIGHT	
NAVIGATION AND PITOT-STATIC SYSTEM			
1 - G300 Airspeed Indicator	1	1	
2 - G300 Altimeter	1	1	
3 - G300 Vertical Speed Indicator	0	0	
4 - G300 Attitude Indicator	0	0	
5 - G300 Directional Indicator (HSI)	0	0	
6 - G300 Turn Coordinator	0	0	
7 - G300 Magnetic Heading Indicator	1	1	
8 - GPS Receiver/Navigator	A/R	A/R	As Required Per Procedure.
9 - GTX 327 Mode C Transponder	A/R	A/R	As Required Per Procedure.
10 - Blind Altitude Encoder	A/R	A/R	As Required Per Procedure.
11 - G300 Clock	0	0	
12 - Magnetic Compass (if installed)	0	0	
13 - Autopilot System	0	0	
ENGINE INDICATING			
1 - Tachometer (RPM)	1	1	
2 - Carburetor Temperature Indicator (CARB °F)	0	0	
3 - Oil Pressure Indicator	1	1	
4 - Oil Temperature Indicator	1	1	
5 - Exhaust Gas Temperature (EGT) Indicator (if installed)	0	0	
ENGINE OIL			
1 - Engine Crankcase Dipstick	1	1	

FUEL LIMITATIONS

Total Fuel: . . . . . .25.46 U.S. GALLONS
(12.73 GALLONS per tank)
Usable Fuel (all flight conditions): . . . . . .24.0 U.S. GALLONS
(12 GALLONS per tank)
Unusable Fuel: . . . . . .1.46 U.S. GALLONS
(0.73 GALLONS per tank)

WARNING

TAKEOFF IS PROHIBITED IF EITHER SIGHT GAGE INDICATES LESS THAN ¼ TANK OF FUEL OR FUEL LEVEL IS BELOW THE BOTTOM OF THE FUEL INDICATOR TAB.

GRND $\frac{\text{MIN}}{\text{T.O.}}$ **MARKING ON FUEL INDICATOR**

NOTE

To ensure maximum fuel capacity and minimize crossfeeding when refueling, always park the airplane in a wings level, normal ground attitude. Refer to Figure 1-1 for normal ground attitude definition.

Fuel remaining in the tank after the fuel quantity indicator reads “E” cannot be safely used in flight.

Approved Fuel Grades (And Colors):

100LL Grade Aviation Fuel (Blue)
100 Grade Aviation Fuel (Green)

FLAP LIMITATIONS

Approved Takeoff Range: . . . . . UP to 10°
Approved Landing Range: . . . . . .UP to FULL

SYSTEM LIMITATIONS

12V POWER OUTLET

The 12 Volt Power Outlet (POWER OUTLET 12V - 7.5A) is not certified for supplying power to flight-critical communications or navigation devices.

Use of the 12 Volt Power Outlet is prohibited during takeoff and landing.

G300 LIMITATIONS

NOTE

It is recommended that a current Garmin G300 Pilot's Guide be available to the pilot during flight.

Use of the MAP page for pilotage navigation is prohibited. The navigation map is intended only to enhance situational awareness. Navigation is to be conducted using only current charts, data and authorized navigation facilities.

Use of the TERRAIN information for primary terrain and obstacle avoidance is prohibited. The terrain map is intended only to enhance situational awareness. It is the pilot's responsibility to provide terrain clearance at all times.

Navigation using the G300 is not authorized north of 70° North latitude or south of 70° South latitude due to unsuitability of the magnetic fields near the Earth's poles. In addition, operations are not authorized in the following two regions:

1. North of 65° North latitude between longitude 75° W and 120° W (Northern Canada).
2. South of 55° South latitude between longitude 120° E and 165° E (region south of Australia and New Zealand).

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 entry, shown on the example below, will vary with installed equipment):

> The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Pilot's Operating Handbook.
>
> No acrobatic maneuvers, including spins, are approved.
>
> Flight into known icing conditions prohibited.
>
> This airplane is approved for the following flight operations as of the date of original airworthiness certificate:
>
> DAY - NIGHT - VFR

2. On control lock:

B6143

3. On left instrument panel above magnetos switch:

TAKEOFF PROHIBITED WITH LESS THAN 1/4 FUEL $\frac{\textbf{MIN}}{\textbf{TO}}$

(Continued Next Page)

PLACARDS (Continued)

4. On the lower left instrument panel:

WARNING

Assure that all contaminants, including water, are removed from fuel and fuel systems before flight. Failure to assure contaminant free fuel and heed all safety instructions and owner advisories prior to flight can result in bodily injury or death.

5. On the upper left instrument panel:

NO INTENTIONAL SPINS

6. On the instrument panel directly above the PFD:

MAXIMUM OPERATING MANEUVERING SPEED: 89 KIAS
DESIGN MANEUVERING SPEED: 102 KIAS

7. On the upper right instrument panel:

B6151

SMOKING PROHIBITED

8. On the right instrument panel:

This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements.

(Continued Next Page)

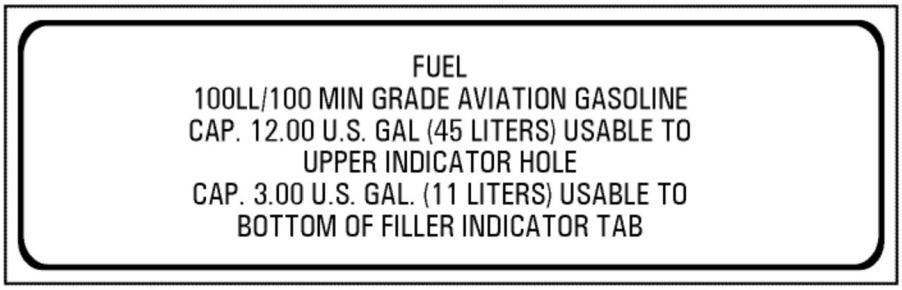
PLACARDS (Continued)

9. On the right side of the baggage compartment below the window:

B14615

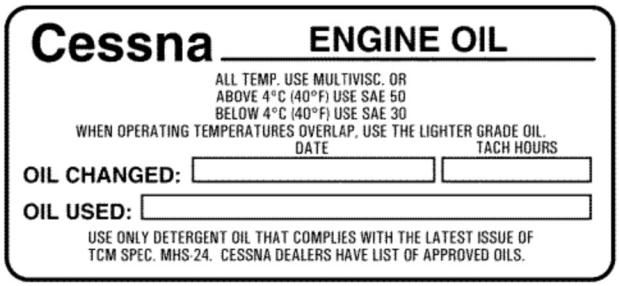
10. Near both fuel tank filler caps:

B14617



11. On the engine oil access door:

B14541



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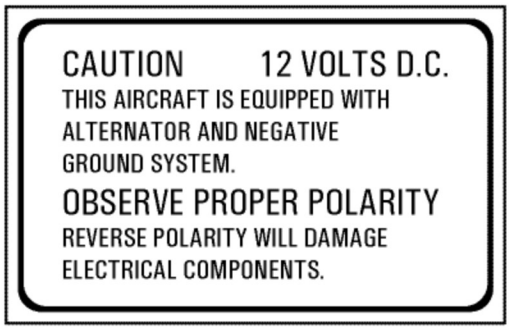
PLACARDS (Continued)

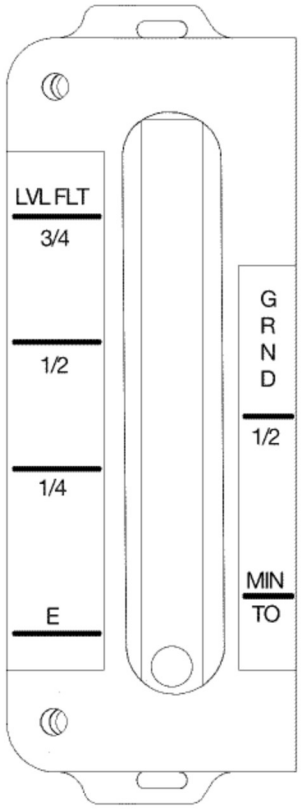
12. On firewall adjacent to battery box and second placard on external power receptacle door if external power receptacle option is installed:

B14616



13. Located on both left and right fuel sight tubes.

B14537



0914T1028

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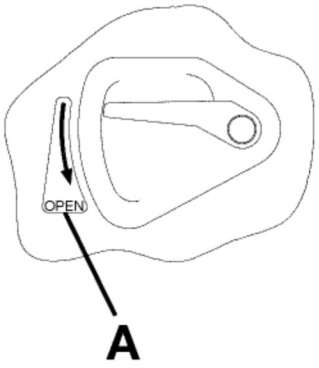
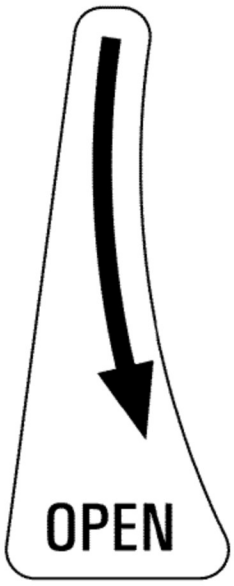
PLACARDS (Continued)

14. Located adjacent to both exterior cabin door latch assemblies.

B17796



Exterior Cabin Door
Handle/Latch Assembly

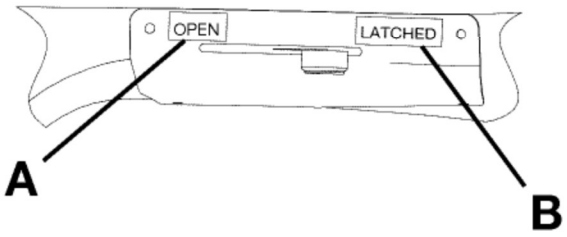


DETAIL A

0919T1022

15. Located adjacent to both primary interior cabin door latch assemblies.

B17797



DETAIL A

DETAIL B

Primary Interior Cabin Door
Latch Assembly

0919T1022

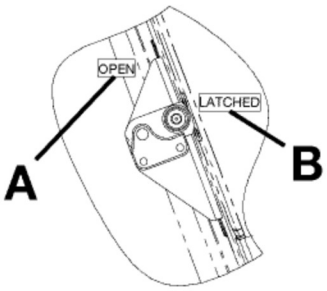
(Continued Next Page)

PLACARDS (Continued)

On Airplanes 16200241 and on, and Airplanes 16200002 thru 16200240 incorporating SB11-52-01.

16. Located adjacent to both secondary interior cabin door latch assemblies.

B17798



DETAIL A

DETAIL B

Secondary Interior Cabin
Door Latch Assembly

0919T1022