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## SECTION 2

**LIMITATIONS**

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SECTION 2
LIMITATIONS

2.1 GENERAL

This section provides the "FAA Approved" operating limitations, instrument markings, color coding and
basic placards necessary for the operation of the airplane and its systems.

This airplane must be operated as a normal or utility category airplane in compliance with the operating
limitations stated in the form of placards and markings and those given in this section and handbook.

Limitations associated with those optional systems and equipment which require handbook supplements
can be found in Section 9 (Supplements).

2.3 AIRSPEED LIMITATIONS

<table>
<thead>
<tr>
<th>SPEED</th>
<th>KIAS</th>
<th>KCAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Exceed Speed (VNE) - Do not exceed this speed in any operation.</td>
<td>160</td>
<td>153</td>
</tr>
<tr>
<td>Maximum Structural Cruising Speed (VNO) - Do not exceed this speed except in smooth air and then only with caution.</td>
<td>126</td>
<td>122</td>
</tr>
<tr>
<td>Design Maneuvering Speed (VA) - Do not make full or abrupt control movements above this speed.</td>
<td>111</td>
<td>108</td>
</tr>
<tr>
<td>At 2325 LBS. G.W.</td>
<td>88</td>
<td>89</td>
</tr>
</tbody>
</table>

CAUTION

Maneuvering speed decreases at lighter weight as the effects of aerodynamic forces become more pronounced. Linear interpolation may be used for intermediate gross weights. Maneuvering speed should not be exceeded while operating in rough air.

Maximum Flaps Extended Speed (VFE) - Do not exceed this speed with the flaps extended. | 103 | 100 |
2.5 AIRSPEED INDICATOR MARKINGS

MARKING IAS
Red Radial Line (Never Exceed) 160 KTS
Yellow Arc (Caution Range - Smooth Air Only) 126 KTS to 160 KTS
Green Arc (Normal Operating Range) 50 KTS to 126 KTS
White Arc (Flap Down) 44 KTS to 103 KTS

2.7 POWER PLANT LIMITATIONS

(a) Number of Engines 1
(b) Engine Manufacturer Lycoming
   Engine Model No. O-320-E3D
(d) Engine Operating Limits
   (1) Maximum Horsepower 150
   (2) Maximum Rotation Speed (RPM) 2700
   (3) Maximum Oil Temperature 245°F
(e) Oil Pressure
   Minimum (red line) 25 PSI
   Maximum (red line) 90 PSI
(f) Fuel Pressure
   Minimum (red line) 5 PSI
   Maximum (red line) 8 PSI
(g) Fuel Grade (AVGAS ONLY) (minimum octane) 80/87 Red
(h) Number of Propellers 1
(i) Propeller Manufacturer McCauley
   Propeller Model 1C160/EGM7653
   Sensenich 74DM6-0-58
(k) Propeller Diameter
   Minimum 74 IN.
   Maximum 76 IN.
(l) Propeller Tolerance (static RPM at maximum permissible throttle setting)
   Not above 2400 RPM
   Not below 2300 RPM

No additional tolerance permitted.
2.9 POWER PLANT INSTRUMENT MARKINGS

(a) Tachometer
   Green Arc (Normal Operating Range) 500 to 2700 RPM
   Red Line (Maximum Continuous Power) 2700 RPM
(b) Oil Temperature
   Green Arc (Normal Operating Range) 75° to 245°F
   Red Line (Maximum) 245°F
(c) Oil Pressure
   Green Arc (Normal Operating Range) 60 PSI to 90 PSI
   Yellow Arc (Caution Range) (Idle) 25 PSI to 60 PSI
   Red Line (Minimum) 25 PSI
   Red Line (Maximum) 90 PSI
(d) Fuel Pressure
   Green Arc (Normal Operating Range) .5 PSI to 8 PSI
   Red Line (Minimum) .5 PSI
   Red Line (Maximum) 8 PSI

2.11 WEIGHT LIMITS

(a) Maximum Weight
   NORMAL 2325 LBS
   UTILITY 1950 LBS
(b) Maximum Baggage
   NORMAL 200 LBS
   UTILITY 0 LBS

NOTE

Refer to Section 5 (Performance) for maximum weight as limited by performance.
## 2.13 CENTER OF GRAVITY LIMITS

(a) Normal Category

<table>
<thead>
<tr>
<th>Weight Pounds</th>
<th>Forward Limit Inches Aft of Datum</th>
<th>Rearward Limit Inches Aft of Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td>2325</td>
<td>87.0</td>
<td>93.0</td>
</tr>
<tr>
<td>1950 (and less)</td>
<td>83.0</td>
<td>93.0</td>
</tr>
</tbody>
</table>

(b) Utility Category

<table>
<thead>
<tr>
<th>Weight Pounds</th>
<th>Forward Limit Inches Aft of Datum</th>
<th>Rearward Limit Inches Aft of Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950 (and less)</td>
<td>83.0</td>
<td>86.5</td>
</tr>
</tbody>
</table>

### NOTES

Straight line variation between points given.

The datum used is 78.4 inches ahead of the wing leading edge at the inboard intersection of the straight and tapered section.

It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 6 (Weight and Balance) for proper loading instructions.

## 2.15 MANEUVER LIMITS

(a) Normal Category - All acrobatic maneuvers including spins prohibited.

(b) Utility Category - Approved maneuvers for bank angles exceeding 60°:

- Steep Turns
- Lazy Eights
- Chandelles

<table>
<thead>
<tr>
<th>Entry Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>111 KIAS</td>
</tr>
</tbody>
</table>

## 2.17 FLIGHT LOAD FACTORS

(a) Positive Load Factor (Maximum)

(b) Negative Load Factor (Maximum)

<table>
<thead>
<tr>
<th>NORMAL</th>
<th>UTILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8 G</td>
<td>4.4 G</td>
</tr>
</tbody>
</table>

No inverted maneuvers approved
2.19 TYPES OF OPERATION

The airplane is approved for the following operations when equipped in accordance with FAR 91 or FAR 135.

(a) Day V.F.R.
(b) Night V.F.R.
(c) Day I.F.R.
(d) Night I.F.R.
(e) Non Icing

2.21 FUEL LIMITATIONS

(a) Total Capacity
(b) Unusable Fuel
   The unusable fuel for this airplane has been determined as 1.0 gallon in each wing in critical flight attitudes.
(c) Usable Fuel
   The usable fuel in this airplane has been determined as 24.0 gallons in each wing.
2.23 PLACARDS

In full view of the pilot:

"THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATION, REFER TO THE PILOT'S OPERATING HANDBOOK.

NO ACROBATIC MANEUVERS ARE APPROVED FOR NORMAL CATEGORY OPERATIONS. SPINS ARE PROHIBITED FOR BOTH NORMAL AND UTILITY CATEGORY."

In full view of the pilot, the following takeoff and landing check lists will be installed:

**TAKEOFF CHECK LIST**

Fuel on proper tank
Electric fuel pump on
Engine gauges checked
Flaps - set
Carb heat off

Mixture set
Seat backs erect
Fasten belts/harness
Trim tab - set
Controls - free
Door - latched

**LANDING CHECK LIST**

Fuel on proper tank
Mixture rich
Electric fuel pump on

Seat backs erect
Flaps - set (103 KIAS max.)
Fasten belts/harness
Adjacent to upper door latch:

"ENGAGE LATCH BEFORE FLIGHT."

On inside of the baggage compartment door:

"BAGGAGE MAXIMUM 200 LBS"
"UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED. NORMAL CATEGORY OPERATION - SEE PILOT'S OPERATING HANDBOOK WEIGHT AND BALANCE SECTION FOR BAGGAGE AND AFT PASSENGER LIMITATIONS."

In full view of the pilot:

"MANEUVERING SPEED 111 KIAS AT 2325 LBS. (SEE P.O.H.)"

"UTILITY CATEGORY OPERATION - NO AFT PASSENGERS ALLOWED."

"DEMONSTRATED CROSS WIND COMPONENT - 17 KTS."

On the instrument panel in full view of the pilot when the oil cooler winterization kit is installed:

"OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50°F."

In full view of the pilot:

"UTILITY CATEGORY OPERATION ONLY."

(1) NO AFT PASSENGERS ALLOWED.
(2) ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

<table>
<thead>
<tr>
<th>ENTRY SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPINS PROHIBITED</td>
</tr>
<tr>
<td>STEEP TURNS</td>
</tr>
<tr>
<td>LAZY EIGHTS</td>
</tr>
<tr>
<td>CHANDELLES</td>
</tr>
</tbody>
</table>

On the instrument panel in full view of the pilot:

"WARNING—TURN OFF STROBE LIGHTS WHEN TAXIING IN VICINITY OF OTHER AIRCRAFT, OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE."