# SECTION 5

## OPERATING LIMITATIONS

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5-1 General

The aircraft will be operated under FAR Part 91. See the Flight Operations Manual for detailed information regarding operation of this aircraft. The minimum crew for a flight is a pilot and a co-pilot.

5-2 Prohibited maneuvers

All aerobatic flight maneuvers are prohibited.

5-3 Airspeed Limitations

Airspeed markings:
- Airspeed limitations Red radial line—maximum limits
- Yellow arc—caution range
- Green arc—normal operating range
- Blue line—best single engine climb
- White line—flap operating speed

\[
\begin{align*}
V_{so\text{ stall in landing configuration}} & = 56 \text{ kts} \\
V_{so\text{ stall clean}} & = 64 \text{ kts} \\
V_{mc} & = 76 \text{ knots} \\
V_{1} & = 81 \text{ knots} \\
\text{Minimum single engine maneuvering} & = 85 \text{ knots} \\
\text{Best SE Climb} & = 90 \text{ knots} \\
\text{Best rate of climb (one or two Engines)} & = 105 \text{ knots} \\
\text{Flaps } \frac{1}{4} & = 135 \text{ knots} \\
\text{Flaps } \frac{1}{2} & = 99 \text{ knots} \\
\text{Flaps } \frac{3}{4} \text{ to full} & = 97 \text{ knots} \\
\text{Gear Extension & operation} & = 140 \text{ knots} \\
\text{Turbulence airspeed} & = 115-125 \text{ knots} \\
\text{Never Exceed speed} & = 202 \text{ knots}
\end{align*}
\]
5-4 Engine limitations

All of the following limits are established on the respective engine instruments:

- Cylinder head temperature
- Oil pressure
- Oil temperature
- Fuel pressure
- Carburetor air temperature
- Suction

The engine instrument markings are as follows:

- Red radial line—maximum and minimum limits
- Yellow arc—takeoff and precautionary range
- Green arc—normal operating range
- Red arc—operation prohibited within this range

Manifold Pressure

The maximum manifold pressure for takeoff is 48 inches for a maximum time period of 1 minute.

<table>
<thead>
<tr>
<th>Power Type</th>
<th>Manifold Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takeoff</td>
<td>48 inches for 1 minute</td>
</tr>
<tr>
<td>METO Power</td>
<td>42.5 inches</td>
</tr>
<tr>
<td>Climb power</td>
<td>35.0 inches</td>
</tr>
<tr>
<td>Reduced climb power</td>
<td>31.0 inches</td>
</tr>
<tr>
<td>Normal cruise power</td>
<td>28.0 inches</td>
</tr>
</tbody>
</table>

The minimum manifold pressure during approach and landing should be no lower than the RPM settings for any extended period of time. The power should be equal—21 inches with 2100 RPM, 18 inches with 1800 RPM, etc. Reduction of manifold pressure below the squared RPM is allowed during approach and landing for short periods of time.
RPM limits

The maximum RPM limit for takeoff is 2700 RPM.

<table>
<thead>
<tr>
<th></th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takeoff</td>
<td>25700</td>
</tr>
<tr>
<td>METO</td>
<td>2550</td>
</tr>
<tr>
<td>Climb power</td>
<td>2300</td>
</tr>
<tr>
<td>Reduced climb power</td>
<td>2100</td>
</tr>
<tr>
<td>Normal cruise power</td>
<td>2050</td>
</tr>
</tbody>
</table>

Oil

The minimum oil quantity prior to takeoff is 20 gallons. Use 120W straight oil only.

Minimum oil required for feather – 2.8 gallons

Oil pressure warning light will illuminate at 40 psi

Minimum oil temp for run up 40 degrees C

Starter Limits

The maximum time limit for continuous cranking of an engine is 30 seconds. An adequate cooling time must be allowed between starting attempts.

5-5 Propeller limits

The maximum RPM is 2700. There are no restricted RPM ranges on this aircraft.

Established limits for the field barometric power check are 2300-2400 RPM.

Takeoff is prohibited without operating feather motors and a good feather check.

5-6 Weight and balance limitations

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Maximum Gross Takeoff Weight</td>
<td>25,200</td>
</tr>
<tr>
<td>Maximum Landing Weight</td>
<td>25,200</td>
</tr>
<tr>
<td>Maximum forward C.G.</td>
<td>11% MAC</td>
</tr>
<tr>
<td>Maximum aft C.G.</td>
<td>28% MAC</td>
</tr>
</tbody>
</table>

Baggage Compartment limits

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear compartment maximum</td>
<td>1,500</td>
</tr>
</tbody>
</table>
5-7 Fuel System

Fuel pressure warning light is set to come on at 10 psi

Desired fuel pressure 16-18 psi

Max fuel pressure  22 psi

The minimum fuel octane is 91-98.  100 LL grade fuel is recommended.

Takeoff should not be attempted with less than 50 gallons of fuel in each main tank.

Fuel boost pumps should be turned on for all takeoffs and landings.

Fuel quantity should be verified visually using the gauge stick prior to takeoff.

5-8 Hydraulic system

The hydraulic quantity should be filled referencing the sight gauge.  Normal system pressure is 600-900 psi.  Pressure relief valve 1100+- 50

Hydraulic type 5606.

Tank capacity 13 gallons.  Emergency reservoir 3 gallons.

Minimum hydraulic pressure for brake operation – 500 psi

5-9 Electrical system

The operating limit for the generators and for ground power is 28 volts.

5-10 Starter System

Max operation of starter 60 seconds

60 – 60 – 60 – 5 min

On – Off –On -Off
5-11 Wind limits

The critical crosswind limit for this aircraft has not been established. The maximum crosswind component considered satisfactory for the airplane for the determination of takeoff and landing lengths is 13 knots.

Tailwind takeoffs and landings are not recommended. Quartering tailwinds can be detrimental to directional control.