## SECTION 2

LIMITATIONS

### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 GENERAL</td>
<td>2-1</td>
</tr>
<tr>
<td>2.2 AIRSPEED LIMITATIONS</td>
<td>2-2</td>
</tr>
<tr>
<td>2.3 AIRSPEED INDICATOR MARKINGS</td>
<td>2-3</td>
</tr>
<tr>
<td>2.4 POWERPLANT LIMITATIONS</td>
<td>2-4</td>
</tr>
<tr>
<td>2.5 POWERPLANT INSTRUMENT MARKINGS</td>
<td>2-7</td>
</tr>
<tr>
<td>2.6 WEIGHT LIMITS</td>
<td>2-8</td>
</tr>
<tr>
<td>2.7 CENTER OF GRAVITY LIMITS</td>
<td>2-9</td>
</tr>
<tr>
<td>2.8 MANOEUVRE LIMITS</td>
<td>2-10</td>
</tr>
<tr>
<td>2.9 FLIGHT MANOEUVRE LOAD FACTOR LIMITS</td>
<td>2-10</td>
</tr>
<tr>
<td>2.10 CREW LIMITS</td>
<td>2-10</td>
</tr>
<tr>
<td>2.11 KINDS OF OPERATION</td>
<td>2-10</td>
</tr>
<tr>
<td>2.12 FUEL LIMITATIONS</td>
<td>2-11</td>
</tr>
<tr>
<td>2.13 SEATING LIMITATIONS</td>
<td>2-11</td>
</tr>
<tr>
<td>2.14 LOADING LIMITS</td>
<td>2-11</td>
</tr>
</tbody>
</table>

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DATE: 21 December 2018
SECTION 2

LIMITATIONS

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>PARAGRAPH</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.15 PLACARDS</td>
<td>2-12</td>
</tr>
</tbody>
</table>
SECTION 2

LIMITATIONS

2.1 GENERAL

This Section presents the aircraft limitations and their significance, the instrument markings, the colour coding and the basic placards necessary for safe operations of aircraft, powerplant, systems and equipment.
## 2.2 AIRSPEED LIMITATIONS

<table>
<thead>
<tr>
<th>SPEED</th>
<th>KCAS</th>
<th>KIAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Manoeuvring Speed ($V_A$)</td>
<td>122</td>
<td>125</td>
</tr>
<tr>
<td>Do not make full or abrupt control movements above this speed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Flaps Fully Extended Speed ($V_{FE}$)</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>Never Exceed Speed ($V_{NE}$)</td>
<td>168</td>
<td>179</td>
</tr>
<tr>
<td>Do not exceed this speed in any operation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Structural Cruising Speed ($V_{NO}$)</td>
<td>125</td>
<td>128</td>
</tr>
<tr>
<td>Do not exceed this speed except in smooth air and in this case only with caution.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CROSSWIND

The maximum demonstrated crosswind velocity is 20 kt.
2.3 AIRSPEED INDICATOR MARKINGS

**PRIMARY** *(STAND-BY)*

MARKINGS

White Bar *(White Bar)*
- Flaps Operating Range
  48 to 78 KIAS

Green Bar *(Green Bar)*
- Normal Operating Range
  59 to 128 KIAS

Yellow Bar *(Yellow Bar)*
- Caution Range
  128 to 179 KIAS

Red Line *(Red Line)*
- Maximum speed for all operations
  179 KIAS

**NOTE**

The actual airspeed value on the primary indicator is white-colored. It is turning yellow from 175 up to 179 KIAS and it is presented in red field when the speed is over the red line.
2.4 POWERPLANT LIMITATIONS

(a) Number of Engines 1
(b) Engine Manufacturer Lycoming Engines
(c) Engine Model Number IO-360-M1A
(d) Engine Operating Limits
(1) Maximum Continuous Power 180 HP @ 2700 RPM
(2) Maximum Cylinder Head Temperature 500 °F
(3) Maximum Oil Temperature 245 °F
(4) Oil Pressure
   - Minimum for idle 25 psi
   - Maximum 95 psi
   - Starting and warm-up 115 psi
(5) Maximum Fuel Pressure 35 psi

(e₁) Aviation Fuel Specifications
See Table 2-1 (refer to the latest approved revision of Lycoming Service Instruction No.1070)

(e₂) Automotive Fuel Specifications
See Table 2-2 (refer to the latest approved revision of Lycoming Service Instruction No.1070)

(f) Oil
(1) Specifications
   Lubricating Oil should conform to Lycoming Spec. No.2656-A or subsequent FAA approved revisions. Refer to the latest approved revision of Lycoming Service Instruction No.1014.
(2) Oil Sump Capacity
   Usable Oil 7.5 lt
   5.7 lt
(g) Propellers

(1) Number of Propellers 1
(2) Number of Blades 2
(3) Propeller Manufacturer Hartzell Propeller Inc.
(4) Propeller Hub Model HC-C2YR-1BFP
(5) Propeller Blade Model F7497
(6) Propeller Diameter 1.880 m (74 in)
(7) Propeller RPM limit 2700

<table>
<thead>
<tr>
<th>Fuel Specification</th>
<th>Fuel Grades</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D910: Standard Specification for Aviation Gasolines</td>
<td>100 100LL 100VLL</td>
<td>Green Blue Blue</td>
</tr>
<tr>
<td>TU 38.5901481-96: High-Octane Gasoline for Gasoline Engines Ukrainian National Standard</td>
<td>91</td>
<td>Yellow</td>
</tr>
<tr>
<td>GOST 1012-72: Aviation petrol Russian National Standard</td>
<td>B91/B95/130</td>
<td>Green Amber</td>
</tr>
<tr>
<td>ASTM D7547: Standard Specification for Unleaded Aviation Gasolines</td>
<td>UL 91</td>
<td>Clear to Yellow (no dye)</td>
</tr>
<tr>
<td>HJELMCO Oil, Inc: HJELMCO 91-96 UL is the registered trade name for colorless unleaded fuel made by HJELMCO Oil, Inc. of Sollentuna, Sweden</td>
<td>HJELMCO 91/96 UL</td>
<td>Clear to Yellow (no dye)</td>
</tr>
</tbody>
</table>

Table 2-1   Aviation Fuel Specifications
The AKI is an octane rating and is the arithmetic average of the Research Octane Number (RON) and Motor Octane Number (MON)

\[
\text{(RON + MON)}/2 = \text{AKI}
\]

Table 2-2  Automotive Fuel Specifications
2.5  POWERPLANT INSTRUMENT MARKINGS

(a) Cylinder Head Temperature
   Green Bar (Normal Operating Range)  200 ÷ 475 °F
   Yellow Bar (Caution Range)  475 ÷ 500 °F
   Red Line (Maximum)  500 °F

(b) Tachometer
   Green Arc (Normal Operating Range)  550 ÷ 2700 RPM
   Red Radial (Maximum)  2700 RPM

(c) Oil Pressure
   Lower Red Line (Minimum)  25 psi
   Yellow Bar (Caution Range)  25 ÷ 55 psi
   Green Bar (Normal Operating Range)  55 ÷ 95 psi
   Upper Red Line (Maximum)  95 psi

(d) Oil Temperature
   Green Bar (Normal Operating Range)  75 ÷ 224 °F
   Yellow Bar (Upper Caution Range)  225 ÷ 245 °F
   Upper Red Line (Maximum)  245 °F

(e) Fuel Pressure (injector inlet)
   Lower Red Line (Minimum)  14 psi
   Green Bar (Normal Operating Range)  14 ÷ 35 psi
   Upper Red Line (Maximum)  35 psi

DATE: 03 December 2015
2.6 WEIGHT LIMITS

It is the responsibility of the aircraft owner and/or pilot to ensure that the aircraft is properly loaded. Maximum allowable weights are listed below. Refer to Section 6 "Weight and Balance" for loading instructions.

<table>
<thead>
<tr>
<th></th>
<th>kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Maximum Take-Off Weight</td>
<td>1155</td>
<td>2546</td>
</tr>
<tr>
<td>(b) Maximum Landing Weight</td>
<td>1100</td>
<td>2425</td>
</tr>
</tbody>
</table>

**WARNING**

Maximum Take-Off Weight of 1155 kg (2546 lb) is allowed only if the landing weight calculated on the basis of fuel consumption is not higher than 1100 kg (2425 lb).

**WARNING**

Exceeding the weight limits will lead to overstressing of the airplane as well as to degradation of flight characteristics and flight performances.
2.7 CENTER OF GRAVITY LIMITS
(Refer to Figure 2-1)

(a) Rearward Limits:
   - 0.465 m (18.31 in) aft of datum at all weights.

(b) Forward Limits:
   - 0.408 m (16.06 in) aft of datum at Maximum Take-Off Weight of 1155 kg (2546 lb).
   - 0.300 m (11.81 in) aft of datum at 825 kg (1819 lb) or less.

Linear variation between given points.

**NOTE**

*The datum line is tangent to the wing leading edge.*

![Figure 2-1 Aircraft Weight vs. Center of Gravity](image_url)
2.8 MANOEUVRE LIMITS

- This is an Utility Category Aircraft.
- Aerobatic manoeuvres approved:

<table>
<thead>
<tr>
<th>Manoeuvre</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climbing Turn</td>
<td>129 KIAS</td>
</tr>
<tr>
<td>Lazy Eight</td>
<td>140 KIAS</td>
</tr>
<tr>
<td>Steep Turn</td>
<td>108 KIAS</td>
</tr>
<tr>
<td>Stalls (except whip stall)</td>
<td>Slow deceleration</td>
</tr>
</tbody>
</table>

- Spin is prohibited.
- At speeds in excess of Design Manoeuvring Speed ($V_A$), it is forbidden to use the flight controls fully or abruptly deflected.

2.9 FLIGHT MANOEUVRING LOAD FACTOR LIMITS

(a) Positive Load Factor (Flaps Up) + 4.4 g
(b) Negative Load Factor (Flaps Up) - 1.0 g

2.10 CREW LIMITS

The minimum crew is one pilot who must occupy the left hand seat.

2.11 KINDS OF OPERATION

The aircraft equipped with Garmin avionics equipment and JPI engine data management system is approved for VFR Day/Night and IFR Operations.

For aircraft operational approval, all the additional equipment required by National Aviation Authority must be installed and operative.

The aircraft has not been approved for flight in known icing conditions.
2.12 FUEL LIMITATIONS

<table>
<thead>
<tr>
<th>TOTAL FUEL USG</th>
<th>USABLE FUEL USG</th>
<th>UNUSABLE FUEL USG</th>
<th>Lit</th>
<th>Lit</th>
<th>Lit</th>
</tr>
</thead>
<tbody>
<tr>
<td>USG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.8</td>
<td>200</td>
<td>50.2</td>
<td>190</td>
<td>2.6</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2-3  Fuel Quantity Limitations

NOTE
To obtain maximum fuel capacity fill one tank, then the other tank, and then return to first tank and top up to compensate for the unbalance.

2.13 SEATING LIMITATIONS

<table>
<thead>
<tr>
<th>No. SEATS</th>
<th>FROM DATUM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>METRES</td>
</tr>
<tr>
<td>FIRST ROW</td>
<td>2</td>
</tr>
<tr>
<td>SECOND ROW</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2-4  Seating Limitations

2.14 LOADING LIMITS

(a) Maximum Baggage Load

40 kg (88 lb)
2.15 PLACARDS

On instrument panel:

(a) THIS AIRCRAFT MUST BE OPERATED AS AN UTILITY CATEGORY AIRPLANE, IN ACCORDANCE WITH THE OPERATING LIMITATIONS PRESCRIBED BY PLACARDS, MARKINGS AND APPLICABLE FLIGHT MANUAL

(b) ACROBATIC MANOEUVRES APPROVED:
- CLIMBING TURN 129 KIAS
- LAZY EIGHT 140 KIAS
- STEEP TURN 108 KIAS
- STALLS SLOW DECELERATION
(except whip stall)
- SPIN IS PROHIBITED

(c) Stall warning inoperative with battery and alternator switches off

(d) OPERATIONAL LIMITS
- Maximum Take-Off Weight of 1155 Kg is allowed only if the Landing Weight calculated on the basis of fuel consumption is not higher than 1100 Kg (2425 lb)
- Max manoeuvring speed 125 KIAS (232 km/h)
- Max speed with Flap fully extended 78 KIAS (144 km/h)
- Max cross-wind speed 20 KIAS (37 km/h)

In the baggage compartment:

(e) MAX LOAD IN BAGGAGE COMPARTMENT 40 KG (88 LB)