

## SECTION 2

### LIMITATIONS

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## SECTION 2

### LIMITATIONS

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## 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

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

## CROSSWIND

The maximum demonstrated crosswind velocity is 20 kt.

## 2.3 AIRSPEED INDICATOR MARKINGS

<b>PRIMARY</b>	<b>(STAND-BY)</b>	
MARKINGS		KIAS
White Bar - Flaps Operating Range	(White Bar)	48 to 78
Green Bar - Normal Operating Range	(Green Bar)	59 to 128
Yellow Bar - Caution Range	(Yellow Bar)	128 to 179
Red Line - Maximum speed for all operations	(Red Line)	179

### **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

(e<sub>1</sub>) Aviation Fuel Specifications

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

(e<sub>2</sub>) 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 7.5 lt

Usable Oil 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                    |

Fuel Specification		Fuel Grades	Color
LEADED	<u>ASTM D910:</u> <i>Standard Specification for Aviation Gasolines</i>	100 100LL 100VLL	Green Blue Blue
	<u>TU 38.5901481-96:</u> <i>High-Octane Gasoline for Gasoline Engines</i> Ukrainian National Standard	91	Yellow
	<u>GOST 1012-72:</u> <i>Aviation petrol</i> Russian National Standard	B91/115 B95/130	Green Amber
UNLEADED	<u>ASTM D7547:</u> <i>Standard Specification for Unleaded Aviation Gasolines</i>	UL 91	Clear to Yellow (no dye)
	<u>HJELMCO Oil, INC.:</u> HJELMCO 91/96 UL is the registered trade name for colorless unleaded fuel made by HJELMCO Oil, Inc. of Sollentuna, Sweden	HJELMCO 91/96 UL	Clear to Yellow (no dye)

Table 2-1 Aviation Fuel Specifications

FUEL SPECIFICATION	FUEL GRADES
<p><b><u>ASTM D4814-09b:</u></b>  <i>Standard Specification for Automotive Spark-Ignition Engine Fuel</i>            Ordering Requirements:                Vapor Pressure: Class A-4                Oxygenate Content: For blends containing one or more oxygenates, oxygenate content shall not exceed 1.0 volume percent.                Prohibited Oxygenates: Ethanol, Methanol</p>	<p>93 AKI</p>
<p><b><u>EN 228:2008(E):</u></b>  <i>Automotive fuels - Unleaded petrol - Requirements and test methods</i>            Ordering Requirements:                Vapor Pressure: Class A                Oxygenate Content: For blends containing one or more oxygenates, oxygenate content shall not exceed 1.0 volume percent.                Prohibited Oxygenates: Ethanol, Methanol</p>	<p>NB 3 93AKI</p>

The AKI is an octane rating and is the arithmetic average of the Research Octane Number (RON) and Motor Octane Number (MON)

$$(RON + MON)/2 = AKI$$

**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         |

## 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.

	kg	lb
(a) Maximum Take-Off Weight	1155	2546
(b) Maximum Landing Weight	1100	2425

### 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.*

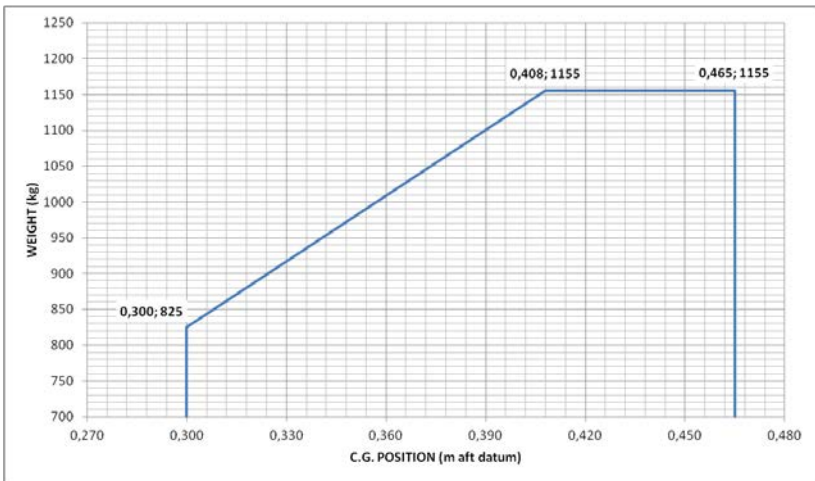


Figure 2-1 Aircraft Weight vs. Center of Gravity

## 2.8 MANOEUVRE LIMITS

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

<u>Manoeuvre</u>	<u>Speed</u>
Climbing Turn	129 KIAS
Lazy Eight	140 KIAS
Steep Turn	108 KIAS
Stalls (except whip stall)	Slow deceleration

- 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

TOTAL FUEL		USABLE FUEL		UNUSABLE FUEL	
USG	lt	USG	lt	USG	lt
52.8	200	50.2	190	2.6	10

**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

	No. SEATS	FROM DATUM	
		Metres	Inches
FIRST ROW	2	+ 0.360	+ 14.2
SECOND ROW	2	+ 1.120	+ 44.1

**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 (except whip stall)	SLOW DECELERATION
-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)**