

MAULE M7-235 ORION

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FLIGHT MANUAL

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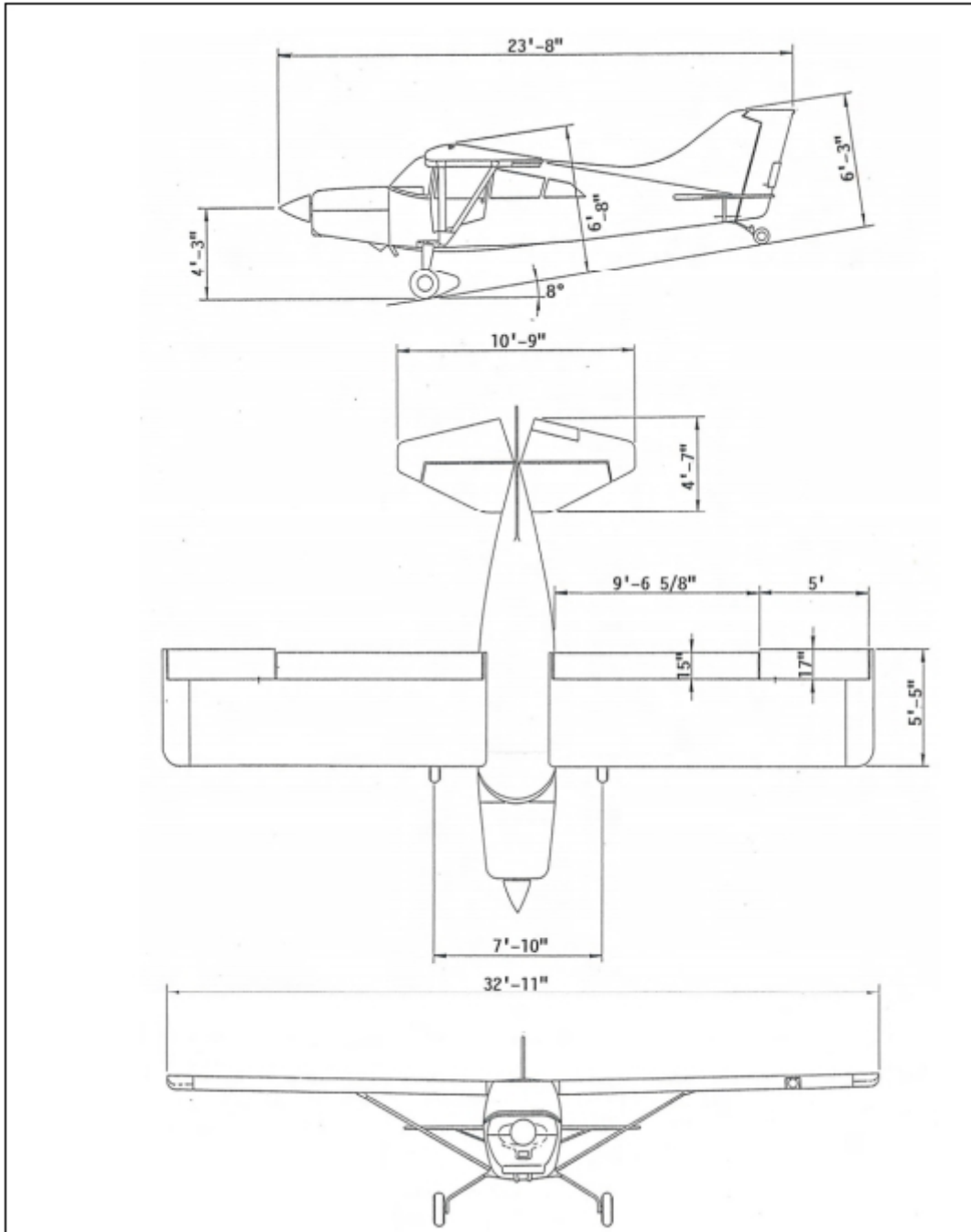
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GENERAL

1. PLAN VIEW





LIMITATIONS

3. LIMITATIONS

3.1 AIRSPEED LIMITS All airspeeds are Indicated Airspeeds (IAS).

A. AIRSPEED INDICATOR MARKINGS:

Red Radial, (VNE) - 158K (182 mph)

Yellow Arc, Caution Range - 128 – 158K (147 – 182 mph)

Green Arc, Normal Operating Range – 54 - 128K (62 - 147 mph)

White Arc, Flap Operating Range – 43 - 83K (50 - 95 mph)

B. EXPLANATION OF AIRSPEED INDICATOR MARKINGS:

Red Radial Line - Never Exceed Speed (VNE) 158K (182 mph): Maximum safe airspeed in smooth air.

Yellow Arc - Caution Range, 128 – 158K (147 – 182 mph): Operation in this speed range should be conducted only in smooth air and control movements should not be large or abrupt.

Green Arc - Normal Operating Range, 54 - 128K (62 - 147 mph): Extends from flaps up, power off stall speed at 2500 lbs. (VS1) to design cruise speed (VC).

White Arc - Flap Operating Range, 43 - 83K (50 - 95 mph): Extends from full flap, power off minimum stall speed at 2500 lbs. (VSO) to the Maximum flaps extended speed (VFE).



3.2 POWER PLANT LIMITS:

Engine: Lycoming O-540-J1A5D, IO-540-W1A5D, O-540-J3A5, IO-540-W1A5, or O-540-B4B5

Engine Limits: 235 hp @ 2400 rpm, Full Throttle Continuous 2575 rpm for B4B5

Propeller: Constant Speed

Hartzell: HC-C2YR-1BF/F8468A-6R (78") or -3R (81") (Use -3R with 7:00 tires or larger/26 psi minimum air pressure)

McCauley: B3D32C414-C/G-82NDA-4 (78") or -2 (80") (use with J or W engines only) or B2D37C224-B/G-90RA-9 (81") (Use -9 with 7:00 tires or larger/26 psi minimum air pressure; use -2 with 7:00 tires or larger)

Fuel: 100/100LL Minimum Grade Aviation Gasoline

Engine Instrument Markings:

Cylinder Head Temperature:

Green Arc - Normal Operating Range, 200°F – 435°F

Red Radial - Operating Limit, 500°F

Oil Temperature:

Green Arc - Normal Operating Range, 140°F – 245°F

Red Radial - Operating Limit, 245°F

Oil Pressure:

Green Arc - Normal Operating Range, 55 to 95 PSI

Yellow Arc - Caution Range, 25 to 55 PSI and 95 to 115 PSI

Red Radial - Minimum Operating Pressure, 25 PSI

Red Radial - Maximum Operating Pressure, 115 PSI

Manifold Pressure

Green Arc - Normal Operating Range, 14.5 to 29 ins. of Mercury

Fuel Pressure (O-540 only)

Green Arc - Normal Operating Range, 0.5 to 8 PSI

Red Radial - Minimum Pressure, 0.5 PSI, Maximum Pressure, 8.0 PSI

Fuel Flow (IO-540 only)

Red Radial - Maximum, 8.9 psi or 26.9 gph



Tachometer: (J and W only)

Green Arc - Normal Operating Range, 2050 - 2400 RPM

Red Radial - Maximum RPM, 2400 RPM

Tachometer: (O-540-B4B5 only)

Green Arc - Normal Operating Range, 2200 - 2575 RPM

Red Radial - Maximum RPM, 2575 RPM

//////////////////// CAUTION //////////////////////

DO NOT EXCEED 23 INCHES M.P. BELOW 2050 RPM. WHEN EQUIPPED WITH THE HARTZELL -6R (78") PROP. THIS IS A VIBRATORY STRESS LIMITATION WHICH APPLIES ONLY TO THIS MODEL PROPELLER.

3.3 FLIGHT LOAD FACTORS

Flaps Fully Retracted: 3.8g Positive to 1.5g Negative

Flaps Extended: 1.9g Positive to 0g Negative

NOTE: DESIGN MANEUVERING SPEED: The maximum safe airspeed at which full aerodynamic controls can be applied (VA) is 109K (125 mph). This airspeed is not marked on the airspeed indicator.

3.4 PLACARDS: The following placards are in the cockpit in clear view of the pilot:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FLIGHT MANUAL AND IN THE FORM OF PLACARDS AND MARKINGS.

NO AEROBATIC MANEUVERS INCLUDING SPINS, APPROVED.

MANEUVERING SPEED 109K (125 MPH) IAS. SEE LOADING INSTRUCTIONS IN WEIGHT AND BALANCE SECTION OF AIRPLANE FLIGHT MANUAL.

THIS AIRPLANE APPROVED FOR DAY OR NIGHT IFR NON-ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91 OR FAR 135.

DO NOT TURN OFF ALTERNATOR IN FLIGHT EXCEPT IN CASE OF EMERGENCY. FUEL REMAINING IN TANK WHEN INDICATOR READS ZERO CANNOT BE USED SAFELY IN FLIGHT.



When equipped with Hartzell –6R (78”) 2 blade propeller:
DO NOT EXCEED 23 INCHES M.P. BELOW 2050 RPM.

At the main fuel tank selector valve on the left kick panel:

FUEL SELECTOR VALVE

LEFT: * GAL.

OFF BOTH

RIGHT: * GAL.

On the instrument panel at the auxiliary tank transfer switches:

FUEL TRANSFER PUMPS

PUSH FOR AUX. QUANT. LEFT

PUSH FOR AUX. QUANT. RIGHT

NOTE: If JPI EDM-900/930 units are installed, the PUSH FOR AUX. QUANT. buttons and placards are not installed. However, FUEL TRANSFER PUMPS and LEFT and RIGHT placards are used as below:

FUEL TRANSFER PUMPS

LEFT RIGHT

FUEL CAPACITY: MAIN TANKS * GAL. USABLE EACH, AUX. TANKS * GAL.
USABLE EACH. (TANK CONFIGURATION ____)

*Instrument Panel Placard will show capacity of the tanks installed in this aircraft. See Table on Page 2 for capacity of available tank configurations.

On flap control handle:

FLAPS / PULL ON / 2ND NOTCH / TAKEOFF / 4TH NOTCH / LANDING.

In rear cabin area:

CARGO OR BAGGAGE LIMITATIONS

MAX. LOAD AREA "A" 100 LBS.

MAX. LOAD AREA "B" 175 LBS.

MAX. LOAD AREA "C" 125 LBS.



In rear cabin area when 5th seat is installed:

CHECK WEIGHT AND BALANCE CAREFULLY WHEN USING 5TH SEAT OR
LOADING REAR/ CARGO/ BAGGAGE. MAXIMUM REAR SEAT LOADING IS 170
LBS.

Or when 5th seat is not installed:

HECK WEIGHT AND BALANCE CAREFULLY WHEN LOADING
REAR/CARGO/BAGGAGE.

On the lower window frame near the latch when optional swing out windows are installed:
WINDOW MUST BE CLOSED ABOVE 120 MPH



NORMAL PROCEDURES

4.1 PREFLIGHT INSPECTION

A. INTERIOR:

1. BAT Switch..... ON
2. Fuel Gauges..... CHECK INDICATIONS
3. Auxiliary Fuel Pumps..... ON, THEN OFF
(LISTEN TO VERIFY OPERATION)
4. All Electrical Switches..... OFF
5. BAT Switch..... OFF
6. Flaps..... FULL DOWN (4TH NOTCH)*

B.EXTERIOR: Begin at the left front door, proceed around the left wing to the nose area, then around the right wing and back to the fuselage, then around the tail section.

1. Fuel drains behind step..... DRAIN (2)
2. Left Flap..... CHECK HINGES & CONTROL
ATTACHMENTS
3. Aileron..... CHECK HINGES & CONTROL
ATTACHMENTS
4. Left Wing Top..... CHECK FOR WRINKLES AS
INDICATION OF INTERNAL DAMAGE
5. Left Wing Main & Aux Fuel Tank Drain..... DRAIN (2)
6. Left Wing Tip & Nav Light..... CHECK FOR DAMAGE
7. Auxiliary Fuel Tank..... VISUALLY CHECK QUANTITY
8. Landing Light..... CHECK FOR DAMAGE
9. Left Wing Tiedown..... REMOVE
10. Pitot Tube..... REMOVE COVER
11. Stall Warning Switch..... CHECK FOR FREEDOM OF
MOVEMENT
12. Main Fuel Tank..... VISUALLY CHECK QUANTITY
13. Left Landing Gear..... CHECK TIRE INFLATION AND
BRAKE LINE SECURITY
14. Bottom left side of Cowl..... DRAIN GASCOLATOR (1)
15. Top Cowl, Oil Access Door..... CHECK OIL QUANTITY
16. Propeller..... CHECK LEADING EDGE FOR
DAMAGE.
17. Air Inlets..... CHECK FOR FOREIGN OBJECTS,
INSPECT VISIBLE CONNECTIONS AND COMPONENTS
18. Right Landing Gear..... CHECK TIRE INFLATION & BRAKE
LINE SECURITY
19. Right Wing & Controls..... INSPECT SAME AS LEFT WING



20. Wing Main & Aux Fuel Tank Drain..... DRAIN (2)
21. Right Fuselage, Side, Top & Bottom..... INSPECT FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
22. Right Side Static Port..... CLEAR
23. Right Stabilizer..... CHECK ATTACHMENT POINTS & STRUT
24. Right Elevator..... CHECK HINGE POINTS
25. Rudder..... CHECK HINGE POINTS, CONTROL ATTACHMENT & NAV LIGHT
26. Tailwheel..... CHECK FOR INFLATION, ATTACHMENTS, REMOVE TIEDOWN
27. Left Elevator..... CHECK TAB CONTROLS & ALL HINGE POINTS
28. Left Stabilizer..... CHECK ATTACHMENT POINTS & STRUT
29. Left Fuselage, Top, Side & Bottom..... CHECK FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
30. Left Side Static Port..... CLEAR

4.2 OPERATING CHECKLISTS

A. BEFORE STARTING:

1. Seat Belts & Shoulder Harnesses..... FASTENED
2. Flaps..... RETRACTED
3. Circuit Breakers..... CHECK

B. STARTING:

1. Parking or Toe Brakes..... ON
2. Fuel Selector Valve..... ON FULLEST TANK, OR BOTH IF SAME QUANTITY
3. Throttle..... OPEN 1/4 INCH
4. Propeller Control..... FULL INCREASE RPM
5. Mixture Control..... RICH (SEE NOTE NEXT PAGE FOR HOT START)
6. Anti-Collision Light..... ON
7. BAT and ALT Switch..... ON
8. Primer (O-540). AS REQUIRED
- Primer (IO-540). AS REQUIRED USING BOOST PUMP (SEE NOTE NEXT PAGE)



- 9. Mixture Control (IO-540 only)..... FULL LEAN
- 10. Starter Switch..... TWIST FULL RIGHT TO ENGAGE
- 11. Mixture Control (IO-540 only)..... FULL RICH WHEN ENGINE STARTS TO FIRE

NOTE: FOR A HOT START, DO NOT PRIME. A HOT ENGINE MAY FLOOD ON A START ATTEMPT. TO CLEAR A FLOODED ENGINE, PULL MIXTURE FULL LEAN AND OPEN THROTTLE, CRANK WITH STARTER. WHEN ENGINE STARTS, PULL THROTTLE TO IDLE AND EASE MIXTURE TO FULL RICH.

NOTE: (IO-540) FOR A COLD ENGINE (FIRST START OF THE DAY), PLACE MIXTURE TO FULL RICH, THROTTLE ¼" OPEN. PRIME WITH BOOST PUMP FOR 3 TO 5 SECONDS. IF ENGINE DOES NOT START, PRIME FOR ANOTHER 3 TO 5 SECONDS. OVER- PRIME CAN BE NOTED BY FUEL COMING FROM DRAIN IN CENTER OF BOTTOM COWL.

//////////////////// CAUTION////////////////////

IN EVENT OF ENGINE FIRE, CONTINUE CRANKING. PULL MIXTURE TO FULL LEAN. IF ENGINE FAILS TO START AFTER SEVERAL REVOLUTIONS, AND FIRE CONTINUES, SECURE IGNITION, BAT. AND ALT. SWITCHES, TURN FUEL VALVE OFF AND EXIT AIRCRAFT.

- 12. After Starting..... CHECK OIL PRESSURE

//////////////////// CAUTION////////////////////

IF OIL PRESSURE DOES NOT EXCEED 25 PSI WITHIN 30 SECONDS, SHUT DOWN ENGINE.

- 13. Alternator..... CHECK CHARGING
- 14. Radios & other electrical switches..... AS REQUIRED
- 15. Parking Brake..... OFF (PUSH KNOB COMPLETELY AGAINST INSTRUMENT PANEL)



C. ENGINE CHECK:

1. Parking Brake..... ON, IF DESIRED
2. Engine Instruments..... CHECK, IN GREEN ARCS
3. Throttle..... INCREASE TO 2000 RPM
4. Magnetos..... SWITCH TO RIGHT, LEFT, BOTH,
CHECKING RPM DROPS
5. Propeller Control..... RETARD SLOWLY UNTIL MAXIMUM
OF 500 RPM DROP IS NOTED. RETURN TO FULL INCREASE RPM. REPEAT. SET
FULL INCREASE RPM

//////////////////// CAUTION\\\\\\\\ //////////////////////

A RPM DROP OF MORE THAN 175 RPM OR A DIFFERENCE BETWEEN LEFT AND
RIGHT OF MORE THAN 50 RPM IS UNACCEPTABLE.

6. Carburetor Air Control (O-540)..... PULL HOT, NORMAL DROP WITH
CARBURETOR AIR HOT IS 150 ± 50 RPM

Alternate Air Control (IO-540)..... TURN LEFT TO UNLOCK AND PULL.
NORMAL RPM DROP WITH ALTERNATE AIR IS APPROXIMATELY 50 RPM

7. Carburetor Air Control (O-540)..... PUSH COLD Alternate Air Control (IO-
540) PUSH IN AND TURN RIGHT TO LOCK

8. Vacuum Gauge..... CHECK IN GREEN

9. Alternator..... CHARGING: LIGHT OUT ABOVE 900
RPM

10. Throttle..... RETARD TO IDLE



D. BEFORE TAKE OFF:

1. Fuel Selector..... ON FULLEST TANK OR BOTH
2. Flaps..... AS DESIRED FOR T.O. (MAX. 24°)
3. Trim Controls..... SET FOR TAKEOFF
4. Flight Controls..... CHECK FOR FREEDOM AND PROPER TRAVEL
5. Mixture Control..... FULL RICH
6. Propeller Control..... FULL INCREASE RPM
7. Carburetor Air Control (O-540)..... PUSH COLD Alternate Air Control (IO-540)..... PUSH IN AND LOCK
8. Engine Instruments..... RECHECK IN NORMAL RANGE
9. Radios..... AS DESIRED
10. Altimeter..... SET
11. Attitude Indicator..... CHECK ERECT
12. Directional Indicator..... SET
13. Seat Belts & Shoulder Harnesses..... RECHECK FASTENED
14. Doors..... CLOSED & LATCHED
15. Passengers..... BELTS & HARNESSSES SECURED. BRIEFED ON OPENING DOORS.
16. Parking Brake..... OFF (PUSH KNOB COMPLETELY AGAINST INSTRUMENT PANEL)

E. BEFORE LANDING:

1. Seat Belts & Shoulder Harnesses..... FASTENED
2. Fuel Selector Valve..... ON FULLEST TANK OR BOTH
3. Mixture Control..... FULL RICH
4. Propeller Control..... FULL INCREASE RPM
5. Flaps..... AS REQUIRED
6. Carburetor Air Control (O-540)..... PULL HOT (AS REQUIRED)
Alternate Air Control (IO-540)..... IN AND LOCKED



F. SHUT DOWN:

1. Parking Brakes..... ON, IF DESIRED
2. Radios..... OFF
3. All other electrical switches..... AS DESIRED
4. Flaps..... AS DESIRED
5. Magneto Grounding Check..... PERFORM BELOW 1000 RPM
6. Mixture Control..... FULL LEAN
7. Magneto Switch..... OFF
8. Anti-Collision Light..... OFF
9. BAT & ALT Switch..... OFF
10. Parking Brake..... OFF (AS DESIRED) (FOR OFF, PUSH KNOB COMPLETELY AGAINST INSTRUMENT PANEL)

4.3 NORMAL FLIGHT OPERATIONS

A. NOTE: FLAP SETTINGS:

The following Flap Settings are available:

Flap Configuration	Flap Handle Position	Flap Position
Cruise	Handle Full Down	-7°
Flaps Up	First Notch	0°
Take off	Second Notch	24°
Landing	Third Notch (optional)	40°
Landing	Fourth Notch	48°

B. RECOMMENDED FLAP SETTINGS:

4. Flap settings are given in number of notches above the fully retracted position, which is handle full down (Normal -7°).
5. NOTE: The airplane meets CAR 3 takeoff climb requirements at 78K (90 mph) IAS with the flaps selected in any of the following three positions: (a) Fully Retracted, Handle full down (-7°), (b) First Notch (0°) and (c) Second Notch (24°).



Normal Takeoff - Second Notch (24°)

Normal Climb - First Notch (0°)

Best Angle of Climb - Second Notch (24°)

Cruise - Fully retracted (-7°/no notches or 0°/1st notch)

Landing - Normally Fourth Notch (48°/full flaps) - other positions optional

C. CLIMBING:

Best Rate of Climb – 78K (90 mph) IAS, flaps @ First Notch (0°)

Best Angle of Climb – 65K (75 mph) IAS with flaps set @ Second Notch (24°)

////////////////////CAUTION////////////////////

FOR TAKEOFF OR LANDING UNDER GUSTY CROSSWIND CONDITIONS, FLAP SETTING OF 0° (one notch) IS RECOMMENDED. -7° OPTIONAL.

////////////////////CAUTION////////////////////

USE CLIMB AIRSPEED BELOW 78K (90 MPH) ONLY AS NECESSARY AND CHECK CYLINDER HEAD TEMPERATURE FREQUENTLY WHEN DOING SO.

D. RUDDER TRIM: NOTE:

To assure full effectiveness of the Right Rudder Trim:

Unlock "T" handle (½ turn left), depress right rudder as you pull "T" handle full out.

Lock "T" handle ½ turn right before releasing right rudder pressure. If too much trim, move handle in until trim is correct and then lock.

E. STALLS:

Stalls are preceded by mild buffet that can be felt through the rudder pedals. The red stall warning light on the instrument panel will illuminate at 4 to 9K (5 to 10 mph) above the stall speed. Loss of altitude prior to recovery from a stall may be as much as 300 feet.

////////////////////CAUTION////////////////////

THE STALL WARNING LIGHT IS INOPERATIVE WHEN THE BATTERY SWITCH IS OFF



F. CROSSWIND LANDINGS & TAKEOFFS:

6. Maximum demonstrated crosswind component is 12K (14 mph) and flap extension should be limited to 0° (first notch) with such crosswind or higher. 12K (14 mph) is the maximum demonstrated for certification of the airplane and is not considered limiting with flaps at 0°.

G. FUEL SYSTEM MANAGEMENT:

Fuel is fed to the engine from the main (inboard) tanks and is controlled by the selector valve on the left kick panel. Auxiliary (outboard) tanks feed their respective main tanks via transfer pumps that are controlled by switches on the instrument panel. These transfer pumps transfer fuel at a rate of 0.4 gallons per minute or approximately 45 minutes for a full auxiliary tank. Since overfilling a main tank from an auxiliary tank will force excess fuel overboard, it is recommended that the transfer pumps not be activated until their respective main tanks are slightly more than one quarter full. If the tank being transferred to is feeding the engine, however, transfer can be initiated when the main tank is down to approximately one half. Confirm fuel transfer by illumination of the transfer pump switch, an increase in the respective main tank fuel gauge indicator, and a decrease on the respective auxiliary tank indicator.

4.4 DOOR-OFF OPERATION

This aircraft may be operated with either one (not both) of the front doors removed, or when both front doors are installed, with the rear passenger door or rear passenger and baggage doors off. When doing so, observe the following additional limitations:

1. Maximum airspeed – 109K (125 mph)
2. Maximum bank angle - 30°
3. Maximum yaw angle - 10°
4. No Smoking permitted
5. Limit flight to VFR conditions



4.5 NOISE LEVEL

The noise levels obtained during certification per FAR 36, were:

			with J/W engine	with B engine
with Hartzell	-6R (78")	2 blade	67.6 dBA	73.9 dBA
with Hartzell	-3R (81")	2 blade	71.3 dBA	73.9 dBA

The noise levels obtained during certification per FAR 36, Appendix G were:

with McCauley	-4 (78")	3 blade	68.0 dBA	76.5 dBA
with McCauley	-2 (80")	3 blade	73.6 dBA	78.1 dBA
with McCauley	-9 (81")	2 blade	73.3 dBA	77.8 dBA

No determination has been made by the Federal Aviation Administration that the noise level of this airplane is or should be acceptable for operation at, into, or out of any airport.

4.6 ANTI-COLLISION LIGHT

////////////////////WARNING////////////////////

ANTI-COLLISION LIGHT MAY CAUSE ADVERSE EFFECT ON PILOT WHEN FLYING IN VISIBLE MOISTURE, OVERCAST OR HAZE. IT IS RECOMMENDED THAT IT BE TURNED OFF UNDER THESE CONDITIONS.



EMERGENCY PROCEDURES

5.1 EMERGENCY BASIC RULES

To assist the pilot when an emergency occurs, three basic rules are established which apply to most emergencies occurring while airborne. They should be remembered by each crew member.

1. Maintain aircraft control
2. Analyze the situation and take proper action
3. Land as soon as conditions permit

5.2 ENGINE EMERGENCY SHUT DOWN

1. Mixture - Full lean
2. Fuel Selector - OFF
3. Ignition Switch – OFF

5.3 ENGINE FIRE DURING STARTING

1. Mixture - Full lean
2. Throttle - Open
3. Continue cranking for several revolutions. Attempt to draw fire inside engine.
4. Accomplish ENGINE EMERGENCY SHUT DOWN if fire continues.

5.4 ENGINE FIRE AFTER STARTING

1. Accomplish ENGINE EMERGENCY SHUT DOWN
2. Master Switch – OFF

5.6 TAKE OFF ABORT (BEFORE LIFT OFF)

1. Throttle - Closed
2. Brakes - As Required



5.7 ENGINE FIRE AFTER TAKE OFF OR FORCED LANDING

1. Glide - Establish 69K (80 mph) IAS with flaps at 0°
2. Switch Fuel Selector to fullest tank
3. Electric Fuel Pump - ON
4. Mixture Rich, Ignition ON
5. Carburetor Air Control (O-540) – Pull HOT
Alternate Air Control – (IO-540) - Pull ON
6. If engine does not restart, accomplish EMERGENCY SHUT DOWN
7. Wing Flaps - As Required
8. Master Switch – OFF

5.8 PARTIAL POWER FAILURE DURING FLIGHT OR AFTER TAKEOFF

1. Mixture - RICH
2. Carburetor Air Control (O-540) – Pull HOT
Alternate Air Control – (IO-540) - Pull ON
3. Airspeed - Glide at 69K (80 mph) IAS if unable to maintain level flight
4. Fuel Selector - BOTH
5. Electric Fuel Pump - ON
6. Ignition Switch - BOTH 7. Master Switch – ON

5.9 COMPLETE POWER FAILURE DURING FLIGHT

1. Glide - Establish 69K (80 mph) (IAS)
2. Attempt engine airstart if warranted

5.10 ENGINE AIRSTART

1. Fuel Selector – BOTH
2. Electric Fuel Pump - ON
3. Mixture – RICH
4. Ignition Switch - BOTH (start if propeller is not turning)
5. Auxiliary fuel tank pump switch – ON for tank feeding engine if auxiliary tank has fuel.
6. If engine does not start, try flooded engine clearing procedure with throttle wide open and mixture FULL LEAN.



7. If no start, make forced landing

NOTE: PROPELLER WILL NOT WINDMILL BELOW 61K (70 MPH). NOTE: AT ALTITUDES OVER 8000 FEET, A LEANER MIXTURE MAY BE REQUIRED.

5.11 ELECTRICAL FIRE

1. Master Switch – OFF

5.12 ENGINE FIRE DURING FLIGHT

1. Accomplish ENGINE EMERGENCY SHUT DOWN
2. Make forced landing

5.13 SMOKE AND FUME ELIMINATION

1. Cabin Heat Knob - IN
2. Cabin Air Knob - IN
3. Upper Air Vents - OPEN
4. Pilot's Window - OPEN (below 104K (120 mph)

5.14 STRUCTURAL DAMAGE

1. On Takeoff - Abort
2. In flight, maintain controllable airspeed
3. Climb to safe stall recovery altitude
4. Notify appropriate controlling agency, if appropriate.
5. Determine control difficulty airspeed by slowing down while flying straight ahead. Do not allow the aircraft to stall.
6. Make full stop landing using 4 to 9K (5-10 mph) above difficulty airspeed or above normal approach speed, whichever is higher.

5.15 RECOVERY FROM INADVERTENT SPINS

Intentional spins are prohibited. If the aircraft inadvertently enters a spin, simultaneously apply full rudder opposite to the direction of rotation and full nose down elevator with ailerons neutral and reduce power to idle. When the rotation stops, neutralize the rudder and elevator, and ease back on the control wheel as required to smoothly regain level flight. Wing flaps should be retracted to avoid exceeding the maximum flap speeds during recovery.



5.16 ALTERNATOR FAILURE

Alternator output should be monitored by reference to the ammeter located on the right side of the engine instrument cluster. Should the ammeter indicate a minus deflection when engine RPM is above 900 and/or red "ALTERNATOR OFF WARNING" light is illuminated, push ALT switch OFF then ON. Repeat two times as necessary to reset. If system will not reset, reduce the electrical load as much as possible, land as soon as practical and investigate the electrical system malfunction before further flight.

WEIGHT AND BALANCE

6.1 WEIGHT AND BALANCE

Serial Number _____ Registration Number _____

It is the responsibility of the airplane owner and the pilot to insure that the airplane is loaded properly. The empty weight, empty weight center of gravity and useful load are listed below for this airplane as delivered from the factory. If the airplane has been altered, refer to the aircraft log and/or aircraft records for this information.

WEIGHT AND BALANCE DATA SUMMARY AS DELIVERED FROM THE FACTORY

Basic Empty Weight (including engine oil)..... _____ Lbs.
Gross Weight..... 2500 Lbs.
Useful Load..... _____ Lbs.
Empty Center of Gravity..... _____ Inches
Empty Weight Moment..... _____ Inch Lbs.

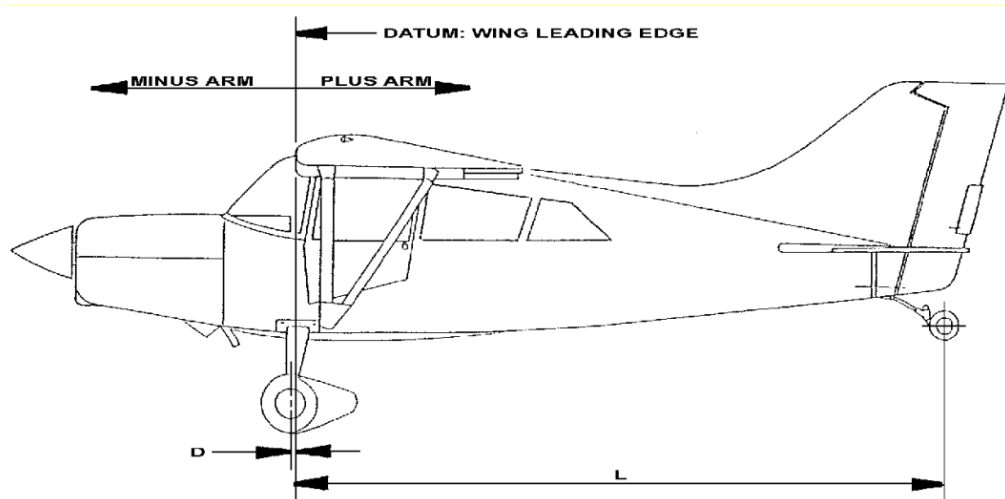
CENTER OF GRAVITY RANGE

Center of Gravity Range	At Weight of
+15.0 to +20.5 inches	2500 lbs.
+12.0 to +20.5 inches	1760 lbs.

NOTE: Straight line variation between given points DATUM: Wing leading edge



DETAILED CALCULATIONS OF EMPTY WEIGHT AND EMPTY WEIGHT CENTER OF GRAVITY AS DELIVERED FROM FACTORY



PROCEDURE

1. Place each of the wheels on a scale with the tailwheel elevated to place the airplane in approximately the flight attitude.

2. Place a level on the leveling mark and leveling lug on the bottom of the right wing near the root. Adjust the height of the tailwheel until the aircraft is level.

3. Measure the following distances:

a. Wheel base (L) - the horizontal distance from the tailwheel weight point (center of axle) to the main wheel weight point (center of axle). L = _____ Inches

b. Main Wheel Station (D) - the horizontal distance from the main wheel weight point (center of axle) to the datum line. D = _____ Inches

4. Measure the weights at the following points:

a. Right Main Wheel.....= _____ Lbs.

b. Left Main Wheel.....= _____ Lbs.

c. Tailwheel, with tare = _____ Lbs., minus tare of _____ Lbs.

= net Tailwheel wt. (T) of _____ Lbs.

Total Weight as Weighted (W) = _____ Lbs.



The above empty weight includes unusable fuel of ** lbs. at 24 inches and 12 quarts of oil at minus 34 inches for the O-540 engine and 8 quarts of oil at minus 34 inches for the IO-540 engine, plus all items of equipment as marked on the accompanying Equipment Lists. The certificated empty weight is the above weight less 24 lbs. drainable oil for the O-540 engine or above weight less 16 lbs. drainable oil for the IO-540 engine at a minus arm of 34 inches and for this airplane is _____ lbs. The corresponding empty weight center of gravity is _____ inches.

5. Calculations for determining weight, C.G. and moment:

a. Center of Gravity (inches) = $\frac{L \times T}{W}$ - D

i.e., C.G. = _____ - _____ = _____ inches.

b. Moment (inch pounds) = W x C.G.

i.e., Moment = _____ x _____ = _____ inch lbs.

EXAMPLE OF WEIGHT AND BALANCE CALCULATION FOR LOADED AIRCRAFT

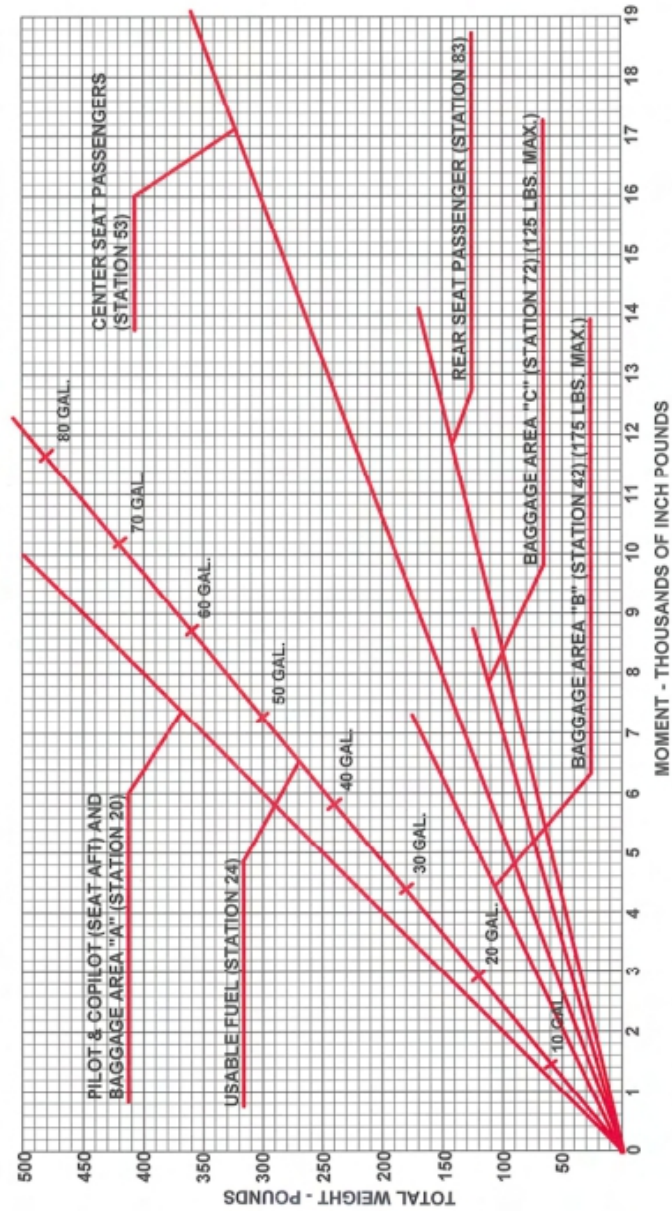
An airplane with an empty weight of 1549 lbs. and empty weight moment of 17,349 inch lbs. is loaded with a pilot and front seat passenger, fuel and baggage.

Item	Weight, lbs.	C.G. Location	Moment, In. lbs.
Empty Weight (including engine oil)	1549	11.2	17,349
Pilot and Front Passenger	340	*	6,800
Fuel - 43 gal. in Mains plus			
30 gal. In Auxiliary Tanks	438	*	10,512
Baggage (Area "C")	<u>125</u>	*	<u>9,000</u>
	2452	17.8	43,661

By locating the point corresponding to 2452 lb. aircraft weight and a C.G. location of 17.8 inches on the Center of Gravity envelope graph, you can see that this point falls within the envelope, signifying the loading is acceptable.

*Moments can be read directly from the loading graph.

**Use 18 lbs. for "A" or "B" configurations and 27.6 lbs. for "C" or "D".



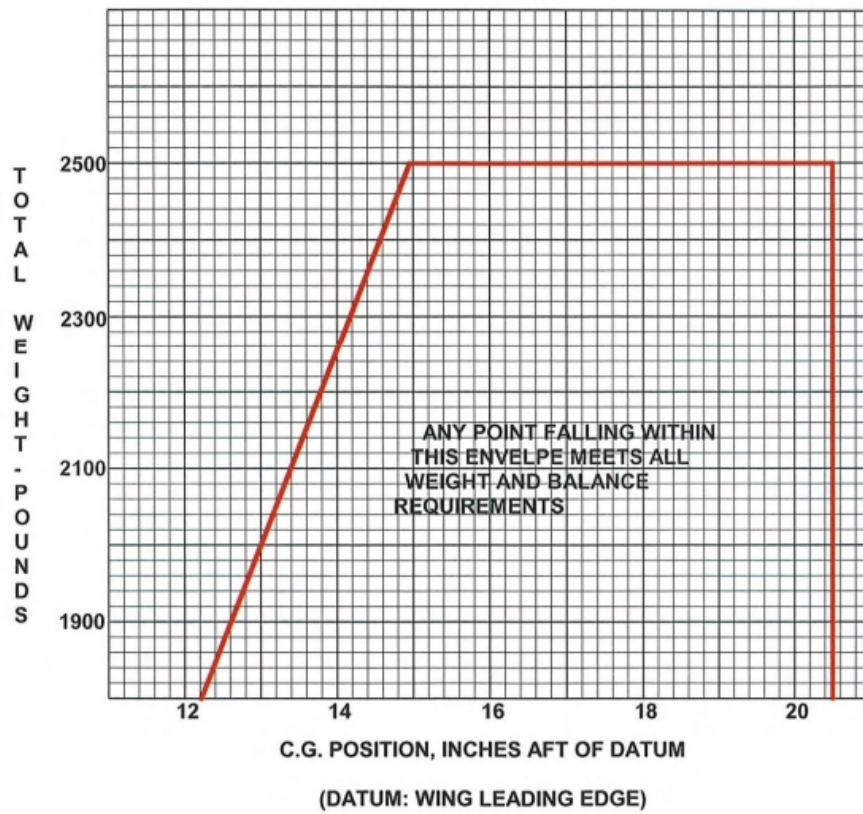
LOADING CHART

PROCEDURE FOR DETERMINING WEIGHT & CENTER OF GRAVITY:

1. Add weight to be carried to the basic empty weight of the aircraft.
2. Find moments of item to be carried by using the above loading graph and add these moments to the empty moment of the aircraft. Divide total moment by total weight for aircraft C.G. location.
3. Using the C.G. location for Step 2, find the point on the Weight and Balance Envelope.

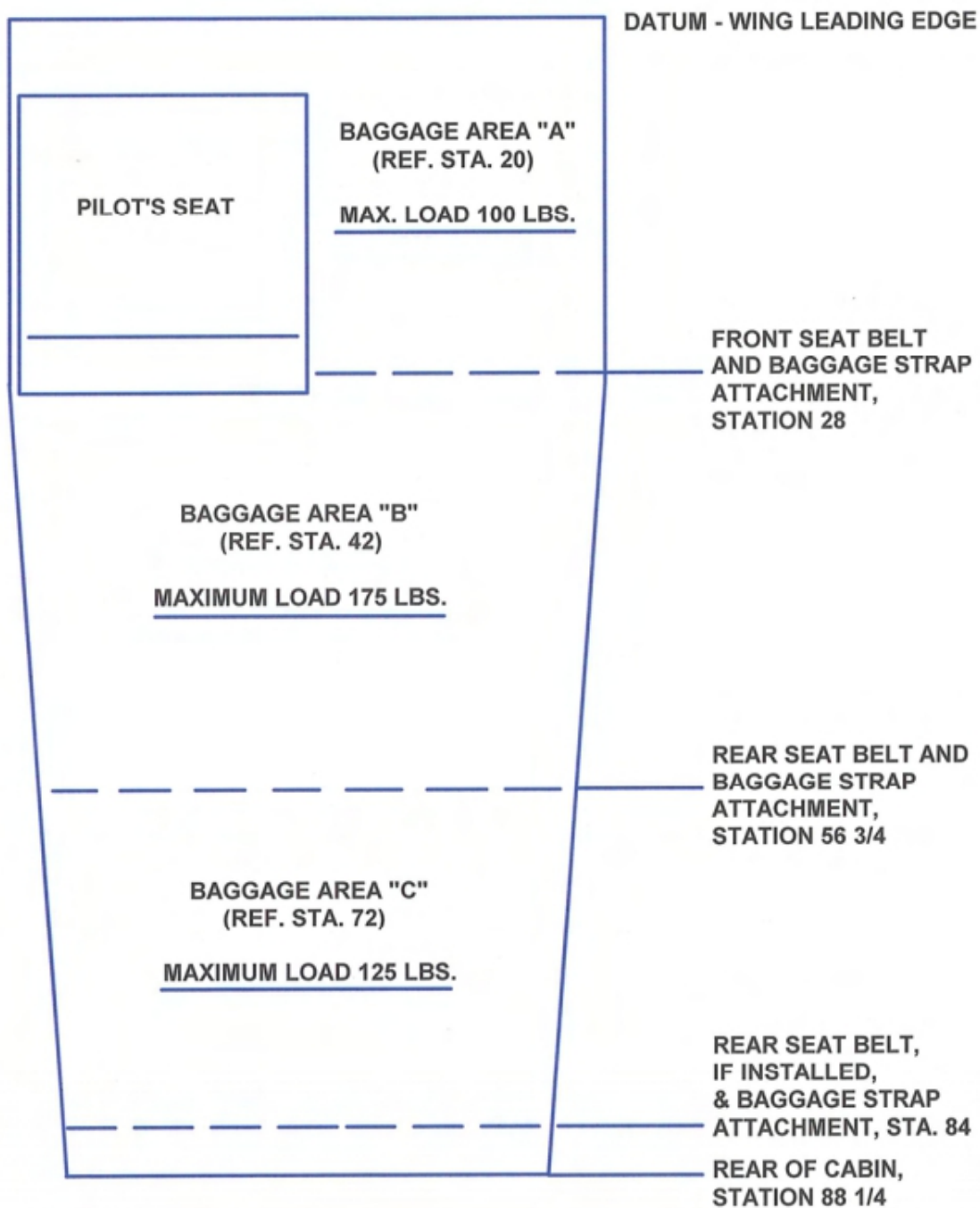


WEIGHT AND BALANCE ENVELOPE





STRUCTURAL CAPACITY CHART





SERIAL NO. _____ REG.NO. _____ MODEL _____

EQUIPMENT CHANGE - WEIGHT AND BALANCE

ITEM'S (MAKE & MODEL) WEIGHT ARM MOMENTS

Previous Aircraft Empty			

A. New Empty Weight _____ lbs.

B. New Empty Center of Gravity _____ ins.

C. New Empty Weight C.G. Moment _____ in. lbs.

D. New Useful Load _____ lbs.

Supersedes all previous weight and balance data. For aircraft loading see instructions in original weight and balance forms.

BY _____ DATE _____



AIRCRAFT SERVICING, HANDLING AND MAINTENANCE

7.1 AIRPLANE INSPECTION PERIOD

The airplane must be maintained as outlined in FAR 43. Recommended inspections are outlined in the airplane Maintenance Manual. The owner/operator is responsible for Airworthiness Directives (AD's) that may be issued from time to time. Reference should be made to FAR 91 and FAR 43 requirements for properly certified agency or personnel to accomplish the required FAA inspection and most of the manufacturer's recommended inspections.

7.2 PREVENTIVE MAINTENANCE THAT MAY BE ACCOMPLISHED BY A CERTIFIED PILOT

A. A certified pilot who owns or operates an airplane not used as an air carrier is authorized by FAR Part 43 to perform limited preventive maintenance on his airplane. Refer to FAR Part 43 for list of things the pilot may do. Pilots operating aircraft of other than U.S. registry should refer to the regulations of the country of certification for information on preventive maintenance that may be performed by pilots. All other maintenance required on airplane is to be accomplished by appropriately licensed personnel and that airplane dealer or service station should be contacted for further information.

B. Preventive maintenance should be accomplished in accordance with the appropriate airplane Maintenance Manual. Manual should be obtained prior to performing preventive maintenance to be sure that proper procedures are followed.

7.3 ALTERATIONS OR REPAIRS TO AIRPLANE

Alterations or repairs to airplane must be accomplished by licensed personnel. The FAA should be contacted prior to any alterations on airplane to insure that Airworthiness of the airplane is not violated .

STEC50 MANUAL

https://files.pilot-experience-sim.fr/products/database/S-TEC_System_40_50.pdf

