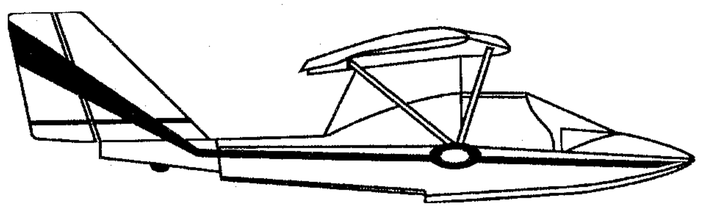

# RECOMMENDED FLIGHT MANUAL

## COVER PAGE

Nationality and Identification Number:_____

Manufacturer/Builder:_____

Address of Manufacturer/Builder:_____

_____

_____

Aircraft Type:_____

Kit Manufacturer: Progressive Aerodyne, Inc.
520 Clifton St.
Orlando, FL 32808
U.S.A.

Kit Manufacturer's Serial Number:_____

## GENERAL AMENDMENT RECORD SHEET

| AMENDMENT NUMBER | PARAGRAPH(S) AFFECTED | SIGNATURE | DATE OF INCORPORATION |
|---|---|---|---|
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NOTE: Amendment numbers may not always be consecutive.



## INTRODUCTION

This Flight Manual contains material to be supplied by the owner/builder ("Test Aircraft"), as well as supplemental data supplied by Progressive Aerodyne, Inc. Sample data from the Progressive Aerodyne Demonstration SeaRey ("P/A Demo") is included for reference.

This Flight Manual applies only to the particular aircraft identified by the Identification Number and Serial Number on the cover page and contains limitations and essential data for this aircraft.

This aircraft is registered as an experimental-type aircraft on the basis of the equipment fitted at the time of issue of the Airworthiness Certificate. Any changes in equipment must be listed in the aircraft's logbook and appropriate amendments should be made in this Manual.

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| EMERGENCY PROCEDURES | 3 |
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| PROPELLER | 1.1 |
| FUEL | 1.1 |
| OIL | 1.1 |
| MAXIMUM APPROVED WEIGHTS | 1.2 |
| BASIC EMPTY WEIGHT | 1.2 |
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## MAXIMUM APPROVED WEIGHTS

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Gross Weight: | _____ | 1370 lbs |
| Max Take-off Weight: | _____ | 1370 lbs |
| Max Landing Weight: | _____ | 1370 lbs |
| Max Baggage Weight: | _____ | 55 lbs |
| Basic Empty Weight: | _____ | 850 lbs |

## ABBREVIATIONS & DEFINITIONS

The following shall apply throughout this Manual:

**PRESSURE ALTITUDE** is the altitude read from an altimeter when the altimeter's barometric scale has been set to 29.92 H.g. (inches of mercury).

**IAS** (Indicated Airspeed) is the speed shown on the airspeed indicator.

**TAKE-OFF SAFETY SPEED** is a speed chosen to ensure that adequate control will exist under all conditions, including turbulence and sudden and complete engine failure, during the climb after take-off.

**APPROACH SPEED** is a speed chosen to ensure that adequate control exists under all conditions, including turbulence, to carry out a normal flare and touchdown.

**Vc – NORMAL OPERATING LIMIT SPEED** is the speed that shall normally not be exceeded. Operations above Vc shall be conducted with caution and only in smooth air.

**Va – MANUEVERING SPEED** is the maximum speed at which you may use abrupt control travel.

**Vfe – MAXIMUM FLAP EXTENDED SPEED** is the highest speed permissible with wing flaps in a prescribed extended position.

**Vno – MAXIMUM STRUCTURAL CRUISING SPEED** is the speed that should not be exceeded except in smooth air, then only with caution.





| ENGINE | Test Aircraft | (P/A Demo) |
|---|---|---|
| Manufacturer: | _____ | Bombardier Rotax |
| Model: | _____ | Rotax 912UL |
| Type: | _____ | See Engine Manual |
| RPM Full Throttle: | _____ | 5800 rpm |
| **PROPELLER** | | |
| Manufacturer: | _____ | R.P.M. |
| Type: | _____ | 2 Blade Wood |
| Diameter: | _____ | 70 inches |
| Pitch: | _____ | Fixed 38 inches |
| **FUEL** | | |
| Grade: | _____ | 93 Oct. Auto Gas |
| Capacity, Total: | _____ | 18 gal. |
| Capacity, Useable: | _____ | 17 gal. |
| **OIL** | | |
| Grade: | _____ | See Engine Manual |
| Capacity: | _____ | 3.5 qt. |

## SECTION 2 – LIMITATIONS

## TABLE OF CONTENTS







**Vs – STALL SPEED** or the minimum steady flight speed at which the aircraft is controllable.

**Vso – STALL SPEED** or the minimum steady flight speed at which the aircraft is controllable in the landing configuration at the most forward center of gravity.

**AIRCRAFT PERFORMANCE & FLIGHT PLANNING TERMINOLOGY**

**USABLE FUEL** is the fuel available for flight planning.

**UNUSABLE FUEL** is the quantity of fuel that can not be safely used in flight.

**WEIGHT & BALANCE TERMINOLOGY**

For complete Weight & Balance terminology, see Section 6 of this manual.

**REFERENCE DATUM** is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.

**ARM** is the horizontal distance from the reference datum to the center of gravity of an item.

**MOMENT** is the product of the weight of an item multiplied by its arm.

**CENTER OF GRAVITY (C.G.)** is the point at which an aircraft, or equipment, would balance is suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the aircraft.

**CENTER OF GRAVITY LIMITS** are the extreme C.G. locations within which the aircraft must be operated at a given weight.

**BASIC EMPTY WEIGHT** is the weight of the aircraft including unusable fuel, full operating fluids and full engine oil.

**GROSS WEIGHT** is the maximum weight to which the aircraft can be loaded for taxi, take-off, flight and landing.

## AIRSPEED INDICATOR MARKINGS

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| White Arc: | _____ | 40-85 mph |

Full Flap Operating Range. Lower limit is at Gross Weight. Vso in landing configuration. Upper limit is maximum speed permissible with flaps extended.

| | | |
|---|---|---|
| Green Arc: | _____ | 50-100 mph |

Normal Operating Range. Lower limit is at Gross Weight. Vs at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.

| | | |
|---|---|---|
| Yellow Arc: | _____ | 100-115 mph |

Operations must be conducted with caution and only in smooth air.

| | | |
|---|---|---|
| Red Line: | _____ | 115 mph |

Maximum Speed. Not to be exceeded.





## AIRSPEED LIMITATIONS

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Va – Design Maneuvering Speed: | _____ | 85 mph |
| Vc – Design Cruising Speed: | _____ | 85 mph |
| Vfe – Maximum Flap Extended Speed: (Flaps 20°/30°) | _____ | 80 mph |
| Vle – Maximum Landing Gear Extended Speed: | _____ | None |
| Vlo – Maximum Landing Gear Operating Speed: | _____ | None |
| Vlof – Lift-off Speed: (Flaps 20°) | _____ | 52 mph |
| Vne – Never Exceed Speed: | _____ | 115 mph |
| Vno Maximum Structural Cruising Speed: | _____ | 100 mph |
| Vr – Rotation Speed: (Flaps 20°) | _____ | 50 mph |
| Vso – Stall Speed in Landing Configuration: (Flaps 30°) | _____ | 38 mph |
| Vx – Speed for Best Angle of Climb: (Flaps 20°) | _____ | 65 mph |
| Vy – Speed for Best Rate of Climb: (Flaps 10°) | _____ | 70 mph |
| Best Speed for Approach: (Flaps 10°/20°) | _____ | 70 mph |
| Speed to Raise/Lower Landing Gear in Water: (Engine at Idle) | _____ | Dead Slow |
| Best Approach for Short Field Landing: (Flaps 10°/20°) | _____ | 62 mph |

NOTE: Take-off and landing on water should be done using 20° of flaps under all conditions.

## EXPERIMENTAL-TYPE CATEGORY

This aircraft is accepted in the Experimental Type Category Only.

**Aerobatic maneuvers including spins are not permitted.**

| **WEIGHT LIMITATIONS** | **Test Aircraft** | **(P/A Demo)** |
|---|---|---|
| Maximum Take-off Weight: | _____ | 1370 lbs |
| Maximum Landing Weight: | _____ | 1370 lbs |
| Baggage Compartment Loading<br>Max. Permissible Compartment Load: | _____ | 55 lbs |
| Maximum Occupant Loading<br>Maximum Combined Occupant Load: | _____ | 380 lbs |
| Minimum Occupant Loading<br>Min. Occupant Load to be not less than: | _____ | 116 lbs |

**CENTER OF GRAVITY LIMITATIONS**
Center of Gravity Range

| | | |
|---|---|---|
| Forward Limit Aft of Datum: | _____ | 97.5 in. |
| Rear Limit Aft of Datum: | _____ | 105 in. |

Datum, Test Aircraft: _____

_____

(P/A Demo Datum used above is 70 inches forward of the wing root leading edge.)





## ENGINE LIMITATIONS

Power, Pressure and Temperatures:

| | **Test Aircraft** Minimum | Maximum | **(P/A Demo)** Minimum | Maximum |
|---|---|---|---|---|
| Take-off Power Setting for 5 min. | | | --- | 5,800 rpm |
| Minimum Safe Idling | | | 1,400 rpm | --- |
| Oil Pressure<br>Green Arc<br>22-58 psi | | | 22 psi<br>Red Line | 58 psi<br>Red Line |
| Oil Temp.<br>Green Arc<br>130°-240°F | | | 130° F<br>Red Line | 280° F<br>Red Line |
| Cylinder Head Temperatures | | | --- | 300° F<br>Red Line |

## FUEL LIMITATIONS

| | **Test Aircraft** | **(P/A Demo)** |
|---|---|---|
| Take-off/Climb Configuration<br>Unusable Fuel: | _____ | .5 Gal. |
| Cruise Configuration<br>Unusable Fuel: | _____ | 1.5 Gal. |
| Landing/Descent Configuration<br>Unusable Fuel: | _____ | 3 Gal. |
| Fuel Grades: | _____ | See Engine Manual |

## PLACARDS
The following information must be displayed:

**EXPERIMENTAL AMATEUR BUILT AIRCRAFT** placard (listing Model, Serial No., Date of Manufacture, Empty Weight, Gross Weight, Engine, Horsepower, and Name and Address of Builder) installed in full view either internally or externally. Recommended installation: on center pylon.

**PASSENGER WARNING** placard (stating "This aircraft is amateur built and does not comply with the federal safety regulations for standard aircraft"), installed in full view of passenger. Recommended installation: on instrument panel.

**EXPERIMENTAL** decal installed in full view of passenger. Recommended installation: on lower outboard cockpit tube or floor pan.

## DOCUMENTATION
The following documentation must be carried on aircraft and accessible in the cockpit at all times: The Airworthiness Certificate and the Registration. Recommended: waterproof covering.





## FLIGHT LOAD FACTOR LIMITS

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| **Normal Category** | | |
| Flight Load Factors: | _____ | +3.8g, -1.52g |

Avoid coarse control movements above Va = 80 mph to ensure these limit load factors are not exceeded.

## KINDS OF OPERATION LIMITS
This aircraft is approved for day VFR and may be equipped for night VFR operations.

## OTHER LIMITATIONS

**Flap Limitations**
Flap setting for take-off and landing,
Land & Water, Normal Operations: _____ 20°

**Crosswind Component**
Maximum permissible crosswind
component for take-off and landing: _____ 17 mph

**Smoking**
Smoking is not permitted at any time.

## AIRSPEEDS FOR EMERGENCY OPERATION

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| **Engine Failure After Take-off:** | | |
| Wing Flaps, Up | _____ | 69 mph |
| Wing Flaps, Down 20° | _____ | 64 mph |
| **Landing Without Engine** | | |
| Wing Flaps, Up | _____ | 69 mph |
| Wing Flaps, Down 20° | _____ | 64 mph |

## ENGINE FAILURES

**During Take-off Run**

| | | | |
|---|---|---|---|
| 1. | Throttle | _____ | CLOSE |
| 2. | Brakes | _____ | APPLY |
| 3. | Ignition Switch | _____ | OFF |

**Immediately After Take-off**

| | | | |
|---|---|---|---|
| 1. | Airspeed – Flaps UP | _____ | 69 mph |
| | Airspeed – Flaps DOWN | _____ | 64 mph |
| 2. | Fuel | _____ | OFF |
| 3. | Ignition Switch | _____ | OFF |
| 4. | Wing Flaps | _____ | AS REQ'D |

**Other Procedures:**

a. If sufficient runway/strip/waterway is available, lower the nose sufficiently to maintain speed and make a normal landing straight ahead.

b. If over the airport boundary and/or in a position where obstacles are in the path of the aircraft and height permits, a slight change in heading may be made to line up on the most suitable landing area.

c. If time permits, carry out the engine failure checks listed on Page 3.2 – *Initial Checks*.

**During Flight**

| | | | |
|---|---|---|---|
| 1. | Airspeed | _____ | 69 mph |
| 2. | Fuel (Troubleshoot) | _____ | CHECK ON |
| 3. | Electric Fuel Pump, if installed | _____ | ON |
| 4. | Ignition Switch – If Propeller is stopped | _____ | START |





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## FORCED LANDINGS

### Emergency Landing Without Engine Power

| | | Test Aircraft | (P/A Demo) |
|---|---|---|---|
| 1. | Airspeed | _____ | 69 mph |
| 2. | Fuel | _____ | OFF |
| 3. | Ignition Switch | _____ | OFF |
| 4. | Radio, if available | _____ | Transmit Distress Call |
| 5. | Transponder, if available | _____ | Set code 7700 |
| 6. | Wing Flaps | _____ | 20° |
| 7. | Sliding Canopies | _____ | Unlatched, Partially Open |
| 8. | Touchdown | _____ | LAND-Brake hard |
| | | _____ | WATER – As normal, if short, back stick |

**Other procedures:**

a. Convert any excess speed to height and at the same time perform the checks listed on Page 3.2, *Initial Checks*.
b. Place the aircraft at optimum gliding angle/attitude/speed.
c. Select the most suitable field/waterway, bearing in mind height above the ground, wind speed and direction and the availability of assistance after landing.
d. Plan descent in relation to the selected field/waterway – aiming to reach a base leg position – as for a normal glide approach.
e. Keeping within easy gliding distance of the field/waterway, carry out the *Troubleshoot* on Page 3.2, *Initial Checks*.
f. If the engine cannot be restarted, continue as planned, brief the passenger and send distress signal, if radio is available.
g. During descent, use flaps intelligently. Aim to have 10° of flap on base leg – use 20° when you are sure of making the field/waterway – turn off all fuel and electrical switches at a time early enough not to interfere with concentration over the final stages of the emergency landing. Refer to Page 3.2, *Safety Check*.

Note: If intending to use the aircraft radio for communication, make a thorough inspection to ensure that no fuel is spilled that would be likely to cause a fire if the electrical circuits are reactivated.





### Restarting The Engine in Flight

General – It is unlikely that the engine will stop during normal maneuvers. However, in the event of the engine stopping in flight the following procedures will normally allow the engine to be restarted without problems.

### Using Starter Motor

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| 1. Throttle | _____ | OPEN ½" |
| 2. Fuel | _____ | CHECK ON |
| 3. Electric Fuel Pump, if Installed | _____ | ON |
| 4. Master Switch | _____ | ON |
| 5. Ignition | _____ | BOTH L & R ON |
| 5. Starter | _____ | Turn Key & Start |

**CAUTION**

Because of the high compression ratio of the Rotax four-cycle engines, the propeller will not windmill, even in a steep dive. If the engine cannot be restarted by using the starter motor, carry out the procedure as set out in "*Emergency Landing Without Power*" on Page 3.3.

### Engine Failure Checks

### Initial Check

Fuel ON – Check contents – Fuel filter bowl, if installed.

**Troubleshoot**

1. Fuel ON – Contents sufficient
2. Oil pressure & temperature normal
3. Switches – Both ON – Check L & R Ignition
4. Throttle checked for operation – Open

**Safety Check**

1. Brakes OFF
2. Switches, Ignition and Master OFF
3. Fuel OFF
4. Harness secure – All occupants
5. Canopies/Hatches set for landing
6. Undercarriage – set for landing

## FIRE

### Action in the Event of Fire
General – due to the high octane fuel carried by the aircraft, there is always the possibility of a violent explosion occurring if an aircraft catches fire. Personnel are therefore warned not to take undue risks in attempting to save an aircraft which is obviously well alight. A small fire extinguisher is only meant to be used on small fires. For large fires, trained personnel with appropriate equipment are required.

### Engine Fire on the Ground
| | | |
|---|---|---|
| 1. | Throttle | CLOSED |
| 2. | Ignition | OFF |
| 3. | Fuel | OFF |
| 4. | Master Switch | OFF |
| 5. | Evacuate the aircraft | |
| 6. | Use fire extinguishers as applicable. | |

### Engine Fire In Flight
Engine Fire – Symptoms confirmed – Shut Down Immediately

| | | |
|---|---|---|
| 1. | Throttle | CLOSED |
| 2. | Ignition | OFF |
| 3. | Fuel | OFF |
| 4. | Landing | Plan EMERGENCY descent and landing |
| 5. | Radio, if available | TRANSMIT MAYDAY CALL |
| 6. | Emergency landing | Refer to Page 3.2, *Safety Check* |

### Electrical Fire In Flight
| | | |
|---|---|---|
| 1. | Master Switch | OFF |
| 2. | Troubleshoot | Identify and Isolate Faulty Circuit |
| 3. | Canopy | CLOSED |
| 4. | Fire Extinguisher | ACTIVATE (if available) |

**WARNING:** After discharging extinguisher within closed cabin, open sliding canopies to ventilate cabin.

5. Carry out an emergency landing at the nearest appropriate airport/waterway or landing ground.
6. If the fire persists, sideslip away from the flames. Instruct the passenger as necessary and proceed to an early landing.

### Electrical Power
Do not turn the generator (if installed) off in flight, except in an emergency.





### Precautionary Landing With Engine Power
In the event of a landing having to be made by virtue of deteriorating weather conditions, or for any reason where it is impossible to continue a flight and where no engine malfunction has occurred, proceed as follows:

| | | Test Aircraft | (P/A Demo) |
|---|---|---|---|
| 1. | Airspeed | _____ | 69 mph |
| 2. | Wing Flaps | _____ | 20° |

### Other Procedures:
a. Aim to land the aircraft at the nearest airfield/waterway or authorized landing ground, suitable for the type.
b. If worsening flying conditions make this impossible or a proper landing ground is unavailable, select the largest and best open area for landing (as close as possible to habitation).
c. Where any area other than a recognized airport or waterway is to be used, make dummy runs over the selected approach and landing path. The dummy runs should be flown at various heights where possible. Never carry out dummy runs up and down sloping terrain, always fly across the slope.
d. Where appropriate, carry out a short field landing.

### Ditching
| | | |
|---|---|---|
| 1. | Landing Gear: | UP POSITION |
| 2. | Radio, if available: | TRANSMIT DISTRESS CALL |
| 3. | Transponder, if available: | SQUAWK 7700 |
| 4. | Baggage, etc.: | SECURE OR JETTISON |
| 5. | Approach: | HIGH WINDS/HEAVY SEAS – Into Wind<br>LIGHT WINDS/HEAVY SWELL – Parallel to swell |
| 6. | Wing Flaps: | 20° |
| 7. | Power: | 100 FT/MIN DESCENT AT 60 MPH |
| 8. | Passenger | Brief – Headset, Seat Belts, Canopy, Orientation, Cockpit Exit, Life Jacket/Raft, Face Protection, Clothing |

## ROUGH ENGINE OPERATION OR LOSS OF POWER

### Carburetor Icing
A gradual loss of RPM and eventual engine roughness may result from the formation of carburetor ice. If carburetor heat is available: To clear the ice, apply full throttle and pull the carburetor heat knob full out until the engine runs smoothly. Then remove the carburetor heat and adjust the throttle.

### Spark Plug Fouling
A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled. This may be verified by turning the ignition switch from BOTH to either L or R position. An obvious power loss in a single ignition operation is evidence of spark plug trouble.

### Low Oil Pressure
If low oil pressure is accompanied by normal oil temperature, there is a possibility the oil pressure gauge or relief valve is malfunctioning. If the condition persists a landing at the nearest airport would be advisable to inspect the source of trouble.

If a total loss of oil pressure is accompanied by a rise in oil temperature, there is every reason to suspect an engine failure is imminent. Reduce engine power immediately and select a suitable forced landing field, using only the minimum amount of power application to carry out the landing.

## SPINS

## DELIBERATE SPINS ARE PROHIBITED
If an inadvertent spin is encountered, proceed as follows:

| | | |
|---|---|---|
| 1. | Throttle | CLOSED |
| 2. | Ailerons | NEUTRAL |
| 3. | Spin Direction | IDENTIFY |
| 4. | Rudder | FULL OPPOSITE to direction of spin |
| 5. | Stick | Progressively forward until rotation ceases |
| 6. | When rotation ceases | Level wings and recover from dive |





## ICING

### Inadvertent Icing Encounter
1. Turn pitot heat switch ON if installed.
2. Alter course or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Open throttle to increase engine speed and minimize ice buildup on propeller blades.
4. Watch for signs of carburetor icing and apply carburetor heat, if installed, as necessary. Loss in engine RPM could be caused by carburetor ice buildup.
5. If airframe ice formation is rapid or buildup is significant, plan a landing at the nearest airport.
6. Be prepared for a higher stall speed.
7. With ice buildup, make faster landing approach, 69-75 mph.

## ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

### Ammeter Shows Excessive Rate of Charge

| | | |
|---|---|---|
| 1. | Generator | OFF |
| 2. | Generator C/Breaker | PULL OFF |
| 3. | Avionics & High Load Equipment | OFF |
| 4. | Flight | TERMINATE |

### Generator "Out" Light (if fitted) Illuminates During Flight – Ammeter Indicates Discharge

| | | |
|---|---|---|
| 1. | Non-essential Equipment | OFF |
| 2. | Generator C/Breaker | CHECK – IN |
| 3. | Master Switch | OFF |
| 4. | Master Switch | ON |
| 5. | Low Voltage Light | CHECK OFF |
| 6. | Avionics & Equipment | TURN ON AGAIN |

**If low voltage light illuminates again:**

| | | |
|---|---|---|
| 7. | Generator | OFF |
| 8. | All Non-essential Equipment | OFF |
| 9. | Flight | TERMINATE |

# SECTION 4 – NORMAL PROCEDURES

This Section contains essential information relating to performance and handling characteristics for conducting normal operation of the aircraft.

## SPEEDS FOR NORMAL OPERATIONS

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Va – Design Maneuvering Speed: | _____ | 85 mph |
| Vc – Design Cruising Speed | _____ | 85 mph |
| Vfe – Maximum Flap Extended Speed: (Flaps 20°/30°) | _____ | 80 mph |
| Vle – Maximum Landing Gear Extended Speed: | _____ | None |
| Vlo – Maximum Landing Gear Operating Speed: | _____ | None |
| Vlof – Lift-off Speed: (Flaps 20°) | _____ | 52 mph |
| Vne – Never Exceed Speed: | _____ | 115 mph |
| Vno Maximum Structural Cruising Speed: | _____ | 100 mph |
| Vr – Rotation Speed (Flaps 20°): | _____ | 50 mph |
| Vso – Stall Speed in Landing Configuration: (Flaps 30°) | _____ | 38 mph |
| Vx – Speed for Best Angle of Climb (Flaps 20°): | _____ | 65 mph |
| Vy – Speed for Best Rate of Climb (Flaps 10°): | _____ | 70 mph |
| Best Speed for Approach (Flaps 10°/20°): | _____ | 70 mph |
| Speed to Raise/Lower Landing Gear in Water: (Engine at Idle) | _____ | Dead Slow |
| Best Approach for Short Field Landing: (Flaps 10°/20°) | _____ | 62 mph |

NOTE: Take-off and landing on water should be done using 20° of flaps under normal conditions.



SECTION 4 – NORMAL PROCEDURES

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## DAILY PREFLIGHT INSPECTION

### 1. Cockpit & Forward Fuselage

| | | Test Aircraft | (P/A Demo) |
|---|---|---|---|
| 1. | Flight Manual & Aircraft Documentation | _____ | AVAILABLE |
| 2. | Control Lock (if fitted) | _____ | REMOVE |
| 3. | Ignition Switch | _____ | OFF |
| 4. | Master Switch | _____ | ON |
| 5. | Fuel Quantity Visual Quantity & Gauge | _____ | CHECK |
| 6. | Electric Trim Operation | _____ | CHECK |
| 7. | Bilge Pump Operation & Hull Water - Drain Any Accumulated Water | _____ | CHECK |
| 8. | Master Switch | _____ | OFF |
| 9. | Carburetor Heat Actuation (if fitted) | _____ | FREE |
| 10. | Undercarriage Overcenter | _____ | LOCKED |
| 11. | Flight Control Full & Free Movement | _____ | CHECK |
| 12. | Aileron Push Rods, Bolt Ends & Cables | _____ | SECURE |
| 13. | Fuel Filter/Glass Bowl-Leaks, Contamination | _____ | CHECK |
| 14. | Check Fuel for Contamination if Fitted with Fuel Drain or Gascolator | _____ | N/A |
| 15. | Instruments Free of Damage & Secure | _____ | CHECK |
| 16. | Static Ports Clear of Blockage & Obstruction | _____ | CHECK |
| 17. | Windshield Cracks & Clean | _____ | CHECK |
| 18. | Seat Belts, Inertia Reels Secure & Functional | _____ | CHECK |
| 19. | Hull Sides & Underside Free of Damage | _____ | CHECK |

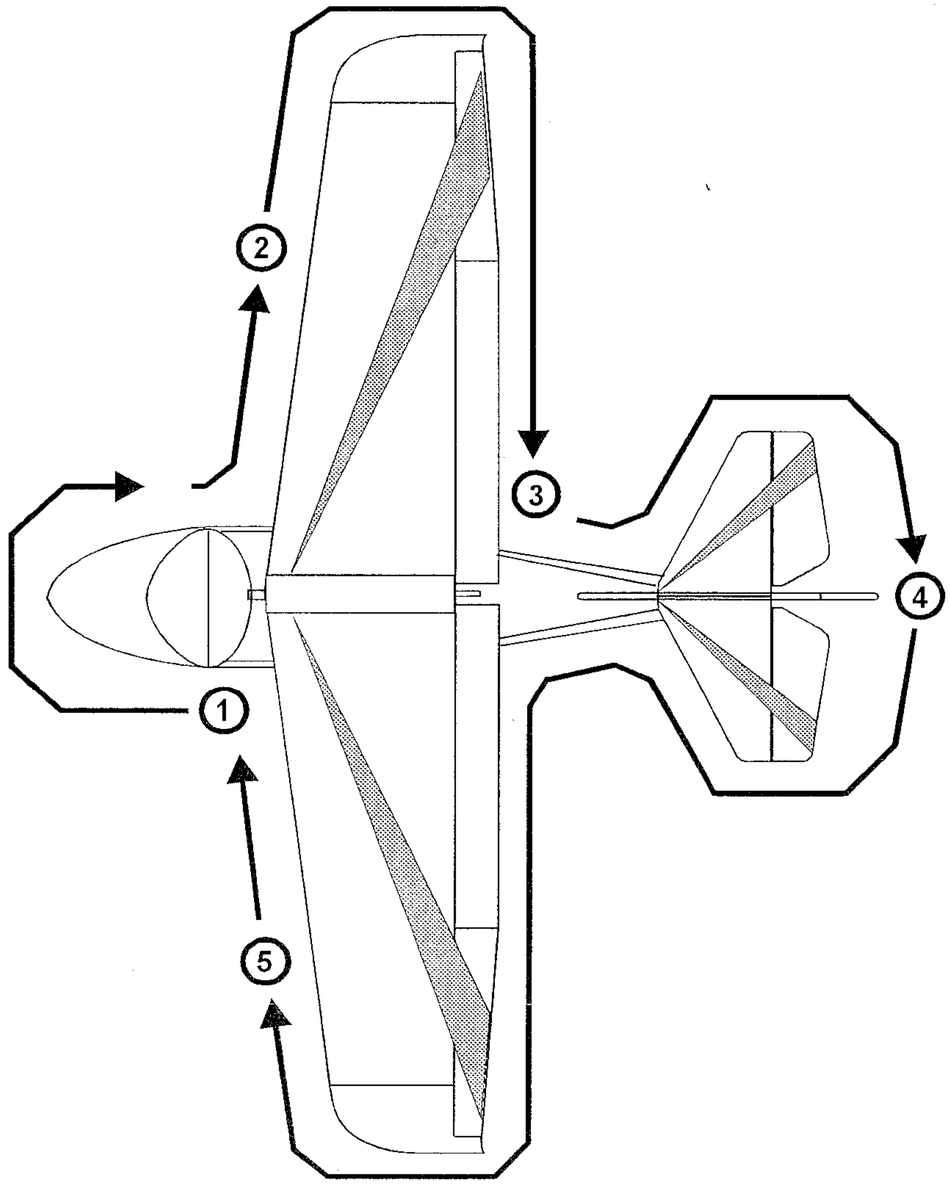
### 2. Starboard Wing

| | | | |
|---|---|---|---|
| 1. | Starboard Tire Inflation, Condition, Attachment | _____ | CHECK |
| 2. | Lower Strut/Fuselage Attachment Bolts | _____ | SECURE |
| 3. | Outer Strut & Jury Strut Attachment | _____ | SECURE |
| 4. | Wing Float, Braces & Secure Attachment | _____ | CHECK |
| 5. | Aileron Outer Push-Pull Rod Attachment | _____ | SECURE |
| 6. | Aileron Movement | _____ | FREE |
| 7. | Flap & Push-Pull Attachment | _____ | SECURE |
| 8. | Wing to Aft Fuselage Brace Cable | _____ | SECURE |
| 9. | Wing Tie-Down | _____ | REMOVE |





## AIRCRAFT SKETCH – PREFLIGHT INSPECTION



## COCKPIT SECURITY

Before starting the engine and conducting any operation, ensure that all articles and equipment are stowed safely and secured.

This is of particular importance in the event of any object exiting the cockpit, which could cause damage to the propeller because of the pusher configuration of this aircraft.

## BEFORE STARTING ENGINE

| | | Test Aircraft | (P/A Demo) |
|---|---|---|---|
| 1. | Preflight Inspection | _____ | Complete |
| 2. | Pull Through Prop – Minimum 2 Revolutions | _____ | Complete |
| 3. | Seat Belts & Shoulder Harnesses Adjusted | _____ | CHECK |
| 4. | Fuel Selector Valve | _____ | ON |
| 5. | All Radio Equipment & Avionics Power | _____ | OFF |
| | CAUTION – Damage to avionics equipment can occur during engine start if avionics are left on. | | |
| 6. | Brakes or Chocks as Required | _____ | SET |
| 7. | Circuit Breakers In | _____ | CHECK |

## STARTING ENGINE

| | | | |
|---|---|---|---|
| 1. | Master Switch | _____ | ON |
| 2 | Prime (none if engine warm) | _____ | AS REQD |
| 3. | Electric Fuel Pump, if Fitted | _____ | ON |
| 4. | Throttle ½" approx. | _____ | OPEN |
| 5. | Propeller Area | _____ | CLEAR |
| 6. | Ignition Switch to Both Position, then | _____ | START |
| 7. | Oil Pressure | _____ | CHECK |
| 8. | Radio & Electrical Equipment as Required | _____ | ON |





## DAILY PREFLIGHT INSPECTION, CONTINUED

### 3. Engine

| | | Test Aircraft (P/A Demo) | |
|---|---|---|---|
| 1. | Oil Level (Run engine 3 min prior to checking) | _____ | CHECK |
| 2. | Propeller – Nicks, Cracks & Security | _____ | CHECK |
| 3. | Carburetor Attachment & Induction System | _____ | SECURE |
| 4. | All Pipes & Hoses – Leakage, Wear & Security | _____ | CHECK |
| 5. | Exhaust & Muffler Springs, Cracks, Attachment | _____ | CHECK |
| 6. | Coolant Level & Color | _____ | CHECK |
| 7. | Engine Mounts | _____ | SECURE |
| 8. | Electrical Cables – Wear & Security | _____ | CHECK |

### 4. Empennage

| | | | |
|---|---|---|---|
| 1. | Stabilizer Leading Edge Trim Attachment | _____ | CHECK |
| 2. | Elevator Push-Pull Tubes & Horn Attachment | _____ | CHECK |
| 3. | Elevators & Rudder – Free Movement, Security | _____ | CHECK |
| 4. | Upper & Lower Tail Cables | _____ | SECURE |
| 5. | Tail Wheel for Inflation & Wear | _____ | CHECK |
| 6. | Tail Tie-Down | _____ | REMOVE |

### 5. Port Wing

In addition to carrying out checks as for the Starboard Wing:

| | | | |
|---|---|---|---|
| 1. | Fuel Cap Securely Attached | _____ | CHECK |
| 2. | Pitot Tube Clear of Obstruction-Cover Removed | _____ | CHECK |

## BEFORE TAKE-OFF

Test Aircraft (P/A Demo)

| | | | |
|---|---|---|---|
| 1. | Hatches as Required (closed but not locked during water operation) | _____ | CHECK |
| 2. | Seat Belts & Shoulder Harness On | _____ | SECURE |
| 3. | Trim – Full Up for Take-off | _____ | SET |
| 4. | Fuel – Double Check | _____ | ON |
| 5. | Electric Fuel Pump, if Fitted | _____ | ON |
| 6. | Flaps - 20° | _____ | SET |
| 7. | Engine Run Up 3500 RPM | _____ | COMPLETE |
| | L & R Ignition - RPM drop-not less than 300 | _____ | CHECK |
| | Carb Heat, if fitted – note RPM drop | _____ | CHECK |
| | Engine Instruments (Temps) & Ammeter | _____ | CHECK |
| | Minimum Oil Temperature 130 ° F | _____ | CHECK |
| 8. | Throttle Reduced to Idle | _____ | 1700 RPM |
| 9. | Radios Frequencies etc., if Fitted | _____ | SET |
| 10. | Transponder (if fitted) | _____ | SET |
| 11. | Strobe Lights (if fitted) | _____ | ON |
| 12. | Clearance | _____ | AS REQD |

## BEFORE TAKE-OFF – (ADDITION FOR WATER OPERATION)

| | | | |
|---|---|---|---|
| 1. | Undercarriage UP & LOCKED | _____ | CHECK |
| 2. | Bilge Pump | _____ | ON/OFF |

## TAKE-OFF

| | | | |
|---|---|---|---|
| 1. | Throttle Maximum 5800 RPM | _____ | OPEN |
| 2. | LAND ONLY: Elevator Control Forward to Lift Tail | _____ | AS REQD |
| 3. | Lift Off | _____ | 46-52 mph |
| 4. | Accelerate to | _____ | 65 mph |
| 5. | Climb Out and When Established Retract Undercarriage (Ground Operation) | _____ | COMPLETE |
| 6. | At Safe Height Reduce Flaps to 10° | _____ | |

## ENROUTE CLIMB

| | | | |
|---|---|---|---|
| 1. | Airspeed | _____ | 63 mph |
| 2 | Throttle | _____ | 5500 RPM |
| 3. | Flaps Set | _____ | UP |
| 4. | Fuel Pump | _____ | OFF |

## CRUISE

| | | | |
|---|---|---|---|
| 1. | Throttle As Required | _____ | 4900 –5200 rpm |
| 2. | Speed | _____ | 80-90 mph |
| 3. | Trim | _____ | AS REQD |





## DESCENT

Test Aircraft (P/A Demo)

| | | | |
|---|---|---|---|
| 1. | Fuel Contents | _____ | CHECK |
| 2. | Throttle Set | _____ | AS REQD |
| 3 | Carb Heat to Prevent Icing | _____ | AS REQD |

## BEFORE LANDING – DOWN WIND CHECK

| | | | |
|---|---|---|---|
| 1. | Canopies Closed but Not Locked | _____ | CHECK |
| 2. | Seat Belts & Shoulder Harnesses | _____ | SECURE |
| 3. | Carburetor Heat (if fitted) | _____ | AS REQD |
| 4. | Fuel Contents | _____ | CHECK |
| 5. | Fuel Pump | _____ | ON |
| 6. | Undercarriage for GROUND LANDING | _____ | **DOWN** |
| | Over Center Lock | _____ | CHECK |
| | Undercarriage for WATER LANDING | _____ | **UP** |
| | Over Center Lock | _____ | CHECK |
| 7. | Flaps Set | _____ | 10° |

## LANDING – LAND OPERATIONS

| | | | |
|---|---|---|---|
| 1. | Airspeed Approach | _____ | 65-75 mph |
| 2 | Flaps Set | _____ | 20° |
| **3.** | **Undercarriage – DOUBLE CHECK** | _____ | **DOWN** |
| 4. | Touchdown | _____ | 46-52 mph |

## LANDING – WATER OPERATIONS

| | | | |
|---|---|---|---|
| 1. | Airspeed Approach | _____ | 65-75 mph |
| 2 | Flaps Set | _____ | 20° |
| **3.** | **Undercarriage – DOUBLE CHECK** | _____ | **UP** |
| 4. | Canopies Closed But Not Locked | _____ | CHECK |
| 5. | Touchdown – CARE in Glassy Water Conditions | _____ | 46-52 mph |

## AFTER LANDING

| | | | |
|---|---|---|---|
| 1. | Wing Flaps | _____ | UP |
| 2. | Fuel Pump | _____ | OFF |
| 3. | Strobe Lights | _____ | AS REQD |

SECTION 5 – PERFORMANCE

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### AFTER LANDING – Water Operations – Docking & Beaching

In the case of Docking or Beaching the following points are recommended to assist in effective & safe operation.

| | | Test Aircraft (P/A Demo) |
|---|---|---|
| 1. | Radio | _____ OFF |
| 2. | Headsets | _____ REMOVE |
| 3. | Seat Belts & Harnesses | _____ RELEASE |
| 4. | Undercarriage DOWN/UP & LOCKED | _____ AS REQD |
| 5. | Canopies | _____ OPEN |
| 6. | Ropes | _____ READY |
| 7. | Ignition – When Required | _____ OFF |
| 8. | Master Switch | _____ OFF |

### SHUT DOWN

| | | |
|---|---|---|
| 1. | Radio | _____ OFF |
| 2. | All Electrical Equipment | _____ OFF |
| 3. | Ignition Switch | _____ OFF |
| 4. | Master Switch | _____ OFF |

### SECURING AIRCRAFT

| | | |
|---|---|---|
| 1. | All Radio & Electrical Equipment | _____ OFF |
| 2. | Ignition Switch | _____ OFF |
| 3. | Master Switches | _____ OFF |
| 4. | Controls Tethered with Seat Belt | _____ SECURE |
| 5. | Canopies | _____ LOCKED |
| 6. | Pitot Tube Cover | _____ FITTED |
| 7. | Chocks | _____ LOCATED |
| 8. | Tie-Downs | _____ SECURE |
| 9. | Cockpit/Engine Covers Fitted | _____ AS REQD |

## TAKE-OFF PERFORMANCE CHART – TEST AIRCRAFT

| **Pressure Altitude – 0 Feet** | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| **Pressure Altitude – 2,500 Feet** | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| **Pressure Altitude – 5,000 Feet** | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| **Pressure Altitude – 7,500 Feet** | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |





## PERFORMANCE CHARTS – INTRODUCTION

The charts in this Section contain data establishing runway and waterway lengths for take-off, landing and climb performance at a gross weight of 1370 lbs.

## TAKE-OFF PERFORMANCE – GENERAL

The maximum gross weight for take-off shall not exceed the maximum take-off weight specified in Section 2 of this Manual.

The take-off distance (ground run in feet) with full throttle, flaps deflected 20° and a take-off safety speed of 50 mph can be determined from the following chart. The take-off distances are for a hard surface runway and/or waterway. Soft ground and/or wet grass will increase the land take-off distance and pilots should satisfy themselves that adequate runway is available to cover these conditions.

The take-off distance can be read from the table, at the appropriate values of pressure altitude and outside air temperature. For values of temperature and altitude not listed, interpolation between the values in the table is permitted.

**Ground Take-off:** Before commencing the take-off roll, check that the gear is in the fully "down" and locked position. To do this check that the over center lock indicator is in the full forward position. After take-off retract the gear only after the take-off safety speed is reached and the aircraft is established in the climb.

**Water Take-off:** The aircraft may be taxied slowly in the water with the gear in the down position, when transitioning from land or water. Check that the gear is retracted before commencing the take-off run.

## CLIMB PERFORMANCE

The climb performance can be determined from the following chart. This chart assumes that maximum take-off power is used.

### CLIMB PERFORMANCE CHART

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Altitude Feet | ROC f.p.m. | ROC f.p.m. |
| O | _____ | 400 |
| 1,000 | _____ | 373 |
| 2,000 | _____ | 348 |
| 3,000 | _____ | 323 |
| 4,000 | _____ | 299 |
| 5,000 | _____ | 276 |
| 6,000 | _____ | 254 |
| 7,000 | _____ | 233 |
| 8,000 | _____ | 212 |
| 9,000 | _____ | 192 |
| 10,000 | _____ | 173 |
| 11,000 | _____ | 154 |
| 12,000 | _____ | 137 |
| 13,000 | _____ | 120 |
| 14,000 | _____ | 104 |

Note: Climb Data is for Standard Atmospheric Conditions.
i.e. 59° F and 29.92 H.g.





### SAMPLE TAKE-OFF PERFORMANCE CHART – (P/A DEMO)

| Pressure Altitude – 0 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 522 | 312 | 155 | 546 | 326 | 163 |
| Distance to 50 Feet | 1078 | 742 | 459 | 1128 | 776 | 480 |

| Pressure Altitude – 2,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 683 | 408 | 203 | 714 | 427 | 213 |
| Distance to 50 Feet | 1411 | 970 | 600 | 1476 | 1015 | 628 |

| Pressure Altitude – 5,000 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 906 | 541 | 270 | 948 | 566 | 282 |
| Distance to 50 Feet | 1872 | 1287 | 796 | 1958 | 1347 | 833 |

| Pressure Altitude – 7,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 1237 | 739 | 368 | 1294 | 773 | 385 |
| Distance to 50 Feet | 2555 | 1757 | 1087 | 2673 | 1839 | 1137 |

## LANDING PERFORMANCE – GENERAL

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Minimum Approach Speed<br>20° Flap | _____ | 58 mph |
| Normal Approach Speed:<br>20° Flap | _____ | 63 – 69 mph |

The landing distances (ground run in feet) that appear in the chart have been calculated by using the gross weight of 1370 lbs.

The landing distance can be read from the table, at the appropriate values of pressure altitude and outside air temperature. For values of temperature and altitude not listed, interpolation between the values in the table is permitted.

These distances are derived using the above minimum approach speed with 20° of flap and engine at idle. After touchdown maximum braking is used to bring the aircraft to a stop. These distances are for a hard level surface. Wet and/or slippery surfaces will increase these distances and pilots should satisfy themselves that adequate runway length is available to cover these conditions.

In the case of water landings, full reduction of power after touchdown and application of full up elevator below 25 mph will result in best speed reduction and reduced landing distance covered.

**Ground Landing:** Check that the gear is fully extended in the "down" and locked position. To do this, check that the over center lock indicator is in the full forward position. In the event that the gear cannot be extended, use a grass runway and land the aircraft on the hull. Minimal damage will result.

**Water Landing:** Check that the gear is fully retracted and locked in the "up" position.

Note: In the interest of safety and good airmanship, pilots should include in the pre-landing check schedule, the habit of double-checking the undercarriage for correct position, particularly when carrying out water landings. This practice is of particular importance.





## CLIMB PERFORMANCE

The climb performance can be determined from the following chart. This chart assumes that maximum take-off power is used.

### CLIMB PERFORMANCE CHART

| | Test Aircraft | (P/A Demo) |
|---|---|---|
| Altitude<br>Feet | ROC<br>f.p.m. | ROC<br>f.p.m. |
| O | _____ | 400 |
| 1,000 | _____ | 373 |
| 2,000 | _____ | 348 |
| 3,000 | _____ | 323 |
| 4,000 | _____ | 299 |
| 5,000 | _____ | 276 |
| 6,000 | _____ | 254 |
| 7,000 | _____ | 233 |
| 8,000 | _____ | 212 |
| 9,000 | _____ | 192 |
| 10,000 | _____ | 173 |
| 11,000 | _____ | 154 |
| 12,000 | _____ | 137 |
| 13,000 | _____ | 120 |
| 14,000 | _____ | 104 |

Note: Climb Data is for Standard Atmospheric Conditions.
i.e. 59° F and 29.92 H.g.

## SAMPLE LANDING PERFORMANCE CHART – (P/A DEMO)

| Pressure Altitude – 0 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 655 | 438 | 265 | 685 | 459 | 277 |
| Distance to 50 Feet | 1492 | 1123 | 798 | 1522 | 1144 | 810 |

| Pressure Altitude – 2,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 718 | 480 | 290 | 751 | 503 | 304 |
| Distance to 50 Feet | 1555 | 1165 | 823 | 1588 | 1187 | 836 |

| Pressure Altitude – 5,000 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 787 | 527 | 319 | 824 | 551 | 333 |
| Distance to 50 Feet | 1624 | 1212 | 851 | 1661 | 1236 | 866 |

| Pressure Altitude – 7,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | 856 | 579 | 350 | 905 | 606 | 366 |
| Distance to 50 Feet | 1702 | 1264 | 883 | 1742 | 1291 | 899 |





## LANDING PERFORMANCE CHART – TEST AIRCRAFT

| Pressure Altitude – 0 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| Pressure Altitude – 2,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| Pressure Altitude – 5,000 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

| Pressure Altitude – 7,500 Feet | | | | | | |
|---|---|---|---|---|---|---|
| | 59° F. OAT | | | 86° F. OAT | | |
| Wind – mph | 0 | 10 | 20 | 0 | 10 | 20 |
| Ground Roll – Feet | | | | | | |
| Distance to 50 Feet | | | | | | |

## WEIGHT AND BALANCE INFORMATION

All aircraft are structurally and aerodynamically engineered for certain load conditions which result from specific weights and forces anticipated to occur in normal operations within its specified flight envelope. An aircraft's handling qualities and structural integrity may be seriously compromised if the weight and balance limits are exceeded in normal operations.

It is the pilot's responsibility to make sure the weight and balance limits are not exceeded as to weight, its location, distribution and security prior to any flight.

## DEFINITIONS

**EMPTY WEIGHT:** The actual weight of the individual aircraft, including the structure, power plant, fixed equipment, any fixed ballast, unusable (in-flight) fuel, lubricants and coolant.

Original Empty Weight is determined by actually weighing the new aircraft before it is flown.

Any time a major alteration, modification, or repair is performed on the aircraft, its new Empty Weight must be determined by either weighing the aircraft again, or by accurate calculation of the weight changes and their effect on Empty Weight Center of Gravity (EWCG) location.

A major alteration or modification results from the addition, deletion, or redistribution of existing equipment and accessories, or from a repair which results in a significant increase of weight of the airframe or engine. For example, addition or removal of battery, radios, installation of a larger fuel tank or engine, painting the airframe, installation of heavier wheels and tires, etc.

**GROSS WEIGHT:** The maximum total weight for which an aircraft's structure and performance have been approved for normal operations by its manufacturer. It is the maximum weight (Empty Weight plus useful load) at which an aircraft can be safely operated. Maximum take-off weight must never exceed the published Gross Weight.

**USEFUL LOAD:** The total amount of weight available for pilot, passengers, baggage, cargo and in-flight usable fuel.

**MAXIMUM/MINIMUM WEIGHTS:** Due to certain balance, structural and aerodynamic considerations, sometimes a maximum or minimum weight may be specified for certain locations on the aircraft.

**CENTER OF GRAVITY (C.G.):** A point along an aircraft's longitudinal axis at which all the loads and forces are perfectly concentrated and balanced.





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## PROCEDURE

All permanent equipment, options and accessories should be installed on the aircraft prior to weighing. All equipment options and accessories installed in the aircraft must be listed on the "installed Equipment List". That list becomes part of Weight and Balance Documents.

Be sure to remove any loose equipment, tools, etc. from the aircraft prior to weighing.

The fuel tank should be empty except for unusable fuel. If the fuel tank is not empty, then the exact amount of usable fuel in the tank must be determined. Usable fuel weight and its moment must be deducted from the empty weight calculations before E.W.C.G. can be accurately determined.

Oil and coolant tanks and reservoirs must be properly filled before weighing. These and any other liquids necessary for normal operations are considered part of an aircraft's empty weight.

If weighing id done outdoors, make sure there is no wind to affect the weight measurements. For best results, weigh indoors.

The scales must be calibrated correctly. All scales must be set on level ground.

Any equipment placed on the scales when weighing the aircraft, such as chocks or blocks, should be weighed separately and the weight deducted from the scale reading. These weights should be noted for reference, if necessary.

The aircraft must be weighed in a level flight attitude, both longitudinally (front to back) and laterally, as shown in the Weight and Balance Data Sheet.

Place a scale under each wheel of the aircraft. Record the weight of each scale on the "Empty Weight and Balance Form", as shown in the Weight and Balance Data Sheet.

Measure the exact horizontal distance from the datum line to center of spindles of wheel axles, as shown in Figure 2. Record these measurements on the Empty Weight and Balance Form.

If only one scale is used for weighing, be sure to level the wheels not being weighed before taking the scale readings. Remember, the aircraft must be in proper level flight attitude to ensure accuracy.





**CENTER OF GRAVITY RANGE:** The horizontal distance, along an aircraft's longitudinal axis, within which an aircraft has been found to be fully maneuverable at all specified design speeds, weights and loading configurations. All aircraft are designed to operate within a specific center of gravity range.

**MAXIMUM FORWARD/MAXIMUM AFT C.G. LOCATIONS:** Every aircraft has specified a forward most and rear most center of gravity location, along its longitudinal axis. These center of gravity location limits are given from a convenient reference (datum) on the aircraft.

**DATUM:** A convenient reference point along the longitudinal axis of an aircraft from which all horizontal measurements are taken.

**WEIGHT:** Actual individual weight of each item such as airframe, persons, fuel, baggage, cargo, etc., in pounds or kilograms.

**ARM:** Horizontal distance, along the longitudinal axis, measured between centroids of an object in the aircraft and the datum line.

**MOMENT:** Obtained by multiplying the weight of an item by its arm.

**INSTALLED EQUIPMENT:** All optional accessories and equipment permanently installed on an airframe or engine at the time of weighing. These items must be listed in the "List of Installed Equipment". Additions and deletions must be noted in the list each time they are made and new weight and balance calculations performed to determine the magnitude and effect of weight change. Ballast, if permanently installed, must also be listed.

**BALLAST:** A specific amount of weight attached in a specific location, which can be temporarily or permanently installed in an aircraft, to help bring its center of gravity within the required limits. If temporary ballast must be used for certain operations, the exact amount and its location must be placarded on the instrument panel within clear view of the pilot. The use of ballast increases empty weight and reduces useful load.

**LOADING CHART:** Used to calculate the actual center of gravity location of a ready to fly aircraft. Care must be taken not to exceed the maximum/minimum weight and balance limits stipulated for the aircraft. These limits are determined by structural, stability and control considerations of a particular design.

Sometimes it is necessary to adjust or reduce fuel, cargo, or passenger weights to remain at or below maximum allowable gross weight. A temporary or permanent ballast is sometimes necessary to bring the C.G. within specified limits. However, the maximum allowable gross weight should not be exceeded under any circumstances.