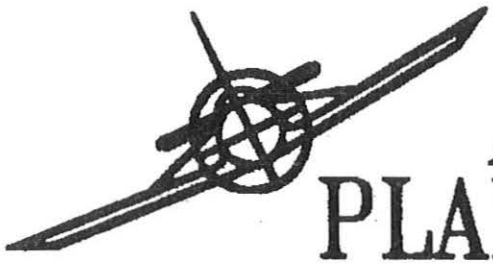


AIR PLAINS SERVICES
we sell performance

PO BOX 541
Wellington, KS 67152

# FAA APPROVED
# AIRPLANE FLIGHT MANUAL SUPPLEMENT

## Document No: R1820910 Rev. A

**FOR CESSNA**
**R18200584 and Subs.**
**TR18200584 and Subs.**

Reg. No._____
Serial. No. _____

This Airplane Flight Manual Supplement (AFM) applies to airplane noted above when a Lycoming IO-540 engine and a Hartzell HC-C3YR-1RF/8468A-6R propeller are installed on a Cessna R182 or TR182 aircraft in accordance with Supplemental Type Certificate (STC) No. **SA00861WI.**

The information herein supplements or supersedes the information presented in the FAA Approved Airplane Flight Manual. For Limitations, Procedures and Performance information not contained in this Approved Airplane Flight Manual Supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual or the placards in the aircraft.

F.A.A. Approved: _____
for Manager
Aircraft Certification Office
Federal Aviation Administration
Wichita, Kansas
Dated: 6/21/01

# LOG OF REVISIONS

| Rev. No. | Pages | Description | Date | Approved |
|---|---|---|---|---|
| **Original** | 26 | Original Flight Manual | 3/14/00 | GM Baker |
| **A** | 26 | Corrected title of Document to "Airplane Flight Manual Supplement" | 06/21/01 | GM Baker |
| | All | Added "Pilot's Operating Handbook" as reference for Limitation, Procedures and Performance Information. | | |
| B | 2 | Added Rev B | 3/18/03 | |
| | 3 | Add IO-540-K1G5 Engine<br>Add HC-C3YR-1RF/F8468AB-6R Propeller with De-Ice | | |
| | 5 | Add IO-540-K1G5 Engine | | |
| | 6 | Add HC-C3YR-1RF/F8468AB-6R Propeller with De-Ice | | |
| | 19 | Add IO-540-K1G5 Engine | | |
| | 25 | Add IO-540-K1G5 Engine | | |

# SECTION 1: GENERAL

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original Pilot's Operating Handbook (POH) and FAA Approved Airplane Flight Manual (AFM).**

**This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and alternate air inserted in its place.**

# DESCRIPTIVE DATA

## ENGINE

Number of Engines: 1.
Engine Manufacturer: Lycoming.
Engine Model Number: IO-540-K1A5.
Engine Type: Normally aspirated, direct drive, air-cooled, horizontally opposed, fuel injected, six cylinder engine with 541.5 cu. in. displacement.
Horsepower Rating and Engine Speed: 300 rated BHP at 2700 RPM.

Number of Engines: 1.
Engine Manufacturer: Lycoming.
Engine Model Number: IO-540-K1G5
Engine Type: Normally aspirated, direct drive, air-cooled, horizontally opposed, fuel injected, six cylinder engine with 541.5 cu. in. displacement.
Horsepower Rating and Engine Speed: 300 rated BHP at 2700 RPM.

## PROPELLER

Propeller Manufacturer: Hartzell Propeller Company.
Propeller Model Number: HC-C3YR-1RF/8468A-6R.
Propeller Model Number: HC-C3YR-1RF/8468AB-6R (with De-Ice Boots)
Number of Blades: 3.
Propeller Diameter: Maximum ..... 80 inches.
Minimum ..... 78 inches.
Propeller Type: Constant speed and hydraulically actuated, with a low pitch setting of 12° and a high pitch setting of 31° (30 inch station).

## FUEL

Approved Fuel Grades (and Colors).

100LL Grade Aviation Fuel (Blue).

100 (Formerly 100/130) Grade Aviation Fuel (Green).

## OIL

MIL-L-6082 Aviation Grade Straight Mineral Oil or MIL-L-22851 Ashless Dispersant Oil.

## SPECIFIC LOADING

Wing Loading: 17.8 lbs. / sq. ft.

Power Loading: 10.3 lbs. / HP.

# SECTION 2: LIMITATIONS

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM. This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM .**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original FAA Approved Airplane Flight Manual should be disregarded and alternate air inserted in its place.**

## POWER PLANT LIMITATIONS

Engine Manufacturer: Lycoming.
Engine Model Number: IO-540-K1A5.
Maximum Power: 300 BHP rating.
Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Engine Speed ..... 2700 RPM
Maximum Cylinder Head Temperature ..... 500° F
Maximum Oil Temperature ..... 245° F

Oil Pressure Minimum ..... 25 psi
Maximum ..... 115 psi

Fuel Grade: ..... 100/100LL Octane
100LL Grade Aviation Fuel (Blue)
100 Grade Aviation Fuel (Green)

Engine Manufacturer: Lycoming.
Engine Model Number: IO-540-K1G5.
Maximum Power: 300 BHP rating.
Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Engine Speed ..... 2700 RPM
Maximum Cylinder Head Temperature ..... 500° F
Maximum Oil Temperature ..... 245° F

Oil Pressure Minimum ..... 25 psi
Maximum ..... 115 psi

Fuel Grade: ..... 100/100LL Octane
100LL Grade Aviation Fuel (Blue)
100 Grade Aviation Fuel (Green)

Oil Grade (Specification):
MIL-L-6082 Aviation Grade Straight Mineral Oil or MIL-L-22851 Ashless Dispersant Oil.

Propeller Manufacturer: Hartzell Propeller Company.
Propeller Model Number: HC-C3YR-1RF/8468A-6R
Propeller Model Number: HC-C3YR-1RF/8468AB-6R, (with De-Ice Boots)

Propeller Diameter: 80 Inches
Propeller Blade Angle at 30 Inch Station:

| | |
|---|---|
| Low | 12° |
| High | 31° |

## POWER PLANT INSTRUMENT MARKINGS

Tachometer

| | | |
|---|---|---|
| Normal Operating | 2100-2500 RPM | Green Arc |
| Maximum Limit | 2700 RPM | Red Line |

Manifold Pressure

| | | |
|---|---|---|
| Normal Operating | 15-25 in.Hg | No Arc |

Oil Temperature

| | | |
|---|---|---|
| Normal Operating | 100°-245° F | Green Arc |
| Maximum Limit | 245° F | Red Line |

Cylinder Head Temperature

| | | |
|---|---|---|
| Normal Operating | 200°-500° F | Green Arc |
| Maximum Limit | 500° F | Red Line |

Fuel Flow

| | | |
|---|---|---|
| Normal Operating | 0 - 35 GPH | Green Arc |
| Maximum Limit | 35 GPH | Red Line |

Oil Pressure -See POH/AFM

For oil pressure limitations refer to the original POH/AFM.

## CENTER OF GRAVITY LIMITS

Center of Gravity Range:

Forward: 33.0 inches aft of datum at 2250 lbs. or less, with straight line variation to 35.5 inches aft of datum at 2700 lbs., with straight line variation to 40.9 inches aft of datum at 3100 lbs.

Aft: 46.0 inches aft of datum at all weights.

## OTHER LIMITATIONS

### FLAP LIMITATIONS

Approved Takeoff Range: 0° to 20°.

Approved Landing Range: 0° to FULL (35°).

## PLACARDS

10. On Oil Filler Cap:

| |
|---|
| **Oil**<br>**12 QTS** |

Next to the alternate air control.

| |
|---|
| **Alternate Air Pull On** |

# SECTION 3: EMERGENCY PROCEDURES

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM.**
**This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and "alternate air" inserted in its place.**

## OPERATIONAL CHECK LISTS

### ENGINE FAILURES

#### ENGINE FAILURE DURING TAKEOFF

1. Throttle – IDLE.
2. Brakes – APPLY
3. Wing Flaps – RETRACT.
4. Mixture – IDLE CUT-OFF.
5. Auxiliary Fuel Pump – Off
6. Ignition Switch – OFF.
7. Master Switch – OFF.

#### ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Airspeed –70 KIAS (Flaps Up), 65 KIAS (Flaps Down)
2. Mixture – IDLE CUT-OFF.
3. Fuel Selector Valve – PUSH DOWN AND ROTATE TO OFF.
4. Ignition Switch – OFF.
5. Wing Flaps – AS REQUIRED (FULL 35° recommended).
6. Master Switch – OFF

#### ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. Airspeed – 80 KIAS.
2. Alternate Air – ON.
3. Fuel Selector Valve – BOTH.
4. Auxiliary Fuel Pump – ON.
5. Mixture – RICH (if restart has not occurred).
6. Ignition Switch – BOTH (or START if propeller is stopped).

### FORCED LANDINGS

#### EMERGENCY LANDING WITHOUT ENGINE POWER

1. Passenger Seat Backs – MOST UPRIGHT POSITION
2. Seats, Seat Belts, Shoulder Harnesses – SECURE.
3. Airspeed – 70 KIAS (Flaps Up), 65 KIAS (Flaps Down).
4. Mixture – IDLE CUT-OFF.
5. Fuel Selector Valve – PUSH DOWN AND ROTATE TO OFF.
6. Ignition Switch – OFF.
7. Landing Gear Lever – GEAR DOWN (GEAR UP if terrain is rough or soft).
8. Wing Flaps – AS REQUIRED (FULL 35° recommended).
9. Doors – UNLATCH PRIOR TO TOUCHDOWN.
10. Master Switch – OFF when landing is assured.
11. Touchdown – SLIGHTLY TAIL LOW.
12. Brakes – APPLY HEAVILY.

## PRECAUTIONARY LANDING WITH ENGINE POWER

1. Passenger Seat Backs – MOST UPRIGHT POSITION.
2. Seats, Seat Belts, Shoulder Harnesses – SECURE.
3. Airspeed – 65 KIAS.
4. Wing Flaps – 20°
5. Selected Field – FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Electrical Switches – OFF.
7. Landing Gear Lever – GEAR DOWN (GEAR UP if terrain is rough or soft).
8. Wing Flaps – FULL (on final approach 35°).
9. Airspeed – 65 KIAS.
10. Doors – UNLATCH PRIOR TO TOUCHDOWN.
11. Avionics Power and Master Switches – OFF.
12. Touchdown – SLIGHTLY TAIL LOW.
13. Ignition Switch – OFF.
14. Brakes – APPLY HEAVILY.

## DITCHING

1. Radio – TRANSMIT MAYDAY on 121.5 MHZ, giving location and intentions and SQUAWK 7700 if transponder is installed.
2. Heavy Objects (in baggage area) – SECURE OR JETTISON.
3. Passenger Seat Backs – MOST UPRIGHT POSITION.
4. Seats, Seat Belts, Shoulder Harnesses – SECURE.
5. Landing Gear Lever – GEAR UP.
6. Flaps –20° to FULL (35°).
7. Power – ESTABLISH 300 FT/MIN DESCENT AT 60 KIAS.

**NOTE**

**If no power available, approach at 70 KIAS with flaps up or at 65 KIAS with 10⊕ flaps.**

8. Approach – High Winds, Heavy Seas – INTO THE WIND
   Light Winds, Heavy Swells – PARALLEL TO SWELLS.
9. Cabin Doors – UNLATCH.
10. Touchdown – LEVEL ATTITUDE AT ESTABLISHED DESCENT.
11. Face – CUSHION at touchdown with folded coat.
12. Airplane – EVACUATE through cabin doors. If necessary, open windows and flood cabin to equalize pressure so doors can be opened.
13. Life Vest and Raft – INFLATE

## FIRES

### DURING START ON GROUND

1. Cranking – CONTINUE, to get a start which would suck the flames and accumulated fuel through the induction system and into the engine.
2. Auxiliary pump – OFF.

### IF ENGINE STARTS

3. Power – 1700 RPM for a few minutes.
4. Engine – SHUT DOWN and inspect for damage.

### IF ENGINE FAILS TO START:

1. Throttle –FULL OPEN.
2. Mixture – IDLE CUT-OFF.
3. Cranking – CONTINUE.
4. Fire Extinguisher – OBTAIN (have ground attendants obtain if not installed)
5. Engine – SECURE.
   a. Master Switch—OFF.
   b. Ignition Switch – OFF.
   c. Fuel Selector Valve – PUSH DOWN AND ROTATE TO OFF
6. Fire – EXTINGUISH using fire extinguisher, wool blanket, or dirt.
7. Fire Damage – INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

## ENGINE FIRE IN FLIGHT

1. Mixture – IDLE CUT-OFF.
2. Auxiliary Pump – OFF.
3. Fuel Selector Valve – PUSH DOWN AND ROTATE TO OFF.
4. Master Switch – OFF.
5. Cabin Heat and Air – OFF (except overhead vents).
6. Airspeed – 100 KIAS (If fire is not extinguished, increase glide speed to find an airspeed which will provide an incombustible mixture).
7. Forced Landing – EXECUTE (as described in Emergency Landing Without Engine Power).

## ELECTRICAL FIRE IN FLIGHT

**Refer to the original POH/AFM.**

## CABIN FIRE

**Refer to the original POH/AFM.**

## WING FIRE

**Refer to the original POH/AFM.**

## ICING

### INADVERTENT ICING ENCOUNTER

1. Turn Pitot heat switch ON (if installed).
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out and rotate defroster control clockwise to obtain maximum defroster airflow.
4. Increase engine speed to minimize ice build-up on propeller blades.
5. Watch for signs of induction air filter ice and apply alternate air as required. An unexplained loss in manifold pressure could be caused by induction ice or air intake filter ice. Lean the mixture if alternate air is used continuously.
6. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.
7. With an ice accumulation of ¼ inch or more on the wing leading edges, be prepared for significantly higher stall speed.

8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open the window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 85 to 95 KIAS, depending upon the amount of ice accumulation.
12. Perform a landing in level attitude.

### STATIC SOURCE BLOCKAGE

**Refer to the original POH/AFM.**

### LANDING GEAR MALFUNCTION PROCEDURES

**Refer to the original POH/AFM.**

### ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

**Refer to the original POH/AFM.**

## AMPLIFIED PROCEDURES

**For amplified procedures not addressed in this Flight Manual Supplement**
**Refer to the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and "alternate air" inserted in its place.**

### Engine Failure

If an engine failure occurs during the takeoff run, the most important thing to do is stop the airplane on the remaining runway. Those extra items on the checklist will provide added safety after a failure of this type.

If an engine failure occurs following turning off the auxiliary fuel pump, return the fuel pump switch to the on position. If power is returned to the engine, land the aircraft at the nearest airport for repairs.

Prompt lowering of the nose to maintain airspeed and establish a glide attitude is the first response to an engine failure after takeoff. In most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions. Altitude and airspeed are seldom sufficient to execute a 180 ° gliding turn necessary to return to the runway. The checklist procedures assume that adequate time exists to secure the fuel and ignition systems prior to touchdown.

After an engine failure in flight, the best glide speed, as shown in figure 3-1 of the AFM , should be established as quickly as possible. While gliding toward a suitable landing area, an effort should be made to identify the cause of the failure. If time permits, an engine restart should be attempted as shown in the checklist. If the engine cannot be restarted, a forced landing without power must be completed.

## EMERGENCY DECENT THROUGH THE CLOUDS

The original POH/AFM is revised by replacing Carburetor heat with "Alternate Air".

## RECOVER FROM A SPRIAL DIVE

The original POH/AFM is revised by replacing Carburetor heat with "Alternate Air".

## Spins

Intentional spins are prohibited in this airplane. Should an inadvertent spin occur, the following recovery procedure must be used:

1. RETARD THROTTLE TO IDLE POSITION
2. PLACE AILERONS IN NEUTRAL POSITION.
3. APPLY AND HOLD FULL RUDDER OPPOSITE TO THE DIRECTION OF ROTATION.
4. JUST AFTER THE RUDDER REACHES THE STOP, MOVE THE WHEEL BRISKLY FORWARD FAR ENOUGH TO BREAK THE STALL. Full down elevator may be required at aft center of gravity loadings to assure optimum recoveries.
5. HOLD THESE CONTROL INPUTS UNTIL ROTATION STOPS. Premature relaxation of the controls inputs may extend the recovery.
6. AS ROTATION STOPS, NEUTRALIZE RUDDER, AND MAKE A SMOOTH RECOVERY FROM THE RESULTING DIVE.

**NOTE**

**If disorientation precludes a visual determination of the direction of rotation, the symbolic airplane in the turn coordinator may be referred to for this information.**

## ROUGH ENGINE OPERATION OR LOSS OF POWER

Induction Icing

By design the induction system is not prone to induction system ice. However an unexplained drop in manifold pressure and eventual engine roughness may result from the formation of ice, possibly on the air filter or on the ram air tubes in the throttle body. If ice is suspected, apply full alternate air by pulling out on the alternate air control and apply full throttle. If power is returned, push the alternate air control in and monitor the power. If power begins to drop, the air filter is blocked with either ice or water. If conditions require the continued use of alternate air in cruise flight, adjust the amount of air as required to maintain the smoothest engine operation. Leaning may be required.

## ENGINE - DRIVEN FUEL PUMP FAILURE

Failure of the engine driven fuel pump will be evidenced by a sudden reduction in the fuel flow indication immediately prior to a loss of power, while operating from a fuel tank containing adequate fuel.

In the event of an engine-driven fuel pump failure, immediately turn the auxiliary fuel pump switch ON to restore engine power. In this event, the flight should be terminated when practical and the fuel pump repaired.

# SECTION 4. NORMAL PROCEDURES

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM.**

**This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and "alternate air" inserted in its place.**

## SPEEDS FOR NORMAL OPERATION

**Refer to the original POH/AFM.**

## CHECKLIST PROCEDURES

### PREFLIGHT INSPECTION

**The Preflight inspection is the same as stated in the original POH/AFM. with the following exceptions.**

1. The oil dipstick is located under the top access door on the engine cowl.
2. The aircraft has two additional fuel sump drains located, one on each side of the belly, just forward of the lift strut attachment points on the fuselage.

### BEFORE STARTING ENGINE

1. Preflight Inspection – COMPLETE
2. Passenger Briefing – COMPLETE.
3. Seats, Seat Belts, Shoulder Harnesses – ADJUST and LOCK.
4. Brakes – TEST and SET.
5. Avionics Power Switch – OFF.

**CAUTION**

**The avionics power switch must be OFF during engine start to prevent possible damage to avionics.**

6. Electrical Equipment – OFF.
7. Circuit Breakers – CHECK IN.
8. Landing Gear Lever – DOWN.
9. Radar (if installed) – OFF.
10. Autopilot (if installed) – OFF.
11. Cowl Flaps – OPEN (move lever out of locking hole to reposition).
12. Fuel Selector Valve – BOTH.

### STARTING ENGINE

1. Propeller – HIGH RPM.
2. Mixture – IDLE CUT OFF.
3. Alternate Air – OFF.
4. Propeller Area – CLEAR.
5. Master Switch – ON.
6. Throttle – FULL IN

7. Auxiliary Fuel Pump – ON.
8. Mixture – ADVANCE to full rich for 3 - 4 seconds - then return to idle cut-off position.
9. Auxiliary Fuel Pump – OFF.
10. Ignition Switch – START (release when engine starts).
11. Throttle—RETARD TO IDLE (when engine starts)
12. Mixture – Advance smoothly to rich when engine fires.

**Note:**

**If the engine floods, apply full throttle and place the mixture control in the idle cut off position. Crank the engine until it fires. Retard the throttle to idle and smoothly return the mixture control to the full rich position.**

13. Oil Pressure – CHECK.
14. Starter – CHECK DISENGAGED (if starter were to remain engaged, ammeter would indicate full scale charge with engine running at 1000 RPM).
15. Avionics Power Switch – ON.
16. Navigation Lights and Beacon – ON as required.
17. Radios – ON.

## BEFORE TAKEOFF

1. Parking Brake –SET.
2. Passenger Seat Backs – MOST UPRIGHT POSITION.
3. Seats, Seat Belts, Shoulder Harnesses – CHECK SECURED.
4. Cabin Doors – CLOSED and LOCKED.
5. Flight Controls – FREE and CORRECT.
6. Flight Instruments – CHECK and SET.
7. Auxiliary Fuel Pump – ON.
9. Mixture – RICH.
10. Fuel Quantity – CHECK.
11. Fuel Selector Valve – RECHECK BOTH.
12. Elevator and Rudder Trim – SET for takeoff.
13. Throttle – 1700 RPM.
    a. Magnetos – CHECK (RPM drop should not exceed 175 RPM on either magneto or 50 RPM differential between magnetos).
    b. Alternate Air – CHECK operation.
    c. Propeller – CYCLE from high to low RPM; return to high RPM (full in).
    d. Suction Gage – CHECK.
    e. Engine Instruments and Ammeter – CHECK.
13. Throttle – 800-1000 RPM.
14. Throttle Friction Lock – ADJUST.
15. Electric Trim (if installed) – PREFLIGHT TEST (See Section 9 of AFM).
16. Strobe Lights (if installed) – AS DESIRED.
17. Radios and Avionics – SET.
18. Radio Lights Dimmer – FULL COUNTERCLOCKWISE for day flight.
19. Autopilot -- PREFLIGHT TEST then OFF.
20. Air Conditioner (if installed) – OFF.
21. Wing Flaps – SET for takeoff (See Takeoff Checklists).
22. Cowl Flaps – OPEN.
23. Brakes – RELEASE.

## TAKEOFF

### Normal Takeoff

1. Wing Flaps – 0° - 20°.
2. Alternate Air – OFF.
3. Auxiliary Fuel Pump – ON.
4. Power – FULL THROTTLE and 2700 RPM.
5. Mixture – FULL RICH (mixture may be leaned above 3000 feet).
6. Elevator Control – LIFT NOSEWHEEL AT 50 KIAS.

**NOTE**

When the nose wheel is lifted, the gear motor may run 1-2 seconds to restore hydraulic pressure.

7. Climb Speed – 70 KIAS (flaps 20°), 80 KIAS (flaps UP)
8. Brakes – APPLY momentarily when airborne.
9. Landing Gear – RETRACT in climb out.
10. Wing Flaps – RETRACT.

### Short Field Takeoff

1. Wing Flaps – 20°.
2. Alternate Air – OFF.
3. Auxiliary Fuel Pump – ON.
4. Brakes – APPLY.
5. Power – FULL THROTTLE and 2700 RPM.
6. Mixture – FULL RICH (mixture may be leaned above 3000 feet).
9. Brakes – RELEASE.
10. Elevator Control – MAINTAIN SLIGHTLY TAIL-LOW ATTITUDE.
11. Climb Speed – Refer to the original POH/AFM.
12. Brakes – APPLY momentarily when airborne.
13. Landing Gear – RETRACT after obstacles are cleared.
14. Wing Flaps – RETRACT slowly after reaching 70 KIAS.

## ENROUTE CLIMB

### Normal Climb

1. Airspeed – Refer to the original POH/AFM.
2. Auxiliary Pump – OFF once a safe altitude is reached.
3. Power – 25 INCHES Hg or FULL THROTTLE (whichever is less) and 2500 RPM.
4. Fuel Selector Valve – BOTH.
5. Mixture –FULL RICH (mixture may be leaned above 3000 feet).
6. Cowl Flaps – OPEN as required.

### Maximum Performance Climb

1. Airspeed – Refer to the original POH/AFM.
2. Auxiliary Pump – OFF once a safe altitude is reached.
3. Power – FULL THROTTLE and 2700 RPM.
4. Fuel Selector Valve – BOTH.
5. Mixture – FULL RICH (mixture may be leaned above 3000 feet).
6. Cowl – FULL OPEN.

## CRUISE

1. Power – 15-25 INCHES Hg, 2100-2500 RPM (no more than 75% power).
2. Elevator and Rudder Trim – ADJUST.
3. Mixture – LEAN.
4. Cowl Flaps – CLOSED.

## DESCENT

1. Fuel Selector Valve – BOTH.
2. Power – AS DESIRED.
3. Mixture – ENRICHEN as required.
4. Cowl Flaps – CLOSED.
5. Wing Flaps – AS DESIRED (refer to the original POH/AFM for speeds)

**NOTE**

**The Landing gear may be used below 140 KIAS to increase the rate of descent.**

## BEFORE LANDING

1. Passenger Seat Backs – MOST UPRIGHT POSITION.
2. Seats, Seat Belts, Shoulder Harnesses – SECURE.
3. Fuel Selector Valve – BOTH.
4. Landing Gear – DOWN (below 140 KIAS).
5. Landing Gear – CHECK (observe main gear down and green indicator light illuminated).
6. Mixture – RICH.
7. Propeller – HIGH RPM.
8. Autopilot (if installed) – OFF.
9. Air Conditioner (if installed) – OFF.
10. Radar (if installed) – OFF.

## LANDING

### Normal Landing

1. Airspeed – 70-80 KIAS (flaps UP).
2. Wing Flaps – Refer to the original POH/AFM.
3. Airspeed – 65-75 KIAS (flaps DOWN).
4. Trim – ADJUST.
5. Touchdown – MAIN WHEELS FIRST.
6. Landing Roll – LOWER NOSEWHEEL GENTLY.
7. Braking – MINIMUM REQUIRED.

### Short Field Landing

1. Airspeed – 70-80 KIAS (flaps UP).
2. Wing Flaps – FULL (35 °) (below 95 KIAS).
3. Airspeed – MAINTAIN 64 KIAS.
4. Trim – ADJUST.
5. Power – REDUCE to idle as obstacle is cleared.
6. Touchdown – MAIN WHEELS FIRST.
7. Brakes – APPLY HEAVILY.
8. Wing Flaps – RETRACT for maximum brake effectiveness.

### Balked Landing

1. Power – FULL THROTTLE and 2700 RPM.
2. Auxiliary Pump – ON.
3. Alternate Air -- AS REQUIRED.
4. Wing Flaps – RETRACT to 20°.
5. Climb Speed – 75 KIAS.
6. Wing Flaps – RETRACT slowly.
7. Cowl Flaps – OPEN.

### AFTER LANDING

1. Wing Flaps – UP.
2. Cowl Flaps – OPEN.

### SECURING AIRPLANE

1. Parking Brake – SET.
2. Throttle – IDLE.
3. Avionics Power Switch, Electrical Equipment – OFF.
4. Auxiliary Pump - OFF.
5. Mixture – IDLE CUT-OFF (pulled full out).
6. Ignition Switch – OFF.
7. Master Switch – OFF.
8. Control Lock – INSTALL.
9. Cowl Flaps – CLOSE.
10. Fuel Selector Valve – RIGHT or LEFT to prevent cross-feeding.

### AMPLIFIED PROCEDURES

**For amplified procedures not addressed in this Flight Manual Supplement refer to the original POH/AFM.**

### STARTING ENGINE

In cooler weather, the engine compartment temperature drops off rapidly following engine shutdown and the injector nozzle lines remain nearly full of fuel.

However in warmer weather, the engine compartment temperatures may increase rapidly following engine shutdown, and fuel in the lines will vaporize and escape into the intake manifold. Hot weather starting procedures depend considerably on how soon the next engine start is attempted. Within the first 20 to 30 minutes after shutdown, the fuel manifold is adequately primed and the empty fuel nozzle lines will fill before the engine stops. However after approximately 30 minutes, the vaporized fuel in the manifold will have nearly dissipated and some priming could be required to refill the nozzle lines and keep the engine running after the initial start. Starting a hot engine is facilitated by advancing the mixture control promptly to 1/3 open when the engine fires, and then smoothly to full rich as power develops.

Should the engine tend to quit after starting, turn on the auxiliary fuel pump temporarily and adjust the throttle and/or mixture as necessary to keep the engine running. In the event of over priming or flooding, turn of the auxiliary fuel pump, open the throttle from ½ to full open, and continue cranking with the mixture full lean. When the engine fires, smoothly advance the mixture control to full rich and retard the throttle to desired speed

Weak intermittent firing followed by puffs of black smoke from the exhaust stack indicates over-priming or flooding. Excess fuel can be cleared from the combustion chambers by the following procedure: Set the mixture control full lean and the throttle full open; then crank the engine through several revolutions with the starter. Repeat the starting procedure without any additional priming.

If the engine is under primed (most likely in cold weather with a cold engine) it will not fire at all. Additional priming will be necessary for the next starting attempt. As soon as the cylinders begin to fire, open the throttle slightly to keep it running. If prolonged cranking is necessary, allow the starter motor to cool at frequent intervals, since excessive heat may damage the armature.

After starting, if the oil gauge does not begin to show pressure within 30 seconds in the summertime and about twice that long in very cold weather, stop engine and investigate. Lack of oil pressure can cause serious engine damage.

After the completion of normal engine starting procedures, it is a good practice to verify that the engine starter has disengaged. If the starter contactor were to stick closed, causing the starter to remain engaged, an excessively high charge indication (full scale at 1000 RPM) would be evident on the ammeter. In this event, immediately shut down the engine and take corrective action prior to flight.

## TAXIING

During taxiing the Alternate air control should be pushed full in.

## ENROUTE CLIMB

**For Speeds during the climb refer to the original POH/AFM.**

Normal climbs are performed with flaps up, 25 In. Hg, or full throttle (whichever is less) and 2500 RPM for the best combination of engine cooling, rate of climb and forward visibility. If it is necessary to climb rapidly to clear terrain or reach favorable winds at high altitudes, the best rate-of-climb speed should be used with maximum power.

If an obstruction ahead requires a steep climb angle, a best angle-of-climb speed should be used with landing gear and flaps up and maximum power.

The mixture should be full rich during climb at altitudes up to 3000 feet. Above 3000 feet, a full rich mixture setting may be used or the mixture may be leaned as required for smooth engine operation.

### CRUISE

Any application of alternate air will require a change in the recommended lean mixture setting.

Normal cruising is performed between 55% and 75% power.

**NOTE**

**Cruising should be done at 75% power as much as practicable until a total of 50 hours has accumulated or oil consumption has stabilized. Operation at this higher power will ensure proper seating of the rings and is applicable to new engines, and engines in service following cylinder replacement or top overhaul of one or more cylinders.**

### COLD WEATHER OPERATION

### STARTING

Cold weather starting procedures are the same as the normal starting procedures in this supplement

### OPERATION

During operations in extreme cold, use of the alternate air may be required for smooth engine operation

During cold weather operation the engine should be ground run additional time to allow the oil to warm for takeoff. Expect high oil pressure until the engine oil reaches normal operating temperatures.

### NOISE CHARACTERISTICS

**The certificated noise level for the Model R182 at 3100 pounds maximum weight with the IO-540-K1A5 or IO-540-K1G5 engine rated at 300 Hp with a three-bladed propeller installed has been determined to not exceed 78.3 d((A). No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.**

# SECTION 5 PERFORMANCE

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM.**

**This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and "alternate air" inserted in its place.**

To maintain constant power, correct manifold pressure approximately 0.18" HG for each 10°F variation in induction air temperature. Add manifold pressure for air temperature above standard; subtract for temperature below standard

**Cruise Fuel Flow**
**Fuel flows at 75% Power Settings.**

| Press Alt. 1000 Feet | Std Alt. Temp °F | 225 HP - 75%Rated Approx. Fuel Flow 18.0 GPH RPM & Man. Press. 2200 | 2300 | 2400 | 2500 |
|---|---|---|---|---|---|
| SL | 59 | 27.65 | 26.6 | 25.8 | 25.0 |
| 1 | 55 | 27.3 | 26.3 | 25.5 | 24.7 |
| 2 | 52 | 27.1 | 26.1 | 25.2 | 24.3 |
| 3 | 48 | FT | 25.8 | 24.9 | 24.0 |
| 4 | 45 | | 25.6 | 24.6 | 23.7 |
| 5 | 41 | | FT | 24.4 | 23.4 |
| 6 | 38 | | | FT | 23.0 |
| 7 | 34 | | | | FT |
| 8 | 31 | | | | |
| 9 | 27 | | | | |

**Cruise Fuel Flow**
**Fuel flows at 65% Power Settings.**

| Press Alt. 1000 Feet | Std Alt. Temp °F | 195 HP - 65%Rated Approx. Fuel Flow 13.8 GPH RPM & Man. Press. 2100 | 2200 | 2300 | 2400 | 2500 |
|---|---|---|---|---|---|---|
| SL | 59 | 25.6 | 24.7 | 23.8 | 23.2 | 22.7 |
| 1 | 55 | 25.3 | 24.4 | 23.5 | 22.9 | 22.4 |
| 2 | 52 | 25.1 | 24.2 | 23.3 | 22.7 | 22.2 |
| 3 | 48 | 24.8 | 23.9 | 23.0 | 22.5 | 22.0 |
| 4 | 45 | 24.6 | 23.7 | 22.8 | 22.2 | 21.7 |
| 5 | 41 | 24.3 | 23.5 | 22.5 | 22.0 | 21.5 |
| 6 | 38 | FT | 23.2 | 22.3 | 21.7 | 21.2 |
| 7 | 34 | | FT | 22.0 | 21.5 | 21.0 |
| 8 | 31 | | | 21.8 | 21.2 | 20.7 |
| 9 | 278 | | | FT | 21.0 | 20.2 |
| 10 | 23 | | | | FT | 19.7 |
| 11 | 19 | | | | | FT |
| 12 | 16 | | | | | |

## Cruise Fuel Flow
## Fuel flows at 55% Power Settings.

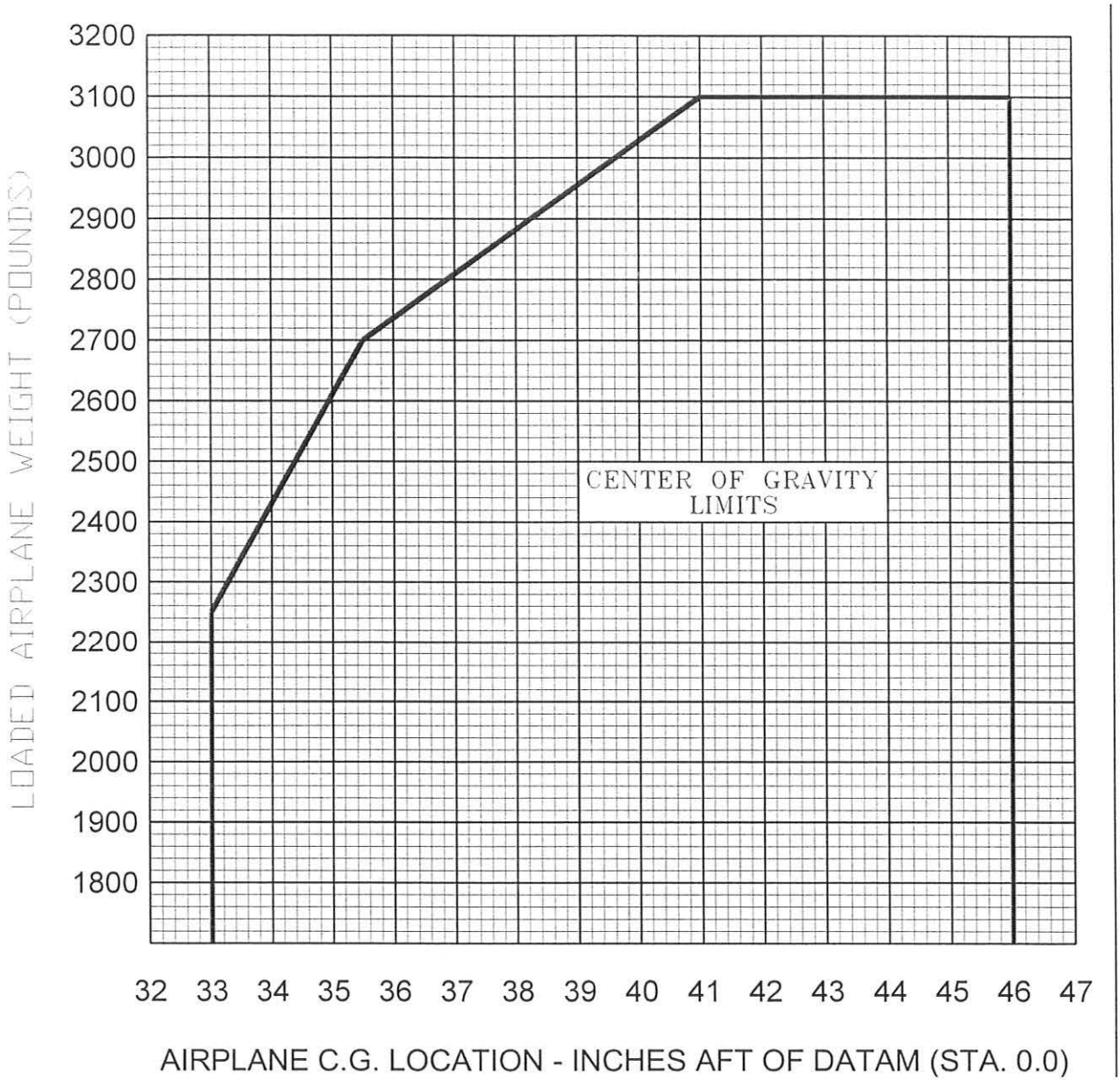
| Press Alt. 1000 Feet | Std Alt. Temp °F | 165 HP - 55%Rated Approx. Fuel Flow 12.8 GPH RPM & Man. Press. 2100 | 2200 | 2300 | 2400 | 2500 |
|---|---|---|---|---|---|---|
| SL | 59 | 22.5 | 21.8 | 21.2 | 20.7 | 20.2 |
| 1 | 55 | 22.3 | 21.6 | 21.0 | 20.5 | 20.0 |
| 2 | 52 | 22.1 | 21.4 | 20.7 | 20.2 | 19.7 |
| 3 | 48 | 21.9 | 21.2 | 20.5 | 20.0 | 19.5 |
| 4 | 45 | 21.7 | 21.0 | 20.3 | 19.8 | 19.3 |
| 5 | 41 | 21.5 | 20.8 | 20.1 | 19.6 | 19.1 |
| 6 | 38 | 21.3 | 20.6 | 19.8 | 19.3 | 18.8 |
| 7 | 34 | 21.0 | 20.4 | 19.6 | 19.1 | 18.6 |
| 8 | 31 | 20.8 | 20.2 | 19.4 | 18.9 | 18.4 |
| 9 | 278 | 20.3 | 20.0 | 19.2 | 18.6 | 18.1 |
| 10 | 23 | 20.4 | 19.8 | 19.0 | 18.4 | 17.9 |
| 11 | 19 | FT | 19.6 | 18.7 | 18.2 | 17.7 |
| 12 | 16 | | FT | 18.5 | 18.0 | 17.5 |
| 13 | 12 | | | FT | 17.7 | 17.2 |
| 14 | 9 | | | | FT | 16.7 |
| 15 | 5 | | | | | FT |

# SECTION 6: WEIGHT AND BALANCE / EQUIPMENT LIST

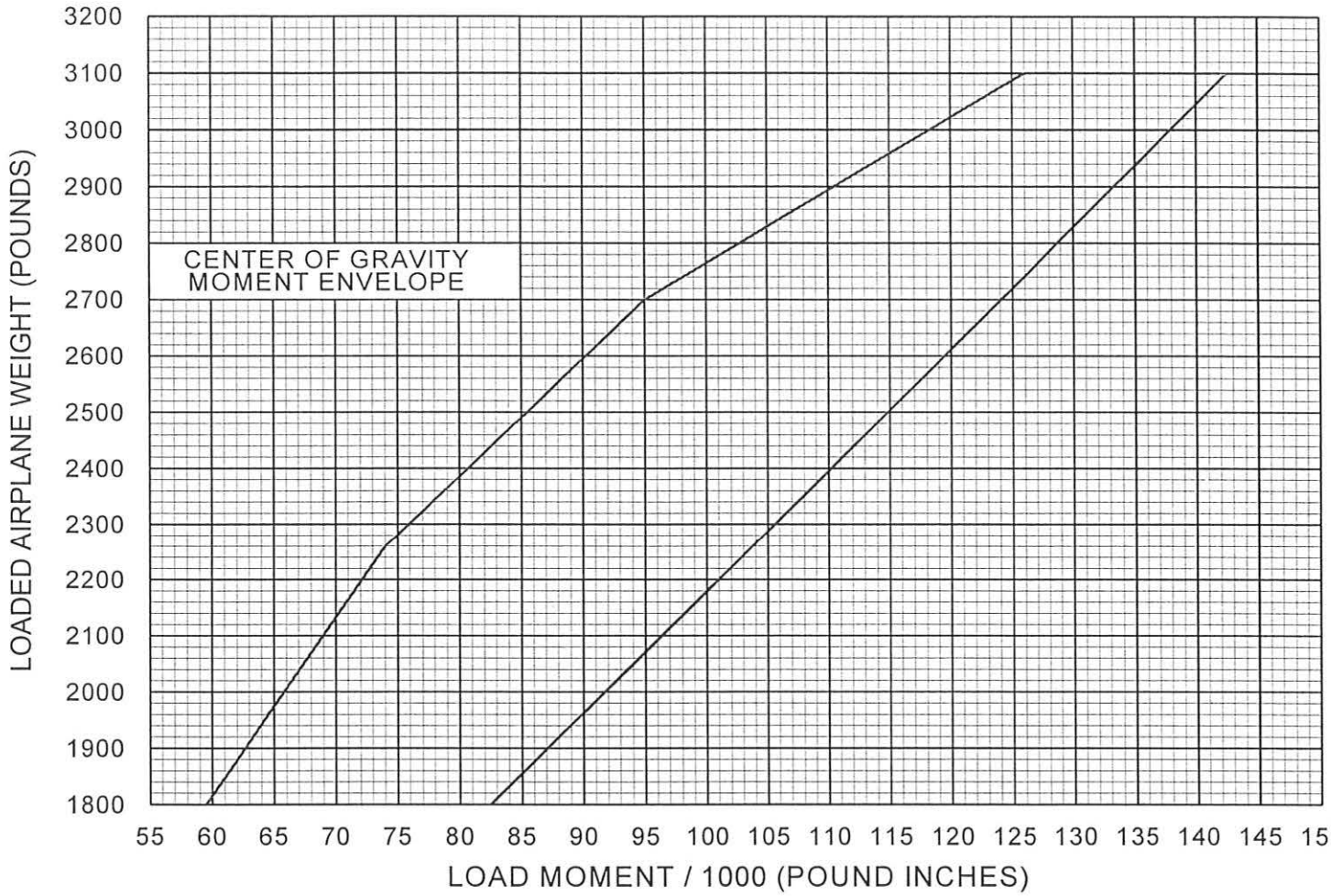
Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM.
This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.

The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and alternate air inserted in its place.

# CENTER OF GRAVITY LIMITS



# CENTER OF GRAVITY MOMENT ENVELOPE




**Equipment List**

**Refer to the Weight & Balance and Equipment List supplement for revisions to the approved engine and propeller per this STC.**

# SECTION 7: AIRPLANE SYSTEMS AND DESCRIPTIONS

**Items not addressed in this Flight Manual Supplement are considered to be unchanged from the original POH/AFM..**

**This Flight Manual Supplement is applicable to R182 and TR182 aircraft. All reference to Turbocharger is to be disregarded in the original POH/AFM.**

**The carbureted engine has been removed and a fuel injected engine installed in the aircraft. All references to carburetor heat in the original POH/AFM should be disregarded and "alternate air" inserted in its place.**

## Engine

The airplane is powered by a horizontally opposed, six cylinder, overhead valve, air cooled, fuel injected engine with a wet sump lubrication system. The engine is a Lycoming Model IO-540-K1A5 or IO-540-K1G5 and is rated at 300 horsepower at 2700 RPM. Major accessories include a starter, belt driven alternator, and propeller governor on the front of the engine, dual magnetos, fuel pump, vacuum pump and full flow oil filter on the rear of the engine.

## Engine Controls

The engine is controlled by conventional throttle, mixture and propeller vernier controls. For rapid control movement the knob on the end of the controls may be pushed in to position the control as desired.

## Engine Instruments.

In addition to the manufacturer installed engine instruments a combination Fuel Flow / Manifold Pressure gauge is installed. The manifold pressure side of the gage indicates the manifold pressure in inches of mercury. The fuel flow sided of the gage is a direct pressure gage calibrated in fuel flow rate. The indicator is marked in gallons per hour and has a green arc from 0 to 35 gallons per hour.

If the optional digital Fuel Flow gage is also installed refer to the manufacturers handbook for operational instructions.

The tachometer is a direct reading instrument with a red line of 2700 RPM. Normal cruise RPM is indicated by a green arc from 2500 to 2100 RPM

The Carb air temp gauge is deleted.

## ENGINE LUBRICATION

The capacity of the engine sump (located on the bottom of the engine) is 12 quarts (one additional quart is contained in the engine oil filter).

An oil dipstick is located on the top of the engine and is combined with the oil filler cap. The engine should not be operated on less than six quarts of oil.

## IGNITION AND STARTER SYSTEM

Engine ignition is provided by two engine driven magnetos, and two spark plugs in each cylinder. The right magneto fires the lower right and upper left spark plugs and the left hand magneto fires the lower left and upper right magnetos. During the starting operation the ignition retard is provided by a shower of sparks system that provides a strong spark to the spark plugs.

## AIR INDUCTION SYSTEM

The engine induction air system receives air through an intake scoop on the left side of the engine cowl. Air passes through an air filter and is ducted into the fuel injection system. In the event that induction icing is encountered, heated unfiltered air is ducted from a shroud around the left muffler and through a cockpit controlled air valve in the air filter box.

## FUEL INJECTION SYSTEM

The engine is equipped with a fuel injection system. The system is comprised of a engine driven fuel pump , fuel air control unit , fuel manifold valve, fuel flow indicator and air -bleed type injector nozzles. Fuel is delivered by the engine driven fuel pump to the fuel control unit mounted on the rear of the engine. The fuel control unit correctly proportions the fuel flow to the induction air flow. After passing through the fuel air control unit fuel is delivered to the fuel manifold valve and air is delivered to the induction manifold. The fuel manifold evenly distributes fuel to all cylinders through a fuel nozzle located in each cylinder.

## COOLING AIR SYSTEM

During warm weather operation it may be necessary to regulate the cowl flap opening to control oil temperature. One half open on the cowl flaps will reduce the oil temperature significantly with very little change in airspeed.

## PROPELLER

The airplane has an all metal, three bladed, constant speed, governor regulated propeller. A setting induced into the governor with the propeller control establishes the propeller speed, and thus the engine speed to be maintained.

## FUEL SYSTEM

To the original fuel system two fuel reservoir tanks have been added beneath the floor panels at the forward door post bulkhead. These reservoir tanks feed with fuel from the wing fuel tanks and supply fuel to the fuel selector valve. Each tank has a drain valve fitting in the bottom that should be checked prior to the first flight of each day.

## AUXILIARY FUEL PUMP OPERATION

The auxiliary fuel pump is used primarily for priming the engine before starting. If the pump is left on for and extended period of time with the engine stopped flooding may occur. The induction system has two drains that will drain off excess fuel in the event flooding does occur.

The auxiliary fuel pump is capable of supplying the fuel requirements of the engine at takeoff power. The auxiliary fuel pump should be used during takeoff and the initial climb segment of a flight. If power is lost once the auxiliary pump is turned off the engine driven pump has failed. The auxiliary pump should be returned to the on position and the aircraft returned to the airport for repairs.

The auxiliary pump is also used for vapor suppression in hot weather. During extended periods of ground-running following a flight or after, the engine has been stopped for a few minutes and then restarted, vapor may cause the engine to surge or lope. Continuous or momentary operation of the auxiliary pump will keep the engine running until such time that sufficient power (approximately 1700 RPM) is applied to remove the vapor.

## ELECTRIC PRIMING SYSTEM

Priming is performed with the electric fuel pump. Applying full throttle and full rich mixture with the electric pump on will force fuel through the fuel nozzles and into the cylinders. Pumping the throttle has no effect on priming the engine for starting.

## EXHAUST SYSTEM

For the turbo-charge model (TR182) the turbo system has been removed and replaced with two separate exhaust collectors, mufflers and tail pipes. The exhaust exits at each cowl flap.

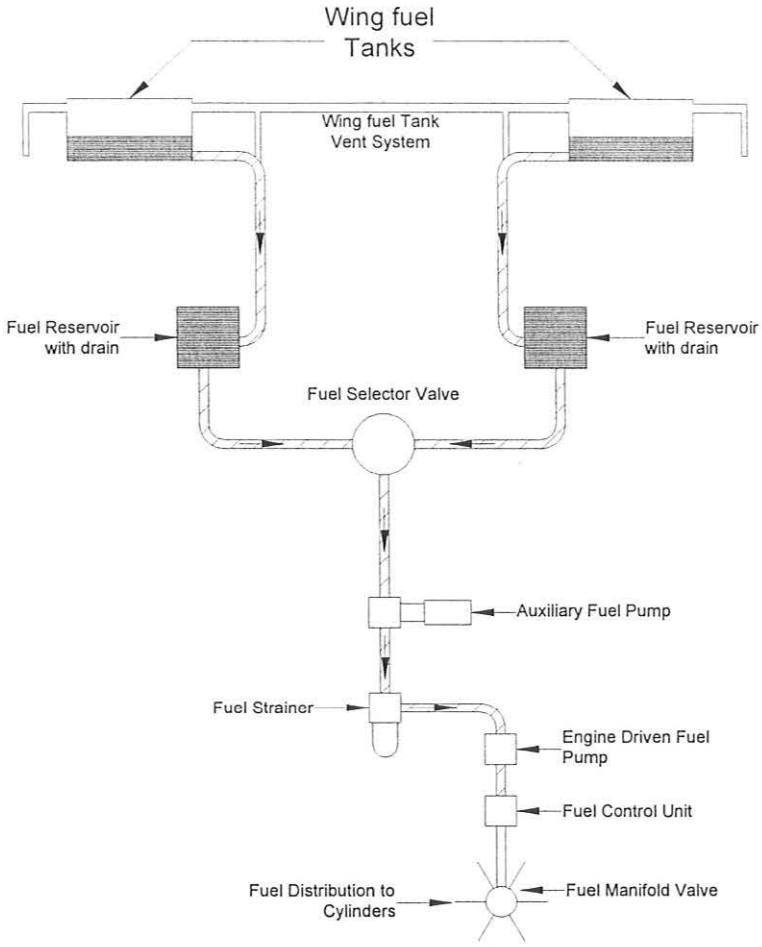
## INSTRUMENT PANEL

An Alternate Air control is located to the left of the Throttle control. Alternate air is applied by pulling out on the control. When the control is pulled out an air valve is actuated on the induction air box that routes heated (unfiltered) air, that comes from a shroud on the left muffler, to the engine.

## LANDING GEAR

In flight with the landing gear retracted the nose gear protrudes from the wheel well approximately 2.5 inches.

# Fuel System Schematic



# SECTION 8: HANDLING, SERVICE AND MAINTENACE

CAPACITY OF THE ENGINE SUMP – 12 Quarts.
Do not operate on less than less than 6 quarts of oil.