A-9

SERIALS 1048, 1111, 1117 & UP

OWNERS MANUAL

IMCO, INC. AFTON, WYOMING

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SECTION I

AIRCRAFT SPECIFICATIONS

ENGINE SPECIFICATIONS

Engine	Lycoming O-540-B2B5
Rated Horsepower	235
Rated Speed, RPM	2575
Bore, Inches	5.125
Stroke, Inches	3.875
Displacement (cubic inches)	541.5
Compression Ratio	7.20:1
Dry Weight, Pounds	395
Oil Sump Capacity (qts.)	12
Fuel Aviation Grade Octane	80
Fuel Consumption (75% Power)(GPH)	14

AIRCRAFT DIMENSIONS

Wing Span	34'8"
Wing Area	182 Sq. Ft.
Wing Loading	16.4#/Sq. Ft.
Length	24 Ft.
Height	8 Ft.
Power Loading	12.8#/HP
Propeller Diameter (inches)	84
Fuel Capacity (gals.)	40

WEIGHTS

Gross Weight (lbs.)	3000
Empty Weight (lbs.)	1500
Useful Load (lbs.)	1500
Max. Hopper Capacity (gals.)	170
(cu. ft.)	22.5

FUEL AND OIL

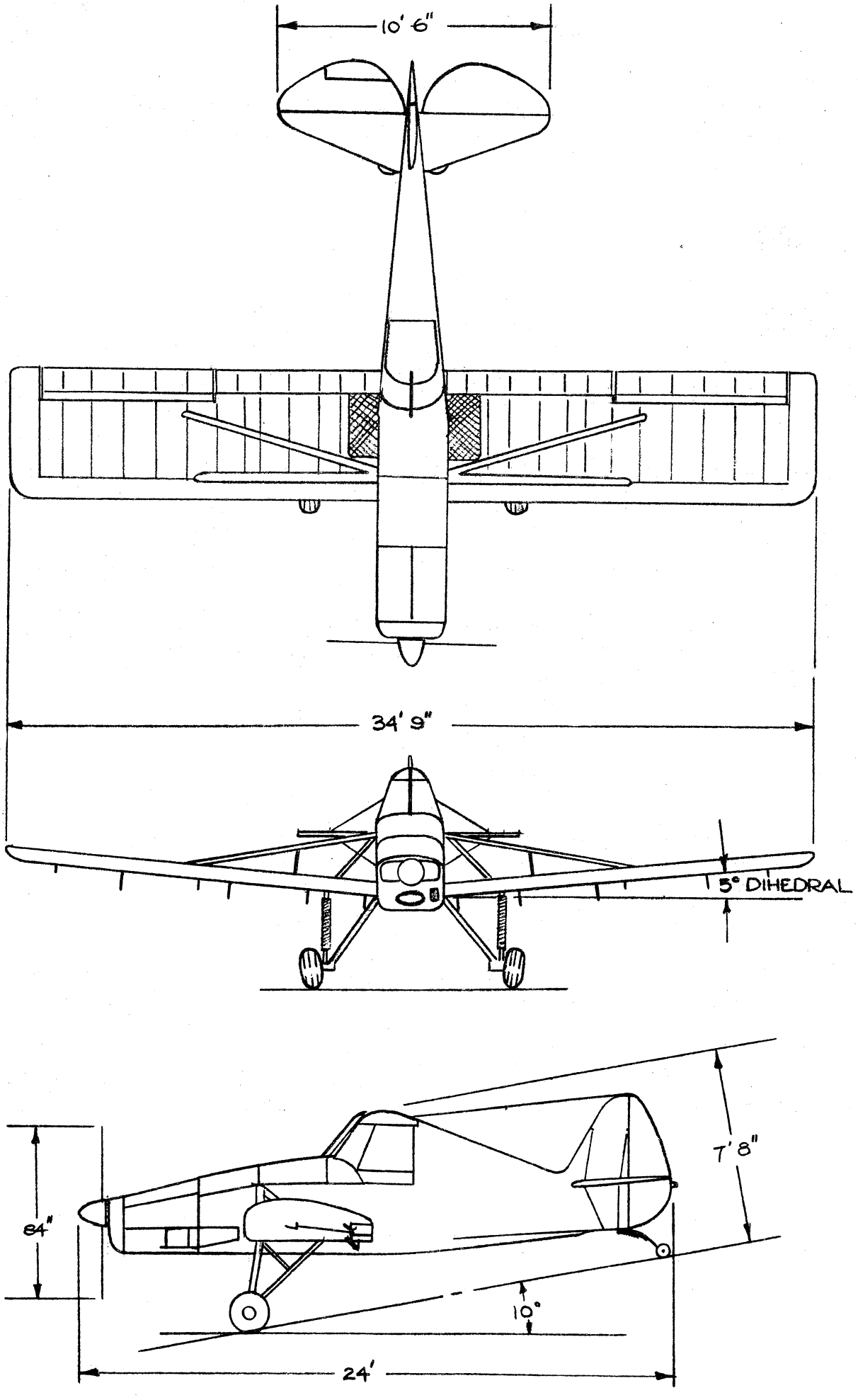
Fuel Capacity (gal.)	40
Useable Fuel	40
Oil Capacity (qts.)	12

LANDING GEAR

Main Wheels	Cleveland Model 40-24
Brakes	Cleveland 30- 6

Tires - 8:50 x 6, 4 ply min. rating

Tire Pressure - Main - 20 lbs.
- Tail - 50 lbs.



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SECTION II

DESIGN INFORMATION

ENGINE & PROPELLER

The CallAir A-9 is powered by a Lycoming O-540-B2B5 engine. The engine is rated at 235 H.P. at 2575 RPM. It is a direct drive, wet pump, borizontally opposed model. It uses 80 octane fuel. Standard installation includes a 12 volt starter and generator.

A Hanlon-Wilson stainless steel exhaust system is installed on the A-9. This exhaust system features expansion joints on each cylinder which minimize the possibility of cracking and associated service problems. The large effective muffler is encased by a stainless steel shroud which provides hot air for the cabin heater as well as for carburetor heat.

The carburetor air filter is of the dry pleated-paper type which provides efficient filtering action.

The standard propeller used on the A-9 is a McCauley one-piece metal design model. A large spinner smooths air flow into the engine air intake.

Engine cooling is accomplished by means of an adjustable cowl flap system actuated by a lever conveniently located in the cockpit. A cylinder head temperature gauge is standard equipment. A thermostatic oil bypass valve is also standard equipment and eliminates the need for covering the oil radiator during winter or cold weather operation.

FUSELAGE & WINGS

The fuselage structure is constructed entirely of 4130 chrome-moly steel. Repairs to this structure can be made in accordance with FAA Manual 18. The entire fuselage structure is given two coats of an Epoxy-Resin paint for protection against chemicals. Removable side panels are provided the entire length of the fuselage on the left side to give access for cleaning and maintenance.

The wings have solid rectangular spars made of Sitka spruce. Ribs are constructed of sheet aluminum. The ribs are made in three segments allowing damaged sections to be replaced without disturbing adjacent ribs. The leading edge is covered with aluminum alloy sheet. Wing tips are constructed of fiberglas. All internal brace wires are constructed of polished stainless steel. The wings are fastened to the fuselage by means of heavy duty fittings at the lower longerons. The wings are braced by heavy duty struts constructed of heavy wall 4130 chrome-moly streamline steel tubing. Adjustable eye bolts are provided where the struts fasten to the fuselage to set the wing rigging.

LANDING GEAR

The rugged A-9 landing gear features a coil spring shock absorber on the main gear. There are no seals, no oil, no rubber cords to replace. The inner and outer springs absorb all landing and taxiing shocks and are completely maintenance free.

A Scott 8" steerable, full-swivel tail wheel is standard equipment on the A-9. Four steel leaf springs provide a rugged tail wheel installation capable of enduring real punishment.

The main wheel assemblies are Cleveland model 40-24 with Cleveland 30-6 disc brake assemblies. Tires are 8:50 x 6, 4 ply, and tires should be inflated to minimum pressure of 20 p.s.i.

Optional tires and wheels are available for muddy and rough field operation. The wheels are Cleveland model 40-80 and utilize Goodyear 30x13-6 airwheel tires. These tires are inflated to a minimum pressure of 9 p.s.i. and provide excellent flotation on wet surfaces. They slow the airplane top speed by 4-5 m.p.h.

TAIL SURFACES

The fin, rudder, stabilizers, and elevators are constructed of 4130 chrome-moly tubular steel. Ribs are also constructed of 4130 tubular steel. Handles are provided on the stabilizer leading edges next to the fuselage to assist in ground handling. Double streamlined stainless steel brace wires are provided for tail bracing.

CONTROL SYSTEM

Conventional flight and engine controls are provided in the A-9. Longitudinal trim is provided by means of an elevator trim tab actuated by a lever located in the cockpit.

FUEL SYSTEM

Twenty gallon aluminum fuel tanks are provided, one in each wing. Fuel quantity gauges are float-type direct indicating units located in the top of the tank in view of the cockpit. The fuel shut-off valve is controlled by a indicator handle located adjacent to the throttle quadrant. The tanks feed independently and are not inter-connected. Tank outlets are provided with finger strainers. Fuel pressure to the engine is provided by an engine-driven, diaphragm type fuel pump. Dual Bendix electric fuel pumps are provided for engine starting and for emergency use. A fuel strainer is provided on the firewall. Quick drains are provided at all fuel system low points.

An idle cut-off is incorporated in the mixture control. The engine should be stopped with the idle cut-off.

ELECTRICAL SYSTEM

An electrical system consisting of starter, generator, battery, voltage regulator, ammeter, starter solenoid, circuit breaker, switches, navigation lights, and related wiring are provided as standard equipment on the A-9.

A 12 volt 35 amp. manifold vented battery is located in the lower left side of the fuselage immediately aft of the firewall. It is accessible through a removable panel. Solenoids are mounted on the firewall.

The circuit breakers automatically break the electrical circuits if an overload is applied. When resetting an open circuit breaker, allow sufficient time for the breaker to cool before applying power to the circuit again.

The voltage regulator is mounted on the firewall in the engine compartment on the left side of the airplane. Anti-collision lights, landing lights, and night flying light installations are available as optional equipment.

FINISH

The A-9 is covered with a Dacron-Polyester fabric and finished using the Eonnex process. All surfaces, both metal and fabric covered are finished in an Epoxy-Resin paint. Patch kits are available for repairs to damaged areas. If the finish becomes stained or dulled, it can readily be restored to its original lustre by cleaning with Mac's Dynamite cleaner. The Epoxy-Resin finish is impervious to most known agricultural chemicals.

CABIN FEATURES

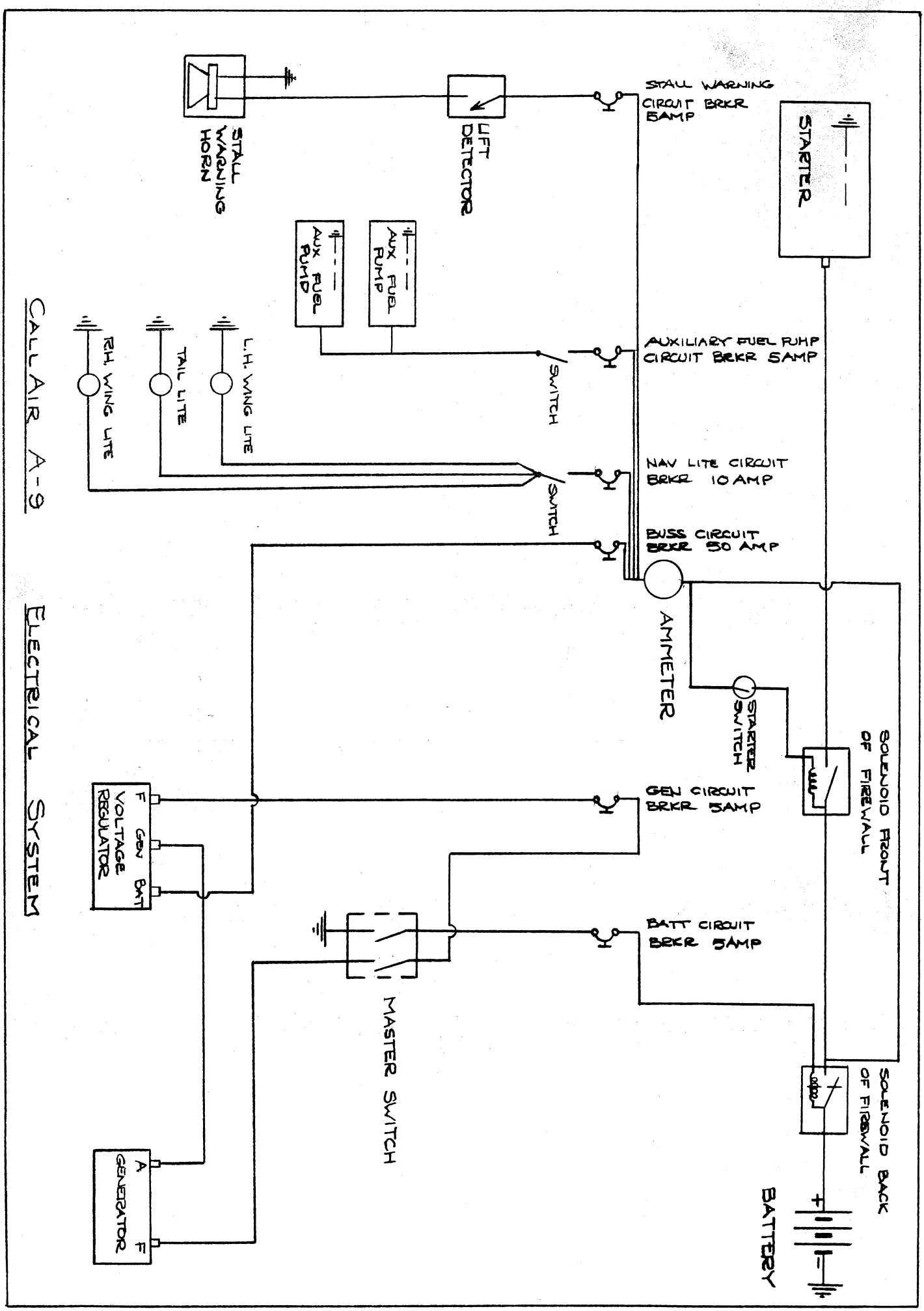
The cockpit of the A-9 features a bucket type seat for increased comfort. The standard instrument group includes the following: Altimeter, Airspeed, Compass, Oil Temperature and Pressure Gauges, Tachometer, and Cylinder Head Temperature Gauge. Shoulder harness is provided in addition to the heavy duty seat belt.

A cabin heater control is provided and the heat outlet is located between the pilot's feet. Heat available is very adequate.

The A-9 can be flown with the cabin side doors open or closed. The cabin side doors may be removed if desired. (Restricted category operation only).

FLAPS

Lift flaps combined with aileron droop are provided for use on takeoff and landing. Due to the aileron control system installation, aileron stick forces will be higher when the flaps are down. Aileron cable tension is higher when ailerons are drooped to eliminate possibility of reduced deflection angle due to air loads.


CALLAIR A-9
ELECTRICAL SYSTEM
STALL WARNING HORN
LIFT DETECTOR
STALL WARNING CIRCUIT BRKR 5AMP
STARTER
AUX FUEL PUMP
AUX FUEL PUMP
AUXILIARY FUEL PUMP CIRCUIT BRKR 5AMP
SWITCH
RH. WING LITE
TAIL LITE
L.H. WING LITE
NAV LITE CIRCUIT BRKR 10 AMP
SWITCH
BUSS CIRCUIT BRKR 50 AMP
AMMETER
STARTER SWITCH
SOLENOID FRONT OF FIREWALL
F GEN BAT VOLTAGE REGULATOR
GEN CIRCUIT BRKR 5AMP
BATT CIRCUIT BRKR 5AMP
MASTER SWITCH
SOLENOID BACK OF FIREWALL
A GENERATOR F
BATTERY

SECTION III

OPERATING INSTRUCTIONS

PREFLIGHT

A preflight visual inspection should be made prior to flight. The following outline is suggested.

1. Check cockpit for general appearance.
2. Check to see that master and magneto switches are in the off position.
3. Check windshield and condition of cockpit enclosure.
4. Check wing strut security, aileron security, flap security, and wing tip lights. Ailerons and flaps should be generally inspected and the security of hinges including control system and attachment bolts.
5. Check tail surfaces, brace wires, and fittings for condition and security. Special attention should be paid to hinge pins and locking cottor pins.
6. Check wing leading edges for dents and condition.
7. Check landing gear for security.
8. Check tires for proper inflation, cuts, and worn spots.
9. Check propeller and spinner for condition and security.
10. Check engine cowling for security and cracks.
11. Check oil capacity - recommend minimum of nine quarts.
12. Drain all quick-drains on fuel tanks and fuel selector valve. Fuel strainer should be drained only with the master switch turned on and the electric fuel pumps operating. This will check the fuel flow of the system to the strainer and insure a positive shut-off against pressure after draining. This procedure is recommended in draining the gascolator or fuel strainer to prevent the possibility of unnoticed leaking of the quick-drain due to foreign particles under the seat.
13. Check fuel tanks for leaks and quantity.
14. Check air filter for security.
15. Check dispersal equipment for security and general condition.

BEFORE OPERATION

1. Fasten safety belt and shoulder harness.
2. Operate the flight controls and check for freedom of movement and proper operation.
3. Set parking brake.

STARTING ENGINE

Turn on the master switch and switch on the electric fuel pumps. Push the mixture control to full rich. When the engine is cold, prime by pumping

the throttle several times. Place cowl flaps in full open position. Turn the magneto switch key to left magneto.

(a) Crack engine throttle one-half inch open. Pump the throttle long strokes while cranking until engine starts. Immediately after the engine starts switch the magneto switch to "Both" position and let the engine operate at 1000 RPM while warming up. If engine is quite cold, it may be necessary to pump the throttle several times while the starter is turning over before it will start. If the engine appears to be loading up, open the throttle completely. When the engine starts set the throttle for the desired warm-up RPM.

WARM-UP AND GROUND CHECK

As soon as the engine starts, the oil pressure should be checked. If no pressures is indicated within thirty seconds, stop the engine and determine the trouble.

Warm up the engine at 1000 to 1200 RPM. The magnetos should be checked at 1800 RPM, the drop not to exceed 125 RPM. The engine is warm enough for the take-off when the throttle can be opened without the engine faltering. Carburetor heat should be checked during warm-up to insure correct operation of the control and the availability of heat if needed.

TAKE-OFF, CLIMB, AND LEVEL FLIGHT

Elevator trim should be in the "Take-off" range, carburetor heat "off", magneto switch on "both". Flaps may be either up or down for take-off. Do Not use flaps for take-off with high crosswinds.

The sharp downward slop of the fuselage ahead of the windshield was designed for maximum visibility. During take-off and level flight the nose of the airplane sets quite low with respect to the horizon. When taking off at high gross weights in a minimum distance, it is very important that the tail be raised to level flight attitude as soon as possible so that the airplane can quickly accelerate to take-off speed. It would be helpful for the pilot to make a pass down the runway in level flight with the main wheels touching the runway (as in a wheel landing) in order to become familiar with the position of the nose with respect to the runway and a level flight attitude. For maximum take-off performance it is also important for the pilot to apply a slight back pressure on the stick for take-off at the proper speed. Any attempt to hasten the take-off by premature application of stick back pressure will extend the take-off run. When taking off with flaps, sufficient altitude and speed (65 M.P.H. Max.) before flap retraction to prevent settling of aircraft into obstructions or terrain.

Special attention should be given to the position of your feet on the rudder pedals so as to not apply brakes during the take-off run. The brake cylinders are very sensitive and the slightest pressure on the toe brake pedal will cause considerable retarding of the take-off.

In all flight operations it is important that the engine be leaned properly, both for proper engine operation and engine cooling. The following method is recommended. Lean mixture until engine begins to lose RPM. Then move mixture control lever ahead until the engine runs smooth. Operating the engine too lean will result in higher cylinder head temperatures and valve damage.

CRUISING

The cruising speed of the A-9 varies with the type of dispersal equipment installed. At 75% power it will cruise at approximately 105 MPH with the Boom Master spray system installed. With the Swathmaster the cruise speed will drop to 95 MPH. With the Transland spreader it will cruise at 100 MPH.

LANDING

Landings may be made flaps up or down. Landings should not be attempted flaps down in high winds. Care should be taken to use sufficient power during landing approach to break the descent and flare for landing. As the A-9 is a heavily flapped airplane, care must be taken to not slow the airplane down to the point where the rate of descent is excessive as when this occurs power and nosing down of the airplane will be required to break the descent for landing. If, in this situation, insufficient altitude is available for nosing the airplane down, an extremely hard landing will result with possible damage to the airplane.

To stop the engine after landing, pull the mixture control full back to idle cut-off. After the engine stops, turn magneto and master switches.

SECURING THE AIRCRAFT WHEN LEAVING IT UNATTENDED

The control surfaces should be locked for parking by pulling the stick all the way back and fastening the safety seat belt around the front of the stock. Parking brakes should be left on and the windows closed. Tie-down rings are provided at the bottom of the rear strut attachment to the spar, and the aircraft should be securely tied down when it is being left unattended.

The tail wheels should also be in the most rearward position so as to engage the steerable mechanism to restrict the rudder from being buffeted by the wind while the aircraft is parked.

HELPFUL SUGGESTIONS

1. After take-off with the aircraft loaded, it is suggested to level off as soon as practical and allow the airplane to accelerate further. Then stabilize your climb to an airspeed of 70 MPH indicated. Higher ferrying speeds can be obtained by actually allowing the airplane to loose a little altitude and accelerate to its highest speed. Ten miles per hour can be picked up by following this procedure.

2. The safe and most efficient climb and glide speeds are 75 MPH indicated, flaps up, and 60 MPH, flaps down.

3. The throttle should be placed in wide open position for take-off.

4. When a pilot is checking out for the first time in the CallAir A-9 before working, he should make a simulated working pass over a strip or a runway allowing his wheels to touch the runway. This will help him to judge where his wheels are to become proficient in judging his proper height above the crop during aerial application operations.

5. Running the engine up and checking the magneto should be accomplished with the airplane sitting on a hard surface, otherwise, small pieces of gravel and dirt will be drawn up by the turbulence of the propeller and cause damage to the leading edge and tips of the propeller.

6. A large air intake scoop has been provided on the right hand side of the fuselage to ventilate and pressurize the fuselage. When applying dust or other chemicals the cabin doors must be closed allowing pressurization of the system or engine compartment from entering the fuselage.

7. An easy way to enter the airplane from the left side is to grasp the handle on the outside of the fuselage in the left hand and the top tube in the cabin with the right hand. Place your right foot over onto the floor boards, sit down in the window, and before getting in bring the left foot in and slide in and sit down. This procedure can be accomplished on the other side in the same manner. Leaving the aircraft should be accomplished in the same manner also. First, put your head and shoulders out, pull yourself up and sit in the window. Pull your outside leg out and step on the wingwalk grasping the handle on the side of the fuselage and swing the other leg out after you.

8. Never exceed the limitations of the aircraft or the pilot. FLY SAFELY, ENJOY YOUR WORK, LIVE LONG, AND MAKE MONEY.

SECTION IV

GENERAL MAINTENANCE

FUEL REQUIREMENTS

The low compression Lycoming engine installed in the A-9 utilizes Aviation Grade 80/87 octane gasoline.

(Note) Revised a/w Lyc Rec Mod. 100 - 130 octane only

OIL REQUIREMENTS

The oil capacity of the O-540-B2B5 engine is 12 quarts. It is recommended that the engine oil be changed every 50 flying hours. (100 hrs. when equipped with an oil filter), or sooner under adverse conditions. The following grades are recommended for the specified temperatures

Temperature above 60° F.....SAE 50
Temperature 30°F to 90°F.....SAE 40
Temperature 0°F to 70°F.....SAE 30
Temperature beloe 10°F.....SAE 20

BATTERY SERVICE

A 12 volt 35 ampere hour battery is standard electrical equipment. The battery should be checked frequently for proper fluid level. Access to the battery is gained by removing the panel on the left side of the fuselage immediately aft of the engine compartment. If the battery requires charging, recharge starting with a maximum charge rate of four amps. and finishing with two amps. The master switch should be off while charging.

WINDSHIELD AND WINDOWS

The windshield and cabin door windows on the A-9 are made of Plexiglas. In order to keep them clean the following procedure is recommended.

1. Flush with clear water and dislodge dirt, mud, etc.
2. Clean with a proper aircraft grade plexiglas windshield cleaner using a soft cloth.
3. Scratches may be removed by use of jewelers rouge. Where available, Mac"s Dynamte Cleaner is an excellent mild abrasive for polishing out small scratches. It is obtainable from most automotive supply houses.

BRAKE AND TIRE SERVICE

The brake system is filled with a Petroleum Base hydraulic brake fluid. When it is necessary to add fluid to the system, the following procedure would apply.

1. Remove proper removable side panel from fuselage left side.
2. Remove filler plugs from top of brake cylinders.
3. Fill with proper hydraulic fluid.
4. Replace filler plugs.
5. Check brake system for proper operation.
6. Replace removable fuselage side panel.

When it is necessary to refill or bleed the brake system to remove air the following procedure would apply.

1. Remove proper removable fuselage side panel from fuselage left side.
2. Remove filler plug from the master cylinder.
3. Remove bleeder screw and drain system into a clean can.
4. Remove bleeder screw from wheel brake unit and insert brake bleeder hose which is fastened to a pump type pressure oil can.
5. Fill the system from the bottom up using the pump type pressure oil can.
6. When master cylinder is full tighten bleeder screw.
7. Install filler plug.
8. Check system for proper operation.
9. Replace removable fuselage side panel.

No adjustment of brake clearances is necessary on the A-9. If brake linings become worn they may be replaced by removing two bolts fastening the brake units together, removing the lining backing plates and replacing the lining.

For maximum service, keep the tires inflated to the proper pressure, 20 pounds is the minimum for satisfactory service. The tires can be removed from the wheels by deflating the tubes, then removing the wheel through bolts, allowing the wheel halves to be separated.

CARBURETOR AIL FILTER

1. Visual Inspection

A visual inspection of the paper cartridge should be made every ten hours of operation or at any time after the filter has been subjected to severe dust conditions. This inspection should be made to determine if there has been a rupture of the paper cartridge or damage to the outer screen or end seals.

2. Cleaning

Remove cartridge and clean by tapping against a hard surface to remove grit, sand, and dirt. Do not blow out with an air hose or wash.

3. Replacement

If the present cartridge is found to be in good condition and is not obstructed after being properly cleaned, the following check should be made.

(a) Before reinstalling filter on the airplane, operate engine to static RPM at full throttle and note RPM.

(b) Reinstall cleaned filter and again operate engine to static RPM at full throttle and note RPM.

If a decrease of 50 RPM or greater is noted, a new cartridge should be installed.

INSPECTIONS

ENGINE SECTION:

1. Operation
   a. Run engine to minimum 120° oil temperature, check full throttle static RPM both magnetos.
   b. Check magnetos 125 RPM drop at 1800 RPM maximum.
   c. Check carburetor heat. 200 RPM drop at 1800 RPM.
   d. Check ignition switch for operation.
   e. Check idle RPM 550-600 carburetor heat off.
   f. Oil Pressure-Minimum idle 25 lbs. Normal 60-85 lbs.
   g. Master switch on, check generator and voltage regulator for operation.
   h. Battery fully charged will show very slight indication on ammeter at full throttle.
   i. Check idle cut-off at 800 RPM; engine should cut off clean.
   j. (1) Lycoming O-540-235 H.P. at Rated RPM 2575.
      (2) Static RPM Metal Fixed Pitch Prop - 2250-2350.

2. Engine Mount
   a. Check engine mount for damage and cracks at gussets or in corners.
   b. Inspect protective finish on mount.
   c. Inspect rubber shock mounts for deterioration and tension.

3. Cowling
   a. Clean and inspect engine cowling for dents and cracks.
   b. Check baffles for cracks and felt installation to prevent chafing.

4. Magnetos
   a. Check magnetos for secure attachment.
   b. Check breaker point housing for excessive oil.
   c. Check points for gap and pitting. Gap setting .015 to .018.
   d. Check plug wiring connections at magneto and wire insulation for deterioration and chafing.
   e. Check grommets at baffles.

5. Oil Drain
   a. Drain oil and check for metal particles.
   b. Remove, clean, and check oil screen drain plug and inlet oil temperature housing for metal particles.

c. Reinstall and safety oil drain plug.
d. Check oil cover for leaks and flexible lines for deterioration.

6. Spark Plugs
   a. Remove plugs, bomb blast and clean.
   b. Plugs with badly burned electrodes should be replaced.
   c. Reset gap to .018 to .022".
   d. Reinstall using thread lubricant to prevent seizing and torque to 300 to 360 inch pounds or 30 foot pounds.

7. Starter
   a. Check starter motor for mounting security.
   b. Check commutator for excessive wear and bridging.
   c. Inspect wiring insulation for deterioration and connections.
   d. Check ring gear for damaged teeth and nose cowl clearance.
   e. Check starter shaft bushings for play.
   f. Check brush retention and tension springs.

8. Generator
   a. Check generator mounting for security.
   b. Check brush retention and condition of tension springs.
   c. Replace worn brushes before there is any danger of brush failure.
   d. Brush worn over 3/16 of an inch sould be replaced.
   e. Check generator drive belt for 3/4" hand deflection.

9. Carburetor and heater
   a. Check carburetor for mounting security.
   b. Inspect carburetor bowl for cracks, particularly at inlet.
   c. Drain carburetor float chamber and check inlet finger screen. Resafety.
   d. Operate throttle in cockpit to be sure that throttle arm hits stops in open and closed positions without binding or sticking.
   e. Check operation of mixture control for binding or sticking and full rich position.
   f. Inspect carburetor airbox for security and cracks and heater valve for full travel.
   g. Check rubber intake hose connections for deterioration and clamp security.
   h. Check intake system for leaks and cracks.
   i. Clean air filter by tapping against a hard surface to remove grit, sand, and dirt. Do not blow out with air hose or wash.

10. Fuel Lines
   a. Check fuel lines for leaks and hose deterioration.
   b. Check hose supports for security and chafing.
   c. Drain and clean fuel strainer and resafety.
   d. Check for stains around fuel system indicating leaks.
   e. Check all connections for tightness.
   f. Check fuel valve travel.

11. Exhaust Stacks
   a. Check stack flanges for security, cracks and leaks.
   b. Remove heater and muffler shroud and inspect for corrosion, cracks, and leaks that might transfer gas to the cockpit, particularly through the cabin heater system.
   c. Check tailpipe, muffler and stacks for security at all clamps and slip joints.

d. Check cabin heater control valve for operation.
e. Check cabin and carburetor heat flexible tubing for security and general condition.

12. Firewall
    a. Check firewall for open holes and gas leaks from engine compartment.
    b. Check all controls for grommets and sealing.

13. Electric Fuel Pump
    a. Remove left exhaust cavity and clean strainers by unsafetying ends and turning 1/4 turn with proper wrench. Reinstall and safety.

PROPELLER SECTION

1. Alignment
    a. Remove spinner and check for cracks or dents in spinner. Propeller blades are to track within 1/16".

COCKPIT

1. Seats
    a. Check seat cushions for wear or deterioration.
    b. Check condition of safety harness and operation of buckle.

2. Windshield
    a. Check weatherstripping for security in channels and for weather leaks.
    b. Visually check for cracks, crazing, distortion and discoloration.

3. Power Instruments
    a. Check power plant instruments for mounting security.
    b. Check connections and plugs.
    c. Check placards and limitation markings

    Lycoming O-540-B Series Engine:

    Tachometer
    Red Line .....2575 R.P.M.
    Green Arc.....500-2575 R.P.M.

    Oil Pressure
    Red Line.....minimum 60 lbs., maximum 85 lbs.
    Green Arc.....60 lbs. -85 lbs.

    Oil Temperature
    Red Line..... 245°

4. Flight Instruments
    a. Check flight instruments for mounting security.
    b. Check connections and plugs.

Airspeed	
Red Line	135 M.P.H.
Yellow Arc	107-135 M.P.H.
Green Arc	60-107 M.P.H.
White Arc	50- 97 M.P.H.

5. Switches, Lights, Fuses
   a. Check battery cable connections for security.
   b. Check circuit breaker wire connectors for security and insulating sleeves.
   c. Check position and landing light switches for placards and operation.

6. Door Latch and Hinges
   a. Check door hinges for looseness.
   b. Check door latches for security.
   c. Check doors for proper fit to prevent air leaks to cockpit.

7. Engine Controls
   a. Check mixture control for quadrant placard and smoothness of operation.
   b. Check carburetor heat for quadrant placard and smoothness of operation.
   c. Check throttle for quadrant placard and smoothness of operation.
   d. Check cabin heat for panel placard and full travel of heater valve.
   e. Check ignition switches for panel and terminal security.
   f. Check ignition for placard - "OFF", "LEFT", "RIGHT", "BOTH".

8. Controls
   a. Check aileron and elevator control torque tube for excessive play.
   b. Check pulleys and cable attachments.
   c. Check control stick bolts.

9. Rudder Pedals and Linkage
   a. Check rudder pedal assembly for play and travel.
   b. Lubricate hinges and torque tube bearings and check for safety.
   c. Check rudder pedal return springs for attachment.

10. Cables and Pulleys
   a. Check all cables for broken strands.
   b. Check aileron pulleys and fairleads.

11. Flight Control Operation
   a. Check aileron, rudder and elevator controls from cockpit for smooth operation.

12. Trim Controls
   a. Check elevator trim control for smooth operation.

13. Fuel Valve
   a. Check fuel valve for smooth operation.
   b. Check placard for "ON" and "OFF" positions.
   c. Check valve for leaks.

LANDING GEAR

1. Shock Struts
   a. Check exposed piston area for grease coating to prevent rust.

2. Wheels and Axles
   a. Remove wheels, wash, check and relubricate bearings.
   b. Check brake disc and segments for wear and scoring.
   c. Check brake system for leaks.
   d. Install wheel and axle nut only tight enough to remove end play.

3. Tires
   a. Check tires for 20 pounds of air pressure.
   b. Tail wheel tire pressure is 50 lbs.
   c. Replace tires as necessary.

4. Brakes
   a. Check brake reservoirs for fluid and assembly for leaks.
   b. Check operation and holding ability of brake and parking brake.

5. Tail Wheel
   a. Check tail wheel and spring assembly for looseness.
   b. Check condition of tail spring pad.
   c. Remove wheel, wash and repack bearing.

FUSELAGE

1. Fabric
   a. Check condition of fabric.

2. Wing Fittings
   a. With fuselage panels removed, visually inspect wing fittings.

3. Landing Gear Fittings
   a. Inspect all fittings with flashlight and magnifying glass for signs of cracks or hole elongation.

4. Fuselage Structure
   a. Through inspection openings and through cockpit, check the condition of all tubing for rust, damage and protective coating.
   b. Check all stringers for damage and security.

5. Debris-In Fuselage
   a. Check the bottom of the fuselage and under floorboards for bolts, nuts and other objects that might jam controls or pulleys.

6. Control Cables
   a. Check for broken control cable strands by sliding a cloth over the cable in vicinity of fairleads and pulleys.
   b. Check upper and lower elevator turnbuckles for safety and maximum of three threads showing outside of barrel.
   c. Check trim cable for wear at fairleads.
   d. Check rudder cable fairleads and cables for wear.

7. Fairings
   a. Check tail assembly fairings for cracks and missing metal screws.

WINGS, AILERONS AND FLAPS

1. Wing Fabric
   a. Check left and right wing fabric for holes and open drain grommets at each rib bay trailing edge.
   b. Open inspection holes at drag wire fittings to inspect drag wires for tension and wing ribs and compression members for damage.

2. Struts
   a. Check bolts for fitting attachment to the spar.
   b. Check struts for dents or cracks.
   c. Check strut ends and lock nut.

3. Bolts
   a. Check strut attachment bolts to be sure that there are no threads in bearing and bolts are properly safetied.

4. Ailerons and Flaps
   a. Check both ailerons and flaps for wrinkles which are possible signs of structural damage.
   b. Check each rib bay for an open drain grommet.
   c. Check condition of fabric and finish.

5. Aileron and Flap Hinges
   a. Check aileron and flap hinge legs for security at rear spar.
   b. Check bolts for wear and safety. Worn or loose bolts must be replaced.

6. Aileron and Flap Controls
   a. Remove inspection covers and check the cables in each wing for interference and chafing.
   b. Check the pulleys in each wing for condition, wear, and safety.
   c. Check wear and safety of the fairleads in each wing.
   d. To locate broken strands at fairleads or pulleys slide a cloth over the cable, all cables with broken strands to be replaced.

7. Wing Root Fairings
   a. Check all screws for security and the fairing for cracks.

EMPENNAGE

1. Stabilizer
   a. Check stabilizer fabric condition and drain grommets for restrictions.
   b. Check stabilizer front and rear hanger tube.
   c. Lift up and down on the stabilizer, checking for excessive play.

2. Fin
   a. Inspect vertical fin for fabric condition and finish.
   b. Check for wrinkles, dents and signs of internal damage.

3. Rudder
   a. Inspect fabric cover on the rudder.
   b. Check bottom of rudder for an open drain grommet.

c. Check rudder for alignment and possible internal damage usually indicated by a wrinkle in the fabric.
d. Inspect rudder hinge pins for wear and safety.
e. Check hinge bushings for play; these bushings are pressed in and should be replaced when worn.
f. Check rudder stops to ascertain full travel:
25° Right and 25° Left, ±1°

4. Elevators
a. Check fabric condition and finish on the elevators.
b. Check for open drain grommets along the elevator trailing edge.
c. Sight check elevators for alignment.
d. Check hinge pins and bushings for wear and replace any worn pins or bushings.
e. Check elevator cable horns for safety, worn bolts and clearance in travel.

LEVELING AND RIGGING

The airplane should be leveled as follows:

Support the tail on an adjustable jack or stand so that the airplane is approximately in a level flight position. Place a level under the first rib outboard from the wing root between the marks directly over the "level here" placard. Next, place the level across the cockpit door sills and level the airplane laterally by letting air out of the tire on the high side.

Rigging of the aircraft is accomplished as follows:

1. Dihedral Angle: The wing dihedral angle is 5° and can be adjusted by lengthening or shortening the front strut by means of an eyebolt located at the upper end. A bubble protractor is used to measure the dihedral angle. The protractor should be placed along the front spar on the bottom side of the wing.

2. Washout: The wings on the A-9 are rigged flat with no washout. Washout is only added, when necessary, to correct for wing heaviness. Adjustment is accomplished by means of the eyebolt located at the upper end of the rear strut.

3. Tail Assembly: With the airplane in level position, the stabilizers should be leveled at their rear spars by adjusting the rear set of tail brace wires while leaving the front set loose. The elevator hinge line should be straight and level from tip to tip. The fin should be vertical at the rudder post. After the rear set of wires are rigged, tighten up on the front set, being careful not to twist the fin or stabilizer.

SERIAL NUMBER PLATE

The Serial Number Plate is located on the left side of the fuselage by the left wing trailing edge. The serial number of the plane should be used in referring to service or warranty matters and spare parts purchases.