

AVIAT AIRCRAFT INC.

PITTS SPECIAL S-2B AIRCRAFT OWNER'S AND MAINTENANCE MANUAL

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PITTS S-2B OWNER'S MANUAL

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SERVICE AND GENERAL MAINTENANCE (cont'd)

3. Onto the loosened bleeder screw, insert brake bleeder hose, which is fastened to a pump-type pressure oil can filled with correct hydraulic fluid.
4. Fill the system from the bottom up using the pump-type pressure oil can.
5. When master cylinder is full, tighten brake bleeder screw after removing bleeder hose.
6. Reinstall filler plug in master cylinder.
7. Check system for proper operation.

No adjustment of brakes clearances is necessary on the S-2B. 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 linings.

TIRES

For maximum service keep the 5.00 x 5 Type III 6 ply rating tube-type tires inflated to 35 pounds per square inch.

The tires can be removed from the wheels by first deflating the tubes, then removing the wheel through-bolts, allowing the wheel halves to be separated.

FABRIC

The fabric covering material of the S-2B is 2.7 oz. per yard dacron with 3.7 oz. used on the fixed surface of the wing. The filler and finish on all fabric surfaces is non tautening butyrate dope or polyurethane. The fabric covering may be repaired or replaced by standard accepted methods for fabric repair or replacement.

METAL FINISH

All cowlings, fairings, etc. are finished in chromated synthetic enamel. It is necessary to etch the metal parts prior to application of the normal finish.

LANDING GEAR

The main landing gear is fabricated of 4130 N tubing. There are no heat treated parts in the main gear. Energy is absorbed by four 1280 HD shock rings and a safety cable is provided in the event the shock rings fail.

The tail gear consists of a Maule SFS-1-4 steerable swivel tail wheel assembly, a flat leaf spring for energy absorption and two steering spring assemblies.

The landing gear should be serviced each 100 hours.

FUSELAGE

The fuselage of the S-2B is of conventional welded 4130 N tube construction. There are no specially heat treated members in the fuselage. The entire fuselage frame assembly is sandblasted and primed with an epoxy primer for protection against corrosion.

TAIL ASSEMBLY

The entire tail assembly is constructed of welded 4130 N tube and sheet and is protected in the same manner as the fuselage.

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MAINTENANCE SCHEDULE

This maintenance schedule is considered to be adequate for aircraft used normally and for aerobatic use and is to be used in conjunction with the FAA Approved Flight Manual on aircraft certified in this category.

NOTE:

On aircraft used for aerobatic work it is important that a good liaison with the pilot is maintained in order to assess the loads imposed and, therefore, the depth of maintenance to be carried out.

DAILY INSPECTION

1. Check aircraft documents and ascertain if there are any reported defects.
2. Inspect aircraft generally for external signs of damage, particularly under lower wing, under fuselage, and under tail.
3. Check control surfaces for full and free travel. Check that there is no excessive backlash in the aileron or elevator system. Ensure that there is tension in the rudder circuit.
4. Check operation of elevator trim.
5. Carry out a general assessment of tension of wing streamline wire. Investigate any uneven tension or change of tension.
6. Check tension of tailplane bracing wire.
7. Check cockpits for freedom from foreign matter.
8. Check condition of safety harness.
9. Check inside of wheel firings for accumulation of mud.
10. Check that aircraft stands level and rock from side to side to check tension of U/C shock chords.
11. Check tires for condition. Inflate to 35 PSI.
12. Check tail wheel unit and springs for condition.
13. Check brake units for condition and signs of fluid leakage.
14. Visually check instruments for condition and zero.
15. Check pitot head and static holes for freedom.
16. Check operation of stall warning sensor with master switch on.
17. Open engine cowling and inspect engine installation visually for leaks of oil and fuel.
18. Check oil level and security of oil filler.
19. Check exhaust gaskets and exhaust nuts. See that exhaust joints are free to move.
20. Check that HT leads are not contacting exhaust pipes.

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DAILY INSPECTION (cont'd)

21. Visually check engine mounting for condition.
22. Check fuel drains.
23. Check cowling attachments and fastenings.
24. Check spinner for security and condition.
25. Check propeller blades for freedom from damage.
26. Check fabric covering for signs of internal damage or distortion.
27. Check fuel and oil contents.

GROUND RUNNING AND ENGINE TEST

STARTING

1. See that switches are off.
2. Pull propeller through 8 compressions to clear any oil accumulated.
3. Make sure that canopy is locked.
4. Select air intake to normal position.
5. Set propeller control to high RPM (low pitch).
6. Select fuel ON.
7. Set throttle to ¼ open.
8. Set mixture to full rich.
9. Switch fuel booster pump to ON (2 to 3 seconds maximum).
10. Set mixture to idle cut off.
11. Crank engine with starter.
12. When engine fires, move mixture control slowly to full rich.
13. Check oil pressure on start up.

WARM UP

1. Head aircraft into wind.
2. Keep mixture full rich.
3. Keep propeller in low pitch.
4. Warm up at approximately 1000-1200 RPM.

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50 HOUR INSPECTION

GENERAL:

1. The satisfactory external condition of the aircraft, especially wing tips, propeller, empennage extremities, fuselage belly and under wing surfaces.
2. Check that all cowlings, panels and spinner are secure and check condition generally.
3. Tire pressure (35 PSI) and condition of tires, i.e. free from cuts, fractures, undue wear, tire creep. Brake units free from fluid leaks and check brake pads for wear.
4. Check action of undercarriage by gently rocking the aircraft laterally. Check attachment bolts for wear. Check shock cords for condition.
5. Check tail wheel assembly and leaf springs for condition and steering action from rudder. Lubricate as required.
6. Remove any control surface locking devices and check the action of all flying controls for freedom and correct movement. Lubricate all hinges.
7. Check security of pitot head and mountings and orifices for obstructions.
8. Check all control surface hinges are free and undamaged.
9. Check windshields and covers for condition and security.
10. Harnesses in good working order.
11. Battery and terminals secure.
12. Electrical systems functioning. Check all circuit breakers.
13. Check fuel tank and lines for security and lack of leaks, and vents clear. Clean fuel filter.
14. Check fuel valve and gauge for correct action.
15. Check fuel drains for water or foreign matter.
16. Check oil level in engine sump for condition and change oil.
17. Check for obvious signs of leakage of oil, fuel, or exhaust gasses.
18. Check attachment of engine mount to engine.
19. Check engine controls for condition, action and correct movement.
20. Check that there are no loose items that can foul the controls.
21. Check safety straps and attachments for condition and security and lock for action and lightly lubricate.
22. Clear all drain and vent holes.
23. Check seat and attachments for security. Check condition and security of floorboards in cockpit.

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50 HOUR INSPECTION (cont'd)

24. Check cockpit for oil soakage on fabric. Check wheel fairings for condition and security.
25. Check engine firewall for condition.
26. Check engine mount for condition and security, especially at attachments to firewall.
27. Clean out cockpit and aft fuselage if necessary.
28. Check cowlings for condition and security.
29. Check fuselage in vicinity of undercarriage legs and inspect. Inspect undercarriage mounting and surrounding structure for condition.
30. Inspect rear and main spar carry-through tubes in fuselage.

WINGS:

1. Check fabric coverings for condition and possible damage from stones, etc.
2. Check leading edge for condition or damage.
3. Check wing tips for condition.
4. Check ribs and trailing edge for damage, security or warping. Inspect for damage in region of walk and cockpit entrance.
5. Check main and rear spar attachments to fuselage for condition and signs of movement, or slackness of bolts.
6. Check rib lacing for condition.
7. Clear all vent holes.
8. Clean and check flying and landing wires for nicks and bends.
9. Check tension of wing rigging wires.

UNDERCARRIAGE:

1. With aircraft at rest on wheels, check that aircraft stands level and bungees are in good condition.
2. Check tail wheel leaf springs for stretching or distortion.
3. Jack up aircraft with wheels clear of ground. Remove wheels for servicing of brakes.
4. Check tailwheel assembly for security of attachment to springs and fuselage. Lubricate as required.
5. Check tailwheel tire, wheel bearings, pivot, actuating levers and coil springs for condition and wear. Lubricate wheel bearings and fork pivot.
6. Check main undercarriage bolts for wear and lubricate.

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50 HOUR INSPECTION (cont'd)

7. Check tires for condition and pressure 35 PSI. Check tires for "creep".
8. Check wheel bearings and brakes for freedom and correct operation.
9. Check brake system for leaks and top up reservoirs if necessary.
Refit wheels.
10. Inspect axle tube elbow for cracks at weld.

TAILPLANE:

1. Check tailplane main attachments for security and condition.
2. Carry out general inspection, especially at junction of tailplane and fuselage. Remove stern fuselage inspection panels to complete this inspection.
3. Clear vent holes.
4. Check rudder and elevator hinges.

FLYING CONTROLS:

1. Check all control surfaces for play in hinges and freedom of movement.
2. Check all controls for correct and full travel.
3. Check rudder cables for correct tension, then renew rudder pedal return springs, if cables are slack. Check cable for condition, particularly in the vicinity of fairleads.
4. Check fairleads and rubbing blocks for security and wear. Check push-pull rod adjustment locknuts for security and self aligning bearings for full movement.
5. Check all control surfaces for damage or trailing edge warp. Check ribs and structure for security, particularly in vicinity of wing walk.
6. Check fabric condition of all surfaces and clear vent holes. Check rib lacing and condition of surfaces.
7. Check rudder pedals, control column, torque shaft, and push-pull rod bearings for wear and security.
8. Check action of trim and condition of operating cable, especially in vicinity of trim control horn. Lubricate.
9. Carry out full lubrication schedule.
10. Check trim operating mechanism for wear.

INSTRUMENTS AND SYSTEMS:

1. Check pitot head for condition and security, also static holes.
2. Check all lines at instrument panel mountings.
3. Check all flexible lines for condition and security and lack of kinks at bends.

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50 HOUR INSPECTION (cont'd)

4. Carry out engine run up and taxi tests.

100 HOUR INSPECTION:

Repeat 50 hour inspection items, plus the following:

1. Remove all upholstery, seats and panels as necessary for inspection of the structure. Thoroughly inspect the upper longerons for cracks in the region just aft of the welds attaching the rear cabane struts (ref. SB24).
2. Remove wheels, clean brake discs, linings, and operating gear.
Replace wheels and check brakes.
3. Check rudder cables for wear, especially in the vicinity of fairleads.
4. Inspect control column and trim bearings for cleanliness and lubrication.
5. Check instrument lines, drain as required, and test for leaks.
Reconnect and test pitot static instruments against suitable standard.
6. Carry out electrical insulation tests if considered necessary.
7. Swing compass and check compass for condition.
8. Carry out 100 hour inspection on engine as laid down in Lycoming hand book.
9. Inspect propeller for condition of blades.
10. Check spinner for tightness and freedom from cracks.

1000 HOUR INSPECTION

Repeat 50 hour and 100 hour inspection and carry out the following extra items:

1. Check wing main attachment bolts for condition of bolts, fittings and condition of holes through fittings.
Refit after inspection.
2. Inspect spars for condition in vicinity of inspection panels.
3. Remove control surfaces and inspect hinges for condition. Refit after inspection.
4. Remove rudder cables to control horn attachment bolts for inspection of bolts and holes. Wear in holes and bolts in excess of .016" requires renewal of component. Refit after inspection.
5. Rig and check all controls. Carry out duplicate 100 hour inspection.
6. Clean and inspect aft section of fuselage.
7. Remove battery for inspection and servicing, recharging and test.
Refit after inspection.
8. Check tension of engine mount main attachment bolts.
9. Check and record wing and empennage rigging.

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1000 HOUR INSPECTION (cont'd)

10. Carry out structure condition and welded joint inspection on complete aircraft structure.
11. Carry out fabric and rib lacing condition check on complete aircraft.
12. Check fuel tanks and lines for leaks and condition. Carry out fuel flow checks on complete system for ample flow and contamination.

HEAVY LANDING INSPECTION

A landing heavier than normal could cause the tires and undercarriage to compress abnormally and create serious stresses throughout the aircraft structure. Further, a heavy landing on one wheel or with drift could be even more serious. Any form of heavy landing should be reported before the aircraft is used again and the necessary inspection carried out on the aircraft by a suitable inspection organization or licensed mechanic. The following Inspection Schedule can act as a guide.

1. With aircraft static, check the aircraft stands level.
2. Check outer and inner struts of undercarriage truss for bowing or dents.
3. Check wheel axles for correct alignment and weld on elbow for signs of failure.
4. Check action of undercarriage by gently lifting on each interplane strut. (Do not do this at wing tips as severe stressing of the spars could result.)
5. Check tires for signs of "creep".
6. Remove fairing panels from top and bottom of interplane struts. Inspect strut welds and strut attachment for signs of overload and bolts for distortion.
7. Remove fuselage side panels and inspect fuselage structure for bowed tubes, dented tubes, tubes with raised ridge, cracks or deformation around welds and damaged fittings.