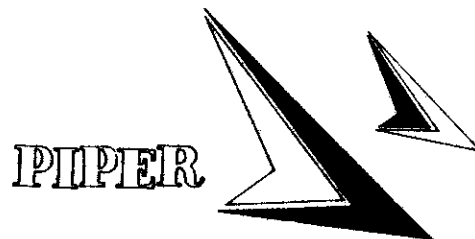


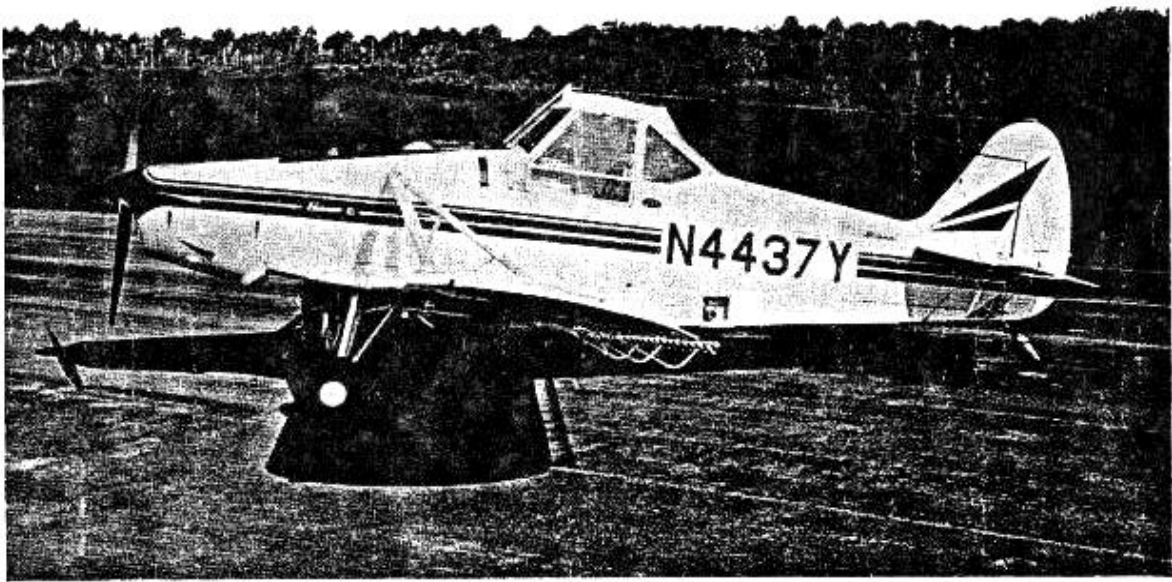
PAWNEE

C

Owner's Handbook



**Piper Aircraft Corporation, Lock Haven, Pa.
U. S. A.**



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SECTION I
SPECIFICATIONS

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SPECIFICATION FEATURES: (cont.) PA-25-235

PA-25-260 (Fixed Pitch)

PA-25-260 (Constant Speed)

WEIGHTS	PA-25-235		PA-25-260 (Fixed Pitch)		PA-25-260 (Constant Speed)	
	Sprayer	Duster	Sprayer	Duster	Sprayer	Duster
Gross Weight (lbs.)	2900	2900	2900	2900	2900	2900
Empty Weight (lbs.)	1523	1514	1540	1531	1556	1556
USEFUL LOAD (lbs.)	1377	1386	1360	1369	1344	1353
Hopper Load (lbs.)	1200	1200	1200	1200	1200	1200

FUEL AND OIL

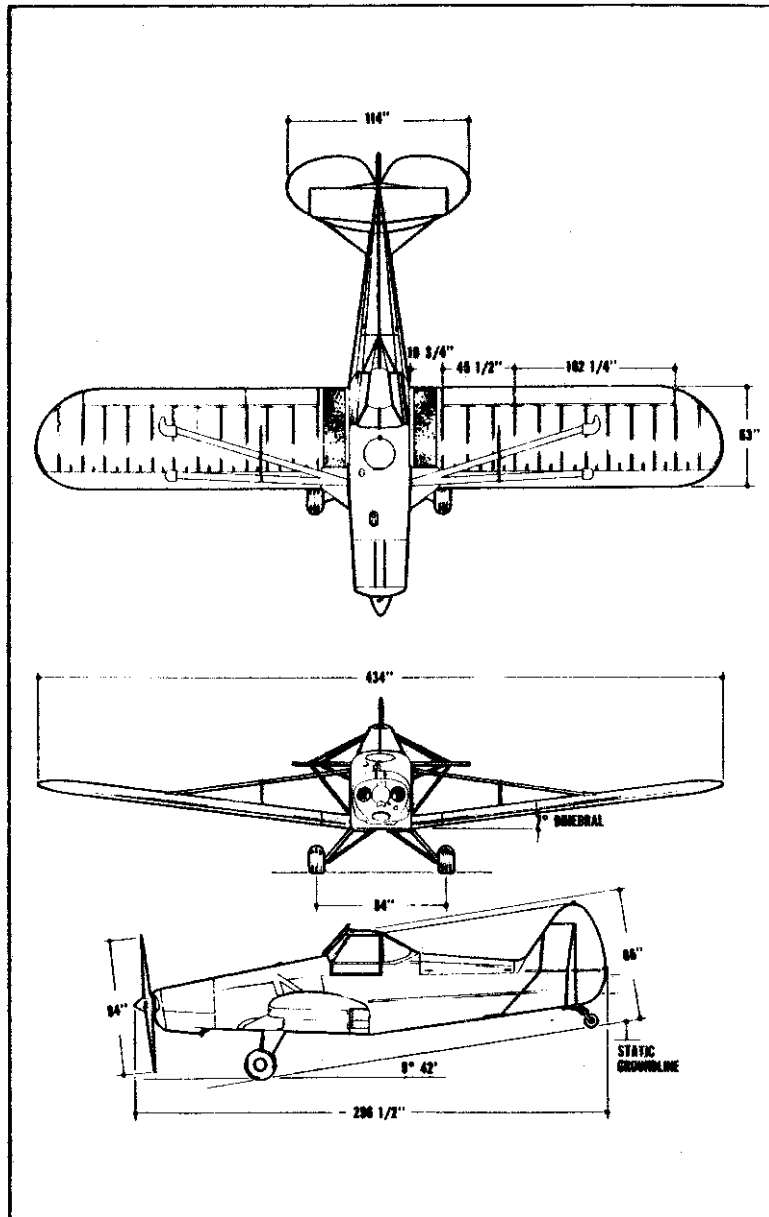
Fuel Capacity (gal)	38	38	38
(Fuel tank with liner. See Figure 2, page 9)			
Oil Capacity (qts.)	12	12	12

DIMENSIONS

Wing Span (ft.)	36.2	36.2	36.2
Wing Area (sq. ft.)	183	183	183
Wing Loading (lbs per sq. ft.)	15.8	15.8	15.8
Length (ft.)	24.7	24.7	24.7
Height (ft.)	7.2	7.2	7.2
Power Loading (lbs per HP)	12.3	11.1	11.1
Propeller Diameter (max. in.)	84	84	84

LANDING GEAR

Tire Pressure (lbs.)	Main	25	25	25
	Tail	50	50	50
Tire Size	Main (four ply)	8:00 x 6	8:00 x 6	8:00 x 6
	Tail (four ply)	3:00 x 4	3:00 x 4	3:00 x 4



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SECTION II

DESIGN INFORMATION

ENGINE AND PROPELLER

The PA-25-235 is powered by a Lycoming O-540-B2C5 engine rated at 235 HP at 2575 RPM, with a compression ratio of 7.20:1 and the PA-25-260 by a Lycoming O-540-G1A5 engine rated at 260 HP at 2700 RPM, with a compression ratio of 8.50:1. The six cylinder, direct drive, carburetor equipped 235 HP engine requires 80/87 minimum octane aviation fuel while the 260 HP engine requires 100/130 minimum octane aviation fuel.

Exhaust gases are carried through a single muffler system constructed of heavy gauge stainless steel and directed overboard at the right of the cowl. The muffler shroud provides a source of heat for the cabin interior, while carburetor heat is furnished by a separate shroud located on the right exhaust stack.

The carburetor air filter is of the dry pleated-paper type which features very efficient filtering action with negligible restriction to carburetor inlet flow. Also standard is a full flow oil filter, with easily replaceable cartridges.

The standard propeller on the PA-25 is a McCauley one-piece metal design. Also available for the PA-25-260 is either a Hartzell HC-C2YK-1/8477-0 or a McCauley B2D34C16/84HF-0 constant speed propeller.

FUSELAGE AND WINGS

The fuselage frame is constructed of steel tubes, gas welded to form a rigid structure. Highly stressed members are made of 4130 chrome-moly steel, others are of 1025 steel.

Repairs to the fuselage can be made in accordance with

the requirements of F.A.A. Manual 18 or Aviation Circular 43.13-1. Repair facilities for this type of construction are commonly available.

The fuselage structure is treated as follows to eliminate corrosion. The interior of the lower tubing is coated with Lionoil to prevent internal corrosion. The longerons and diagonal tubes are completely sprayed with zinc chromate primer followed by a coating of Rexton Activated Copon paint. A paste mixture composed of Permalite and polyester resin is applied at various points on the structure to eliminate dust pockets. Dope sealer is applied to the frame at points where fabric attaches.

The wing framework consists of riveted aluminum ribs mounted on extruded aluminum spars with tubular drag and compression struts and high strength stainless steel drag wires. Aluminum sheet is used to form the leading edge and the false spars. An ash wing-tip bow provides a light tough member which can withstand considerable wing tip shock without failing.

The wings are attached to the fuselage at fittings on the lower longerons, and by means of compression struts which bolt to upper fuselage members and wing spar fittings. The rear struts may be adjusted by means of a threaded attachment fitting at the outboard end of the struts. This adjustment is used to set the rigging of the wings.

LANDING GEAR

The Pawnee "C" landing gear employs two air-oil shock absorbers designed for minimum maintenance operation. (Consult Section IV for shock absorber maintenance.)

The only maintenance normally required is lubrication of the hinge bolts and each end of the shock struts according to the lubrication chart. The steel hinge bolt bushings should be inspected and replaced if worn.

The Scott 8" steerable, full-swivel tail wheel is standard equipment on the Pawnee. This unit is combined with steel leaf springs which are easily replaced if needed.

The main wheel assemblies are Cleveland Products 40-84A with Cleveland 30-41 Disc Brake Assemblies. The tires are 8:00 x 6 four ply rating. Tires should be inflated to 25 psi to prevent slippage and to produce even wear.

EMPENNAGE

The fin, rudder, stabilizers and elevator are all constructed of tubular steel with steel channel ribs. The control surface hinges have bronze bushing inserts and should be oiled according to lubrication chart. The elevators and the rudder are designed with an aerodynamic balance to increase stability and lighten control forces.

Double stainless steel tie rods and fittings brace the stabilizers to the fin and fuselage. The tail brace wires should not be used for lifting or ground handling of the airplane.

CONTROL SYSTEM

Conventional flight and engine controls are provided in the Pawnee. The flap lever has three positions, full up, half, or full down. The flaps are provided for an increased angle of descent only and should not be used for take-off or climb.

The elevator trim control is located on the left side of the cockpit and consists of a two-spring system with an irreversible geared crank mechanism. This system normally requires very little maintenance except for inspection and lubrication according to lubrication chart.

FUEL SYSTEM

Located in the first fuselage bay aft of the firewall is a 38 gallon, non-corrosive, fiberglass reinforced, plastic fuel tank incorporating a polyurethane and nylon liner. The liner is a safety feature incorporated to prevent fuel spillage in the event of a severe impact. The fuel quantity gauge is a float-type direct indicating unit installed in the top of the tank within easy view of the cockpit. The fuel shut-off valve is controlled by a "T" handle on the right side of the cockpit.

The fuel strainer, on the lower forward side of the firewall in the engine compartment, traps water or sediment that may collect in the system. Additional fuel screens are provided at the tank outlet and in the carburetor. The quick-drain valve on the strainer should be checked daily for water or dirt.

The fuel tank itself has an external vent line, and a non-vented fuel cap is used.

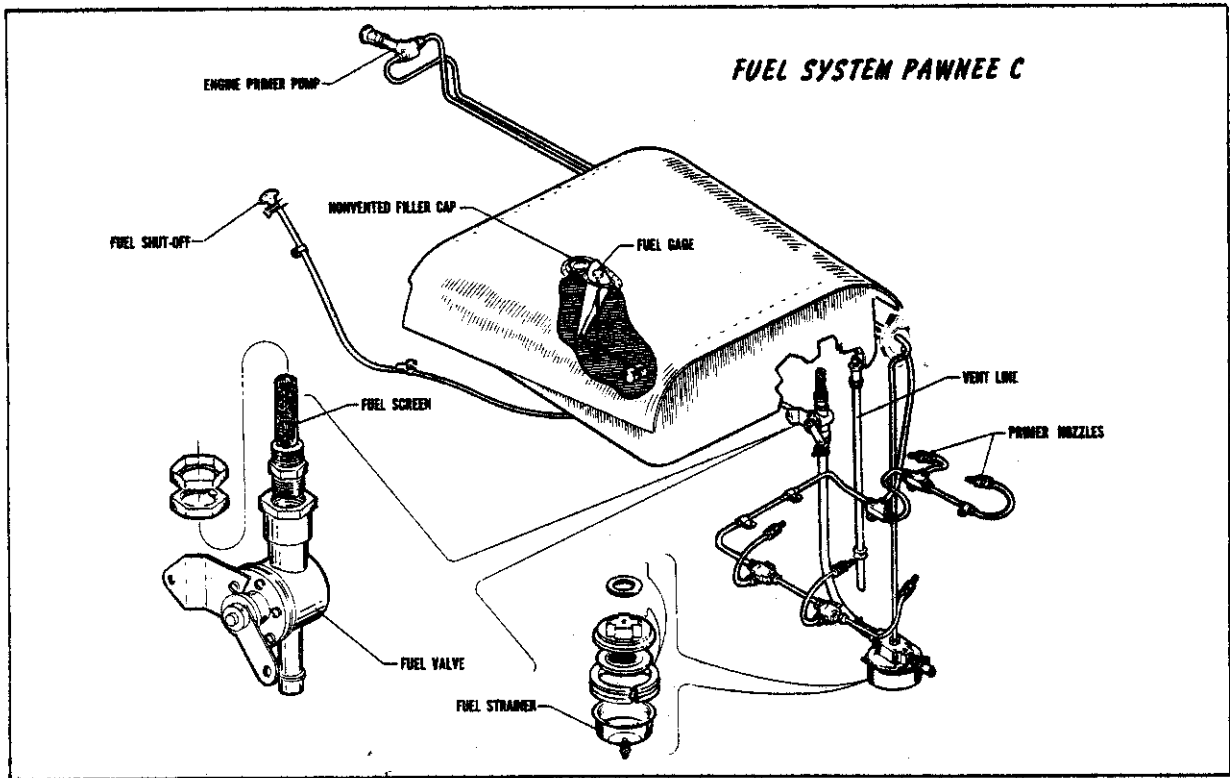
The engine primer pump on the left hand side of the instrument panel takes fuel from the top of the fuel strainer and pumps directly to the cylinders of the engine. The primer should be locked in at all times except when in use, to prevent malfunctioning of the engine.

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

ELECTRICAL SYSTEM

A 12-volt 25-ampere hour battery, voltage regulator, ammeter, starter solenoid, alternator, circuit breakers, stall warning light, switches, and related wiring are all included as standard equipment on the Pawnee.

The battery is located in a box in the fuselage just forward of the horizontal stabilizer. It is accessible through the removable turtle deck. The master solenoid and an energizing diode are located on the forward side of the battery box. The diode excites a circuit permitting a completely dead battery to



be charged after the engine is cranked manually. The voltage regulator is attached to the underside of the floorboard.

All switches, ammeter and circuit breakers are grouped on the right side of the instrument panel. 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.

Position lights, anti-collision lights, landing lights and instrument lights are available as optional equipment.

FINISH

The finish of the Pawnee consists of fire-resistant butyrate plastic material on the fabric surfaces and Rexton enamel on metal surfaces.

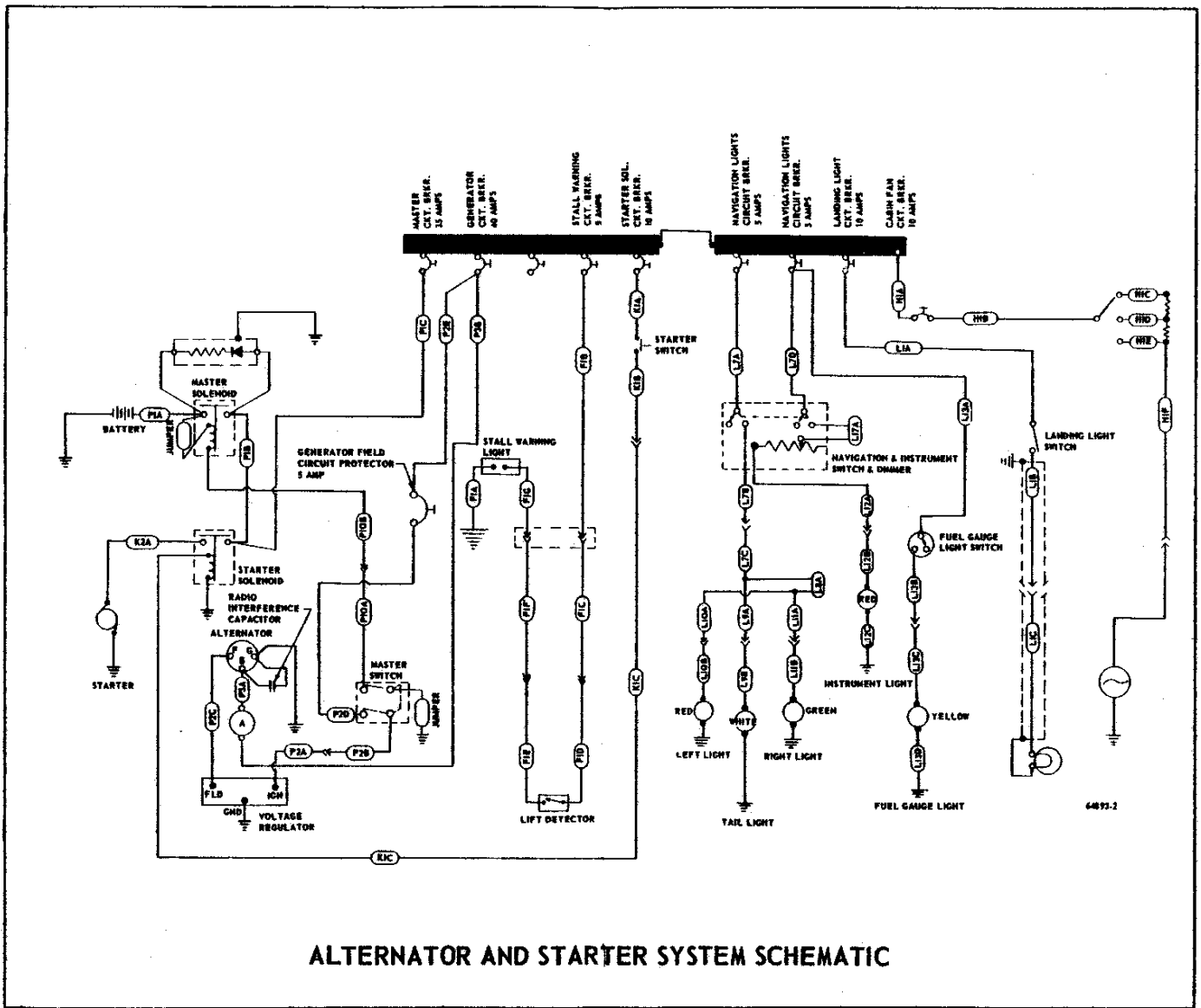
The butyrate finish must not be covered over with any incompatible material. The use of different materials from those originally applied will damage the finish.

CABIN FEATURES

The standard instrument group in the Pawnee includes the following: Altimeter, Airspeed, Compass, Oil Temperature and Pressure Gauge, and Tachometer.

The seat is adjustable fore and aft and up and down. The angle of the seat back is not adjustable.

The inertia reel for the shoulder harness installed in the Pawnee has a manual control to lock or unlock the harness in any position as well as an automatic locking device which will



lock the reel automatically in any position upon application of more than $2-1/2 \pm 1/2$ G inertia load on the reel.

When the lock is set automatically and the manual control is in the unlocked position, or when the lock is unlocked manually with a shoulder harness cable load, the cable drum will remain locked after both the inertia and the shoulder harness cable loads are released. Upon removal of these loads and operation of the manual control from the unlocked to the locked position and return to unlocked position, the reel shall automatically retract the shoulder harness cable.

The cabin ventilation system serves two purposes:

1. It provides cabin and fuselage pressurization to prevent the entrance of dust and toxic fumes into the airplane.
2. It provides ventilating air to the pilot.

The pressurization is controlled by the most forward door in the canopy. When the door is opened, pressurizing air flows through the chamber in the top of the canopy and is ejected into the fuselage at the rear of the canopy. The pressurizing system should be in use during all spraying and dusting operations.

Cabin ventilation is obtained by bleeding air from the pressurizing air chamber. The flow of air can be controlled by the circular ventilator located forward and above the pilot's head, and the "Y" shaped ventilator located at the rear of the cabin. The most forward door must be opened in order to obtain any cabin ventilation.

The control to regulate the flow of hot air to the cabin is by means of the cabin-heat control located just below the right corner of the instrument panel. To better distribute the heated air within the cabin, the circulation fan may be turned on to the low position.

Emergency door releases are located on each side of the instrument panel. To operate, pull red tee handle hard enough to break safety wire then push out door.

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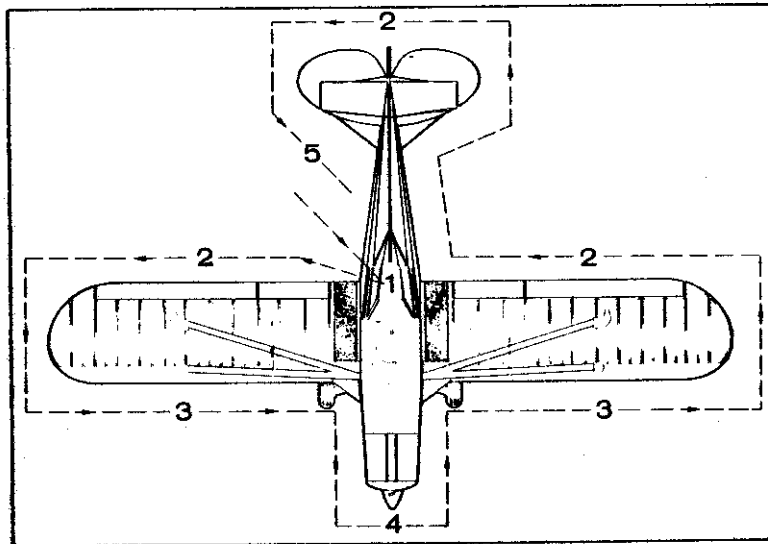
SECTION III

OPERATING INSTRUCTIONS

PREFLIGHT

The preflight should be a careful visual inspection made prior to flight. The following is an outline for preflighting the Pawnee.

1. a. As the aircraft is approached check the general appearance.
- b. Check cockpit for general appearance. Check the master and magneto switches in off position.
- c. Check windshield and condition of cockpit enclosure.
2. a. Check top side of wings, strut security, flap and aileron security and wing tip light.



- b. Check tail surfaces, tail brace wires and fittings for condition and security.
- 3. a. Check leading edge of wing for dents and condition.
b. Check landing gear for security, check tires for proper inflations, cuts and flat spots.
- 4. a. Check propeller and spinner for condition and security.
b. Open engine cowling and check for oil capacity. Check engine and accessories for security.
c. Drain fuel strainer. Allow sufficient fuel to drain so that the system is free of sediment.
d. Check fuel tank for leaks and quantity.
e. Check air filter for security.
- 5. a. If agricultural equipment is installed, check for security and general condition.
b. Check turtle deck for condition and security.

BEFORE OPERATION

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

STARTING ENGINE

When the engine is cold, prime three to five strokes. Push mixture control to full rich, prop pitch to full increase RPM (if so equipped), carburetor heat off, and open throttle about one-eighth inch.

Next place left magneto switch in the on position, turn on master switch, and with brakes set, push starter button. If the engine does not start in the first few revolutions open the throttle an additional one-half inch, while the engine is still turning over on the starter. If the engine appears to be loading up, open

throttle completely; when engine starts retard throttle to desired idle position and turn on right magneto switch.

When the engine is warm, do not prime before starting.

WARM-UP AND GROUND CHECK

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

Warm up the engine at 800 to 1000 RPM for not more than two minutes in warm weather, four minutes in cold weather. The magnetos should be checked at 1800 RPM, the drop not to exceed 125 RPM. The engine is warm enough for take-off when the throttle can be opened without the engine faltering.

If installed, the constant speed prop control should be moved through its complete range to check for proper operation and then placed to increase RPM for take-off.

Carburetor heat should be checked during the warm up to insure the correct operation of the control and the availability of heat if needed.

TAKE-OFF, CLIMB AND LEVEL FLIGHT

The fuselage, forward of the cockpit, was designed to give better visibility. During take-off and in flight the nose appears to have a nose-down attitude. If the nose-down appearance is kept in mind during the operator's first few take-offs, no difficulty should be encountered in obtaining the correct attitude.

If desired, a level flight may be simulated by raising the tail on a tail stand to a level position. With the airplane in this position, the nose attitude as seen from the cockpit is correct for take-off. Because of the nose down appearance, propeller clearance is sometimes questioned and should be observed while the aircraft is in this position to eliminate any doubts of adequate

clearance.

The elevator trim should be set three quarters of its travel nose up for take-off. The mixture should be full rich, and the carburetor heat off. The flaps should be retracted for take-off at all times. The best rate of climb speed for the Pawnee sprayer is 83 MPH, while 80 MPH is recommended for the duster.

After take-off hold the best rate of climb speed. In this attitude (normal climb) the nose attitude will appear a little low. Check the airspeed with the nose attitude until the attitude of the airplane has been determined. This is the best climb attitude and raising the nose higher will only decrease the rate of climb.

STALLS

Normal maneuvers in the Pawnee are permitted. A slip, skid, or high rate of roll will cause a slight buffet, however, this should not be interpreted as a stall warning but an indication of unbalanced flight. A slight buffet may also be felt in a steep, abrupt, pull-up but this is similar to the buffet felt in a high rate-of-roll maneuver and should not cause concern.

In any attitude or under any loading condition the stall is preceded by a moderate aerodynamic buffet and a proportional decrease in stick forces. All controls are effective up to and completely through the stall and there is no noticeable tendency to enter a spin after the stall.

With agricultural equipment installed the flaps down stall speed is 61 MPH, flaps up 62 MPH.

CRUISING

The cruising speed with agricultural equipment at gross

load under standard sea level conditions at 75% power for the PA-25-235 is 105 MPH with the sprayer installation and 100 MPH with the duster installation. For the PA-25-260 the speeds are 108 MPH and 103 MPH for the fixed pitch and 108 MPH and 103 MPH for the controllable pitch. At 75% power, fuel consumption will be approximately 14 gallons per hour for the PA-25-235 and 14.1 for the PA-25-260. See fuel consumption charts for additional information.

APPROACH AND LANDING

During the approach, trim elevator to maintain a glide speed of 75 MPH. Flap extension should not exceed 109 MPH. The mixture should be full rich, prop set to increase RPM, and carburetor heat off unless icing conditions prevail. The engine should be cleared occasionally by opening the throttle.

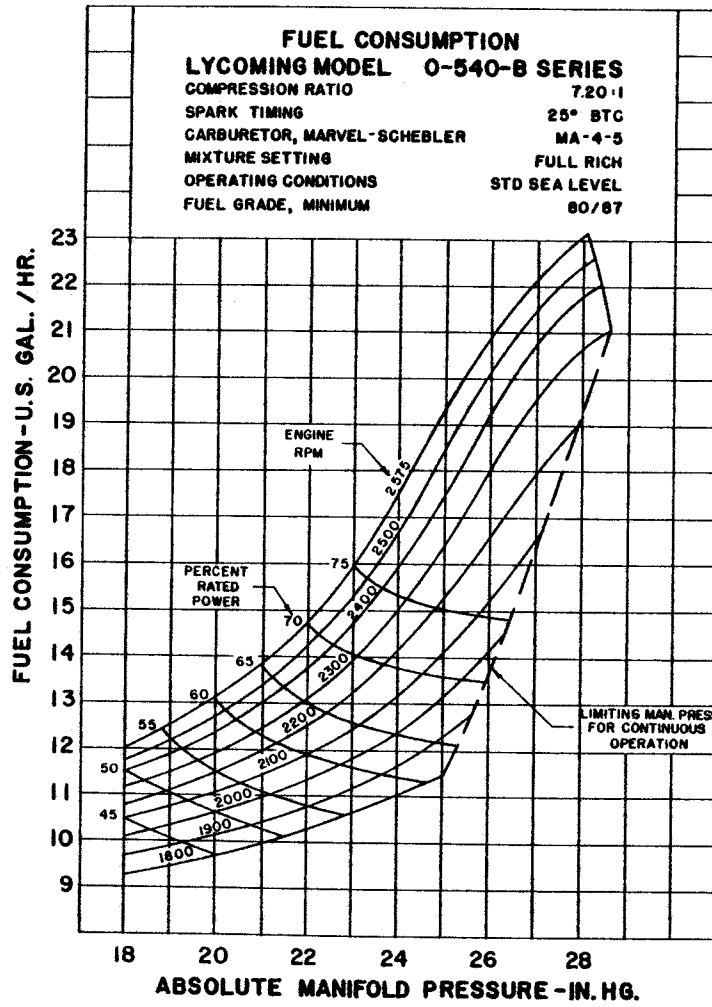
During the landing roll steer the airplane with the rudder pedals, using brakes as little as possible to avoid excessive brake and tire wear.

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 off.

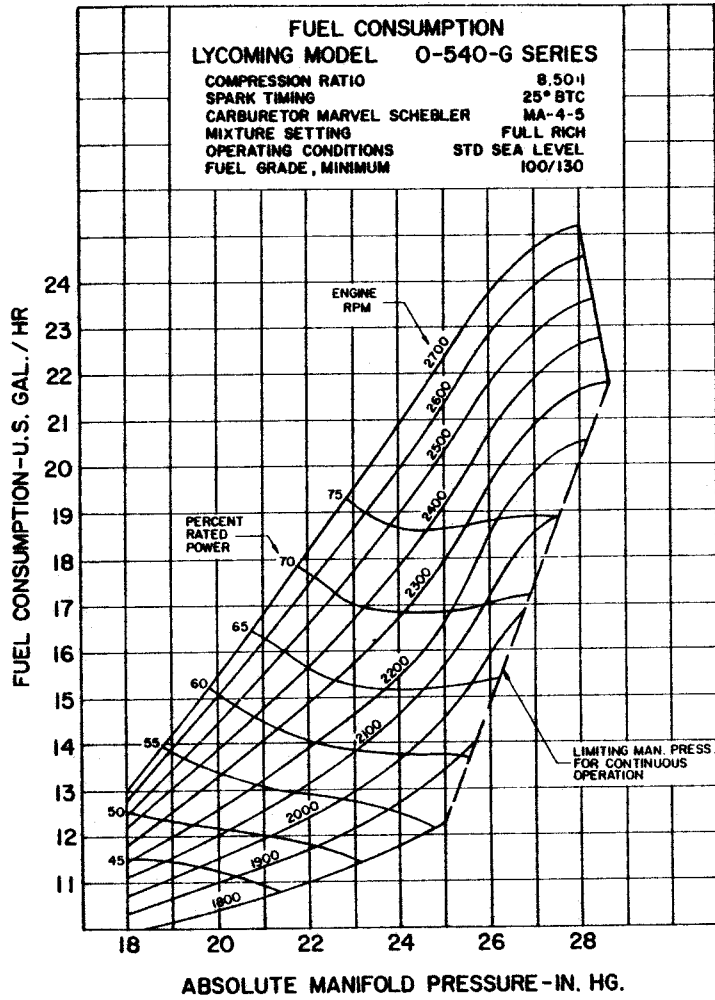
WEIGHT AND BALANCE

For weight and balance data, see the weight and balance manual supplied with each airplane.

PIPER PAWNEE PA-25-235



PIPER PAWNEE PA-25-260



Power Setting Table - Lycoming Model O-540-E,-G, 260 HP Engine

Press. Alt Feet	Std. Alt Temp ° F	143 HP - 55% Rated RPM AND MAN. PRESS.				169 HP - 65% Rated RPM AND MAN. PRESS.				195 HP - 75% Rated RPM AND MAN. PRESS.				Press. Alt Feet
		2100	2200	2300	2400	2100	2200	2300	2400	2200	2300	2400	2500	
SL	59	21.7	20.8	20.2	19.5	24.6	23.6	22.7	21.9	26.3	25.3	24.4	23.8	SL
1,000	55	21.5	20.6	20.0	19.3	24.4	23.3	22.5	21.7	26.0	25.0	24.1	23.5	1,000
2,000	52	21.3	20.4	19.8	19.1	24.1	23.1	22.2	21.5	25.7	24.8	23.9	23.3	2,000
3,000	48	21.0	20.1	19.6	18.9	23.8	22.9	22.0	21.2	25.4	24.5	23.6	23.0	3,000
4,000	45	20.8	19.9	19.4	18.7	23.6	22.6	21.8	21.0	25.1	24.2	23.3	22.7	4,000
5,000	41	20.6	19.7	19.2	18.4	23.3	22.4	21.5	20.8	24.8	23.9	23.0	22.5	5,000
6,000	38	20.4	19.5	18.9	18.2	23.1	22.2	21.3	20.6	--	23.7	22.8	22.2	6,000
7,000	34	20.2	19.3	18.7	18.0	22.8	22.0	21.1	20.4	--	--	22.5	22.0	7,000
8,000	31	20.0	19.1	18.5	17.8	22.6	21.8	20.8	20.1	--	--	22.3	21.7	8,000
9,000	27	19.8	18.8	18.3	17.6	--	21.6	20.6	19.9					9,000
10,000	23	19.6	18.6	18.1	17.4	--	--	20.3	19.7					10,000
11,000	19	19.4	18.4	17.9	17.2	--	--	--	19.5					11,000
12,000	16	19.2	18.2	17.7	17.0				19.3					12,000
13,000	12	--	17.9	17.4	16.8									13,000
14,000	9	--	17.7	17.2	16.6									14,000
15,000	5	--	--	17.0	16.4									15,000

To maintain constant power, correct manifold pressure approximately 0.17" Hg for each 10° F variation in carburetor air temperature from standard altitude temperature. Add manifold pressure for air temperature above standard; subtract for temperatures below standard.

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SECTION IV

GENERAL MAINTENANCE

FUEL REQUIREMENTS

Aviation grade 80/87 octane gasoline should be used at all times in the PA-25-235 while the PA-25-260 should always use 100/130 octane gasoline.

OIL REQUIREMENTS

The oil capacity of both the O-540 engines is 12 quarts. It is recommended that the engine oil be changed every 100 flying hours or sooner under adverse conditions. It is recommended the oil filter be changed every 50 hours. The minimum safe quantity of oil required is 3 quarts. The following grades are recommended for the specified temperatures.

Recommended oil for the O-540 engines:

Temperature above 60 ^o F	S. A. E. 50
Temperature 30 ^o F to 90 ^o F	S. A. E. 40
Temperature 0 ^o F to 70 ^o F	S. A. E. 30
Temperature below 10 ^o F	S. A. E. 20

BATTERY SERVICE

A 12 volt 25 ampere hour battery is installed with the

standard electrical equipment. The battery should be checked frequently for proper fluid level. Do not fill the battery above the baffle plates. At least every 30 days terminals, connections and battery area should be checked for corrosion. Corrosion effects may be neutralized by applying a solution of baking soda and water.

CAUTION

Do not allow soda solution to enter battery.

Repeat application until bubbling action has ceased. Wash with clean water and dry. Remove cup from bottom of battery box drain tube. Wash and flush battery box with clean water and replace cup.

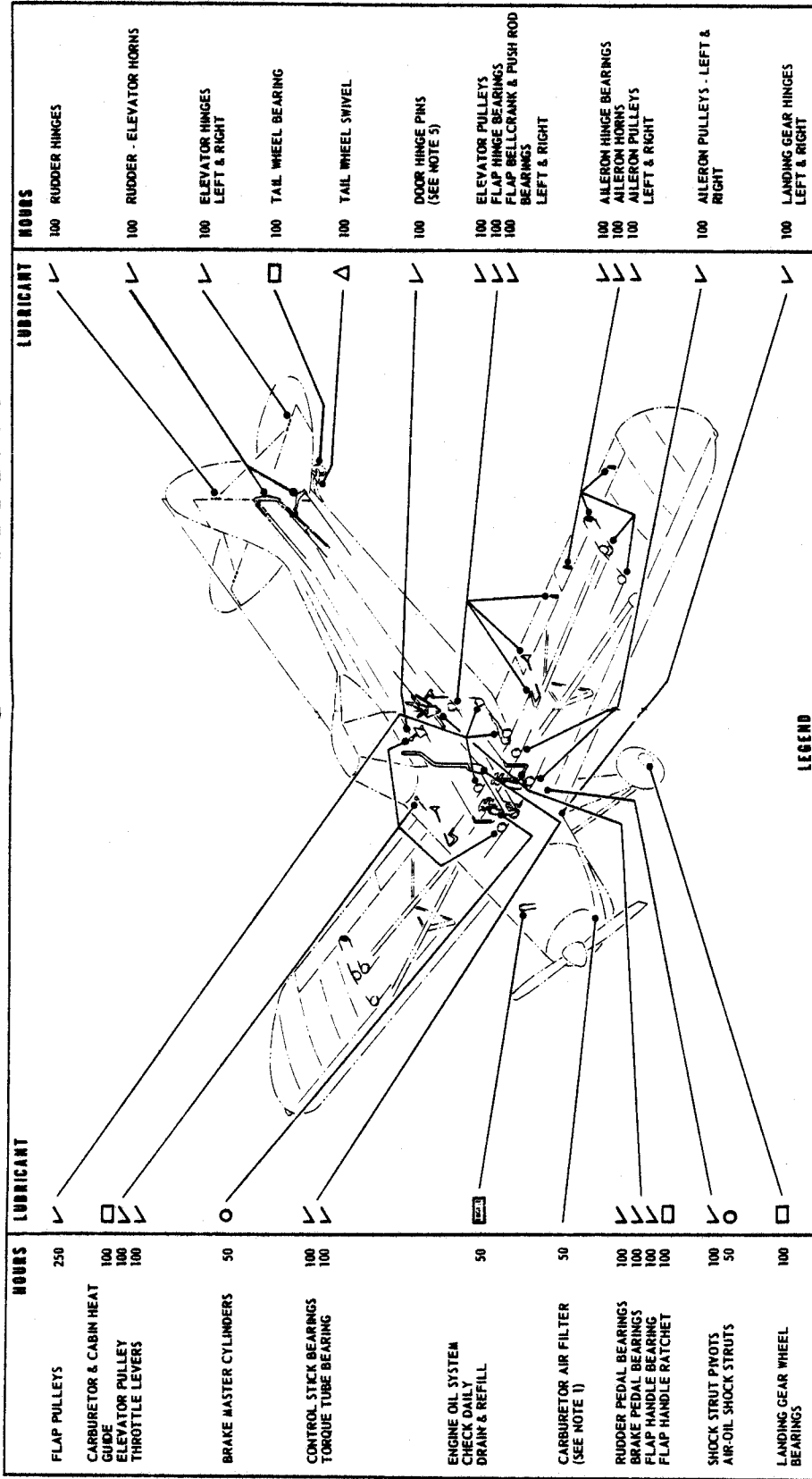
If the battery is not up to charge, recharge, starting with a maximum charge rate of four amps and finishing with two amps. The master switch should be off while charging.

CARE OF WINDSHIELD AND WINDOWS

The windshield and windows are made of Plexiglas and a certain amount of care is required to keep them clear and clean. The following procedure is recommended:

1. Flush with clean water and dislodge excess dirt, mud, etc. with your hand.
2. Wash with mild soap and warm water. Use a soft cloth or sponge. Do not rub.
3. Remove oil, grease, or dust and spray residue with a cloth soaked in kerosene. Do not use gasoline, alcohol, benzene, carbon tetrachloride, lacquer thinner or window cleaning sprays.
4. After cleaning apply a thin coat of hard polishing wax. Rub lightly with a soft dry cloth.
5. A severe scratch or mar can be removed by using jeweler's rouge to rub out scratch. Smooth area and apply wax.

LUBRICATION CHART



HOURS	LUBRICANT	HOURS	LUBRICANT
250	✓	100	RUDDER HINGES
100	□	100	RUDDER - ELEVATOR HORNS
100	∨	100	∨
100	∨	100	ELEVATOR HINGES LEFT & RIGHT
50	○	100	TAIL WHEEL BEARING
100	∨	100	TAIL WHEEL SWIVEL
100	∨	100	DOOR HINGE PINS (SEE NOTE 5)
50	□	100	ELEVATOR PULLEYS
50	□	100	FLAP HINGE BEARINGS
50	□	100	FLAP BELLCRANK & PUSH ROD BEARINGS LEFT & RIGHT
100	∨	100	AILERON HINGE BEARINGS
100	∨	100	AILERON HORNS
100	∨	100	AILERON PULLEYS LEFT & RIGHT
100	∨	100	AILERON PULLEYS - LEFT & RIGHT
100	∨	100	LANDING GEAR HINGES LEFT & RIGHT

LEGEND

MIL-L-7870 OIL - GENERAL PURPOSE LOW TEMP.
 MIL-G-3545 GREASE - LUBRICATION HIGH TEMP.
 MIL-G-7327 GREASE - GENERAL PURPOSE
 MIL-H-5606 HYDRAULIC FLUID (RED)
 SAE 50 ABOVE 60° F AIR TEMP.
 SAE 40 30° F TO 60° F AIR TEMP.
 SAE 30 0° F TO 70° F AIR TEMP.
 SAE 20 BELOW 10° F AIR TEMP.

NOTES

- CARBURETOR AIR FILTER - CHECK EVERY 8 HOURS AND IF NECESSARY REMOVE CARTRIDGE AND CLEAN BY TAPPING AGAINST A HARD SURFACE TO REMOVE GRIT, SAND AND DIRT. DO NOT BLOW OUT WITH AN AIR HOSE.
- PILOT AND PASSENGER SEATS - LUBRICATE TRACK ROLLERS AND STOP PINS AS REQUIRED WITH MIL-L-7870 LUBRICANT.
- WHEEL BEARINGS REQUIRE CLEANING AND REPACKING AFTER EXPOSURE TO AN ABNORMAL QUANTITY OF WATER.
- AIR OIL SHOCK STRUTS - SERVICE SHOCK STRUTS WITH AIR AND OIL AS REQUIRED PER INSTRUCTIONS IN OWNERS HANDBOOK.
- CABIN DOOR EMERGENCY RELEASE PINS - CHECK CONDITION, CLEAN AND LUBRICATE.
- MISCELLANEOUS - DURING ROUTINE MAINTENANCE CHECKS, LUBRICATE COWL HINGES AND MISCELLANEOUS LINKAGES.

CAUTIONS

- DO NOT USE A HYDRAULIC FLUID WITH A CASTER OIL OR ESTER BASE.
- DO NOT APPLY LUBRICANT TO RUBBER PARTS.
- TRIM CABLES - UNDER NO CIRCUMSTANCES SHOULD THE TRIM CABLES FROM THE COCKPIT TO THE REAR OF THE FUSELAGE BE LUBRICATED (TO PREVENT SLIPPAGE).
- CONTROL CABLES - WIPE CLEAN AT REGULAR INTERVALS BUT DO NOT LUBRICATE UNDER SALT WATER CONDITIONS OCCASIONAL LUBRICATION WITH MIL-L-7870 IS RECOMMENDED.
- SEE LYCOMING SERVICE INSTRUCTIONS NO. 1014 FOR USE OF DETERGENT OIL.

BRAKE AND TIRE SERVICE

The brake system is filled with a Petroleum Base hydraulic brake fluid. This should be checked at every 100 hour inspection, and replenished if necessary. Do not refill with vegetable base fluid. When it is necessary to refill the system, or when the brakes seem spongy, probably due to the air in the lines, the following procedures will apply:

Cleveland Brake #30-41

To fill the brake system with this type brake assembly installed, proceed as follows:

1. Remove the rubber cap from the bleeder assembly and slide the hose from the pressure cap over the bleeder screw. Loosen the bleeder screw and fill the system until the master cylinder is full. Repeat this procedure for the left brake. If a pressure can is not available an open can with a hose attached may be used, provided the can is held higher than the master cylinder.

2. Air in the brake lines causes faulty operation which can be corrected by bleeding the individual brake systems as follows:

- a. Check the entire system for breaks or leaks.

- b. Remove rubber cap from bleeder assembly, and slide a hose over the bleeder screw.

- c. Remove filler screw from master cylinder of the particular brake which is being bled.

- d. Fill the master cylinder with Univis No. 40 MIL-H-5606 hydraulic fluid and keep the cylinder full during the bleeding process.

- e. Loosen the bleeder screw and work the brake pedal rapidly to force fluid through the bleeder hose into the receptacle. Tighten bleeder screw during return of pedal to the off position. Continue this process until no air bubbles are observed coming through the bleeder hose. The system is then properly bled.

- f. Tighten the bleeder screw, remove hose, and replace the rubber cap. Insure the master cylinders are full of

fluid and that the brakes operate properly.

No adjustment of the brake clearances is necessary on the Pawnee. If after extended service the brakes become less effective, new segments may be installed by taking off the dust covers and axle nuts, and removing four bolts from the brake assembly after which the wheel, the brake body, and the inner segments may be disassembled. The outer segments may be removed from the brake body by removing an 8-32 steel lock nut which is located centrally on the face of the brake body. Also the pistons, "O" rings and cylinders may be inspected after the outer segments are removed.

For maximum service, keep the tires inflated to the proper pressure. 25 lbs. is the minimum for satisfactory service. When carrying heavier loads, increased pressure may be desired. This may be gauged visually to meet the existing load conditions. The main gear tires may be rotated to produce even wear if necessary.

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

CARBURETOR AIR FILTER

1. Visual Inspection:

A visual inspection of the paper cartridge should be made at intervals not exceeding eight (8) 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, damage to the outer screen or end seals, or blockage of the air flow due to leaves, paper, etc.

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 (see paragraphs 1 and 2), the following check should be made:

- a. Operate engine to static RPM at full throttle and note RPM.
- b. Remove filter cartridge and repeat operation in paragraph 3a.

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

LANDING GEAR SERVICE

To service the air charge only:

1. Remove right front side panel.
2. Remove inspection covers in lower fuselage bulkhead.
3. Remove valve cap and attach air line to air valve.
4. Loosen air lock nut and inflate strut to 575 ± 15 psi using either a strut pump or a portable charging bottle.
5. Tighten air lock nut and remove air line.
6. Replace valve cap, inspection covers and side panel.
7. Check for oil leaks.

To service both air and oil charges:

1. Remove right front side panel.
2. Remove lower left fuselage bulkhead and release air charge.
3. Remove the bleeder plug in the side of the shock strut body and fill to overflowing with MIL-H-5606 hydraulic fluid when strut is fully retracted. If fluid is added under pressure, filler hose connection should be hand tightened only.
4. Install the plug with bleeder hole exposed.
5. Charge with air as outlined above. Any excess oil will be discharged from the bleeder vent at this time.
6. Torque the AN814-2 plug to 175 ± 25 inch pounds.
7. Replace lower fuselage bulkhead and side panel.

A portable charging bottle is available through our Service Department.

INSPECTIONS

ENGINE SECTION

1. Operation:

- a. Run engine to minimum 120^o oil temperature - check full throttle static RPM both magnetos.
- b. Check magnetos 125 RPM drop at 1800.
- c. Check carburetor heat. 150 RPM drop at 1800.
- d. Check ignition switch for operation.
- e. Check idle RPM 550-600 carburetor heat off.
- f. Oil pressure - Minimum idle 25 lbs. Normal 60-90 lbs.
- g. Master switch on, check alternator 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. Static RPM PA-25-235, 2250-2350. PA-25-260 fixed pitch prop, 2325-2425; constant speed prop, 2700.

2. Engine Mount:

- a. Check engine mount for damage and cracks at gussets or in corners.
- b. Inspect protective finish on mount, sand and touch up bare areas.
- c. Inspect rubber shock mounts for deterioration and tension.
- d. Check mount bolts for safety.

3. Cowling:

- a. Clean and inspect engine cowling for dents and cracks at hinges and reinforcement.

- b. Check for tension adjustment on cowl doors at latch.
- c. Tension prevents vibration and cowl cracking.
- d. 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. Alternator:

- a. Check alternator mounting for security.
- b. Check alternator drive belt for 3/4" hand deflection.
- c. The amount of current shown on the ammeter is the load in amperes demanded by the electrical system from the alternator. To check, take for example a condition where the battery is demanding 10 amperes charging current. Switch on the rotating beacon. Note the value in amperes placarded for the beacon fuse (15 amps) and multiply by 80 percent. You get an actual current of 12 amperes. There will then be an increase of current from 10 to 22 amperes displayed on the ammeter. As each unit of electrical equipment is switched on, the currents will add up and the total, including the battery, will appear on the ammeter. Maximum continuous load is 37 to 40 amperes.

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 air box 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 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
- 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 at the valve.

11. Exhaust Stacks:

- a. Check stack flanges for security, cracks and leaks.
- b. Remove all heater and muffler shrouds 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 box and 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.

PROPELLER SECTION**1. Alignment:**

- a. Remove spinner and check for cracks or dents in spinner and back plate. Propeller blades are to track within 1/16".
- b. Metal propeller hub bolts are torqued 55-65 ft. lbs.
- c. Check for oil leaks on controllable pitch prop hub.

COCKPIT

1. Seats:
 - a. Check seat cushions for wear or deterioration.
 - b. Check seat fore and aft adjustment and lubricate track.
 - c. 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.

Tachometer	PA-25-235	PA-25-260
Red Line . . .	2575 RPM	2700 RPM
Green Arc. . .	500-2575 RPM	500-2700 RPM

Oil Pressure	min	max	min	max
Red Line . . .	60 lbs	90 lbs	60 lbs	90 lbs
Yellow Arc . . .	25 lbs	60 lbs	25 lbs	60 lbs
Green Arc. . .	60 lbs	90 lbs	60 lbs	90 lbs

Oil Temperature		
Red Line	245°	245°
Yellow Arc . . .	40° - 120°	40° - 120°
Green Arc. . . .	120° - 245°	120° - 245°

4. Flight Instruments:

- a. Check flight instruments for mounting security.
- b. Check connections and plugs.
- c. Check placards and limitation markings.

Airspeed

Red Line	156 M. P. H.
Yellow Arc	124 - 156 M. P. H.
Green Arc.	61 - 124 M. P. H.
White Arc (Flap Operation)	60 - 109 M. P. H.

5. Switches, Lights, Fuses:

- a. Check battery cable connections for security.
- b. Check circuit breaker wire connector 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 propeller for panel placard and smoothness of operation.
- e. Check primer for operation and leaks.
- f. Check cabin heat for panel placard and full travel of heater butterfly valve.

g. Check ignition switches for panel and terminal security, and placard for "OFF", "LEFT", "RIGHT."

8. Controls:

- a. Check aileron and elevator control torque tube for excessive play.
- b. Check pulleys and cable attachments.
- c. Check aileron arm attachment on torque tube.
- d. 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. Flap Controls:

- a. Check flap handle for placard and condition of ratchet for flap positions.
- b. Check flap torque tube for excessive play.
- c. Check flap cable attachments.
- d. Check flap pulleys at bottom of fuselage.
- e. Remove inspection covers and check cable fairleads within wingwalk.
- f. Through wing inspection openings check the attachment of flap return springs.

11. Cables and Pulleys:

- a. Check all cables for broken strands.
- b. Check aileron pulleys and fairleads.

12. Flight Control Operation:

- a. Check aileron, rudder and elevator controls from

cockpit for smooth operation.

b. Check stick for neutral position with control surfaces streamlined.

13. Trim Controls:

a. Check elevator trim control for smooth operation.

b. Check indicator against elevator for proper position.

14. Fuel Valves:

a. Check fuel valve for smooth operation.

b. Check placard for "ON" and "OFF" positions.

c. Check fuel valve for full travel at valve.

LANDING GEAR

1. Shock Struts:

a. Check shock absorbers for proper extension.

b. Check shock struts and hinge bolts for wear and lubrication.

2. Wheels and Axles:

a. Remove wheels, wash, check and relubricate.

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.

e. Check torque on wheel thru bolts.

3. Tires:

a. Check tires for 25 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. Landing Gear Vees:
 - a. Hoist aircraft and check gear bushings; vee bushings are replaceable if worn.
 - b. Check for skin wrinkles which may indicate interior damage.

6. 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 particularly on top surfaces. (Use strip test method.)
 - b. Check the finish for cracks or checks. Sand out and repaint all checks or cracks to preserve the fabric.

2. Wing Fittings:
 - a. With fuselage bottom panel removed, inspect wing fittings with a flashlight and magnifying glass for minute cracks in the ears. Check bolts to be sure that there are no threads in bearing and that bolts are properly safetied.
 - b. Check wing fitting holes for elongation by having

someone pull up and down on the wing tips.

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 behind seat 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.

b. If considerable dirt or oil exist on the fuselage bottom, wash out with a non-caustic soap.

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 bungee spring attachment at upper and lower elevator horn, and 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, cracks or checks in the finish and open drain grommets at each rib bay trailing edge. (Fabric usually deteriorates first on the upper surface of the wing and along the trailing edge.)
- b. Install inspection grommets at drag wire fittings to inspect drag wires for tension and wing ribs and compression members for damage.

2. Struts:

- a. Check right and left wing strut fittings for elongation by lifting up and down on the wing.
- b. Check bolts for fitting attachment to the spar.
- c. Check struts for dents or cracks. Sight down strut trailing edge to ascertain that struts are straight.
- d. 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:

- a. Check both ailerons 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, refinishing any dope cracks, checks or ringworm.

5. Aileron Hinges:

- a. Check aileron hinge legs for security at rear spar and false spar.

b. Check clevis bolts for wear and safety. Worn or loose bolts must be replaced.

6. Aileron Control:

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 and lubricate pulley bearings.

c. Check wear and safety of the fairleads in each wing.

d. Aileron travel - 23° up 23° down $\pm 2^{\circ}$.

e. Stop at aileron should engage first to allow for full travel of ailerons.

f. Check the four aileron horn bolts for wear, threads in bearing and safety.

g. Check the turnbuckle to see that it is safetied and not more than three threads are showing outside the barrel.

h. To locate broken strands at fairleads or pulleys slide a cloth over the cable, all cables with broken strands to be replaced.

7. Flap Covering:

a. Check fabric condition of both flaps for deterioration.

b. Check condition of finish for cracks, checks, or ringworm and refinish any that exist.

c. Any internal structural damage will cause wrinkles on the fabric surface.

8. Flap Attachments:

a. Each flap has two hinges and two hinge legs that are riveted to the wing false spar and attached with a single bolt to the wing rear spar. Lowering the flaps at excessive speed can cause possible damage to these hinge legs so a careful inspection is recommended.

b. Check stop in up position for streamline of flap.

c. Check the clevis bolts for wear and installation of washers and safety.

9. Flap Mechanism:

a. Check rod-end bearings and push-pull tube for clearance through hole drilled in the bearing. Check minimum distance the push-pull tube is screwed into the rod. Be sure lock nut is tight.

b. Ascertain through inspection that both flap return springs are secure and in good condition. Operate flaps and check springs to be sure they do not chafe, bind or interfere with other controls or adjacent structure.

c. Check travel: Full Flap $57^{\circ} \pm 2^{\circ}$.

d. Check bellcrank casting for cracks, particularly at the ears and for safety and security of the bracket.

10. Wing Root Fairings:

a. Check all screws for security and the fairing for cracks.

EMPENNAGE

1. Stabilizer:

a. Check stabilizer fabric condition and drain grommet for restrictions.

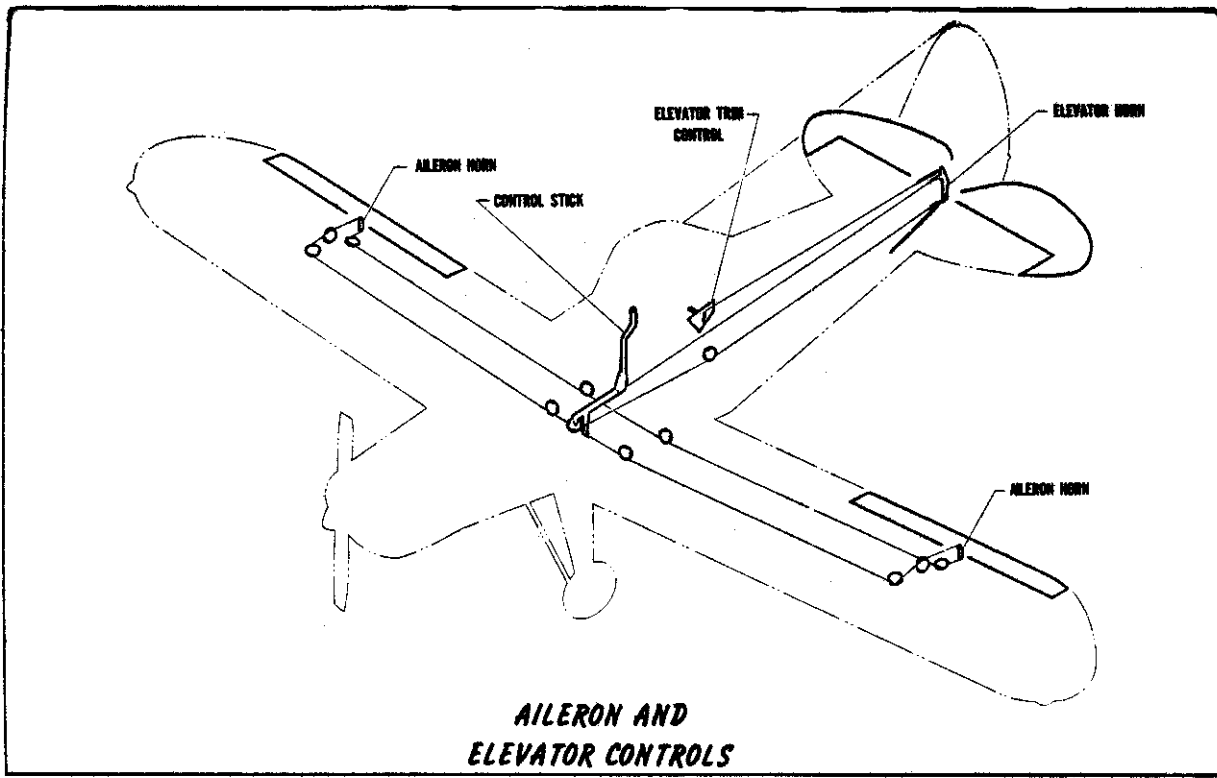
b. Check stabilizer front and rear hanger tube.

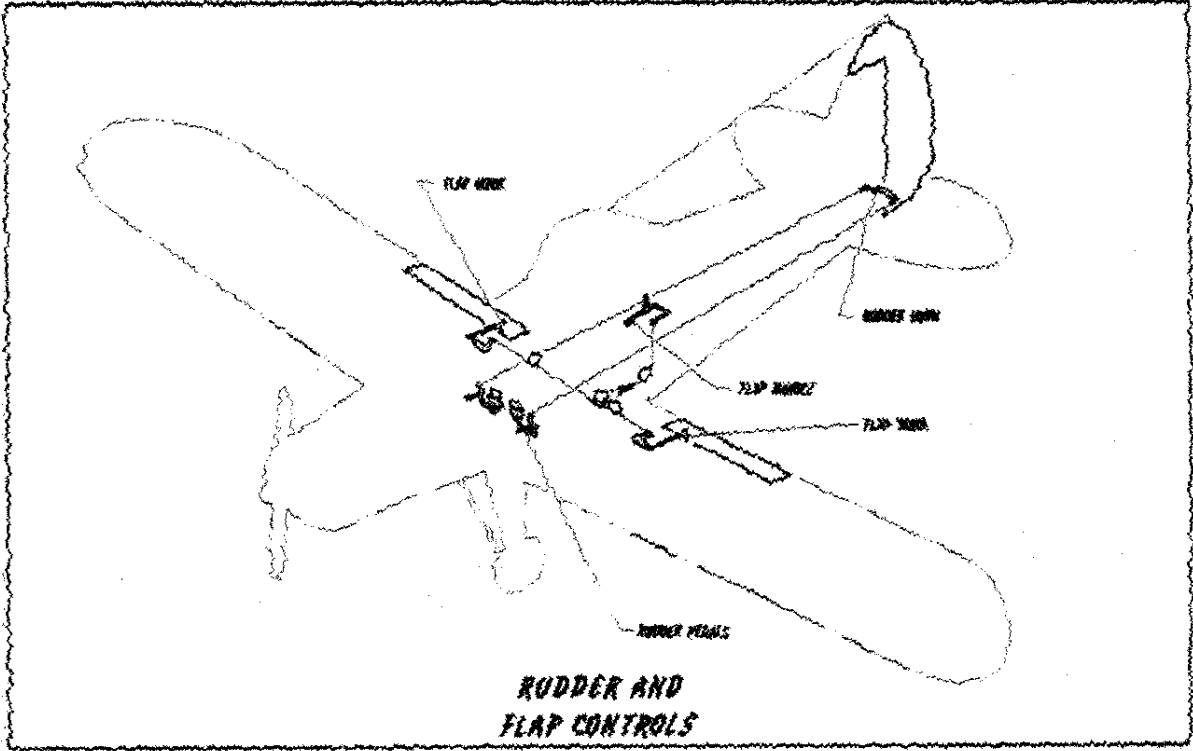
c. Lift up and down on the stabilizer, checking for excessive play.

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 for fabric and dope condition.
- 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 bolts 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, $\pm 2^\circ$.

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 bolts and bushings for wear and replace any worn pins or bushings.
- e. Check elevator cable horns for safety, worn bolts and clearance in travel.
- f. Check elevator stops to ascertain full travel:
28° up and 15° down, $\pm 2^\circ$.

5. Tail Brace Wires:

- a. Check empennage brace wires for corrosion and cracks or nicks that might result in failure.
- b. Check fittings for alignment with the wire and bolts for safety.
- c. Brace wires should be taut with little hand deflection.
- d. Check each wire to be sure there are no loose fork lock nuts.

6. Empennage Controls:

- a. Check rudder and elevator horns for worn bolts and safety with no threads in bearing.
- b. Check horns for alignment with the cable and freedom of travel.
- c. Check top and bottom cable turnbuckles for safety and a maximum of three threads showing outside of the barrel.
- d. Check cables through the fuselage for interference and chafing.

7. Electrical System:

- a. Check wiring for chafing and clamping.
 - b. Check that all terminals are tight.
 - c. Check bonding straps for security.
 - d. Check mounting and operation of landing lights.
 - e. Battery installation and terminals should be secure.
- Check that battery is charged and that there is no acid spillage.
- f. Check circuit breakers for security.

AGRICULTURAL EQUIPMENT**1. Spray Equipment**

- a. Check spray lines for leaks and hose deterioration.
- b. Check line supports and clamps for security and corrosion.
- c. Drain and clean spray strainer.
- d. Check pump, fan, and brake assemblies, for security and proper operation.
- e. Check pump lubrication.
- f. Check on-off control and valve for security and correct operation.
- g. Check pressure control valve for security and correct operation.
- h. Inspect booms and boom supports for security and

corrosion.

- i. Inspect nozzle diaphragms for deterioration.
- j. Check hopper outlets and seals for leaks.
- k. Check fan blades for cracks.

2. Duster Equipment:

- a. Check gear box oil level.
- b. Check fan, gear box, drive shaft, agitator, and couplings for security and proper operation.
- c. Check fan for cracks and nicks.
- d. Check security of drive shaft hole doubler in lower right wingwalk.
- e. Check agitator shaft seal at hopper for security and leaks.
- f. Check distributor for cracks, loose rivets, and security.
- g. Check all seals for tightness.
- h. Check canvas bottom seal for deterioration.

LEVELING AND RIGGING

The airplane may be leveled as follows:

Support the tail on an adjustable jack or stand so that the airplane is in approximately level flight position. Place a level on either top longeron in the cockpit area and raise or lower the tail until the bubble is centered; next place the level across the cockpit from longeron to longeron and level the airplane laterally by letting air out of the tire on the high side.

Rigging of the aircraft is done as follows:

1. Dihedral angle: This is fixed and cannot be adjusted without structural alteration.
2. Washout: Place a 1/4" spacer block on top of a 30 inch level at one end. With the aircraft level, hold the level fore and aft against the bottom of the rib outboard of aileron, with

the spacer block at front spar. The correct washout will exist when the bubble is centered. Adjust the rear struts until this condition exists.

3. Tail assembly: With the airplane in level position, the stabilizer 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 after deck behind the pilot's seat. The serial number of the plane should be used in referring to service or warranty matters.