

AA-5 SERIES  
MAINTENANCE MANUAL

CHAPTER 71

POWER PLANT

TABLE OF CONTENTS

<u>NUMBER</u>		<u>PAGE</u>
71-0	POWER PLANT	
	Description/Operation	1
	General	1
	Engine Data	1
	Engine Operation	1
	Troubleshooting the Power Plant	101
	Maintenance Practices	201
	General	201
	Cleaning Power Plant	201
	Power Plant Removal/Installation	201
71-1-1	POWER PLANT COWLING	
	Description/Operation	1
	General	1
	Maintenance Practices	201
	Removal/Installation AA-5 Serial No. 0001 through 0640	201
	Removal/Installation AA-5 Serial No. 0641 and Subsequent, AA-5A and AA-5B	201
71-2-1	ENGINE MOUNT	
	Description	1
	General	1
	Maintenance Practices	201
	Removal/Installation	201
71-6-1	AIR INTAKES	
	Description/Operation	1
	General	1

AA-5 SERIES  
MAINTENANCE MANUAL

<u>NUMBER</u>		<u>PAGE</u>
71-6-2	ENGINE BAFFLES	
	Description/Operation	1
	General	1
	Maintenance Practices	201
	Removal/Installation	201
71-7-1	ENGINE DRAINS	
	Description	1
	General	1

POWER PLANT - DESCRIPTION/OPERATION

1. General

The AA-5 and AA-5A are powered by a 150 H.P. Lycoming, four-cylinder, horizontally opposed, air-cooled engine. The engine turns a McCauley fixed pitch propeller, model 1C172/BTM-7359 or 1C172/SBTM-7359. The AA-5B is powered by a 180 H.P. Lycoming, four-cylinder, horizontally opposed, air cooled engine. The engine turns a McCauley fixed pitch propeller, model 1A170/FAA-7563.

The power plant is enclosed by a three-segment cowl assembly consisting of an upper, lower, and forward cowl assembly.

The engine is attached to the engine mount assembly at four places using vibration isolator type shock mounts. After complete engine build-up the power plant is attached to the fuselage at the four engine mount support locations.

The engine is cooled by ram air pressure that is forced over and around the cylinders by the use of baffles. The air is then exhausted to the atmosphere through exit ducts located in the bottom of the lower cowl.

2. Engine Data

	<u>AA-5 and AA-5A</u>	<u>AA-5B</u>
Engine	0-320-E2G	0-360-A4K
Rated horsepower	150	180
Rated speed,RPM	2700	2700
Bore, inches	5.125	5.125
Stroke, inches	3.875	4.375
Displacement, cubic inches	319.8	361.0
Compression Ratio	7.0:1	8.50:1
Firing order	1-3-2-4	1-3-2-4
Spark occurs degrees BTC	25	25
Spark plug gap	0.017 to 0.021*	0.017 to 0.021*
Valve rocker clearance (hydraulic tappets collapsed)	0.028-0.080	0.028-0.080
Propeller drive ratio	1:1	1:1
Propeller drive rotation (viewed from rear)	Clockwise	Clockwise

\*See latest revision of Lycoming Service Instruction Number 1042 for gap on specific plug being used.

3. Engine Operation

Refer to Avco Lycoming Operator's Manual, Avco Lycoming Service Instructions, and the Aircraft Owner's Manual or Pilot's Operating Handbook for proper operation of the engine.

AA-5 SERIES  
MAINTENANCE MANUAL

POWER PLANT - TROUBLESHOOTING

1. Troubleshooting the Power Plant

TROUBLE	PROBABLE CAUSE	REMEDY
Engine fails to start	Lack of fuel	Open fuel selector valve. Service fuel tanks. Push mixture control to full rich position.
	Flooded, or over-primed	Open the throttle and unload engine by cranking.
	Underprimed	Prime with two to three strokes.
	Incorrect throttle setting	Open throttle approximately 1/4 inch.
	Defective spark plugs	Clean and regap, or replace.
	Dead or weak battery	Recharge or replace.
	Defective ignition wire	Check with electric tester, and replace any defective wires.
	Water in carburetor	Drain carburetor and lines.
	Internal failure	Check oil sump for metal particles. If found, complete overhaul is indicated.
Engine not idling properly	Incorrect carburetor idle adjustment	Adjust throttle stop to obtain correct idle.
	Idle mixture	Adjust mixture.
	Open primer	Lock primer in closed position.
	Leak in the induction system	Tighten all connections and replace defective parts.
	Uneven cylinder compression	Check condition of rings and valve seats and then check cylinder compression.
	Insufficient fuel pressure	Check fuel pumps and filters.
	Faulty ignition system	Check ignition leads, plugs and magnetos.

**AA-5 SERIES  
MAINTENANCE MANUAL**

TROUBLE	PROBABLE CAUSE	REMEDY
Low power and uneven running	Mixture too rich	Readjustment of carburetor by authorized personnel.
	Mixture too lean	Readjustment of carburetor by authorized personnel.
	Leaks in induction system	Tighten all connections and replace defective parts.
	Defective spark plugs	Clean and gap or replace spark plugs.
	Defective ignition wire	Replace wire.
	Magnetos not properly timed	Check for proper timing and synchronization.
	Defective spark plug terminal connectors	Replace connectors on spark plug wire.
	Improper grade of fuel	Empty tank and fill with proper grade fuel.
Failure of engine to develop full power	Throttle not properly adjusted	Adjust throttle lever.
	Leak in the induction system	Tighten all connections and replace defective parts.
	Dirty air filter	Clean or replace filter.
	Restriction in air scoop	Remove restriction.
	Improper grade of fuel	Empty tank and fill with proper grade fuel.
	Faulty ignition system	Check ignition leads, plugs and magnetos.
Rough running engine	Lead deposit on spark plugs	Clean and regap or replace spark plugs.
	Unbalanced propeller	Remove propeller and check for balance.
	Worn mounting bushings	Install new mounting bushings.
	Uneven compression	Check compression.
	Magneto not properly timed	Check magneto timing (Refer to Chapter 74).

AA-5 SERIES  
MAINTENANCE MANUAL

TROUBLE	PROBABLE CAUSE	REMEDY
Low oil pressure	Insufficient oil	Check oil supply and fill as recommended.
	Defective pressure gauge	Replace gauge.
	Dirty oil strainer	Remove and clean oil strainer.
	Air or dirt in relief valve	Remove and clean oil pressure relief valve.
	Leak in pressure or suction lines	Check gasket between accessory housing and crankcase.
	Stoppage in oil pump intake passage	Check line for obstruction and clean strainer.
	High oil temperature	See "High oil temperature" in "Trouble" column.
High oil temperature	Insufficient oil supply	Check oil supply and fill as recommended.
	Insufficient cooling air	Check cowl inlet and outlet for obstructions. Check baffles.
	Low grade of oil	Replace with oil conforming to specifications. (Refer to Chapter 12)
	Clogged oil cooler, lines or strainers	Remove and clean oil cooler, lines, and strainers.
	Defective gauge	Replace gauge.
	Defective probe	Replace probe.
	Excessive blow by	Usually caused by worn or stuck rings. Complete overhaul required.
	Bearing failure	Examine sump for metal particles. If found, complete overhaul required.
Excessive oil consumption	Bearing failure	Examine sump for metal particles. If found, complete overhaul required.
	Worn piston rings	Install new rings.
	Incorrect installation of piston rings	Install new rings.

**AA-5 SERIES  
MAINTENANCE MANUAL**

TROUBLE	PROBABLE CAUSE	REMEDY
	Low grade of oil	Replace with proper grade of oil.
	External leakage	Check engine carefully for leaking gaskets and "O" rings.
	Failure of rings to seat (new nitrided cylinders)	Use mineral base oil, climb to cruise altitude at full power and operate above 75% cruise power setting until oil consumption stabilizes.
Engine does not stop	Mixture control not correctly adjusted	Adjust mixture control.
	Faulty ignition system	Check ground wires.
Cold weather difficulties	Cold oil	Heat oil.
	Weak battery	Recharge or replace.
	High oil pressure	In extreme cold weather, readings up to approximately 100 psi do not necessarily indicate malfunctioning.
	Overpriming	Open throttle, put mixture control in idle cut-off position. Crank engine until it starts. Immediately return mixture control to full rich position and close throttle as required.

POWER PLANT - MAINTENANCE PRACTICES

1. General

Prior to performing maintenance on the power plant, ensure that all safety precautions such as switches in OFF position, fire extinguishers available, and NO SMOKING rules are enforced. The complete power plant should be inspected for cleanliness and general condition. More detailed and up-to-date maintenance information can be obtained from the Avco Lycoming Operator's Manual, Service Letters, Bulletins, and Service Instructions.

2. Cleaning Power Plant

**WARNING: USE SOLVENTS IN A WELL VENTILATED AREA. AVOID BREATHING FUMES. KEEP AWAY FROM FLAMES.**

Cleaning of the power plant can be accomplished with a suitable solvent and drying thoroughly. (Standard Solvent or equivalent)

**NOTE: Use extreme care to prevent solvent entering the magnetos, alternators, starter, vacuum pump, and openings in the engine. Keep the amount of solvent contacting wiring to a minimum.**

3. Removal/Installation of Power Plant

A. Remove Power Plant

**CAUTION: PRIOR TO REMOVAL OF THE ENGINE, PLACE A SUPPORT UNDER THE TAIL OF THE AIRCRAFT TO PREVENT DAMAGE TO THE EMPENNAGE. TAG OR LABEL ALL WIRING AND CABLES PRIOR TO REMOVAL OF THE ENGINE FOR REFERENCE ON INSTALLATION.**

- (1) Remove the propeller and spinner (refer to Chapter 61).
- (2) Remove the cowling (refer to 71-1-1).
- (3) Disconnect the throttle, mixture, and carburetor heat controls.
- (4) Disconnect the fuel and oil pressure lines.
- (5) Disconnect the main fuel line at the inlet to the engine-driven fuel pump.
- (6) Disconnect the tachometer cable.
- (7) Disconnect the vacuum pump hose at the pump.
- (8) Disconnect the fuel primer lines.
- (9) Disconnect bonding from engine.
- (10) Disconnect all wiring from the engine.
- (11) Disconnect spark plug leads and lead clamps from engine.
- (12) Disconnect the heater duct at the muffler.
- (13) Attach a suitable lifting device to engine and remove the engine mounting bolts.



B. Install Power Plant

NOTE: Inspect the engine rubber mounting bushings for wear and deterioration. Replace as required.

- (1) Position the engine to the engine mount and install the mounting bolts. Torque mounting bolts to 450-500 inch-pounds.
- (2) Connect the heater duct to the muffler.
- (3) Connect all wiring to the engine.
- (4) Connect the fuel primer lines.
- (5) Connect the vacuum pump hose at the pump.
- (6) Connect the tachometer cable.
- (7) Connect the main fuel line at the inlet to the engine-driven fuel pump.
- (8) Connect the fuel and oil pressure lines.
- (9) Connect the throttle, mixture, and carburetor heat controls.
- (10) Connect bonding at top of engine.
- (11) Connect all spark plug leads and lead clamps.

NOTE: Refer to Chapter 73 for proper installation of the carburetor throttle control.

NOTE: Maintain a minimum 4-1/2 inches bend radius on all carburetor controls.

- (12) Install the cowling (refer to 71-1-1).
- (13) Install the propeller (refer to Chapter 61).

POWER PLANT COWLING - DESCRIPTION/OPERATION

1. General

The power plant is enclosed by a three-piece cowl assembly. The upper cowl assembly is located above the engine between the fuselage and forward cowl. The upper cowl is hinged in the center and latched to the lower cowl on each side. The upper cowl can be raised to gain access to the engine for inspection, service, or minor repair. The lower cowl assembly encloses the lower engine components and must be removed to gain access to the carburetor, exhaust system, air induction system and other lower engine components. The forward cowl covers the front of the engine and encloses the starter, flywheel, and alternator. The landing light is mounted in the forward cowl.

POWER PLANT COWLING – MAINTENANCE PRACTICES

1. Removal/Installation of Cowling AA-5 Serial No. 0001 through 0640

A. Remove Cowling (See Figure 201.)

- (1) Unfasten the latches (1) on each side of the cowl.
- (2) Remove screws (2) and lift off the upper cowl assembly (3).
- (3) Remove the screws (4 and 5) and washers (6).
- (4) Remove the lower cowl assembly (7).
- (5) Remove the propeller spinner, propeller, and spacer (refer to Chapter 61).
- (6) Disconnect landing light wires and remove forward cowl assembly (8).

NOTE: For removal, installation, and adjustment of the landing light assembly, refer to Chapter 33.

B. Install Cowling

CAUTION: WHEN ADJUSTING COWL LATCHES AT INSTALLATION, PROVIDE ONLY ENOUGH TENSION TO HOLD UPPER COWL SECURELY. OVER-TIGHTENING WILL CREATE EXCESSIVE STRESS AND CAUSE CRACKING OF COWL SKIN IN THE LATCH AREA.

- (1) Position forward cowl assembly (8) on front of engine and connect landing light wires.
- (2) Install spacer, propeller, and propeller spinner (refer to Chapter 61).
- (3) Position lower cowl assembly (7) in place on engine and install washers (6) and screws (4 and 5).
- (4) Position upper cowl assembly (3) in place on engine and install screws (2).
- (5) Fasten latches (1) on each side of the cowl.

2. Removal/Installation of Cowling AA-5 Serial No. 0641 and Subsequent, AA-5A and AA-5B

A. Remove Cowling (See Figure 202.)

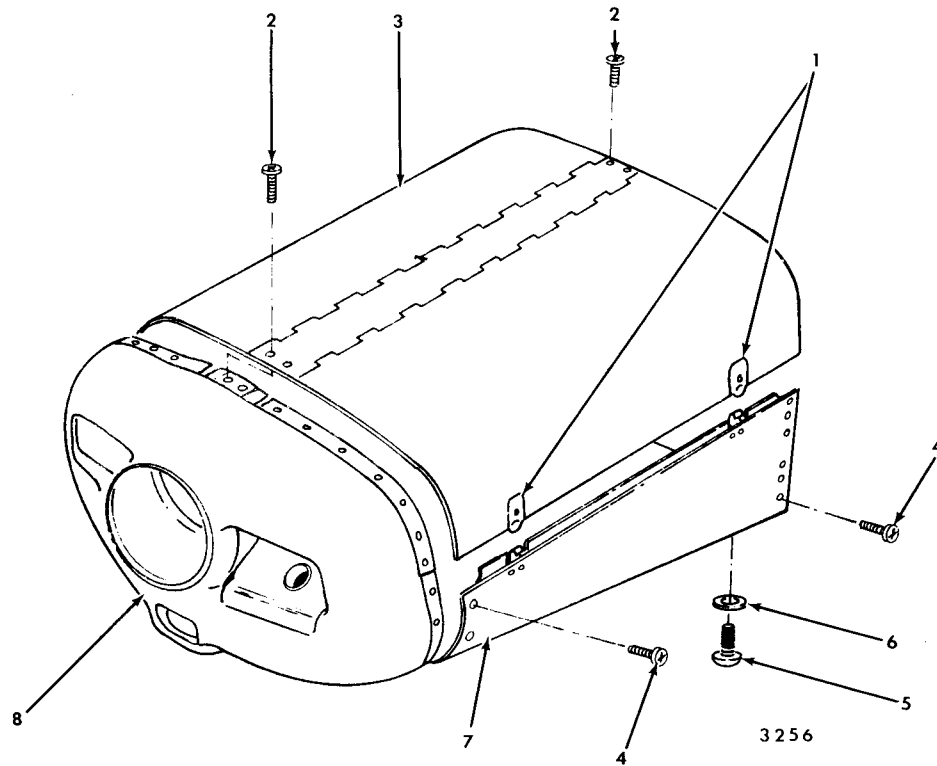
- (1) Unfasten latches (1) on each side of the lower cowl.
- (2) Remove nuts (2), bolts (3), and washers (4) and lift off the upper cowl assembly (5).
- (3) Remove screws (6, 7, and 8) and strut fairing attach screws, and remove lower cowl assembly (9).

NOTE: Screws (7) that attach the induction system to the cowl are only used on aircraft AA-5, Serial No. 0641 and subsequent and on AA-5A.

- (4) Remove propeller spinner, propeller, and spacer (refer to Chapter 61).
- (5) Disconnect landing light wires and remove forward cowl assembly (10).

NOTE: For removal of the landing light assembly, refer to Chapter 33.

AA-5 SERIES  
MAINTENANCE MANUAL



- |                     |                       |
|---------------------|-----------------------|
| 1. Cowl Latch       | 5. Screw              |
| 2. Screw            | 6. Washer             |
| 3. Upper Cowl Ass'y | 7. Lower Cowl Ass'y   |
| 4. Screw            | 8. Forward Cowl Ass'y |

Cowl Assembly - AA-5 Serial No. 0001 thru 0640  
Figure 201

**AA-5 SERIES  
MAINTENANCE MANUAL**

**B. Install Cowling**

**NOTE:** Adjust latch pin (11) lengths for snug fit of upper cowl at front and rear edges. Back off, if required, so that each latch requires no more than a 50 pound push for engagement. Latch pin must be rotated so that notch is aligned with clevis pin (12) for complete engagement. Measure latch position outside/inside cowl contour with cowl closed and open. Latch position when open must be 0.030 inch minimum outside of latch position when closed to ensure complete pin engagement.

**NOTE:** Coat lower 2.00 inches of latch pin (11) and inside diameter of guide bushing (13) with lubricant, McLube 1708, by McGee Chemicals Company, Inc.

(1) Position forward cowl assembly (10) on front of engine and connect landing light wires.

**NOTE:** For installation and adjustment of the landing light assembly, refer to Chapter 33.

(2) Install spacer, propeller, and propeller spinner (refer to Chapter 61).

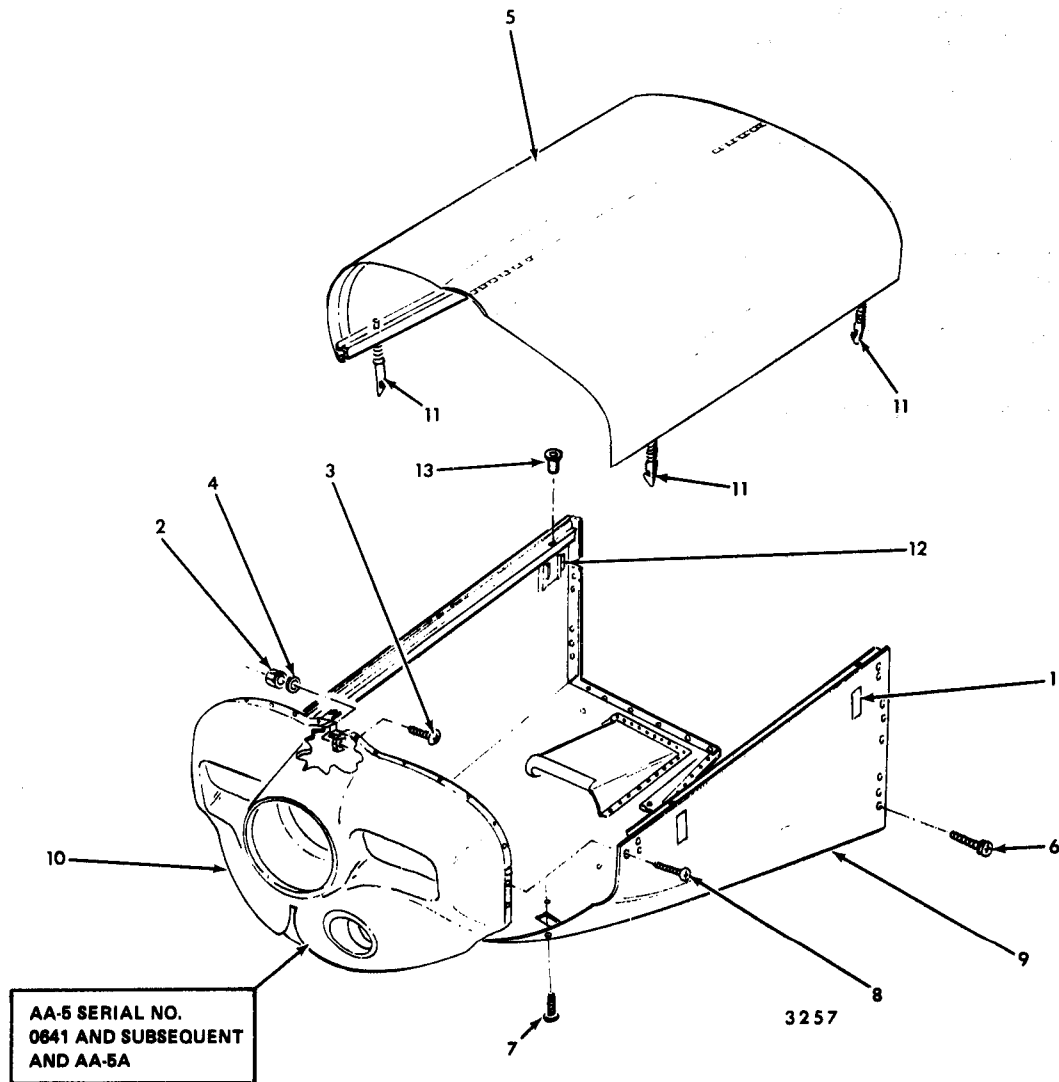
(3) Position lower cowl assembly (9) in place on engine and install screws (6, 7, and 8) and strut fairing attach screws.

**NOTE:** Screws (7) that attach the induction system to the cowl are only used on aircraft AA-5 Serial No. 0641 and subsequent and on AA-5A.

(4) Position upper cowl assembly (5) in place on engine and install bolts (3), washers (4), and nuts (2).

(5) Fasten latches (1) on each side of lower cowl.

AA-5 SERIES  
MAINTENANCE MANUAL



- |                     |                        |                   |
|---------------------|------------------------|-------------------|
| 1. Latch            | 6. Screw               | 11. Latch Pin     |
| 2. Nut              | 7. Screw               | 12. Clevis Pin    |
| 3. Bolt             | 8. Screw               | 13. Guide Bushing |
| 4. Washer           | 9. Lower Cowl Ass'y    |                   |
| 5. Upper Cowl Ass'y | 10. Forward Cowl Ass'y |                   |

Cowl Assembly - AA-5 Serial No. 0641 and Subsequent, AA-5A, and AA-5B  
Figure 202

**AA-5 SERIES  
MAINTENANCE MANUAL**

**ENGINE MOUNT - DESCRIPTION**

1. **General**

The engine mount is composed of sections of tubing, formed and welded together. The purpose of the engine mount is to support the engine and attach the engine to the airframe. The engine is attached to the mount at four places using vibration isolator type shock mount assemblies, bolts, and self-locking type nuts. The engine mount is attached to the airframe at four places using bolts, washers, and nuts safetied with cotter pins.

ENGINE MOUNT - MAINTENANCE PRACTICES

1. Removal/Installation of Engine Mount

A. Remove Engine Mount (See Figures 201 and 202)

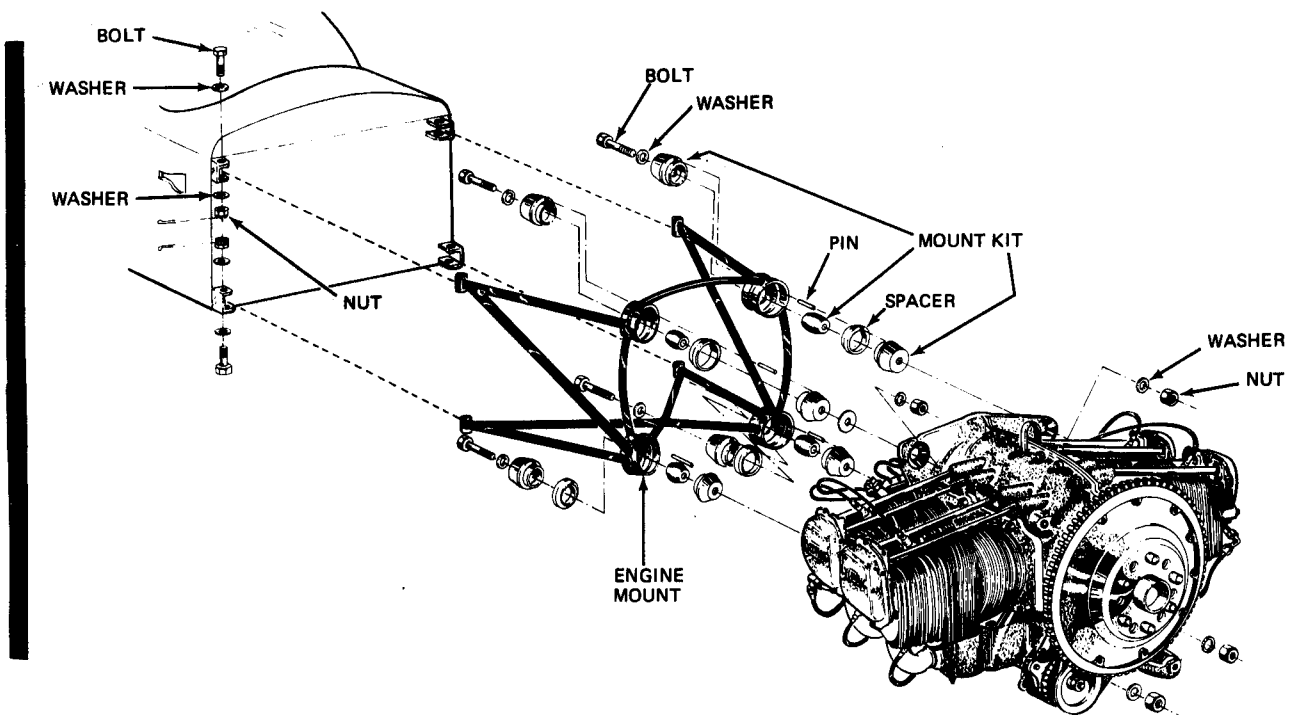
- (1) Remove power plant (refer to subsection 71-0, Power Plant Removal).
- (2) Disconnect all wiring, ties, and clamps attached to engine mount.
- (3) Remove nuts, washers, and bolts securing mount to engine mount supports, and remove mount.

B. Install Engine Mount (See Figures 201 and 202)

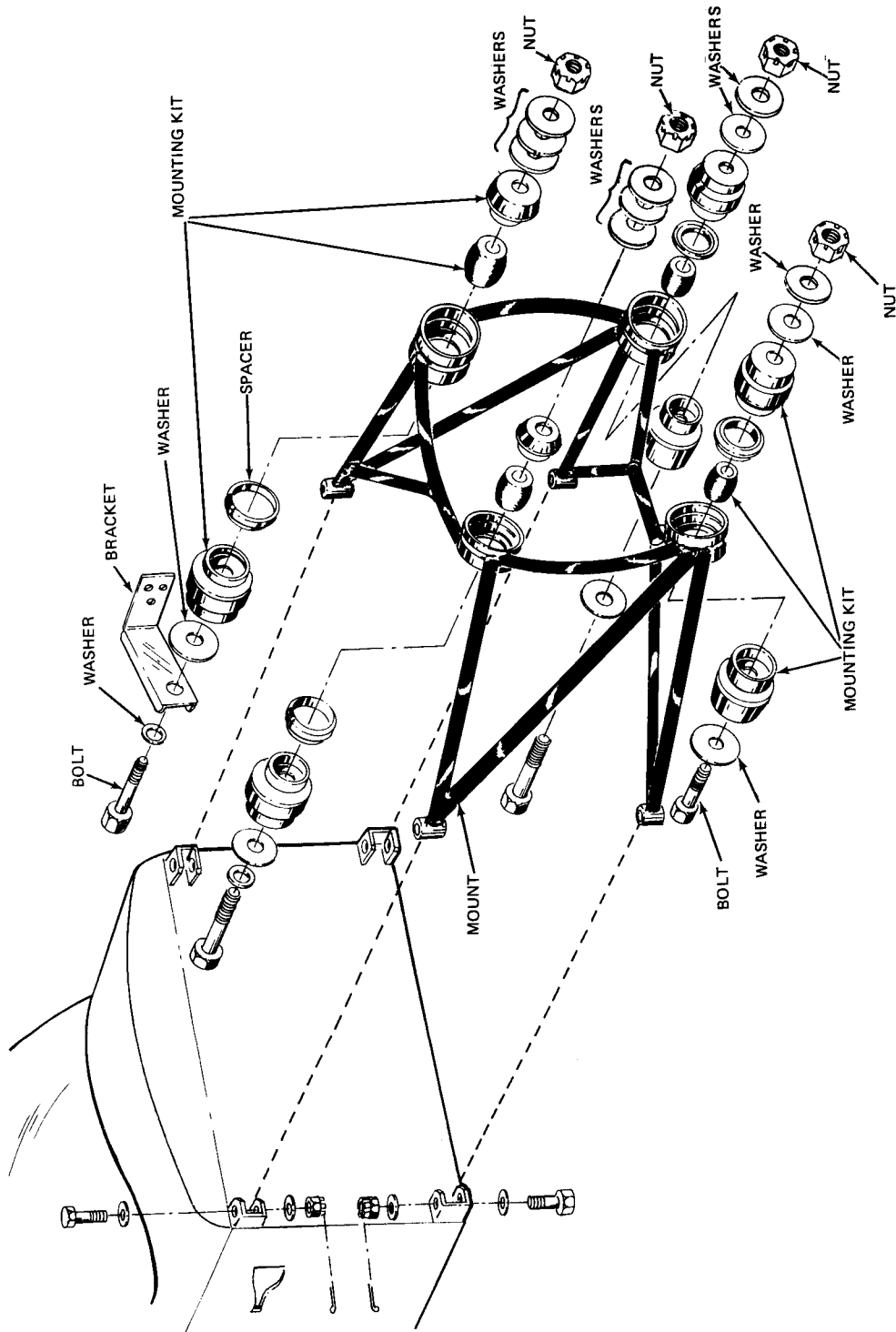
- (1) Position engine mount to engine mount supports and install mounting bolts, washers, and nuts.
- (2) Connect clamps and ties to mount.
- (3) Install power plant as outlined in subsection 71-0.



AA-5 SERIES  
MAINTENANCE MANUAL



Engine Mount Installation-AA-5 and AA-5A  
Figure 201



Engine Mount Installation - AA-5B  
Figure 202

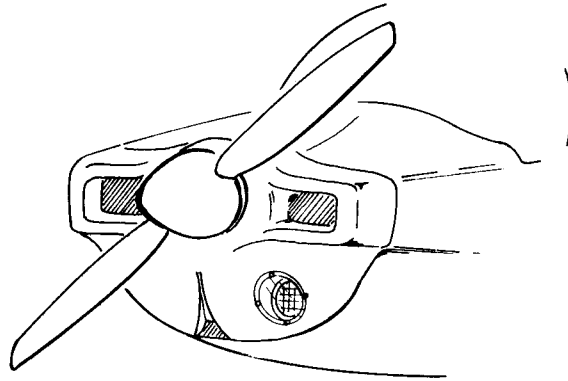
**AA-5 SERIES  
MAINTENANCE MANUAL**

**AIR INTAKES - DESCRIPTION/OPERATION**

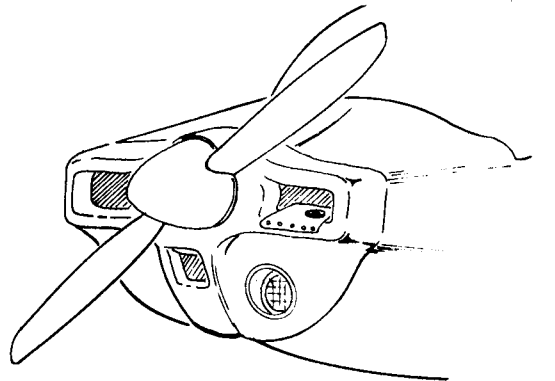
1. **General** (See Figure 1)

Openings in the forward cowl provide for entry of ram air to the engine. On the AA-5 and AA-5A an opening in the lower front of the forward cowl provides ram air directly to the carburetor air filter and then to the carburetor. On the AA-5B, ram air enters the openings in the forward cowl and is then picked up through an opening in the right hand side of the rear baffle and is ducted to the carburetor air box.

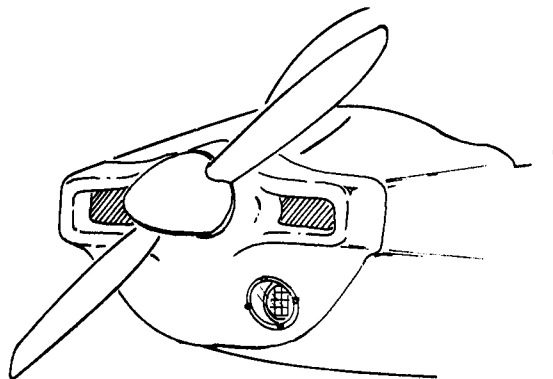
**AA-5 SERIES  
MAINTENANCE MANUAL**



**AA-5 SERIAL NO. 0641 AND SUBSEQUENT AND AA-5A**



**AA-5 SERIAL NO. 0001 THROUGH 0640**



**AA-5B**

**Engine Air Intake Systems  
Figure 1**

ENGINE BAFFLES - DESCRIPTION/OPERATION

1. General

The engine baffles are made from sheet aluminum with rubber-asbestos composition seals at point of contact with the engine cowling. The baffles are attached to the engine and direct the cooling air around the engine to provide optimum engine cooling. The complete baffles are composed of several segments which provides for easy removal and replacement of any single segment. The engine baffles should be inspected thoroughly at each periodic inspection for condition and security of mounting. Any loose or damaged baffles should be repaired or replaced.

ENGINE BAFFLES - MAINTENANCE PRACTICES

1. Removal/Installation of Engine Baffles

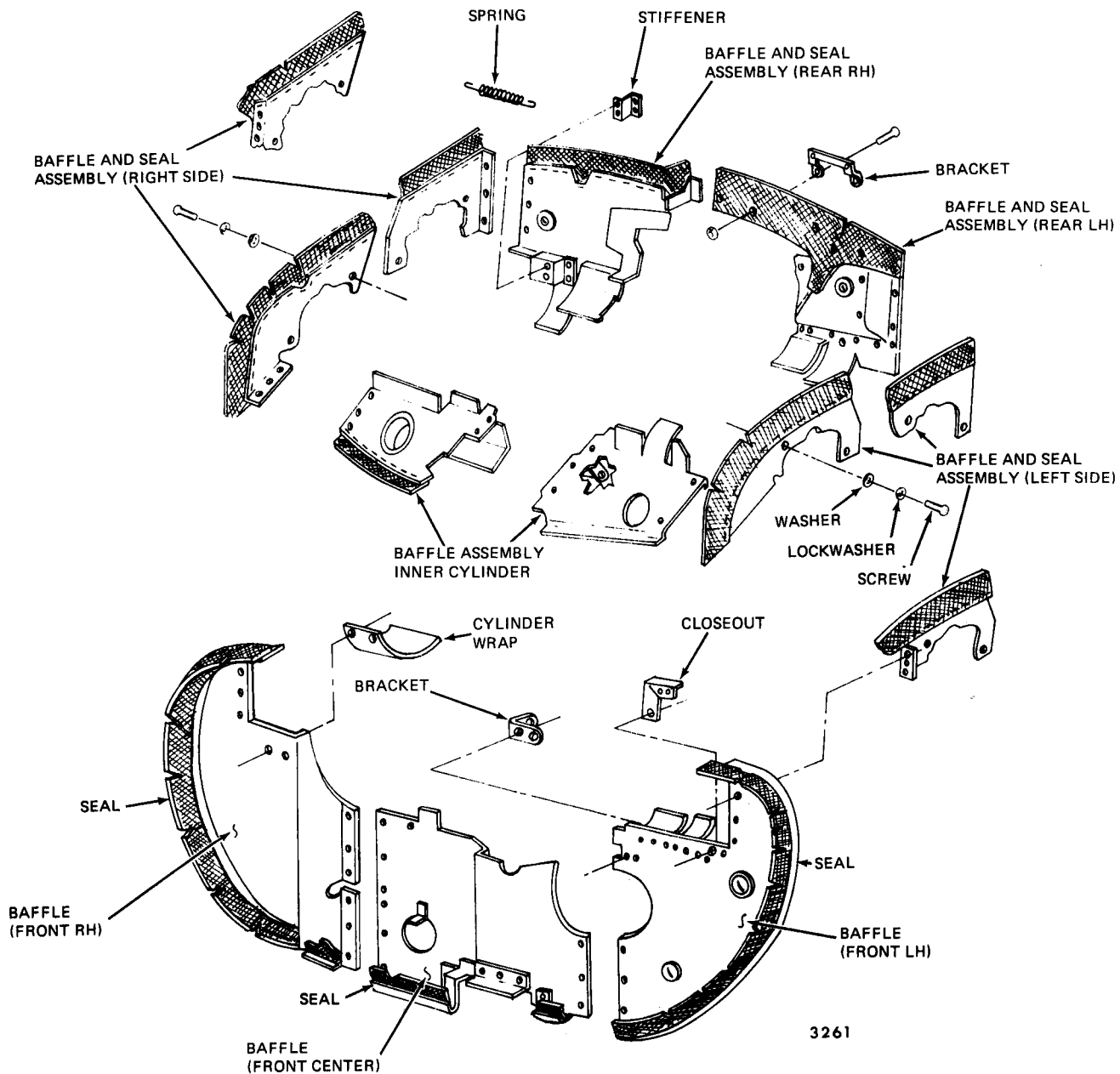
A. Remove Engine Baffles. (See Figures 201 and 202.)

- (1) Remove cowling as necessary to gain access. (Refer to Section 71-1-1)
- (2) Disconnect baffle springs on underside of engine.
- (3) Disconnect upper spark plug leads and pull lead ends through hole in rear baffles.
- (4) Disconnect braces to exhaust clamp on front baffles.
- (5) Disconnect air inlet flexible duct from front baffle.
- (6) Remove attaching screws and bolts that secure baffles to engine.
- (7) Remove screws that secure baffle segments together where necessary to remove individual segments and remove baffles.

B. Install Engine Baffles. (See Figures 201 and 202)

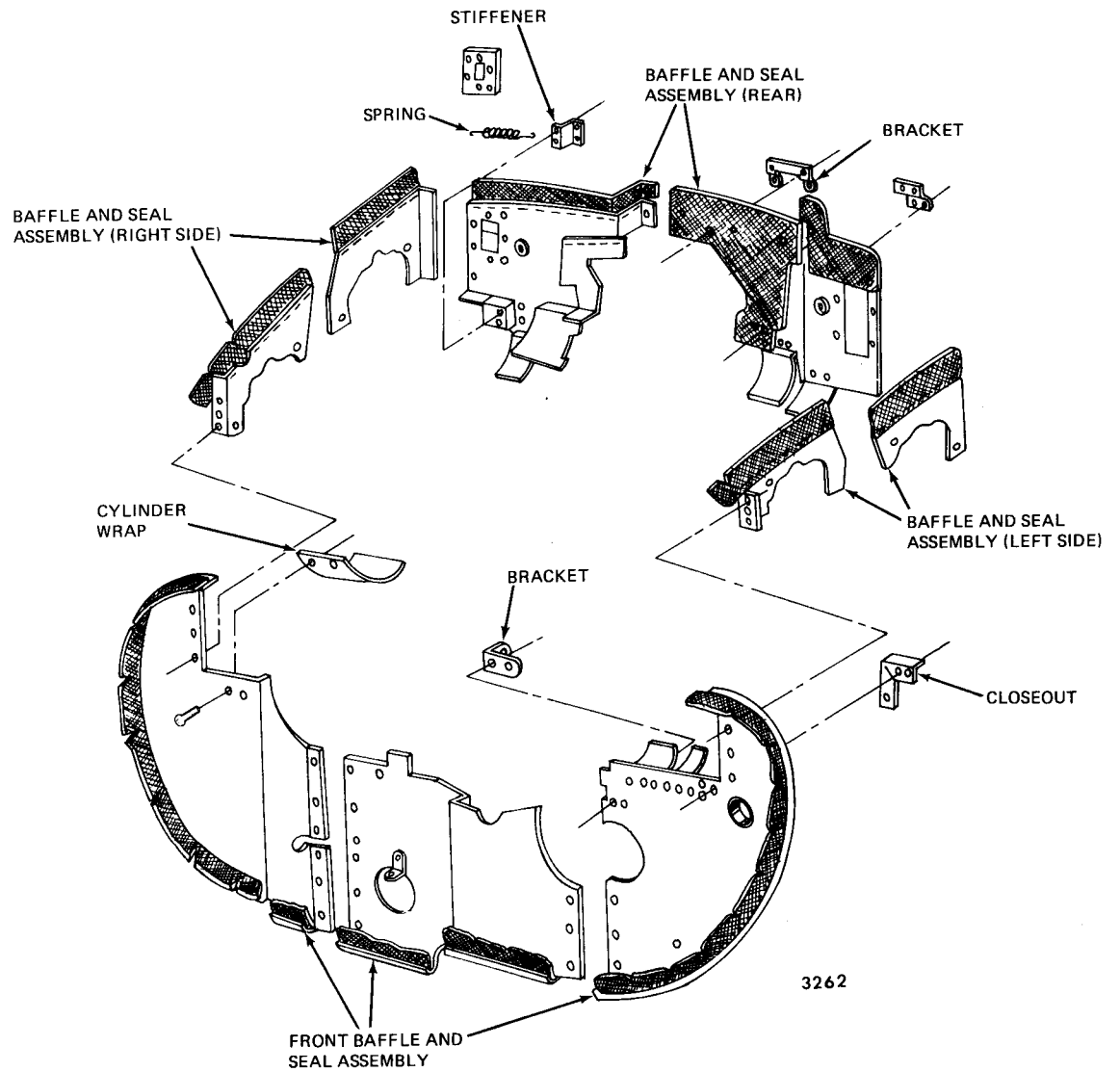
- (1) Assemble individual baffle segments in position on the engine and secure together with screws.
- (2) Install attaching screws and bolts that secure baffles to the engine.
- (3) Connect baffle springs on underside of engine.
- (4) Connect baffle-to-exhaust clamp braces on front baffle.
- (5) Connect air inlet flexible ducts to front baffle.
- (6) Pull spark plug leads through holes in rear baffle, install grommets in holes, and connect spark plug leads.
- (7) Install cowling. (Refer to Section 71-1-1)

AA-5 SERIES  
MAINTENANCE MANUAL



Engine Baffles - AA-5 and AA-5A  
Figure 201

AA-5 SERIES  
MAINTENANCE MANUAL



Engine Baffles - AA-5B  
Figure 202



**AA-5 SERIES  
MAINTENANCE MANUAL**

**ENGINE DRAINS - DESCRIPTION**

**1. General**

All drain lines are routed overboard through openings in the bottom of the lower cowl.

The engine breather line is a flexible line attached at the breather vent port in the top of the engine. The breather prevents an excessive pressure buildup inside the crankcase. The flexible line is extended by a piece of aluminum tubing attached to the flexible line with a spring clamp.

The fuel pump drain line may be either a clear plastic line attached to the pump vent by a spring type clamp or an aluminum line connected to a nipple vent by a nut. The battery box drain line is a short length of clear plastic tubing attached to the battery box drain with a spring type clamp. On the AA-5B, the carburetor air filter box drain is a short length of clear plastic tubing attached to the air box drain with a spring type clamp.