

AA-5 SERIES
MAINTENANCE MANUAL

CHAPTER 74

IGNITION

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IGNITION SYSTEM - DESCRIPTION/OPERATION

1. General

The ignition system components generate, control, and distribute an electrical current to ignite the fuel-air mixture in the cylinders. The engine dual ignition system consists of the magnetos, shielded harness, spark plugs and the ignition switch. The magnetos are a sealed, lightweight type requiring no internal adjustments. Timing the magneto to the engine at installation is the only adjustment required. Each lead of the ignition harness can be removed separately. The ignition switch is located on the lower left-hand side of the instrument panel.

IGNITION SYSTEM - MAINTENANCE PRACTICES

1. Inspection of Ignition System Components

- A. Check magneto harness for security of mounting clamps, tight connections, and frayed shielding.

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

- B. Examine spark plug lead shielding, compression springs, and ceramics for corrosion and deposits. If this condition exists, clean the leads and ceramics with a clean cloth moistened with methyl-ethyl-ketone.

NOTE: If lead has been disassembled, see Figure 201 for correct arrangement at reassembly.

- C. Remove and check spark plugs for proper gap and evidence of fouling. Clean and regap plugs if necessary. (See latest revision of Lycoming Service Instruction No. 1042). Plugs should be rotated upper-to-lower every 100 hours of plug service life, or sooner if lead fouling occurs.

- D. Check magnetos to engine timing. If necessary, time the magnetos to the engine. The magneto to engine timing check should be made every 100 hours.

2. Removal/Installation of Ignition System Components

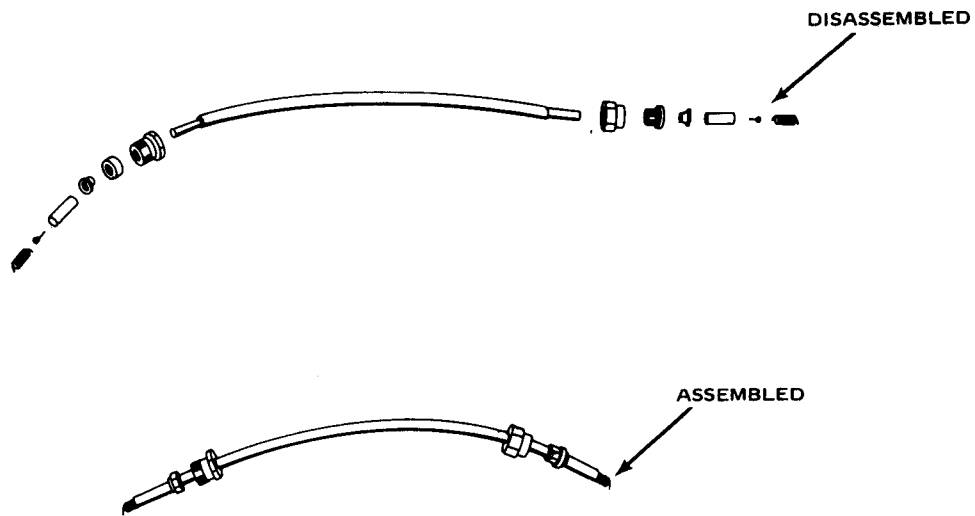
A. Remove Ignition Harness.

- (1) Remove cowl as necessary to gain access.
- (2) Tag or identify each lead for reference at installation.
- (3) Disconnect harness leads at spark plugs.
- (4) Remove clamps securing the harness to the cylinder head.
- (5) Remove harness ties to engine mount.
- (6) Remove plastic ties as necessary to separate harness leads.
- (7) Remove attaching screws from magneto caps.
- (8) Remove the magneto caps and harness as an assembly.

B. Install Ignition Harness.

- (1) Route ignition harness leads as shown in Figure 202. (For alternate ignition lead routing, see Lycoming Service Instruction No. 1294).
- (2) Install ignition harness leads and magneto caps on magnetos.
- (3) Connect ignition harness leads to spark plugs. Tighten nut finger tight plus one-fourth turn.
- (4) Install plastic ties on harness as necessary.
- (5) Install clamps securing ignition leads to cylinder heads as necessary.
- (6) Secure ignition harness to engine mount as necessary.

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Magneto Lead Arrangement
Figure 201

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(7) Remove identification tags installed prior to removal.

(8) Install cowl.

C. Remove Spark Plugs.

(1) Remove cowl as necessary to gain access.

(2) Disconnect ignition harness leads from spark plugs.

(3) Remove spark plugs.

D. Install Spark Plugs.

(1) Apply anti-seize compound on all but first two threads of the spark plug.

(2) Install spark plugs and torque to 360 - 420 inch-pounds.

(3) Install ignition harness leads to spark plugs. Tighten nut finger tight plus one-fourth turn.

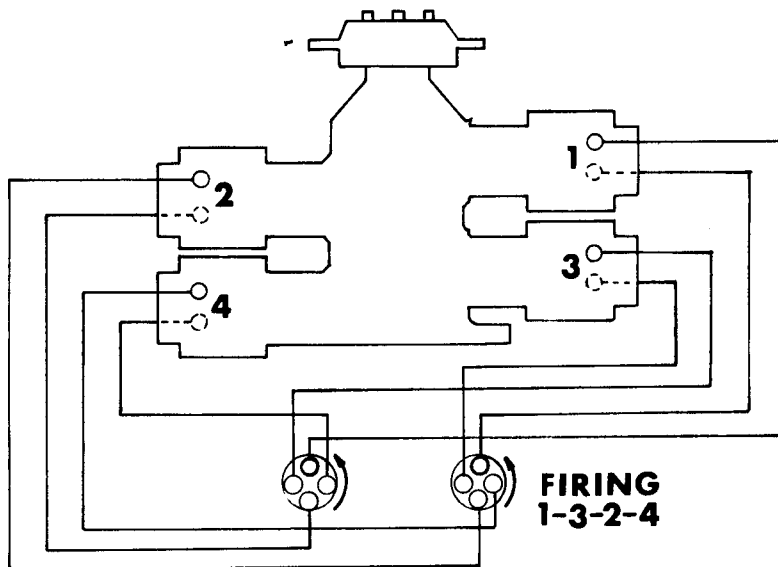
(4) Install cowl.

E. Remove Magneto.

WARNING: DURING ALL MAGNETO MAINTENANCE, TAKE PROPER PRECAUTIONS TO MAKE SURE THE ENGINE CANNOT FIRE OR START WHEN THE PROPELLER IS MOVED.

(1) Remove cowl as necessary to gain access.

(2) Disconnect the magneto ground wire and shielding terminal.



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Ignition System Schematic
Figure 202

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- (3) Remove the distributor cap assembly.
- (4) Remove the mounting lugs and withdraw the magneto.

NOTE: Make a note of the approximate angle the magneto makes with the engine centerline as an aid in its subsequent installation.

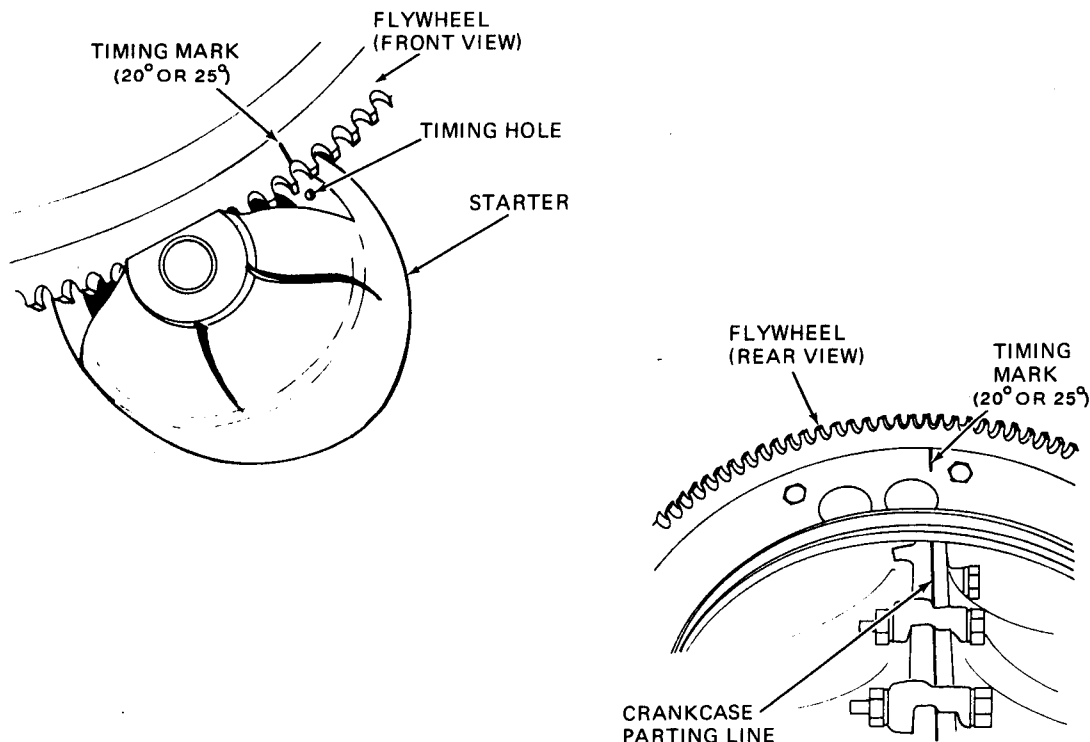
F. Install Magneto

- (1) Rotate the propeller in the normal direction of rotation until No. 1 cylinder enters its compression cycle.

NOTE: (1) To determine if the No. 1 cylinder is in the compression cycle, remove the top plug from the No. 1 cylinder and place thumb over the port. As the piston approaches the end of the compression stroke, a positive pressure will try to force the thumb off the port.

(2) The ring gear (flywheel) may be marked at 20° or 25°. Consult Engine Specifications for correct timing mark for your installation.

- (2) Continue turning the propeller in the normal direction of rotation until the advanced timing mark on the forward face of the flywheel becomes aligned with the small hole drilled in the head of the starter casing. Alternate method is to align the advance mark on the back of the flywheel with the crankcase parting line. At this point, the engine is ready to receive the magnetos. (See Figure 203.)



Advance Timing Alignment
Figure 203

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- (3) Remove the plug from the bottom of the magneto.

NOTE: In order to rotate the magneto incorporating on impulse coupling, depress the pawl on the impulse coupling with the finger.

- (4) Rotate the magneto shaft until a spark occurs from number one lead (hold screw driver close to No. 1 lead while turning the shaft). As soon as the spark occurs, slowly reverse direction until the timing hole in the rotor is centered in the plug opening. (See Figure 204.)

NOTE: Failure to spark check the number one position leaves the possibility of the magneto being 180° out of phase. The timing hole appears in the plug opening twice for every complete firing cycle.

- (5) Insert a pin (0.093" diameter) into the timing hole in order to keep the rotor in the timed position.

NOTE: On Slick magnetos, use the special Slick timing pin.

- (6) Position the magneto into the crankcase at the approximate angle noted on removal. Be sure gasket is installed behind the magneto mounting flange.

- (7) Install the attach clip over the magneto mounting flange and tighten the nut finger-tight.

NOTE: Install the magneto with the impulse coupling on the left side.

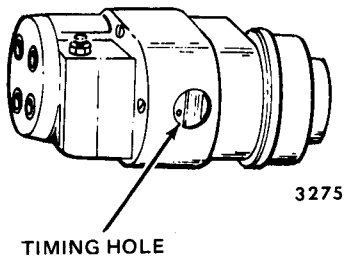
- (8) Install the second magneto in the same manner as described in steps (3) through (7) above.

CAUTION: BE SURE TO NOT ROTATE THE PROPELLER WITH THE PIN STILL INSTALLED IN THE MAGNETO TIMING HOLE.

- (9) Final timing should be accomplished with a timing light. Using a battery powered timing light, attach the positive leads to the magneto ground terminal, and the negative leads to any unpainted portion of the engine.

- (10) Remove the pins from the magnetos.

- (11) Rotate the magneto in its mounting flange until the light comes on. Slowly turn the magneto in the opposite direction until the light goes off. Bring the magneto back slowly until the light just comes on.



Magneto Timing Hole
Figure 204

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- (12) Repeat this process for the other magneto.
- (13) Upon timing both magnetos, check to ascertain that both magnetos will fire simultaneously.

NOTE: To check the simultaneous firing of both magnetos, back off on the propeller a few degrees (timing light should go out). Bring the propeller back slowly in the direction of normal rotation until the 25° advanced timing mark aligns with the hole in the starter casing. At this point, both lights should go on simultaneously. When timing the magneto to the engine, a maximum tolerance of $\pm 2^\circ$ is allowable.

- (14) Tighten the magneto mounting nuts and torque to 150 inch-pounds and install magneto ground wire and shielding terminal.
- (15) When the magneto shows an excessive rpm loss or has reached a total of 900 hours, whichever comes first, the magneto should be returned to the magneto manufacturer for exchanging. No attempt should be made to repair the magneto in the field since disassembly of the magneto will void its warranty.

NOTE: If the drive shaft nut has been removed from the magneto incorporating the impulse coupling, care should be exercised when reassembling, not to overtighten. The recommended torque is 156 inch-pounds. Torque may be increased to line up hole with slot in nut.