

## Results

1. If the DMM indicated CONTINUITY to ground in Step 6, repair or replace shorted ground Wire 18 between the engine and the controller connector.
2. If the DMM indicated INFINITY to ground in Step 6, replace the control board and re-test for spark.
3. If ignition (spark) was not present in Step 2 with Wire 18 disconnected, proceed to **Test 60 – Check and Adjust Ignition Magnetos**.

## Test 60 – Check and Adjust Ignition Magnetos

### General Theory

In Test 55, a spark tester was used to check for engine ignition. If sparking or weak spark occurred, one possible cause might be the ignition magneto(s). This test consists of checking values across the primary and secondary windings of the magneto and adjusting the air gap between the ignition magneto(s) and the flywheel. The flywheel and flywheel key will also be checked during this test.

**NOTE:** On V-Twin units a diode is installed in the primary winding inside the coil. This is done to inhibit a spark occurring on both magnetos at the same time.

### Procedure: Testing Magnetos

1. See **Figure 4-65** and **Figure 4-66**. Disconnect Wire 18 at the bullet connector.
2. Depending on engine type, disconnect spark plug wires from the spark plugs on one or both cylinders.
3. Set DMM to measure resistance when performing resistance checks and to Diode function when performing the Diode Test.
4. Follow the chart connections and record readings on DMM to chart.

**NOTE:** Readings are approximate.

5. **Secondary Resistance Check:** Connect a meter lead to the spark plug wire and connect the other meter lead to battery ground. Record the readings and compare to **Table 4-10**. Readings are approximate.
6. **Primary Resistance and Diode Check:** Connect the meter lead to the bolt connector or bullet connector where Wire 18 was disconnected in Step 1. Connect the other meter lead to the spark plug wire or to ground following **Table 4-10**.
7. On V-twin generators, repeat Steps 5 and 6 on Cylinder Two. If readings are not measured, replace the magnetos.

**NOTE:** On V-twin generators it is recommended to replace magnetos in pairs.

**NOTE:** Readings can change based on supplier changes. Check GENservice or contact Generac for updates.

**NOTE:** Resistance values can vary depending on the type and quality of meter being used.

Table 4-10.			
Measurements with Wire 18 disconnected			
Magneto Wire Diagnostics		V-Twins	Single Cyl
POS Test Lead	NEG Test Lead	Ohms	Ohms
To Magneto Wire	To Ground	1.5-2.5 M	.5-1.0
To Ground	To Magneto Wire	OL	3.0
To Magneto Wire	To Plug Wire	1.5-2.5 M	10-11 K
To Plug Wire	To Magneto Wire	OL	10-11 K
To Plug Wire	To Ground	7-14 K	9-16 K
Diode Test		V-Twins	Single Cyl
POS Test Lead	NEG Test Lead	VDC	VDC
To Magneto Wire	To Ground	0.5-0.6	N/A
To Ground	To Magneto Wire	OL	N/A
Measurements with Wire 18 connected			
AC Voltage Wire 18 Backprobed		V-Twins	Single Cyl
Cranking		3-5 VAC	1.5-2 VAC
Running @ 3600 rpm		14-20 VAC	7-8.5 VAC
Running @ 3000 rpm		11.5-16.5 VAC	5.8-7 VAC
Frequency		V-Twins	Single Cyl
Cranking		35-45 Hz	13-17 Hz
Running @ 3600 rpm		120 Hz	60 Hz
Running @ 3000 rpm		100 Hz	50 Hz

### Procedure: Adjusting Magneto Flywheel Gap

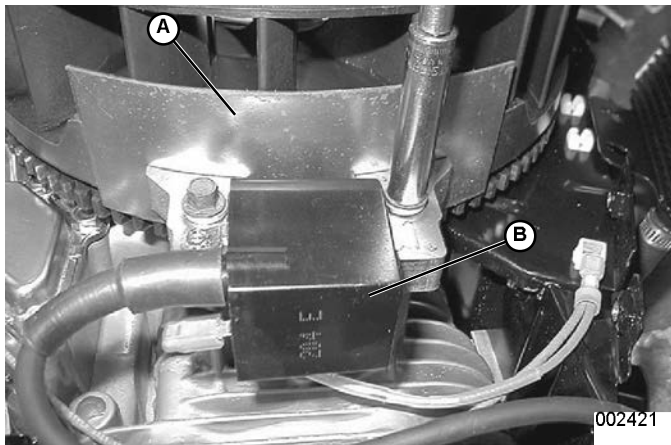
The air gap between the ignition magneto and the flywheel on single cylinder engines is not adjustable. Proceed directly to Step 10 for single cylinder engines.

For V-twin engines, proceed as follows:

1. See **Figure 4-67**. Rotate the flywheel (by hand) until the magnet is under the module (armature) laminations.
2. Place a 0.008-0.012 inch (0.20-0.30mm) non metallic thickness gauge between the flywheel magnet and the module laminations.

**NOTE:** A typical business card is approximately 0.010 inch thick.

3. Loosen the mounting screws and let the magnet pull the magneto down against the thickness gauge.
4. Tighten both mounting screws.
5. To remove the thickness gauge, rotate the flywheel (manually).



A. 0.008-0.012" Gauge  
B. Magneto

#### Figure 4-67. Setting Ignition Magneto Air Gap

6. Repeat the above procedure for the second magneto.
7. Repeat **Test 55 – Check for Ignition Spark** and check for spark across the spark tester gap.
  - a. A spark test may be conducted with unit disassembled by following this procedure.
  - b. Battery must be connected.
  - c. The harness connector must be connected to the controller.
  - d. Remove Wire 56 from the SCR located beneath the controller.

**NOTE:** Verify all debris is cleared from the engine compartment and all body parts are clear from flywheel before proceeding.

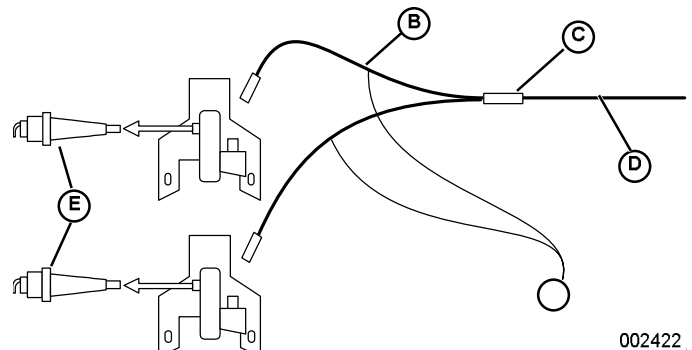
- e. Refer to **Test 55 – Check for Ignition Spark**.
- f. Connect a jumper wire to the 194 terminal block. Connect the other end to where Wire 56

was disconnected in Step 7d. The engine should crank once the jumper from 194 is connected.

8. If spark was not indicated, replace magnetos.

**NOTE:** If gap is only adjusted, properly test the magnetos by cranking the engine before reassembly. Spark should be present on both cylinders.

9. If air gap was not out of adjustment, test ground wires.
10. Set a DMM to the measure resistance.
11. See **Figure 4-68**. Disconnect the engine wire harness from the ignition magnetos.
  - See **Figure 4-65** and **Figure 4-66**. Disconnect Wire 18 at the bullet connector.
12. Connect one meter test lead to one of the wires removed from the ignition magneto(s). Connect the other test lead to an engine ground. INFINITY should be measured. If CONTINUITY is measured, replace the shutdown harness.



A. Remove leads  
B. Engine wire harness  
C. Bullet connector  
D. Wire 18 to circuit board  
E. Spark plug

#### Figure 4-68. Engine Ground Harness

13. Check the flywheel magnet by holding a screwdriver at the extreme end of its handle and with its point down. When the tip of the screwdriver is moved to within 3/4 inch (19 mm) of the magnet, the blade should be pulled in against the magnet.
14. For rough running or hard starting engines check the flywheel key. The flywheel's taper is locked on the crankshaft taper by the torque of the flywheel nut. A keyway is provided for alignment only and theoretically carries no load.

**NOTE:** If the flywheel key becomes sheared or even partially sheared, ignition timing can change. Incorrect timing can result in hard starting or failure to start.

**NOTE:** As stated earlier, the armature air gap is fixed for single cylinder engine models and is not adjustable. Visually inspect the armature air gap and hold down bolts.

**Results**

If sparking still does not occur after adjusting the armature air gap, testing the ground wires and performing the basic flywheel test, replace the ignition magneto(s).

**Procedure, Replacing Magnetos:**

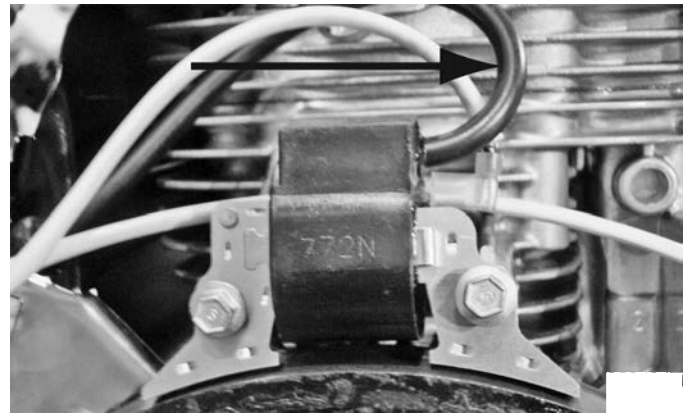
1. Follow all steps of the **Major Disassembly procedures that are located in Section 6.**
2. Once the magnetos are visible, make note of how they are connected.

**NOTE:** Each magneto has its own part number. Verify the part number prior to installation.

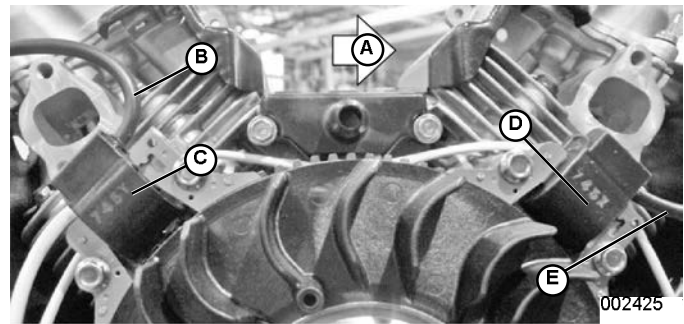
3. See **Figure 4-69.** Cylinder one is the back cylinder.
4. See **Figure 4-70.** Cylinder two is the front cylinder.
5. See **Figure 4-71.** When installing new magnetos there will be one with a short plug wire and one with a longer plug wire.

**NOTE:** Magneto gap to flywheel needs to be 0.010 inch.

6. Short plug Wire will be installed on back cylinder (Cylinder One).
7. Long plug wire (B) will be installed on front cylinder (Cylinder Two).
8. Verify installation of magnetos correctly by ensuring both spark plug wires point to the back of the enclosure and shutdown terminals are nearest cylinder head as shown in **Figure 4-72** and **Figure 4-73.**

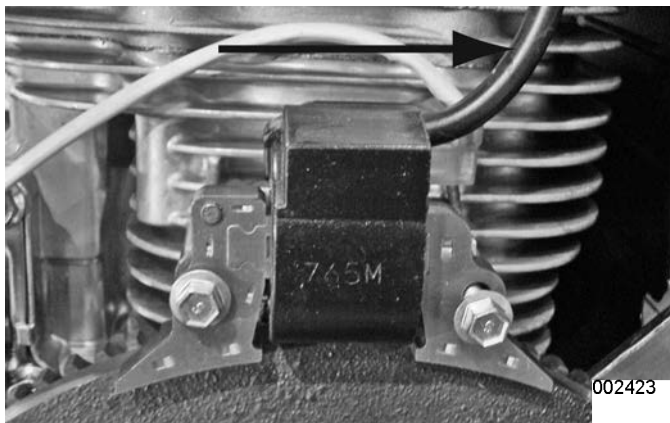


**Figure 4-70. Cylinder Two (Front, Long)**

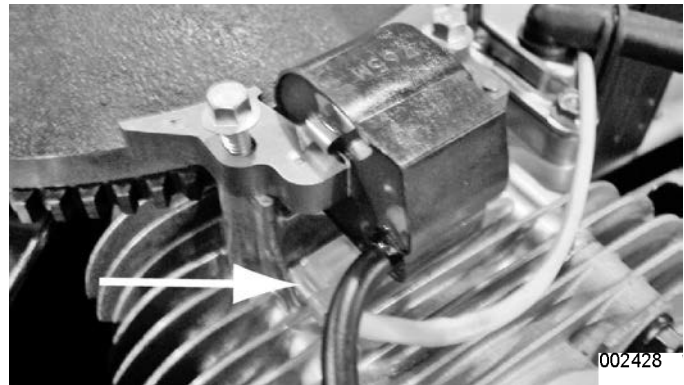


A. Back Of Enclosure                      D. Cylinder One  
 B. Long Spark Plug Wire                E. Short Spark Plug Wire  
 C. Cylinder Two

**Figure 4-71. Magneto Positions**



**Figure 4-69. Cylinder One (Back, Short)**



**Figure 4-72. Cylinder One Shutdown Wire**



**Figure 4-73. Cylinder Two Shutdown Wire**