

To remove the rotor mounting screws use a 3mm allen wrench.

On M20 engines, remove the dust shield and inspect the large O-ring on the rear of the shield. See Fig. 6. If the O-ring is crushed or damaged, it should be replaced. Installation of the rotor and cap is the reverse of removal. Do not over tighten the rotor mounting screws.

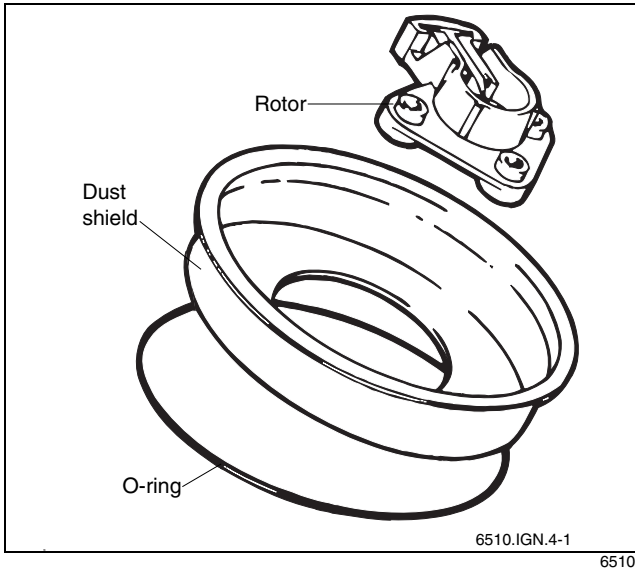


Fig. 6. Ignition rotor, distributor cap dust shield and O-ring on M20 engine.

Tightening Torque

- Ignition rotor to rotor adaptor 2.8±0.2 Nm (25±1.8 in-lb)

NOTE —

The inductive pickup (cylinder identification sensor) on the spark plug wire is used to sequence the fuel injectors. See 130 Fuel Injection—DME.

To test ignition coil (M50/M60 engines)

1. Remove the plastic engine cover(s) from the top of the engine by prying off the nut covers and removing the cover mounting nuts.
2. Disconnect the harness connector from the coil. Connect a voltmeter between terminal 15 (+) in the harness connector and ground. See Fig. 7. Turn the ignition on and check for battery voltage.
 - If battery voltage is not present, check the wire between terminal 15 and the ignition switch. See **Electrical Wiring Diagrams**.
3. Turn the ignition off.

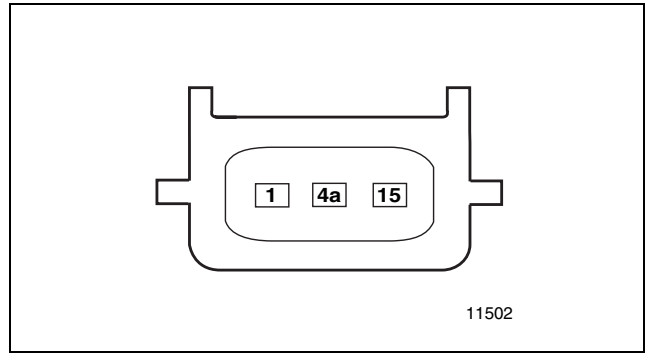


Fig. 7. Ignition coil harness connector terminal identification for M50 and M60 engines.

CAUTION —

The wiring to terminal 15 of the coil (via the ignition switch) is not fuse protected. Use care when testing this circuit.

4. Use an ohmmeter to test the coil primary. Resistance values are listed in **Table b**.

Table b. Ignition Coil Resistance (M50/M60 engines)

	Terminals	Resistance
Coil primary	1 (-) and 15 (+)	0.4-0.8 ¾
Coil secondary	N.A.	N.A.

5. Remove the coil and inspect the coil housing for hair-line cracks or leaking casting material. If any faults are found, the coil should be replaced.

NOTE —

On "May and Christe" manufactured coils, check carefully for thermal stress cracks or signs of leaking casting material. If any of these faults are found, the coil should be replaced before it causes damage to the DME ECM.

Testing crankshaft position/rpm sensor

The crankshaft position/rpm sensor is mounted to the front of the engine and reads a toothed wheel on the front of the crankshaft. Engine speed is determined by the rate at which the wheel's teeth pass the sensor. Crankshaft position is determined by the missing-teeth gap on the pulse wheel. If the DME control module does not receive a crankshaft position signal during cranking the engine will not start.

1. Disconnect the sensor harness connector.
2. Using an ohmmeter, check the resistance between the terminals 1 and 2 in the sensor end of the connector. See Fig. 8.

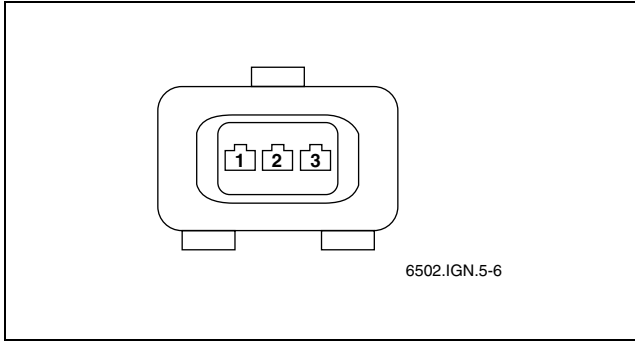


Fig. 8. Crankshaft position/rpm sensor connector (arrow).

Crankshaft position/rpm sensor specifications

- Coil resistance (approx.)
terminals 1 and 2 $540 \pm 10\%$ ohms
- Air gap (sensor distance from
toothed wheel) 1.0 ± 0.3 mm (0.04 ± 0.01 in.)

3. If the resistance is not correct, the sensor is faulty and should be replaced.

NOTE —

To replace a faulty sensor, remove the sensor mounting bolt using a 5 mm hex wrench. Cut wire ties as necessary to the remove wiring. When installing the new sensor, be sure the wiring is rerouted in the same orientation. Secure the sensor using new wire ties.

Tightening Torque

- Crankshaft position/rpm sensor to
mounting bracket 7 ± 1 Nm (62 ± 9 in-lb)

Ignition Firing Order

On M20 and M30 engines, spark plug wires must be installed so that the spark plugs fire in a specified order. The rotor turns in a clockwise direction when viewed from the front with the cap removed. Fig. 9 shows the correct routing of the spark plug wires in the distributor cap.

NOTE —

- On 6-cylinder engines, cylinder no. 1 is at front of engine.

On 8-cylinder engines, cylinder no. 1 is at the front of the engine on the right-hand cylinder head.

- Ignition Firing Order**
- M20, M30, M50 engines 1-5-3-6-2-4
 - M60 engines 1-5-4-8-6-3-7-2

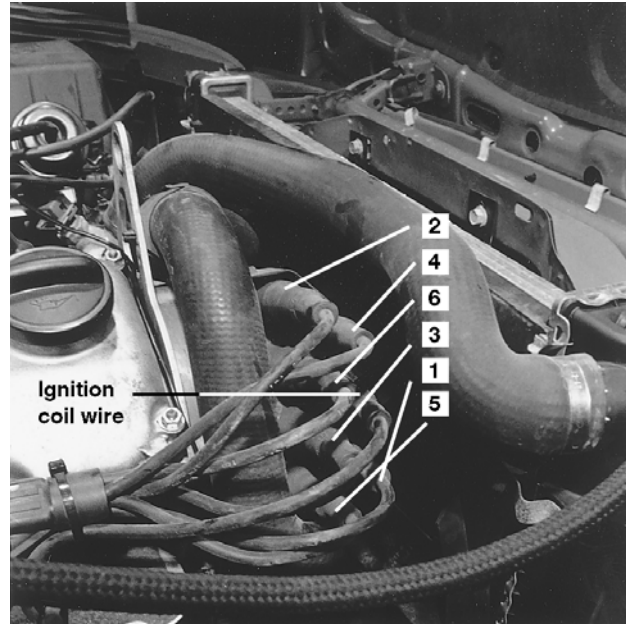


Fig. 9. Spark plugs wires correctly installed in distributor cap (M20/M30 engines).

Knock Sensors

Knock sensors are used on DME 3.3 and later engine management systems. M50 engines use two knock sensors and the M60 engines use four sensors. The knock sensors are bolted to the cylinder block and monitor the combustion chamber for engine-damaging knock. If knock is detected, the ignition point is retarded accordingly via the DME control module. On M50 engines, the knock sensors are accessible after removing the top engine covers. On M60 engines, access to the knock sensor requires removal of the intake manifold.

CAUTION —

On DME 3.3 and 3.3.1 engines, do not interchange the knock sensor harness connectors. Serious engine damage may result if the sensors are monitoring the wrong cylinders. If the connectors need to be removed, be sure to label them before disconnecting.

NOTE —

- Knock sensor function is monitored by the On-board diagnostic system. If a knock sensor is detected to be faulty, an appropriate diagnostic trouble code (DTC) may be stored in memory. See 100 Engine—General for information on retrieving DTCs.
- On M60 engines, intake manifold removal procedures are described as part of cylinder head removal in 113 Cylinder Head Removal and Installation.