VOLVO PENTA

Volvo Penta of the Americas
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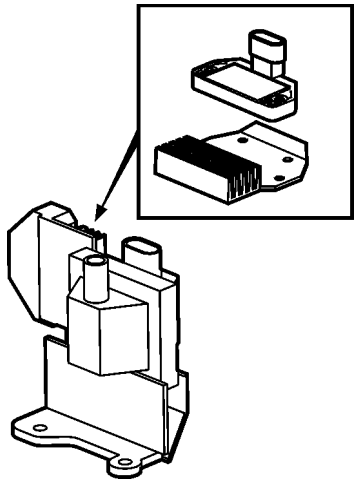
USA

Service Bulletin

Group	Number	Version
28-1	**6**	**1**

Diagnostic steps for ignition coil

Gas engines 3.0, Gas engines 4.3, Gas engines 5.0, Gas engines 5.7



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The following information applies to port fuel injected IAFM engines (2001 and up) that use a MEFI or EGC engine controller. The ignition coils on these engines have a heat sink and ignition module mounted to the coil assembly.

The symptoms of this failure are a crank but no start condition.

Preliminary troubleshooting should be performed to fuel and mechanical systems to be sure they are functioning correctly and that a weak spark or no spark condition is suspected.

The procedure that follows is an on-engine test of the ignition coil.

⚠ WARNING!
Fire and Explosion Risk!
Accidental spark could ignite fuel vapors.

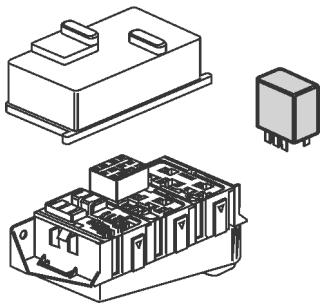
Clear the engine area of all fuel and fuel vapors before starting work.

Preliminary Troubleshooting

Before beginning the coil diagnostic steps, check the other ignition system components for correct condition and operation.
Check; distributor cap, rotor, spark plugs, spark plug wires.

Check the voltage and/or load test the battery. The system voltage should not dip below 10 volts while cranking the starter. If it falls below this voltage, correct by charging or replacing the battery.

Wiring diagrams, troubleshooting and diagnostic steps are found in the Workshop Manuals for the engine (see Serial Number Search on the Partner Network).



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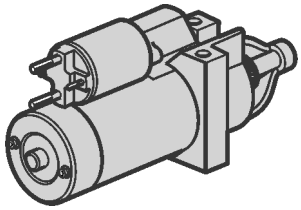
NOTICE! To prevent catalyst and other engine damage, the fuel pumps must be disabled before starting the procedure.

Remove the fuel pump relay to disable the pumps. See cover on fuse box for the location of the relay.



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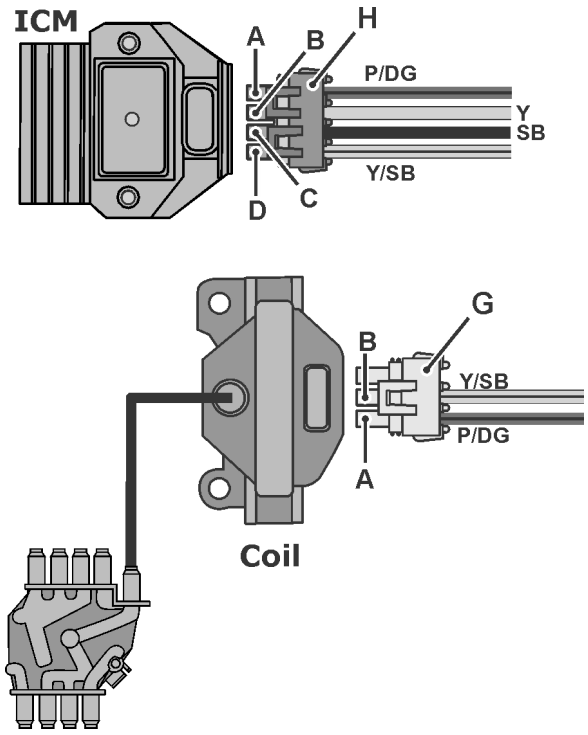
NOTICE! Procedure requires cranking the engine. Do not run starter for extended periods, starter over-heat and failure may occur.



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Diagnostic Procedure

Abbreviations and call-outs, equipment;
DVOM — Digital Volt and Ohm Meter
ICM — Ignition Control Module
Coil — Ignition coil
ECM — Engine Control Module
H — ICM connector, from main engine harness
G — coil connector, from main engine harness

Abbreviations, wire color;
P — pink
Y — yellow
SB — black
DG — dark green

1 Remove the harness connector from the coil.

2 Set DVOM to DC volts. Connect the leads between pins A and B on the coil connector.

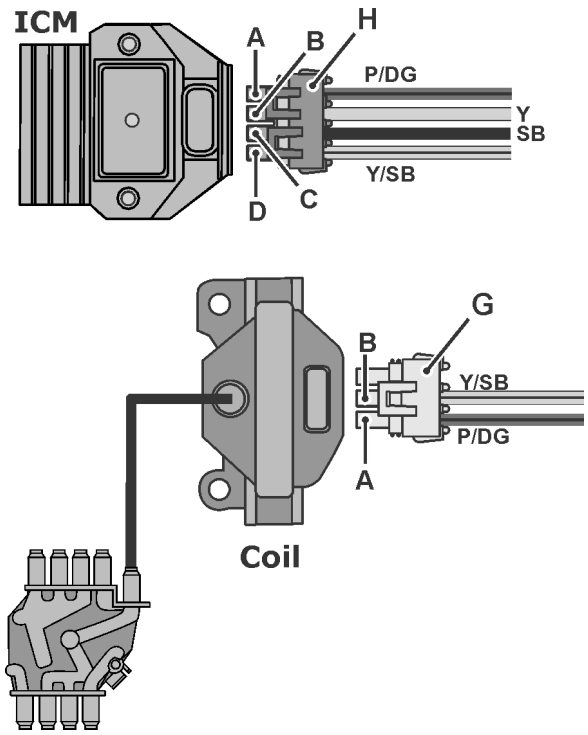
3 Turn key to start position and while cranking the engine, observe the voltage. Expect to see zero volts before cranking.

4 Is there a reading of 7 -10 volts (slight movement in reading indicating switched current)?
Yes — Then primary coil voltage is being produced. ICM and wiring is good. Coil secondary circuit is faulty. Replace the ignition coil assembly. See note below on verifying secondary coil output.(1).
No — continue to step 5.

5 Set DVOM to DC volts. Connect leads between pin A on the coil connector and ground on the engine. Turn key to start position and while cranking the engine observe the voltage.

6 Is the voltage at 9 volts or higher?
Yes — continue to step 7.
No — There is an low voltage in the ICM/Coil P/DG circuit that powers the ignition system. Check IGN fuse. Check P/DG wire for continuity between pin A at the coil connector and the fuse output terminal. Repair the voltage supply circuit for the coil. Retest steps 1-6 to verify.

1. A faulty coil secondary output can be verified with a coil test using kilovolt meter. Reinstall all removed connectors and connect kv meter to the coil wire. Turn the key to the start position and observe the kv reading. The coil should sustain 25-30 kv. If below, replace coil assembly.



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7 Remove harness connector from the ICM.

8 With DVOM set to Ohms, check the resistance between pin C on the ICM connector and ground.

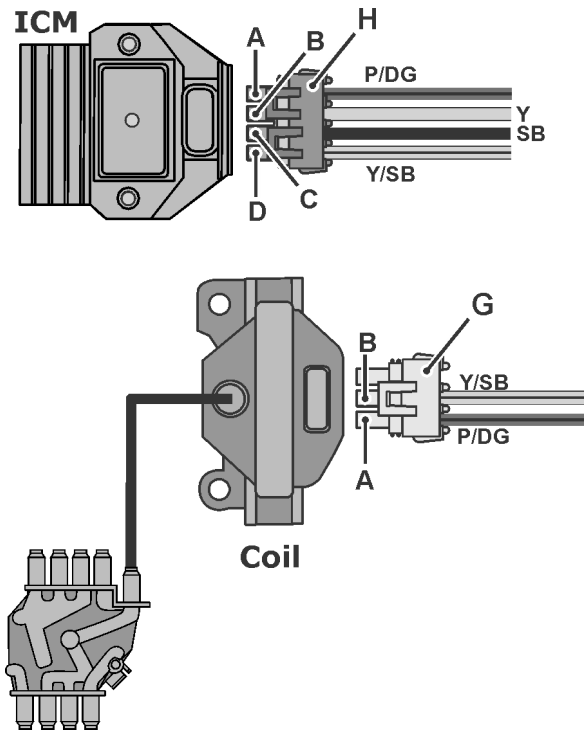
9 Resistance 0.2 Ohms or less?
Yes — Continue to step 10.
No — (Infinity reading) There is an open circuit in the ICM ground wire. Check main system grounds for loose connections, corrosion, etc. Be sure grounds are secure on the studs at the flywheel housing. Repair or replace the wiring harness or ground as required.

10 Set DVOM to DC volts and connect leads to pin A on ICM connector and ground. Turn key to start position and while cranking the engine observe the voltage.

11 Is the voltage at 9 volts or higher?
Yes — continue to step 12.
No — There is low voltage for the circuit that supplies voltage to the ICM. Check IGN fuse. Use Ohm meter to test wire for open circuit. Repair or replace wiring harness as required and re-test step 10.

12 With DVOM set to Ohms, check resistance between pin D on the ICM connector and pin B on the coil connector.

13 Resistance 0.2 Ohms or less?
Yes — continue to step 14.
No — (Infinity reading) Ground wire is open for ICM. Use DVOM set to Ohms and check ICM ground wire circuit for open circuit. Repair or replace harness as required.



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14 Set DVOM to volts DC. Connect leads to pin B and pin C on ICM connector. Turn key to start position and while cranking the engine, observe the voltage.

15 Is the voltage between 3-5 volts DC?
Yes — Replace Ignition Control Module.
No — Consult engine wiring diagram from Workshop Manual. Check continuity between Ignition Control Module connector pin B and ECM connector. Check for open circuits at pins and connectors. Repair or replace harness as required.

If all coil and ICM tests above have been completed and all wires have been checked for opens and shorts, the ECM has a failed Ignition Driver. This is a hardware failure in the ECM and is nonrepairable.

Reinstall all removed connectors.

Reinstall fuel pump relay.