

IGNITION SYSTEM - ELECTRONIC

1988 Volvo 740

B230F/FT With EZ117K

1) Check for voltage at ignition coil with a multimeter. Attach multimeter negative (-) lead to ground and positive (+) lead to coil terminal No. 15. See Fig. 2. Turn ignition on and note voltage. Voltage should be approximately 12 volts. If no voltage is present, check for broken wire between coil and ignition ECU.

2) Turn ignition off. Disconnect power stage connector and remove dust cover. Connect multimeter negative (-) lead to ground. Turn ignition on. Touch multimeter positive (+) lead to connector pin No. 1 and note voltage reading. Touch positive (+) lead to connector pin No. 4 and note voltage reading. Voltage should be approximately 12 volts.

3) If no voltage is present, check for a broken wire between power stage connector and ignition ECU. Turn ignition off. Check ignition coil resistance. Resistance measurement should be taken at an ambient temperature of 68°F (20°C). Attach multimeter lead between power stage connector pins No. 1 and 4. Resistance should be 0.6-0.9 ohm.

4) If resistance is not within specifications, check resistance at ignition coil. Attach multimeter leads between ignition coil terminals No. 1 and 15. See Fig. 2. Resistance should be 0.6-0.9 ohm. If not within specifications, replace coil assembly and recheck.

5) If resistance is within specifications, check continuity of wires between ignition coil and power stage connector pins No. 1 and 4. Repair or replace as necessary.

6) Turn ignition off and disconnect ignition coil leads.

Check ignition coil secondary windings resistance. Attach multimeter leads between ignition coil tower and terminal No. 1 of the coil. See Fig. 2. Resistance should be 6500-9000 ohms. If not within specifications, install a new ignition coil and recheck.

7) Check power stage ground resistance. Turn ignition off. Attach multimeter positive (+) lead to power stage connector pin No. 2 and negative (-) lead to ground. Resistance should be zero ohm. If resistance is other than zero ohm, check continuity of wire between connector pin No. 2 and intake manifold. Repair or replace as necessary.

8) Check shield (ground) wire between ignition ECU connector pin No. 16 and power stage connector pin No. 5. Shield wire should be connected to power stage connector pin No. 3. See Fig. 1.

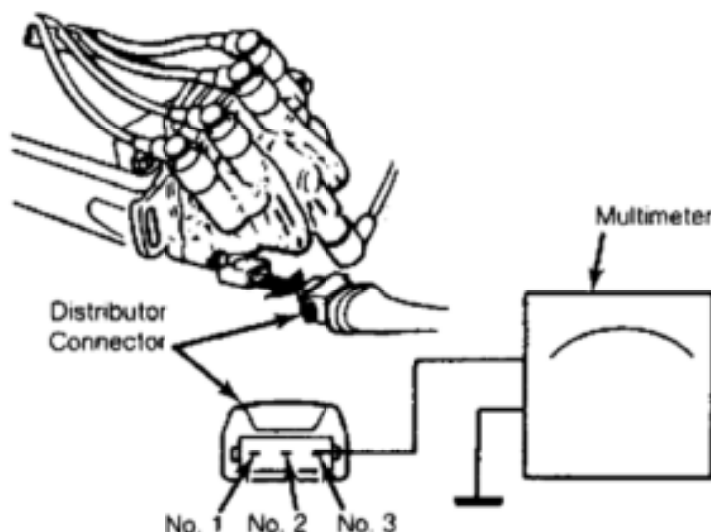


Fig. 7: Distributor Connector Identification
Courtesy of Volvo Cars of North America.

9) Check voltage signal from ignition ECU to power stage with multimeter. Disconnect Red/White wire from ignition coil terminal No. 1 and Blue wire from coil terminal No. 15. See Fig. 2. Attach

multimeter positive (+) lead to power stage connector pin No. 5 and negative (-) lead to ground. Crank starter motor and monitor voltage reading. Voltage should be approximately 2 volts. If no voltage is present, proceed to step 18).

10) Turn ignition off and reconnect ignition coil wires. Reconnect power stage connector. Disconnect distributor electrical connector. Attach multimeter negative (-) lead to ground. Turn ignition on. Touch multimeter positive (+) lead to harness connector pin No. 3. See Fig. 7. Voltage should be approximately 11 volts. If no voltage is present, proceed to step 16).

11) Leave multimeter negative (-) lead attached to ground and attach positive (+) lead to harness connector pin No. 2. Turn ignition on and note voltage reading. Voltage should be approximately 5 volts. If no voltage is present, proceed to step 18). If other than 5 volts are present, replace ignition ECU and recheck.

12) Turn ignition off and check distributor ground resistance. Leave multimeter negative (-) lead attached to ground and attach positive (+) lead to harness connector pin No. 1. Resistance should be zero ohm. If infinite resistance is present, check for poor or no ground connection at ignition ECU connector pin No. 20. Replace defective ignition ECU and perform step 18).

13) Turn ignition off and reconnect distributor electrical connector. Remove panel under steering wheel. Remove ignition ECU from above pedal cluster. Disconnect ECU connector and remove dust cover and side covers. Carefully reconnect connector to ECU. Ensure ignition is off.

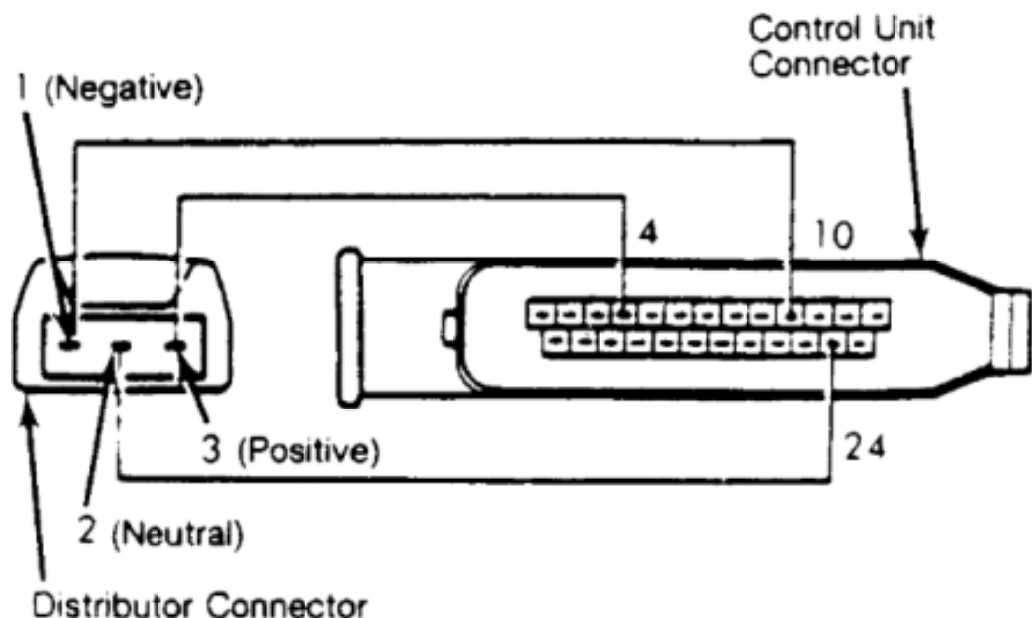
14) Disconnect ignition coil Red-White wire and Blue wire. Attach multimeter negative (-) lead to ground and positive (+) lead to ECU connector pin No. 24 at rear of connector. Turn ignition on. Using a helper, turn crankshaft with a wrench and observe voltage reading.

15) As distributor trigger wheel vane passes switch in distributor, voltage should be more than 1.8 volts. Between vanes, the voltage should be 0.0-0.7 volt. If voltage is other than specified, replace hall switch in distributor. Turn ignition off and disconnect multimeter.

16) Ensure ignition is off and disconnect ignition ECU connector. Attach multimeter negative (-) lead to ground and positive (+) lead to ECU connector pin No. 6. Turn ignition on and note voltage reading. Voltage should be approximately 12 volts. If no voltage is present, check continuity of wire and repair or replace as necessary.

17) Leave positive (+) lead attached to connector pin No. 6 and attach negative (-) lead to connector pin No. 20. Voltage reading should be approximately 12 volts. If no voltage is present, check ground connection at intake manifold.

18) Turn ignition off. Check continuity between distributor harness connector and ignition ECU connector as follows: Probe distributor harness connector pin No. 1 and ECU connector pin No. 10. Probe distributor harness connector pin No. 2 and ECU connector pin No. 24. Probe distributor harness connector pin No. 3 and ECU connector pin No. 4. See Fig. 8. Resistance between all pins should be zero.



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Fig. 8: Checking Distributor-to-Ignition ECU
Courtesy of Volvo Cars of North America.

19) Disconnect power stage connector. Attach multimeter leads between power stage connector pin No. 5 and ECU connector pin No. 16. Resistance should be zero. If continuity is present, replace ignition ECU. If continuity is not present, repair or replace wire. Reconnect power stage connector. Check ignition ECU connector pin No. 3 is not shorted to ground.

20) Ensure ignition is off. Attach multimeter negative (-) lead to ground and positive (+) lead to ECU connector pin No. 7. Resistance should be zero ohm. Depress accelerator pedal slightly. Resistance should increase but never be infinite. If resistance is not within specifications, check resistance at throttle switch to determine if switch is defective or if there is a broken wire(s).

21) Disconnect wiring harness from knock sensor. Attach a jumper wire to both terminals on back of knock sensor connector. Attach multimeter between ignition ECU connector pins No. 12 and 13. If resistance shows zero ohm, remove jumper wire from knock sensor connector. An infinity reading should now be present. If both checks fail, check for broken or shorted wire(s).

NOTE: Visually check that circuit wire is connected to ECU connector pin No. 13 and that shield (ground) is connected to connector pin No. 12. Reversed connections will retard ignition timing and cause loss of power.

22) Measure voltage signal from fuel system ECU. Attach multimeter negative (-) lead to ground and positive (+) lead to **IGNITION SYSTEM ELECTRONICS Selected Block (p. 3) 1988 Volvo 740 G For NONE** approximately 11 volts. If no voltage is present, check and repair wire between ignition ECU connector pin No. 8 and fuel system ECU connector pin No. 24. If wire and connections are okay, replace fuel system ECU.

23) Turn ignition off. If no faults were found in the previous steps and a problem still exists, install a new ignition ECU and/or power stage. Reconnect all disconnected components.

Fig. 1: Power Stage Location & Connector Identification
Courtesy of Volvo Cars of North America.

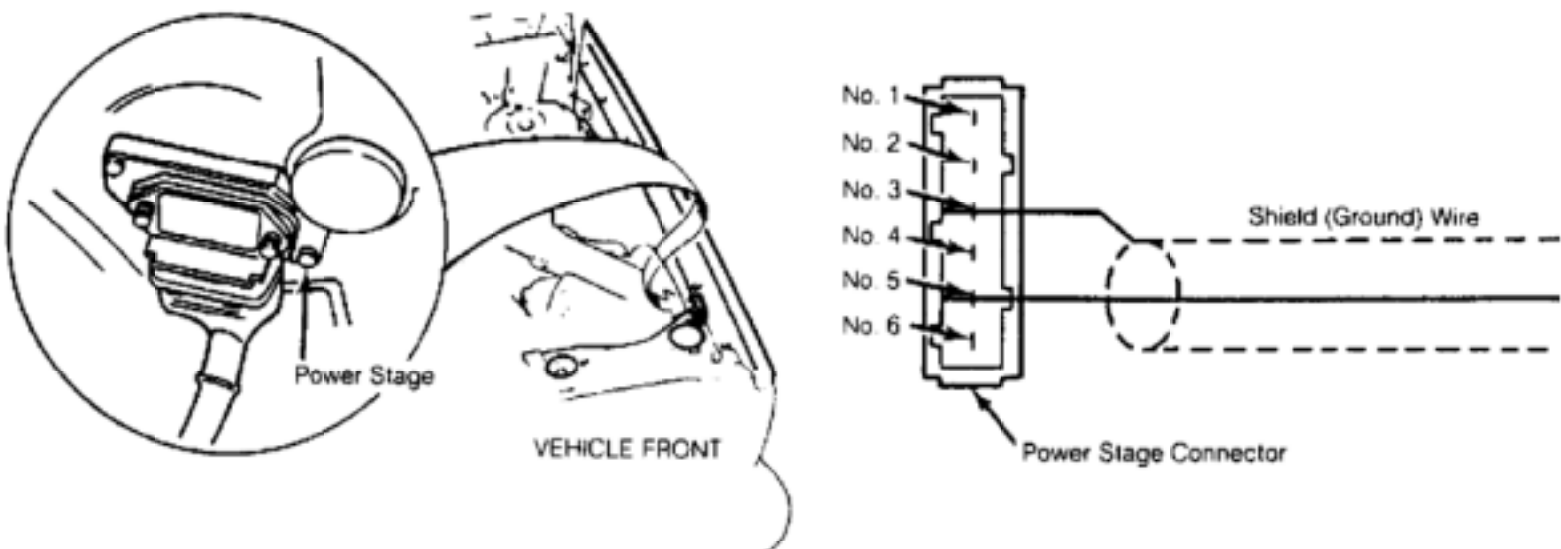


Fig. 2: Ignition Coil Terminal Identification

