General Guide to Self-Diagnosis (SD)

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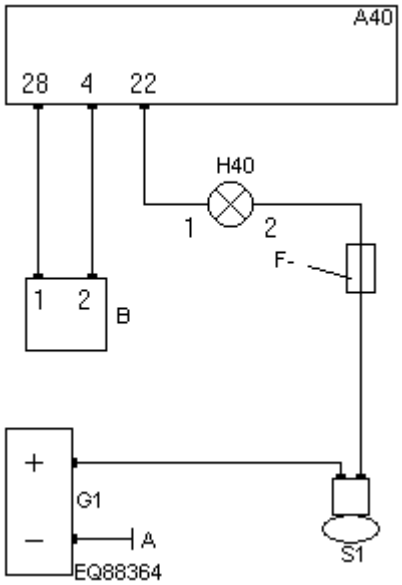
The EMS-ECM has a self-test capability that continually examines the signals from the system sensors and actuators and compares the signal to pre-programmed parameters.

A sensor or actuator signal that falls outside of the system parameters will be captured by the EMS-ECM, and stored as a fault in the form of a Fault Code. Intermittent faults are also logged by the EMS-ECM and retained when the ignition is turned off. Fault Codes will not be stored about components for which codes are not available or for conditions not covered by the SD software.



Guide to Test Procedures

Codes stored by ECM

1. Use a Scantool to interrogate the ECM for Fault Codes or manually gather codes as described below.
2. If one or more Fault Codes are gathered, refer to the tables to determine their meaning.
3. Test each component with reference to the test procedures and component measurement values.
4. If several codes are gathered, look for a common factor such as a defective ground return or supply.
5. Once the fault has been resolved, clear the codes and run the engine under various conditions to determine if the problem has cleared.
6. Check the ECM for Fault Codes once more. Repeat the above procedures where codes are still being stored.

Codes not stored by ECM

Where a running problem is experienced, but no codes are stored, the fault is outside of the parameters designed into the SD system.

Drawing Key:

A. Ground
B. DLC

Test all areas of the system with reference to the test procedures and component measurement values

Datastream

This system captures live data in real time from the various engine sensors and actuators and allows this data to be displayed upon the Scantool. Irrespective of whether a fault code is generated or not, this is a very useful method of checking that the relevant circuits are operating within their parameters.

Self-Diagnosis (SD) with a Scantool

1. Connect a Scantool to the DLC and use the Scantool for the following purposes in strict compliance with the tool manufacturer's instructions:
   - Retrieve Fault Codes.
   - Clear Fault Codes.
   - Test actuators.
   - Display Datastream.
2. As a general rule, the Fault Code will indicate a faulty circuit - but not necessarily the faulty component. By following relevant test routines, the faulty circuit or component should be quickly diagnosed.
3. Codes must always be cleared after component tests or after repairs involving the removal or replacement of an engine management component.

Important note: During the course of certain test procedures, it is possible for additional Fault Codes to be generated. Care must be taken that codes generated during test routines do not create misleading diagnosis

Clearing Fault Codes without a Scantool

1. Turn off the ignition and disconnect the battery negative terminal for a period of approximately 5 minutes.
2. Re-connect the battery negative terminal.

Note: The first drawback to this method is that battery disconnection will re-initialise all ECM adaptive values. Re-learning the appropriate adaptive values requires starting the engine from cold and driving at various engine speeds - both cold and hot for approximately 20 to 30 minutes. The engine should also be allowed to idle for approximately 10 minutes. The second drawback is that the radio security codes, clock setting and other stored values will be initialised and these must be re-entered once the battery has been reconnected. Where possible a Scantool should be used for code clearing on these vehicles.

Retrieving Fault Codes (Flash Codes) by Manual Means

1. Outline of method: The Fault Codes logged by the ECM are output as 'slow codes' and are generally able to be captured by an LED flashing tool or a dash mounted MIL. The various 2-digit Fault Codes output by this system are indicated by the flashing of the MIL on the instrument cluster. The first series of flashes indicates the number of tens, the second series of flashes indicates the single units.
2. Attach an on/off accessory switch between the DLC green multiplug terminal 2 (see Diagram) and ground.
3. Switch on the ignition.
4. Close the switch for three seconds (the MIL will remain off).
5. Open the switch, the MIL will flash once (indicating 10).
6. After a 1.5 second pause the MIL will flash twice (indicating 2).
7. This indicates the code of twelve (12) which is the test start code.
8. The MIL will extinguish.
9. Close the switch for three seconds (the MIL will remain off).
10. Open the switch, the MIL will flash to indicate a code.
11. Example :-
    MIL flashes twice (indicating 2 tens).
    After a 1.5 second pause the MIL will flash once (indicating 1). This indicates a Fault Code of 21.
12. Once the MIL has extinguished, wait for three seconds before continuing.
13. Close the switch for three seconds & repeat the test to obtain further codes. When code 11 is obtained this indicates 'End of Test'.
14. After code 11 is obtained the complete test may be repeated.
15. If code 11 is the first code obtained after code 12, no faults are logged by the ECM.
16. Switch off the ignition and remove the accessory switch.
17. As a general rule, the Fault Code will indicate a faulty circuit - but not necessarily the faulty component. By following relevant test routines, the faulty circuit or component should be quickly diagnosed.
18. Codes must always be cleared after component tests or after repairs involving the removal or replacement of an engine management component.

Important note: During the course of certain test procedures, it is possible for additional Fault Codes to be generated. Care must be taken that codes generated during test routines do not create misleading diagnosis.