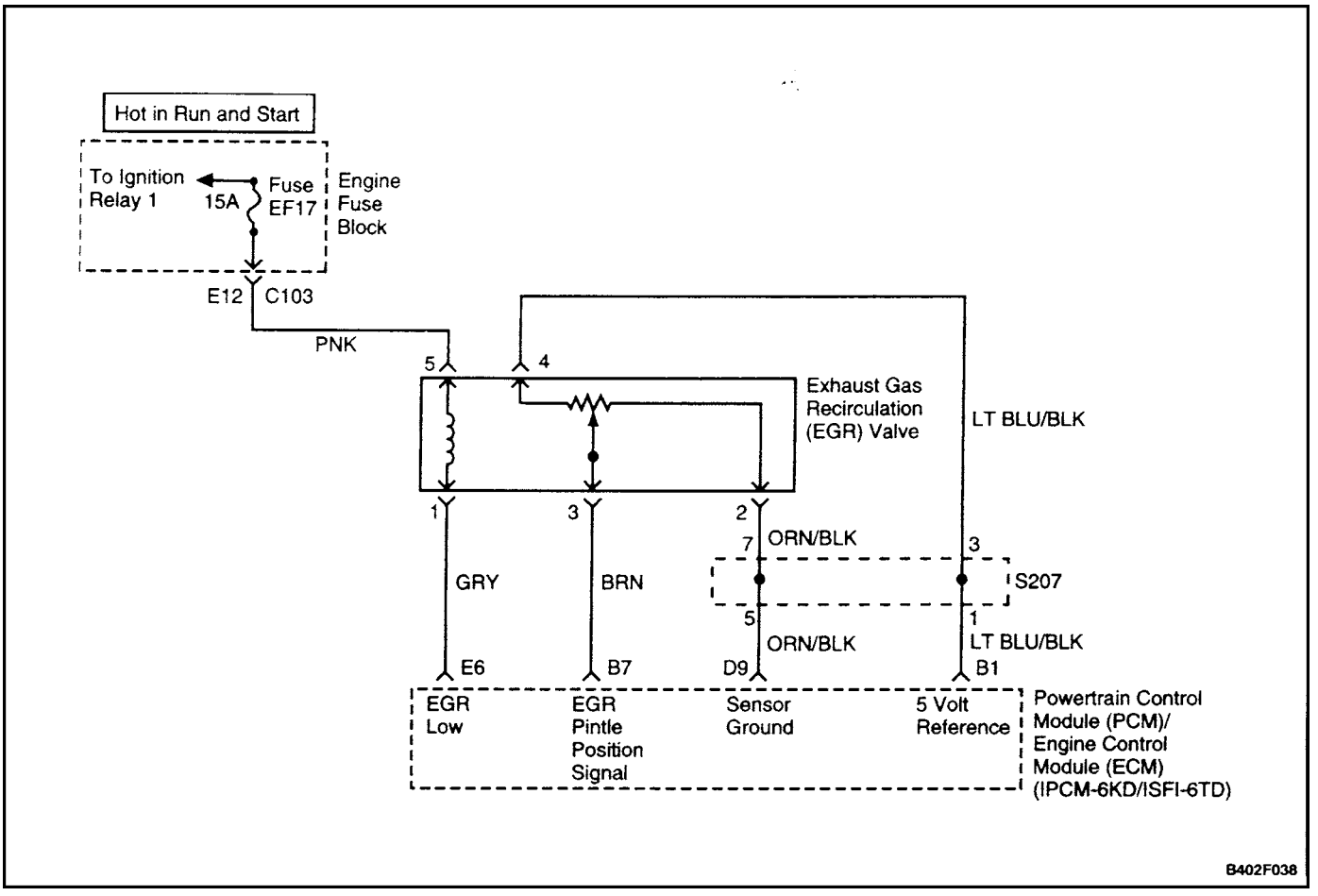


DIAGNOSTIC TROUBLE CODE (DTC) P1404

EXHAUST GAS RECIRCULATION CLOSED VALVE PINTLE ERROR

Circuit Description

An Exhaust Gas Recirculation (EGR) system is used to lower Oxides of Nitrogen (NOx) emission levels caused by high combustion temperatures. It accomplishes this by feeding small amounts of exhaust gases back into the combustion chamber. When the air/fuel mixture is diluted with the exhaust gases, combustion temperatures are reduced.

A linear EGR valve is used on this system. The linear EGR valve is designed to accurately supply exhaust gases to the engine without the use of intake manifold vacuum. The valve controls exhaust flow going into the intake manifold from the exhaust manifold through an orifice with a powertrain control module (PCM)/engine control module (ECM) controlled pintle. The PCM/ECM controls the pintle position using inputs from the Throttle Position (TP) and Manifold Absolute Pressure (MAP) sensors. The PCM/ECM then commands the EGR valve to operate when necessary by controlling an ignition signal through the PCM/ECM. This can be monitored on a scan tool as the Desired EGR Position.

The PCM/ECM monitors the results of its command through a feedback signal. By sending a 5 volt reference and a ground to the EGR valve, a voltage signal representing the EGR valve pintle position is sent to the PCM/ECM. This feedback signal can also be monitored on a scan tool and is the actual position of the EGR pintle.

The Actual EGR Position should always be near the commanded or Desired EGR Position.

Conditions for Setting the DTC

- Engine running.
- Ignition voltage is between 11.7 and 16 volts.
- Desired EGR position is equal to 0.
- Difference between current and learned low position is greater than 16 A/D counts.
- Failed conditions exist for more than 6.3 seconds for 3 EGR cycles each separated by 5 seconds at the desired position of greater than 30%.
- Intake Air Temperature (IAT) is greater than 36˚F (2˚C).

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate after two consecutive ignition cycles in which the diagnostic runs with the fault active.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.
- A history Diagnostic Trouble Code (DTC) is stored.
  - Coolant fan turns on.
  - EGR is disabled.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault.
- A history DTC will clear after 80 consecutive warm–up cycles without a fault.
  - DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Due to moisture associated with exhaust systems, the EGR valve may freeze and stick in cold weather. After the vehicle is brought into a warm shop for repairs, the valve warms and the problem disappears. By watching the Actual EGR and Desired EGR Positions on a cold vehicle with a scan tool, the fault can be easily verified. Check the freeze frame data to determine if the DTC set when the vehicle was cold by viewing the Engine Coolant Temperature (ECT).

Test Description

Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
2. Commanding the EGR valve open determines whether the EGR system can control the EGR valve accurately and if the fault is present.
3. When the EGR valve electrical connector is disconnected, the scan tool should display the Actual EGR Position as 0%. If it does not, the fault lies either in the EGR signal circuit or the PCM/ECM.
5. If the ERG valve 5 volt reference is shorted to voltage, the Digital Voltmeter (DVM) will read battery voltage and additional DTCs may be set and engine performance will be poor.
6. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.
10. An open or poor connection condition may have caused this DTC to set. Be sure to check the terminals for being backed out, improperly formed or damaged, and for poor tension.
11. All circuits to the EGR valve are OK at this point. The fault lies internally in the EGR valve and therefore must be replaced. Be sure all gasket material is removed from the EGR mounting surface. Even a small amount of material may cause a DTC P0401 to set.
12. Check the terminals for being backed out, improperly formed or damaged, and for poor tension.
13. Clearing DTCs is a very important step for this diagnostic. The clearing function allows the EGR valve to relearn a new pintle position as the old pintle position was inaccurate due to the failure that caused the DTC. The DTC must be cleared with the ignition ON, engine OFF or when the engine is idling. If the PCM/ECM sees a EGR command, the new pintle will not be learned.
14. If no malfunctions have been found at this point and no additional DTCs were set, refer to ”Diagnostic Aids” in this section for additional checks and information.

DTC P1404 Exhaust Gas Recirculation Closed Valve Pintle Error

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition switch ON with the engine OFF. 2. Install a scan tool. 3. Command the Exhaust Gas Recirculation (EGR) valve to the specified values. Does the Actual EGR Position follow the Desired EGR Position?	25%, 50%, 75%, 100%	Go to *Step 13*	Go to *Step 3*
3	Disconnect the EGR valve electrical connector. Is the Actual EGR Position near the specified value?	100%	Go to *Step 4*	Go to *Step 5*

Step	Action	Value(s)	Yes	No
4	Check the signal circuit terminal 3 for a short to voltage and repair as necessary. Is a repair necessary?		Go to *Step 13*	Go to *Step 6*
5	With a digital voltmeter (DVM) connected to ground, probe the 5 volt reference circuit terminal D to the EGR valve. Does the DVM read near the specified value?	5 v	Go to *Step 7*	Go to *Step 8*
6	Replace the powertrain control module (PCM)/engine control module (ECM). Is the action complete?		Go to *Step 13*	
7	1. Connect a test light to ground. 2. Probe the EGR control circuit to the EGR valve. Does the test light illuminate?		Go to *Step 9*	Go to *Step 10*
8	Check the 5 volt reference circuit for a short to voltage and repair as necessary. Is a repair necessary?		Go to *Step 13*	Go to *Step 6*
9	Check the control circuit for a short to voltage and repair as necessary. Is the repair complete?		Go to *Step 13*	Go to *Step 6*
10	Check the EGR sensor ground circuit for an open or poor connection at the EGR valve electrical connector and repair as necessary. Is a repair necessary.		Go to *Step 13*	Go to *Step 12*
11	Replace the EGR valve. Is the repair complete?		Go to *Step 13*	
12	Check the PCM/ECM electrical connector for a poor connection and repair as necessary. Is a repair necessary?		Go to *Step 13*	Go to *Step 6*
13	1. Using the scan tool, clear the Diagnostic Trouble Codes (DTCs). 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 14*	Go to *Step 2*
14	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK

DIAGNOSTIC TROUBLE CODE (DTC) P1441

EVAPORATIVE EMISSION CONTINUOUS PURGE FLOW

System Description

The evaporative (EVAP) emission system includes the following components:

- Fuel tank
- EVAP emission vent solenoid
- Fuel tank pressure sensor
- Fuel pipes and hoses
- Fuel vapor lines
- Fuel cap
- EVAP emission canister
- Purge lines
- EVAP emission canister purge valve
- EVAP emission service port

The EVAP emission system is checked by applying vacuum to the EVAP emission system and monitoring for a vacuum decay. The powertrain control module (PCM)/ engine control module (ECM) monitors the vacuum level through the fuel tank pressure sensor signal.

At the appropriate time, the EVAP emission canister purge valve and the EVAP emission vent solenoid are turned ON, allowing the engine to draw a small vacuum on the entire EVAP emission system. After the desired vacuum level has been achieved, the EVAP emission canister purge valve is turned OFF, sealing the system. The EVAP emission canister purge valve allows manifold vacuum to purge the canister. The PCM/ECM supplies a ground to energize the solenoid valve (purge ON). The EVAP emission canister purge valve control is Pulse Width Modulated (PWM) or turned ON and OFF several times a second. The duty cycle (pulse width) is determined by engine operating conditions including load, Throttle Position (TP), Engine Coolant Temperature (ECT) and ambient temperature. The duty cycle is calculated by the PCM/ECM and the output is commanded when the appropriate conditions have been met.

The system checks for conditions that cause the EVAP emission system to purge continuously by commanding the EVAP emission vent solenoid ON and the EVAP emission canister purge valve OFF (EVAP emission vent solenoid CLOSED, EVAP emission purge PWM 0%).

If the fuel tank vacuum level increases during the test, a continuous purge flow condition is indicated. This can be caused by the following conditions:

- EVAP emission purge and engine vacuum lines switched at the EVAP emission canister purge valve.
- EVAP emission canister purge valve driver circuit grounded.

If any of these conditions are present, DTC P1441 will set.

Conditions for Setting the DTC

- DTC(s) P0106, P0107, P0108, P0113, P0117, P0118, P0121, P0122, P0123, P0131, P0132, P0133, P0134, P0135, P0137, P0138, P0140, P0141, P0201, P0202, P0203, P0204, P0300, P0402, P0404, P0405, P0406, P0443, P0449, P0452, P0453, P0506, P0507, P1130, P1133, P1134, P1404, P1627 and P1640 not set.
- No system voltage malfunction.
- Fuel tank vacuum is greater than 8 inches of H2O for 0.5 second.
- Intake air temperature (IAT) and ECT are between 4˚C and 32˚C (40˚F and 90˚F) at engine start up.
- Barometric Pressure (BARO) is greater than 72 kPa.
- IAT is not more than 1˚C (2˚F) greater than the ECT at start up.
- ECT is not more then 6.25˚C (44˚F) greater than the IAT at start up.
- Fuel tank level is between 15% and 85%.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.

A history DTC is stored.
Coolant fan turns on.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault.
- A history DTC will clear after 80 consecutive warm–up cycles without a fault.

DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Although this DTC is considered a type A diagnostic (refer to ”Powertrain Control Module/Engine Control Module” in this section), it acts like a type B diagnostic under certain conditions. Whenever this diagnostic reports the system has passed, or if the battery is disconnected, the diagnostic must fail twice before setting a DTC. The initial failure is not reported to the diagnostic executive or displayed on a scan tool. A passing system always reports to the diagnostic executive immediately. Check for the following conditions:

Check for the following conditions:

- Poor connection at PCM/ECM. Inspect harness connectors for the following conditions:
  - Backed–out terminals
  - Improper mating
  - Broken locks
  - Improperly formed
  - Damaged terminals

- Poor terminal–to–wire connection
- Damaged harness. Inspect the wiring harness for damage. If the harness appears to be OK, connect the EVAP emission pressure/purge cart to the EVAP emission service port, pressurize the EVAP emission system to 10 inches H2O and observe the Fuel Tank Vacuum Pressure display on the scan tool while moving connectors and wiring harnesses related to the EVAP emission canister purge valve. A sudden change in the display will indicate the location of the fault.
- Incorrect vacuum line routing. Verify that the source vacuum line routing to the EVAP emission canister purge valve is correct and that the EVAP emission purge and source vacuum lines to the EVAP emission canister purge valve are not switched.
- Loose Carbon in the purge solenoid. Blow out the lines and replace the purge canister.

Test Description

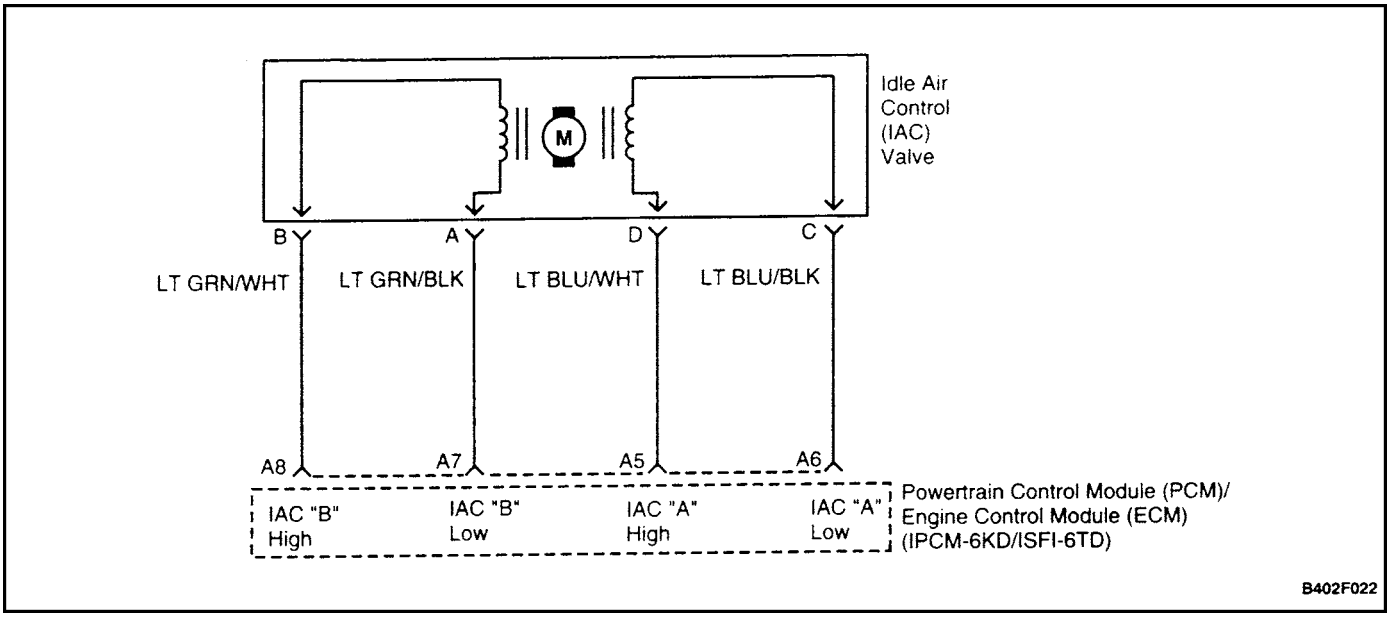
Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
2. If an EVAP canister purge valve electrical malfunction is present, the purge system will not operate correctly. Repairing the electrical malfunction will-very likely correct the condition that set DTC P1441.
3. Checks the fuel tank pressure sensor at ambient pressure.
5. Forces fuel tank pressure sensor to re–zero.
7. Verifies that the fuel tank pressure sensor accurately reacts to EVAP system pressure changes.
9. If the EVAP purge and engine vacuum lines are switched at the EVAP canister purge valve, the solenoid valve will leak vacuum.
12. Duplicates the On–Board diagnostic test.

DTC P1441 Evaporative Emission Continuous Purge Flow

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Install scan tool. 2. Command the Evaporative Emission (EVAP emission) canister purge valve and vent solenoid ON and OFF with the scan tool. Does the purge valve and vent solenoid click ON and OFF?		Go to *Step 3*	Go to ”PCM/ECM Output Diagnosis”
3	1. Turn the ignition switch OFF. 2. Remove the fuel cap. 3. Turn the ignition switch ON. Is the Fuel Tank Pressure at the specified value?	0 in. H2O (±1 in. H2O)	Go to *Step 6*	Go to *Step 4*
4	Check the battery. Has the battery been disconnected?		Go to ”EVAP Control System Diagnosis”	Go to *Step 5*
5	Disconnect the battery. Is the action complete?		Go to *Step 3*	

Step	Action	Value(s)	Yes	No
6	**Important :** Before continuing with this diagnosis, zero the EVAP Pressure and Vacuum gauges on the EVAP emission pressure/purge cart. Also read the temperature variation instruction card. 1. Reinstall the fuel cap. 2. Connect the EVAP emission pressure/purge cart to EVAP emission service port. 3. Using the scan tool, command the EVAP emission vent solenoid ON (closed). 4. Attempt to pressurize the EVAP emission system to the specified value using the EVAP emission pressure/purge cart (monitor the pressure using the gauge an the cart with the switch in the HOLD position). Can the specified value be achieved?	5 in. H20	Go to *Step 7*	Go to *Step 8*
7	1. Maintain tank pressure at 5 inches of H2O. 2. Observe the Fuel Tank Pressure on the scan tool. Is the Fuel Tank Pressure at the specified value?	5 in. H2O	Go to *Step 8*	Go to ”EVAP Control System Diagnosis”
8	1. Remove the engine vacuum source line from the EVAP emission canister purge valve. 2. Connect a vacuum hand pump to the engine vacuum side of the EVAP emission canister purge valve and apply specified vacuum to the solenoid. Does the EVAP emission canister purge valve maintain vacuum at the specified value?	15 in. Hg	Go to *Step 9*	Go to *Step 10*
9	Check the EVAP emission purge and source vacuum line routing and connections at the EVAP emission canister purge valve. Are the EVAP emission purge and source vacuum lines connected correctly at the EVAP emission canister purge valve?		Go the”Diagnosis Aids”	Go to *Step 11*
10	Replace the EVAP emission canister purge valve. Is the action complete?		Go to *Step 12*	
11	Connect the EVAP emission purge and source vacuum line routing and connections. Is the action complete?		Go to *Step 12*	
12	1. Start the engine. 2. Remove the fuel cap. 3. Using the scan tool, command the EVAP emission vent solenoid ON (closed) and the EVAP emission canister purge valve OFF(0%). 4. Replace the fuel cap. 5. Run the engine at the specified rpm while monitoring the Fuel Tank Pressure on the scan tool. Does the Fuel Tank Pressure remain at or above the specified value while the EVAP emission vent solenoid is commanded ON (closed) and the EVAP emission canister purge valve is commanded OFF 0%).	2500 rpm 0 in. H20	System OK	Go to *Step 2*



DIAGNOSTIC TROUBLE CODE (DTC) P1508

IDLE AIR CONTROL COUNTS TOO LOW

Circuit Description

The powertrain control module (PCM)/engine control module (ECM) controls engine idle speed by adjusting the position of the idle air control (IAC) motor pintle. The IAC is a bi–directional stepper motor driven by two coils. The PCM/ECM applies current to the IAC coils in steps (counts) to extend the IAC pintle into a passage in the throttle body to decrease air flow. The PCM/ECM reverses the current to retract the pintle, increasing air flow. This method allows highly accurate control of idle speed and quick response to changes in engine load. If the PCM/ECM detects a condition where too low of an idle speed is present and the PCM/ECM is unable to adjust idle speed by decreasing the IAC counts, DTC P1508 will set, indicating a problem with the idle control system.

Conditions for Setting the DTC

- No scan tool test is being run.
- All of the above conditions are met for 10 seconds.l.
- Barometric pressure (BARO) is above 75 kPa.
- Engine Coolant Temperature (ECT) is above 50˚C 120˚F).
- Engine speed is more than 100–200 rpm lower than desired idle, based upon coolant temperature.
- The engine has been running for at least 125 seconds.
- Canister purge duty cycle is above 10%.
- Ignition voltage is between 9.5 and 16.7 volts.
- The throttle is closed.
- Engine speed is lower than desired idle.
- All of the above conditions are met for 10 seconds.

Action Taken When the DTC Sets

- The PCM/ECM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM/ECM will store conditions which were present when the DTC was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- A history DTC P1508 will clear after 40 consecutive warm–up cycles have occurred without a fault.
- DTC P1508 can be cleared by using the scan tool CLEAR INFO function or by disconnecting the battery.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM or IAC motor – Inspect harness connectors for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage.
- Restricted air intake system – Check for a possible collapsed air intake duct, restricted air filter element, or foreign objects blocking the air intake system.
- Throttle body – Check for objects blocking the IAC passage or throttle bore, excessive deposits in the IAC passage and on the IAC pintle, and excessive deposits in the throttle bore and on the pintle plate.
- Large vacuum leak – Check for a condition that causes a large vacuum leak, such as a disconnected brake booster hose.

Reviewing the Failure Records vehicle mileage since the diagnostic test last failed may help determine how often the condition that caused the DTC to be set occurs. This may assist in diagnosing the condition.

Test Description

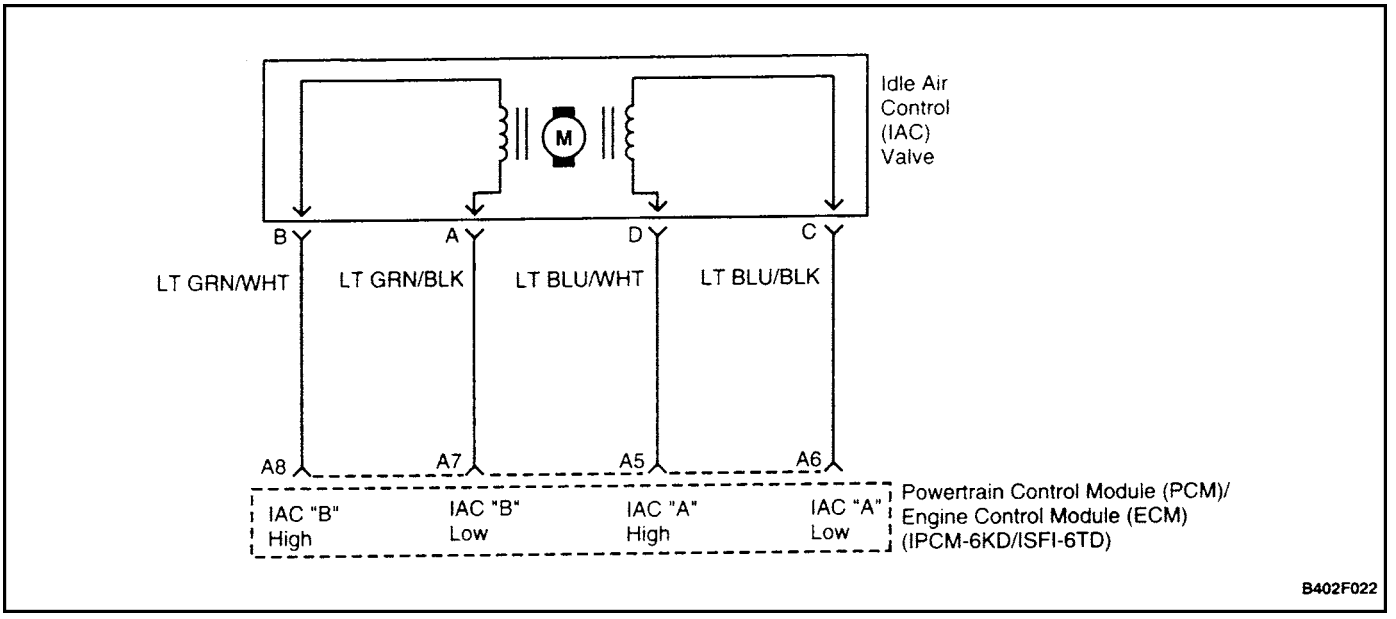
Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
8. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P1508 Idle Air Control Counts Too Low

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Start the engine. 2. Turn all accessories off. 3. Using a scan tool, command rpm up to 1500, down to 500, and than up to 1500 while monitoring the Engine Speed on the scan tool. **Important :** This scan tool command may cause the engine to ”cut out”when the rpm goes above 1500. If this occurs, the ”cutting out”will stop when the scan tool command for the test is discontinued, or if the scan tool command is changed to less than 1500 rpm. Does ”Engine Speed” remain within the specified value of ”Desired Idle” for each rpm command?	± 50 rpm	Go to ”Diagnostic Aids”	Go to *Step 3*
3	1. Disconnect the Idle Air Control (IAC). 2. Install IAC Node Light J–37027 or equivalent. 3. With the engine running, command rpm up to 1500, down to 500, and then up to 1500 while observing the node light. **Important :** This scan tool command may cause the engine to ”cut out” when the rpm goes above 1500. If this occurs, the ”cutting out”will stop when the scan tool command for the test is discontinued, or if the scan tool command is changed to less than 1500 rpm. Does each node light cycle red and green (never ”OFF”)?		Go to *Step 5*	Go to *Step 4*
4	1. Check the following circuits for an open, short to ground, short to voltage, or poor connections at the PCM/ECM: • IAC ”A”Low, terminal A6. • IAC ”A”High, terminal A5. • IAC ”B”Low, terminal A7. • IAC ”B”High, terminal A8. 2. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 9*	Go to *Step 8*

Step	Action	Value(s)	Yes	No
5	Visually/physically inspect for the following conditions: • Restricted air intake system. Check for a possible collapsed air intake duct, restricted air filter element, or foreign objects blocking the air intake system. • Throttle body. Check for objects blocking the IAC passage and on the IAC pintle, and excessive deposits in the throttle bore and on the throttle plate. Do any of the above require a repair?		Go to appropriate On–Vehicle Service	Go to *Step 6*
6	• Check for a poor connection at the IAC harness connector. • If a problem is found, replace faulty terminals as necessary. Is a problem found?		Go to *Step 9*	Go to *Step 7*
7	Replace the IAC valve. Is the action complete?		Go to *Step 9*	
8	Replace the powertrain control module (PCM)/engine control module (ECM). Is the action complete?		Go to *Step 9*	
9	1. Using the scan tool, clear the Diagnostic Trouble Codes (DTCs). 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 10*	Go to *Step 2*
10	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK



DIAGNOSTIC TROUBLE CODE (DTC) P1509

IDLE AIR CONTROL COUNTS TOO HIGH

Circuit Description

The powertrain control module (PCM)/engine control module (ECM) controls engine idle speed by adjusting the position of the idle air control (IAC) motor pintle. The IAC is a bi–directional stepper motor driven by two coils. The PCM/ECM applies current to the IAC coils in steps (counts) to extend the IAC pintle into a passage in the throttle body to decrease air flow. The PCM/ECM reverses the current to retract the pintle, increasing air flow. This method allows highly accurate control of idle speed and quick response to changes in engine load. If the PCM/ECM detects a condition where too low of an idle speed is present and the PCM/ECM is unable to adjust idle speed by decreasing the IAC counts, DTC P1508 will set, indicating a problem with the idle control system.

Conditions for Setting the DTC

- No scan tool test is being run.
- None of these DTCs are set: Throttle Position (TP) sensor, Vehicle Speed Sensor (VSS), Engine Coolant Temperature (ECT), Exhaust Gas Recirculation EGR), Fuel System, Mass Airflow, Manifold Absolute Pressure (MAP), Intake Air Temperature (IAT), Canister Purge, Injector Control or Ignition Control.
- Barometric pressure (BARO) is above 75 kPa.
- Engine Coolant Temperature (ECT) is above 50˚C (120˚F).
- Engine speed is more than 100–200 rpm lower than desired idle, based upon coolant temperature.
- The engine has been running for at least 125 seconds.
- Canister purge duty cycle is above 10%.
- Ignition voltage is between 9.5 and 16.7 volts.
- The throttle is closed.
- Engine speed is lower than desired idle.
- All of the above conditions are met for 10 seconds.

Action Taken When the DTC Sets

- The PCM/ECM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM/ECM will store conditions which were present when the DTC was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- A history DTC P1509 will clear after 40 consecutive warm–up cycles have occurred without a fault.
- DTC P1509 can be cleared by using the scan tool CLEAR INFO function or by disconnecting the battery.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM or IAC motor – Inspect harness connectors for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage.
- Restricted air intake system – Check for a possible collapsed air intake duct, restricted air filter element, or foreign objects blocking the air intake system.
- Throttle body – Check for objects blocking the IAC passage or throttle bore, excessive deposits in the IAC passage and on the IAC pintle, and excessive deposits in the throttle bore and on the pintle plate.
- Check for the following conditions:

Check for the following conditions:

Test Description

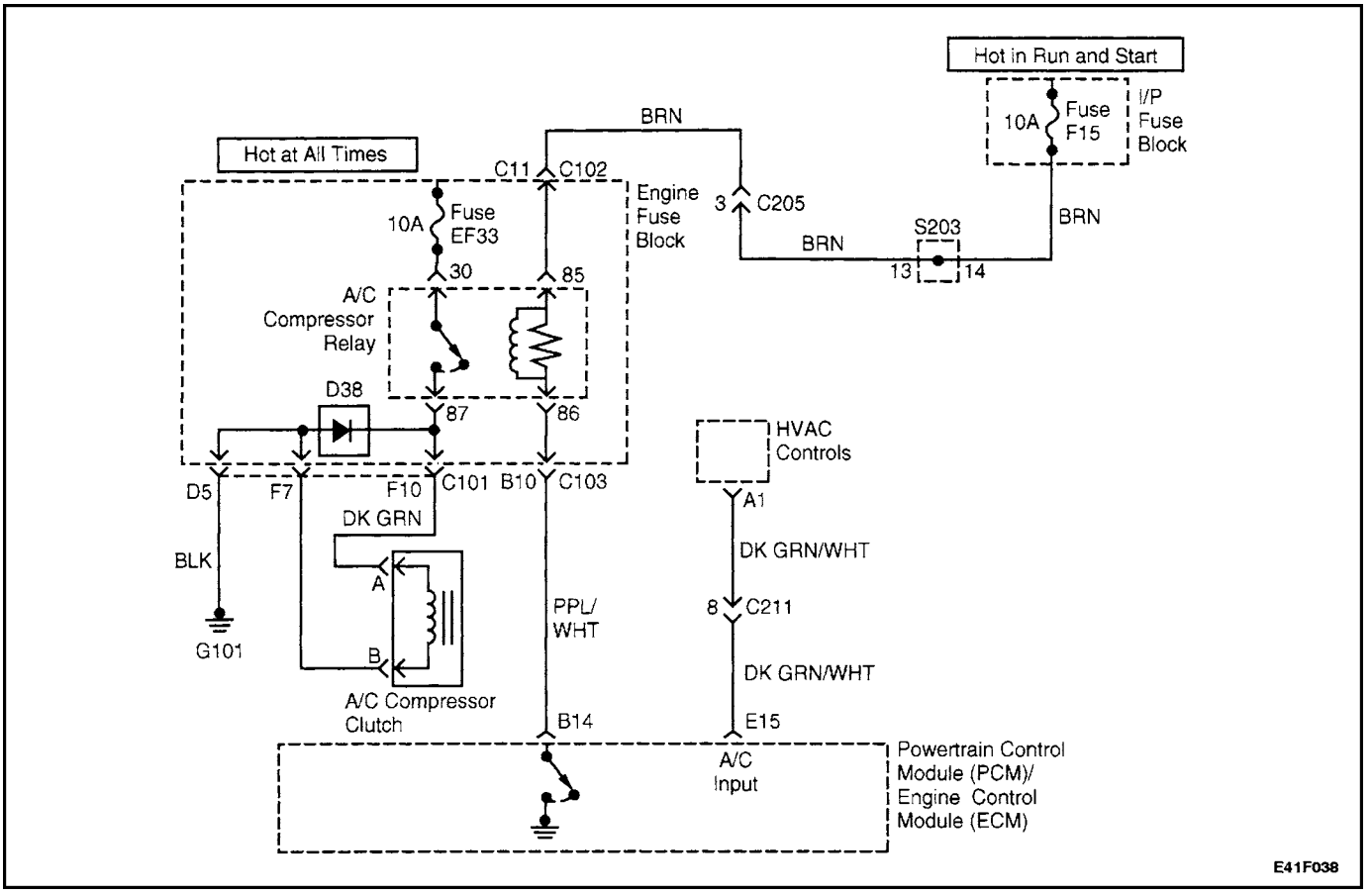
Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
2. A problem that may prevent the compressor from engaging may or may not cause DTC P1546 to set.
3. If the scan tool indicates that the A/C request is ON, then the status circuit is OK.
4. Using Freeze Frame and/or Failure Records data may aid in locating an intermittent condition. If the DTC cannot be duplicated, the information included in the Freeze Frame and/or Failure Records data can be useful in determining how many miles since the DTC set. The Fail Counter and Pass Counter can also be used to determine how many ignition cycles the diagnostic reported a pass and/or a fail. Operate vehicle within the same freeze frame conditions (rpm, load, vehicle speed, temperature, etc.) that were noted. This will isolate when the DTC failed.
5. Checks whether ignition voltage is available at the relay.
6. Determines if the A/C relay is at fault or the A/C request circuit is at fault. If the A/C clutch engages, this indicates that the A/C status circuit is OK.
10. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P1509 Idle Air Control Counts Too High

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Install the scan tool. 2. Start the engine and idle with the A/C ON. Does the A/C clutch operate properly?		Go to *Step 3*	Go to *Step 5*
3	Using the scan tool, monitor the A/C request display on the scan tool. Does the scan tool indicate A/C request as ON?		Go to *Step 4*	Go to *Step 8*
4	1. Turn the engine OFF, ignition ON. 2. Review the Freeze Frame and /or FailureRecords data for this DTC and note parameters. 3. Turn the ignition OFF for 15 seconds. 4. Start the engine and operate the vehicle within the conditions required for this diagnostic to run, and as close to the conditions recorded in Freeze Frame/Failure Records as possible. Does the scan tool indicate that this diagnostic failed this ignition?		Go to *Step 5*	Go to ”Diagnostic Aids”
5	1. Turn the ignition OFF. 2. Disconnect the A/C clutch relay. 3. Turn the ignition ON, engine OFF. 4. Probe the ignition feed circuit at the A/C relay terminal 85 with a test light to ground. Does the test light illuminate?		Go to *Step 6*	Go to *Step 9*
6	Using a Digital Voltmeter (DVM), probe the resistance between the terminals 85 and 86 on the compressor relay. Is the resistance around the specified value?	98 Ω	Go to *Step 7*	Go to *Step 8*

Step	Action	Value(s)	Yes	No
7	1. Ignition OFF. 2. Disconnect the powertrain control module PCM)/engine control module (ECM) connector 1 red) from the PCM/ECM. 3. Using a DVM, probe the resistance between terminal connector B14 and 86. Is the resistance equal to the specified value?	0Ω	Go to *Step 10*	Go to *Step 11*
8	Replace the A/C compressor relay. Is the repair complete?		Go to *Step 12*	
9	Repair the open or short to ground in the ignition feed circuit. Is the repair complete?		Go to *Step 12*	
10	1. Turn the ignition OFF. 2. Replace the PCM/ECM. Is the repair complete?		Go to *Step 12*	
11	Repair the open or short to voltage in the A/C output circuit. Is the repair complete?		Go to *Step 12*	
12	1. Using the scan tool, clear the Diagnostic Trouble Codes (DTCs). 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 13*	Go to *Step 2*
10	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK



DIAGNOSTIC TROUBLE CODE (DTC) P1546

A/C CLUTCH OUTPUT CIRCUIT FAULT

Circuit Description

When the powertrain control module (PCM)/engine control module (ECM) detects that A/C has been requested, the PCM/ECM will activate the A/C clutch relay. When the relay has been activated, voltage should be present at both the A/C compressor clutch and the A/C clutch status circuit at the PCM/ECM.

Conditions for Setting the DTC

- Ignition ON and voltage is greater than 10 volts. Engine run time is more than 5 seconds
- Engine run time is more than 5 seconds
- The PCM/ECM has commanded the A/C ON and no voltage is detected on the A/C clutch status line for more than 5 seconds.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will not illuminate.

The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.

A history DTC is stored.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault.
- A history DTC will clear after 40 consecutive warm–up cycles without a fault.

DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM. Inspect harness connectors for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness. Inspect the wiring harness for damage. If the harness appears OK, observe the throttle position display on the scan tool while moving connectors and wiring harnesses related to the Throttle Position (TP) sensor. A change in the display will indicate the location of the fault.

Test Description

Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This

creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.

2. A problem that may prevent the compressor from engaging may or may not cause DTC P1546 to set.
3. If the scan tool indicates that the A/C request is ON, then the status circuit is OK.
4. Using Freeze Frame and/or Failure Records data may aid in locating an intermittent condition. If the DTC cannot be duplicated, the information included in the Freeze Frame and/or Failure Records data can be useful in determining how many miles since the DTC set. The Fail Counter and Pass Counter can also be used to determine how many ignition cycles the diagnostic reported a pass and/or a fail. Operate vehicle within the same freeze frame conditions (rpm, load, vehicle speed, temperature, etc.) that were noted. This will isolate when the DTC failed.
5. Checks whether ignition voltage is available at the relay.
6. Determines if the A/C relay is at fault or the A/C request circuit is at fault. If the A/C clutch engages, this indicates that the A/C status circuit is OK.
10. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P1546 A/C Clutch Output Circuit Fault

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Install the scan tool. 2. Start the engine and idle with the A/C ON. Does the A/C clutch operate properly?		Go to *Step 3*	Go to *Step 5*
3	Using the scan tool, monitor the A/C request display on the scan tool. Does the scan tool indicate A/C request as ON?		Go to *Step 4*	Go to *Step 8*
4	1. Turn the engine OFF, ignition ON. 2. Review the Freeze Frame and /or FailureRecords data for this DTC and note parameters. 3. Turn the ignition OFF for 15 seconds. 4. Start the engine and operate the vehicle within the conditions required for this diagnostic to run, and as close to the conditions recorded in Freeze Frame/Failure Records as possible. Does the scan tool indicate that this diagnostic failed this ignition?		Go to *Step 5*	Go to ”Diagnostic Aids”
5	1. Turn the ignition OFF. 2. Disconnect the A/C clutch relay. 3. Turn the ignition ON, engine OFF. 4. Probe the ignition feed circuit at the A/C relay terminal 85 with a test light to ground. Does the test light illuminate?		Go to *Step 6*	Go to *Step 9*
6	Using a Digital Voltmeter (DVM), probe the resistance between the terminals 85 and 86 on the compressor relay. Is the resistance around the specified value?	98 Ω	Go to *Step 7*	Go to *Step 8*
7	1. Ignition OFF. 2. Disconnect the powertrain control module PCM)/engine control module (ECM) connector 1 red) from the PCM/ECM. 3. Using a DVM, probe the resistance between terminal connector B14 and 86. Is the resistance equal to the specified value?	0Ω	Go to *Step 10*	Go to *Step 11*

Step	Action	Value(s)	Yes	No
8	Replace the A/C compressor relay. Is the repair complete?		Go to *Step 12*	
9	Repair the open or short to ground in the ignition feed circuit. Is the repair complete?		Go to *Step 12*	
10	1. Turn the ignition OFF. 2. Replace the PCM/ECM. Is the repair complete?		Go to *Step 12*	
11	Repair the open or short to voltage in the A/C output circuit. Is the repair complete?		Go to *Step 12*	
12	1. Using the scan tool, clear the Diagnostic Trouble Codes (DTCs). 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 13*	Go to *Step 2*
13	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK