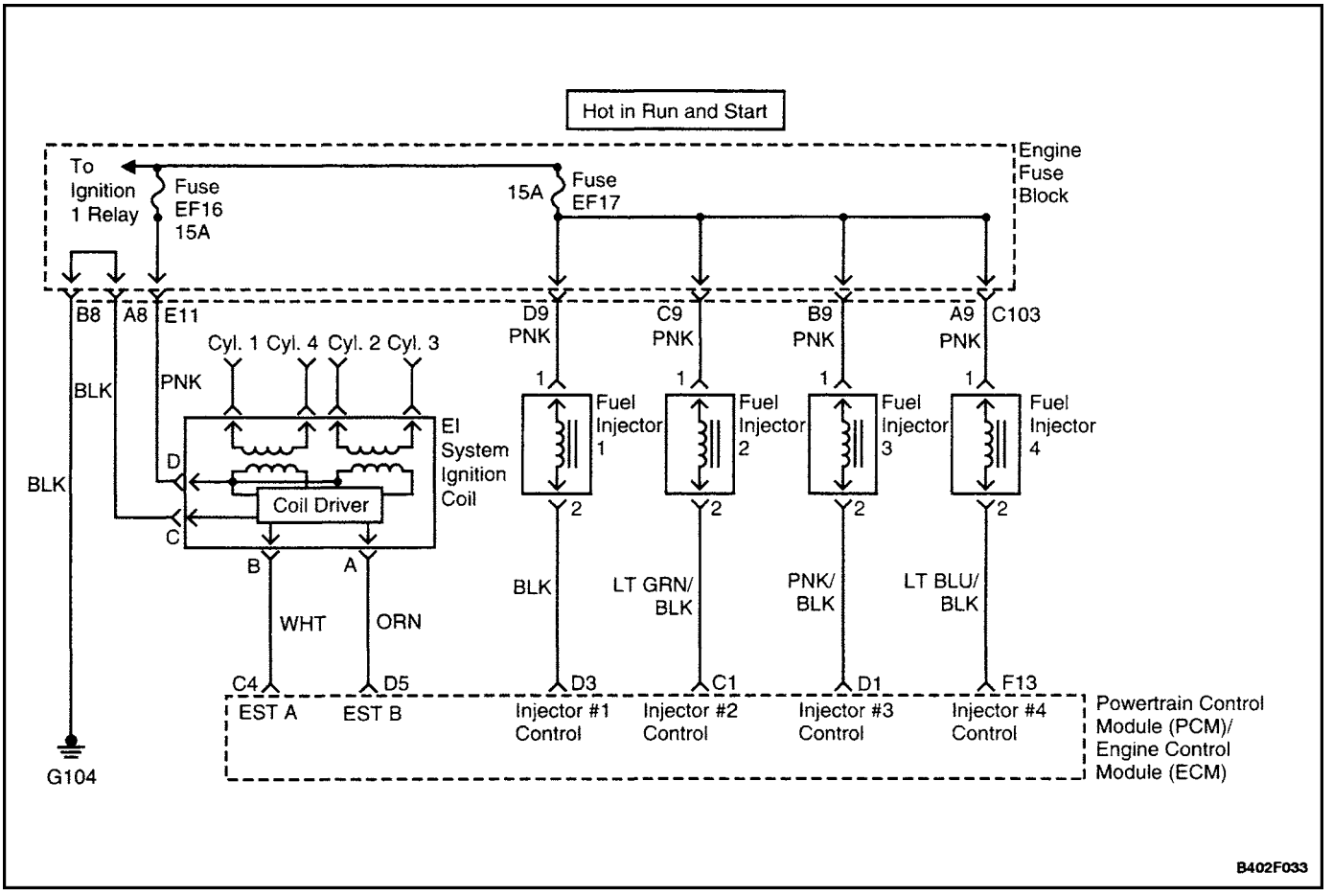


DIAGNOSTIC TROUBLE CODE (DTC) P0301

CYLINDER 1 MISFIRE

System Description

The powertrain control module (PCM)/engine control module (ECM) monitors the crankshaft and camshaft position to detect if the engine is misfiring. The PCM/ECM looks for a quick drop in crankshaft speed. This test is executed in blocks of 100 camshaft revolution tests. It may take between one to several tests to store a Diagnostic Trouble Code (DTC) and illuminate the Malfunction Indicator Lamp (MIL). Under light misfire conditions, it may also take more than one trip to set a DTC. Severe misfire will flash the MIL indication that catalyst damage is possible. The Torque Converter Clutch (TCC) is disabled momentarily to determine if the misfire was due to a rough road condition (automatic transaxle only).

Conditions for Setting the DTC

- DTCs P0106, P0107, P0108, P0117, P0118, P0121, P0122, P0123, P0336, P0337, P0341, P0342, and P0502, not set.
- Engine run time is greater than or equal to 30 seconds.
- A/C compressor clutch has not just engaged or disengaged.
- Air injection reaction intrusive diagnostic is not in progress.
- Engine load and engine speed are in a detectable region and are at or above zero torque.
- Camshaft Position (CMP) sensor is in synchronization.
- Exhaust Gas Recirculation (EGR) flow diagnostic is not in progress.
- Deceleration fuel cutoff not active.
- Fuel is not shut off from high engine speed of 6300 rpm in drive and 4100 rpm in park (automatic transaxles).
- Fuel is not shut off at 255 mph.
- No automatic transaxle shifting.
- Pulse throttle position change is less than 1.56% per 100 ms.
- Minus throttle position change is less than 1.56% per 100 ms.
- Throttle position is greater than 3.125% or vehicle speed is less than 20 mph.
- 20 engine cycles have occurred since cranking has started.
- Engine speed is between 750 and 5600 rpm.
- Vehicle voltage is between 10 and 16 volts.

- Coolant temperature is between –6.25˚C (20.8˚F) and 119.8˚C (247.6˚F).
- The TCC is not forced on because the transaxle is overheating while the misfire diagnosis is requesting to disable the torque converter clutch.
- The engine speed is less than or equal to 3000 rpm or the crank angle sensing error has been learned.
- Crankshaft speed patterns are normal.
- There is the correct ratio between crankshaft position (CKP) sensor pulses and CMP sensor pulses.

Action Taken When the DTC Sets

- The MIL will illuminate after two consecutive ignition cycles in which the diagnostic runs with the fault active.

Or

- The MIL will illuminate immediately and flash if misfire is present (automatic only).
- 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 within the freeze frame conditions that the DTC failed.
- 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

An intermittent can also be the result of a defective reluctor wheel. Remove the CKP sensor and inspect the reluctor wheel through the sensor mount hole. Check for porosity and the condition of wheel. If the DTC is intermittent, refer to ”Symptoms Diagnosis” in this section.

Test Description

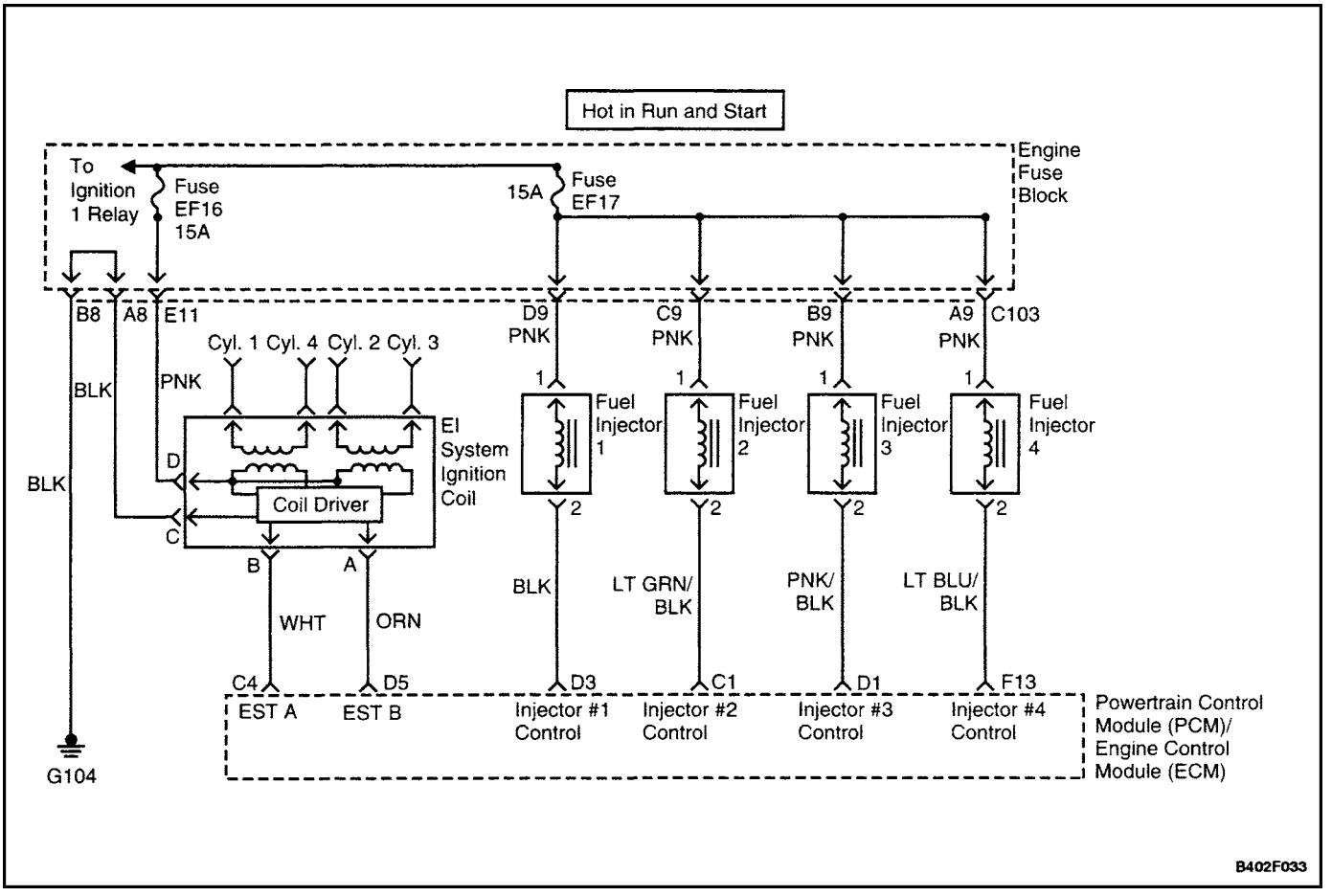
Number(s) below refer to the step number(s) on the Diagnostic Table.

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.
3. A visual/physical inspection should include checking the following components:
   - The wiring for proper connections, pinches or cuts.
   - The PCM/ECM grounds for being clean and tight.
   - The vacuum hoses for splits, kinks, and proper connections as shown on the Vehicle Emission Information label.
   - Check thoroughly for any type of leak or restriction.
   - For air leaks at the throttle body mounting area and intake manifold sealing surfaces.
5. When all the accumulators are relatively equal, then the misfire is being caused by something that affects the entire engine. When they are not then the misfire is being caused by something that is specific to two or more cylinders.
6. Whenever the misfire is not present operating the vehicle may be necessary to duplicate the conditions in the Freeze Frame Data in order to detect misfire. Depending on the engine load, the conditions may have to be maintained for up to 20 seconds. Whenever the misfire accumulators start to increment, then misfire is present. A history misfire counter will store the number of misfires that have occurred until the DTC is cleared.
8. Check the fuel for water, alcohol, etc.
9. A basic engine problem that affects all cylinders is the only possibility at this point. (Cam timing, throttle body leak, restricted air flow, etc.)
11. Tests the ignition system voltage output using a spark tester.
12. Replace any spark plugs that are worn, cracked or fouled.
13. Checks for voltage at the ignition feed circuit.
18. Whenever the driver circuit is shorted to ground, the light will be on steady. When the driver circuit is shorted to voltage or open, the light will be off.
19. Since voltage is supplied to the fuel injector on a single circuit, the malfunction could only be a poor connection or open in the fuel injector harness. An open before the harness would result in an ”Engine Cranks But Will Not Run” complaint.
28. Before replacing the PCM/ECM, check terminals for improper mating, broken locks, or physical damage to the wiring harness. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0301 Cylinder 1 Misfire

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to "On–Board Diagnostic System Check"
2	Install a scan tool. Are Diagnostic Trouble Codes (DTCs) P0201 or P0300 set?		Go to applicable DTC	Go to *Step 3*
3	1. Perform a visual/physical inspection. 2. Make any repairs that are necessary. Are any repairs necessary?		Go to *Step 27*	Go to *Step 4*
4	Start the engine and allow it to idle. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to *Step 6*
5	Are all counters equal (within a percentage of each other)?		Go to *Step 7*	Go to *Step 11*
6	1. Turn the ignition ON, engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and conditions for setting this DTC as noted. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to "Diagnostic Aids"
7	1. Turn the engine OFF. 2. Install a fuel pressure gauge. 3. Observe the fuel pressure with the engine running. Is the fuel pressure within the specified value?	284–325 kPa (41–47 psi)	Go to *Step 8*	Go to "Fuel System Diagnosis"
8	Check the fuel for contamination. Is the fuel OK?		Go to *Step 9*	Go to *Step 10*
9	Check for a basic engine problem. Is the action complete?		Go to *Step 27*	
10	Replace the contaminated fuel. Is the action complete?		Go to *Step 27*	
11	1. Turn the engine OFF. 2. Disconnect the fuel injector harness connector. 3. Install a spark tester on cylinder #1 spark plug cable. 4. Crank the engine and check for spark. Is spark observed on all four spark plug cables?		Go to *Step 12*	Go to *Step 20*
12	Replace the malfunctioning spark plug. Are any malfunctioning?		Go to *Step 27*	Go to *Step 13*
13	1. Turn the engine OFF. 2. Disconnect the cylinder 1 fuel injector connector from the injector. 3. Install an injector test light on the injector harness connector, terminal 2. 4. Crank the engine and note the test light. Does the injector test light blink?		Go to *Step 14*	Go to *Step 15*
14	Perform the Fuel Injector Balance Test. Is the fuel injector OK?		Go to *Step 9*	Go to *Step 16*

Step	Action	Value(s)	Yes	No
15	1. Disconnect the injector test light. 2. With a test light connected to ground, probe the ignition feed terminal 1 of the injector harness connector for the cylinder that had misfired. 3. Crank the engine. Does the test light illuminate?		Go to *Step 17*	Go to *Step 19*
16	Replace the malfunctioning fuel injector. Is the action complete?		Go to *Step 27*	
17	Check the affected fuel injector driver circuit for an open, short or short to voltage. Is a problem found?		Go to *Step 18*	Go to *Step 24*
18	Repair the open or the shorted fuel injector driver circuit. Is the action complete?		Go to *Step 27*	
19	Repair the open ignition feed circuit between the fuel injector harness connector and the fuel injector connector. Is the action complete?		Go to *Step 27*	
20	Measure the resistance of the spark plug cable. Is the resistance of the spark plug cable less than the specified value?	30,000 Ω	Go to *Step 26*	Go to *Step 25*
21	Inspect the powertrain control module (PCM)/engine control module (ECM) connector and connections. Are the connections OK?		Go to *Step 27*	Go to *Step 22*
22	Check the affected cylinder ignition control circuit for an open or short and repair as necessary. Is a repair necessary?		Go to *Step 27*	Go to *Step 24*
23	Repair the connector or connections. Is the action complete?		Go to *Step 27*	
24	Replace the PCM/ECM. Is the action complete?		Go to *Step 27*	
25	Replace the spark plug cable. Is the action complete?		Go to *Step 27*	
26	Replace the faulty ignition coil. Is the action complete?		Go to *Step 27*	
27	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 29*	Go to *Step 2*
28	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) P0302

CYLINDER 2 MISFIRE

System Description

The powertrain control module (PCM)/engine control module (ECM) monitors the crankshaft and camshaft position to detect if the engine is misfiring. The PCM/ECM looks for a quick drop in crankshaft speed. This test is executed in blocks of 100 camshaft revolution tests. It may take between one to several tests to store a Diagnostic Trouble Code (DTC) and illuminate the Malfunction Indicator Lamp (MIL). Under light misfire conditions, it may also take more than one trip to set a DTC. Severe misfire will flash the MIL indication that catalyst damage is possible. The Torque Converter Clutch (TCC) is disabled momentarily to determine if the misfire was due to a rough road condition (automatic transaxle only).

Conditions for Setting the DTC

- DTCs P0106, P0107, P0108, P0117, P0118, P0121, P0122, P0123, P0336, P0337, P0341, P0342, and P0502, not set.
- Engine run time is greater than or equal to 30 seconds.
- A/C compressor clutch has not just engaged or disengaged.
- Air injection reaction intrusive diagnostic is not in progress.
- Engine load and engine speed are in a detectable region and are at or above zero torque.
- Camshaft position (CMP) sensor is in synchronization.
- Exhaust Gas Recirculation (EGR) flow diagnostic is not in progress.
- Deceleration fuel cutoff not active.
- Fuel is not shut off from high engine speed of 6300 rpm in drive and 4100 rpm in park (automatic transaxles).
- Fuel is not shut off at 255 mph.
- No automatic transaxle shifting.
- Pulse throttle position change is less than 1.56% per 100 ms.
- Minus throttle position change is less than 1.56% per 100 ms.
- Throttle position is greater than 3.125% or vehicle speed is less than 20 mph.
- 20 engine cycles have occurred since cranking has started.
- Engine speed is between 750 and 5600 rpm.
- Vehicle voltage is between 10 and 16 volts.

- Coolant temperature is between –6.25˚C (20.8˚F) and 119.8˚C (247.6˚F).
- The TCC is not forced on because the transaxle is overheating while the misfire diagnosis is requesting to disable the TCC.
- The engine speed is less than or equal to 3000 rpm or the crank angle sensing error has been learned.
- Crankshaft speed patterns are normal.
- There is the correct ratio between crankshaft position CKP) sensor pulses and CMP sensor pulses.

Action Taken When the DTC Sets

- The MIL will illuminate after two consecutive ignition cycles in which the diagnostic runs with the fault active.

Or

- The MIL will illuminate immediately and flash if misfire is present (automatic only).
- 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 within the freeze frame conditions that the DTC failed.
- 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

An intermittent can also be the result of a defective reluctor wheel. Remove the crankshaft sensor and inspect the reluctor wheel through the sensor mount hole. Check for porosity and the condition of wheel. If the DTC is intermittent, refer to ”Symptoms Diagnosis” in this section.

Test Description

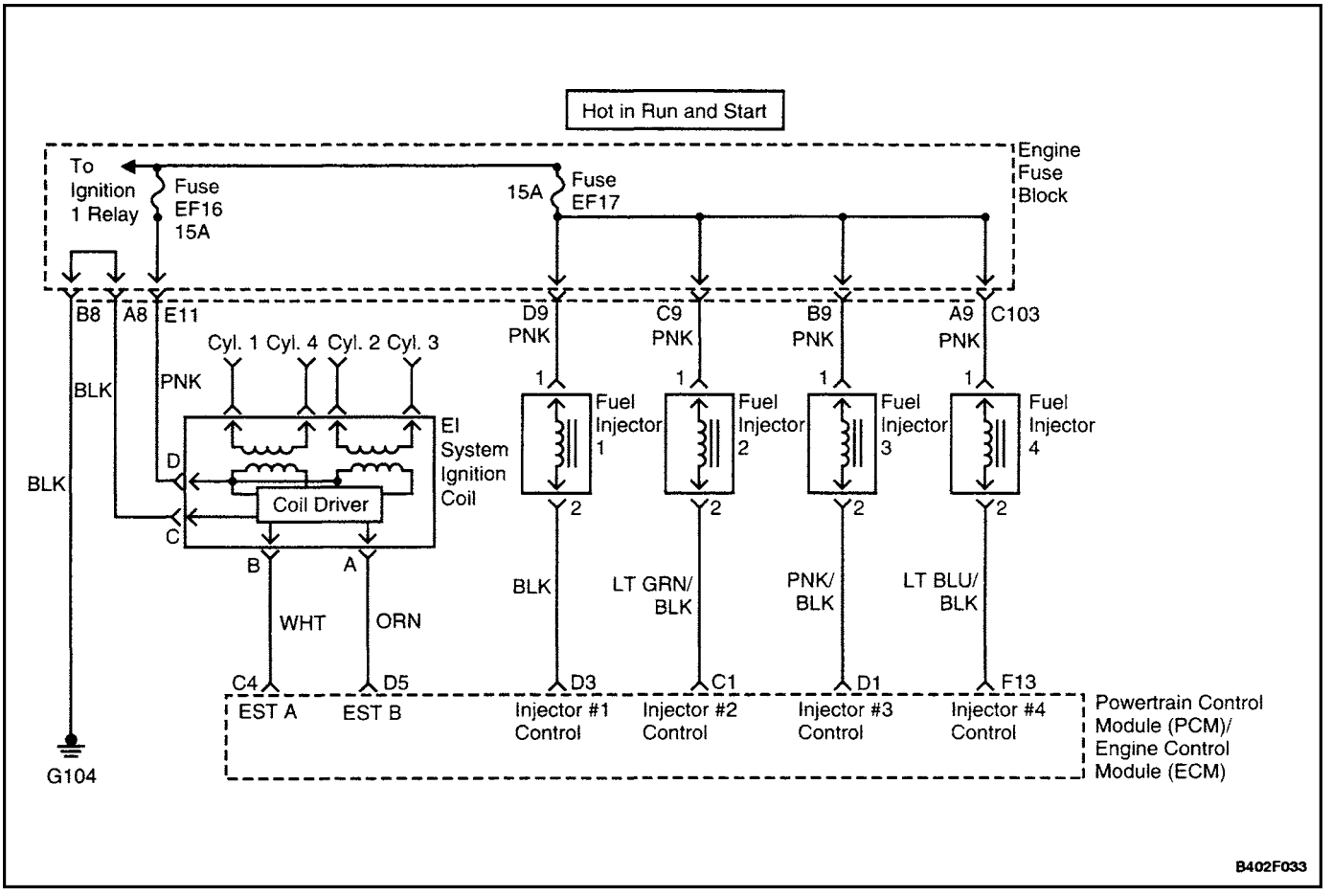
Number(s) below refer to the step number(s) on the Diagnostic Table.

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.
3. A visual/physical inspection should include checking the following components:
   - The wiring for proper connections, pinches or cuts.
   - The PCM/ECM grounds for being clean and tight.
   - The vacuum hoses for splits, kinks, and proper connections as shown on the Vehicle Emission Information label. Check thoroughly for any type of leak or restriction.
   - For air leaks at the throttle body mounting area and intake manifold sealing surfaces.
5. When all the accumulators are relatively equal, then the misfire is being caused by something that affects the entire engine. When they are not then the misfire is being caused by something that is specific to two or more cylinders.
6. Whenever the misfire is not present operating the vehicle may be necessary to duplicate the conditions in the Freeze Frame Data in order to detect misfire. Depending on the engine load, the conditions may have to be maintained for up to 20 seconds. Whenever the misfire accumulators start to increment, then misfire is present. A history misfire counter will store the number of misfires that have occurred until the DTC is cleared.
8. Check the fuel for water, alcohol, etc.
9. A basic engine problem that affects all cylinders is the only possibility at this point. (Cam timing, throttle body leak, restricted air flow, etc.)
11. Tests the ignition system voltage output using a spark tester.
12. Replace any spark plugs that are worn, cracked or fouled.
13. Checks for voltage at the ignition feed circuit.
18. Whenever the driver circuit is shorted to ground, the light will be on steady. When the driver circuit is shorted to voltage or open, the light will be off.
19. Since voltage is supplied to the fuel injector on a single circuit, the malfunction could only be a poor connection or open in the fuel injector harness. An open before the harness would result in an ”Engine Cranks But Will Not Run” complaint.
28. Before replacing the PCM/ECM, check terminals for improper mating, broken locks, or physical damage to the wiring harness. The replacement PCM/ECM must be programmed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0302 Cylinder 2 Misfire

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check completed?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	Install a scan tool. Are Diagnostic Trouble Codes (DTCs) P0202 or P0300 set?		Go to applicable DTC	Go to *Step 3*
3	1. Perform a visual/physical inspection. 2. Make any repairs that are necessary. Are any repairs necessary?		Go to *Step 27*	Go to *Step 4*
4	Start the engine and allow it to idle. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to *Step 6*
5	Are all counters equal (within a percentage of each other)?		Go to *Step 7*	Go to *Step 11*
6	1. Turn the ignition ON, engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and conditions for setting this DTC as noted. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to ”Diagnostic Aids”
7	1. Turn the engine OFF. 2. Install a fuel pressure gauge. 3. Observe the fuel pressure with the engine running. Is the fuel pressure within the specified value?	284–325 kPa (41–47 psi)	Go to *Step 8*	Go to ”Fuel System Diagnosis”
8	Check the fuel for contamination. Is the fuel OK?		Go to *Step 9*	Go to *Step 10*
9	Check for a basic engine problem. Is the action complete?		Go to *Step 27*	
10	Replace the contaminated fuel. Is the action complete?		Go to *Step 27*	
11	1. Turn the engine OFF. 2. Disconnect the fuel injector harness connector. 3. Install a spark tester on cylinder #2 spark plug cable. 4. Crank the engine and check for spark. Is spark observed on all four spark plug cables?		Go to *Step 12*	Go to *Step 20*
12	Replace the malfunctioning spark plug. Are any malfunctioning?		Go to *Step 27*	Go to *Step 13*
13	1. Turn the engine OFF. 2. Disconnect the cylinder 2 fuel injector connector from the injector. 3. Install an injector test light on the injector harness connector, terminal 2 for the cylinder that had misfired. 4. Crank the engine and note the test light. Does the injector test light blink?		Go to *Step 14*	Go to *Step 15*

Step	Action	Value(s)	Yes	No
14	Perform the Fuel Injector Balance Test. Is the fuel injector OK?		Go to *Step 9*	Go to *Step 16*
15	1. Disconnect the injector test light. 2. With a test light connected to ground, probe the ignition feed terminal 1 of the injector harness connector for the cylinder that had misfired. 3. Crank the engine. Does the test light illuminate?		Go to *Step 17*	Go to *Step 19*
16	Replace the malfunctioning fuel injector. Is the action complete?		Go to *Step 27*	
17	Check the affected fuel injector driver circuit for an open, short or short to voltage. Is a problem found?		Go to *Step 18*	Go to *Step 24*
18	Repair the open or the shorted fuel injector driver circuit. Is the action complete?		Go to *Step 27*	
19	Repair the open ignition feed circuit between the fuel injector harness connector and the fuel injector connector. Is the action complete?		Go to *Step 27*	
20	Measure the resistance of the spark plug cable. Is the resistance of the spark plug cable less than the specified value?	30,000 Ω	Go to *Step 26*	Go to *Step 25*
21	Inspect the powertrain control module (PCM)/engine control module (ECM) connector and connections. Are the connections OK?		Go to *Step 27*	Go to *Step 22*
22	Check the affected cylinder ignition control circuit for an open or short and repair as necessary. Is a repair necessary?		Go to *Step 27*	Go to *Step 24*
23	Repair the connector or connections. Is the action complete?		Go to *Step 27*	
24	Replace the PCM/ECM. Is the action complete?		Go to *Step 27*	
25	Replace the spark plug cable. Is the action complete?		Go to *Step 27*	
26	Replace the faulty ignition coil. Is the action complete?		Go to *Step 27*	
27	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 29*	Go to *Step 2*
28	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) P0303

CYLINDER 3 MISFIRE

System Description

The powertrain control module (PCM)/engine control module (ECM) monitors the crankshaft and camshaft position to detect if the engine is misfiring. The PCM/ECM looks for a quick drop in crankshaft speed. This test is executed in blocks of 100 camshaft revolution tests. It may take between one to several tests to store a Diagnostic Trouble Code (DTC) and illuminate the Malfunction Indicator Lamp (MIL). Under light misfire conditions, it may also take more than one trip to set a DTC. Severe misfire will flash the MIL indication that catalyst damage is possible. The Torque Converter Clutch (TCC) is disabled momentarily to determine if the misfire was due to a rough road condition (automatic transaxle only).

Conditions for Setting the DTC

- DTCs P0106, P0107, P0108, P0117, P0118, P0121, P0122, P0123, P0336, P0337, P0341, P0342, and P0502, not set.
- Engine run time is greater than or equal to 30 seconds.
- A/C compressor clutch has not just engaged or disengaged.
- Air injection reaction intrusive diagnostic is not in progress.
- Engine load and engine speed is in a detectable region and is at or above zero torque.
- Camshaft position (CMP) sensor is in synchronization.
- Exhaust Gas Recirculation (EGR) flow diagnostic is not in progress.
- Deceleration fuel cutoff not active.
- Fuel is not shut off from high engine speed of 6300 rpm in drive and 4100 rpm in park (automatic transaxles).
- Fuel is not shut off at 255 mph.
- No automatic transaxle shifting.
- Pulse throttle position change is less than 1.56% per 100 ms.
- Minus throttle position change is less than 1.56% per 100 ms.
- Throttle position is greater than 3.125% or vehicle speed is less than 20 mph.
- 20 engine cycles have occurred since cranking has started.
- Engine speed is between 750 and 5600 rpm.
- Vehicle voltage is between 10 and 16 volts.

- Coolant temperature is between –6.25˚C (20.8˚F) and 119.8˚C (247.6˚F)
- The TCC is not forced on because the transaxle is overheating while the misfire diagnosis is requesting to disable the TCC.
- The engine speed is less than or equal to 3000 rpm or the crank angle sensing error has been learned.
- Crankshaft speed patterns are normal.
- There is the correct ratio between crankshaft position (CKP) sensor pulses and CMP sensor pulses.

Action Taken When the DTC Sets

- The MIL will illuminate after two consecutive ignition cycles in which the diagnostic runs with the fault active.

Or

- The MIL will illuminate immediately and flash if misfire is present (automatic only).
- 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 within the freeze frame conditions that the DTC failed.
- 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

An intermittent can also be the result of a defective reluctor wheel. Remove the CKP sensor and inspect the reluctor wheel through the sensor mount hole. Check for porosity and condition of wheel. If the DTC is intermittent, refer to ”Symptoms Diagnosis” in this section.

Test Description

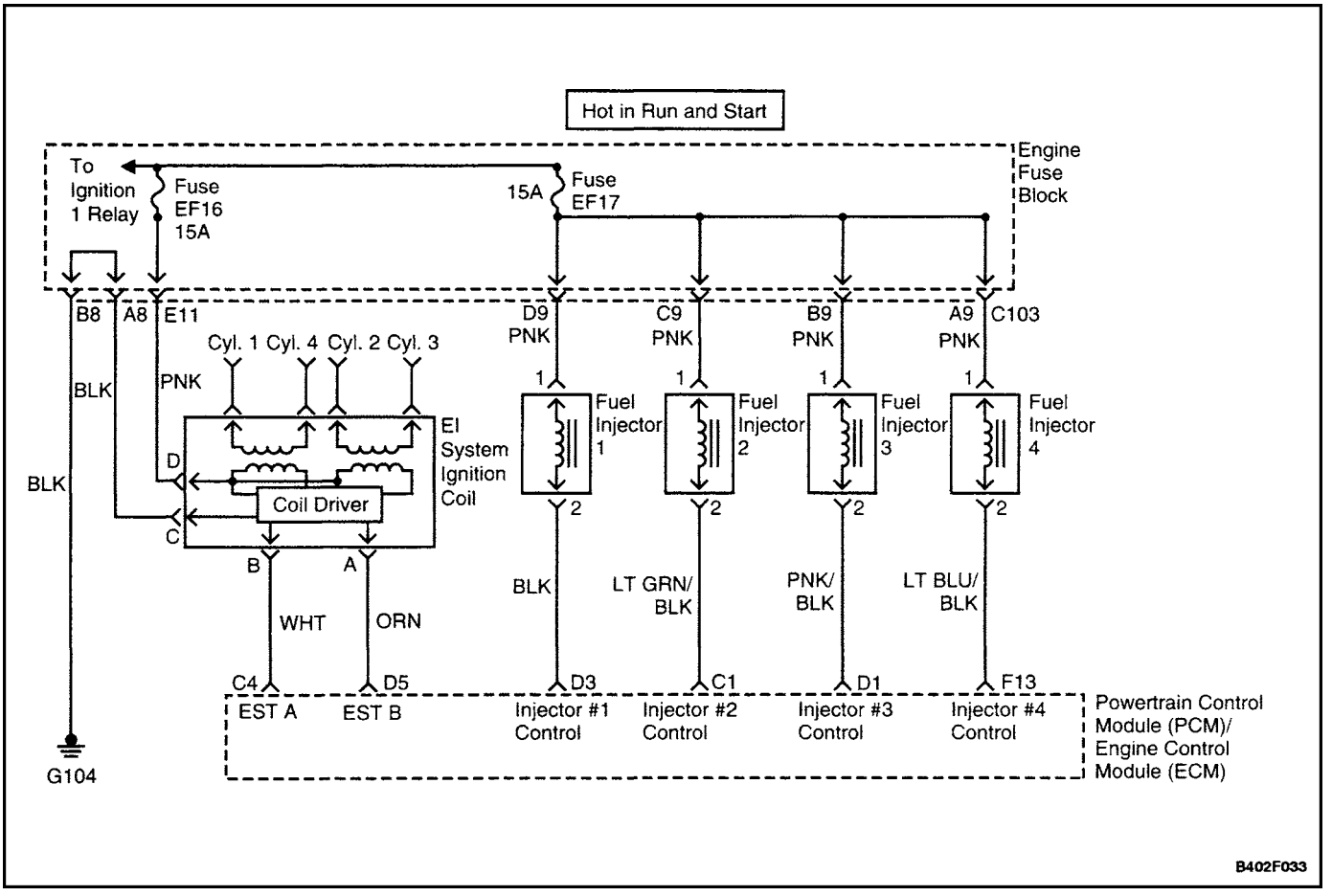
Number(s) below refer to the step number(s) on the Diagnostic Table.

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.
3. A visual/physical inspection should include checking the following components:
   - The wiring for proper connections, pinches or cuts.
   - The PCM/ECM grounds for being clean and tight.
   - The vacuum hoses for splits, kinks, and proper connections as shown on the Vehicle Emission Information label. Check thoroughly for any type of leak or restriction.
   - For air leaks at the throttle body mounting area and intake manifold sealing surfaces.
5. When all the accumulators are relatively equal, then the misfire is being caused by something that affects the entire engine. When they are not then the misfire is being caused by something that is specific to two or more cylinders.
6. Whenever the misfire is not present operating the vehicle may be necessary to duplicate the conditions in the Freeze Frame Data in order to detect misfire. Depending on the engine load, the conditions may have to be maintained for up to 20 seconds. Whenever the misfire accumulators start to increment, then misfire is present. A history misfire counter will store the number of misfires that have occurred until the DTC is cleared.
8. Check the fuel for water, alcohol, etc.
9. A basic engine problem that affects all cylinders is the only possibility at this point. (Cam timing, throttle body leak, restricted air flow, etc.)
11. Tests the ignition system voltage output using a spark tester.
12. Replace any spark plugs that are worn, cracked or fouled.
13. Checks for voltage at the ignition feed circuit.
18. Whenever the driver circuit is shorted to ground, the light will be on steady. When the driver circuit is shorted to voltage or open, the light will be off.
19. Since voltage is supplied to the fuel injector on a single circuit, the malfunction could only be a poor connection or open in the fuel injector harness. An open before the harness would result in an ”Engine Cranks But Will Not Run” complaint.
28. Before replacing the PCM/ECM, check terminals for improper mating, broken locks, or physical damage to the wiring harness. The replacement PCM/ECM must be programmed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0303 Cylinder 3 Misfire

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	Install a scan tool. Are Diagnostic Trouble Codes (DTCs) P0203 or P0300 set?		Go to applicable DTC	Go to *Step 3*
3	1. Perform a visual/physical inspection. 2. Make any repairs that are necessary. Are any repairs necessary?		Go to *Step 27*	Go to *Step 4*
4	Start the engine and allow it to idle. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to *Step 6*
5	Are all counters equal (within a percentage of each other)?		Go to *Step 7*	Go to *Step 11*
6	1. Turn the ignition ON, engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and conditions for setting this DTC as noted. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to ”Diagnostic Aids”
7	1. Turn the engine OFF. 2. Install a fuel pressure gauge. 3. Observe the fuel pressure with the engine running. Is the fuel pressure within the specified value?	284–325 kPa (41–47 psi)	Go to *Step 8*	Go to ”Fuel System Diagnosis”
8	Check the fuel for contamination. Is the fuel OK?		Go to *Step 9*	Go to *Step 10*
9	Check for a basic engine problem. Is the action complete?		Go to *Step 27*	
10	Replace the contaminated fuel. Is the action complete?		Go to *Step 27*	
11	1. Turn the engine OFF. 2. Disconnect the fuel injector harness connector. 3. Install a spark tester on cylinder #3 spark plug cable. 4. Crank the engine and check for spark. Is spark observed on all four spark plug cables?		Go to *Step 12*	Go to *Step 20*
12	Replace the malfunctioning spark plug. Are any malfunctioning?		Go to *Step 27*	Go to *Step 13*
13	1. Turn the engine OFF. 2. Disconnect the cylinder 3 fuel injector connector from the injector. 3. Install an injector test light on the injector harness connector, terminal 2 for the cylinder that had misfired. 4. Crank the engine and note the test light. Does the injector test light blink?		Go to *Step 14*	Go to *Step 15*

Step	Action	Value(s)	Yes	No
14	Perform the Fuel Injector Balance Test. Is the fuel injector OK?		Go to *Step 9*	Go to *Step 16*
15	1. Disconnect the injector test light. 2. With a test light connected to ground, probe the ignition feed terminal 1 of the injector harness connector for the cylinder that had misfired. 3. Crank the engine. Does the test light illuminate?		Go to *Step 17*	Go to *Step 19*
16	Replace the malfunctioning fuel injector. Is the action complete?		Go to *Step 27*	
17	Check the affected fuel injector driver circuit for an open, short or short to voltage. Is a problem found?		Go to *Step 18*	Go to *Step 24*
18	Repair the open or the shorted fuel injector driver circuit. Is the action complete?		Go to *Step 27*	
19	Repair the open ignition feed circuit between the fuel injector harness connector and the fuel injector connector. Is the action complete?		Go to *Step 27*	
20	Measure the resistance of the spark plug cable. Is the resistance of the spark plug cable less than the specified value?	30,000 Ω	Go to *Step 26*	Go to *Step 25*
21	Inspect the powertrain control module (PCM)/engine control module (ECM) connector and connections. Are the connections OK?		Go to *Step 27*	Go to *Step 22*
22	Check the affected cylinder ignition control circuit for an open or short and repair as necessary. Is a repair necessary?		Go to *Step 27*	Go to *Step 24*
23	Repair the connector or connections. Is the action complete?		Go to *Step 27*	
24	Replace the PCM/ECM. Is the action complete?		Go to *Step 27*	
25	Replace the spark plug cable. Is the action complete?		Go to *Step 27*	
26	Replace the faulty ignition coil. Is the action complete?		Go to *Step 27*	
27	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 29*	Go to *Step 2*
28	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) P0304

CYLINDER 4 MISFIRE

System Description

The powertrain control module (PCM)/engine control module (ECM) monitors the crankshaft and camshaft position to detect if the engine is misfiring. The PCM/ECM looks for a quick drop in crankshaft speed. This test is executed in blocks of 100 camshaft revolution tests. It may take between one to several tests to store a Diagnostic Trouble Code (DTC) and illuminate the Malfunction Indicator Lamp (MIL). Under light misfire conditions, it may also take more than one trip to set a DTC. Severe misfire will flash the MIL indication that catalyst damage is possible. The Torque Converter Clutch (TCC) is disabled momentarily to determine if the misfire was due to a rough road condition (automatic transaxle only).

Conditions for Setting the DTC

- DTCs P0106, P0107, P0108, P0117, P0118, P0121, P0122, P0123, P0336, P0337, P0341, P0342, and P0502, not set.
- Engine run time is greater than or equal to 30 seconds.
- A/C compressor clutch has not just engaged or disengaged.
- Air injection reaction intrusive diagnostic is not in progress.
- Engine load and engine speed are in a detectable region and are at or above zero torque.
- Camshaft position (CMP) sensor is in synchronization.
- Exhaust Gas Recirculation (EGR) flow diagnostic is not in progress.
- Deceleration fuel cutoff not active.
- Fuel is not shut off from high engine speed of 6300 rpm in drive and 4100 rpm in park (automatic transaxles).
- Fuel is not shut off at 255 mph.
- No automatic transaxle shifting.
- Pulse throttle position change is less than 1.56% per 100 ms.
- Minus throttle position change is less than 1.56% per 100 ms.
- Throttle position is greater than 3.125% or vehicle speed is less than 20 mph.
- 20 engine cycles have occurred since cranking has started.
- Engine speed is between 750 and 5600 rpm.
- Vehicle voltage is between 10 and 16 volts.

- Coolant temperature is between –6.25˚C (20.8˚F) and 119.8˚C (247.6˚F)
- The TCC is not forced on because the transaxle is overheating while the misfire diagnosis is requesting to disable the TCC.
- The engine speed is less than or equal to 3000 rpm or the crank angle sensing error has been learned.
- Crankshaft speed patterns are normal.
- There is the correct ratio between crankshaft position (CKP) sensor pulses and CMP sensor pulses.

Action Taken When the DTC Sets

- The MIL will illuminate after two consecutive ignition cycles in which the diagnostic runs with the fault active.

Or

- The MIL will illuminate immediately and flash if misfire is present (automatic only).
- 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 within the freeze frame conditions that the DTC failed.
- 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

An intermittent can also be the result of a defective reluctor wheel. Remove the crankshaft sensor and inspect the reluctor wheel through the sensor mount hole. Check for porosity and the condition of wheel. If the DTC is intermittent, refer to ”Symptoms Diagnosis” in this section.

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.
3. A visual/physical inspection should include checking the following components:
   - The wiring for proper connections, pinches or cuts.
   - The PCM/ECM grounds for being clean and tight.
   - The vacuum hoses for splits, kinks, and proper connections as shown on the Vehicle Emission Information label. Check thoroughly for any type of leak or restriction.
   - For air leaks at the throttle body mounting area and intake manifold sealing surfaces.
5. When all the accumulators are relatively equal, then the misfire is being caused by something that affects the entire engine. When they are not then the misfire is being caused by something that is specific to two or more cylinders.
6. Whenever the misfire is not present operating the vehicle may be necessary to duplicate the conditions in the Freeze Frame Data in order to detect misfire. Depending on the engine load, the conditions may have to be maintained for up to 20 seconds. Whenever the misfire accumulators start to increment, then misfire is present. A history misfire counter will store the number of misfires that have occurred until the DTC is cleared.
8. Check the fuel for water, alcohol, etc.
9. A basic engine problem that affects all cylinders is the only possibility at this point. (cam timing, throttle body leak, restricted air flow, etc.)
11. Tests the ignition system voltage output using a spark tester.
12. Replace any spark plugs that are worn, cracked or fouled.
13. Checks for voltage at the ignition feed circuit.
18. Whenever the driver circuit is shorted to ground, the light will be on steady. When the driver circuit is shorted to voltage or open, the light will be off.
19. Since voltage is supplied to the fuel injector on a single circuit, the malfunction could only be a poor connection or open in the fuel injector harness. An open before the harness would result in an ”Engine Cranks But Will Not Run” complaint.
28. Before replacing the PCM/ECM, check terminals for improper mating, broken locks, or physical damage to the wiring harness. The replacement PCM/ECM must be programmed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0304 Cylinder 4 Misfire

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	Install a scan tool. Are Diagnostic Trouble Codes (DTCs) P0204 or P0300 set?		Go to applicable DTC	Go to *Step 3*
3	1. Perform a visual/physical inspection. 2. Make any repairs that are necessary. Are any repairs necessary?		Go to *Step 27*	Go to *Step 4*
4	Start the engine and allow it to idle. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to *Step 6*
5	Are all counters equal (within a percentage of each other)?		Go to *Step 7*	Go to *Step 11*
6	1. Turn the ignition ON, engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and conditions for setting this DTC as noted. Are any Misfire Current counters incrementing?		Go to *Step 5*	Go to ”Diagnostic Aids”
7	1. Turn the engine OFF. 2. Install a fuel pressure gauge. 3. Observe the fuel pressure with the engine running. Is the fuel pressure within the specified value?	284–325 kPa (41–47 psi)	Go to *Step 8*	Go to ”Fuel System Diagnosis”
8	Check the fuel for contamination. Is the fuel OK?		Go to *Step 9*	Go to *Step 10*
9	Check for a basic engine problem. Is the action complete?		Go to *Step 27*	
10	Replace the contaminated fuel. Is the action complete?		Go to *Step 27*	
11	1. Turn the engine OFF. 2. Disconnect the fuel injector harness connector. 3. Install a spark tester on cylinder #4 spark plug cable. 4. Crank the engine and check for spark. Is spark observed on all four spark plug cables?		Go to *Step 12*	Go to *Step 20*
12	Replace the malfunctioning spark plug. Are any malfunctioning?		Go to *Step 27*	Go to *Step 13*
13	1. Turn the engine OFF. 2. Disconnect the cylinder 4 fuel injector connector from the injector. 3. Install an injector test light on the injector harness connector, terminal 2 for the cylinder that had misfired. 4. Crank the engine and note the test light. Does the injector test light blink?		Go to *Step 14*	Go to *Step 15*

Step	Action	Value(s)	Yes	No
14	Perform the Fuel Injector Balance Test. Is the fuel injector OK?		Go to *Step 9*	Go to *Step 16*
15	1. Disconnect the injector test light. 2. With a test light connected to ground, probe the ignition feed terminal 1 of the injector harness connector for the cylinder that had misfired. 3. Crank the engine. Did the test light illuminate?		Go to *Step 17*	Go to *Step 19*
16	Replace the malfunctioning fuel injector. Is the action complete?		Go to *Step 27*	
17	Check the affected fuel injector driver circuit for an open, short or short to voltage. Is a problem found?		Go to *Step 18*	Go to *Step 24*
18	Repair the open or the shorted fuel injector driver circuit. Is the action complete?		Go to *Step 27*	
19	Repair the open ignition feed circuit between the fuel injector harness connector and the fuel injector connector. Is the action complete?		Go to *Step 27*	
20	Measure the resistance of the spark plug cable. Is the resistance of the spark plug cable less than the specified value?	30,000 Ω	Go to *Step 26*	Go to *Step 25*
21	Inspect the powertrain control module (PCM)/engine control module (ECM) connector and connections. Are the connections OK?		Go to *Step 27*	Go to *Step 22*
22	Check the affected cylinder ignition control circuit for an open or short and repair as necessary. Is a repair necessary?		Go to *Step 27*	Go to *Step 24*
23	Repair the connector or connections. Is the action complete?		Go to *Step 27*	
24	Replace the PCM/ECM. Is the action complete?		Go to *Step 27*	
25	Replace the spark plug cable. Is the action complete?		Go to *Step 27*	
26	Replace the faulty ignition coil. Is the action complete?		Go to *Step 27*	
27	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 29*	Go to *Step 2*
28	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) P0325
KNOCK SENSOR SNEF INTERNAL MALFUNCTION

System Description

The knock sensor (KS) system is used to detect engine detonation, allowing the powertrain control module (PCM)/engine control module (ECM) to retard ignition control spark timing based on the KS signal being received. The KS produces an AC signal so that under a no knock condition the signal on the KS circuit measures about 0.007 volts AC. The KS signal's amplitude and frequency depend upon the amount of knock being experienced. The PCM/ECM contains a non–replaceable knock filter module called a signal–to–noise enhancement filter (SNEF) module. This filter module in the PCM/ECM determines whether knock is occurring by comparing the signal level on the KS circuit with the voltage level on the noise channel. The noise channel allows the PCM/ECM to reject any false knock signal by knowing the amount of normal engine mechanical noise present. Normal engine noise varies depending on engine speed and load. When the PCM/ECM determines that an abnormally low noise channel voltage level is being experienced, a DTC P0325 will set.

Conditions for Setting the DTC

- Vacuum is less than 10 to 50 kPa, based on rpm.
- The rpm is greater than 2500.
- SNEF Analog/Dialog (A/D) reading is greater than 110 for any of the 4 cylinders.
- Maximum minus the minimum A/D reading is less than 1 for one complete engine cycle.
- The PCM/ECM determines that its internal signal from its knock filter module indicates a continuous knocking condition for more than 32 seconds.

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 Diagnostic Trouble Code (DTC) is stored.
- The PCM/ECM will default to 6 degrees timing.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault within the freeze frame conditions that the DTC failed.
- 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

Check and correct any abnormal engine noise before using the diagnostic table.

Any circuitry, that is suspected as causing the complaint, should be thoroughly checked for the following conditions:

- Backed–out terminals
- Improper mating
- Broken locks
- Improperly formed
- Damaged terminals
- Poor terminal–to–wire connection
- Physical damage to the wiring harness

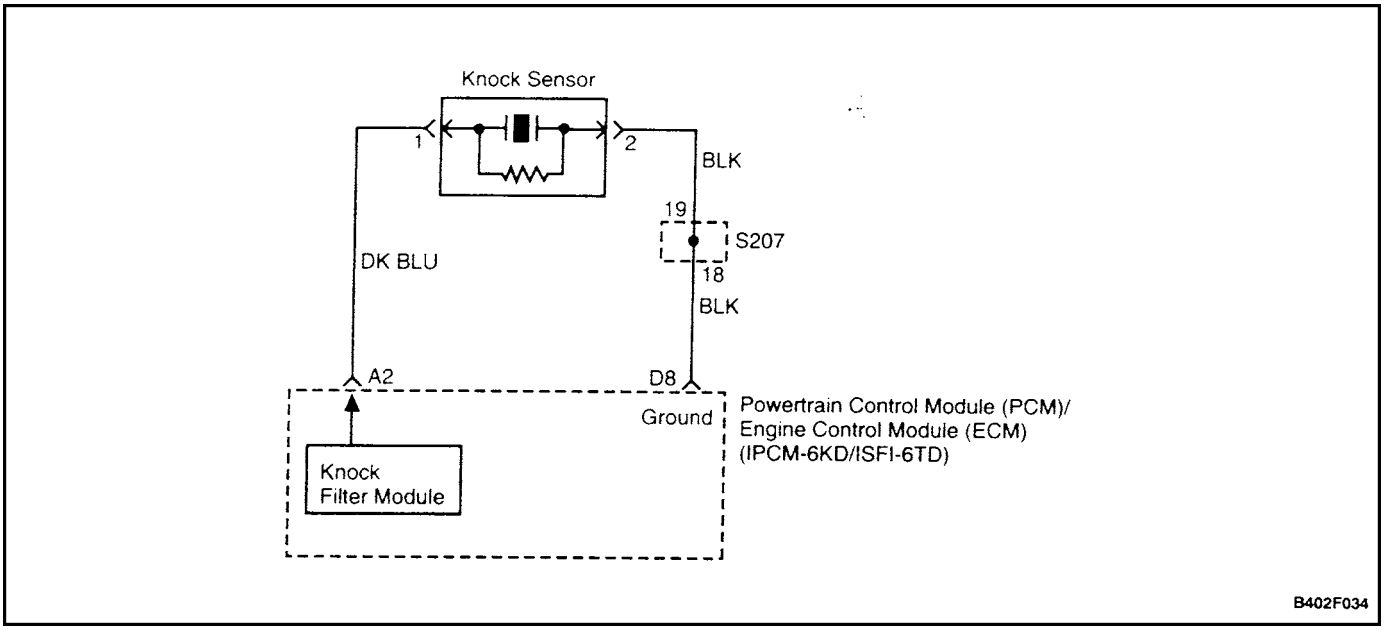
Test Description

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 the conditions for the test as described above are met, a DTC P0325 will set and MIL will illuminate.
4. If the engine has an internal knock or audible noise that causes a knocking type noise on the engine block, the knock sensor may be responding to the noise.
6. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0325 Knock Sensor SNEF Internal Malfunction

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Start the engine. 2. Install a scan tool. 3. Clear the Diagnostic Trouble Codes (DTCs). 4. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting The DTC as noted. Does the Malfunction Indicator Lamp (MIL) illuminate?	120 seconds	Go to *Step 4*	Go to *Step 3*
3	1. Turn the ignition switch ON, with the engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting The DTC as noted. Does the Malfunction Indicator Lamp (MIL) illuminate?		Go to *Step 4*	Go to *Step 7*
4	Listen to the engine while raising and lowering the engine speed. Is a knock or audible noise present?		Go to *Step 5*	Go to *Step 6*
5	Repair the mechanical engine problem or a loose bracket or component. Is the action complete?		Go to *Step 7*	
6	Replace the powertrain control module (PCM)/engine control module (ECM). Is the action complete?		Go to *Step 7*	
7	1. Using the scan tool, clear the 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 has ran and passed?		Go to *Step 8*	Go to *Step 2*
8	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) P0327

KNOCK SENSOR CIRCUIT FAULT

System Description

The knock sensor (KS) system is used to detect engine detonation, allowing the powertrain control module (PCM)/engine control module (ECM) to retard ignition control spark timing based on the KS signal being received. The KS produces an AC signal so that under a no knock condition the signal on the KS circuit measures about 0.007 volts AC. The KS signal's amplitude and frequency depend upon the amount of knock being experienced. The PCM/ECM monitors the KS signal and can diagnose the KS sensor and circuitry.

Conditions for Setting the DTC

- All cylinder gain is greater than 191 and the rpm is greater than 3800.
- KS voltage on all cylinders is less than 0.88 volts and all cylinder gain is greater than 191.
- Vacuum is less than 10 to 50 kPa based on rpm.
- The rpm is greater than 2500.

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.
- The PCM/ECM will use a calculated spark retard value to minimize knock during conditions when knock is likely to occur. The calculated value will vary based on engine speed and load.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault within the freeze frame conditions that the DTC failed.
- 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

Check and correct any abnormal engine noise before using the diagnostic table.

Any circuitry, that is suspected as causing the complaint, should be thoroughly checked for the following conditions:

- Backed–out terminals
- Improper mating
- Broken locks
- Improperly formed
- Damaged terminals
- Poor terminal–to–wire connection
- Physical damage to the wiring harness

Test Description

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

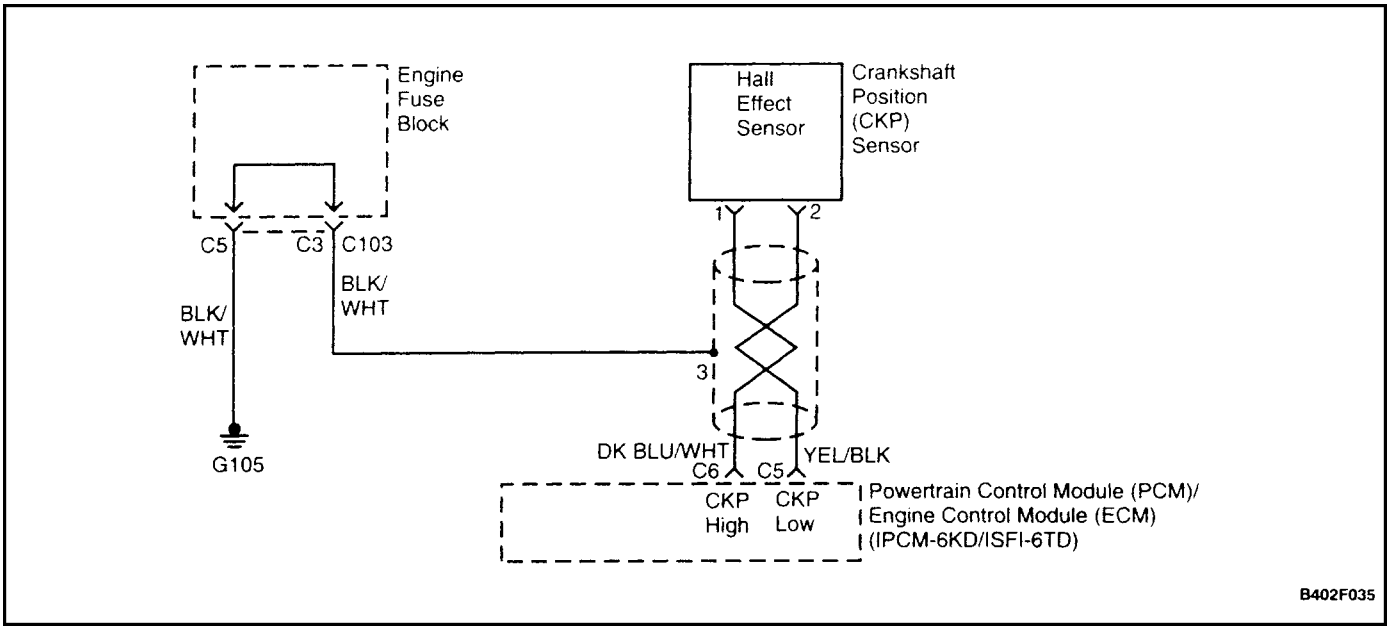
1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
2. If the conditions for the test as described above are met, a DTC P0327 will set and MIL will illuminate.

4. If the engine has an internal knock or audible noise that causes a knocking type noise on the engine block, the KS may be responding to the noise.
6. Checking the internal resistance of the KS or the wiring to the KS is OK.
7. Any circuitry, that is suspected as causing the complaint, should be thoroughly checked for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal–to–wiring connections or physical damage to the wiring harness.
8. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P0327 Knock Sensor Circuit Fault

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Start the engine. 2. Install a scan tool. 3. Clear the Diagnostic Trouble Codes (DTCs). 4. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting The DTC as noted. Does the Malfunction Indicator Lamp (MIL) illuminate?	120 sec	Go to *Step 4*	Go to *Step 3*
3	1. Turn the ignition switch ON with the engine OFF. 2. Review the Freeze Frame data and note the parameters. 3. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting The DTC as noted. Does the Malfunction Indicator Lamp (MIL) illuminate?		Go to *Step 4*	Go to *Step 12*
4	Listen to the engine while raising and lowering the engine speed. Is a knock or audible noise present?		Go to *Step 5*	Go to *Step 6*
5	Repair the mechanical engine problem or a loose bracket or component. Is the action complete?		Go to *Step 12*	
6	1. Turn the ignition switch OFF. 2. Disconnect the powertrain control module (PCM)/engine control module (ECM) connectors at the PCM/ECM. 3. With a Digital Voltmeter (DVM) connected to ground, measure the resistance of the knock sensor through the knock sensor signal circuit, terminal A2. Is the measured value within the specified value?	90K–110KΩ	Go to *Step 7*	Go to *Step 9*
7	Check for a poor connection at the PCM/ECM connector, Knock Sensor (KS) signal circuit and repair as necessary. Is a repair necessary?		Go to *Step 12*	Go to *Step 8*
8	Replace the PCM/ECM. Is the action complete?		Go to *Step 12*	

Step	Action	Value(s)	Yes	No
9	Check the KS electrical connector for a poor connection and repair as necessary. Is a repair necessary?		Go to *Step 12*	Go to *Step 10*
10	Check the KS signal circuit for an open or a short to ground or voltage and repair as necessary. Is a repair necessary?		Go to *Step 12*	Go to *Step 11*
11	Replace the KS. Is the action complete?		Go to *Step 12*	
12	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic has run 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



DIAGNOSTIC TROUBLE CODE (DTC) P0336

58X CRANK POSITION EXTRA/MISSING PULSES

Circuit Description

The 58X reference signal is produced by the crankshaft position (CKP) sensor. During one crankshaft revolution, 58 crankshaft pulses will be produced. The powertrain control module (PCM)/engine control module (ECM) uses the 58X reference signal to calculate engine rpm and CKP. The PCM/ECM constantly monitors the number of pulses on the 58X reference circuit and compares them to the number of camshaft position (CMP) signal pulses being received. If the PCM/ECM receives and incorrect number of pulses on the 58X reference circuit, DTC P0336 will set.

Conditions for Setting the DTC

- Engine is running.
- Extra or missing pulses is detected between consecutive 58X reference pulses.
- Above condition is detected in 10 of 100 crankshaft rotations.

Action Taken When the DTC Sets

- The PCM/ECM will store conditions which were present when the Diagnostic Trouble Code (DTC) was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM/ECM will turn the MIL off on the third consecutive trip cycle during which the diagnostic has been run and the fault condition is no longer present.
- A history DTC P0336 will clear after 80 consecutive warm–up cycles have occurred without a fault.
- DTC P0336 can be cleared by using the scan tool CLEAR INFO function or by disconnecting the PCM/ECM battery feed.

Diagnostic Aids

An intermittent may be caused by a poor connection, rubbed–through wire insulation or a wire broken inside the insulation. Check for:

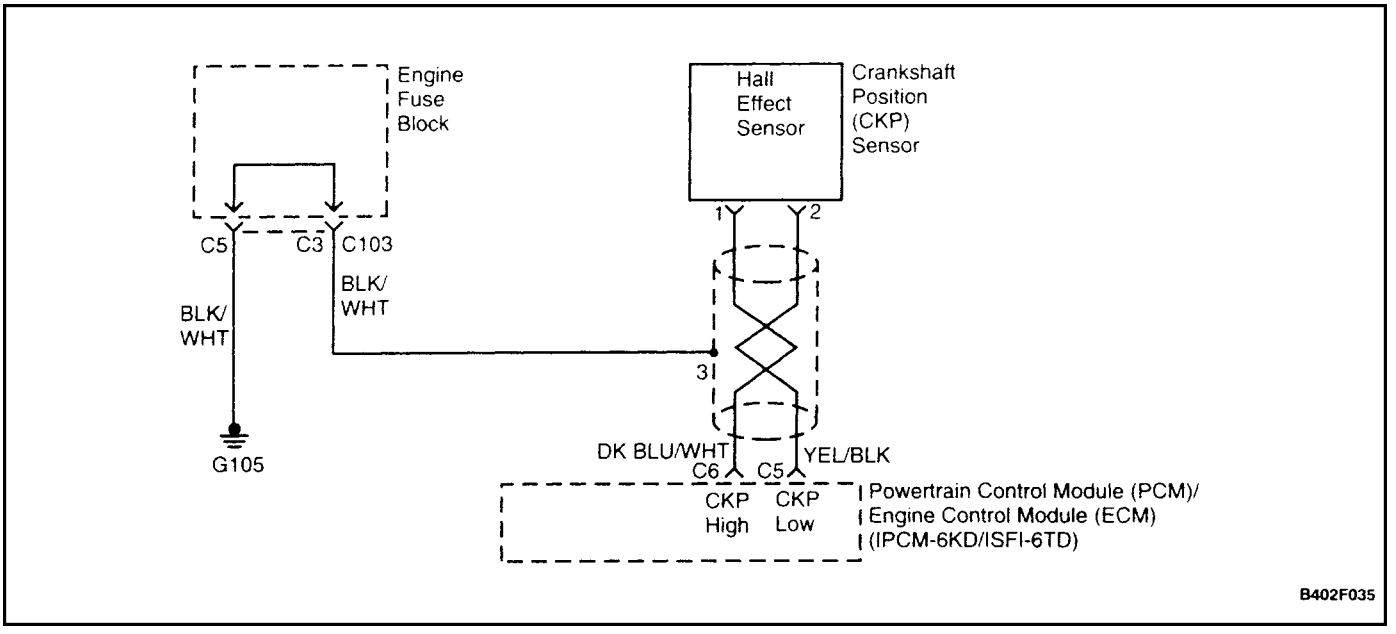
- Poor connection – Inspect the PCM/ECM harness and connectors for improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage. If the harness appears to be OK, disconnect the PCM/ECM, turn the ignition on and observe a voltmeter connected to the 58X reference circuit at the PCM/ECM harness connector while moving connectors and wiring harnesses related to the PCM/ECM. A change in voltage will indicate the location of the fault.

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.

DTC P0336 58X Crank Position Extra/Missing Pulses

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	Attempt to start the engine. Does the engine start?		Go to *Step 3*	Go to ”Engine Cranks But Will Not Run”
3	1. Review and record Failure Records information. 2. Clear Diagnostic Trouble Code (DTC) P0336. 3. Start the engine and idle for 1 minute. 4. Observe the DTCs. Is DTC P0336 set?		Go to *Step 4*	Go to ”Diagnostic Aids”
4	1. Disconnect the powertrain control module (PCM)/engine control module (ECM) and the Crankshaft Position (CKP) sensor. 2. Check for an open or a short to ground in the 58X reference circuit between the CKP sensor connector and the PCM/ECM harness connector. Is a problem found?		Go to *Step 5*	Go to *Step 6*
5	Repair the open or short to ground in the 58X reference circuit between the CKP sensor connector and the PCM/ECM harness connector. Is the repair complete?		Go to *Step 11*	
6	1. Reconnect the PCM/ECM and CKP sensor. 2. Connect a digital voltmeter (DVM) to measure voltage on the 58X reference circuit, terminal C6 at the PCM/ECM connector. Observe the voltage while cranking the engine. Is the voltage near the specified value?	2.5 v	Go to *Step 9*	Go to *Step 7*
7	Check the connections at the CKP sensor and replace the terminals if necessary. Do any terminals require replacement?		Go to *Step 11*	Go to *Step 8*
8	Replace the CKP sensor. Is the action complete?		Go to *Step 11*	
9	Check the connections at the PCM/ECM and replace the terminals if necessary. Do any terminals require replacement?		Go to *Step 11*	Go to *Step 10*
10	1. Turn the ignition OFF. 2. Replace PCM/ECM. Is the action complete?		Go to *Step 11*	

Step	Action	Value(s)	Yes	No
11	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as supported in the text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 12*	Go to *Step 2*
12	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) P0337

58X CRANK POSITION NO SIGNAL

Circuit Description

The 58X reference signal is produced by the crankshaft position (CKP) sensor. During one crankshaft revolution, 58 crankshaft pulses will be produced. The powertrain control module (PCM)/engine control module (ECM) uses the 58X reference signal to calculate engine rpm and crankshaft position. The PCM/ECM constantly monitors the number of pulses on the 58X reference circuit and compares them to the number of camshaft position (CMP) signal pulses being received. If the PCM/ECM receives and incorrect number of pulses on the 58X reference circuit, DTC P0337 will set.

Conditions for Setting the DTC

- No camshaft position (CKP) sensor DTCs are set.
- Engine cranking.

Action Taken When the DTC Sets

- The PCM/ECM will illuminate the Malfunction Indicator Lamp (MIL) after the second consecutive trip in which the fault is detected.
- The PCM/ECM will store conditions which were present when the Diagnostic Trouble Codes (DTC) was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM/ECM will turn the MIL off on the third consecutive trip cycle during which the diagnostic has been run and the fault condition is no longer present.
- A history DTC P0337 will clear after 40 consecutive warm–up cycles have occurred without a fault.
- DTC P0337 can be cleared by using the scan tool CLEAR INFO function or by disconnecting the PCM/ECM battery feed.

Diagnostic Aids

An intermittent may be caused by a poor connection, rubbed–through wire insulation or a wire broken inside the insulation. Check for:

- Poor connection – Inspect the PCM/ECM harness and connectors for 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 to be OK, disconnect the PCM/ECM, turn the ignition on and observe a voltmeter connected to the 58X reference circuit at the PCM/ECM harness connector while moving connectors and wiring harnesses related to the PCM/ECM. A change in voltage will indicate the location of the fault.

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.

DTC P0337 58X Crank Position No Signal

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. Disconnect the Crankshaft Position (CKP) sensor. 2. Turn the ignition ON. 3. Using a digital voltmeter (DVM), verify that a 5 volt reference and ground are being supplied at the sensor connector terminals 1 and 3. Are 5 volt and ground being supplied to the sensor?		Go to *Step 5*	Go to *Step 3*
3	1. Turn the ignition ON. 2. With a DVM, backprobe the powertrain control module (PCM)/engine control module (ECM) connector 5 volt reference and signal connectors, terminals C6 and C5. Are 5 volt reference and ground available at the PCM/ECM?		Go to *Step 4*	Go to *Step 9*
4	Repair the open circuit, short to ground or short to voltage for the 5 volt reference or signal between the CKP sensor and the PCM/ECM. Is the repair complete?		Go to *Step 11*	
5	1. Turn the ignition OFF. 2. Disconnect the PCM/ECM and CKP sensor 3. Check for an open or a short to ground in the 58X reference circuit between the CKP sensor connector and the PCM/ECM harness connector. 4. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 11*	Go to *Step 6*
6	1. Reconnect the PCM/ECM and CKP sensor. 2. Connect a DVM to measure voltage on the 58X reference circuit at the PCM/ECM connector, terminal C6. 3. Observe the voltage while cranking the engine. Is the voltage near the specified value?	2.5 v	Go to *Step 9*	Go to *Step 7*
7	Check the connections at the CKP sensor and replace the terminals if necessary. Do any terminals require replacement?		Go to *Step 11*	Go to *Step 8*
8	Replace the CKP sensor. Is the repair complete?		Go to *Step 11*	
9	Check the connections at the PCM/ECM and replace the terminals if necessary. Did any terminals require replacement?		Go to *Step 11*	Go to *Step 10*
10	Replace the PCM/ECM. Is the action complete?		Go to *Step 11*	

Step	Action	Value(s)	Yes	No
11	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 12*	Go to *Step 2*
12	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK