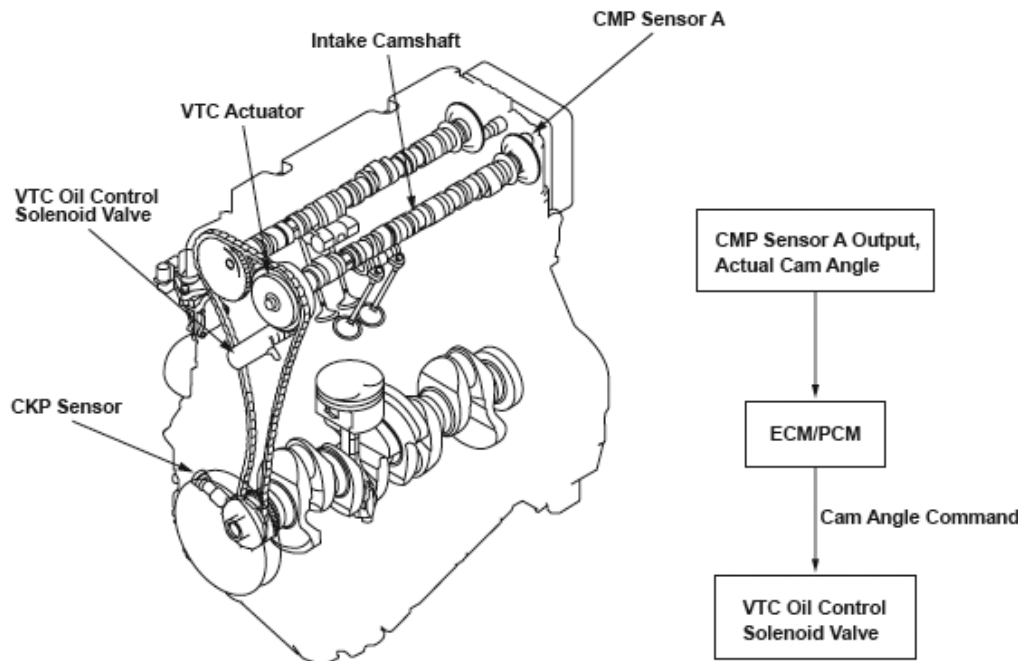


2007 ENGINE PERFORMANCE

Advanced Diagnostics - Element

DTC P0011 (56): ADVANCED DIAGNOSTICS

DTC P0011: VARIABLE VALVE TIMING CONTROL (VTC) SYSTEM MALFUNCTION



P0011-0770

**Fig. 1: Identifying Variable Valve Timing Control (VTC) System Consisting Components With Flow Diagram**

**General Description**

The variable valve timing control (VTC) system controls the timing of the intake camshaft. It uses hydraulic pressure to operate the VTC actuator so the valve timing is optimized depending on driving conditions. The engine control module (ECM)/powertrain control module (PCM) monitors the phase control command and the actual timing of the camshaft by using camshaft position (CMP) sensor A. If the phase difference between them is excessive for a certain time period, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	15 seconds or more
DTC Type	Two drive cycles, MIL ON

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OBD Status | PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine	10 seconds	-
Engine coolant temperature	23 °F (-5 °C) <sup>(1)</sup>	158 °F (70 °C)
	-13 °F (-25 °C) <sup>(1)</sup>	185 °F (85 °C)
Engine speed	203 °F (95 °C) <sup>(2)</sup>	800 rpm
	227 °F (107 °C) <sup>(2)</sup>	1,600 rpm
Elapsed TDC revolutions	25 °F (-4 °C) <sup>(1)</sup>	Per 0 revolutions
	-13 °F (-25 °C) <sup>(1)</sup>	Per 23,500 revolutions
Battery voltage	10.5 V	-
No active DTCs	P0010, P0107, P0108, P0112, P0113, P0117, P0118, P0122, P0123, P0222, P0223, P0335, P0339, P0340, P0341, P0344, P1009, P1128, P1129, P2101, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2227, P2228, P2229, P2646, P2647, P2648, P2649	
(1) Depending on initial engine coolant temperature.		
(2) Depending on engine coolant temperature.		

### Malfunction Threshold

The timing difference between the timing control command and the actual timing of the camshaft is 5.0 ° or more for at least 15 seconds.

### Confirmation Procedure with the HDS

Do the VTC TEST in the INSPECTION MENU of the HDS.

### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a steady speed between 25 - 75 mph (40 - 120 km/h) for at least 15 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

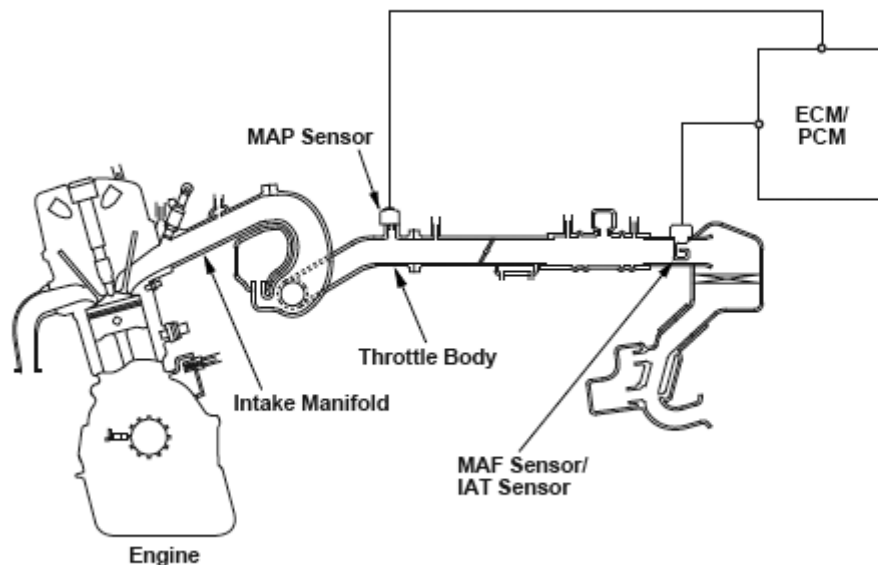
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0101 (50): ADVANCED DIAGNOSTICS

### DTC P0101: MASS AIRFLOW (MAF) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM

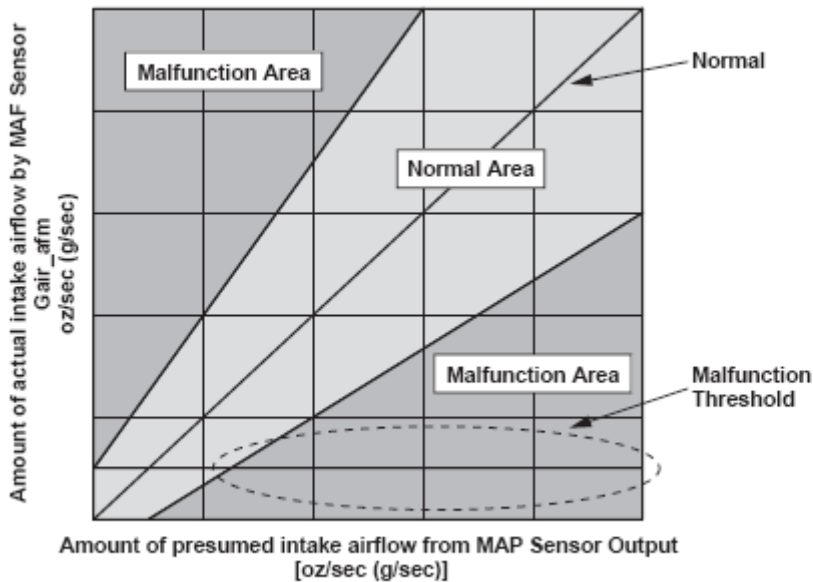
Outline of Engine System Structure



P0101-0770

**Fig. 2: Outline Of Engine System Structure**

Actual Intake Airflow versus Presumed Intake Airflow



P0101-0371

**Fig. 3: Actual Intake Airflow Versus Presumed Intake Airflow Graph**

**General Description**

The mass airflow (MAF) sensor directly measures the amount of intake airflow into the engine, and the engine control module (ECM)/powertrain control module (PCM) controls the fuel injection based on the measured value. The manifold absolute pressure (MAP) sensor measures the intake manifold pressure and the ECM/PCM calculates the amount of intake airflow from the MAP sensor output and the engine revolutions. The ECM/PCM compares the MAF sensor output (amount of intake airflow) and the amount of intake airflow calculated from MAP sensor output. If their difference is too large (in the malfunction area), the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	5 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time after		

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starting the engine	3 seconds	-
Engine coolant temperature	156 °F (69 °C)	-
Engine speed	600 rpm	5,700 rpm
No active DTCs	P0102, P0103, P0107, P0108, P0112, P0113, P0117, P0118, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P0506, P0507, P1128, P1129, P145C, P2646, P2647, P2648, P2649	

#### Malfunction Threshold

The difference between the amount of intake air measured by the MAF sensor and the amount of intake air calculated from the MAP sensor output is out of the normal area for at least 5 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 5 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

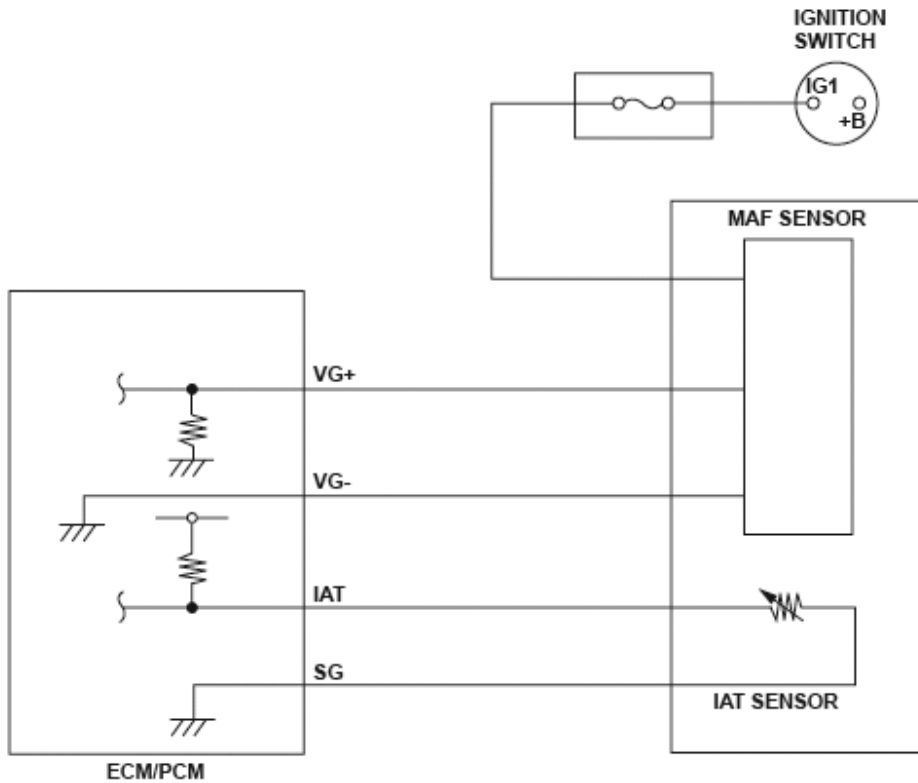
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

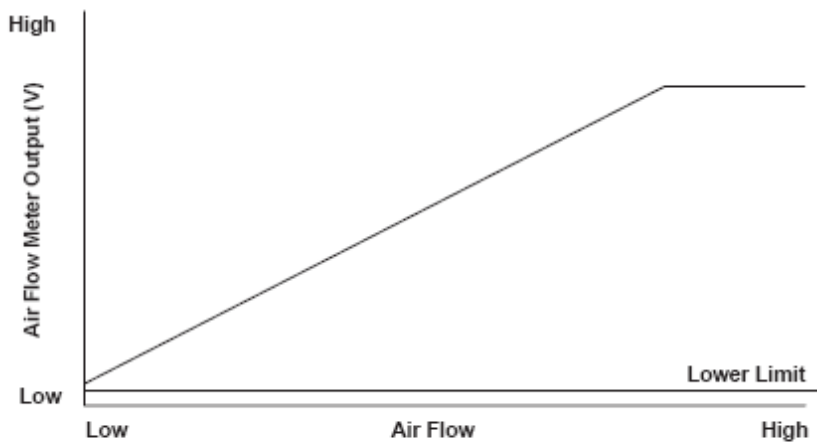
## DTC P0102 (50): ADVANCED DIAGNOSTICS

### DTC P0102: MASS AIRFLOW (MAF) SENSOR CIRCUIT LOW VOLTAGE



P0101-0301

**Fig. 4: Mass Airflow (MAF) Sensor Circuit Diagram**



P0102-0370

**Fig. 5: Mass Air Flow Meter Output Voltage Graph**

**General Description**

The mass airflow (MAF) sensor is attached to the intake air passage, and it measures the amount of intake airflow. The MAF sensor is a hot wire airflow meter. The airflow cools the electrically heated wire that is

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mounted in the air passage. The engine control module (ECM)/powertrain control module (PCM) determines the amount of intake airflow by detecting the current that is required to keep the hot wire at a constant temperature. The lower limit of the MAF sensor output is specified. If the output is below that limit, the ECM/PCM detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P0103

#### Malfunction Threshold

The input voltage from the MAF sensor is 0.1 V or less for at least 2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

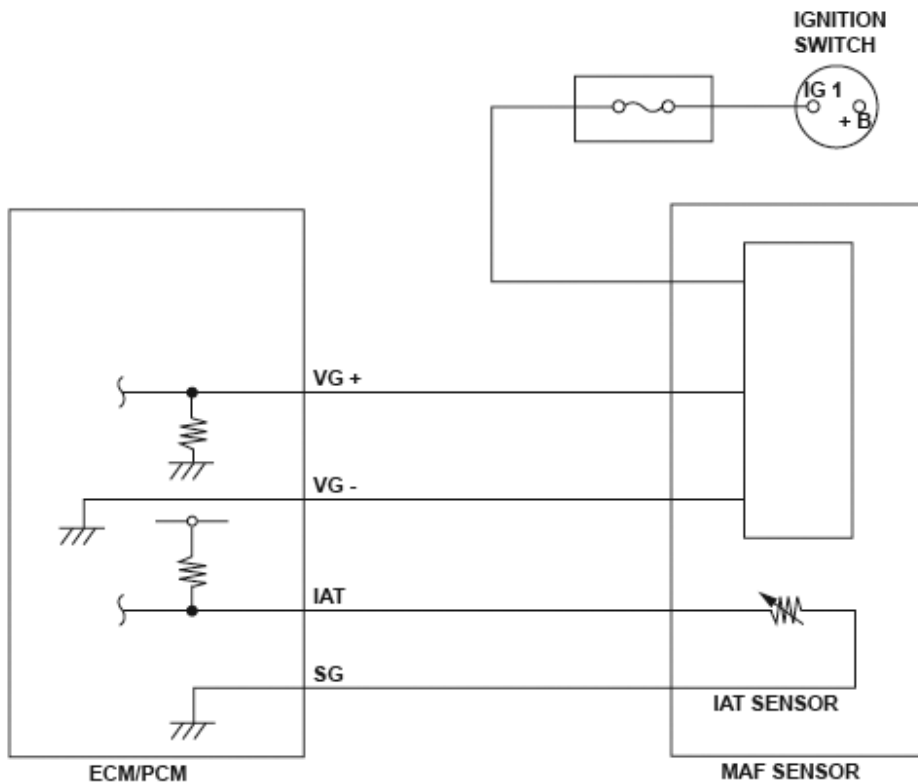
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

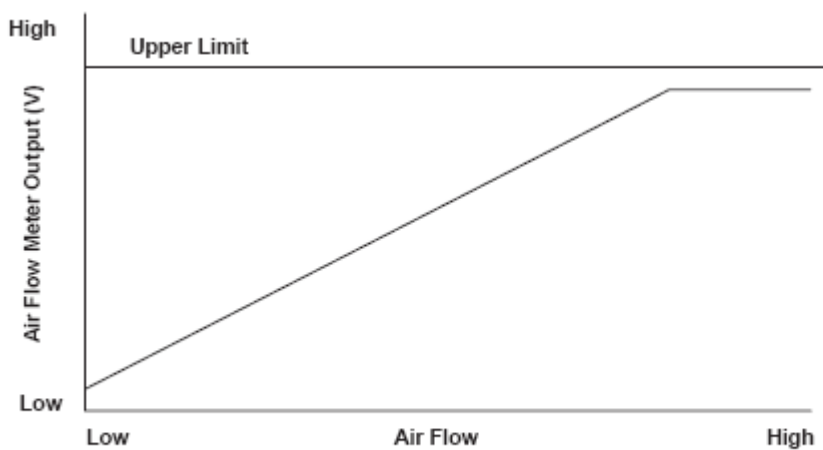
## DTC P0103 (50): ADVANCED DIAGNOSTICS

### DTC P0103: MASS AIRFLOW (MAF) SENSOR CIRCUIT HIGH VOLTAGE



P0101-0301

**Fig. 6: Mass Airflow (MAF) Sensor Circuit Diagram**



P0103-0370

**Fig. 7: Mass Air Flow Meter Output Voltage Graph**

**General Description**

The mass airflow (MAF) sensor is attached to the intake air passage, and it measures the amount of intake airflow. The MAF sensor is a hot wire airflow meter. The airflow cools the electrically heated wire that is



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mounted in the air passage. The engine control module (ECM)/powertrain control module (PCM) determines the amount of intake airflow by detecting the current that is required to keep the hot wire at a constant temperature. The upper limit of the MAF sensor output is specified. If the output is above that limit, the ECM/PCM detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P0102

#### Malfunction Threshold

The input voltage from the MAF sensor is 4.89 V or more for at least 2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

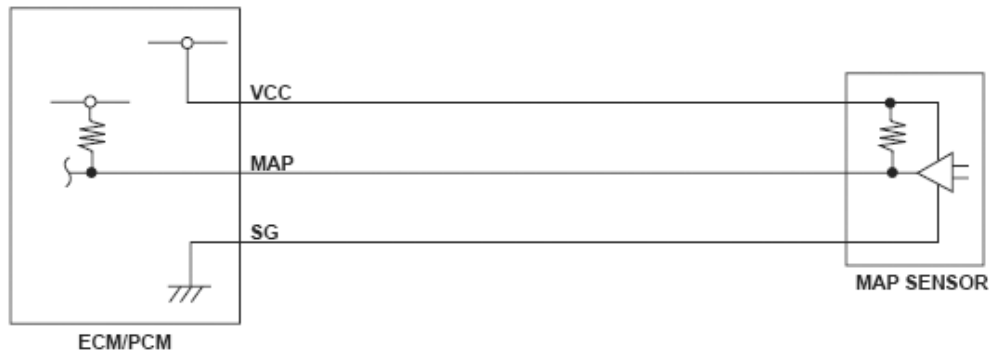
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

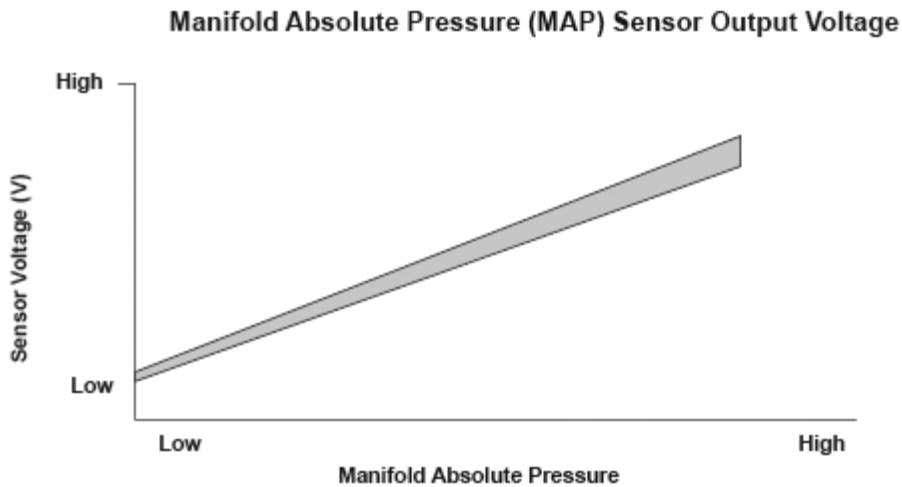
## DTC P0107 (3): ADVANCED DIAGNOSTICS

### DTC P0107: MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT LOW VOLTAGE



P0106-9801

**Fig. 8: Manifold Absolute Pressure (MAP) Sensor Circuit Diagram**



P0107-9871

**Fig. 9: Manifold Absolute Pressure (MAP) Sensor Output Voltage - Graph**

**General Description**

The manifold absolute pressure (MAP) sensor senses manifold absolute pressure (vacuum) and converts it into electrical signals. The MAP sensor outputs low signal voltage at high-vacuum (throttle valve closed) and high signal voltage at low-vacuum (throttle valve wide open).

If a signal voltage from the MAP sensor is a set value or less, the engine control module (ECM)/powertrain control module (PCM) detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P0108

#### Malfunction Threshold

The MAP sensor output voltage is 0.23 V or less for at least 2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

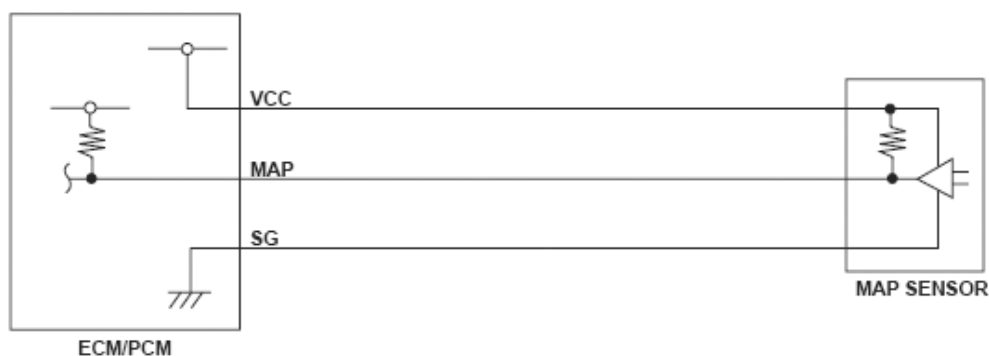
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

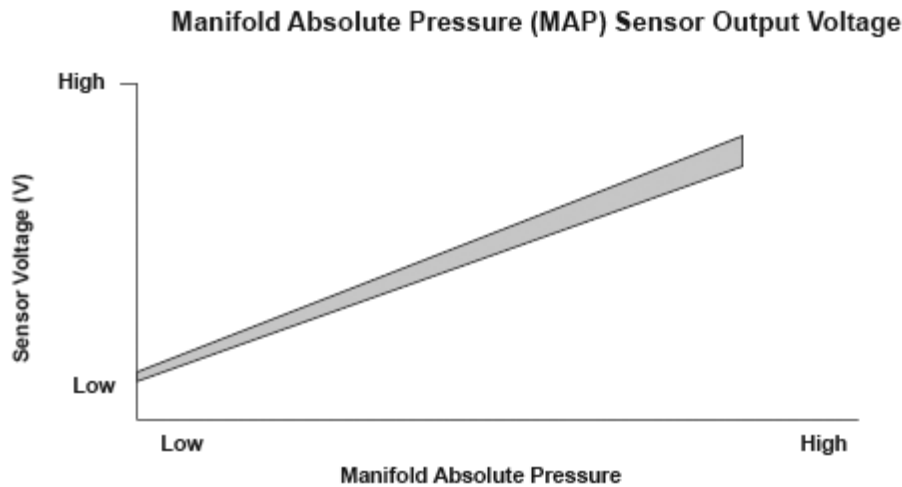
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0108 (3): ADVANCED DIAGNOSTICS

### DTC P0108: MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR CIRCUIT HIGH VOLTAGE



**Fig. 10: Manifold Absolute Pressure (MAP) Sensor Circuit Diagram**



P0107-9671

**Fig. 11: Manifold Absolute Pressure (MAP) Sensor Output Voltage - Graph**

**General Description**

The manifold absolute pressure (MAP) sensor senses manifold absolute pressure (vacuum) and converts it into electrical signals. The MAP sensor outputs low signal voltage at high-vacuum (throttle valve closed) and high signal voltage at low-vacuum (throttle valve wide open). If a signal voltage from the MAP sensor is a set value or more, the engine control module (ECM)/powertrain control module (PCM) detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P0107

**Malfunction Threshold**

The MAP sensor output voltage is 4.49 V or more for at least 2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

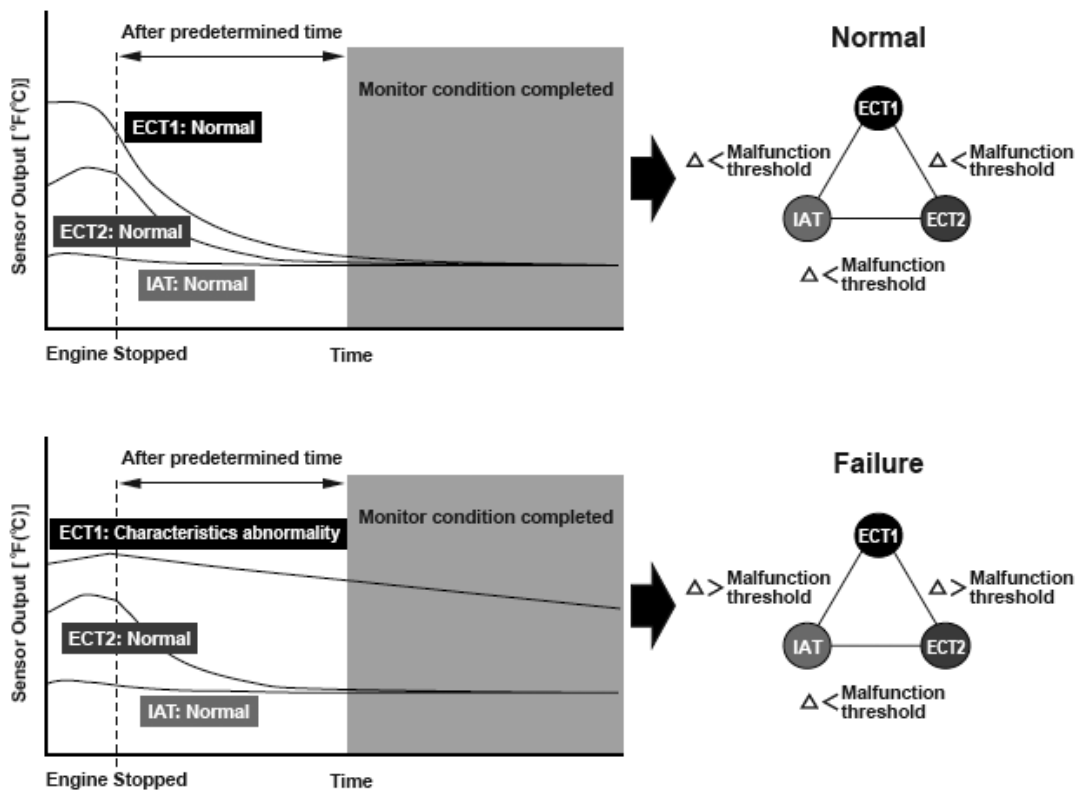
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0111 (10): ADVANCED DIAGNOSTICS**

**DTC P0111: INTAKE AIR TEMPERATURE (IAT) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM**



**Fig. 12: Intake Air Temperature (IAT) Sensor Circuit Range/Performance - Graph**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### General Description

Two engine coolant temperature sensors and one intake air temperature sensor are used by the engine control module (ECM)/powertrain control module (PCM).

When the engine is stopped and enough time has passed, the temperature of the engine will equal the ambient temperature. When an inappropriate temperature is detected after comparing the temperature readings of each sensor, a malfunction in the corresponding sensor is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine off time	6 hours	-
No active DTCs	P0112, P0113, P0116, P0117, P0118, P0125, P1116, P2183, P2184, P2185, P2610	

#### Malfunction Threshold

A malfunction is detected if these three conditions are present after the engine and the ignition switch have been off for at least 6 hours:

- When the temperature difference between the IAT and ECT1 is 61 °F (34 °C) or more.
- When the temperature difference between the IAT and ECT2 is 28 °F (16 °C) or more.
- When the temperature difference between the ECT2 and ECT1 is 60 °F (33 °C) or more.

#### Driving Pattern

1. Turn the ignition off, and wait at least 6 hours.
2. Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the

freeze frame data are stored.

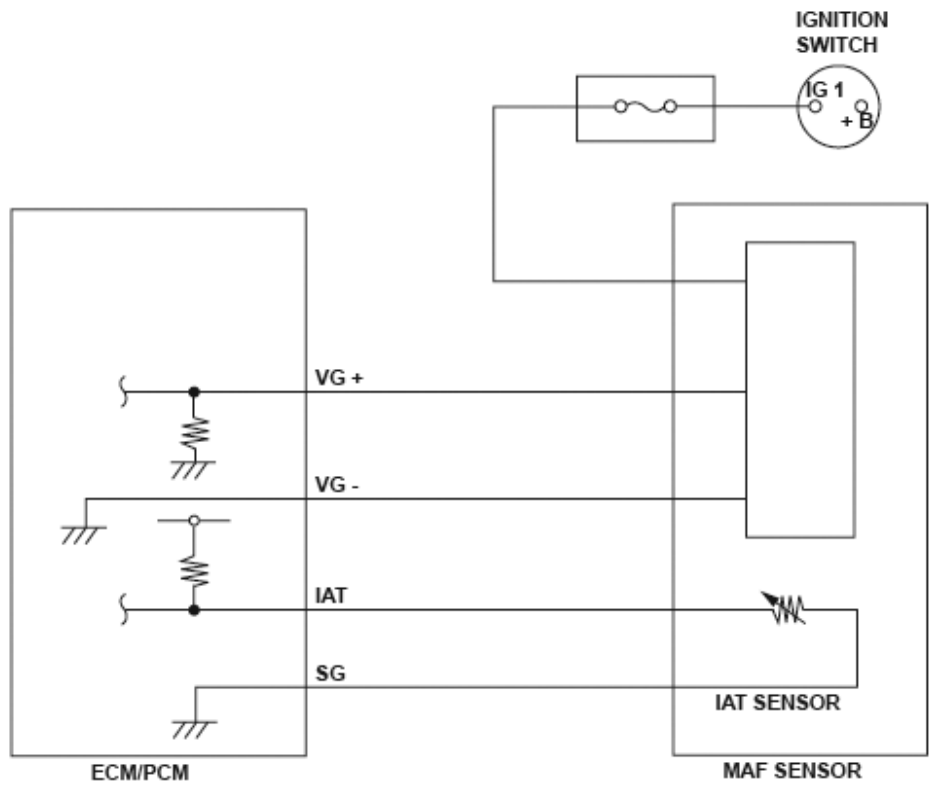
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

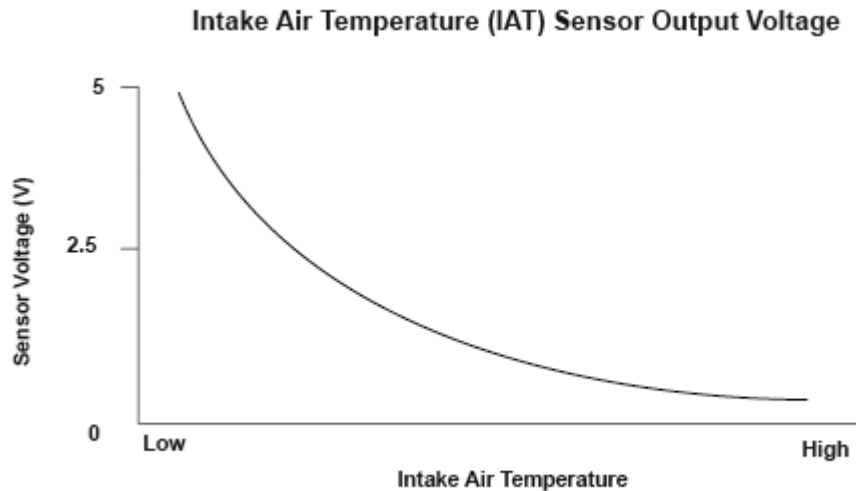
**DTC P0112 (10): ADVANCED DIAGNOSTICS**

**DTC P0112: INTAKE AIR TEMPERATURE (IAT) SENSOR CIRCUIT LOW VOLTAGE**



P0101-0301

**Fig. 13: Intake Air Temperature (IAT) Sensor Circuit Diagram**



P0112-9671

**Fig. 14: Intake Air Temperature (IAT) Sensor Output Voltage - Graph**

**General Description**

The intake air temperature (IAT) sensor is a thermistor that detects intake air temperature, and it is used for A/F feedback control to compensate for the atmospheric density fluctuations that accompany changes in intake air temperature.

The IAT sensor resistance varies depending on temperature. The output voltage and the sensor resistance increase as the intake air temperature decreases. Conversely, the output voltage and the sensor resistance decrease as the intake air temperature increases. If the IAT sensor output voltage is excessively low, the engine control module (ECM)/powertrain control module (PCM) detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P0113

**Malfunction Threshold**



The IAT sensor output voltage is 0.08 V or less for at least 2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

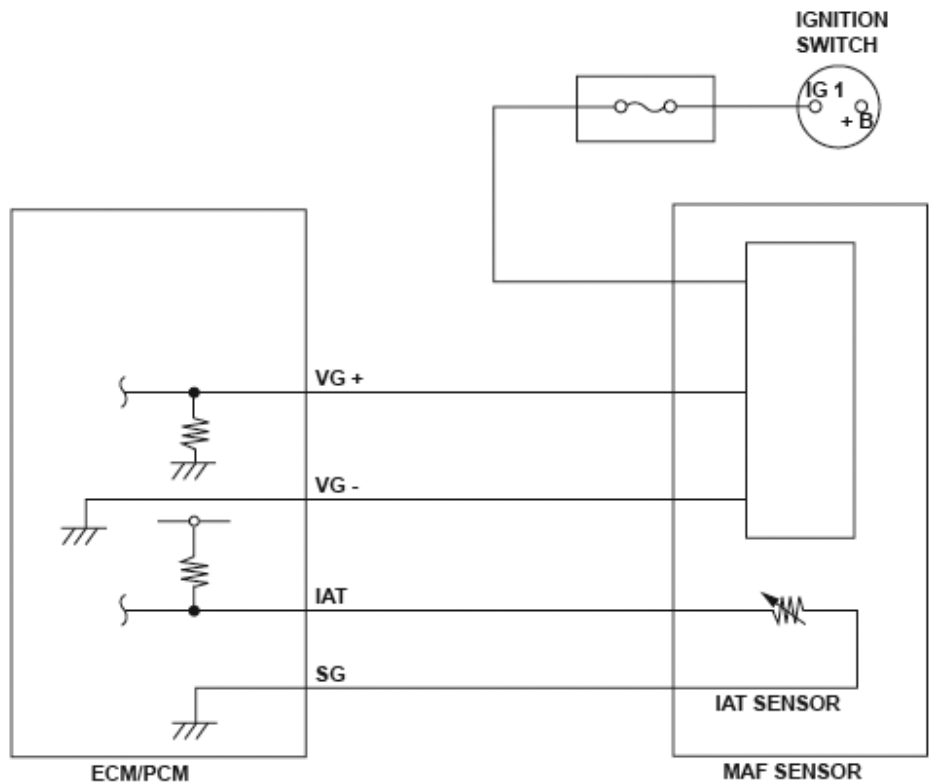
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

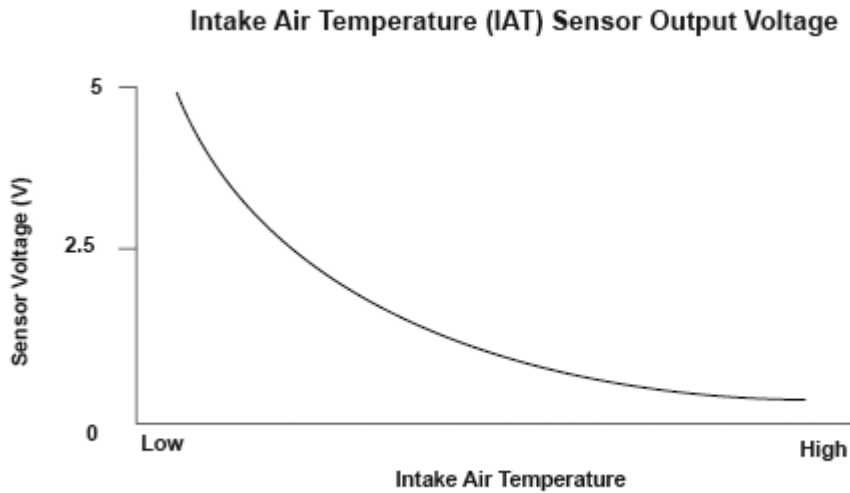
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0113 (10): ADVANCED DIAGNOSTICS**

**DTC P0113: INTAKE AIR TEMPERATURE (IAT) SENSOR CIRCUIT HIGH VOLTAGE**



**Fig. 15: Intake Air Temperature (IAT) Sensor Circuit Diagram**



P0112-9671

**Fig. 16: Intake Air Temperature (IAT) Sensor Output Voltage - Graph**

**General Description**

The intake air temperature (IAT) sensor is a thermistor that detects intake air temperature, and it is used for A/F feedback control to compensate for the atmospheric density fluctuations that accompany changes in intake air temperature.

The IAT sensor resistance varies depending on temperature. The output voltage and the sensor resistance increase as the intake air temperature decreases. Conversely, the output voltage and the sensor resistance decrease as the intake air temperature increases. If the IAT sensor output voltage is excessively high, the engine control module (ECM)/powertrain control module (PCM) detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P0112

**Malfunction Threshold**

The IAT sensor output voltage is 4.92 V or more for at least 2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

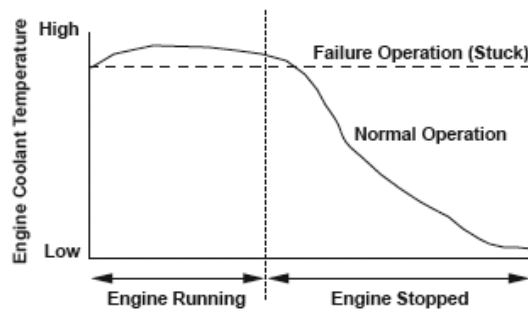
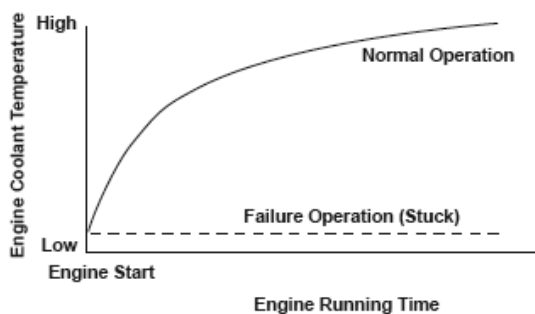
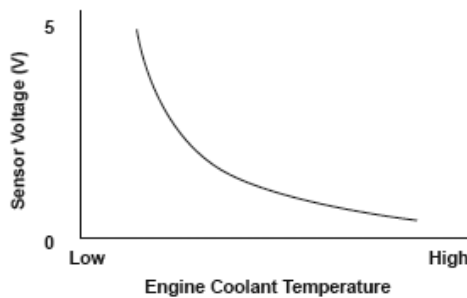
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0116 (86): ADVANCED DIAGNOSTICS**

**DTC P0116: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT RANGE/PERFORMANCE PROBLEM**

Engine Coolant Temperature Sensor



P0116-0570

**Fig. 17: Engine Coolant Temperature (ECT) Sensor 1 Circuit Range/ Performance - Graph**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### General Description

The engine control module (ECM)/powertrain control module (PCM) supplies voltage to the engine coolant temperature (ECT) signal circuit (about 5 V) through a pull-up resistor. As the engine coolant cools, ECT sensor 1 resistance increases, and the ECM/PCM detects a high signal voltage. As the engine coolant warms, ECT sensor 1 resistance decreases, and the ECM/PCM detects a low signal voltage.

If the ECT sensor 1 output voltage after driving a set time after starting the engine does not reach a set temperature, or when the difference between the ECT sensor 1 output voltage when driving and the output voltage of the ECT sensor 1 after the engine is stopped a set time does not change a certain amount, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 minutes or more
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine	10 seconds	-
Fuel feedback	Other than during fuel cut-off operation	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P0506, P0507, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2610, P2646, P2647, P2648, P2649	
Others	With a completely cooled engine (one that has been off for at least 6 hours): Judgment is made after the engine has been run for at least 10 minutes, turned off for at least 10 seconds, then started and run again for at least 10 seconds.	
	With a partially cooled engine (one that has been off for less than 6 hours): Judgment is made after the engine has been run for at least 10 minutes, turned off for at least 150 minutes, then started and run again for at least 10 seconds.	

#### Malfunction Threshold

Malfunction determination 1:

With a completely cooled engine (one that has been off for at least 6 hours):

When the change in coolant temperature after 10 minutes or more of running time is 50 °F (10 °C) or less, a malfunction is detected.

Malfunction determination 2:

With a partially cooled engine (one that has been off for less than 6 hours):

When the difference between the coolant temperature after 10 minutes or more of running time minus the coolant temperature after the engine has been off for 150 minutes and then run for 10 seconds is 50 °F (10 °C) or less, a malfunction is detected.

### **Driving Pattern**

- With a completely cooled engine (one that has been off for at least 6 hours).
  1. Start the engine, and let it idle for at least 10 minutes.
  2. Turn off the ignition for 10 seconds, then restart the engine and let it idle for at least 10 seconds.
    - With a partially cooled engine (one that has been off for less than 6 hours).
      1. Start the engine, and let it idle for at least 10 minutes.
      2. Turn off the ignition for 150 minutes, then restart the engine and let it idle for at least 10 seconds.

### **Diagnosis Details**

#### **Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### **Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

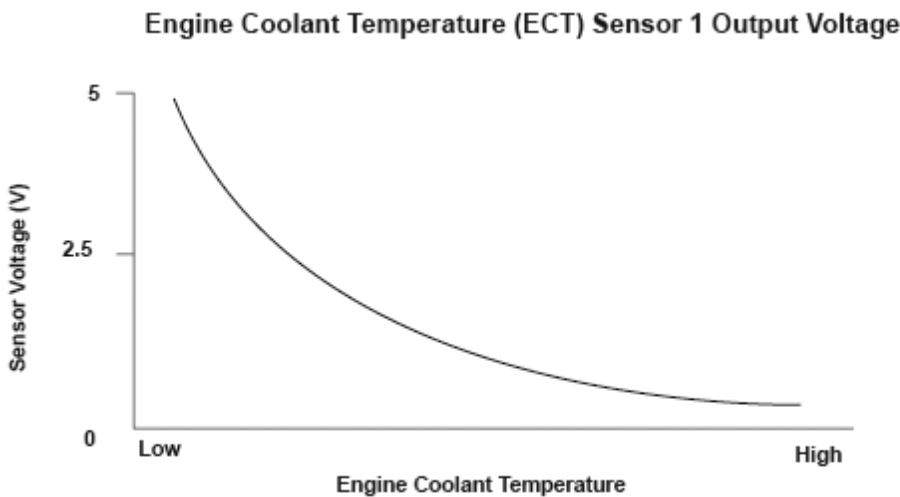
## **DTC P0117 (6): ADVANCED DIAGNOSTICS**

### **DTC P0117: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT LOW VOLTAGE**



P0116-0801

**Fig. 18: Engine Coolant Temperature (ECT) Sensor 1 Circuit Diagram**



P0116-0571

**Fig. 19: Engine Coolant Temperature (ECT) Sensor 1 Output Voltage - Graph**

**General Description**

Engine coolant temperature (ECT) sensor 1 is used for air/fuel ratio feedback control, ignition timing control, idle speed control, and other functions. The ECT sensor 1 resistance varies depending on the engine coolant temperature. As the engine coolant cools, the ECT sensor 1 resistance increases, and the engine control module (ECM)/powertrain control module (PCM) detects a high signal voltage. As the engine coolant warms, the ECT sensor 1 resistance decreases, and the ECM/PCM detects a low signal voltage. If the ECT sensor 1 output voltage is less than a set value when the engine coolant temperature is high, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON

OBD Status

N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	
Ignition switch	ON
No active DTCs	P0118

**Malfunction Threshold**

The ECT sensor 1 output voltage is 0.08 V or less for at least 2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

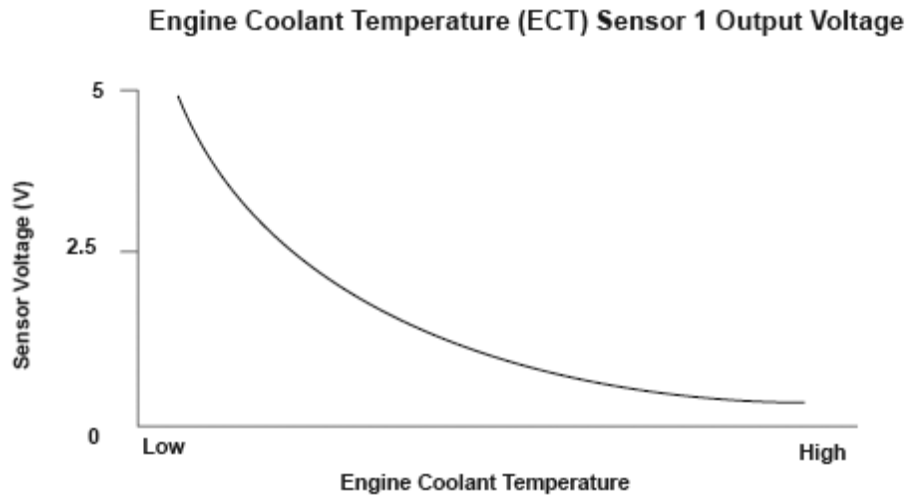
**DTC P0118 (6): ADVANCED DIAGNOSTICS**

**DTC P0118: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT HIGH VOLTAGE**



P0118-0801

**Fig. 20: Engine Coolant Temperature (ECT) Sensor 1 Circuit Diagram**



P0116-0571

**Fig. 21: Engine Coolant Temperature (ECT) Sensor 1 Output Voltage - Graph**

**General Description**

Engine coolant temperature (ECT) sensor 1 is used for air/fuel ratio feedback control, ignition timing control, idle speed control, and other functions. The ECT sensor 1 resistance varies depending on the engine coolant temperature. As the engine coolant cools, the ECT sensor 1 resistance increases, and the engine control module (ECM)/powertrain control module (PCM) detects a high signal voltage. As the engine coolant warms, the ECT sensor 1 resistance decreases, and the ECM/PCM detects a low signal voltage. If the ECT sensor 1 output voltage is more than a set value when the engine coolant temperature is low, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P0117

**Malfunction Threshold**



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The ECT sensor 1 output voltage is 4.92 V or more for at least 2 seconds.

#### **Diagnosis Details**

##### **Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

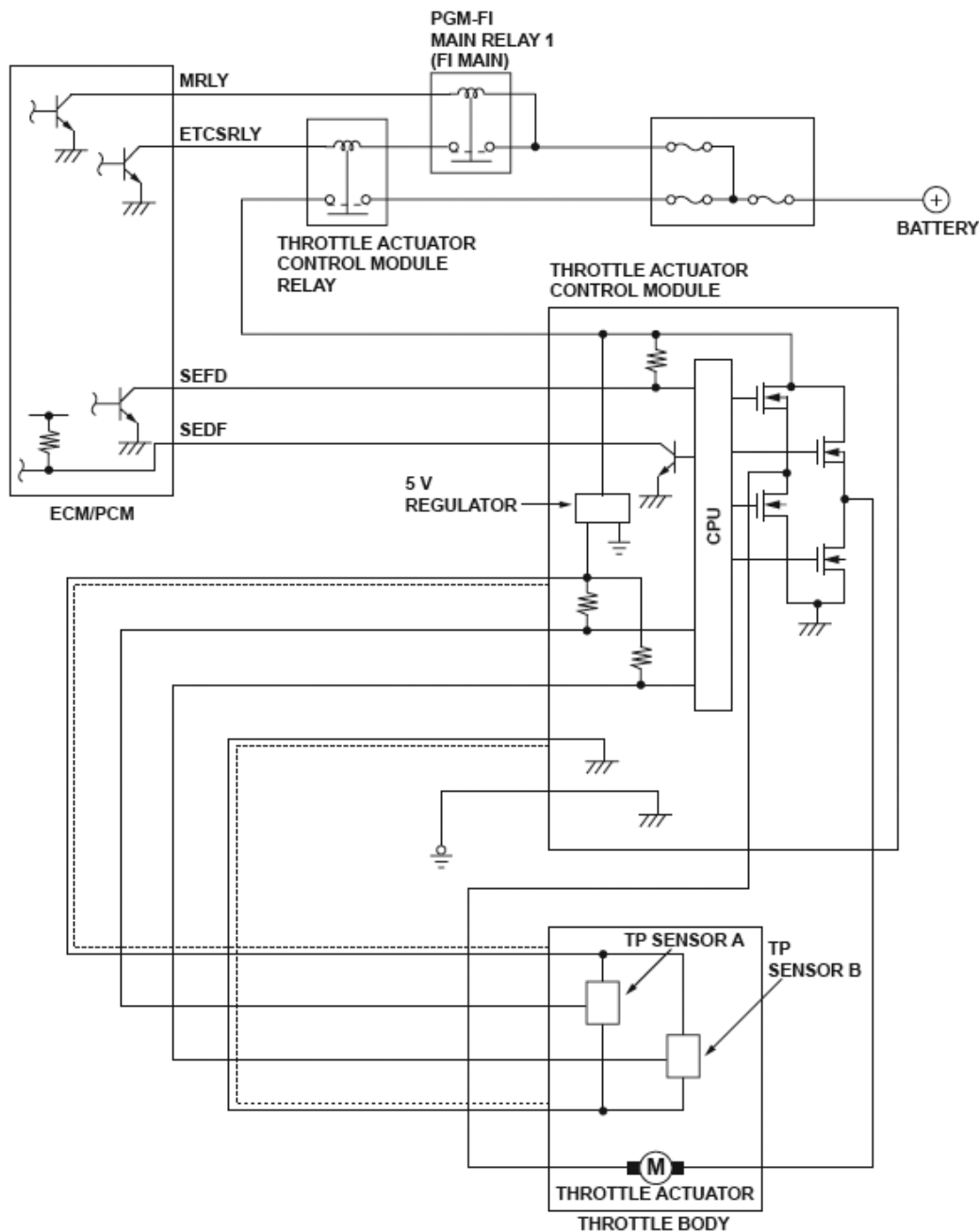
##### **Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## **DTC P0122 (7): ADVANCED DIAGNOSTICS**

### **DTC P0122: THROTTLE POSITION (TP) SENSOR A CIRCUIT LOW VOLTAGE**



P0122-0700

**Fig. 22: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

Throttle position (TP) sensor A is a semiconductor type, and it is attached to the throttle body and shaft to determine throttle valve position.

The throttle valve position signal from TP sensor A is transmitted to the throttle actuator control module for target position feedback control, then to the engine control module (ECM)/powertrain control module (PCM) as

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an actual throttle valve position signal.

If the signal from TP sensor A is a fixed value or less for a set time, the throttle actuator control module detects a malfunction and sends the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a TP sensor A malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0123, P2101, P2108, P2118, P2135, P2176, U0107

#### Malfunction Threshold

The TP sensor A output voltage is 0.3 V or less for at least 0.2 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

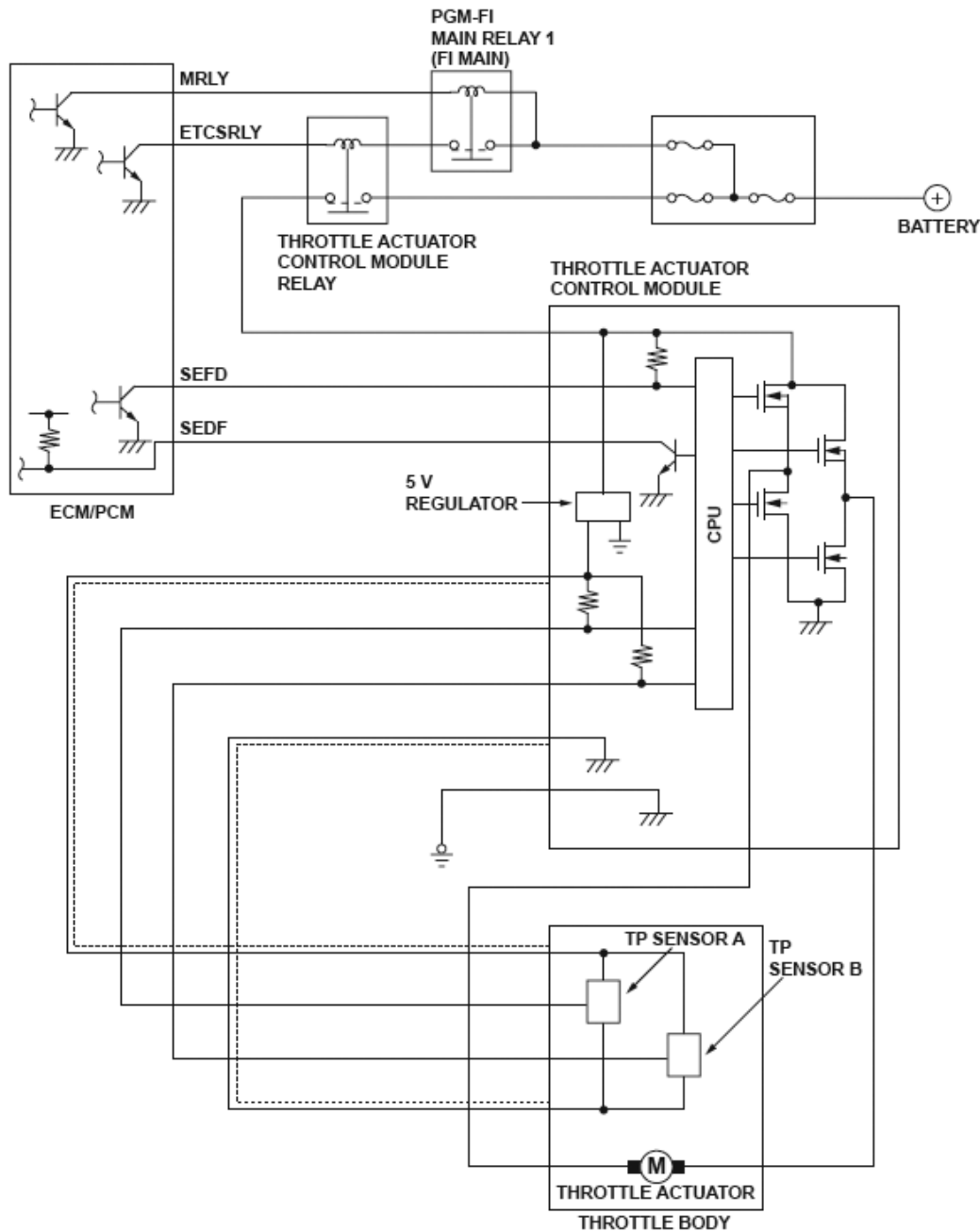
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0123 (7): ADVANCED DIAGNOSTICS

### DTC P0123: THROTTLE POSITION (TP) SENSOR A CIRCUIT HIGH VOLTAGE



P0122-0700

**Fig. 23: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

Throttle position (TP) sensor A is a semiconductor type, and it is attached to the throttle body and shaft to determine throttle valve position.

The throttle valve position signal from TP sensor A is transmitted to the throttle actuator control module for target position feedback control, then to the engine control module (ECM)/powertrain control module (PCM) as

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an actual throttle valve position signal.

If the signal from TP sensor A is a fixed value or more for a set time, the throttle actuator control module detects a malfunction and sends the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a TP sensor A malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0122, P2101, P2108, P2118, P2135, P2176, U0107

#### Malfunction Threshold

The TP sensor A output voltage is 4.8 V or more for at least 0.2 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

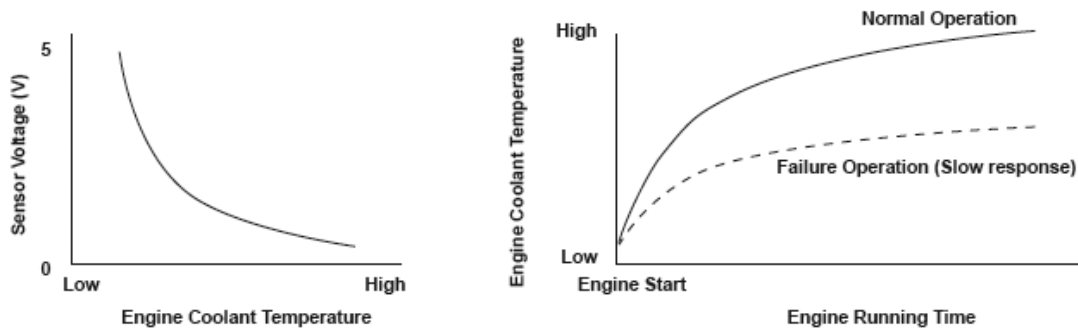
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0125 (86): ADVANCED DIAGNOSTICS

### DTC P0125: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 MALFUNCTION/SLOW RESPONSE

Engine Coolant Temperature Sensor



P0125-0570

**Fig. 24: Engine Coolant Temperature (ECT) Sensor - Graph**

**General Description**

The engine control module (ECM)/powertrain control module (PCM) supplies voltage to the engine coolant temperature (ECT) signal circuit (about 5 V) through a pull-up resistor. As the engine coolant cools, the ECT sensor 1 resistance increases, and the ECM/PCM detects a high signal voltage. As the engine coolant warms, the ECT sensor 1 resistance decreases, and the ECM/PCM detects a low signal voltage.

If the ECT sensor 1 output voltage does not reach a specified temperature at which closed-loop control for stoichiometric air/fuel ratio starts within a set time, depending on the initial coolant temperature after starting the engine, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	20 minutes or less
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Initial engine coolant temperature	-	0 °F (-18 °C)
Fuel feedback	Other than during fuel cut-off operation	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0117, P0118, P0134, P0135, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P0506, P0507, P1009, P1128,	

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P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2646, P2647, P2648, P2649

### Malfunction Threshold

The engine running time before the engine coolant temperature reaches 98°F (36°C), based on the initial engine coolant temperatures, is as follows.

### INITIAL ENGINE COOLANT TEMPERATURES

Initial engine coolant temperature	-54 °F (-48 °C)	-35 °F (-37 °C)	0 °F (-18 °C)
Engine running time	300 seconds or more		60 seconds or more

### Driving Pattern

1. Start the engine at an engine coolant temperature as specified under Enable Conditions.
2. Let the engine idle for at least 20 minutes.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle with the ECT and IAT at engine start-up within the specified temperature range, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle with the ECT and IAT at engine start-up within the specified temperature range, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

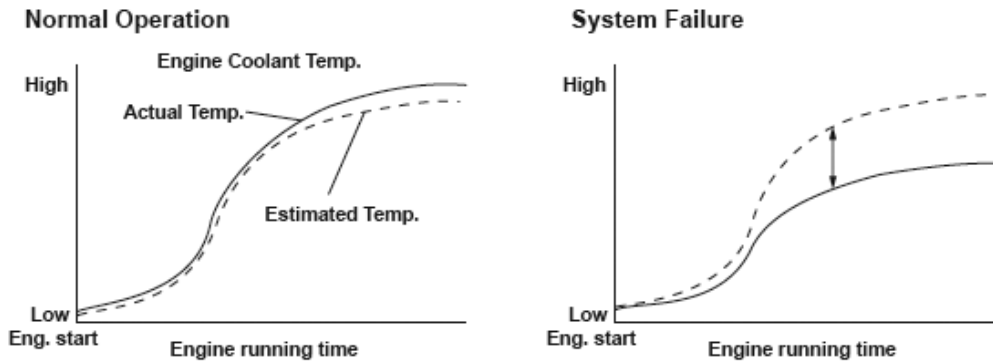
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

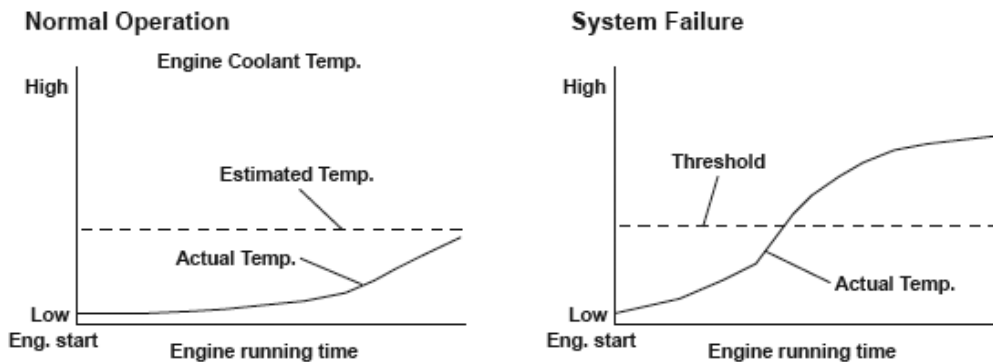
## DTC P0128 (87): ADVANCED DIAGNOSTICS

### DTC P0128: COOLING SYSTEM MALFUNCTION

Engine Coolant Temperature of Engine Block (ECT 1)



Engine Coolant Temperature of Radiator (ECT 2)



P0128-0570

**Fig. 25: Engine Coolant Temperature Of Engine Block (ECT 1) And Radiator (ECT 2)**

**General Description**

The thermostat is closed when the engine coolant temperature is low, and it stops the circulation of engine coolant to speed engine warm up. When the engine coolant temperature increases, the thermostat opens and circulates engine coolant to control its temperature. When the engine coolant temperature decreases, the opening area of the thermostat is reduced to regulate the engine coolant temperature. If the thermostat sticks open, engine warm up is delayed, and exhaust emissions are adversely affected. The engine control module (ECM)/powertrain control module (PCM) measures the rise in the coolant temperature after the engine starts at the engine block and at the radiator, and it estimates the characteristics of the engine coolant temperature by calculations based on those two temperatures and the driving conditions. When ECT 2 immediately increases from the starting value, it is defined as the thermostat stuck open. When ECT 2 does not increase to the specified value, it is defined as a thermostat malfunction.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
-----------	------------------------



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Sequence	None
Duration	Depending on driving conditions
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine off time	6 hours	-
Initial engine coolant temperature (ECT 1)	20 °F (-6 °C)	123 °F (50 °C)
Initial engine coolant temperature (ECT 2)	20 °F (-6 °C)	-
Initial intake air temperature	20 °F (-6 °C)	-
The difference between initial intake air temperature and current intake air temperature	-	3 °F (2 °C) <sup>(1)</sup>
		7 °F (4 °C) <sup>(2)</sup>
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0116, P0117, P0118, P0122, P0123, P0125, P0134, P0135, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P0506, P0507, P1009, P1116, P1128, P1129, P1157, P1172, P145C, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2183, P2184, P2185, P2195, P2227, P2228, P2229, P2238, P2252, P2610, P2646, P2647, P2648, P2649, U0107	

(1) Intake air temperature decrease judgement when there is no driving record of 25 mph (40 km/h) in this drive cycle.

(2) Intake air temperature decrease judgement when there is a driving record of 25 mph (40 km/h) in this drive cycle.

#### Malfunction Threshold

##### Malfunction determination 1:

If the difference between the current measured coolant temperature at the radiator (ECT 2) and the initial coolant temperature at the radiator (ECT 2) is at least 46 °F (8 °C) when the calculated coolant temperature at the engine (ECT 1) reaches 159 °F (71 °C), a malfunction is detected (thermostat stuck open); or if the coolant temperature at the radiator (ECT 2) only reaches 73 °F (23 °C), a malfunction is detected (thermostat malfunction).

**Malfunction determination 2:**

When the calculated engine coolant temperature (ECT 1) reaches 158 °F (70 °C) before the measured engine coolant temperature (ECT 1) reaches 158 °F (70 °C), a malfunction is detected.

**Driving Pattern**

1. Start the engine under the conditions specified under Enable Conditions.
2. Drive the vehicle at a speed between 15 - 75 mph (24 - 120 km/h) for at least 10 minutes.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details****Conditions for illuminating the MIL**

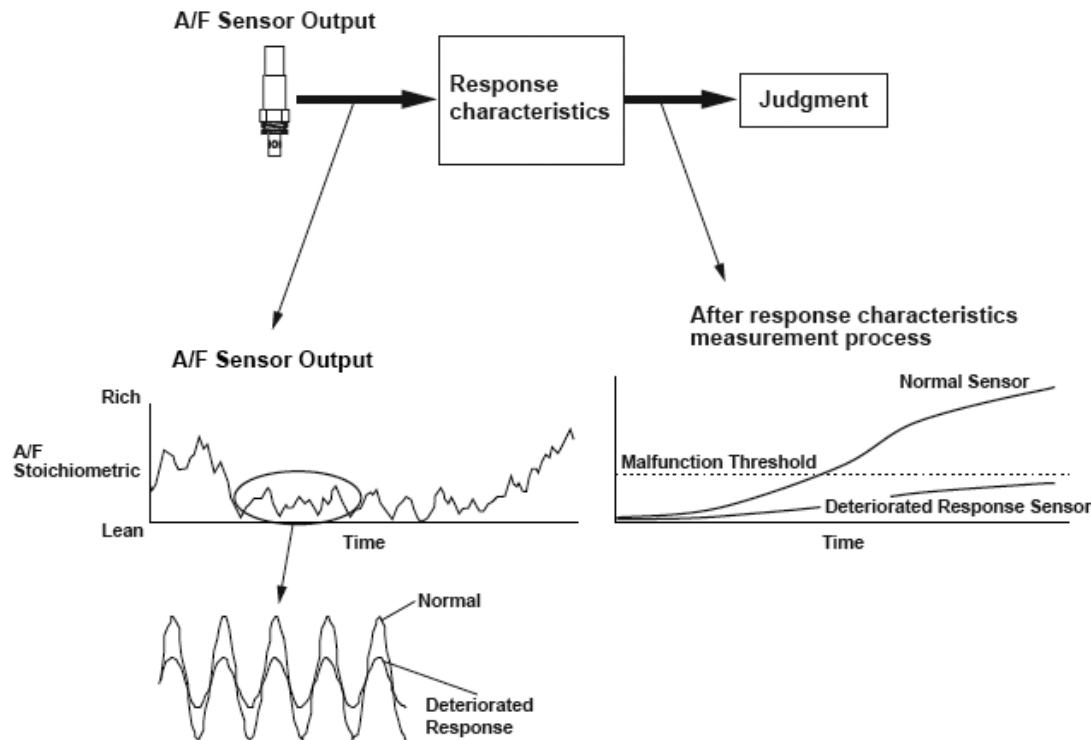
When a malfunction is detected during the first drive cycle with the ECT and IAT at engine start-up within the specified temperature range, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle with the ECT and IAT at engine start-up within the specified temperature range, the MIL comes on and the DTC and the freeze frame data are stored.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0133 (61): ADVANCED DIAGNOSTICS****DTC P0133: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) MALFUNCTION/ SLOW RESPONSE**



P0133-0570

**Fig. 26: Air/Fuel Ratio (A/F) Sensor 1 Signal Outputs**

**General Description**

The air/fuel ratio (A/F) sensor has a linear signal output in relation to the oxygen concentration. The engine control module (ECM)/powertrain control module (PCM) computes the air/fuel ratio from the A/F sensor output voltage and uses fuel feedback control to improve exhaust emissions. The ECM/PCM measures the response characteristics against the A/F sensor output, and if the average inversion cycle time is less than the specified value, it detects a deteriorated response and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	8 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum

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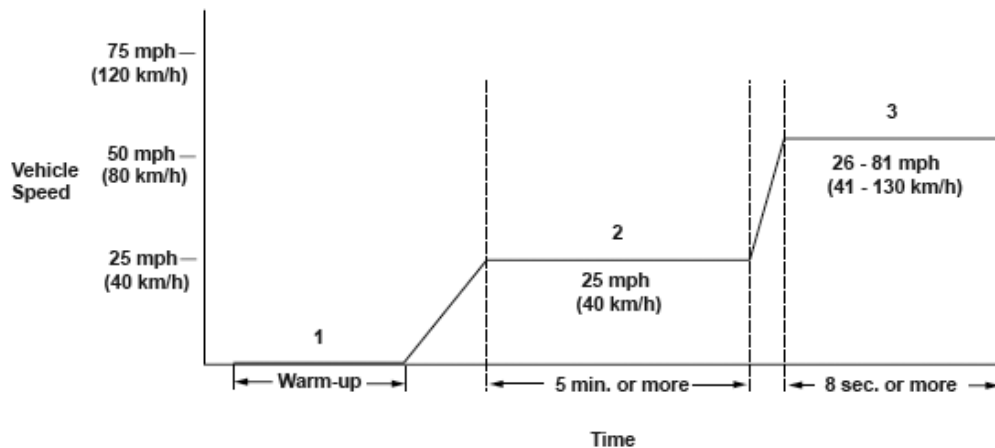
### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	-13 °F (-25 °C)	-
Engine speed	A/T	2,400 rpm
	M/T	3,750 rpm
MAP value	1,500 rpm	40 kPa (11.9 in.Hg, 300 mmHg)
	3,000 rpm	27 kPa (7.9 in.Hg, 200 mmHg)
Vehicle speed	33 mph (52 km/h)	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop at stoichiometric	
Monitoring priority	P0456, P0457, P0497	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0112, P0113, P0117, P0118, P0134, P0135, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2646, P2647, P2648, P2649, P2A00	
Other	Without excessive load change	

### Malfunction Threshold

The average of 20 periods or less of the A/F sensor inversion cycle is at least 8 seconds.

### Driving Pattern



P0133-0552

**Fig. 27: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator

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fan comes on.

2. Drive the vehicle at a steady speed up to 25 mph (40 km/h), for at least 5 minutes.
3. Then, drive immediately at a steady speed between 26 - 81 mph (41 - 130 km/h) for at least 8 seconds.
  - If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

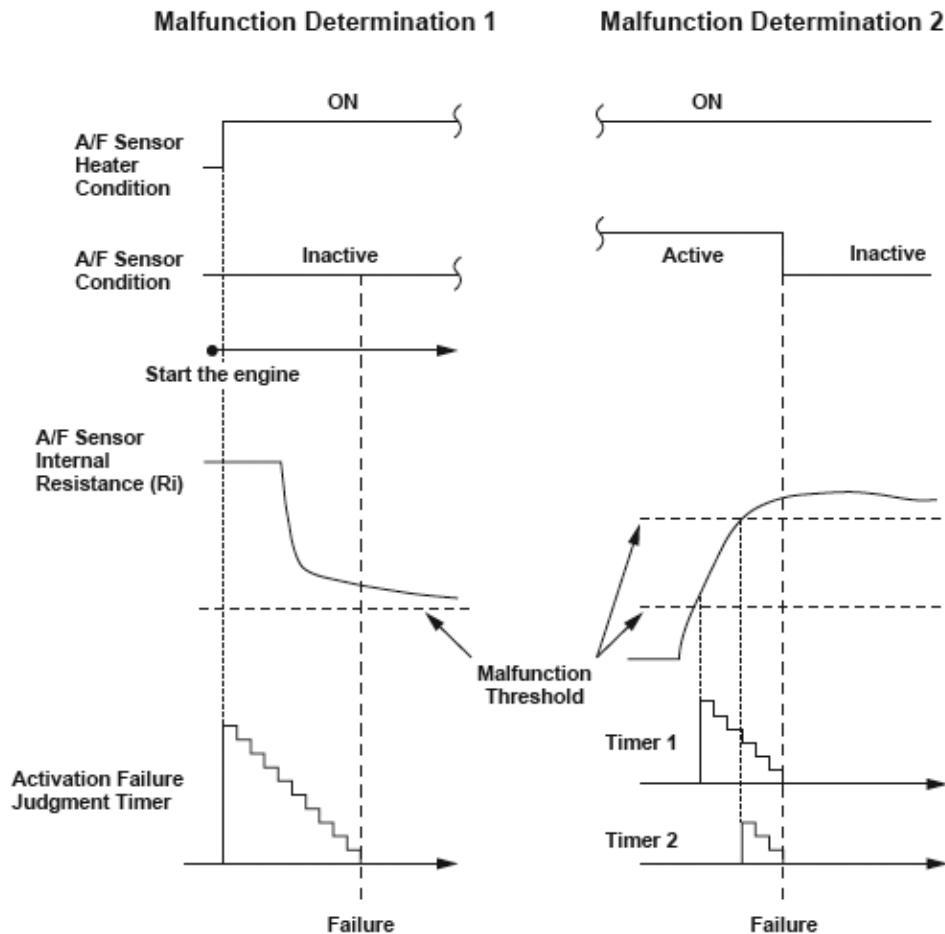
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0134 (41): ADVANCED DIAGNOSTICS

### DTC P0134: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) HEATER SYSTEM MALFUNCTION



P0134-0670

**Fig. 28: Air/Fuel Ratio (A/F) Sensor 1 Malfunction Determination**

### General Description

The air/fuel ratio (A/F) sensor is activated by warming the element with a heater to maintain it at a steady high temperature for accurate air/fuel (A/F) ratio calculation. The A/F sensor does not become active when the element is not properly heated due to a heater malfunction, and the exhaust emissions deteriorate. The engine control module (ECM)/powertrain control module (PCM) monitors the A/F sensor condition by monitoring the A/F sensor internal resistance.

1. When the A/F sensor does not activate in a set time after the A/F sensor heater is turned on (with high A/F sensor internal resistance), a malfunction of the A/F sensor heater is detected, and a DTC is stored.
2. The A/F sensor heater cycles ON and OFF within a set time. The heater's state is detected by monitoring the internal resistance of the A/F sensor. If the resistance remains high when the heater is ON, a malfunction in the A/F sensor heater is detected, and a DTC is stored.

Because the degree of effect on engine control differs according to the A/F sensor internal resistance, there are two malfunction detection threshold levels. When either one is reached, a malfunction is detected.

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#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	40 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	10.5 V	-
Fuel feedback	Other than during fuel cut-off operation	
No active DTCs	P0135, P1157, P1172, P2195, P2238, P2252	

#### Malfunction Threshold

##### Malfunction determination 1

The A/F sensor internal resistance value is 50 ohms or more for at least 40 seconds right after the engine starts.

##### Malfunction determination 2

- The A/F sensor internal resistance value is 50 ohms or more for at least 15 seconds.
- The A/F sensor internal resistance value is 80 ohms or more for at least 1 second.

#### Driving Pattern

Start the engine, then let it idle for at least 2 minutes.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

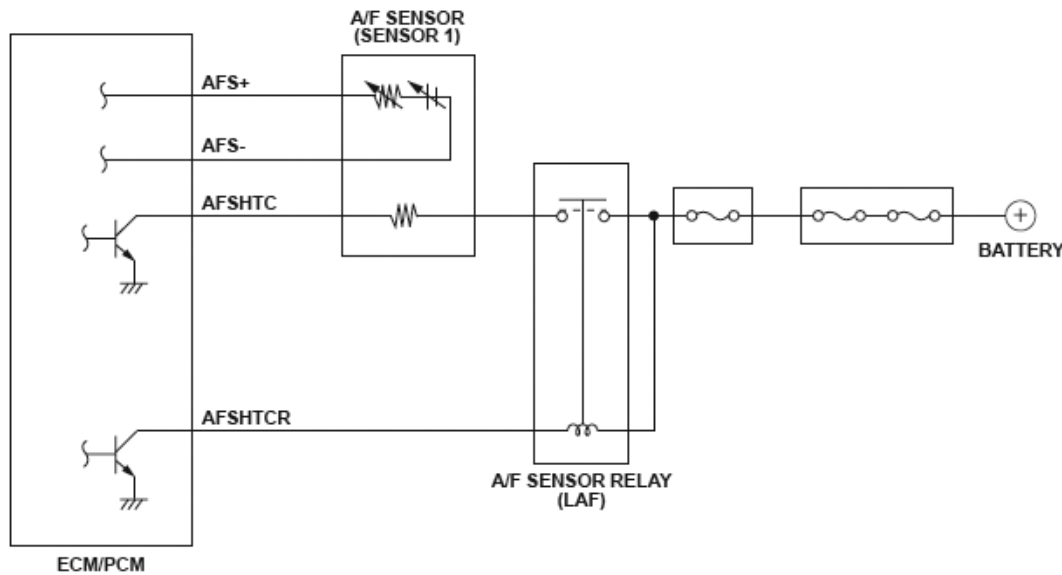
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear

command or by disconnecting the battery.

## DTC P0135 (41): ADVANCED DIAGNOSTICS

### DTC P0135: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) HEATER CIRCUIT MALFUNCTION



P0135-0700

**Fig. 29: Air/Fuel Ratio (A/F) Sensor 1 Heater Circuit Diagram**

#### General Description

A heater for the sensor element is embedded in the air/fuel ratio (A/F) sensor (sensor 1), and it is controlled by the engine control module (ECM)/powertrain control module (PCM). It is activated and heats the sensor to stabilize and speed up the detection of oxygen content when the exhaust gas temperature is cold.

If the A/F sensor (sensor 1) heater current is not a set value, or the heater is overheated, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	4 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions



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2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	68 °F (20 °C)	-
Battery voltage	10.5 V	-
State of the engine	Running	
No active DTCs	P0117, P0118, P0134, P1157, P2195, P2238, P2252	

### Malfunction Threshold

One of these conditions must be met.

- The heater current is 0.8 A or more for at least 4 seconds while the heater is activated, and the heater current is 0.8 A or less for at least 4 seconds while the heater is not activated.
- . The heater current is 15.2 A or more for at least 0.6 second.

### Driving Pattern

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

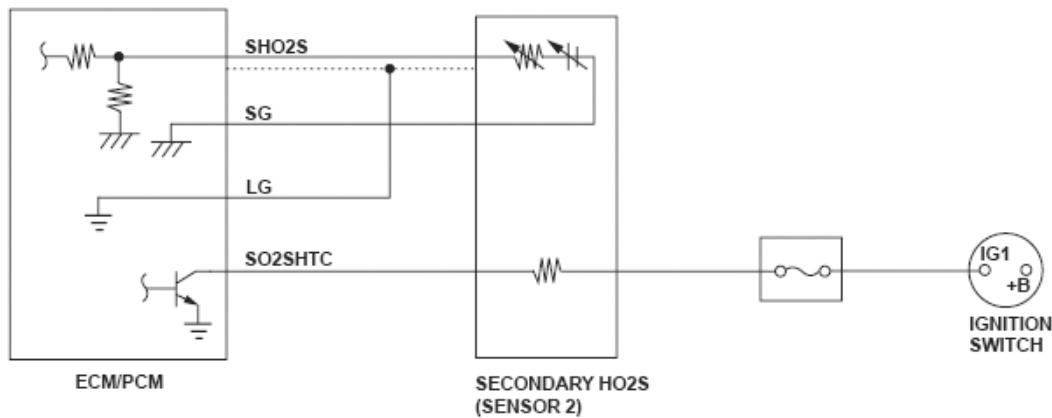
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

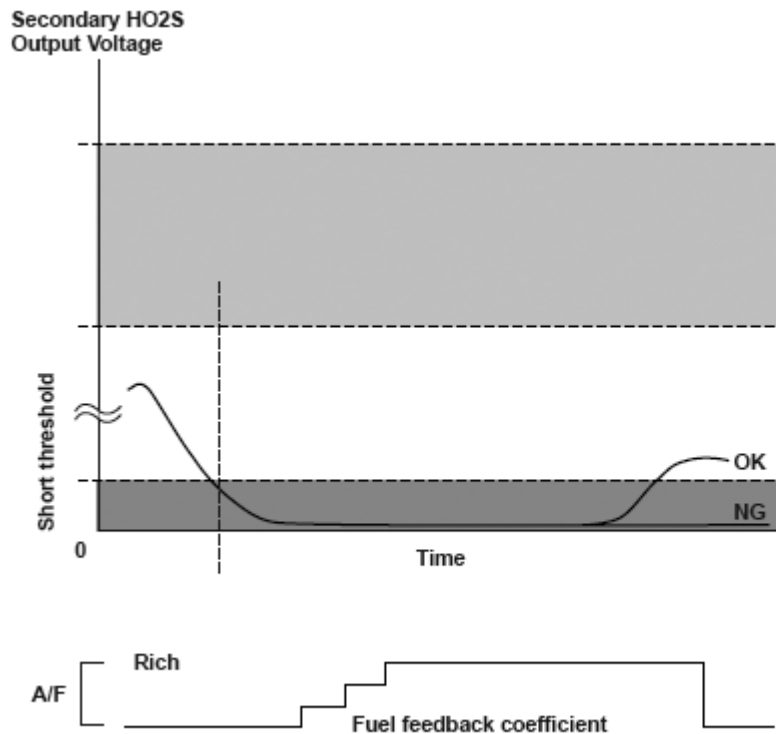
## DTC P0137 (63): ADVANCED DIAGNOSTICS

### DTC P0137: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2)) CIRCUIT LOW VOLTAGE



P0137-0302

**Fig. 30: Secondary Heated Oxygen Sensor 2 Heater Circuit Diagram**



P0137-0570

**Fig. 31: Secondary Heated Oxygen Sensor Output Voltage - Graph**

**General Description**

The secondary heated oxygen sensor (HO2S) (sensor 2) detects the oxygen content in the exhaust gas downstream of the three way catalytic converter (TWC) during stoichiometric air/fuel ratio feedback control based on the air/fuel ratio (A/F) sensor (sensor 1) output voltage. The secondary HO2S controls the air/fuel ratio from the A/F sensor output voltage so that the

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TWC efficiency is optimized.

After current is applied to the secondary HO2S heater, if the secondary HO2S output continues low (lean) during feedback control, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	30 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time that secondary HO2S activity is not monitored after starting the engine	15 seconds	-
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	-13 °F (-25 °C)	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0112, P0113, P0117, P0118, P0133, P0134, P0135, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2238, P2252, P2646, P2647, P2648, P2649, P2A00	
Other	Other than at idle	

#### Malfunction Threshold

The secondary HO2S output voltage is 0.05 V or less for at least 30 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Then, drive immediately at a steady engine speed between 1,500 - 3,000 rpm for at least 1 minute.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

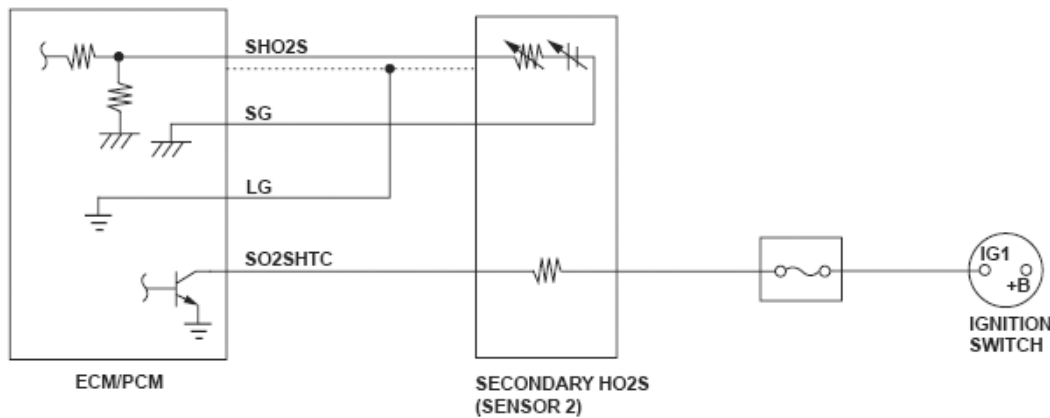
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

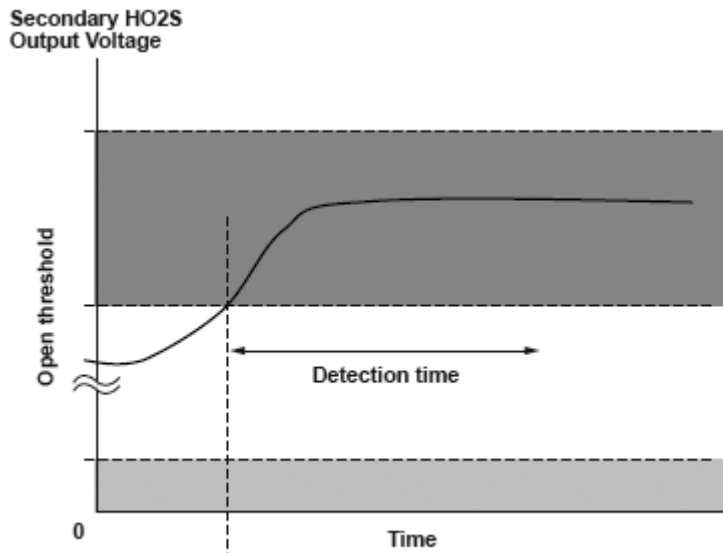
**DTC P0138 (63): ADVANCED DIAGNOSTICS**

**DTC P0138: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2)) CIRCUIT HIGH VOLTAGE**



P0137-0302

**Fig. 32: Secondary Heated Oxygen Sensor 2 Heater Circuit Diagram**



P0138-0570

**Fig. 33: Secondary Heated Oxygen Sensor Output Voltage - Graph**

**General Description**

The secondary heated oxygen sensor (HO2S) (sensor 2) detects the oxygen content in the exhaust gas downstream of the three way catalytic converter (TWC) during stoichiometric air/fuel ratio feedback control based on the air/fuel ratio (A/F) sensor (sensor 1) output voltage. The secondary HO2S controls the air/fuel ratio from the A/F sensor output voltage to optimize TWC efficiency.

After current is applied to the secondary HO2S heater, if the secondary HO2S output continues high (rich) exceeding the upper limit used during feedback control, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time that secondary HO2S activity is not monitored after	15 seconds	-

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starting the engine		
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	-13 °F (-25 °C)	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0112, P0113, P0133, P0134, P0135, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2238, P2252, P2646, P2647, P2648, P2649, P2A00	
Other	Other than at idle	

#### Malfunction Threshold

The secondary HO2S output voltage is 1.270 V or more for at least 5 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Then, drive immediately at a steady engine speed between 1,500 - 3,000 rpm for at least 1 minute.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

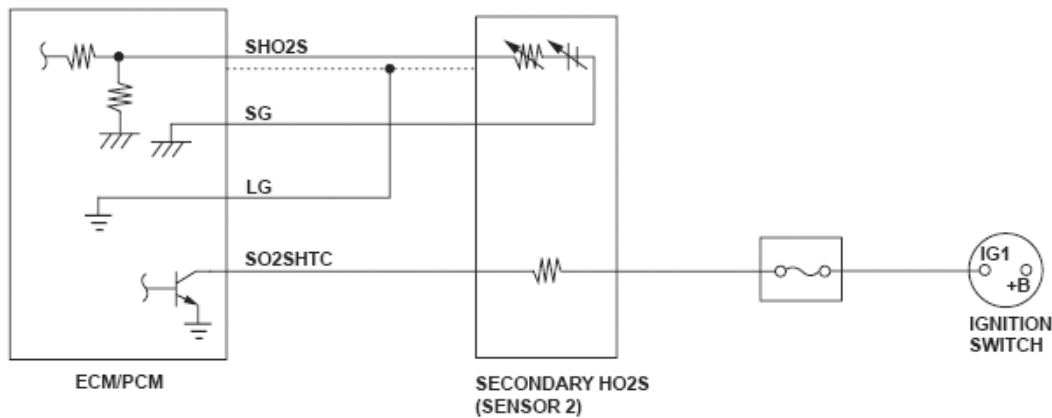
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

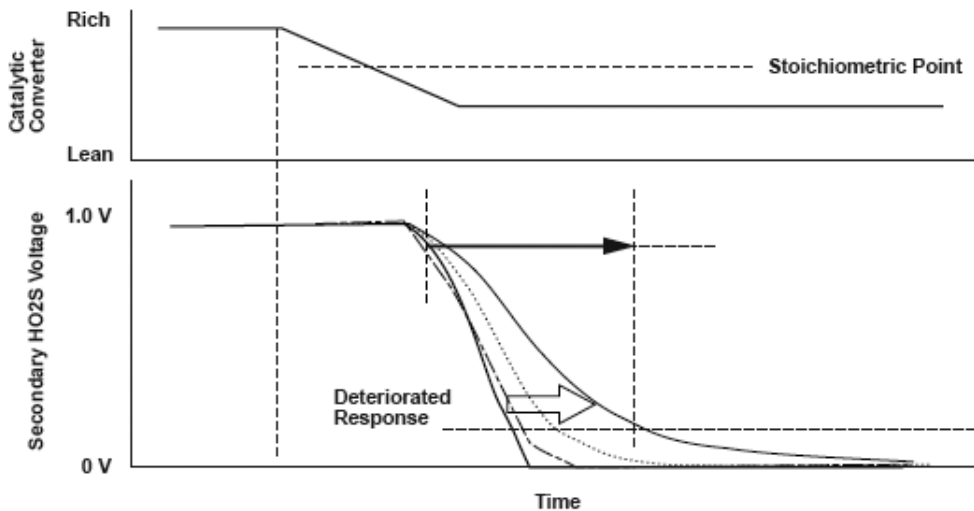
## DTC P0139 (63): ADVANCED DIAGNOSTICS

### DTC P0139: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2)) SLOW RESPONSE



P0137-0302

**Fig. 34: Secondary Heated Oxygen Sensor 2 Heater Circuit Diagram**



P0139-0570

**Fig. 35: Secondary Heated Oxygen Sensor Output Voltage - Graph**

**General Description**

The secondary heated oxygen sensor (HO2S) (sensor 2) detects the oxygen content in the exhaust gas downstream of the three way catalytic converter (TWC) during stoichiometric air/fuel ratio feedback control. The secondary HO2S controls the air/fuel ratio with the A/F sensor output voltage to optimize TWC efficiency.

If the response time of the secondary HO2S becomes longer than the specified time after current to the secondary HO2S heater is applied, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
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Sequence	None
Duration	15.7 seconds or less
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions****ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time that secondary HO2S activity is not monitored after starting the engine	15 seconds	-
Elapsed time after fuel cut-off	-	185 seconds
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	-13 °F (-25 °C)	-
Engine speed	A/T	1,300 rpm
	M/T	1,825 rpm
MAP value	27 kPa (7.9 in.Hg, 200 mmHg)	79 kPa (23.6 in.Hg, 600 mmHg)
Vehicle speed	30 mph (48 km/h)	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0117, P0118, P0133, P0134, P0135, P0137, P0138, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2238, P2252, P2270, P2271, P2646, P2647, P2648, P2649, P2A00	

**Malfunction Threshold**

1. When the secondary HO2S output drops to the response deterioration judgment threshold value and the response characteristics measurement is finished.

**MALFUNCTION THRESHOLD VALUE**

MIN	0.75 second
MAX	2.20 seconds

2. The voltage does not drop to the response deterioration judgment threshold value after a predetermined time (2.20 seconds) has elapsed.

**Driving Pattern**



1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Then, drive immediately at a steady speed of 35 mph (57 km/h) or more for at least 15.7 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

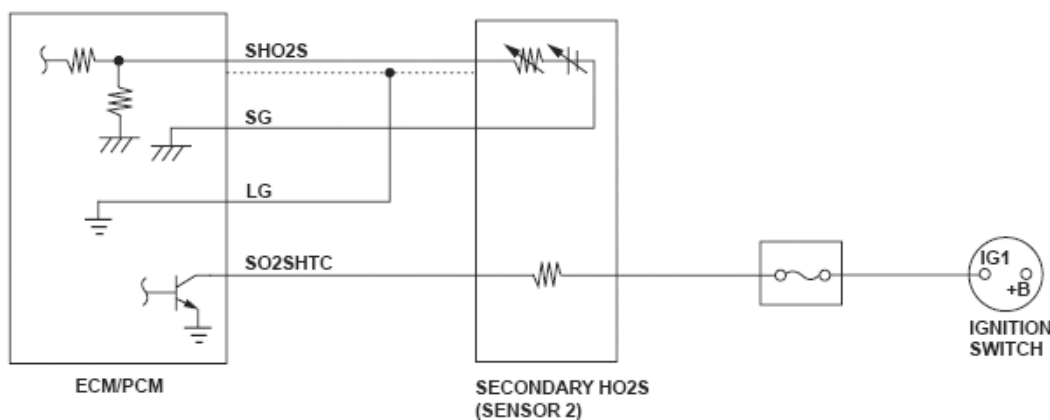
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0141 (65): ADVANCED DIAGNOSTICS**

**DTC P0141: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2)) HEATER CIRCUIT MALFUNCTION**



P0137-0302

**Fig. 36: Secondary Heated Oxygen Sensor 2 Heater Circuit Diagram**

**General Description**

A heater for the zirconia element is embedded in the secondary heated oxygen sensor (secondary HO2S), and it is controlled by the engine control module (ECM)/powertrain control module (PCM). When activated, it heats the sensor to stabilize and speed up the detection of oxygen content when the exhaust gas temperature is cold.

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If the secondary HO2S heater draws other than a specified amperage, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage (IGP terminal of ECM/PCM)	11.0 V	16.0 V
Engine coolant temperature	41 °F (5 °C)	-
State of the engine	Running	
No active DTCs	P0117, P0118	

#### Malfunction Threshold

The current is 0.53 A or less, or 3.60 A or more, for at least 5 seconds when the heater is on.

#### Driving Pattern

Start the engine. Let it idle until the radiator fan comes on.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

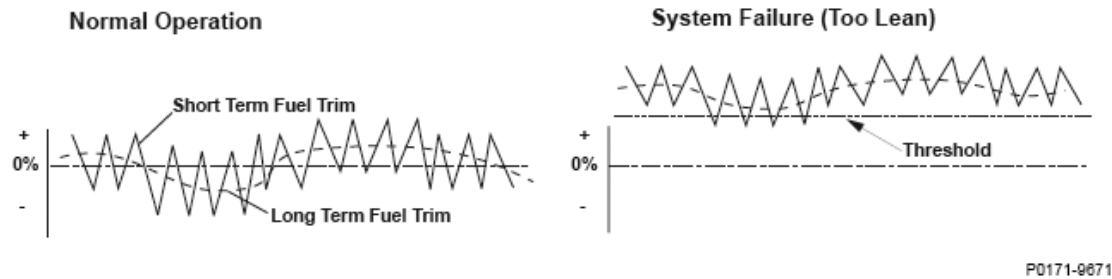
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0171 (45): ADVANCED DIAGNOSTICS

**DTC P0171: FUEL SYSTEM TOO LEAN**



**Fig. 37: Air/Fuel Ratio - Graph**

**General Description**

The engine control module (ECM)/powertrain control module (PCM) detects the oxygen content in the exhaust gas from the air/fuel ratio (A/F) sensor (sensor 1) signal voltage, and it uses fuel feedback control to maintain the optimal air/fuel ratio. The air/fuel ratio coefficient for correcting the amount of injected fuel is the short term fuel trim. The ECM/PCM varies short term fuel trim continuously to keep the air/fuel ratio close to the stoichiometric ratio for all driving conditions.

Long term fuel trim is computed from short term fuel trim and is used to regulate long term deviation from the stoichiometric air/fuel ratio, which occurs when fuel metering components deteriorate with age or system failures occur. In addition, long term fuel trim is stored in the ECM/PCM memory and is used to determine when fuel metering components malfunction.

When long term fuel trim is higher than normal, which is about 1.0 (0 %), the amount of injected fuel must be increased, and when lower than normal, it must be decreased. If long term fuel trim is higher than normal (too lean), a malfunction in the fuel metering components is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle <sup>(1)</sup>
Sequence	None
Duration	Every 7 seconds
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

(1) The malfunction judgment is cleared when it is judged as normal under the same driving conditions in which the malfunction is detected.

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Engine coolant		

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temperature	156 °F (69 °C)	-
Intake air temperature	19 °F (-7 °C)	-
Engine speed	A/T	4,000 rpm
	M/T	4,100 rpm
MAP value	20 kPa (6.0 in.Hg, 150 mmHg)	-
Fuel feedback	Closed loop	
Monitoring priority	P0420, P0456, P0457, P0497	
No active DTCs	P0107, P0108, P0112, P0113, P0117, P0118, P0134, P0135, P0137, P0138, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0341, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2270, P2271, P2646, P2646, P2647, P2647, P2648, P2649	

#### Malfunction Threshold

Long term fuel trim is higher than 1.18 (+18 %).

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Then, drive at a steady speed between 15 - 75 mph (24 - 120 km/h) for at least 15 minutes, and watch the long term fuel trim. If the long term fuel trim stays at about 1.0, the vehicle is OK or it is a very minor problem. If a significant fault is still present, the long term fuel trim will move up or down while driving.
  - When freeze frame data is stored, drive the vehicle under those conditions instead of Driving Pattern 2.
  - If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
  - After clearing the DTC by disconnecting the battery or using the scan tool, extend Driving Pattern 2 to 40 minutes or longer to allow time for long term fuel trim to recover.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

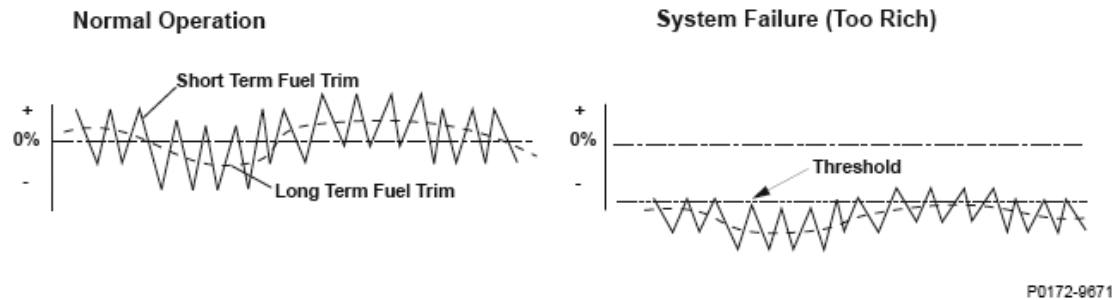
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0172 (45): ADVANCED DIAGNOSTICS

### DTC P0172: FUEL SYSTEM TOO RICH



**Fig. 38: Air/Fuel Ratio - Graph**

#### General Description

The engine control module (ECM)/powertrain control module (PCM) detects the oxygen content in the exhaust gas from the air/fuel ratio (A/F) sensor (sensor 1) signal voltage, and it uses fuel feedback control to maintain the optimal air/fuel ratio. The air/fuel ratio coefficient for correcting the amount of injected fuel is the short term fuel trim. The ECM/PCM varies short term fuel trim continuously to keep the air/fuel ratio close to the stoichiometric ratio for all driving conditions. Long term fuel trim is computed from short term fuel trim and is used to regulate long term deviation from the stoichiometric air/fuel ratio, which occurs when fuel metering components deteriorate with age or system failures occur. In addition, long term fuel trim is stored in the ECM/PCM memory and is used to determine when fuel metering components malfunction. When long term fuel trim is higher than normal, which is about 1.0 (0 %), the amount of injected fuel must be increased, and when lower than normal, it must be decreased. If long term fuel trim is lower than normal (too rich), a malfunction in the fuel metering components is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle <sup>(1)</sup>
Sequence	None
Duration	11.2 seconds
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

(1) The malfunction judgment is cleared when it is judged as normal under the same driving conditions in which the malfunction is detected.

#### Enable Conditions

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	19 °F (-7 °C)	-
Engine speed	550 rpm	A/T 4,000 rpm
		M/T 4,100 rpm
MAP value	20 kPa (6.0 in.Hg, 150 mmHg)	-
Fuel feedback	Closed loop	
Monitoring priority	P0420, P0456, P0457, P0497	
No active DTCs	P0107, P0108, P0112, P0113, P0117, P0118, P0134, P0135, P0137, P0138, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0341, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2270, P2271, P2646, P2646, P2647, P2647, P2648, P2649	

#### Malfunction Threshold

Long term fuel trim is lower than 0.81 (-19 %).

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Then, drive at a steady speed between 15 - 75 mph (24 - 120 km/h) for at least 15 minutes, and watch the long term fuel trim. If the long term fuel trim stays at about 1.0, the vehicle is OK or it is a very minor problem. If a significant fault is still present, the long term fuel trim will move up or down while driving.
  - When freeze frame data is stored, drive the vehicle under those conditions instead of Driving Pattern 2.
  - If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
  - After clearing the DTC by disconnecting the battery or using the scan tool, extend Driving Pattern 2 to 40 minutes or longer to allow time for long term fuel trim to recover.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

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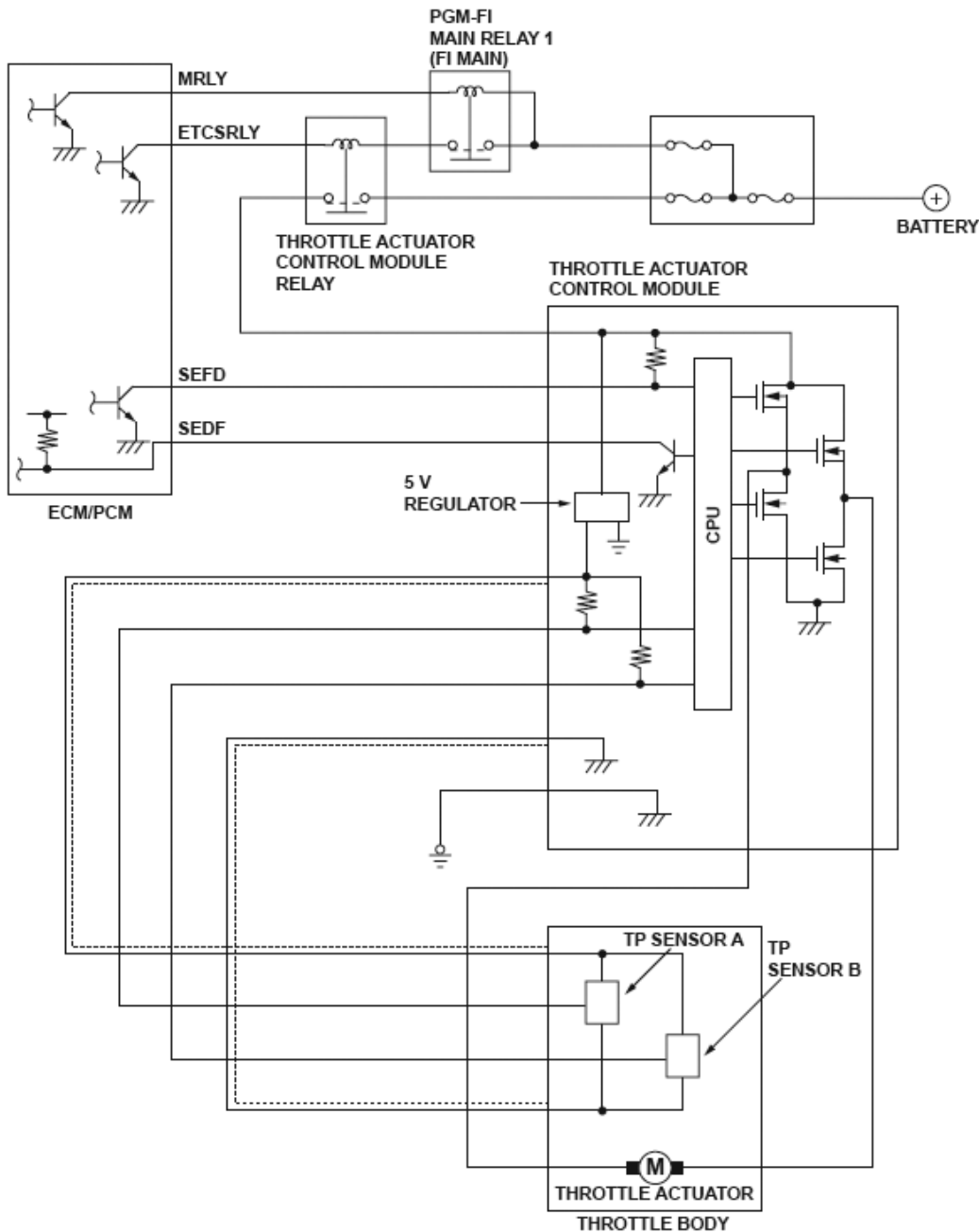
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The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

### **DTC P0222 (7): ADVANCED DIAGNOSTICS**

**DTC P0222: THROTTLE POSITION (TP) SENSOR B CIRCUIT LOW VOLTAGE**



P0122-0700

**Fig. 39: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

Throttle position (TP) sensor B is a semiconductor type, and it is attached to the throttle body and shaft to determine throttle valve position.

The throttle valve position signal from TP sensor B is transmitted to the throttle actuator control module for target position feedback control, then to the engine control module (ECM)/powertrain control module (PCM) as



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an actual throttle valve position signal.

If the signal from TP sensor B is a fixed value or less for a set time, the throttle actuator control module detects a malfunction and sends the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a TP sensor B malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0223, P2101, P2108, P2118, P2135, P2176, U0107

#### Malfunction Threshold

The TP sensor B output voltage is 0.3 V or less for at least 0.2 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

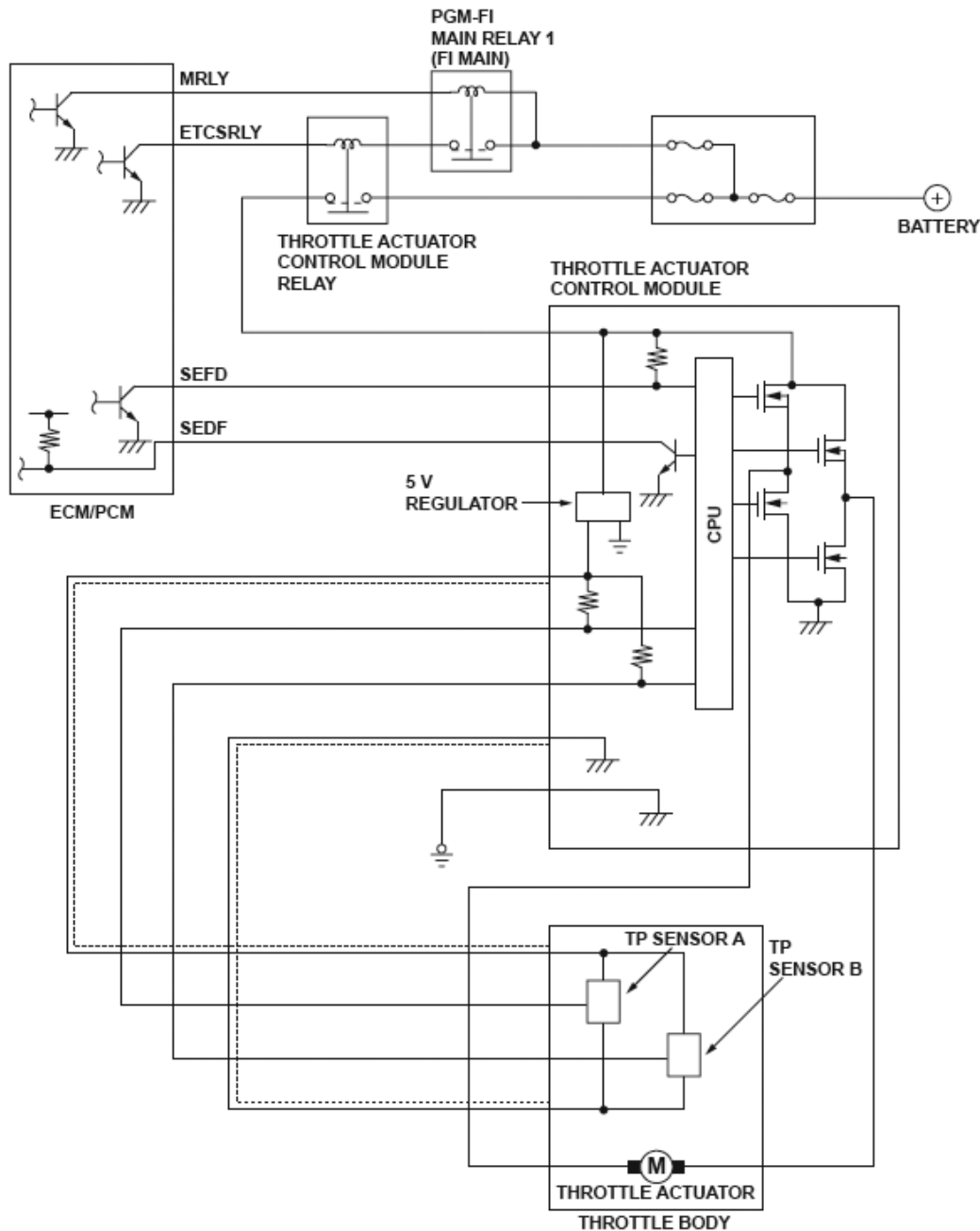
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0223 (7): ADVANCED DIAGNOSTICS

### DTC P0223: THROTTLE POSITION (TP) SENSOR B CIRCUIT HIGH VOLTAGE



P0122-0700

**Fig. 40: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

Throttle position (TP) sensor B is a semiconductor type, and it is attached to the throttle body and shaft to determine throttle valve position.

The throttle valve position signal from TP sensor B is transmitted to the throttle actuator control module for target position feedback control, then to the engine control module (ECM)/powertrain control module (PCM) as

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an actual throttle valve position signal.

If the signal from TP sensor B is a fixed value or more for a set time, the throttle actuator control module detects a malfunction and sends the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a TP sensor B malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0222, P2101, P2108, P2118, P2135, P2176, U0107

#### Malfunction Threshold

The TP sensor B output voltage is 4.8 V or more for at least 0.2 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

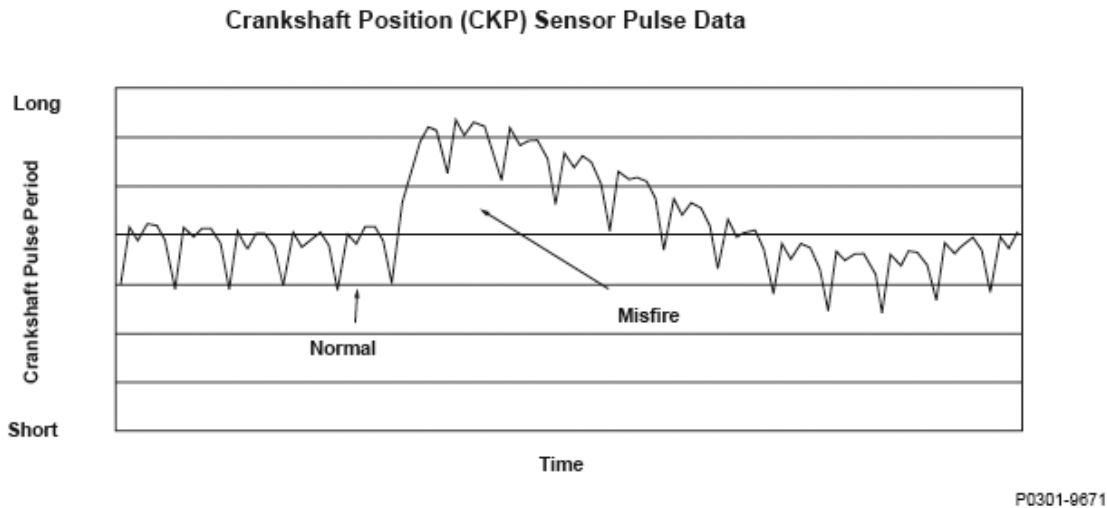
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0300 (75): ADVANCED DIAGNOSTICS

### DTC P0300: RANDOM MISFIRE DETECTED



**Fig. 41: Crankshaft Position Sensor Pulse Data**

**General Description**

The crankshaft vibrates slightly when each cylinder fires. If a misfire occurs, the crankshaft rotation speed changes rapidly. The engine control module (ECM)/powertrain control module (PCM) monitors the crankshaft rotation speed based on the output pulses from the crankshaft position (CKP) sensor. By monitoring changes in the crankshaft rotation speed, the ECM/PCM counts the number of misfires and determines which cylinder is misfiring. If more than one DTC from P0301 through P0304 has been stored while misfires in multiple cylinders are detected, a malfunction is detected and a DTC is stored.

There are two types of misfire detection.

**Type 1 (1 drive cycle):** When the number of misfires per 200 engine revolutions reaches the level that damages the three way catalyst (TWC), a DTC is stored and the MIL blinks. When the misfire ceases, the MIL remains on steady instead of blinking.

**Type 2 (2 drive cycles):** When the number of misfires per 1,000 engine revolutions reaches the level that affects FTP mode exhaust emissions, a DTC is stored and the MIL comes on.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution		Continuous
Sequence		None
Duration	Type 1	Every 200 rpm
	Type 2	Every 1,000 rpm
DTC Type		Two drive cycles, MIL ON
OBD Status		PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### ENABLE CONDITIONS

Condition		Minimum	Maximum
Engine coolant temperature		14 °F (-10 °C) <sup>(1)</sup>	-
		68 °F (20 °C) <sup>(2)</sup>	
Engine speed		500 rpm	6,500 rpm
MAP value <sup>(3)</sup>	700 rpm	A/T	25 kPa (7.3 in.Hg, 183 mmHg)
		M/T	24 kPa (6.9 in.Hg, 173 mmHg)
	2,500 rpm	A/T	23 kPa (6.7 in.Hg, 168 mmHg)
		M/T	21 kPa (6.1 in.Hg, 154 mmHg)
Fuel feedback		Other than during fuel cut-off operation	
No active DTCs		P0107, P0108, P0117, P0118, P0122, P0123, P0222, P0223, P0335, P0339, P1128, P1129, P2227, P2228, P2229	
Other		Test-drive on a flat road to avoid misdetection	
<p>(1) When starting the engine at an engine coolant temperature of more than 14 °F (-10 °C).</p> <p>(2) When starting the engine at an engine coolant temperature of 14 °F (-10 °C) or less.</p> <p>(3) Varies with driving conditions.</p>			

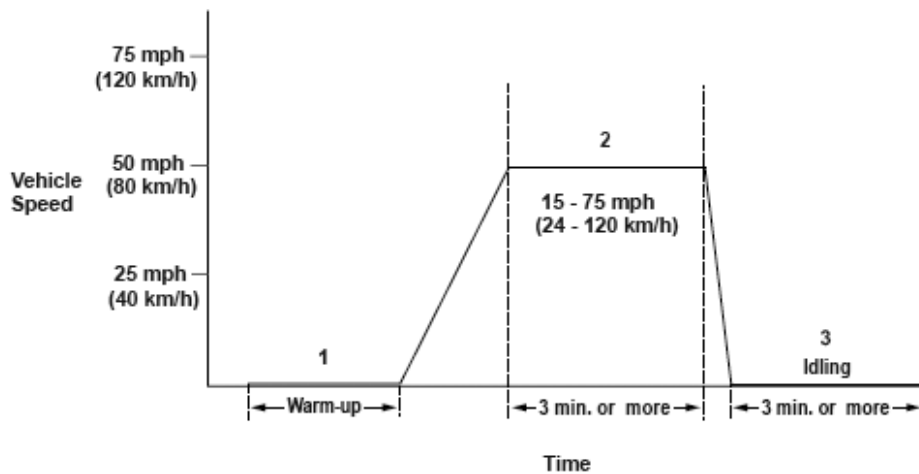
#### Malfunction Threshold

The number of misfires versus engine revolutions is equal to or greater than the values in the table.

#### MALFUNCTION THRESHOLD VALUE

Misfire Type	The number of engine revolutions	The number of misfires
Misfire Type 1 (Severe)	Per 200 revolutions	18 - 90 times <sup>(1)</sup>
Misfire Type 2 (Light)	Per 1,000 revolutions	105 times
(1) Depending on engine speed and load.		

#### Driving Pattern



P0301-0350

**Fig. 42: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 15 - 75 mph (24 - 120 km/h) for at least 3 minutes.
3. Stop the vehicle, and let the engine idle for at least 3 minutes.
  - When freeze frame data is stored, drive the vehicle under those conditions instead of Driving Patterns 2 or 3.
  - When you have difficulty duplicating the DTC because of road conditions and traffic situations, repeat the driving pattern several times.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

Misfire Type 1: Under high rpm or high load conditions: The MIL blinks once per second if a type 1 misfire (catalyst damaging) occurs, and a Temporary DTC is stored. If the type 1 misfire ceases, the MIL goes off. If a type 1 misfire occurs during the next (second) drive cycle, the MIL blinks at the first misfire occurrence, and the DTC and the freeze frame data are stored. The MIL remains on steady if the type 1 misfire ceases.

Under normal driving conditions: The MIL blinks once per second if a type 1 misfire occurs a third time, and a Temporary DTC is stored. If a type 1 misfire occurs during the next (second) drive cycle, the MIL blinks during the third type 1 misfire occurrence, and the DTC and the freeze frame data are stored. If the type 1 misfire ceases, the MIL remains on steady.

Misfire Type 2: When a type 2 misfire (emission-related but not severe enough to immediately damage the TWC) occurs within the first 1,000 engine revolutions after engine start-up, a Temporary DTC is stored.

If a type 2 misfire occurs after the first 1,000 engine revolutions after engine start-up, a Temporary DTC is stored during the fourth type 2 misfire occurrence.

If a type 2 misfire occurs during the next (second) drive cycle, the MIL comes on, and the DTC and the freeze frame data are stored.

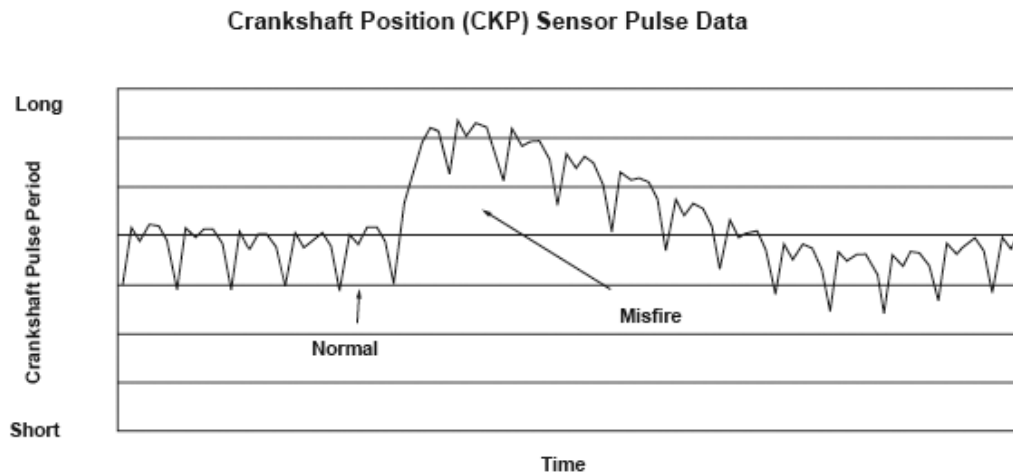
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0301 (71), P0302 (72), P0303 (73), P0304 (74): ADVANCED DIAGNOSTICS

**DTC P0301: NO. 1 CYLINDER MISFIRE DETECTED; DTC P0302: NO. 2 CYLINDER MISFIRE DETECTED; DTC P0303: NO. 3 CYLINDER MISFIRE DETECTED; DTC P0304: NO. 4 CYLINDER MISFIRE DETECTED**



**Fig. 43: Crankshaft Position Sensor Pulse Data**

#### General Description

The crankshaft vibrates slightly when each cylinder fires. If a misfire occurs, the crankshaft rotation speed changes rapidly. The engine control module (ECM)/powertrain control module (PCM) monitors engine misfiring based on the output pulses from the crankshaft position (CKP) sensor, counts the number of misfires, and determines which cylinder is misfiring. If a misfire is detected, a DTC is stored.

There are two types of misfire detection.

**Type 1 (1 drive cycle):** When the number of misfires per 200 engine revolutions reaches the level that damages the three way catalyst (TWC), a DTC is stored and the MIL blinks. When the misfire ceases, the MIL remains on steady instead of blinking.

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Type 2 (2 drive cycles): When the number of misfires per 1,000 engine revolutions reaches the level that affects FTP mode exhaust emissions, a DTC is stored and the MIL comes on.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous	
Sequence	None	
Duration	Type 1	Every 200 rpm
	Type 2	Every 1,000 rpm
DTC Type	Two drive cycles, MIL ON	
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION	

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum		
Engine coolant temperature	14 °F (-10 °C) <sup>(1)</sup>	-		
	68 °F (20 °C) <sup>(2)</sup>			
Engine speed	500 rpm	6,500 rpm		
MAP value <sup>(3)</sup>	700 rpm	A/T	25 kPa (7.3 in.Hg, 183 mmHg)	-
		M/T	24 kPa (6.9 in.Hg, 173 mmHg)	
	2,500 rpm	A/T	23 kPa (6.7 in.Hg, 168 mmHg)	-
		M/T	21 kPa (6.1 in.Hg, 154 mmHg)	
Fuel feedback	Other than during fuel cut-off operation			
No active DTCs	P0117, P0118, P0122, P0123, P0222, P0223, P0335, P0339, P1128, P1129, P2227, P2228, P2229			
Other	Test-drive on a flat road to avoid misdetection			

(1) When starting the engine at an engine coolant temperature of more than 14 °F (-10 °C).

(2) When starting the engine at an engine coolant temperature of 14 °F (-10 °C) or less.

(3) Varies with driving conditions.

#### Malfunction Threshold

The number of misfires versus engine revolutions is equal to or greater than the values in the table.

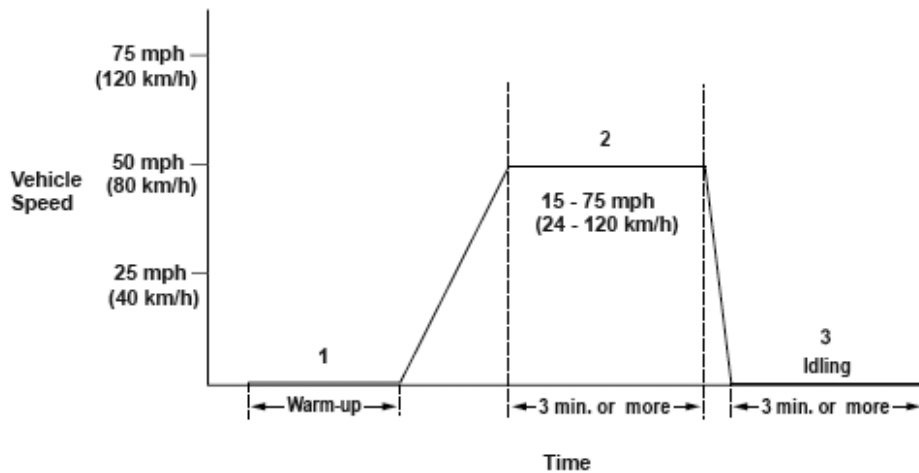
#### MALFUNCTION THRESHOLD VALUE

Misfire Type	The number of engine revolutions	The number of misfires
Misfire Type 1 (Severe)	Per 200 revolutions	18 - 90 times <sup>(1)</sup>
Misfire Type 2 (Light)	Per 1,000 revolutions	105 times

(1) Depending on engine speed and load.



## Driving Pattern



P0301-0350

**Fig. 44: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 15 - 75 mph (24 - 120 km/h) for at least 3 minutes.
3. Stop the vehicle, and let the engine idle for at least 3 minutes.
  - When freeze frame data is stored, drive the vehicle under those conditions instead of Driving Patterns 2 or 3.
  - When you have difficulty duplicating the DTC because of road conditions and traffic situations, repeat the driving pattern several times.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

## Diagnosis Details

### Conditions for illuminating the MIL

**Misfire Type 1:** Under high rpm or high load conditions: The MIL blinks once per second if a type 1 misfire (catalyst damaging) occurs, and a Temporary DTC is stored. If the type 1 misfire ceases, the MIL goes off. If a type 1 misfire occurs during the next (second) drive cycle, the MIL blinks at the first misfire occurrence, and the DTC and the freeze frame data are stored. The MIL remains on steady if the type 1 misfire ceases.

**Under normal driving conditions:** The MIL blinks once per second if a type 1 misfire occurs a third time, and a Temporary DTC is stored. If a type 1 misfire occurs during the next (second) drive cycle, the MIL blinks during the third type 1 misfire occurrence, and the DTC and the freeze frame data are stored. If the type 1 misfire ceases, the MIL remains on steady.

**Misfire Type 2:** When a type 2 misfire (emission-related but not severe enough to immediately damage the TWC) occurs within the first 1,000 engine revolutions after engine start-up, a Temporary DTC is stored.

If a type 2 misfire occurs after the first 1,000 engine revolutions after engine start-up, a Temporary DTC is stored during the fourth type 2 misfire occurrence.

If a type 2 misfire occurs during the next (second) drive cycle, the MIL comes on, and the DTC and the freeze frame data are stored.

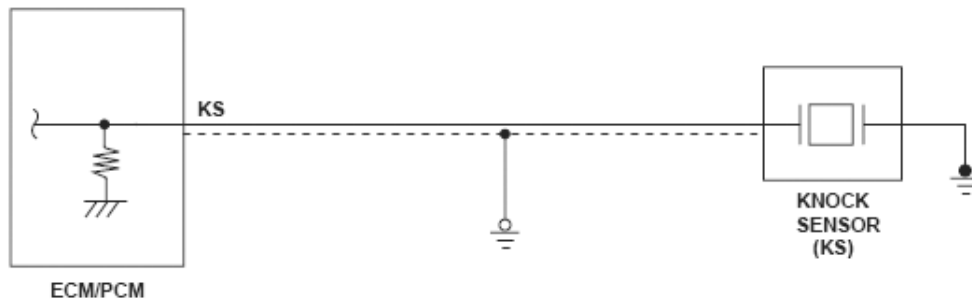
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0325 (23): ADVANCED DIAGNOSTICS**

**DTC P0325: KNOCK SENSOR CIRCUIT MALFUNCTION**



P0325-0302

**Fig. 45: Knock Sensor Circuit Diagram**

**General Description**

The knock sensor is mounted on the engine block and detects engine knocking. The vibrations caused by the knocking are converted into electrical signals through the piezo ceramic element. The engine control module (ECM)/powertrain control module (PCM) controls the ignition timing based on the electrical signals. If the signals from the knock sensor do not vary for a set time, the ECM/PCM detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

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### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	140 °F (60 °C)	-
Engine speed	2,000 rpm	-
No active DTCs	P0112, P0113, P0117, P0118, P0335, P0339, P0340, P0341, P0344, P0365, P0369 P0606, P2646, P2647, P2648, P2649	

### Malfunction Threshold

No signals from the knock sensor are detected for at least 5 seconds.

### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Hold the engine speed at 3,000 - 4,000 rpm for at least 10 seconds.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

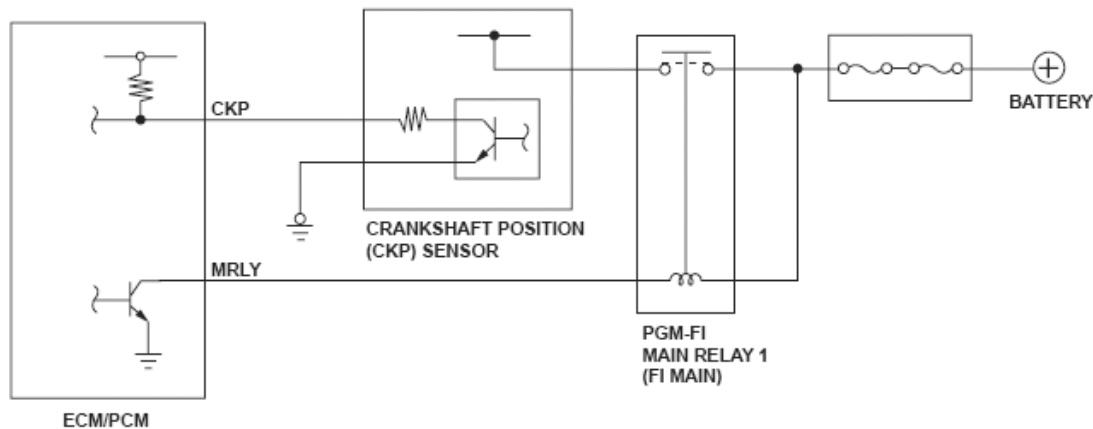
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0335 (4): ADVANCED DIAGNOSTICS

### DTC P0335: CRANKSHAFT POSITION (CKP) SENSOR NO SIGNAL



P0335-0101

**Fig. 46: Crankshaft Position Sensor Circuit Diagram**

**General Description**

The crankshaft position (CKP) sensor consists of a rotor and a semiconductor that detects rotor position. When the engine starts, the rotor turns and the magnetic flux in the semiconductor device changes. The changes of magnetic flux are converted into pulsing signals to the engine control module (ECM)/powertrain control module (PCM). The CKP sensor detects injection/ignition timing for each cylinder and engine speed.

If no pulsing signals from the CKP sensor are detected, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more (when the engine speed is 750 rpm)
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
State of the engine	Running
No active DTCs	P0365, P0369

**Malfunction Threshold**

No signals from the CKP sensor are input at least 63 times.

**Diagnosis Details**

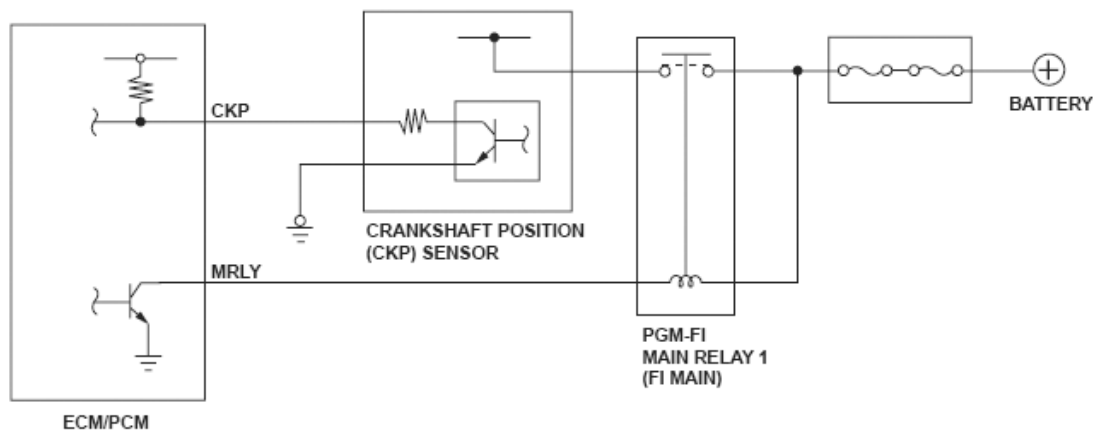
**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0339 (4): ADVANCED DIAGNOSTICS****DTC P0339: CRANKSHAFT POSITION (CKP) SENSOR CIRCUIT INTERMITTENT INTERRUPTION**

P0335-0101

**Fig. 47: Crankshaft Position Sensor Circuit Diagram****General Description**

The crankshaft position (CKP) sensor consists of a rotor and a semiconductor that detects rotor position. When the engine starts, the rotor turns and the magnetic flux in the semiconductor device changes. The changes of magnetic flux are converted into pulsing signals to the engine control module (ECM)/powertrain control module (PCM). The CKP sensor detects injection/ignition timing for each cylinder and engine speed.

If an abnormal amount of pulsing signals from the CKP sensor are detected, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status****MONITOR DESCRIPTION**

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## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Execution	Continuous
Sequence	None
Duration	2.0 seconds or more (when the engine speed is 750 rpm)
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0335

#### Malfunction Threshold

Abnormal signals from the CKP sensor are input at least 30 times.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

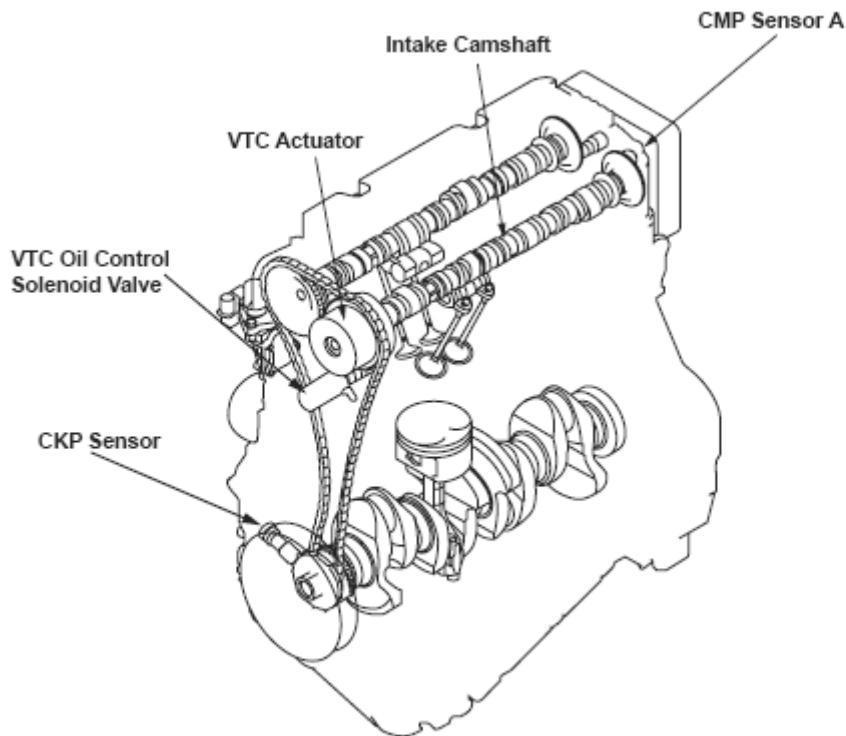
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0341 (57): ADVANCED DIAGNOSTICS

### DTC P0341: CAMSHAFT POSITION (CMP) SENSOR A AND CRANKSHAFT POSITION (CKP) SENSOR INCORRECT PHASE DETECTED



P0010-0370

**Fig. 48: Identifying Camshaft And Crankshaft Position Sensor**

**General Description**

Camshaft position (CMP) sensor A detects the intake camshaft timing and sends pulsing signals to the engine control module (ECM)/powertrain control module (PCM). The ECM/PCM determines the advance or the retard of the camshaft timing according to the signals from the crankshaft position (CKP) sensor and CMP sensor A. If the pulse deviates from a set range over a specified time period while the variable valve timing control (VTC) is not activated, or the timing of the camshaft deviates from a set range over a specified time period while the engine is running with the VTC activated, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

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## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Condition	Minimum	Maximum
Engine speed	400 rpm	-
No active DTCs	P0010, P0335, P0339, P0340, P0344, P1009	

#### Malfunction Threshold

##### VTC OFF

- The gap between the position of the CMP sensor A pulse and the median of the CMP sensor A assembly is  $10^\circ$  or more for at least 5 seconds.

##### Engine running, VTC active

- The timing of the camshaft is out of the specified range (other than when BTDC is between  $10 - 100^\circ$ ) for at least 5 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a steady speed between 19 - 38 mph (30 - 60 km/h) for at least 10 minutes.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

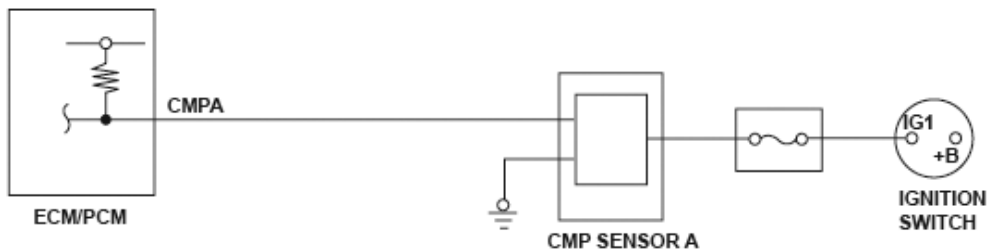
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0344 (57): ADVANCED DIAGNOSTICS

### DTC P0344: CAMSHAFT POSITION (CMP) SENSOR A CIRCUIT INTERMITTENT INTERRUPTION





P0340-0302

**Fig. 49: Camshaft Position (CMP) Sensor A Circuit Diagram**

**General Description**

Camshaft position (CMP) sensor A detects the intake camshaft timing and sends pulsing signals to the engine control module (ECM)/powertrain control module (PCM). The ECM/PCM determines the advance or the retard of the camshaft timing according to the signals from the crankshaft position (CKP) sensor and CMP sensor A. If the number of pulsing signals from CMP sensor A during intervals between the CKP standard pulses is more or less than the proper number, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	-
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
State of the engine	Running
No active DTCs	P0335, P0339, P0340

**Malfunction Threshold**

More or less than CMP sensor A pulses is detected during intervals between the CKP standard pulses at least 30 times.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

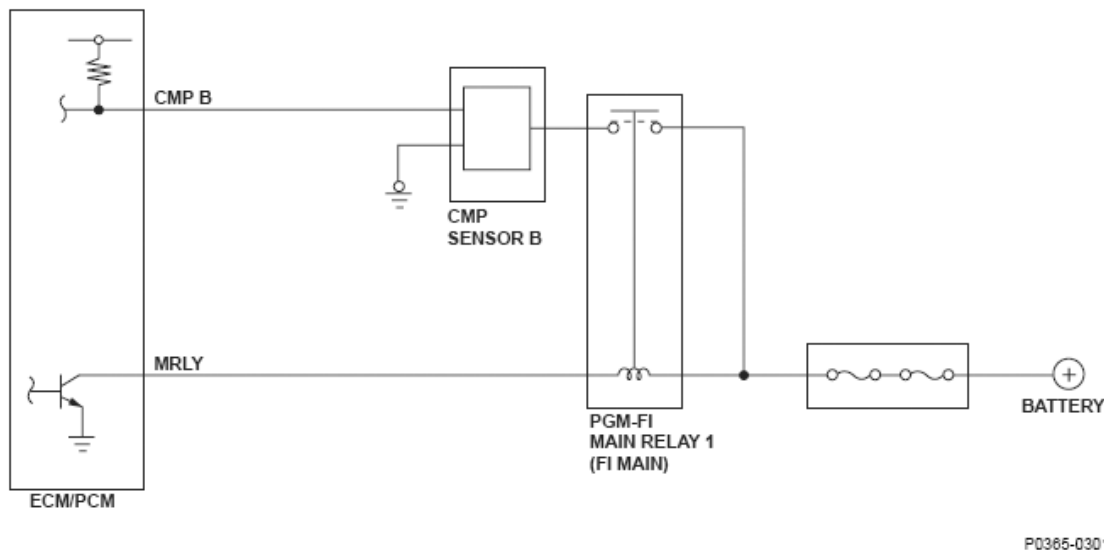
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0369 (8): ADVANCED DIAGNOSTICS**

**DTC P0369: CAMSHAFT POSITION (CMP) SENSOR B CIRCUIT INTERMITTENT INTERRUPTION**



**Fig. 50: Camshaft Position Sensor B Circuit Diagram**

**General Description**

The camshaft position (CMP) sensor B consists of a rotor and a semiconductor that detects rotor position. When the rotor turns after starting the engine, the changes of magnetic flux in the semiconductor are converted into pulsing signals to the engine control module (ECM)/powertrain control module (PCM). The CMP sensor B detects the top dead center of each cylinder for fuel injection timing.

If CMP sensor B pulsing signals are detected an abnormal number of times due to noise, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Duration	1.2 seconds or more (when the engine speed is 750 rpm)
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
State of the engine	Running
No active DTCs	P0335, P0339, P0365

#### Malfunction Threshold

Abnormal CMP sensor B pulsing signal is detected at least 30 times.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

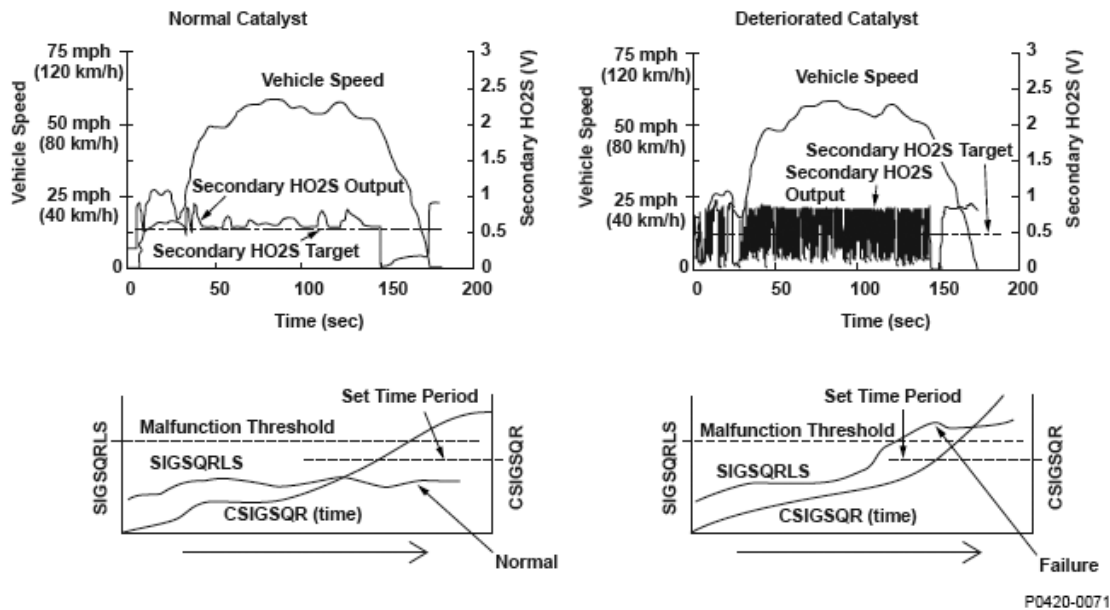
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0420 (67): ADVANCED DIAGNOSTICS

### DTC P0420: CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD

# 2007 Honda Element EX

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**Fig. 51: Secondary HO2S Output - Graph**

### General Description

The three way catalytic converter (TWC) converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NO<sub>x</sub>) in the exhaust gas to water vapor, carbon dioxide (CO<sub>2</sub>), and dinitrogen (N<sub>2</sub>).

The TWC efficiency does not depend entirely on engine conditions or the deterioration level of the TWC. It can be optimized by stabilizing the secondary HO2S output.

If the TWC deteriorates, the air/fuel ratio downstream of the TWC (the secondary HO2S output) often differs from the target secondary HO2S output, and the status is represented by the parameter (SIGSQRLS).

Therefore, if the SIGSQRLS exceeds a specified value for a set time, a malfunction is detected and a DTC is stored.

### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	52 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

### Enable Conditions

### ENABLE CONDITIONS

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P0420-0071

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Condition		Minimum	Maximum
Engine coolant temperature		156 °F (69 °C)	-
Intake air temperature		-13 °F (-25 °C)	-
Estimated TWC temperature		932 °F (500 °C)	-
Engine speed	A/T	1,300 rpm	2,600 rpm
	M/T	1,825 rpm	3,750 rpm
MAP value	A/T	27 kPa (7.9 in.Hg, 200 mmHg)	89 kPa (26.3 in.Hg, 670 mmHg)
	M/T		73 kPa (21.6 in.Hg, 550 mmHg)
Vehicle speed		4 mph (5 km/h)	-
Fuel trim		0.69	1.47
Fuel feedback		Closed loop	
Monitoring priority		P0456, P0457, P0497	
No active DTCs		P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0112, P0113, P0117, P0118, P0133, P0134, P0135, P0137, P0138, P0139, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2270, P2271, P2646, P2647, P2648, P2649, P2A00	

#### Malfunction Threshold

The number of detections is 832 (CTAGLT67)\*1, 416 (CTAGLT67)\*2 or more.

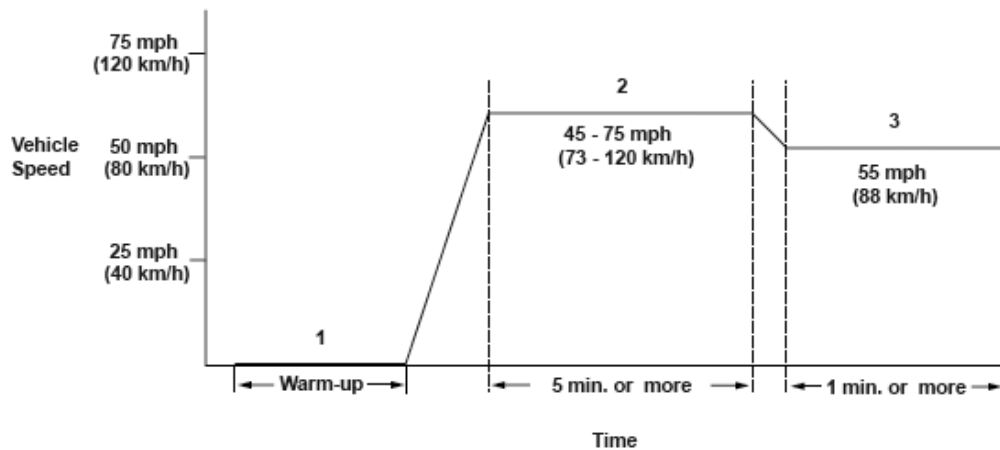
\*1: A/T model

\*2: M/T model

#### Driving Pattern

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0420-0350

**Fig. 52: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 45 - 75 mph (73 - 120 km/h) for at least 5 minutes, to warm up the TWC.
3. Set a vehicle speed of 55 mph (88 km/h) on the cruise control, and drive for at least 1 minute.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

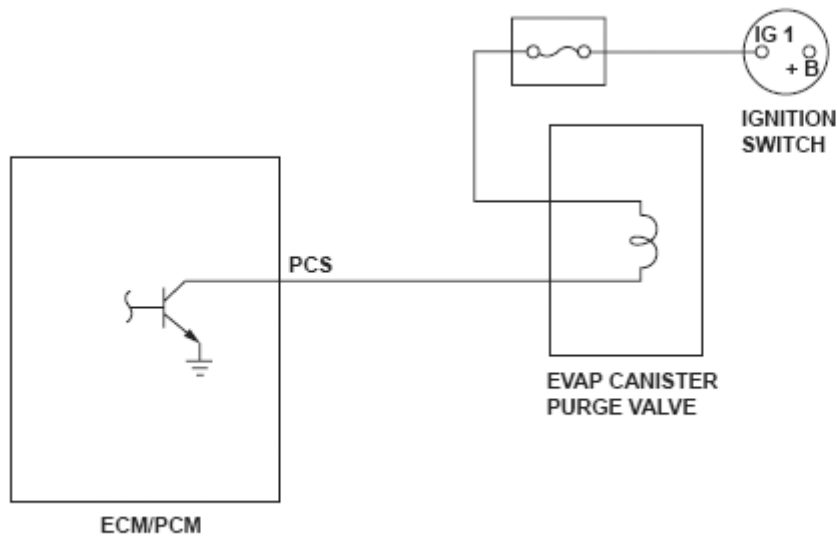
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0443 (92): ADVANCED DIAGNOSTICS

### DTC P0443: EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE CIRCUIT MALFUNCTION



P0443-0501

**Fig. 53: Evaporative Emission Control System Canister Purge Valve Circuit Diagram**

**General Description**

The evaporative emission (EVAP) canister purge valve is attached to the vacuum port between the EVAP canister and the intake manifold. The engine control module (ECM)/powertrain control module (PCM) does not turn on the EVAP canister purge valve when the engine coolant temperature is 131 °F (55 °C) or less. The ECM/PCM adjusts the amount of fuel vapor sent to the engine by controlling the EVAP canister purge valve duty cycle.

When the return signal does not change according to the EVAP canister purge valve output for a set time, the ECM/PCM detects a malfunction, and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	10.1 V	-
EVAP canister purge valve output duty	2 %	98 %

State of the engine

Running

**Malfunction Threshold**

The return signal does not change according to the EVAP canister purge valve output for at least 5 seconds.

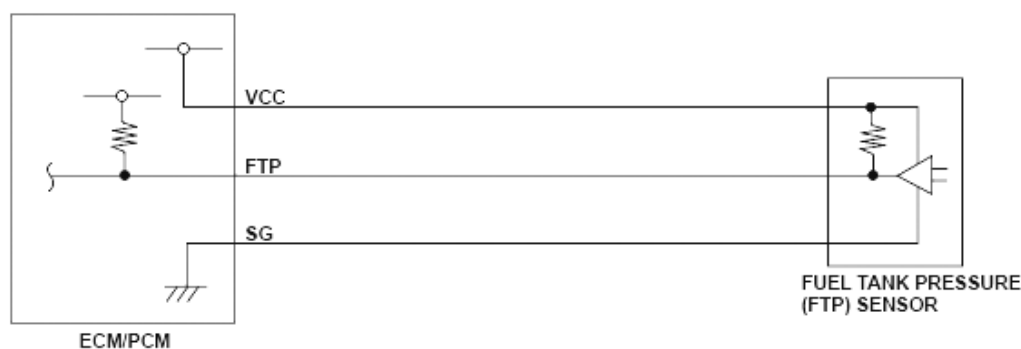
**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

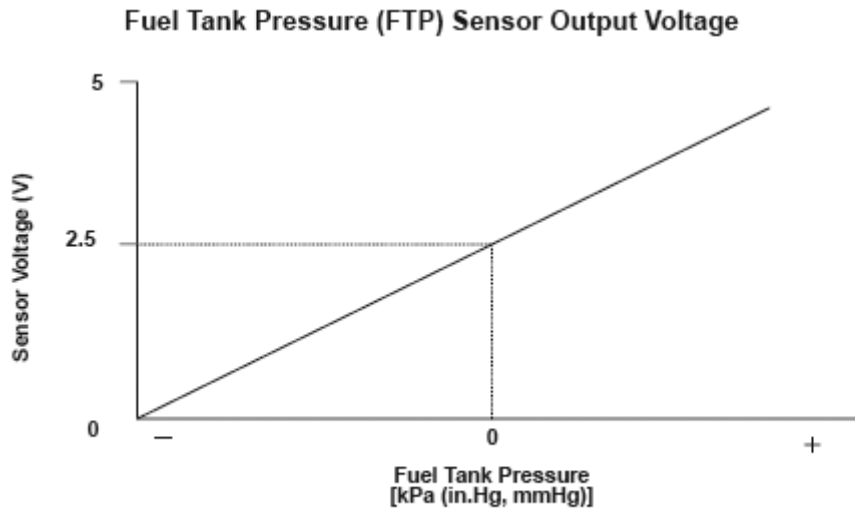
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0451 (91): ADVANCED DIAGNOSTICS****DTC P0451: FUEL TANK PRESSURE (FTP) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM**

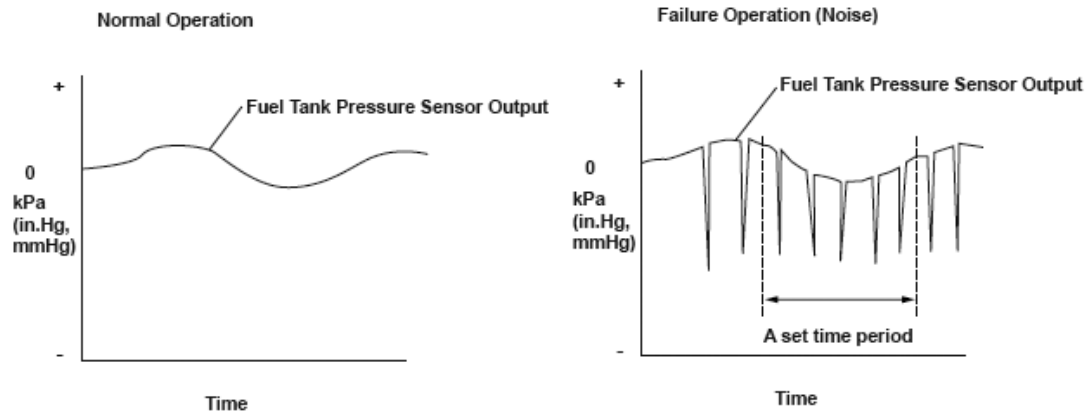
P0452-0301

**Fig. 54: Fuel Tank Pressure Sensor - Circuit Diagram**





P0451-0670

**Fig. 55: Fuel Tank Pressure (FTP) Sensor Voltage - Graph**

P0451-0071

**Fig. 56: Fuel Tank Pressure Sensor Output - Graph****General Description**

The fuel tank pressure (FTP) sensor is installed on the evaporative emission (EVAP) canister. The FTP sensor is used to detect leaks in the EVAP system. The engine control module (ECM)/powertrain control module (PCM) monitors the FTP sensor output voltage. The FTP sensor output voltage rises as the fuel tank pressure increases. Conversely, the FTP sensor output voltage drops as the fuel tank pressure decreases. Rapid changes in the FTP sensor output voltage due to electrical noise or an intermittent open during the EVAP leak detection may cause incorrect leak detection, so abnormal output is monitored.

If the FTP sensor output voltage changes a specified number of times within a set time, the ECM/PCM detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	20 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine	2 seconds	-
Throttle position	Fully closed	
No active DTCs	P0122, P0123, P0222, P0223, P0452, P0453, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, U0107	

### Malfunction Threshold

The FTP sensor output fluctuates by 0.3 kPa (0.1 in.Hg, 2 mmHg) or more at least five times within 3 seconds.

### Driving Pattern

Start the engine in a cold condition, and let it idle for at least 20 seconds.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

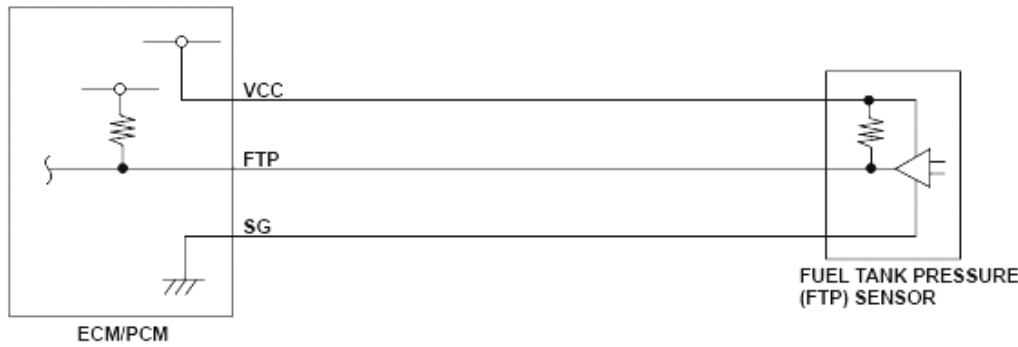
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

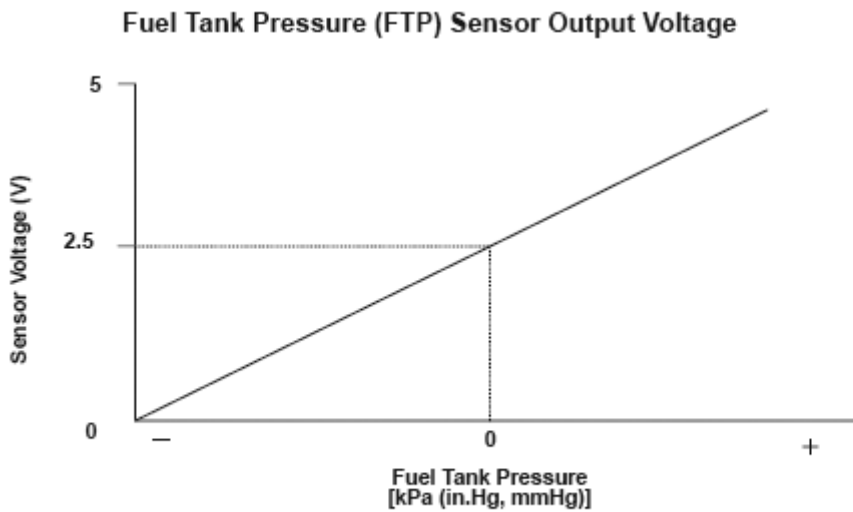
## DTC P0452 (91): ADVANCED DIAGNOSTICS

### DTC P0452: FUEL TANK PRESSURE (FTP) SENSOR CIRCUIT LOW VOLTAGE



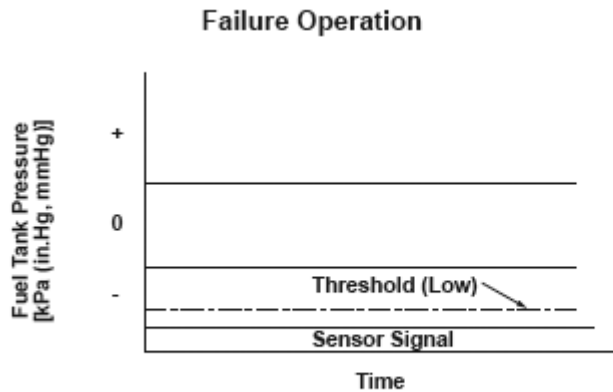
P0452-0301

**Fig. 57: Fuel Tank Pressure Sensor - Circuit Diagram**



P0451-0670

**Fig. 58: Fuel Tank Pressure (FTP) Sensor Output Voltage - Graph**



P0452-0670

**Fig. 59: Fuel Tank Pressure - Graph**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### General Description

The fuel tank pressure (FTP) sensor is installed on the evaporative emission (EVAP) canister and detects the fuel tank pressure. The FTP sensor is used to detect leaks in the EVAP system.

The engine control module (ECM)/powertrain control module (PCM) monitors the FTP sensor output voltage. The FTP sensor output voltage rises as the fuel tank pressure increases. Conversely, the FTP sensor output voltage drops as the fuel tank pressure decreases. If the FTP sensor output voltage does not reach a target value within a set time after starting the engine in a cold condition, the ECM/PCM detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	3 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine	2 seconds	-
Other	At idle	

#### Malfunction Threshold

The output from the fuel tank pressure sensor is less than -7 kPa (-2.1 in.Hg, -55 mmHg) for at least 3 seconds.

#### Driving Pattern

Start the engine in a cold condition, and let it idle until the radiator fan comes on.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

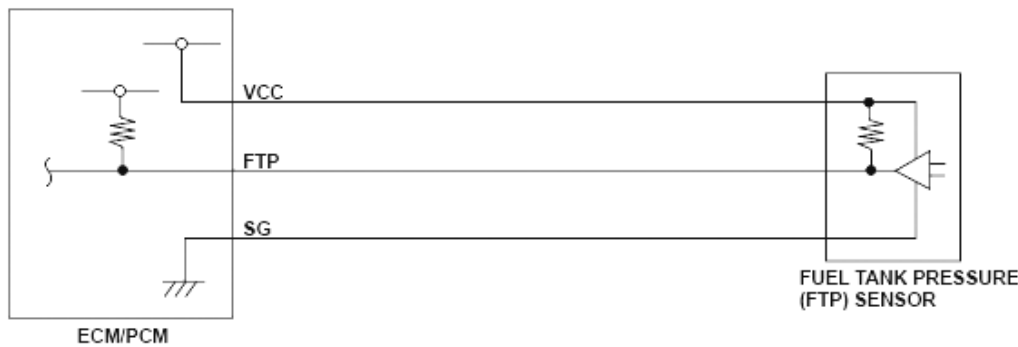
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic

runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

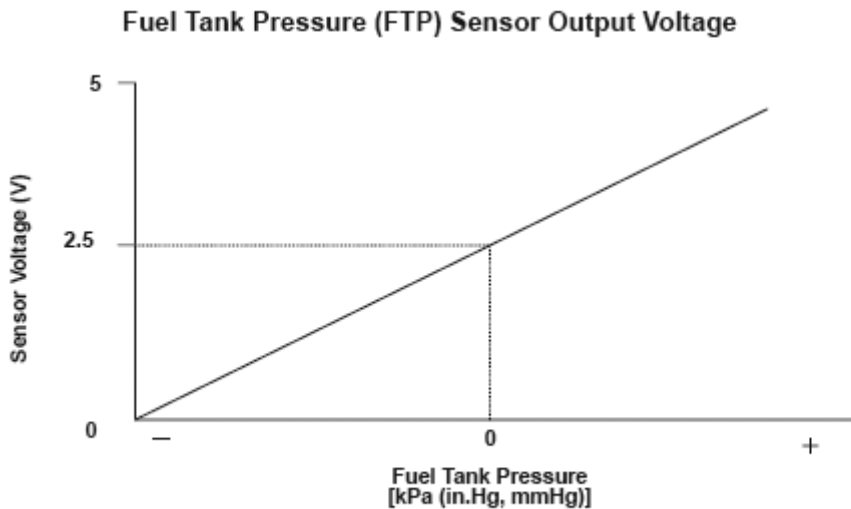
## DTC P0453 (91): ADVANCED DIAGNOSTICS

### DTC P0453: FUEL TANK PRESSURE (FTP) SENSOR CIRCUIT HIGH VOLTAGE



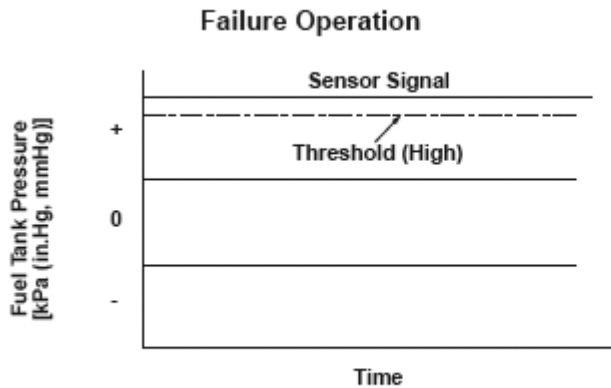
P0452-0301

**Fig. 60: Fuel Tank Pressure Sensor - Circuit Diagram**



P0451-0670

**Fig. 61: Fuel Tank Pressure (FTP) Sensor Output Voltage - Graph**



P0453-0870

**Fig. 62: Fuel Tank Pressure - Graph**

**General Description**

The fuel tank pressure (FTP) sensor is installed on the evaporative emission (EVAP) canister and detects the fuel tank pressure. The FTP sensor is used to detect leaks in the EVAP system.

The engine control module (ECM)/powertrain control module (PCM) monitors the FTP sensor output voltage. The FTP sensor output voltage rises as the fuel tank pressure increases. Conversely, the FTP sensor output voltage drops as the fuel tank pressure decreases. If the FTP sensor output voltage is higher than a target value for a set time after starting the engine in a cold condition, the ECM/PCM detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	3 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time after starting the engine	2 seconds	-
Other	At idle	

**Malfunction Threshold**

The output from the fuel tank pressure sensor is more than 8 kPa (2.2 in.Hg, 55 mmHg) for at least 3 seconds.

### Driving Pattern

Start the engine in a cold condition, and let it idle until the radiator fan comes on.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

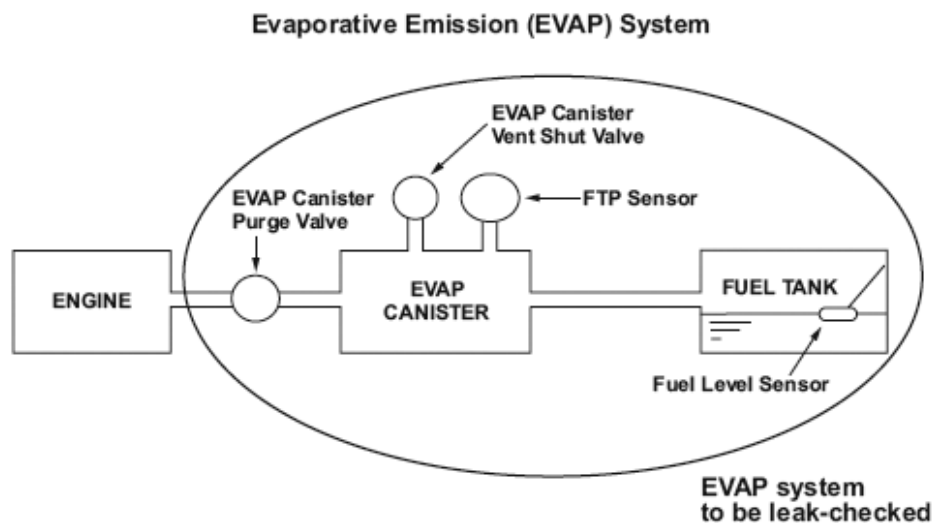
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0455 (90): ADVANCED DIAGNOSTICS

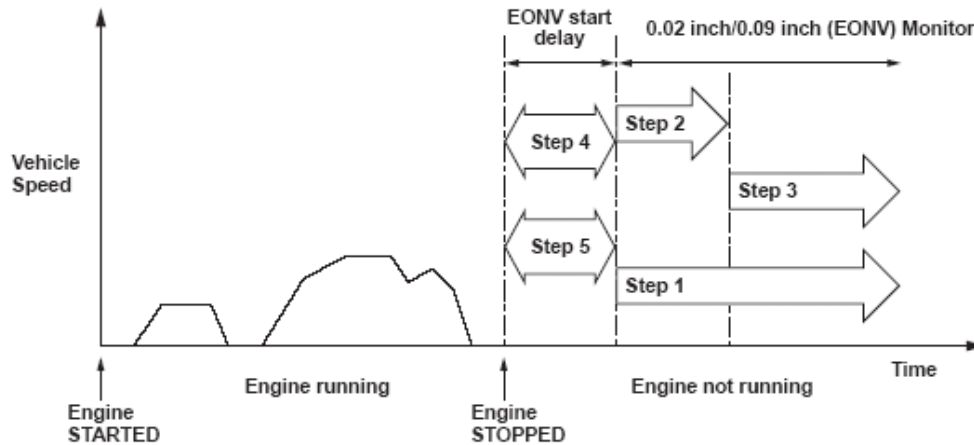
### DTC P0455: EVAPORATIVE EMISSION (EVAP) SYSTEM LARGE LEAK DETECTED



P0442-0570

**Fig. 63: Evaporative Emission (EVAP) System Diagram**

### Diagnosis Execution



P0455-0770

**Fig. 64: Evaporative Emission (EVAP) System Diagnosis Execution**

#### General Description

The evaporative emission (EVAP) leak detection system uses an engine off natural vacuum (EONV) method. The EONV method detects leakage from the change in fuel tank pressure via the fuel tank pressure (FTP) sensor with the engine off.

Here is an overview of the malfunction detection for the EONV method:

Step 1: Judgement of detection of 0.09 inch leak as normal operation

Step 2: Judgement of detection of 0.02 inch leak as normal operation

Step 3: Detection of 0.02 inch leak

Step 4: Detection of atmospheric air open failure

Step 5: Flickering of the FTP sensor

< Step 1, 2 and 3 proceed simultaneously. Step 4 and 5 proceed simultaneously. >

Step 1:

After the engine has stopped, the engine control module (ECM)/powertrain control module (PCM) monitors the variation of the FTP sensor output to detect "no 0.09 inch leak" depending on the variation corresponding to the pressure inside the fuel tank.

- If the variation corresponding to the pressure is less than a specified value and continues for a specified duration, it is identified as a malfunction of "0.09 inch leak" and the diagnosis completes.



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- If the variation corresponding to pressure is more than a specified value before a specified duration has passed, it is defined as "no 0.09 inch leak", judgement of detection of a 0.09 inch leak is completed, and goes to 0.02 inch leak monitor.

#### Step 2:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect "no 0.02 inch leak" depending on the variation corresponding to the increasing pressure inside the fuel tank.

- If "no 0.02 inch leak" is detected, it is identified as normal; the diagnosis is complete.
- If the pressure inside the fuel tank does not increase for a specified value or more within a specified duration, goes to step 3.

#### Step 3:

The ECM/PCM continues to monitor the FTP sensor output to detect "no 0.02 inch leak" depending on the variation corresponding to the decreasing pressure inside the fuel tank. until the detection completes.

- If a "0.02 inch leak" is detected, it is identified as a malfunction; the diagnosis is complete.
- If "no leakage" is detected, it is identified as normal; the diagnosis is complete.
- If the pressure is not atmospheric pressure or less when the detection is completed, reserve identification and the diagnosis is complete.

#### Step 4:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect atmospheric air failure, after keeping the canister vent opened for a specified duration to stabilize the pressure inside the fuel tank.

- If the pressure inside the fuel tank after a specified duration has passed deviated exceeding a specified value from the sensor zero point, and if oil is not identified to fuel during EONV is performed, atmospheric air open failure is detected.

#### Step 5:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect FTP sensor flickering failure, after keeping the canister vent opened for a specified duration to stabilize the pressure inside the fuel tank.

- If the deviation of pressure inside the fuel tank and an average value after a specified duration has passed exceeded a specified value for more than a specified duration, failure of FTP sensor flickering is detected.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
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Sequence	None
Duration	31 minutes, 37 seconds or less
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time before starting the engine	6 hours	-
Initial condition A <sup>(1)</sup>	-	18 °F (10 °C)
Initial condition B <sup>(2)</sup>	-	18 °F (10 °C)
Initial engine coolant temperature	40 °F (5 °C)	95 °F (35 °C)
Initial intake air temperature	40 °F (5 °C)	95 °F (35 °C)
Barometric pressure	76 kPa (23.0 in.Hg, 569 mmHg)	-
Battery voltage	10.5 V	-
No active DTCs	P0111, P0112, P0113, P0116, P0117, P0118, P0125, P0443, P0451, P0452, P0453, P0496, P0497, P0498, P0499, P0685, P1116, P1454, P145C, P2227, P2228, P2229, P2422, P2610	
Others	Other than when there is excessive vapor generation (fuel level is not full)	
	Avoid abrupt acceleration, deceleration, and turns	
	Test-drive on a flat road to avoid misdetection	
	No refueling is required	
(1) The initial intake air temperature minus the current intake air temperature		
(2) The initial engine coolant temperature minus the initial intake air temperature		

#### Malfunction Threshold

The variation of pressure inside the fuel tank is 0.03 kPa (0.009 in.Hg, 0.24 mmHg) or more.

#### Confirmation Procedure with the HDS

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. After the vehicle has been left for an appropriate amount of time as specified, with the engine coolant temperature and intake air temperature within the specified range, start the engine.
2. Warm up the engine at idle until the radiator fan comes on.

3. Drive the vehicle immediately at a speed between 45 - 75 mph (72 - 120 km/h) for at least 20 minutes.
4. After stopping the engine, turn the ignition switch off, and leave the vehicle for 32 minutes or more (EONV executes).
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle with the ECT and IAT at engine start-up within the specified temperature range, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle with the ECT and IAT at engine start-up within the specified temperature range, the MIL comes on and the DTC and the freeze frame data are stored.

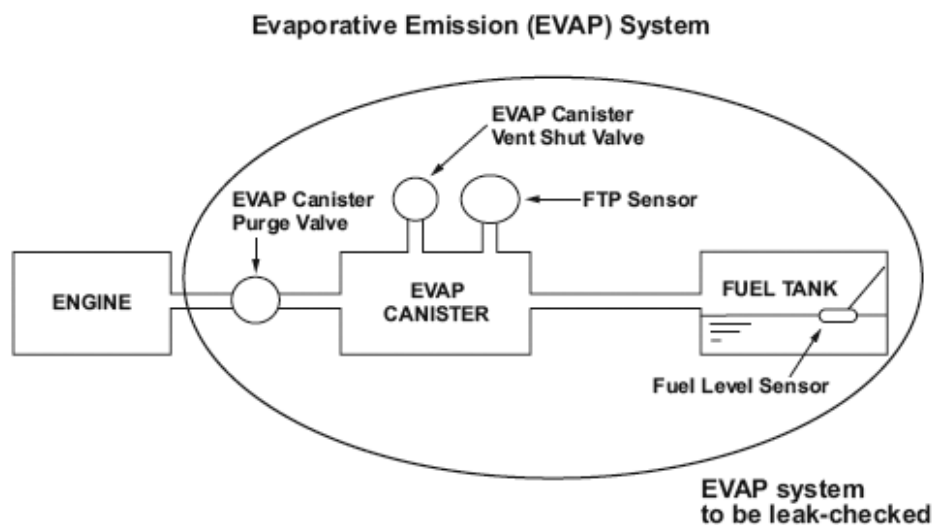
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0456 (90): ADVANCED DIAGNOSTICS

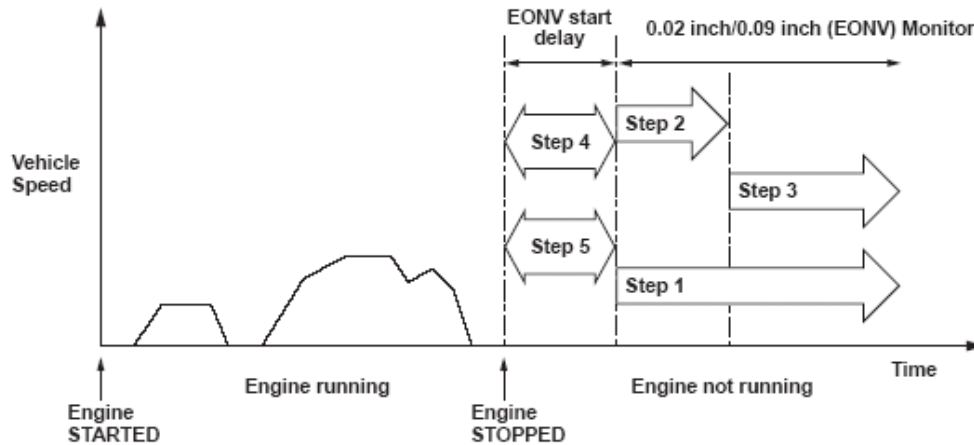
### DTC P0456: EVAPORATIVE EMISSION (EVAP) SYSTEM VERY SMALL LEAK DETECTED



P0442-0570

**Fig. 65: Evaporative Emission (EVAP) System - Diagram**

### Diagnosis Execution



P0455-0770

**Fig. 66: Evaporative Emission (EVAP) System Diagnosis Execution**

#### General Description

The evaporative emission (EVAP) leak detection system uses an engine off natural vacuum (EONV) method. The EONV method detects leakage from the change in fuel tank pressure via the fuel tank pressure (FTP) sensor with the engine off.

Here is an overview of the malfunction detection for the EONV method:

Step 1: Judgement of detection of 0.09 inch leak as normal operation

Step 2: Judgement of detection of 0.02 inch leak as normal operation

Step 3: Detection of 0.02 inch leak

Step 4: Detection of atmospheric air open failure

Step 5: Flickering of the FTP sensor

< Step 1, 2 and 3 proceed simultaneously. Step 4 and 5 proceed simultaneously. >

Step 1:

After the engine has stopped, the engine control module (ECM)/powertrain control module (PCM) monitors the variation of the FTP sensor output to detect "no 0.09 inch leak" depending on the variation corresponding to the pressure inside the fuel tank.

- If the variation corresponding to the pressure is less than a specified value and continues for a specified duration, it is identified as a malfunction of "0.09 inch leak" and the diagnosis completes.

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- If the variation corresponding to pressure is more than a specified value before a specified duration has passed, it is defined as "no 0.09 inch leak", judgement of detection of a 0.09 inch leak is completed, and goes to 0.02 inch leak monitor.

#### Step 2:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect "no 0.02 inch leak" depending on the variation corresponding to the increasing pressure inside the fuel tank.

- If "no 0.02 inch leak" is detected, it is identified as normal; the diagnosis is complete.
- If the pressure inside the fuel tank does not increase for a specified value or more within a specified duration, goes to step 3.

#### Step 3:

The ECM/PCM continues to monitor the FTP sensor output to detect "no 0.02 inch leak" depending on the variation corresponding to the decreasing pressure inside the fuel tank. until the detection completes.

- If a "0.02 inch leak" is detected, it is identified as a malfunction; the diagnosis is complete.
- If "no leakage" is detected, it is identified as normal; the diagnosis is complete.
- If the pressure is not atmospheric pressure or less when the detection is completed, reserve identification and the diagnosis is complete.

#### Step 4:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect atmospheric air failure, after keeping the canister vent opened for a specified duration to stabilize the pressure inside the fuel tank.

- If the pressure inside the fuel tank after a specified duration has passed deviated exceeding a specified value from the sensor zero point, and if oil is not identified to fuel during EONV is performed, atmospheric air open failure is detected.

#### Step 5:

After the engine has stopped, the ECM/PCM monitors the variation of the FTP sensor output to detect FTP sensor flickering failure, after keeping the canister vent opened for a specified duration to stabilize the pressure inside the fuel tank.

- If the deviation of pressure inside the fuel tank and an average value after a specified duration has passed exceeded a specified value for more than a specified duration, failure of FTP sensor flickering is detected.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Sequence	P0455, P0457, P0497 are judged as OK
Duration	At least 11 minutes, 37 seconds but not more than 31 minutes, 37 seconds
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time before starting the engine	6 hours	-
Initial condition A <sup>(1)</sup>	-	18 °F (10 °C)
Initial condition B <sup>(2)</sup>	-	18 °F (10 °C)
Initial engine coolant temperature	40 °F (5 °C)	95 °F (35 °C)
Initial intake air temperature	40 °F (5 °C)	95 °F (35 °C)
Barometric pressure	76 kPa (23.0 in.Hg, 569 mmHg)	-
Battery voltage	10.5 V	-
No active DTCs	P0111, P0112, P0113, P0116, P0117, P0118, P0125, P0443, P0451, P0452, P0453, P0496, P0497, P0498, P0499, P0685, P1116, P1454, P145C, P2227, P2228, P2229, P2422, P2610	
Others	Other than when there is excessive vapor generation (fuel level is not full)	
	Avoid abrupt acceleration, deceleration, and turns	
	Test-drive on a flat road to avoid misdetection	
	No refueling is required	
(1) The initial intake air temperature minus the current intake air temperature		
(2) The initial engine coolant temperature minus the initial intake air temperature		

#### Malfunction Threshold

- The misalignment of zero point pressure inside the fuel tank is 0.6 kPa (0.1 in.Hg, 5 mmHg) or more.
- The output from the FTP sensor flickering is 3.04 seconds or more.
- The variation of pressure inside the fuel tank after phase 1 is 0.3 kPa (0.1 in.Hg, 2.8 mmHg) or more (depending on fuel level and barometric pressure).
- The sum of the variations of pressure inside the fuel tank after phase 1 and phase 2 is 10 kPa (3.1 in.Hg, 80 mmHg) or less (depending on fuel level and barometric pressure).
- The barometric pressure is stable for at least 24 minutes, 55 seconds.

#### Confirmation Procedure with the HDS

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

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#### Driving Pattern

1. After the vehicle has been left for an appropriate amount of time as specified, with the engine coolant temperature and intake air temperature within the specified range, start the engine.
2. Warm up the engine at idle until the radiator fan comes on.
3. Drive the vehicle immediately at a speed between 45 - 75 mph (72 - 120 km/h) for at least 20 minutes.
4. After stopping the engine, turn the ignition switch off, and leave the vehicle for 32 minutes or more (EONV executes).
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle with the ECT and IAT at engine start-up within the specified temperature range, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle with the ECT and IAT at engine start-up within the specified temperature range, the MIL comes on and the DTC and the freeze frame data are stored.

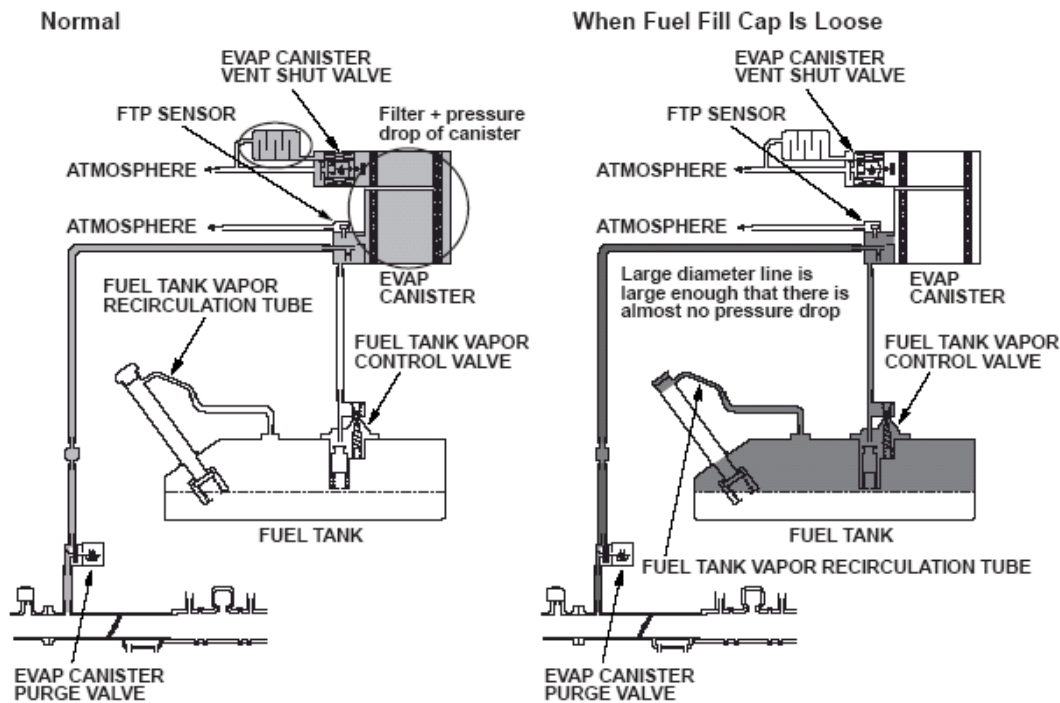
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

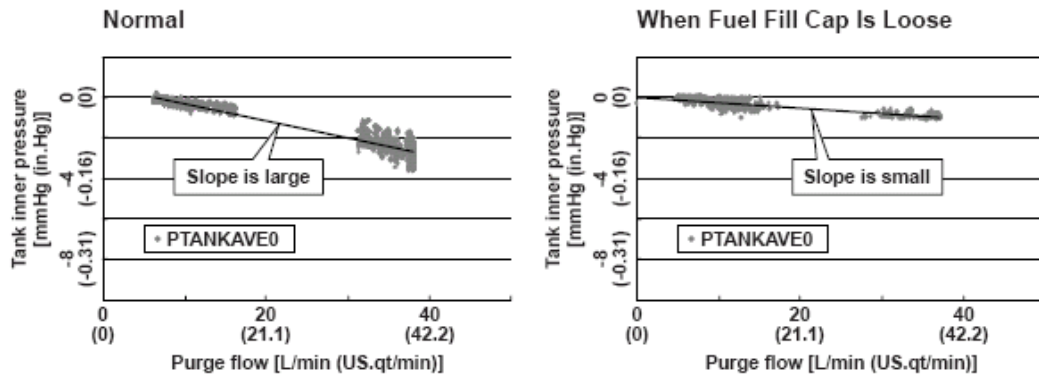
## DTC P0457 (90): ADVANCED DIAGNOSTICS

**DTC P0457: EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTED/FUEL FILL CAP LOOSE OR MISSING**



P0457-0770

**Fig. 67: Evaporative Emission (EVAP) System Operation Diagram**



P0457-0771

**Fig. 68: Relationship Between Purge Flow And Fuel Tank Pressure**

**General Description**

When the fuel fill cap is installed properly, and the purge flow increases, there is some normal resistance to airflow through the evaporative emission (EVAP) canister, and the fuel tank pressure (FTP) sensor value drops as expected.

If the fuel fill cap is loose, and the purge flow increases, there is less resistance to airflow through the system because air is drawn into the fuel tank from the atmosphere, and the FTP sensor value does not drop as expected.



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Based on these characteristics, the engine control module (ECM)/powertrain control module (PCM) looks at the relationship between purge flow and fuel tank pressure, and when the fuel tank pressure decreases very little as the purge flow increases, a loose fuel cap is detected.

< Above failure detection is normally operated during purge >

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	P0455 or P0456 are judged as NG
Duration	12 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature before EVAP purge control starts	131 °F (55 °C)	-
Vehicle speed	2 mph (2 km/h)	-
Barometric pressure	76 kPa (23.0 in.Hg, 569 mmHg)	-
Battery voltage	10.5 V	-
Low purge flow side detection	5 l/min (5.3 US qt/min, 4.4 Imp qt/min)	10 l/min (10.5 US qt/min, 8.7 Imp qt/min)
High purge flow side detection	35 l/min (37.0 US qt/min, 30.8 Imp qt/min)	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop at stoichiometric	
Duration of redetection implementation permission	Every 54.6 minutes	
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0451, P0452, P0453, P0496, P0497, P0498, P0499, P1128, P1129, P1157, P1172, P1454, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2422, P2647, U0028, U0155	
Others	Other than when there is excessive vapor generation (fuel level is not full)	
	Avoid abrupt acceleration, deceleration, and turns	
	Test-drive on a flat road to avoid misdetection	
	No refueling is required	

**Malfunction Threshold**

The output from the fuel cap monitor is 0.071 or more for at least 12 seconds (when there is no NG judgment history in this drive cycle).

**Confirmation Procedure with the HDS**

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

**Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 12 seconds.
3. Drive the vehicle immediately at a speed between 45 - 75 mph (72 - 120 km/h) for at least 12 minutes.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details****Conditions for illuminating the fuel fill cap caution**

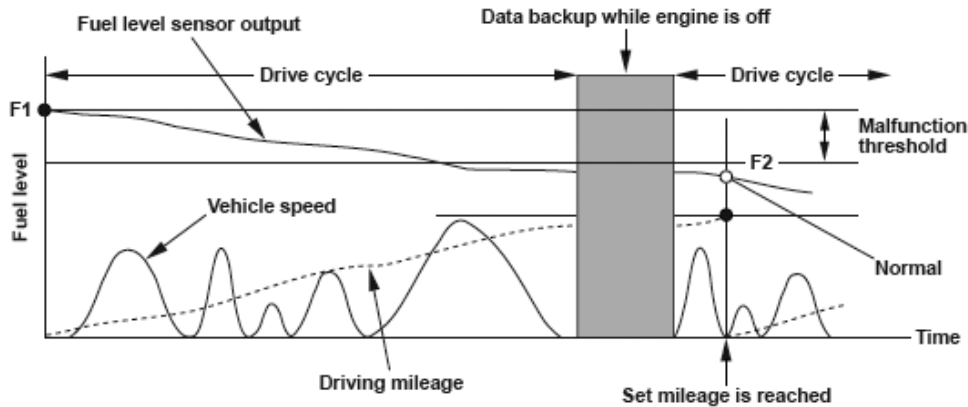
1. When a loose fuel fill cap is judged by this detection, the fuel fill cap caution is displayed. At this time, the DTC is not stored.
2. When the first drive cycle leak judgement (Temporary DTC stored) is implemented at a 0.02 inch leak or a 0.09 inch leak, the fuel fill cap caution is displayed when the ignition switch is turned on the next time.

**Conditions for clearing the fuel fill cap caution**

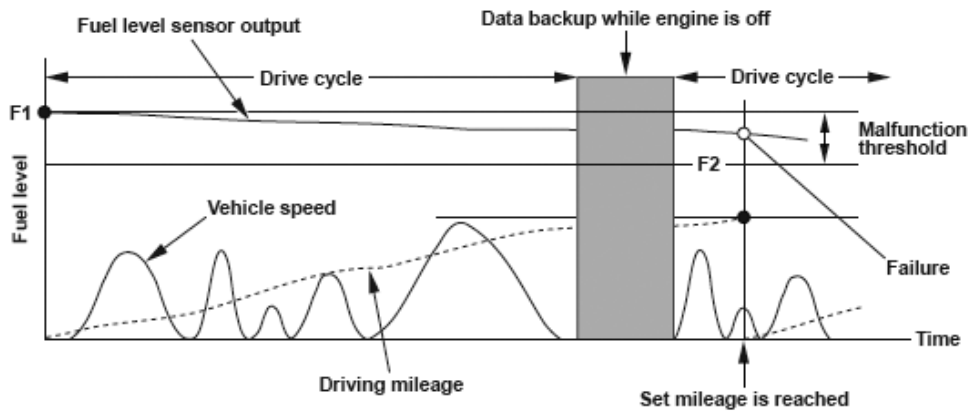
1. When the fuel fill cap caution is displayed by the first drive cycle leak judgement (Temporary DTC stored) at a 0.02 inch leak or a 0.09 inch leak, the fuel fill cap caution goes out when the next failure occurs (second drive cycle) and P0457 is stored. (MIL illuminates by the leak detection)
2. When normally judged by a 0.02 inch leak or a 0.09 inch leak after the fuel fill cap caution is displayed, the fuel fill cap caution goes out when the ignition is turned on the next time. (P0457 is not stored at this time)
3. When driving three times without this failure detection and a 0.02 inch leak or a 0.09 inch leak detection is not done after the fuel fill cap caution is displayed, the fuel fill cap caution goes out. (P0457 is not stored at this time)
4. Use the Clear command of scan tool to erase the caution. This is also applied to cancelling the battery caution. The caution is erased when the MIL is illuminated.

**DTC P0461 (121): ADVANCED DIAGNOSTICS****DTC P0461: FUEL LEVEL SENSOR (FUEL GAUGE SENDING UNIT) CIRCUIT RANGE/PERFORMANCE PROBLEM**

**Normal**



**Malfunction**



P0461-0370

**Fig. 69: Fuel Level Sensor (Fuel Gauge Sending Unit) Malfunction - Graph**

**General Description**

The fuel level sensor is incorporated with the fuel pump and installed in the fuel tank. Using a built-in potentiometer and float, it converts the movement of the float into electrical signals that correspond to the fuel level, and it indicates the amount of fuel in the fuel tank. If the engine control module (ECM)/powertrain control module (PCM) receives no change in the fuel level sensor output after driving for a specified number of miles, it detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None

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Duration	-
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Mileage	125 miles (200 km)	-
No active DTCs	P0462, P0463, U0028, U0155	
Others	Avoid driving and stopping on a steep road	

### Malfunction Threshold

The change in the fuel level sensor output is 3.5 % or less.

### Driving Pattern

Drive for the specified mileage under Enable Conditions without refueling (Turning the ignition switch off is acceptable).

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the indicator

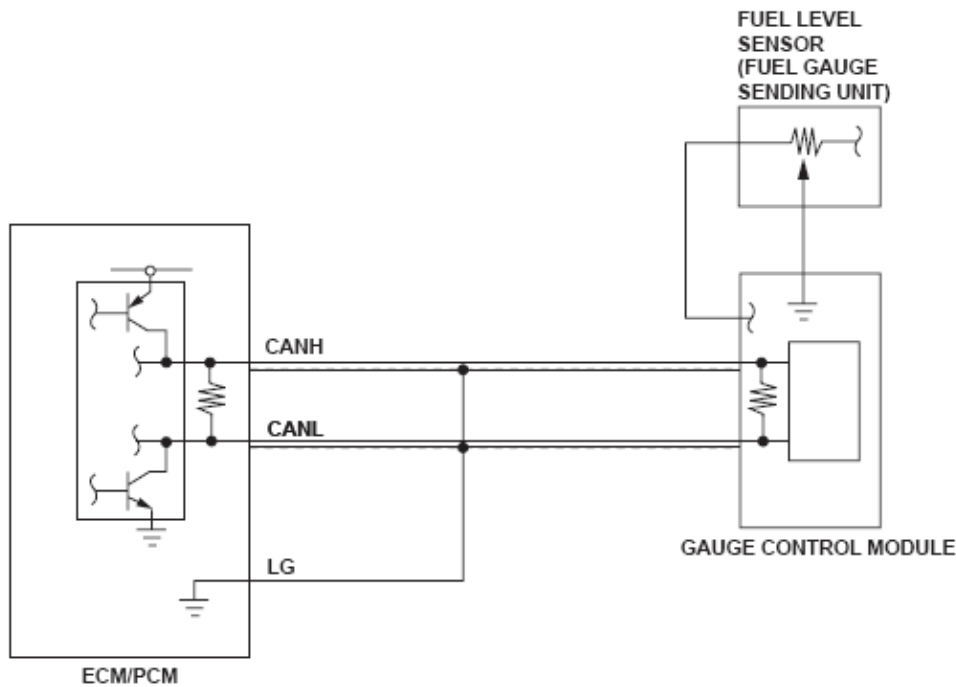
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

#### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0462 (121): ADVANCED DIAGNOSTICS

**DTC P0462: FUEL LEVEL SENSOR (FUEL GAUGE SENDING UNIT) CIRCUIT LOW VOLTAGE**



P0462-0801

**Fig. 70: Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Diagram**

**General Description**

The fuel level sensor (fuel gauge sending unit) is incorporated into the fuel pump and installed in the fuel tank. Using a built-in potentiometer and float, it converts the movement of the float to electrical signals as an output that corresponds to fuel level variations in the fuel tank. The fuel level, which is indicated by the gauge control module, is sent to the engine control module (ECM)/powertrain control module (PCM) via the controller area network (CAN). If the ECM/PCM detects a signal from the fuel level sensor (fuel gauge sending unit) below a predetermined value for a set time or more, it detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON

No active DTCs

P0463, U0028, U0155

**Malfunction Threshold**

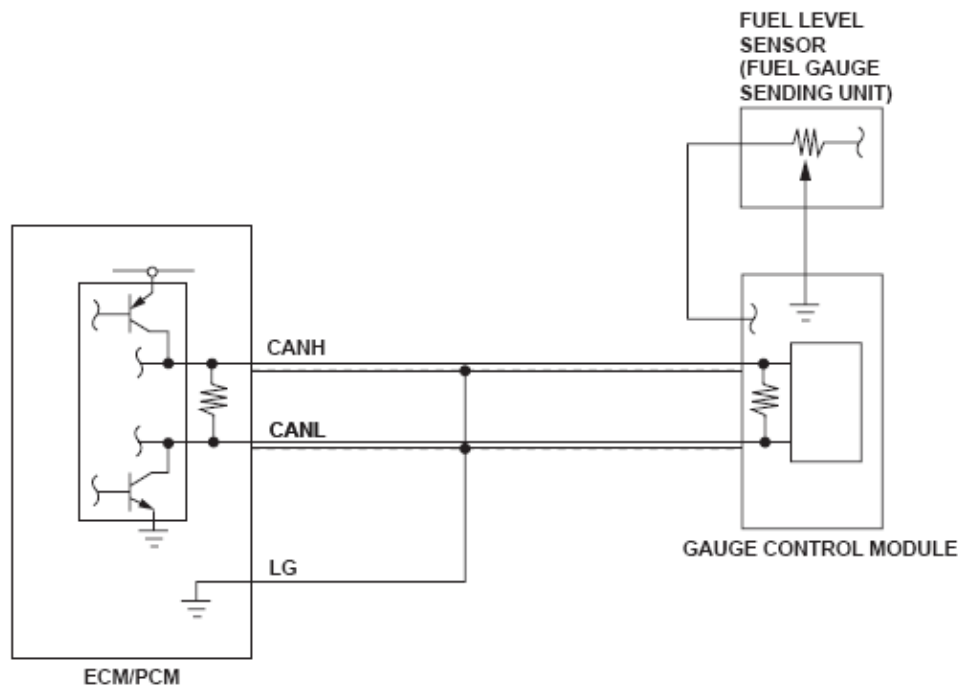
The fuel level sensor (fuel gauge sending unit) output voltage is 0.10 V or less for at least 5 seconds.

**Diagnosis Details****Conditions for illuminating the indicator**

When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0463 (121): ADVANCED DIAGNOSTICS****DTC P0463: FUEL LEVEL SENSOR (FUEL GAUGE SENDING UNIT) CIRCUIT HIGH VOLTAGE**

P0462-0801

**Fig. 71: Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Diagram****General Description**

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The fuel level sensor (fuel gauge sending unit) is incorporated into the fuel pump and installed in the fuel tank. Using a built-in potentiometer and float, it converts the movement of the float to electrical signals as an output that corresponds to fuel level variations in the fuel tank. The fuel level, which is indicated by the gauge control module, is sent to the engine control module (ECM)/powertrain control module (PCM) via the controller area network (CAN). If the ECM/PCM detects a signal from the fuel level sensor (fuel gauge sending unit) above a predetermined value for a set time or more, it detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P0462, U0028, U0155

#### Malfunction Threshold

The fuel level sensor (fuel gauge sending unit) output voltage is 4.92 V or more for at least 5 seconds.

#### Diagnosis Details

##### Conditions for illuminating the indicator

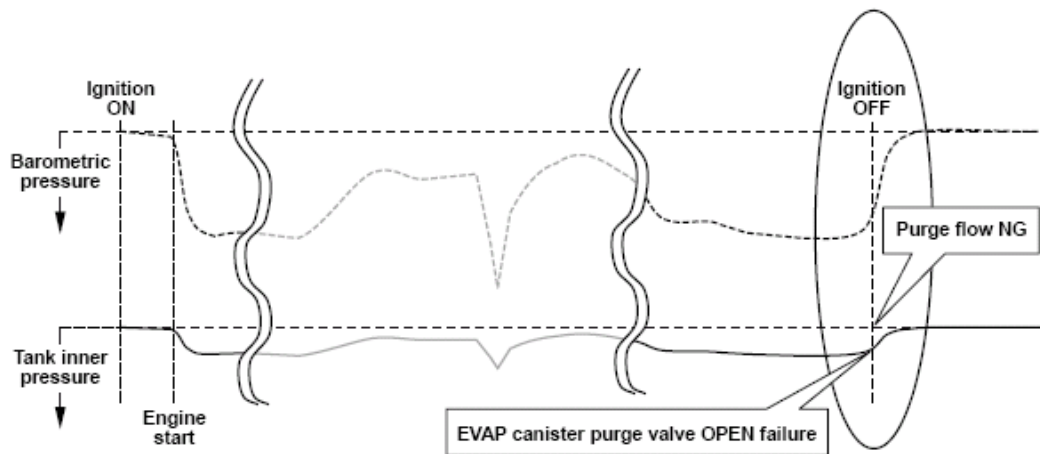
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0496 (92): ADVANCED DIAGNOSTICS

### DTC P0496: EVAPORATIVE EMISSION (EVAP) SYSTEM HIGH PURGE FLOW



P0496-0770

**Fig. 72: Evaporative Emission (EVAP) System Purge Flow**

### General Description

The fuel (vapor) vaporized in the fuel tank is stored in the canister temporarily and introduced in the engine through the evaporative emission (EVAP) canister purge valve. The engine control module (ECM)/powertrain control module (PCM) controls the vapor amount introduced in the engine by repeating switching the power of the EVAP canister purge valve at a constant frequency according to the condition of the engine.

#### < STEP 1 >

The EVAP canister purge valve drives normally (EVAP canister purge valve OPEN OK) and detects that the purge flow is normal when the pulse of the EVAP canister purge valve drive cycle is transmitted to fuel tank pressure (FTP) sensor by the purge flow (pulse method).

OK determination: Pulse exists (P145C OK)

- P0497 Purge flow OK
- P0496 EVAP canister purge valve Open fix OK

NG determination: No pulse (P145C NG)

- Either purge flow P0497 abnormality or P0496 EVAP canister purge valve OPEN failure.
- In this case, classify the failure part according to < STEP 2 >.

#### < STEP 2 >

In case there is no pulse, it is determined either no purge flow or EVAP canister purge valve OPEN fix as follows:

When the FTP sensor fluctuates from negative pressure condition to atmospheric pressure side after the ignition is turned off: P0496 EVAP canister purge valve OPEN fix



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When there is no fluctuation of the FTP sensor: P0497 purge flow NG

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	P145C is judged as OK
Duration	-
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Low load duration time	10 seconds	-
Wait for stability after the ignition is turned off	10 seconds	-
Engine coolant temperature before EVAP purge control starts	131 °F (55 °C)	-
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0451, P0452, P0453, P0498, P0499, P0685, P1128, P1129, P1157, P1172, P1454, P2195, P2227, P2228, P2229, P2238, P2252, P2422	

#### Malfunction Threshold

The output from the EVAP canister purge valve is 0.2 kPa (0.07 in.Hg, 2 mmHg) or more for at least 10 seconds.

#### Confirmation Procedure with the HDS

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 92 seconds.
3. Turn off the ignition for at least 10 seconds.

#### Diagnosis Details

### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

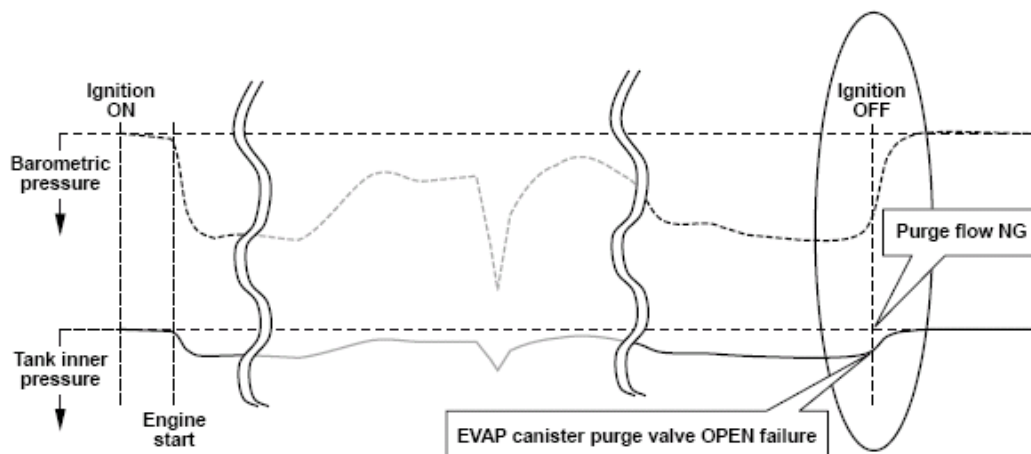
### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0497 (90): ADVANCED DIAGNOSTICS

### DTC P0497: EVAPORATIVE EMISSION (EVAP) SYSTEM LOW PURGE FLOW



P0496-0770

**Fig. 73: Evaporative Emission (EVAP) System Purge Flow**

### General Description

The fuel (vapor) vaporized in the fuel tank is stored in the canister temporarily and introduced in the engine through the evaporative emission (EVAP) canister purge valve. The engine control module (ECM)/powertrain control module (PCM) controls the vapor amount introduced in the engine by repeating switching the power of the EVAP canister purge valve at a constant frequency according to the condition of the engine.

### < STEP 1 >

The EVAP canister purge valve drives normally (EVAP canister purge valve OPEN OK) and detects that the purge flow is normal when the pulse of the EVAP canister purge valve drive cycle is transmitted to fuel tank pressure (FTP) sensor by the purge flow (pulse method).

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OK determination: Pulse exists (P145C OK)

- P0497 Purge flow OK
- P0496 EVAP canister purge valve Open fix OK

NG determination: No pulse (P145C NG)

- Either purge flow P0497 abnormality or P0496 EVAP canister purge valve OPEN failure.
- In this case, classify the failure part according to < STEP 2 >.

< STEP 2 >

In case there is no pulse, it is determined either no purge flow or EVAP canister purge valve OPEN fix as follows:

When the FTP sensor fluctuates from negative pressure condition to atmospheric pressure side after the ignition is turned off: P0496 EVAP canister purge valve OPEN fix

When there is no fluctuation of the FTP sensor: P0497 purge flow NG

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	P145C is judged as OK
Duration	-
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

**Enable Conditions**

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Low load duration time	10 seconds	-
Wait for stability after the ignition is turned off	10 seconds	-
Engine coolant temperature before EVAP purge control starts	131 °F (55 °C)	-
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0451, P0452, P0453, P0496, P0498, P0499, P0685, P1128, P1129, P1157, P1172, P1454, P2195, P2227, P2228, P2229, P2238, P2252, P2422	

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#### Malfunction Threshold

The output from the fuel tank pressure sensor is 0.2 kPa (0.07 in.Hg, 2 mmHg) or less for at least 10 seconds.

#### Confirmation Procedure with the HDS

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 92 seconds.
3. Turn off the ignition for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

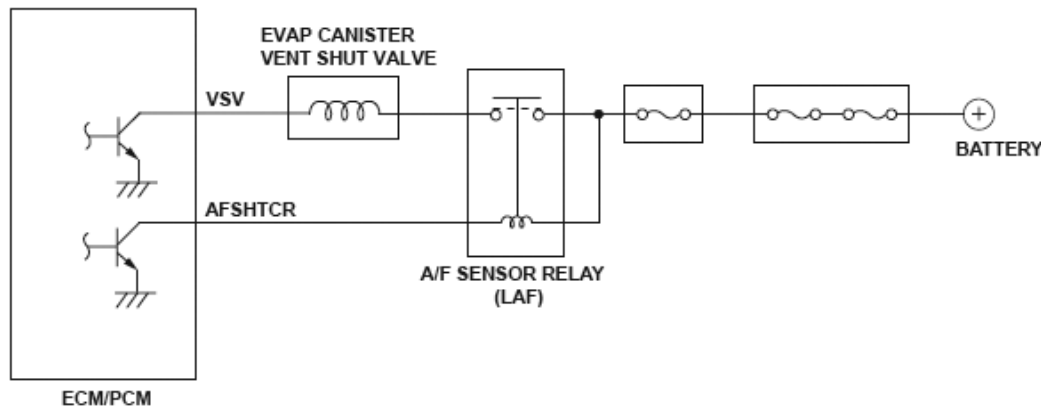
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0498 (117): ADVANCED DIAGNOSTICS

### DTC P0498: EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE CIRCUIT LOW VOLTAGE



P0498-0700

**Fig. 74: Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit Diagram**

**General Description**

The evaporative emission (EVAP) canister vent shut valve is attached to the EVAP canister to control the venting of the EVAP canister to atmosphere.

The EVAP canister vent shut valve is open (open to atmosphere) when the VSV signal is OFF.

If the return signal is "OFF" when the engine control module (ECM)/powertrain control module (PCM) outputs the "ON" signal to the EVAP canister vent shut valve, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	10.1 V	-
State of the engine	Running	
No active DTCs	P0499	

**Malfunction Threshold**

The return signal is "OFF" for at least 5 seconds when the ECM/PCM outputs the "ON" signal to the EVAP canister vent shut valve.

### Confirmation Procedure with the HDS

Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

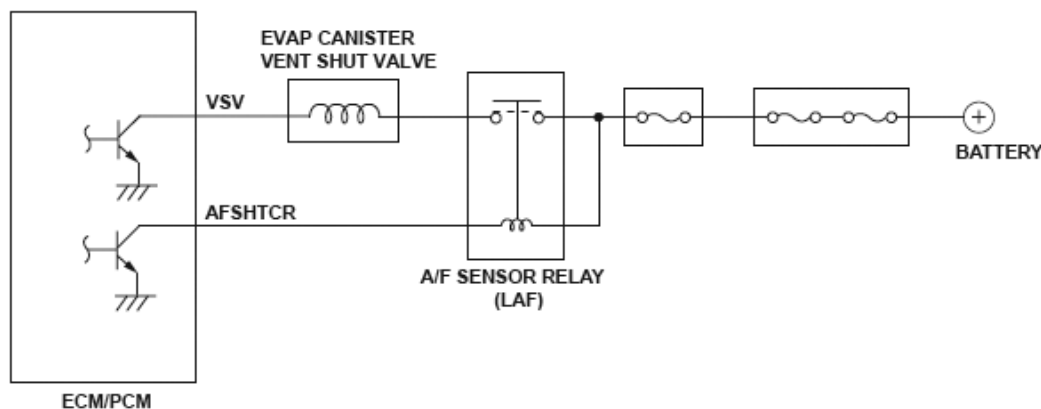
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0499 (117): ADVANCED DIAGNOSTICS

### DTC P0499: EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE CIRCUIT HIGH VOLTAGE



P0498-0700

**Fig. 75: Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit Diagram**

### General Description

The evaporative emission (EVAP) canister vent shut valve is attached to the EVAP canister to control the venting of the EVAP canister to atmosphere.

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

The EVAP canister vent shut valve is open (open to atmosphere) when the VSV signal is OFF.

If the return signal is "ON" when the engine control module (ECM)/powertrain control module (PCM) outputs the "OFF" signal to the EVAP canister vent shut valve, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	10.1 V	-
State of the engine	Running	
No active DTCs	P0498	

#### Malfunction Threshold

The return signal is "ON" for at least 5 seconds when the ECM/PCM outputs the "OFF" signal to the EVAP canister vent shut valve.

#### Confirmation Procedure with the HDS

Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

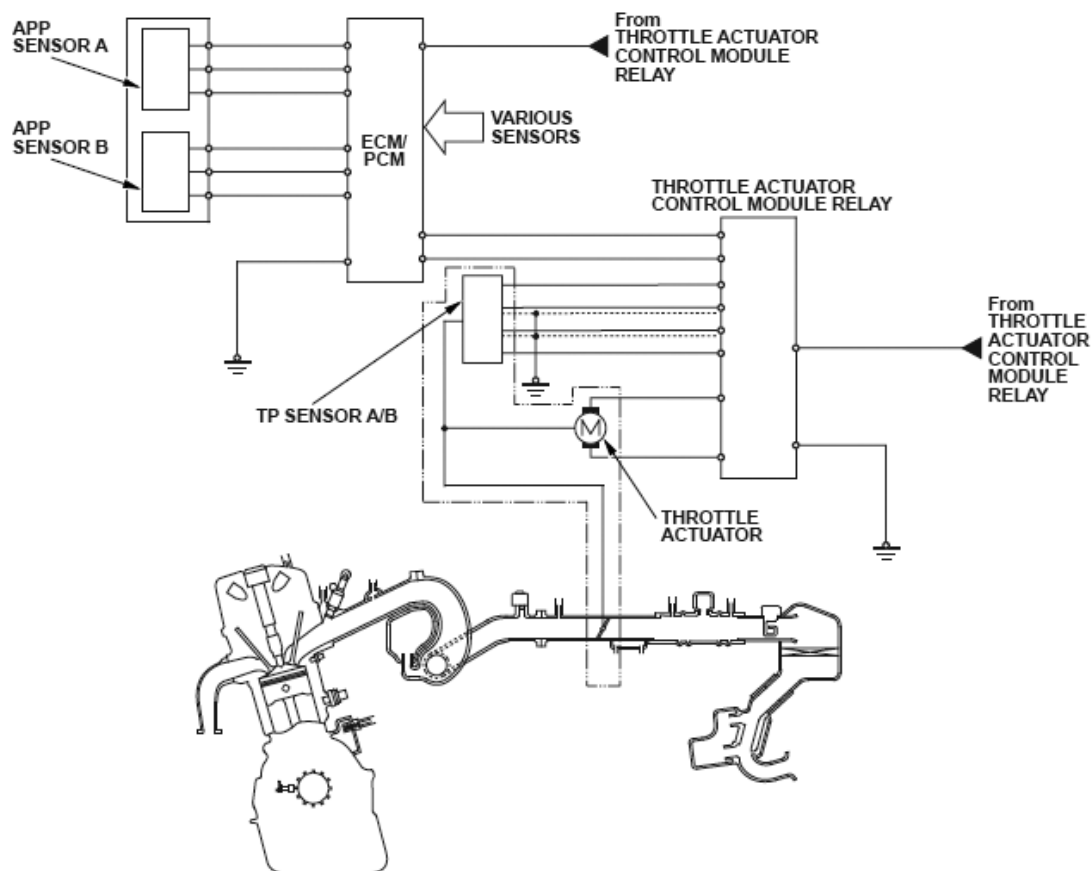
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

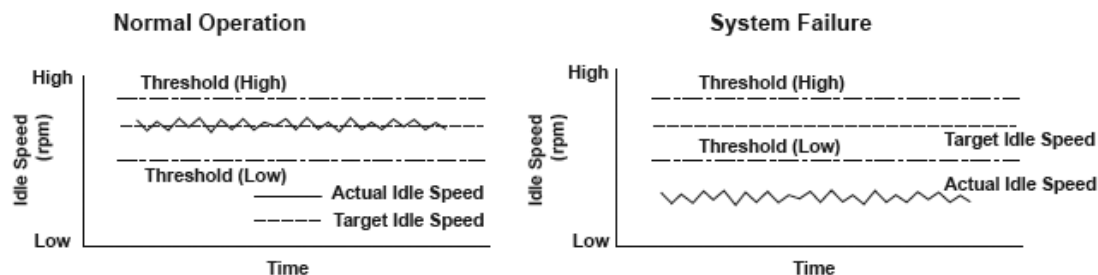
## DTC P0506 (14): ADVANCED DIAGNOSTICS

### DTC P0506: IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED



P0506-0771

**Fig. 76: Idle Control System Diagram**



P0506-0371

**Fig. 77: Idle Control System Normal Operation And System Failure - Graph**

#### General Description

A target idle speed that meets the engine operating conditions (coolant temperature, A/C ON or OFF, etc.) is



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stored in the engine control module (ECM)/powertrain control module (PCM). The ECM/PCM monitors and controls the idle speed so that the actual idle speed is equal to the target idle speed. If the actual idle speed varies beyond a specified value from the target speed over a certain period of time, the ECM/PCM detects a malfunction in the idle speed control system and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	20 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	19 °F (-7 °C)	-
Battery voltage	10.5 V	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop	
Throttle position	Fully closed	
No active DTCs	P0010, P0011, P0107, P0108, P0112, P0113, P0117, P0118, P0122, P0123, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0341, P0443, P0496, P0497, P1009, P1128, P1129, P145C, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2646, P2647, P2648, P2649, U0107	
Other	The engine is under no load	

#### Malfunction Threshold

The actual idle speed is at least 100 rpm less than the target idle speed for at least 20 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 20 seconds.

#### Diagnosis Details

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

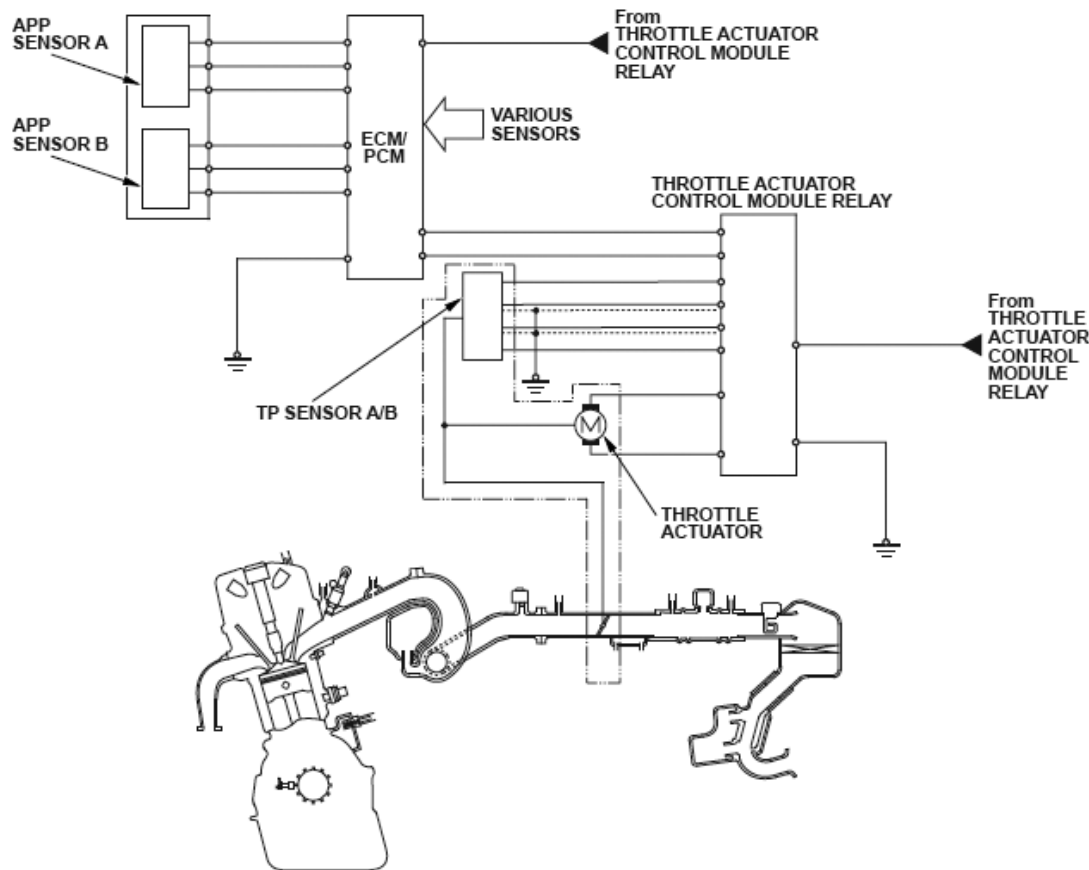
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0507 (14): ADVANCED DIAGNOSTICS**

**DTC P0507: IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED**

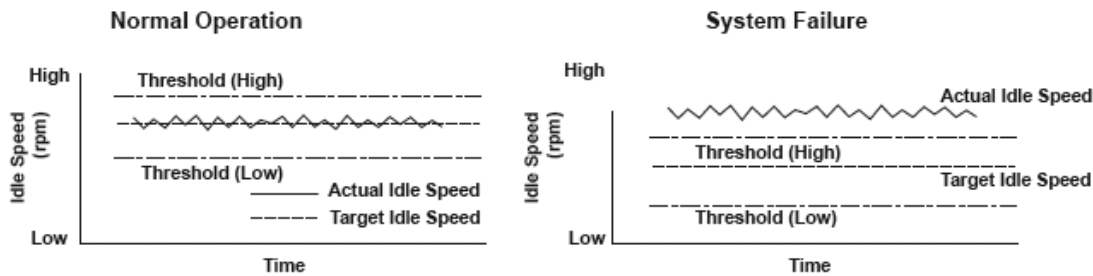


P0506-0771

**Fig. 78: Idle Control System Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0507-0370

**Fig. 79: Idle Control System Normal Operation And System Failure - Graph**

#### General Description

A target idle speed that meets the engine operating conditions (coolant temperature, A/C ON or OFF, etc.) is stored in the engine control module (ECM)/powertrain control module (PCM). The ECM/PCM monitors and controls the idle speed so that the actual idle speed is equal to the target idle speed. If the actual idle speed varies beyond a specified value from the target speed over a certain period of time, the ECM/PCM detects a malfunction in the idle speed control system and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	20 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	156 °F (69 °C)	-
Intake air temperature	19 °F (-7 °C)	-
Battery voltage	10.5 V	-
Fuel trim	0.69	1.47
Fuel feedback	Closed loop	
Throttle position	Fully closed	
No active DTCs	P0010, P0011, P0107, P0108, P0112, P0113, P0117, P0118, P0122, P0123, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0341, P0443, P0496, P0497, P1009, P1128, P1129, P145C, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2646, P2647, P2648, P2649, U0107	

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Other | The engine is under no load

#### Malfunction Threshold

The actual idle speed is at least 200 rpm greater than the target idle speed for at least 20 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 20 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

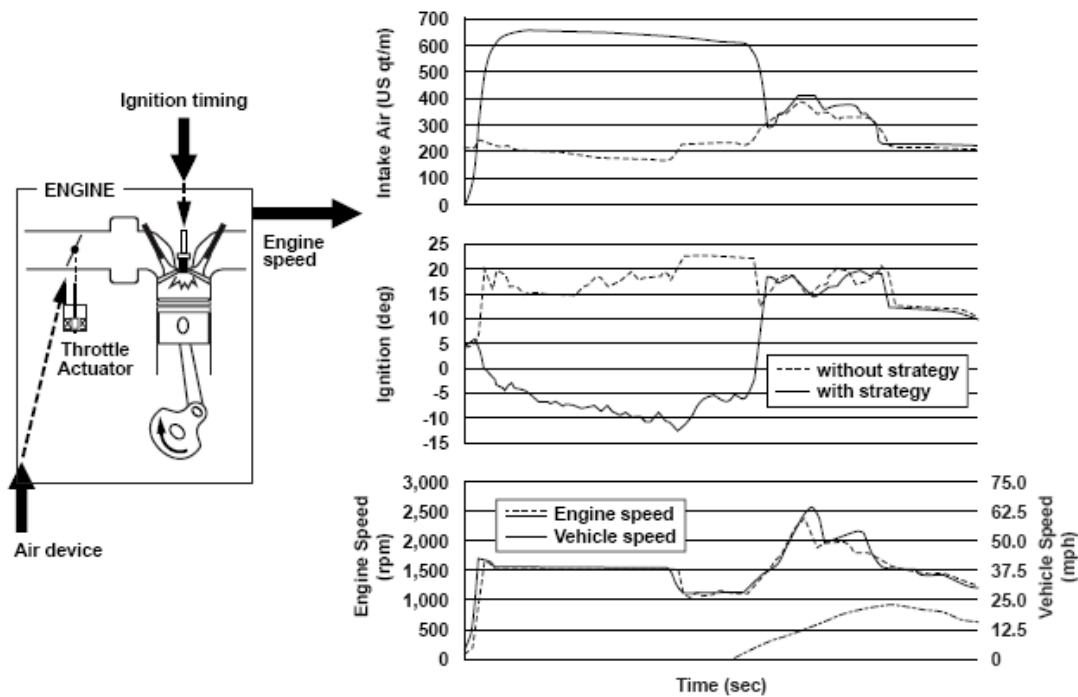
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

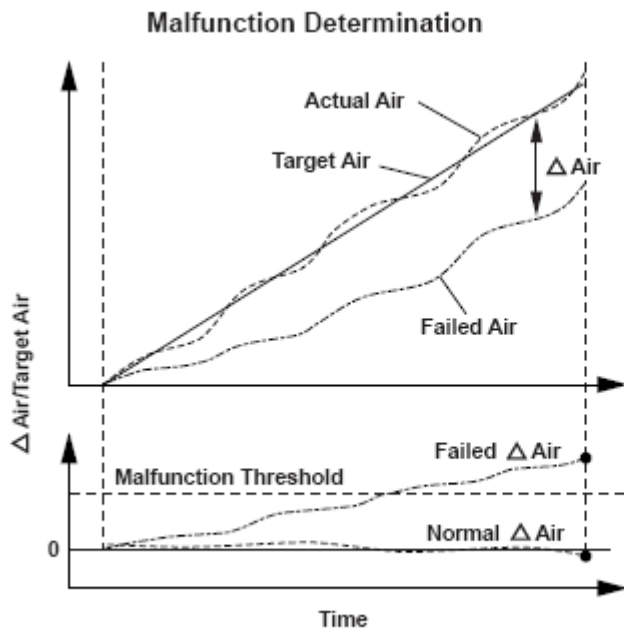
## DTC P050A (167): ADVANCED DIAGNOSTICS

### DTC P050A: COLD START IDLE AIR CONTROL SYSTEM PERFORMANCE



P050A-0670

**Fig. 80: Air Control System Performance Graph**



P050A-0671

**Fig. 81: Air Control System Malfunction Determination**

**General Description**

The quick warm-up system supplies additional air and retards the ignition timing when the engine is cold to

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

activate the catalytic converter as quickly as possible.

When the actual amount of air is less than the target amount, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Duration of quick warm-up system operation after engine start-up	-	40 seconds
Engine coolant temperature	32 °F (0 °C)	140 °F (60 °C)
Throttle position	Fully closed	
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0116, P0117, P0118, P0122, P0123, P0125, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0341, P0506, P0507, P1009, P1116, P1128, P1129, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2227, P2228, P2229, P2646, P2647, P2648, P2649	
Other	Vehicle stopped	

#### Malfunction Threshold

The total airflow is decreased by a factor of 0.826 for at least 10 seconds.

#### Confirmation Procedure with the HDS

Do the ETCS TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. Allow the engine to cool to an ambient engine coolant temperature of 140 °F (60 °C) or less.
2. Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

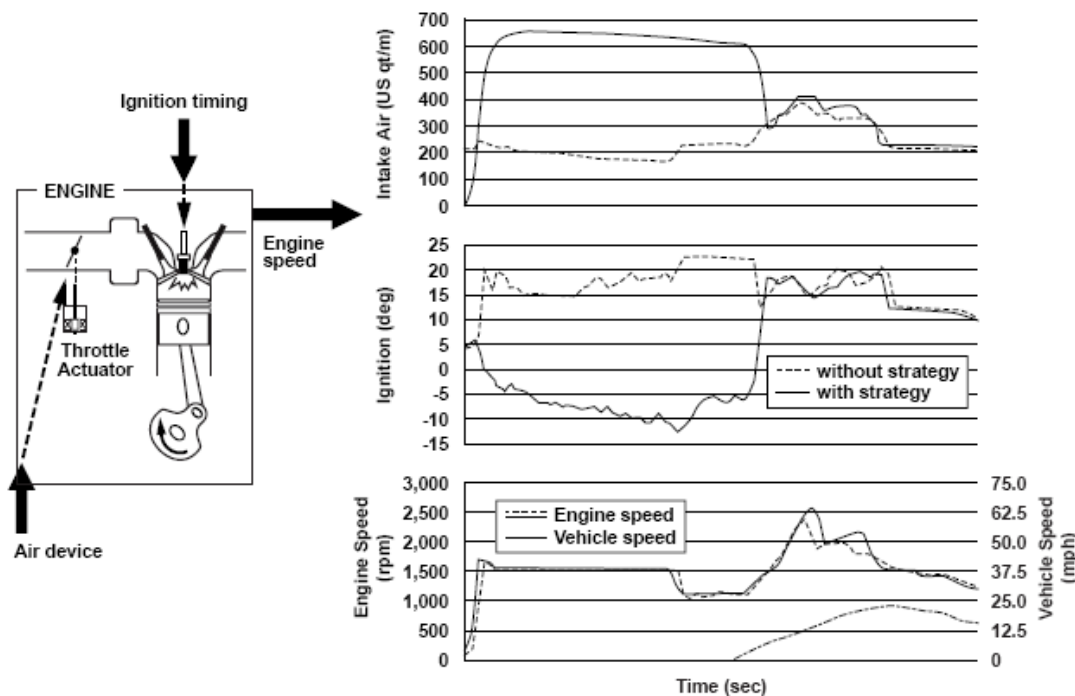
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

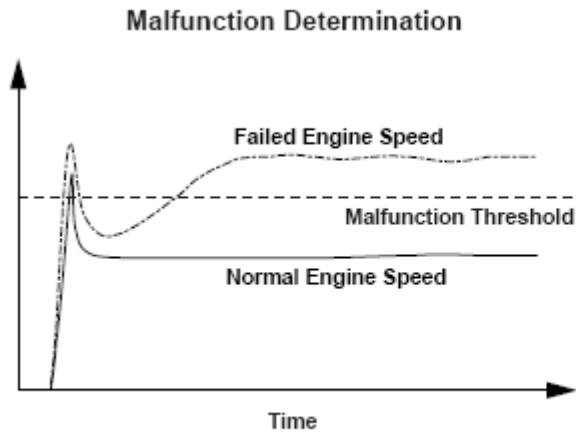
**DTC P050B (167): ADVANCED DIAGNOSTICS**

**DTC P050B: COLD START IGNITION TIMING PERFORMANCE**



P050A-0670

**Fig. 82: Air Control System Performance Graph**



P050B-0670

**Fig. 83: Air Control System Malfunction Determination**

**General Description**

The quick warm-up system supplies additional air and retards the ignition timing when the engine is cold to activate the catalytic converter as quickly as possible.

When the actual engine speed is a specified value or more, and it continues for a specified time, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	3.5 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time after starting the engine	2.5 seconds	-
Duration of quick warm-up system operation after engine start-up	-	40 seconds
Engine coolant temperature	32 °F (0 °C)	140 °F (60 °C)



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Throttle position	Fully closed
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0116, P0117, P0118, P0122, P0123, P0125, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0341, P0506, P0507, P1009, P1116, P1128, P1129, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2227, P2228, P2229, P2646, P2647, P2648, P2649
Other	Vehicle stopped

#### Malfunction Threshold

The engine speed is 2,200 rpm or more for at least 3.5 seconds.

#### Confirmation Procedure with the HDS

Do the ETCS TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. Allow the engine to cool to an ambient engine coolant temperature of 140 °F (60 °C) or less.
2. Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

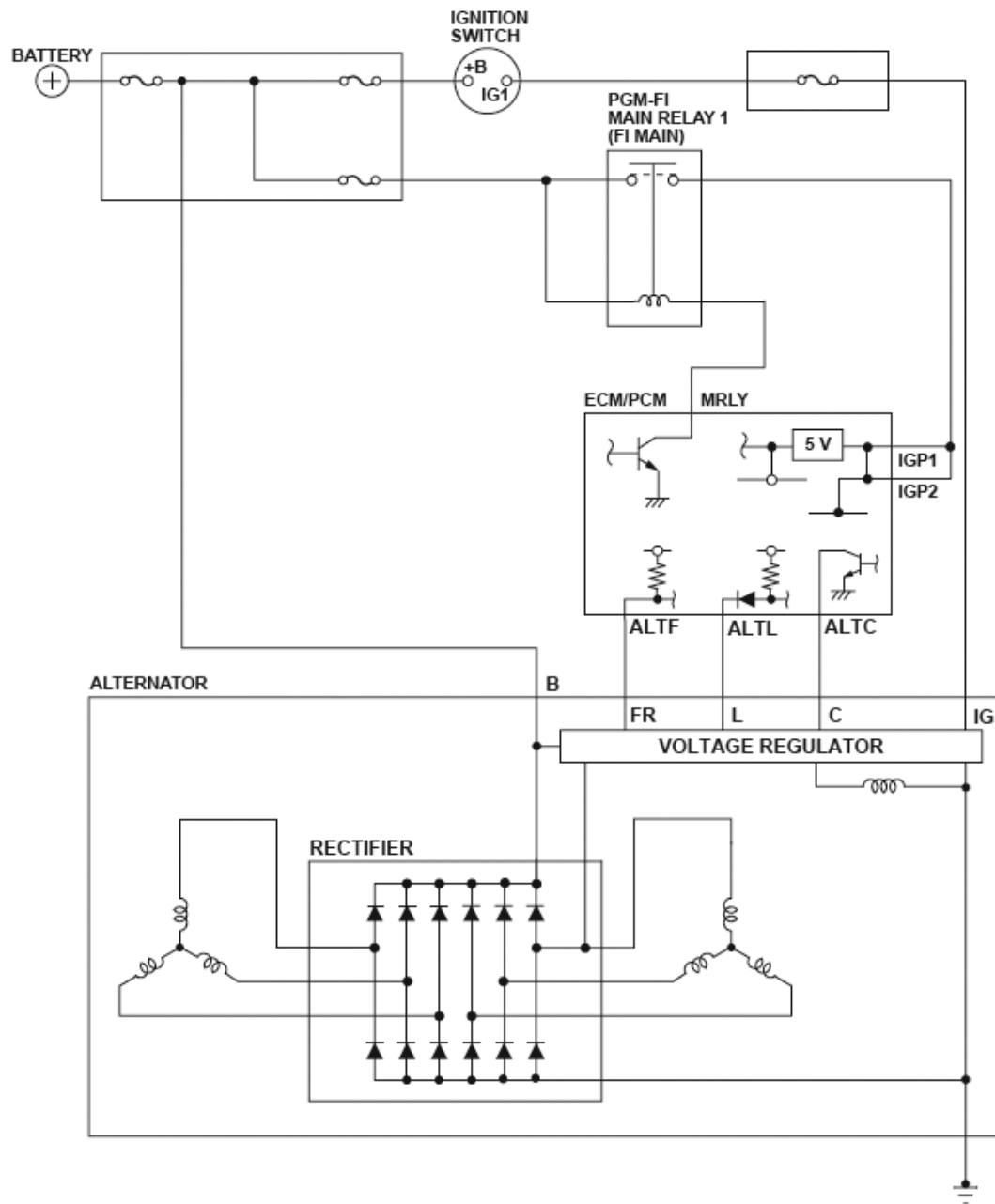
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0562 (34): ADVANCED DIAGNOSTICS

### DTC P0562: CHARGING SYSTEM LOW VOLTAGE



P0562-0700

**Fig. 84: Charging System Circuit Diagram**

**General Description**

The alternator is driven by the engine, and it generates electricity to supply the necessary power to the electrical system and to charge the battery. The alternator voltage target values of 14.5 V and 12.5 V are achieved by switching the alternator control mode (controlled by the engine control module (ECM)/powertrain control module (PCM)). The alternator output signal is sent to the ECM/PCM, and it varies according to the battery's state of charge, the electrical load, and engine speed.

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When the IGP (power source) terminal voltage is a set value or less for a set time, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	60 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	-

#### Malfunction Threshold

The IGP terminal voltage is 11.0 V or less for at least 60 seconds.

#### Diagnosis Details

##### Conditions for illuminating the indicator

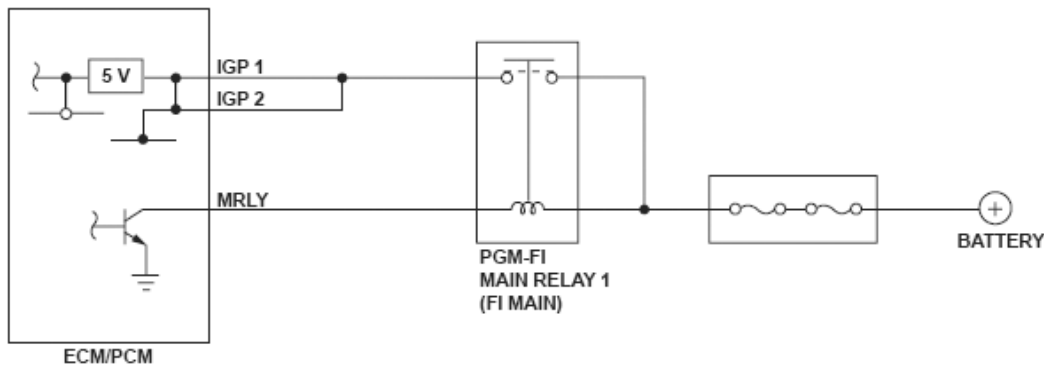
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0563 (34): ADVANCED DIAGNOSTICS

### DTC P0563: ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) POWER SOURCE CIRCUIT UNEXPECTED VOLTAGE



P0563-0101

**Fig. 85: Engine Control Module/Power Control Module Power Source Circuit Diagram**

**General Description**

If there is a short to ground in the harness between the engine control module (ECM)/powertrain control module (PCM) and the PGM-FI main relay 1, the PGM-FI main relay 1 stays ON even though the ignition switch is OFF, and the ECM/PCM remains active. However, the engine is not running because the power for the gauges, the ignition, and the fuel pump is turned OFF by the ignition switch.

When the ECM/PCM operates for a fixed time or more after the ignition switch is turned OFF, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage (IGP terminal of ECM/PCM)	10.1 V	-

**Malfunction Threshold**

The ECM/PCM operates for 5 seconds or more after the ignition switch is turned OFF.

**Diagnosis Details**

**Conditions for illuminating the indicator**

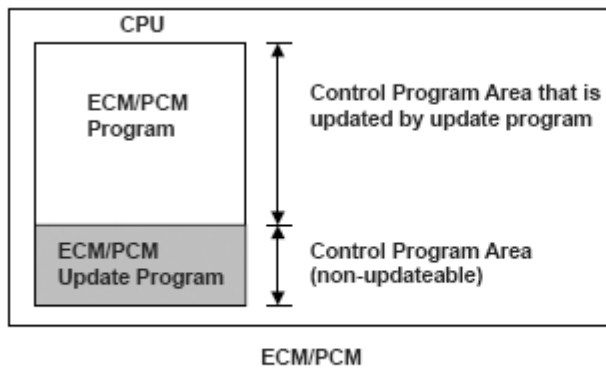
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0602 (196): ADVANCED DIAGNOSTICS**

**DTC P0602: ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) PROGRAMMING ERROR**



P0602-0570

**Fig. 86: Identifying ECM/PCM Program**

**General Description**

The engine control module (ECM)/powertrain control module (PCM) is equipped with an update program to update its control program. The programs in the CPU of the ECM/PCM are classified as an ECM/PCM program (update-capable program) and a program for the update function (non-updateable program). The program update only updates the ECM/PCM program.

When the ECM/PCM power is turned off during an update, the power for the update function is lost, and the update process stops. When the program update is stopped before it is completed, the ECM/PCM stores a DTC that indicates the update is not finished.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1 second or less
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	
Ignition switch	ON

**Malfunction Threshold**

The ECM/PCM program update is stopped before it is finished for at most 1 second.

**Diagnosis Details**

**Conditions for illuminating the MIL**

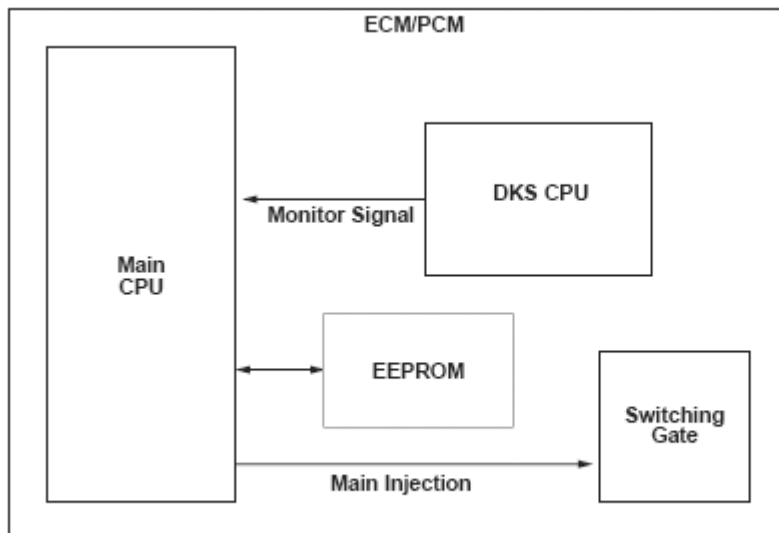
When the ECM/PCM program is not written in the ECM/PCM, the MIL comes on and the DTC is stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL and the DTC will be cleared when the ECM/PCM program update is complete.

**DTC P0606 (0): ADVANCED DIAGNOSTICS**

**DTC P0606: ECM/PCM PROCESSOR MALFUNCTION**



P0603-0371

**Fig. 87: Monitor Signal Communication Diagram**

**General Description**

If something is wrong in the engine control module (ECM)/powertrain control module (PCM), and the monitor

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signal from the digital knock system (DKS) CPU is not received for a set period of time, or a signal communication error remains for a set period time, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	10 V	-
State of the engine	Running	
Other	After 30 seconds have elapsed since start-up, or after the engine speed exceeds 1,000 rpm once	
No active DTCs	P0335, P0339, P0365, P0369	

#### Malfunction Threshold

Either condition mentioned below must be met for at least 5 seconds.

- No signal from the DKS CPU is detected.
- Signal from the DKS CPU is detected to be abnormal.

#### Driving Pattern

Start the engine, let it idle for at least 30 seconds or raise the engine speed to at least 1,000 rpm.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

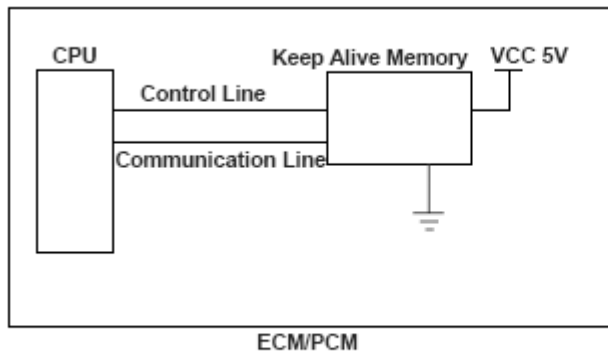
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P062F (131): ADVANCED DIAGNOSTICS

### DTC P062F: ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) INTERNAL CONTROL MODULE KEEP ALIVE MEMORY (KAM) ERROR



P0603-0570

**Fig. 88: Keep Alive Memory (KAM) Communication Diagram**

#### General Description

The engine control module (ECM)/powertrain control module (PCM) is equipped with a keep-alive memory. The data (control learn data etc) for powertrain control and information (Vehicle Identify Number (VIN) etc) related to the vehicle control is stored in the keep alive memory, so that it can be maintained even when power is not supplied to the ECM/PCM such as when the battery is disconnected. When power is restored to the ECM/PCM, the CPU retrieves the stored information from the keep-alive memory, but when the data retrieval process is not finished normally, a malfunction is detected and a DTC is stored.

The CPU writes data to the keep-alive memory from the CPU: Control related data is written when the ignition is turned on, and vehicle information when commanded from the HDS.

If the data writing process is not completed normally, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions



**ENABLE CONDITIONS**

Condition	
Ignition switch	ON

**Malfunction Threshold**

A malfunction is detected whenever the keep alive data retrieval and writing process is not completed normally.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

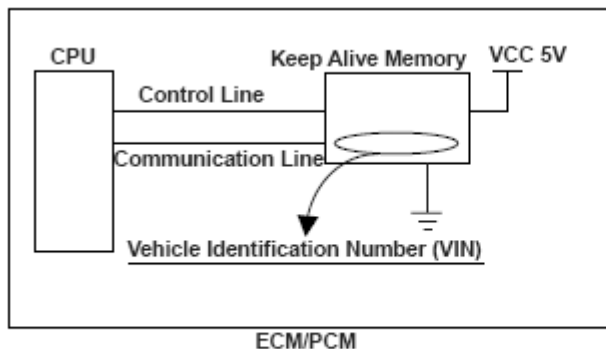
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0630 (139): ADVANCED DIAGNOSTICS**

**DTC P0630: VIN NOT PROGRAMMED OR MISMATCH**



P0630-0570

**Fig. 89: VIN Outputs**

**General Description**

The engine control module (ECM)/powertrain control module (PCM) stores a vehicle identification number (VIN) in the keep-alive memory and outputs the VIN according to the command from the HDS.

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The VIN for each vehicle is registered to the ECM/PCM using the HDS. The registered VIN is read by the CPU from the keep-alive memory after the ignition is turned on or after the Clear command is executed.

If the VIN is not registered in the keep-alive memory when the ignition is turned on or when the Clear command is executed, it is detected as a VIN unregistered condition and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or less
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P062F

#### Malfunction Threshold

The VIN is not registered in the keep-alive memory in the ECM/PCM.

#### Diagnosis Details

##### Conditions for illuminating the MIL

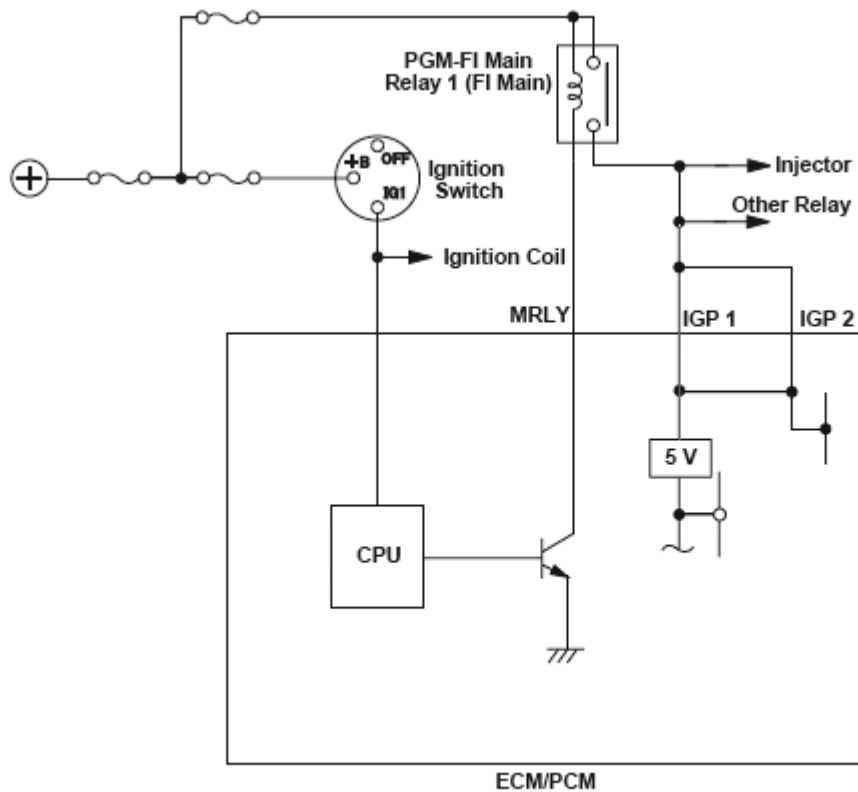
When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

When the VIN registration is completed, MIL is cleared.

## DTC P0685 (135): ADVANCED DIAGNOSTICS

**DTC P0685: ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM)  
POWER CONTROL CIRCUIT/INTERNAL CIRCUIT MALFUNCTION**



P0685-0604

**Fig. 90: Engine Control Module (ECM)/Powertrain Control Module (PCM) Power Control Circuit Diagram**

**General Description**

After the ignition switch is turned off, the engine control module (ECM)/powertrain control module (PCM) does not shut down immediately. After finishing a predetermined process according to the request of each device and system, the power supply is automatically disconnected (self shut-down function). The ECM/PCM power is disconnected by controlling PGM-FI main relay 1 (FI MAIN).

During a normal ECM/PCM shut down, the shut down process is executed by the CPU, PGM-FI main relay 1 (FI MAIN) is turned off, and the voltage to the ECM/PCM is turned off to shut down the ECM/PCM. When the voltage to the ECM/PCM is turned off and the ECM/PCM shuts down without the normal shut down procedure, a malfunction in the PGM-FI main relay 1 (FI MAIN) control circuit is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1 second or less
DTC Type	Two drive cycles, MIL ON

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OBD Status

N/A

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	400 rpm	-

### Malfunction Threshold

The ECM/PCM is shut down without the normal shut-down procedure.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0705 (5): ADVANCED DIAGNOSTICS

**DTC P0705: SHORT IN TRANSMISSION RANGE SWITCH CIRCUIT (MULTIPLE SHIFT-POSITION INPUT)**



P0705-0700

**Fig. 91: Transmission Range Switch Circuit Diagram**

**TRANSMISSION RANGE SWITCH CONTACT POINT INPUT MATRIX**

Shift lever position	Input per switch							
	P	R	RVS	N	D	2	1	FWD
P	O	X	X	X	X	X	X	X
R	X	O	O	X	X	X	X	X
N	X	X	X	O	X	X	X	X
D	X	X	X	X	O	X	X	O
2	X	X	X	X	X	O	X	O
1	X	X	X	X	X	X	O	O

O: Closed X: Open

**General Description**

The transmission range switch is attached to the control shaft. Operating the shift lever makes the control shaft rotate via the shift cable. The A/T gear position indicator indicates which position is selected according to the Low/High signal combinations which vary based on shift lever position. The control shaft changes the position of the transmission range switch, activates the manual valve, and switches hydraulic pressure to shift the transmission through forward/neutral/reverse. The transmission range switch signal is used to determine the shift schedule. The voltage is 12 V (High) at the powertrain control module (PCM) input terminal when each transmission range switch position is open, and it is 0 V (Low) when each switch is closed. If the PCM detects multiple switch inputs instead of the correct switch input for the selected range at that time, it detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
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Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-

#### Malfunction Threshold

##### Case 1

The PCM detects the selected range switch input and another range switch (except FWD switch) input simultaneously for at least 1 second.

##### Case 2

The PCM detects the P, R, or N range switch input and the FWD switch input simultaneously for at least 1 second.

#### Driving Pattern

Start the engine, and then place the shift lever in each position for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

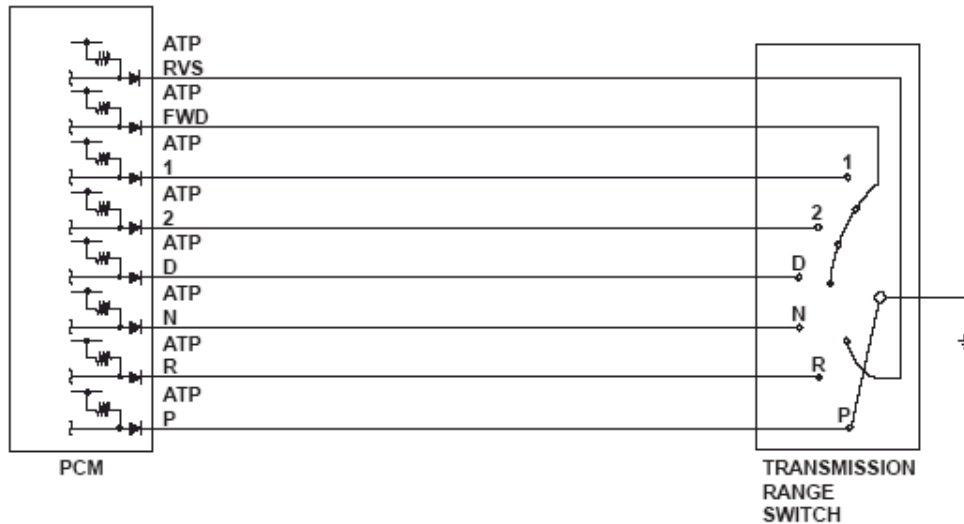
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0706 (6): ADVANCED DIAGNOSTICS

**DTC P0706: OPEN IN TRANSMISSION RANGE SWITCH CIRCUIT**



P0705-0700

**Fig. 92: Transmission Range Switch Circuit Diagram**

**TRANSMISSION RANGE SWITCH CONTACT POINT INPUT MATRIX**

Shift lever position	Input per switch							
	P	R	RVS	N	D	2	1	FWD
P	O	X	X	X	X	X	X	X
R	X	O	O	X	X	X	X	X
N	X	X	X	O	X	X	X	X
D	X	X	X	X	O	X	X	O
2	X	X	X	X	X	O	X	O
1	X	X	X	X	X	X	O	O

O: Closed X: Open

**General Description**

The transmission range switch is attached to the control shaft. Operating the shift lever makes the control shaft rotate via the shift cable. The A/T gear position indicator indicates which position is selected according to the Low/High signal combinations which vary based on the control shaft rotational angle. The control shaft changes the position of the transmission range switch, activates the manual valve, and switches hydraulic pressure to shift the transmission through forward/neutral/reverse. The transmission range switch signal is used to determine the shift schedule. The voltage is 12 V (High) at the powertrain control module (PCM) input terminal when each transmission range switch position is open, and it is 0 V (Low) when each switch is closed. If the FWD switch stays open while the vehicle repeatedly accelerates to a specified vehicle speed and then stops despite being in the D position, the PCM detects a malfunction in the transmission range switch (open) and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

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### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	Depending on the driving pattern
DTC Type	Two drive cycles, MIL ON, D indicator OFF
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0705, P0721, P0722	

### Malfunction Threshold

No FWD position signal is detected when the vehicle speed changes from 6 mph (10 km/h) --> 30 mph (48 km/h) --> 6 mph (10 km/h) in the D or 2 position.

### Driving Pattern

1. Start the engine, and accelerate to 30 mph (48 km/h) or more in D position, then slow down to 6 mph (10 km/h).
2. Stop the vehicle, turn the ignition switch OFF, and repeat step 1.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

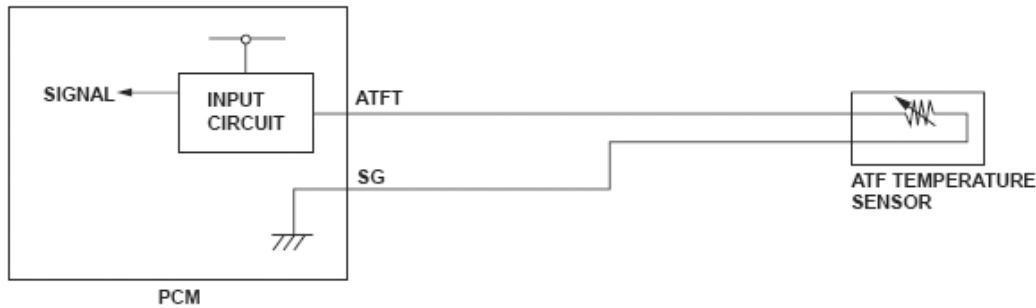
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0711 (28): ADVANCED DIAGNOSTICS

### DTC P0711: PROBLEM IN ATF TEMPERATURE SENSOR CIRCUIT

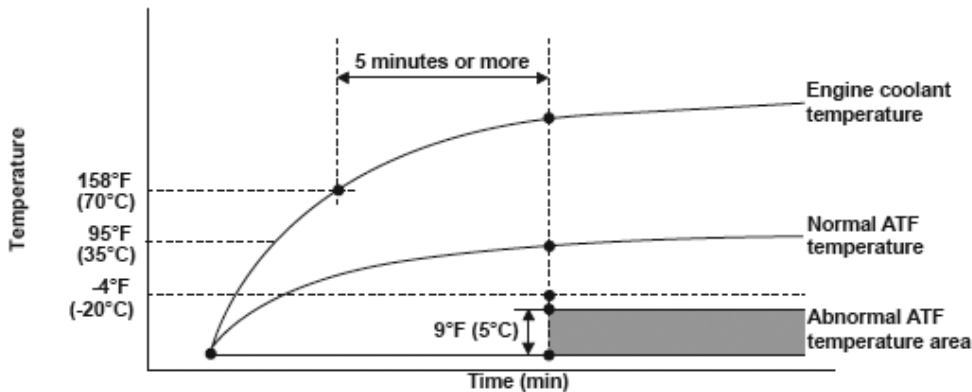




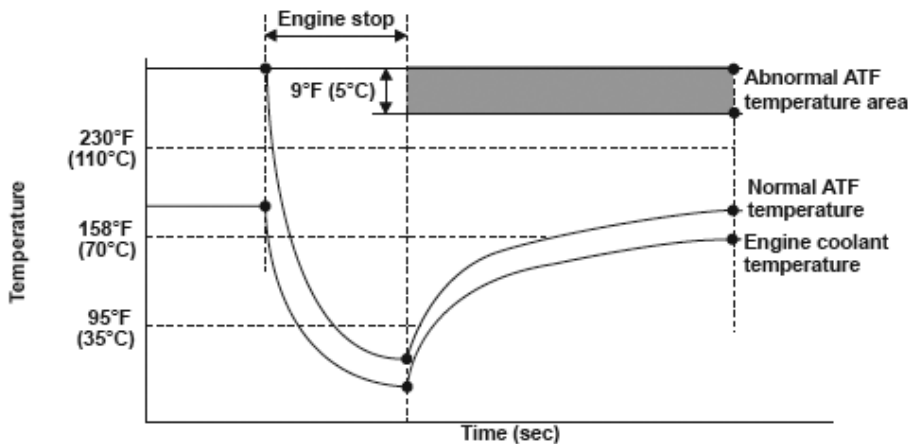
P0711-0301

**Fig. 93: ATF Temperature Sensor Circuit Diagram**

**1. Stuck at the low temperature**



**2. Stuck at the high temperature**



P0711-0370

**Fig. 94: ATF Temperature Graph**

**General Description**

The ATF temperature sensor is a thermistor type sensor whose resistance changes according to the change in ATF temperature. The powertrain control module (PCM) sends a 5 V reference voltage to the grounded sensor

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through a pull-up resistor. When the ATF temperature is low, the sensor resistance increases and the PCM detects a high signal voltage. As the ATF temperature rises, the sensor resistance decreases and the PCM detects a low signal voltage.

If the ATF temperature sensor signal does not change, the PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	5 minutes or more <sup>(1)</sup>
	20 seconds or more <sup>(2)</sup>
DTC Type	One drive cycle, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)
(1) Stuck at Low temperature is detected	
(2) Stuck at High temperature is detected	

#### Enable Conditions

1. Stuck at Low temperature

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	-	-4 °F (-20 °C)
Initial engine coolant temperature	-	95 °F (35 °C)
Engine coolant temperature	158 °F (70 °C)	-
Throttle position	4.0 °	-
Vehicle speed	19 mph (30 km/h)	-
No active DTCs	P0116, P0117, P0118, P0712, P0713, P0721, P0722	
Other	After the engine coolant temperature reaches the fixed value, both the vehicle speed and the throttle position meet the conditions for at least 5 minutes	

2. Stuck at High temperature

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	230 °F (110 °C)	-

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Previous engine coolant temperature when the ignition switch was turned OFF	158 °F (70 °C)	-
Present engine coolant temperature when the ignition switch is turned ON	-	95 °F (35 °C)
Engine coolant temperature	158 °F (70 °C)	-
No active DTCs	P0116, P0117, P0118, P0712, P0713, P0721, P0722	

#### Malfunction Threshold

##### 1. Stuck at Low temperature

The ATF temperature rise is 9 °F (5 °C) or less after the ignition switch is turned ON, and the current ATF temperature is -4 °F (-20 °C) or less for at least 5 minutes.

##### 2. Stuck at High temperature

The ATF temperature drop is -9 °F (-5 °C) or less after the ignition switch is turned OFF, and the current ATF temperature is 230 °F (110 °C) or more for at least 20 seconds.

#### Driving Pattern

##### 1. Stuck at Low temperature

Start the engine with engine coolant temperature at 95 °F (35 °C) or less, and warm up the engine until the engine coolant temperature reaches 158 °F (70 °C) or more. Then drive the vehicle at a speed of 19 mph (30 km/h) or more with the throttle position at 4.0 ° or more for at least 5 minutes.

##### 2. Stuck at High temperature

Turn off the engine with the engine coolant temperature at 158 °F (70 °C) or more. Restart the engine after the engine coolant temperature drops to 95 °F (35 °C) or less, and warm up the engine until the engine coolant temperature reaches 158 °F (70 °C), and wait for at least 20 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

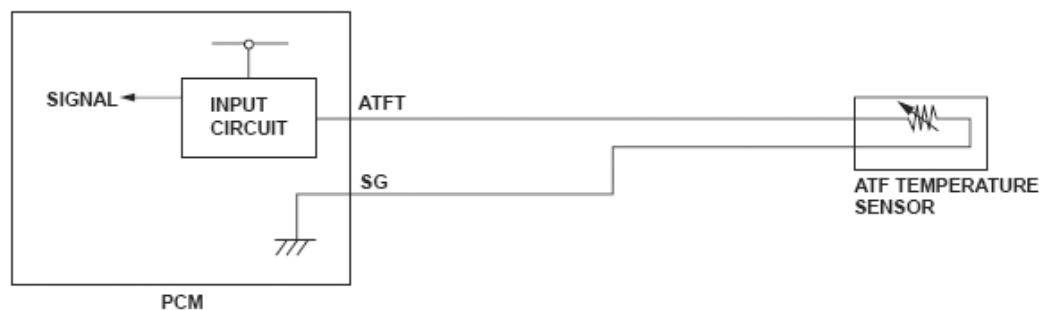
#### Diagnosis Details

##### Conditions for illuminating the indicator

When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0712 (28): ADVANCED DIAGNOSTICS****DTC P0712: SHORT IN ATF TEMPERATURE SENSOR CIRCUIT**

P0711-0301

**Fig. 95: ATF Temperature Sensor Circuit Diagram****General Description**

The ATF temperature sensor is a thermistor type sensor whose resistance changes according to the change in ATF temperature. The powertrain control module (PCM) sends a 5 V reference voltage to the grounded sensor through a pull-up resistor. When the ATF temperature is low, the sensor resistance increases and the PCM detects a high signal voltage. As the ATF temperature rises, the sensor resistance decreases and the PCM detects a low signal voltage.

When the ATF temperature sensor signal voltage to the PCM is under the specification, indicating that the temperature is above the specification (a short to ground), a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status****MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions****ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0711, P0713	

**Malfunction Threshold**

The ATF temperature sensor output voltage is less than 0.07 V for at least 10 seconds.

### Driving Pattern

Start the engine, shift to the P position, and wait for at least 10 seconds.

### Diagnosis Details

#### Conditions for illuminating the indicator

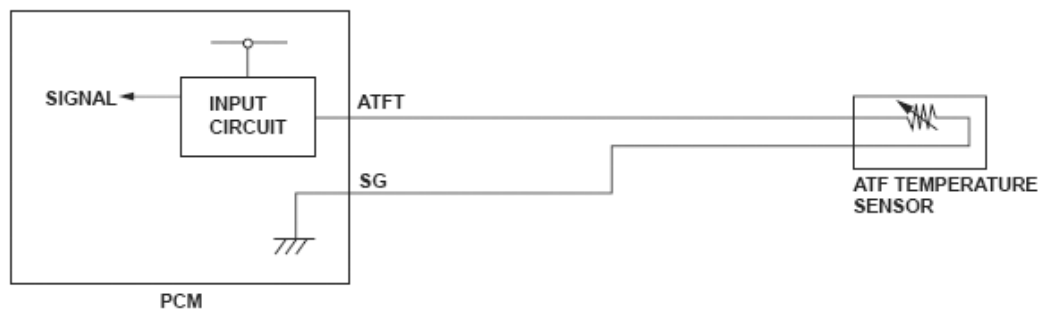
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

#### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0713 (28): ADVANCED DIAGNOSTICS

### DTC P0713: OPEN IN ATF TEMPERATURE SENSOR CIRCUIT



P0711-0301

**Fig. 96: ATF Temperature Sensor Circuit Diagram**

### General Description

The ATF temperature sensor is a thermistor type sensor whose resistance changes according to the change in ATF temperature. The powertrain control module (PCM) sends a 5 V reference voltage to the grounded sensor through a pull-up resistor. When the ATF temperature is low, the sensor resistance increases and the PCM detects a high signal voltage. As the ATF temperature rises, the sensor resistance decreases and the PCM detects a low signal voltage.

When the ATF temperature sensor signal voltage to the PCM is above the specification, indicating that the temperature is under the specification (open), a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0711, P0712	

### Malfunction Threshold

The ATF temperature sensor output voltage is 4.93 V or more for at least 10 seconds.

### Driving Pattern

Start the engine, shift to the P position, and wait for at least 10 seconds.

### Diagnosis Details

#### Conditions for illuminating the indicator

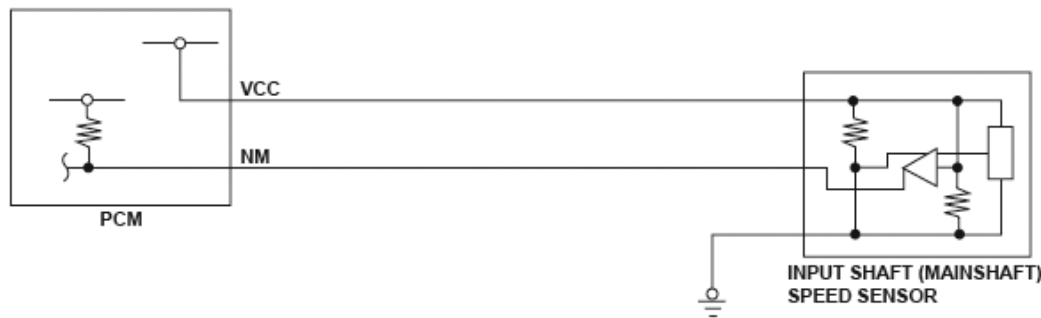
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

#### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0716 (15): ADVANCED DIAGNOSTICS

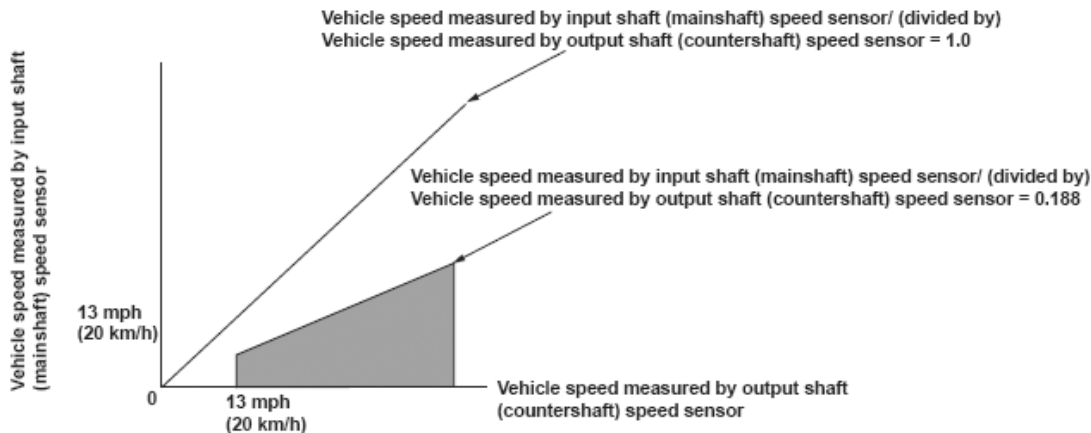
**DTC P0716: PROBLEM IN INPUT SHAFT (MAINSHAFT) SPEED SENSOR CIRCUIT**



P0716-0403

**Fig. 97: Input Shaft (Mainshaft) Speed Sensor Circuit Diagram**

**Failure Area**



P0716-0471

**Fig. 98: Vehicle Speed Graph**

**General Description**

The input shaft (mainshaft) speed sensor is attached to the outside of the transmission housing. The input shaft (mainshaft) speed sensor generates a pulsing signal according to the speed of the input shaft (mainshaft) idler gear on the input shaft (mainshaft). Using that signal, the powertrain control module (PCM) determines the speed of the input shaft (mainshaft). If no pulses occur with the input shaft (mainshaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the velocity ratio measured by the output shaft (countershaft) speed sensor and the input shaft (mainshaft) speed sensor, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON, D indicator blinks

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

OBD Status | PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	-
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D, 2, or 1	
No active DTCs	P0705, P0706, P0717, P0721, P0722, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
Others	Not during shifting	
	Not when the shift lever is being shifted	
	No electrical noise in the output shaft (countershaft) speed sensor output circuit	

#### Malfunction Threshold

The vehicle speed measured by the input shaft (mainshaft) speed sensor/(divided by) the vehicle speed measured by the output shaft (countershaft) speed sensor < 0.188 for at least 10 seconds.

#### Driving Pattern

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more for at least 10 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

##### Conditions for clearing the MIL

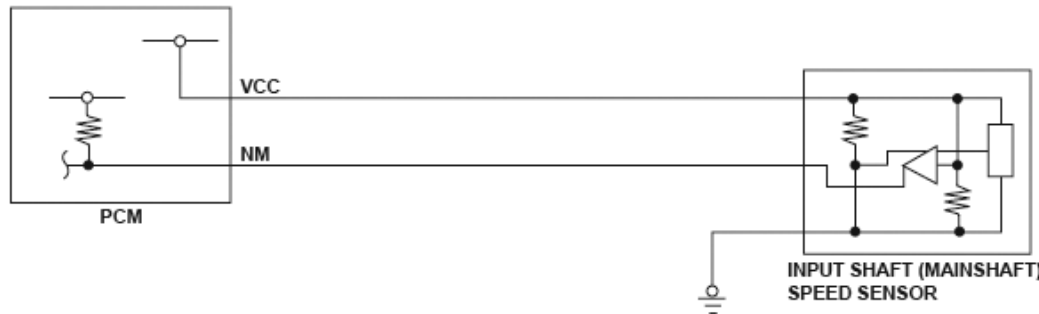
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0717 (15): ADVANCED DIAGNOSTICS



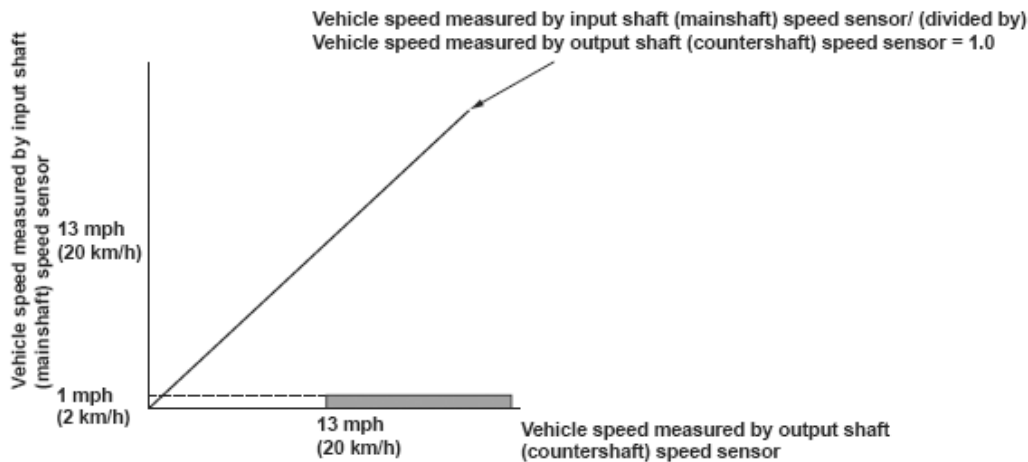
**DTC P0717: PROBLEM IN INPUT SHAFT (MAINSHAFT) SPEED SENSOR CIRCUIT (NO SIGNAL INPUT)**



P0716-0403

**Fig. 99: Input Shaft (Mainshaft) Speed Sensor Circuit Diagram**

**Failure Area**



P0717-0470

**Fig. 100: Vehicle Speed Graph**

**General Description**

The input shaft (mainshaft) speed sensor is attached to the outside of the transmission housing. The input shaft (mainshaft) speed sensor generates a pulsing signal according to the speed of the input shaft (mainshaft) idler gear on the input shaft (mainshaft). Using that signal, the powertrain control module (PCM) determines the speed of the input shaft (mainshaft). If no pulses occur with the input shaft (mainshaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the correlation between the vehicle speed measured by the output shaft (countershaft) speed sensor and the input shaft (mainshaft) speed sensor, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

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## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	-
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D, 2, or 1	
No active DTCs	P0705, P0706, P0716, P0721, P0722, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
Others	Not during shifting	
	Not when the shift lever is being shifted	
	No electrical noise in the output shaft (countershaft) speed sensor output circuit	

#### Malfunction Threshold

When the vehicle speed measured by the output shaft (countershaft) speed sensor is 13 mph (20 km/h) or more, the vehicle speed measured by the input shaft (mainshaft) speed sensor is 1 mph (2 km/h) or less for at least 10 seconds.

#### Driving Pattern

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more for at least 10 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

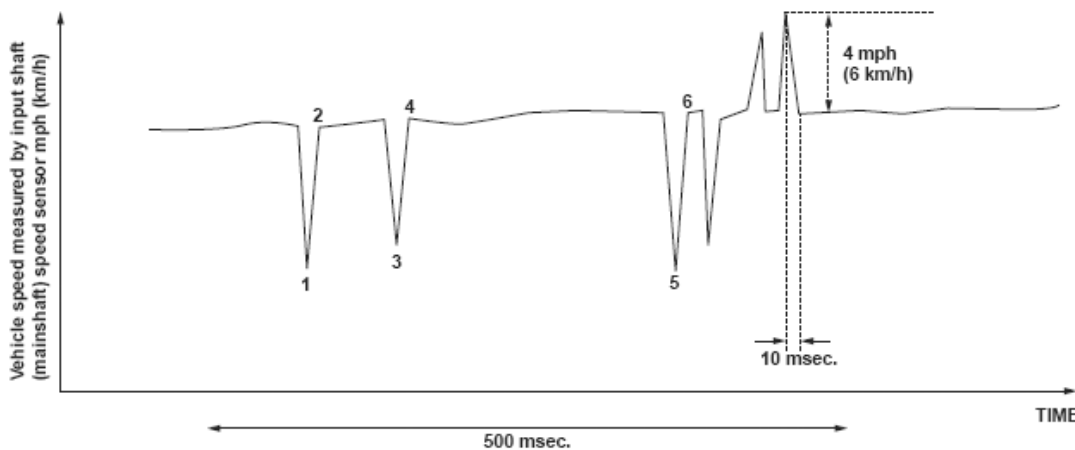
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0718 (15): ADVANCED DIAGNOSTICS

### DTC P0718: INPUT SHAFT (MAINSHAFT) SPEED SENSOR INTERMITTENT FAILURE



**Fig. 101: Input Shaft (Mainshaft) Speed Sensor Circuit Diagram**



**Fig. 102: Vehicle Speed Graph**

#### General Description

The input shaft (mainshaft) speed sensor is attached to the outside of the transmission housing. The input shaft (mainshaft) speed sensor generates a pulsing signal according to the speed of the input shaft (mainshaft) idler gear on the input shaft (mainshaft). Using that signal, the powertrain control module (PCM) determines the speed of the input shaft (mainshaft). If no pulses occur with the input shaft (mainshaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the fluctuation of the vehicle speed measured by the input shaft (mainshaft) speed sensor, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	500 msec
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
No active DTCs	P0716, P0717, P0721, P0722	
Others	Not during shifting	
	Not when an output shaft (countershaft) speed sensor intermittent failure is detected	

### Malfunction Threshold

The fluctuation of the vehicle speed measured by the input shaft (mainshaft) speed sensor in 10 milliseconds is 4 mph (6km/h) or more, and it fluctuates at least six times within 500 milliseconds.

### Driving Pattern

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more so it shifts from 1st to 5th in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

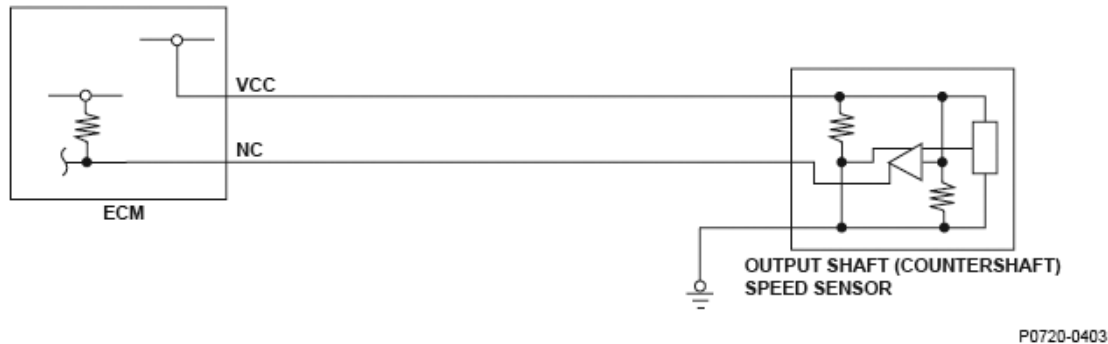
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0720 (122): ADVANCED DIAGNOSTICS

### DTC P0720: OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CIRCUIT MALFUNCTION (M/T MODEL)



**Fig. 103: Output Shaft (Countershaft) Speed Sensor Circuit Diagram**

#### General Description

The output shaft (countershaft) speed sensor is attached to the transmission housing to sense output shaft (countershaft) revolutions. The engine control module (ECM) determines the vehicle speed according to the signal from the output shaft (countershaft) speed sensor to the control units. If no signal from the output shaft (countershaft) speed sensor is received for a set time, the ECM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	-	4,000 rpm
Battery voltage	10.0 V	-

#### Malfunction Threshold

No signal from the output shaft (countershaft) speed sensor is detected for at least 5 seconds.

#### Diagnosis Details

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM memory.

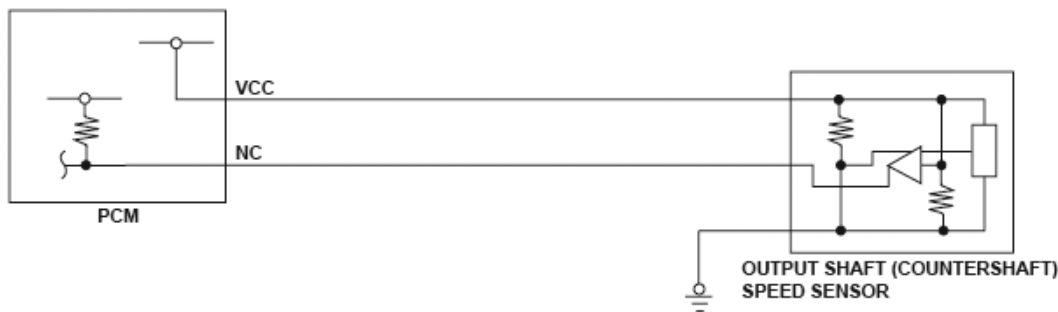
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0721 (9): ADVANCED DIAGNOSTICS**

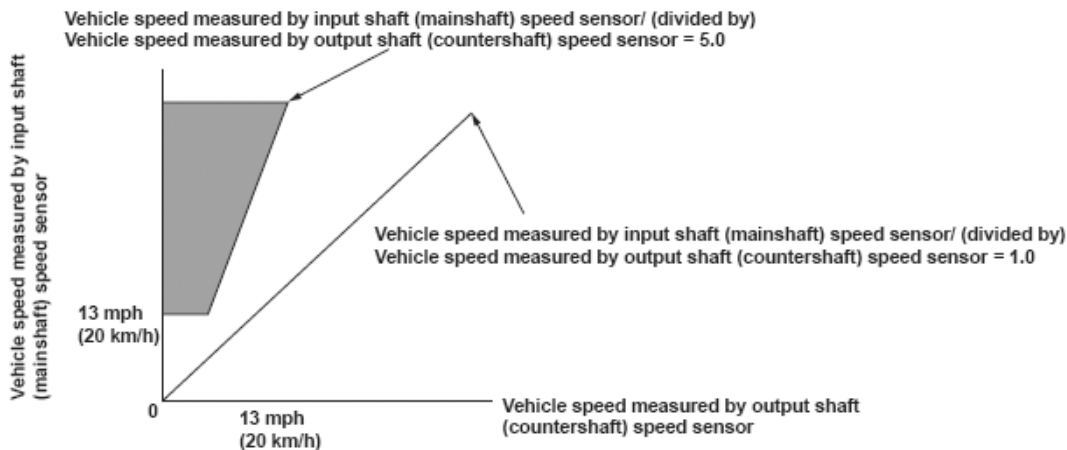
**DTC P0721: PROBLEM IN OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CIRCUIT**



P0721-0403

**Fig. 104: Output Shaft (Countershaft) Speed Sensor Circuit Diagram**

**Failure Area**



P0721-0471

**Fig. 105: Vehicle Speed Graph**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### General Description

The output shaft (countershaft) speed sensor is attached to the outside of the transmission housing. The output shaft (countershaft) speed sensor generates a pulsing signal according to the speed of the park gear on the output shaft (countershaft). Using that signal, the powertrain control module (PCM) determines the speed of the output shaft (countershaft). If pulse dropouts occur with the output shaft (countershaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the velocity ratio measured by the input shaft (mainshaft) speed sensor and the output shaft (countershaft) speed sensor, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	-
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D, 2, or 1	
No active DTCs	P0705, P0706, P0716, P0717, P0722, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
Others	Not during shifting	
	Not when the shift lever is being shifted	
	No electrical noise in the input shaft (mainshaft) speed sensor output circuit	

#### Malfunction Threshold

The vehicle speed measured by the input shaft (mainshaft) speed sensor/(divided by) the vehicle speed measured by the output shaft (countershaft) speed sensor > 5.0 for at least 10 seconds.

#### Driving Pattern

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more for at least 10 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

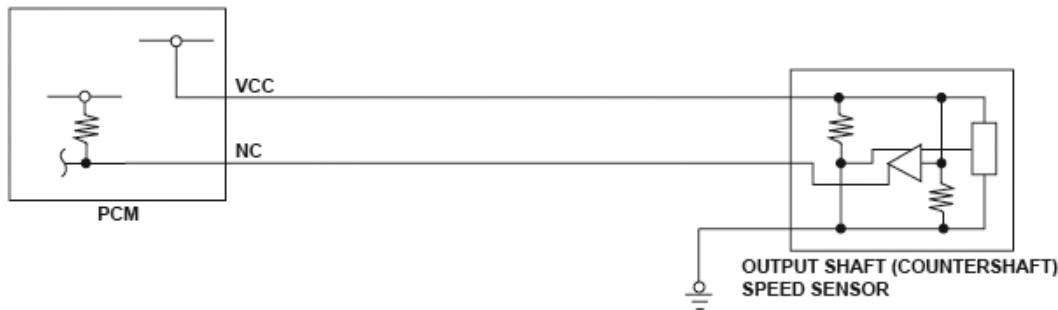
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

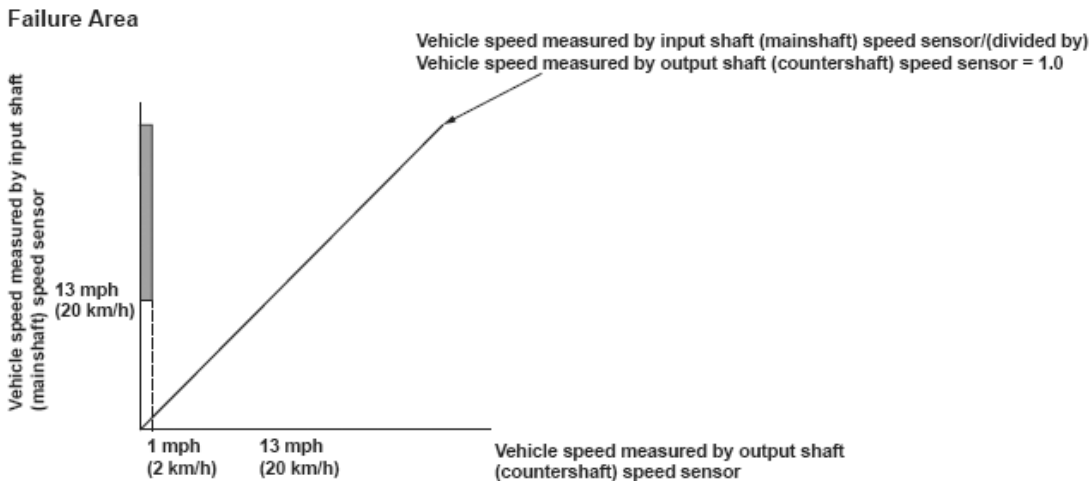
**DTC P0722 (9): ADVANCED DIAGNOSTICS**

**DTC P0722: PROBLEM IN OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CIRCUIT (NO SIGNAL INPUT)**



P0721-0403

**Fig. 106: Output Shaft (Countershaft) Speed Sensor Circuit Diagram**



P0722-0470



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### **Fig. 107: Vehicle Speed Graph**

#### **General Description**

The output shaft (countershaft) speed sensor is attached to the outside of the transmission housing. The output shaft (countershaft) speed sensor generates a pulsing signal according to the speed of the park gear on the output shaft (countershaft). Using that signal, the powertrain control module (PCM) determines the speed of the output shaft (countershaft). If pulse dropouts occur with the output shaft (countershaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the correlation between the vehicle speed measured by the output shaft (countershaft) speed sensor and the input shaft (mainshaft) speed sensor, a malfunction is detected and a DTC is stored.

#### **Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

#### **MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### **Enable Conditions**

#### **ENABLE CONDITIONS**

Condition	Minimum	Maximum
Engine speed	500 rpm	-
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D, 2, or 1	
No active DTCs	P0705, P0706, P0716, P0717, P0721, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
Others	Not during shifting	
	Not when the shift lever is being shifted	
	No electrical noise in the input shaft (mainshaft) speed sensor output circuit	

#### **Malfunction Threshold**

When the vehicle speed measured by the input shaft (mainshaft) speed sensor is 13 mph (20 km/h) or more, the vehicle speed measured by the output shaft (countershaft) speed sensor is 1 mph (2 km/h) or less for at least 10 seconds.

#### **Driving Pattern**

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more for at least 10 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0723 (9): ADVANCED DIAGNOSTICS

### DTC P0723: OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR INTERMITTENT FAILURE

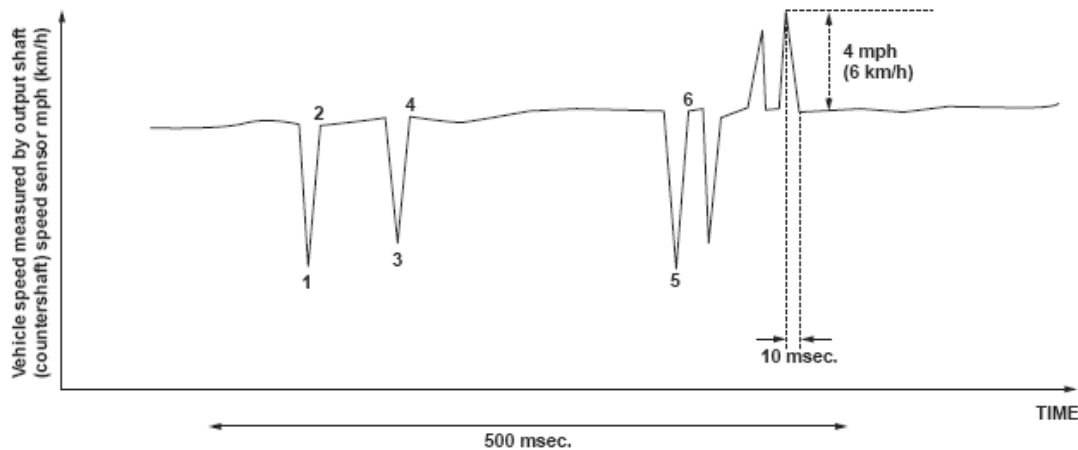


P0721-0403

**Fig. 108: Output Shaft (Countershaft) Speed Sensor Circuit Diagram**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0723-0470

**Fig. 109: Vehicle Speed Graph**

#### General Description

The output shaft (countershaft) speed sensor is attached to the outside of the transmission housing. The output shaft (countershaft) speed sensor generates a pulsing signal according to the speed of the park gear on the output shaft (countershaft). Using that signal, the powertrain control module (PCM) determines the speed of the output shaft (countershaft). If pulse dropouts occur with the output shaft (countershaft) rotating, the PCM detects a malfunction that may be caused by an open, a temporary open, or a short to ground. Based on the fluctuation of the vehicle speed measured by the output shaft (countershaft) speed sensor, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	500 milliseconds
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	13 mph (20 km/h)	-
Battery voltage	11.0 V	-
No active DTCs	P0721, P0722	
Others	Not during shifting	
	Not when a input shaft (mainshaft) speed sensor intermittent failure is detected	

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### Malfunction Threshold

The fluctuation of the vehicle speed measured by the output shaft (countershaft) speed sensor in 10 milliseconds is 4 mph (6km/h) or more, and it fluctuates at least six times within 500 milliseconds.

#### Driving Pattern

Start the engine, and drive the vehicle at a speed of 13 mph (20 km/h) or more so it shifts from 1st to 5th in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

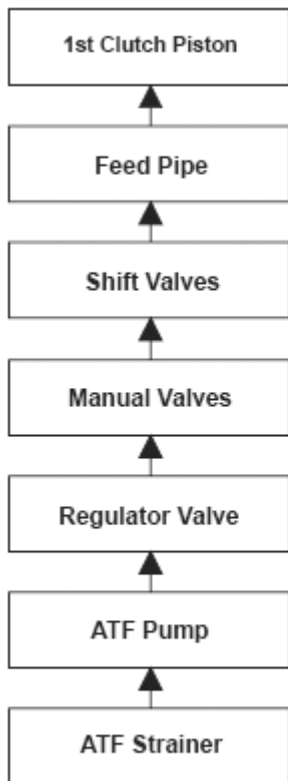
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

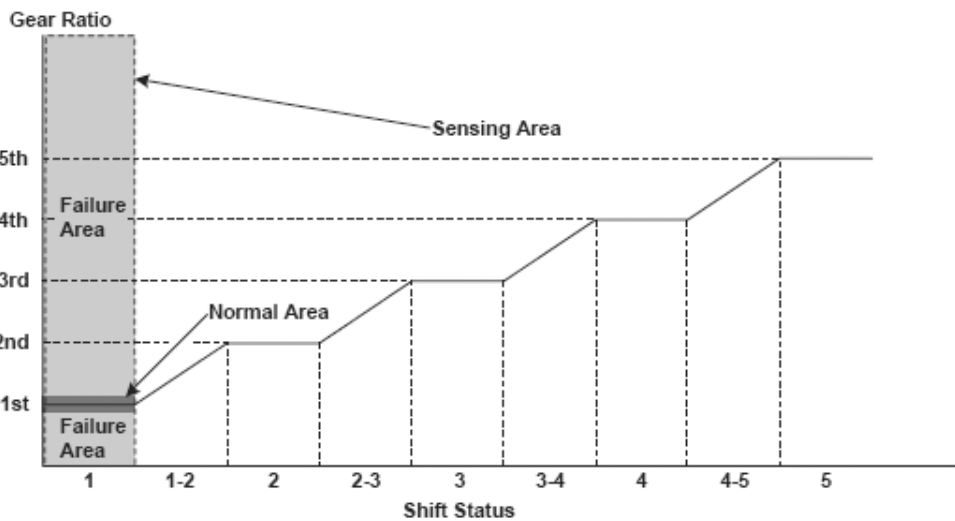
## DTC P0731 (64): ADVANCED DIAGNOSTICS

**DTC P0731: PROBLEM IN 1ST CLUTCH AND 1ST CLUTCH HYDRAULIC CIRCUIT (1ST GEAR INCORRECT RATIO)**



P0731-0370

**Fig. 110: Problem In 1st Clutch And 1st Clutch Hydraulic Circuit Flow Chart**



P0731-0371

**Fig. 111: Gear Ratio Versus Shift Status Graph**

**General Description**

To engage 1st gear, line pressure is supplied to the 1st clutch piston, engaging the 1st clutch, and the secondary

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

shaft and the secondary shaft 1st gear are connected and revolve together. Hydraulic pressure is supplied to the 1st clutch through the ATF strainer --> the ATF pump --> the regulator valve --> the manual valve --> the shift valves --> the feed pipe --> 1st clutch piston. (A shift valve failure in the supply route above is detected by the malfunction detection of each shift solenoid valve.) The powertrain control module (PCM) computes the ratio of the input shaft (mainshaft) speed to the output shaft (countershaft) speed. When the ratio is not the 1st gear ratio, it is detected as a malfunction of the hydraulic circuit or the 1st clutch, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	12 seconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	1,000 rpm	-
Vehicle speed	8 mph (12 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D	
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The actual gear ratio must match one of these conditions for at least 12 seconds with the 1st gear command:

- Actual gear ratio > 1st gear ratio by a factor of 1.2
- Actual gear ratio < 1st gear ratio by a factor of 0.75

#### Driving Pattern

Start the engine, shift to D position, and drive the vehicle at a speed of 8 mph (12 km/h) or more for at least 12 seconds in 1st gear.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the indicator

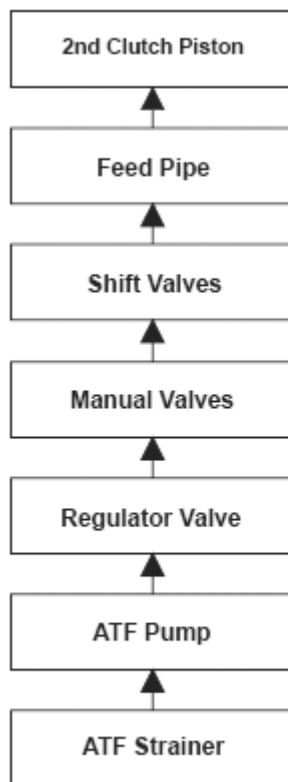
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

#### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

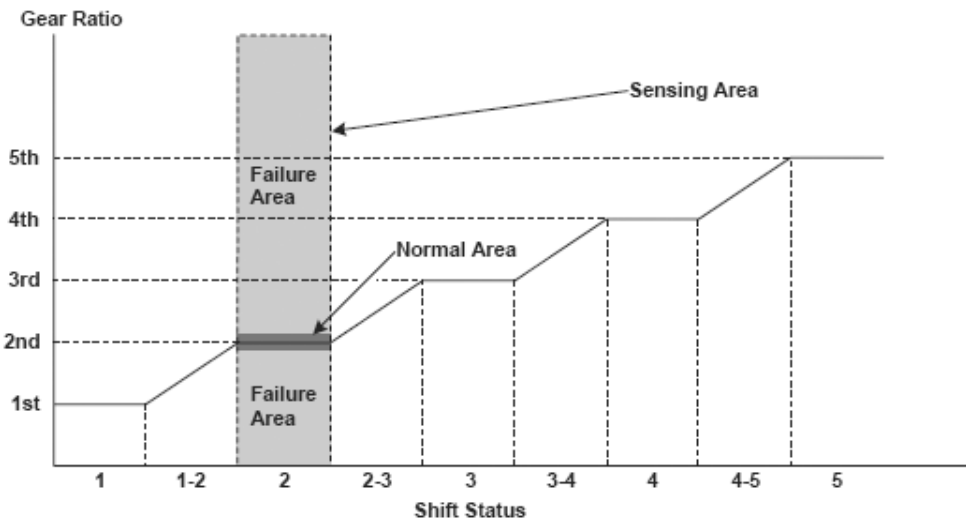
## DTC P0732 (64): ADVANCED DIAGNOSTICS

### DTC P0732: PROBLEM IN 2ND CLUTCH AND 2ND CLUTCH HYDRAULIC CIRCUIT (2ND GEAR INCORRECT GEAR RATIO)



P0732-0370

**Fig. 112: Problem In 2nd Clutch And 2nd Clutch Hydraulic Circuit Flow Chart**



P0732-0371

**Fig. 113: Gear Ratio Versus Shift Status Graph**

**General Description**

To engage 2nd gear, line pressure is supplied to the 2nd clutch piston, engaging the 2nd clutch, and the secondary shaft and the secondary shaft 2nd gear are connected and revolve together. Hydraulic pressure is supplied to the 2nd clutch through the ATF strainer --> the ATF pump --> the regulator valve --> the manual valve --> the shift valves --> the feed pipe --> 2nd clutch piston. (A shift valve failure in the supply route above is detected by the malfunction detection of each shift solenoid valve.) The powertrain control module (PCM) computes the ratio of the input shaft (mainshaft) speed to the output shaft (countershaft) speed. When the ratio is not the 2nd gear ratio, it is detected as a malfunction of the hydraulic circuit or the 2nd clutch, and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	12 seconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Engine speed	1,000 rpm	-
Vehicle	8 mph (12 km/h)	-



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speed		
Battery voltage	11.0 V	-
Shift lever position	D	
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The actual gear ratio must match one of these conditions for at least 12 seconds with the 2nd gear command:

- Actual gear ratio > 2nd gear ratio by a factor of 1.2
- Actual gear ratio < 2nd gear ratio by a factor of 0.75

#### Driving Pattern

Start the engine, shift to D position, and drive the vehicle at a speed of 8 mph (12 km/h) or more for at least 12 seconds in 2nd gear.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the indicator

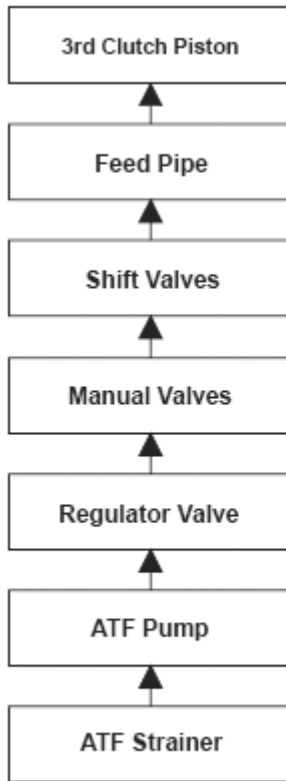
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

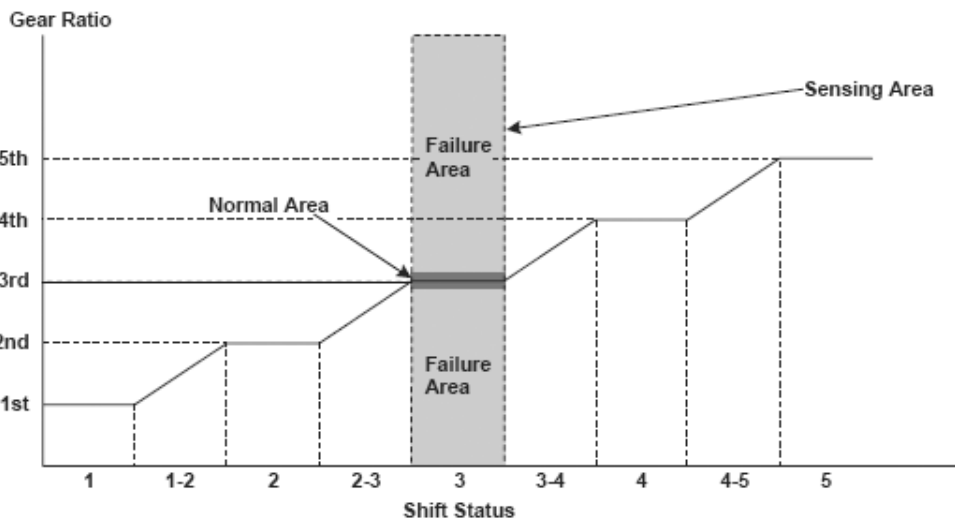
## DTC P0733 (64): ADVANCED DIAGNOSTICS

**DTC P0733: PROBLEM IN 3RD CLUTCH AND 3RD CLUTCH HYDRAULIC CIRCUIT (3RD GEAR INCORRECT GEAR RATIO)**



P0733-0370

**Fig. 114: Problem In 3rd Clutch And 3rd Clutch Hydraulic Circuit Flow Chart**



P0733-0371

**Fig. 115: Gear Ratio Versus Shift Status Graph**

**General Description**

To engage 3rd gear, line pressure is supplied to the 3rd clutch piston, the 3rd clutch is engaged, and the

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secondary shaft and the secondary shaft 3rd gear are connected and revolve together. Hydraulic pressure is supplied to the 3rd clutch through the ATF strainer --> the ATF pump --> the regulator valve --> the manual valve --> the shift valves --> the feed pipe --> 3rd clutch piston. (The shift valve failure in the supplying route above is detected by the malfunction detection of each shift solenoid valve.) The powertrain control module (PCM) computes the ratio of the mainshaft speed to the countershaft speed. When the ratio is not the 3rd gear ratio, it is detected as a malfunction of the hydraulic circuit or the 3rd clutch, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	12 seconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	1,000 rpm	-
Vehicle speed	8 mph (12 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D	
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The actual gear ratio must match one of these conditions for at least 12 seconds with the 3rd gear command:

- Actual gear ratio > 3rd gear ratio by a factor of 1.2
- Actual gear ratio < 3rd gear ratio by a factor of 0.75

#### Driving Pattern

Start the engine, shift to D position, and drive the vehicle at a speed of 8 mph (12 km/h) or more for at least 12 seconds in 3rd gear.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the indicator

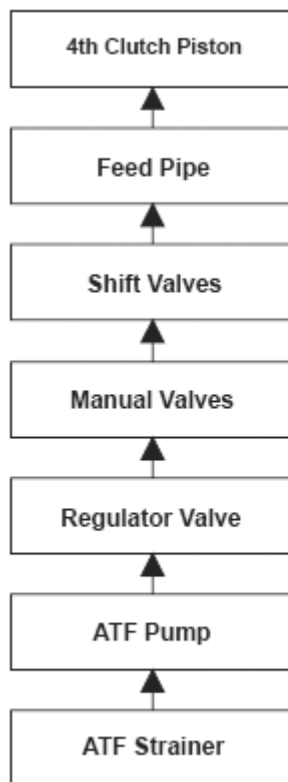
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

#### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

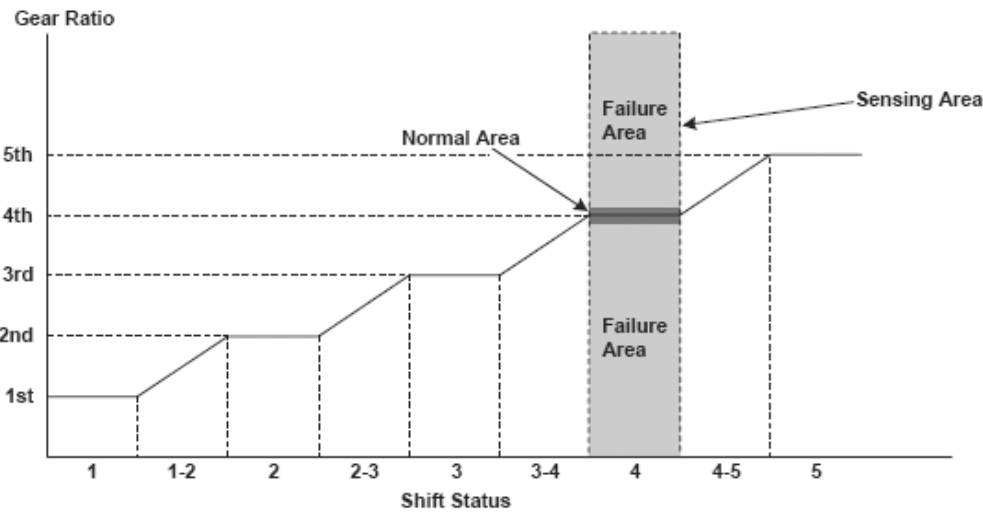
## DTC P0734 (64): ADVANCED DIAGNOSTICS

### DTC P0734: PROBLEM IN 4TH CLUTCH AND 4TH CLUTCH HYDRAULIC CIRCUIT (4TH GEAR INCORRECT GEAR RATIO)



P0734-0370

**Fig. 116: Problem In 4th Clutch And 4th Clutch Hydraulic Circuit Flow Chart**



P0734-0371

**Fig. 117: Gear Ratio Versus Shift Status Graph**

**General Description**

To engage 4th gear, line pressure is supplied to the 4th clutch piston, engaging the 4th clutch, and the input shaft (mainshaft) and the input shaft (mainshaft) 4th gear are connected and revolve together. Hydraulic pressure is supplied to the 4th clutch through the ATF strainer --> the ATF pump --> the regulator valve --> the manual valve --> the shift valves --> the feed pipe --> 4th clutch piston. (A shift valve failure in the supply route above is detected by the malfunction detection of each shift solenoid valve.) The powertrain control module (PCM) computes the ratio of the input shaft (mainshaft) speed to the output shaft (countershaft) speed. When the ratio is not the 4th gear ratio, it is detected as a malfunction of the hydraulic circuit or the 4th clutch, and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	12 seconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Engine speed	1,000 rpm	-
Vehicle speed	8 mph (12 km/h)	-

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Battery voltage	11.0 V	-
Shift lever position	D	
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The actual gear ratio must match one of these conditions for at least 12 seconds with the 4th gear command:

- Actual gear ratio > 4th gear ratio by a factor of 1.2
- Actual gear ratio < 4th gear ratio by a factor of 0.75

#### Driving Pattern

Start the engine, shift to D position, and drive the vehicle at a speed of 8 mph (12 km/h) or more for at least 12 seconds in 4th gear.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the indicator

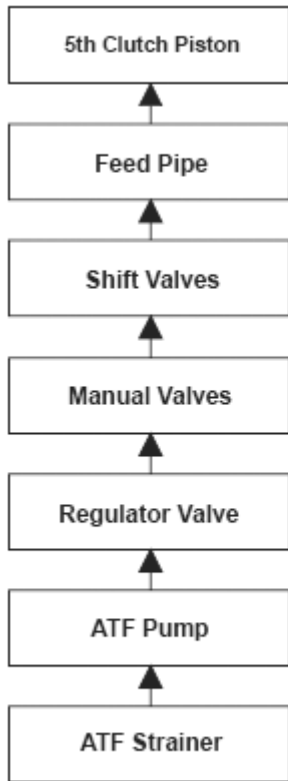
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

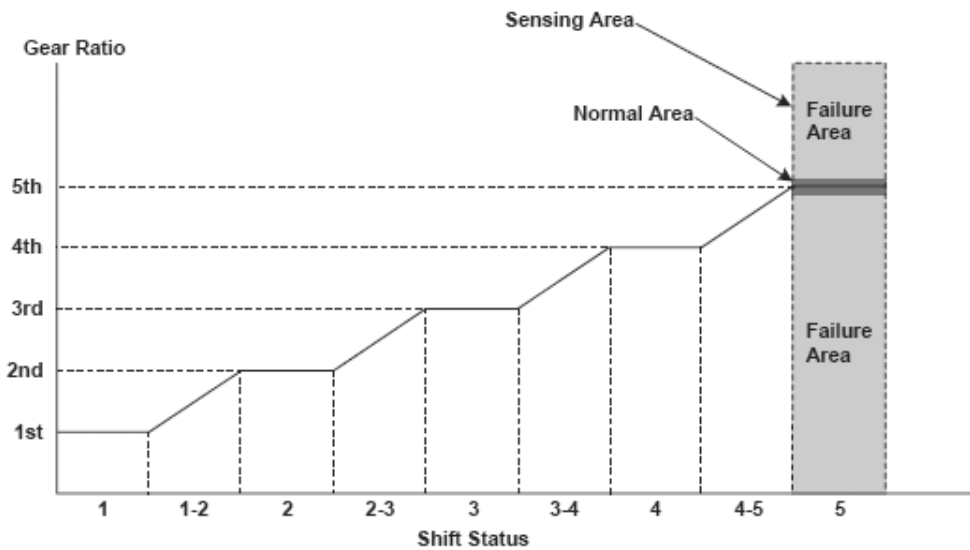
## DTC P0735 (64): ADVANCED DIAGNOSTICS

**DTC P0735: PROBLEM IN 5TH CLUTCH AND 5TH CLUTCH HYDRAULIC CIRCUIT (5TH GEAR INCORRECT RATIO)**



P0735-0370

**Fig. 118: Problem In 5th Clutch And 5th Clutch Hydraulic Circuit Flow Chart**



P0735-0371

**Fig. 119: Gear Ratio Versus Shift Status Graph**

**General Description**

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To engage 5th gear, line pressure is supplied to the 5th clutch piston, engaging the 5th clutch, and the input shaft (mainshaft) and the input shaft (mainshaft) 5th gear are connected and revolve together. Hydraulic pressure is supplied to the 5th clutch through the ATF strainer --> the ATF pump --> the regulator valve --> the manual valve --> the shift valves --> the feed pipe --> 5th clutch piston. (A shift valve failure in the supply route above is detected by the malfunction detection of each shift solenoid valve.) The powertrain control module (PCM) computes the ratio of the input shaft (mainshaft) speed to the output shaft (countershaft) speed. When the ratio is not the 5th gear ratio, it is detected as a malfunction of the hydraulic circuit or the 5th clutch, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	12 seconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	1,000 rpm	-
Vehicle speed	8 mph (12 km/h)	-
Battery voltage	11.0 V	-
Shift lever position	D	
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The actual gear ratio must match one of these conditions for at least 12 seconds with the 5th gear command:

- Actual gear ratio > 5th gear ratio by a factor of 1.2
- Actual gear ratio < 5th gear ratio by a factor of 0.75

#### Driving Pattern

Start the engine, shift to D position, and drive the vehicle at a speed of 8 mph (12 km/h) or more for at least 12



seconds in 5th gear.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the indicator**

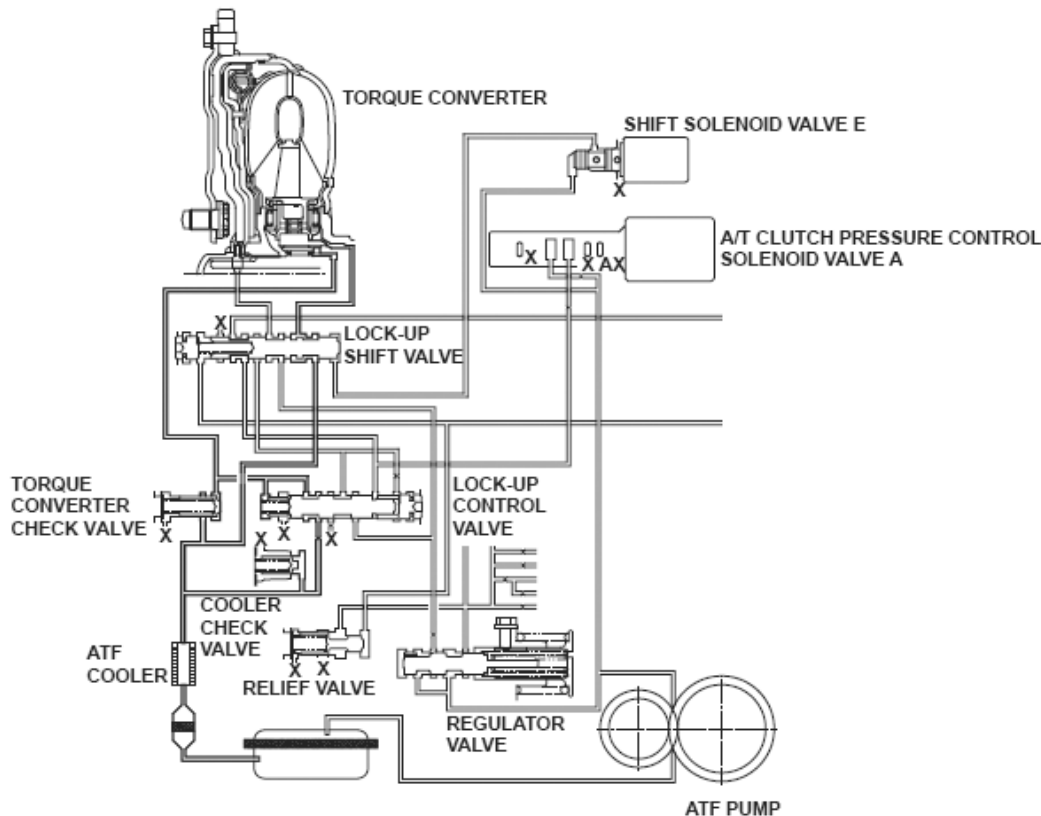
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0741 (40): ADVANCED DIAGNOSTICS**

**DTC P0741: TORQUE CONVERTER CLUTCH HYDRAULIC CIRCUIT STUCK OFF**



P0741-0372

**Fig. 120: Torque Converter Clutch System Diagram**

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### TORQUE CONVERTER CLUTCH OPERATION REFERENCE

Torque converter clutch operation		A/T clutch pressure control solenoid valve A	
		ON (100 %)	OFF (0 %)
Shift solenoid valve E	ON (12 V)	Torque converter clutch: maximum duty	Torque converter clutch OFF
	OFF (0 V)	Torque converter clutch OFF	Torque converter clutch OFF

#### General Description

The power transfer capacity of the torque converter clutch is controlled by the balance of automatic transmission fluid (ATF) supplied to and discharged from the torque converter. When hydraulic pressure is applied internally, the torque converter clutch turns ON, and when hydraulic pressure is applied from the back pressure side, the lock-up clutch turns OFF. As the hydraulic pressure from the internal pressure side increases, the power transfer capacity of the torque converter clutch increases. The direction of hydraulic pressure supply is switched by shift solenoid valve E and the lock-up shift valve. ATF is supplied from the internal pressure side to shift solenoid valve E when the signal from the powertrain control module (PCM) is ON (12 V), and ATF is supplied from the back pressure side when it is OFF (0 V). The balance of internal pressure and back pressure is controlled by A/T clutch pressure control solenoid valve A and the lock-up control valve. A/T clutch pressure control solenoid valve A maximizes the power transfer capacity of the torque converter clutch when the signal from the PCM is ON (1 A), and it minimizes the power transfer capacity of the torque converter clutch when the signal from the PCM is OFF (0 A). If the ratio of engine speed and mainshaft speed is not about 1:1 while the PCM is issuing the command to turn shift solenoid valve E and A/T clutch pressure control solenoid valve A ON, the PCM detects a faulty lock-up control system and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	20 seconds
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	158 °F (70 °C)	212 °F (100 °C)
Battery voltage	11.0 V	-
ATF temperature	-	284 °F (140 °C)

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Shift status	5th
Torque converter clutch	During controlling operation
No active DTCs	P0116, P0117, P0118, P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734
Other	<p>When both the vehicle speed and the throttle position are in Enable Range</p> <p>Throttle Pedal Position (degrees)</p> <p>18.4 °</p> <p>3.1 °</p> <p>50 (80)</p> <p>73 mph (117 km/h)</p> <p>Vehicle Speed</p> <p>Enable Range</p> <p>P0741-0770</p>

#### Malfunction Threshold

The ratio of the engine revolution to the transmission input pulse does not reach about 100% for at least 20 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a constant speed of 60 mph (96 km/h) for at least 20 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the indicator

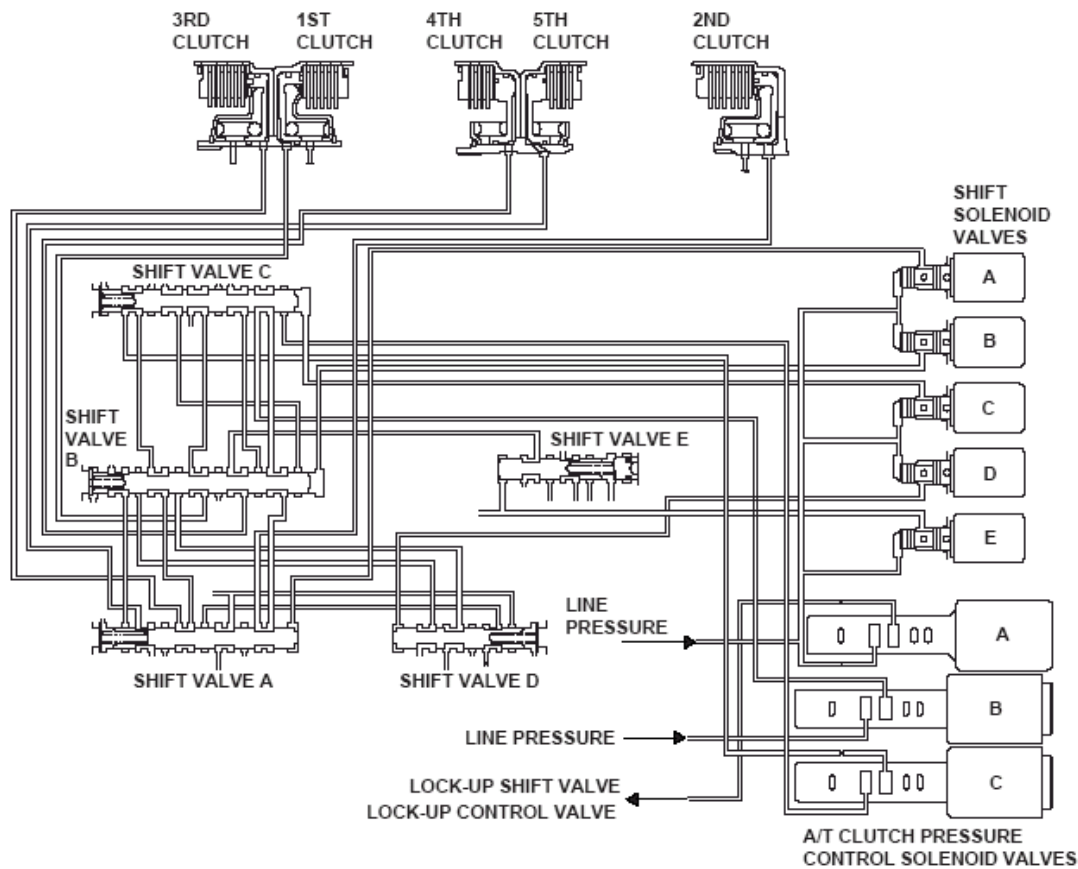
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0747 (76): ADVANCED DIAGNOSTICS**

**DTC P0747: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A STUCK ON**



P0747-0770

**Fig. 121: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve  Clutch	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 122: Shift Solenoid Valve Output (D Position) Hydraulic Pressure Supply To Clutch By Shift Solenoid Valve Output (D Position)**

#### General Description

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft and countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in A/T clutch pressure control solenoid valve A or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2.5 seconds
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	-4 °F (-20 °C) <sup>(1), (3)</sup>	-
Throttle position	4.0 % or more, or fully closed <sup>(1), (3)</sup>	
	6.0 % or more, or fully closed <sup>(2)</sup>	

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift lever position	D
Shift status	1st --> 2nd <sup>(1)</sup>
	2nd <sup>(2)</sup>
	3rd --> 4th <sup>(3)</sup>
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734
Other	Torque converter clutch lock-up OFF <sup>(3)</sup>
(1) Symptom 1-A	
(2) Symptom 1-B	
(3) Symptom 2-A	

#### Malfunction Threshold

One of these symptoms occurs.

#### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Shifting between 1st gear and 2nd gear	Held in 1st gear
1-B	Driving in 2nd gear	Driving in 2nd gear

#### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
2-A	Shifting between 3rd gear and 4th gear	Driving in 3rd gear

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

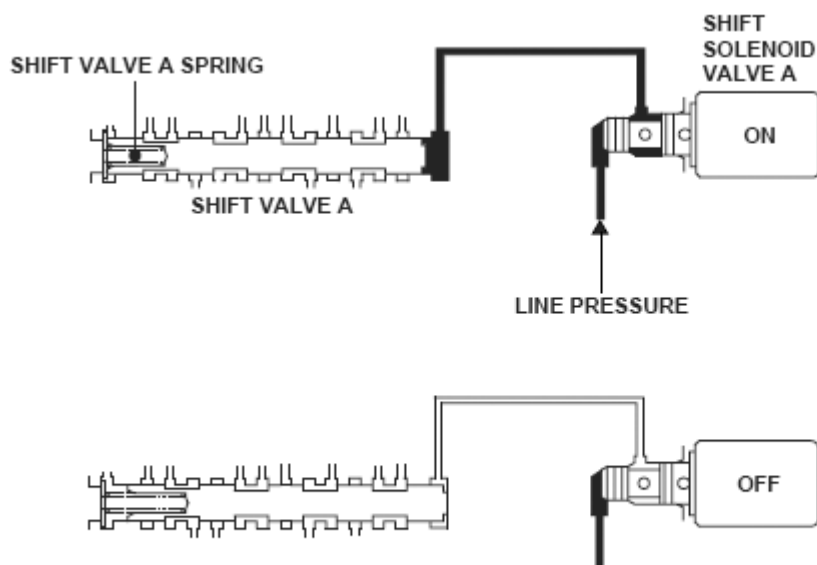
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0752 (70): ADVANCED DIAGNOSTICS

### DTC P0752: SHIFT SOLENOID VALVE A STUCK ON



P0752-0371

**Fig. 123: Shift Solenoid Valve A Operation Diagram**

Shift solenoid valve driving signal combination table

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4th - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 124: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

Shift solenoid valve A is installed in the transmission housing. It is controlled by the ON/OFF signal from the powertrain control module (PCM) to apply line pressure to shift valve A. The signal from the PCM is output to apply clutch pressure control pressure to the proper gear change clutch according to the gear change schedule. When the signal to shift solenoid valve A from the PCM is OFF, line pressure is discharged, and shift valve A is inactive. When the signal to shift solenoid valve A from the PCM is ON, line pressure is applied to shift valve A, and it operates against the shift valve A spring. The PCM monitors the mainshaft speed and the countershaft speed at the gear change determined by the shift schedule. When an improper gear ratio is output compared to the predetermined gear change mode, a shift solenoid valve A ON failure is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2.5 seconds (symptom 1-A, 2-A, 2-B)
	3 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1), (2)</sup>	-
Battery		



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voltage	11.0 V	-
Accelerator pedal position	6.0 % or more, or fully closed <sup>(3)</sup>	
Shift lever position	D	
Shift status	2nd <sup>(1)</sup>	
	3rd <sup>(2)</sup> , <sup>(3)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A, 2-A		
(2) Symptom 1-B		
(3) Symptom 2-B		

**Malfunction Threshold**

One of these symptoms occurs.

**MALFUNCTION THRESHOLD - SYMPTOM 1**

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 2nd gear	Neutral
1-B	Driving in 3rd gear	Neutral

**MALFUNCTION THRESHOLD - SYMPTOM 2**

Symptom	Gear position commanded by the PCM	Actual gear position
2-A	Driving in 2nd gear	Neutral
2-B	Driving in 1st gear	Driving in 1st gear

**Driving Pattern**

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

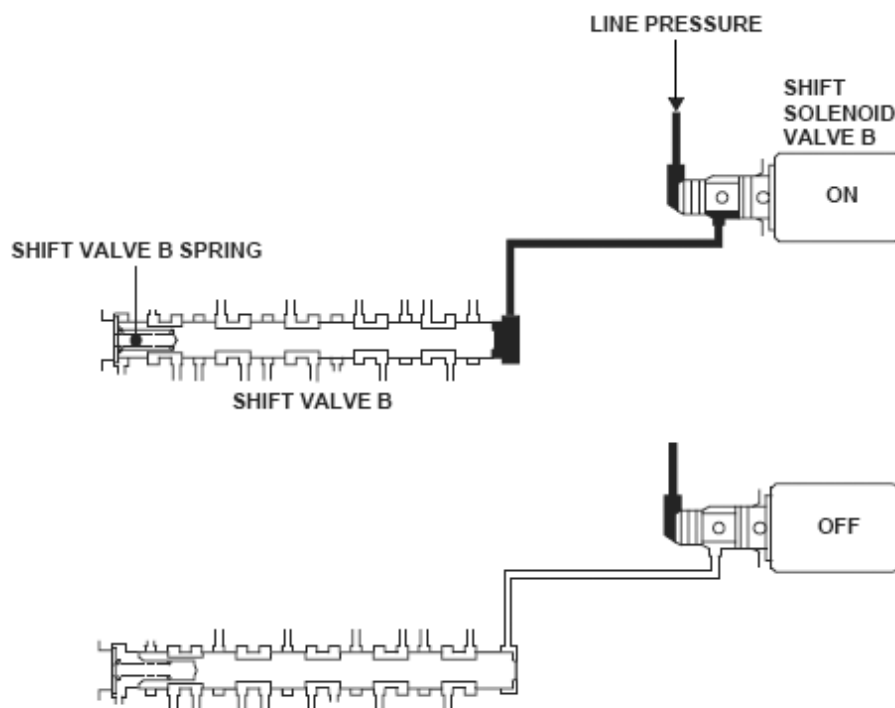
**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0756 (71): ADVANCED DIAGNOSTICS****DTC P0756: SHIFT SOLENOID VALVE B STUCK OFF**

P0756-0372

**Fig. 125: Shift Solenoid Valve B Operation Diagram**

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Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4th - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 126: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

Shift solenoid valve B is installed in the transmission housing. It is controlled by the ON/OFF signal from the powertrain control module (PCM) to apply line pressure to shift valve B. The signal from the PCM is output to apply clutch pressure control pressure to the proper gear change clutch according to the gear change schedule. When the signal to shift solenoid valve B from the PCM is OFF, and line pressure is discharged, shift valve B is inactive. When the signal to shift solenoid valve B from the PCM is ON, and line pressure is applied to shift valve B, it operates against the shift valve B spring. The PCM monitors the mainshaft speed and the countershaft speed at the gear change determined by the shift schedule. When an improper gear ratio is output compared to the predetermined gear change mode, a shift solenoid valve B OFF failure is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds (symptom 1-A)
	2.5 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle	-	6 mph (9 km/h) <sup>(1)</sup>

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speed	-	2 mph (4 km/h) <sup>(2)</sup>
Battery voltage	11.0 V	-
ATF temperature	-	248 °F (120 °C) <sup>(1)</sup>
Throttle position	Fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	Neutral --> 1st <sup>(1)</sup>	
	1st <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		

**Malfunction Threshold****MALFUNCTION THRESHOLD SYMPTOMS**

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	1st gear shifting from the N position	Neutral
1-B	Driving in 1st gear	Neutral

**Driving Pattern**

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

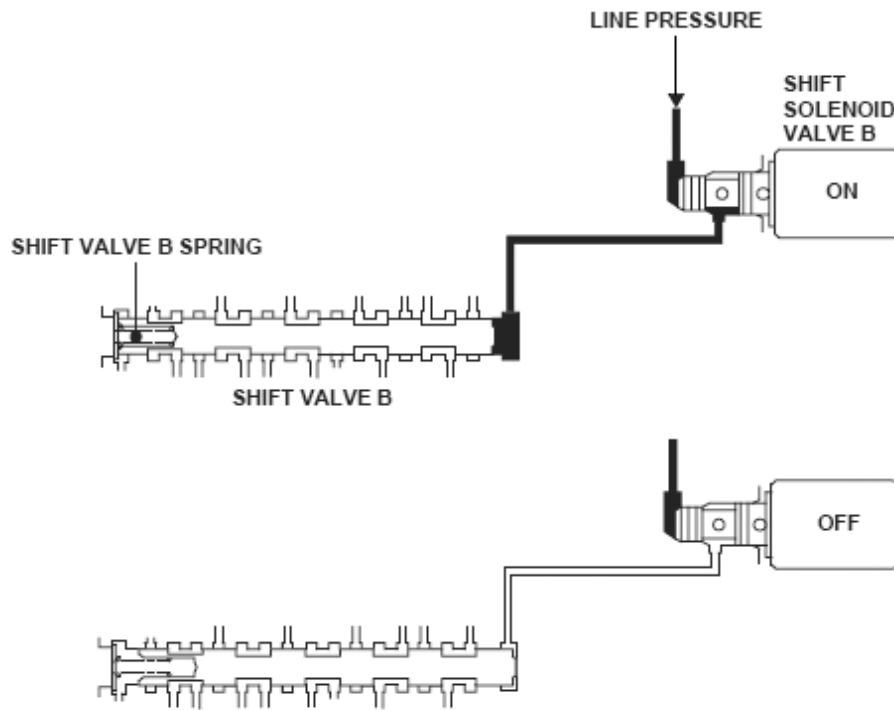
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0757 (71): ADVANCED DIAGNOSTICS

### DTC P0757: SHIFT SOLENOID VALVE B STUCK ON



P0756-0372

**Fig. 127: Shift Solenoid Valve B Operation Diagram**

Shift solenoid valve driving signal combination table

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Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4th - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 128: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

Shift solenoid valve B is installed in the transmission housing. It is controlled by the ON/OFF signal from the powertrain control module (PCM) to apply line pressure to shift valve B. The signal from the PCM is output to apply clutch pressure control pressure to the proper gear change clutch according to the gear change schedule. When the signal to shift solenoid valve B from the PCM is OFF, and line pressure is discharged, shift valve B is inactive. When the signal to shift solenoid valve B from the PCM is ON, and line pressure is applied to shift valve B, it operates against the shift valve B spring. The PCM monitors the mainshaft speed and the countershaft speed at the gear change determined by the shift schedule. When an improper gear ratio is output compared to the predetermined gear change mode, a shift solenoid valve B ON failure is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	6 seconds (symptom 1-A)
	2.5 seconds (symptom 1-B, 2-A, 2-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle	2 mph (4 km/h) <sup>(1), (3)</sup>	-

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speed		
Battery voltage	11.0 V	-
Throttle position	6.0 % <sup>(4)</sup>	-
	6.0 % or more, or fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	5th <sup>(1)</sup>	
	3rd <sup>(2)</sup>	
	4th <sup>(3)</sup>	
	2nd --> 3rd <sup>(4)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		
(3) Symptom 2-A		
(4) Symptom 2-B		

#### Malfunction Threshold

One of these symptom combinations occurs:

- Symptom 1 occurs during the 1st drive cycle, and symptom 2 occurs during the 2nd drive cycle.
- Symptom 2 occurs during the 1st drive cycle, and symptom 1 occurs during the 2nd drive cycle.

#### MALFUNCTION THRESHOLD - SYMPTOM 1

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 5th gear	Neutral
1-B	Driving in 3rd gear	Driving in 3rd gear

#### MALFUNCTION THRESHOLD - SYMPTOM 2

Symptom	Gear position commanded by the PCM	Actual gear position
2-A	Driving in 4th gear	Neutral
2-B	Shifting between 2nd gear and 3rd gear	Shifting between 2nd gear and 3rd gear

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### **Diagnosis Details**

#### **Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### **Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

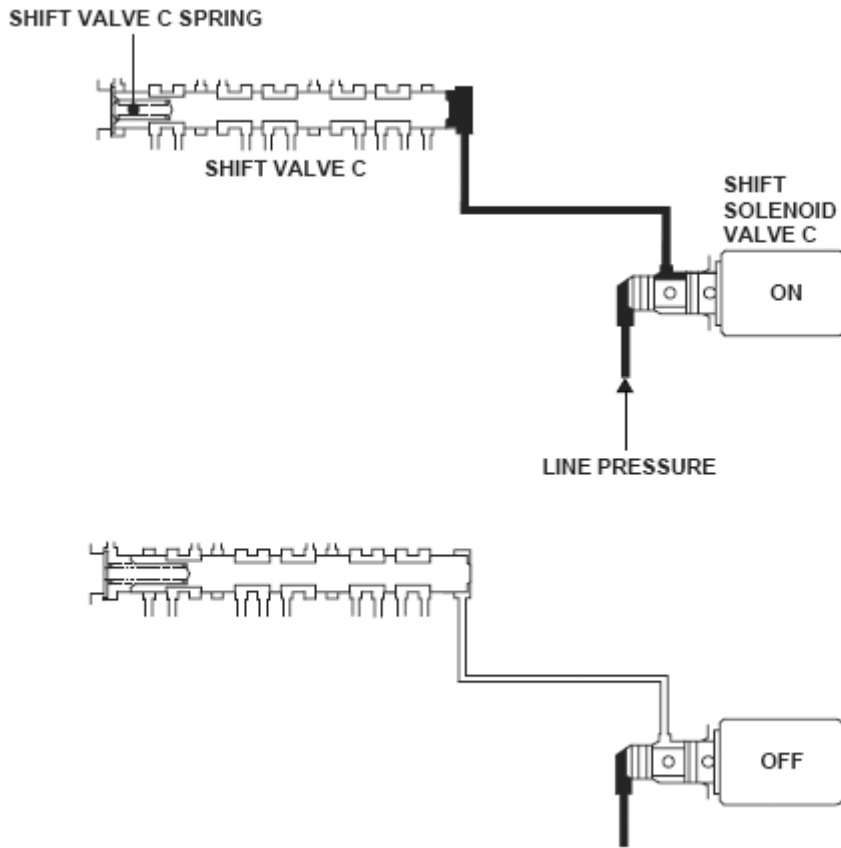
## **DTC P0761 (72): ADVANCED DIAGNOSTICS**

### **DTC P0761: SHIFT SOLENOID VALVE C STUCK OFF**



## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0761-0372

**Fig. 129: Shift Solenoid Valve C Operation Diagram**

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4th - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 130: Shift Solenoid Valve Driving Signal Combination Table**

**General Description**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve C is installed in the transmission housing. It is controlled by the ON/OFF signal from the powertrain control module (PCM) to apply line pressure to shift valve C. The signal from the PCM is output to apply clutch pressure control pressure to the proper gear change clutch according to the gear change schedule. When the signal to shift solenoid valve C from the PCM is OFF, line pressure is discharged, and shift valve C is inactive. When the signal to shift solenoid valve C from the PCM is ON, line pressure is applied to shift valve C, and it operates against the shift valve C spring. The PCM monitors the mainshaft speed and the countershaft speed at the gear change determined by the shift schedule. When an improper gear ratio is output compared to the predetermined gear change mode, a shift solenoid valve C OFF failure is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds (symptom 1-A) 2.5 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	-	2 mph (4 km/h) <sup>(2)</sup>
Battery voltage	11.0 V	-
Accelerator pedal position	Fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	Neutral --> 1st <sup>(1)</sup> 1st <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0771, P0776, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOM

Symptom	Gear position commanded by the PCM	Actual gear position
---------	------------------------------------	----------------------

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1-A	1st gear shifting from the N position	2nd gear
1-B	1st gear	Neutral

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

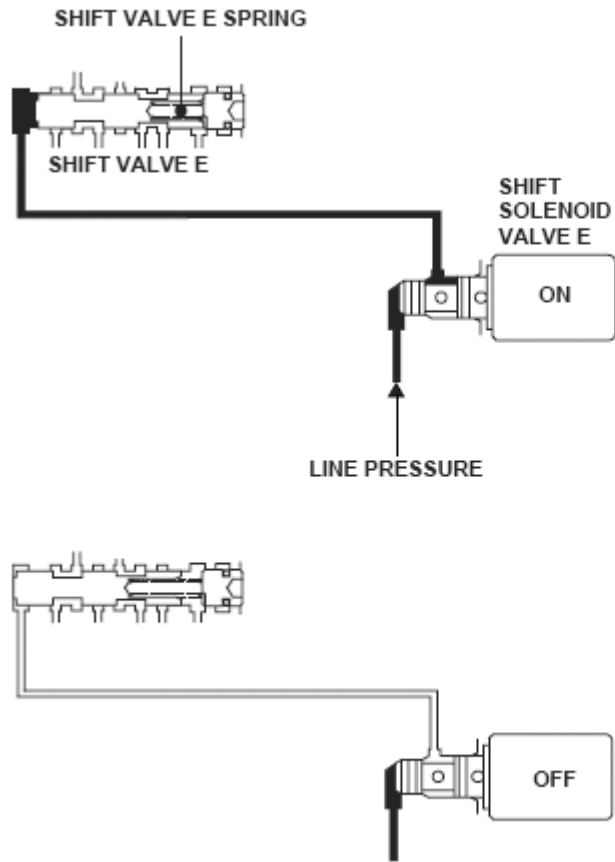
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0771 (74): ADVANCED DIAGNOSTICS

### DTC P0771: SHIFT SOLENOID VALVE E STUCK OFF

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0771-0370

**Fig. 131: Shift Solenoid Valve E Operation Diagram**

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4th - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 132: Shift Solenoid Valve Driving Signal Combination Table**

**General Description**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve E is installed in the transmission housing. It is controlled by the ON/OFF signal from the powertrain control module (PCM) to apply line pressure to shift valve E. The signal from the PCM is output to apply clutch pressure control pressure to the proper gear change clutch according to the gear change schedule. When the signal to shift solenoid valve E from the PCM is OFF, line pressure is discharged, and shift valve E is inactive. When the signal to shift solenoid valve E from the PCM is ON, line pressure is applied to shift valve E, and it operates against the shift valve E spring. The PCM monitors the mainshaft speed and the countershaft speed at the gear change determined by the shift schedule. When an improper gear ratio is output compared to the predetermined gear change mode, a shift solenoid valve E OFF failure is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	-4 °F (-20 °C)	-
Shift lever position	D	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0776, P0777, P0780, P0796, P0797, P0842, P0843, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
Other	Torque converter clutch lock-up ON	

#### Malfunction Threshold

This symptom occurs.

#### MALFUNCTION THRESHOLD - SYMPTOM 1 Symptom 1

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Shifting between 3rd gear and 4th gear	Driving in 3rd gear

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

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- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

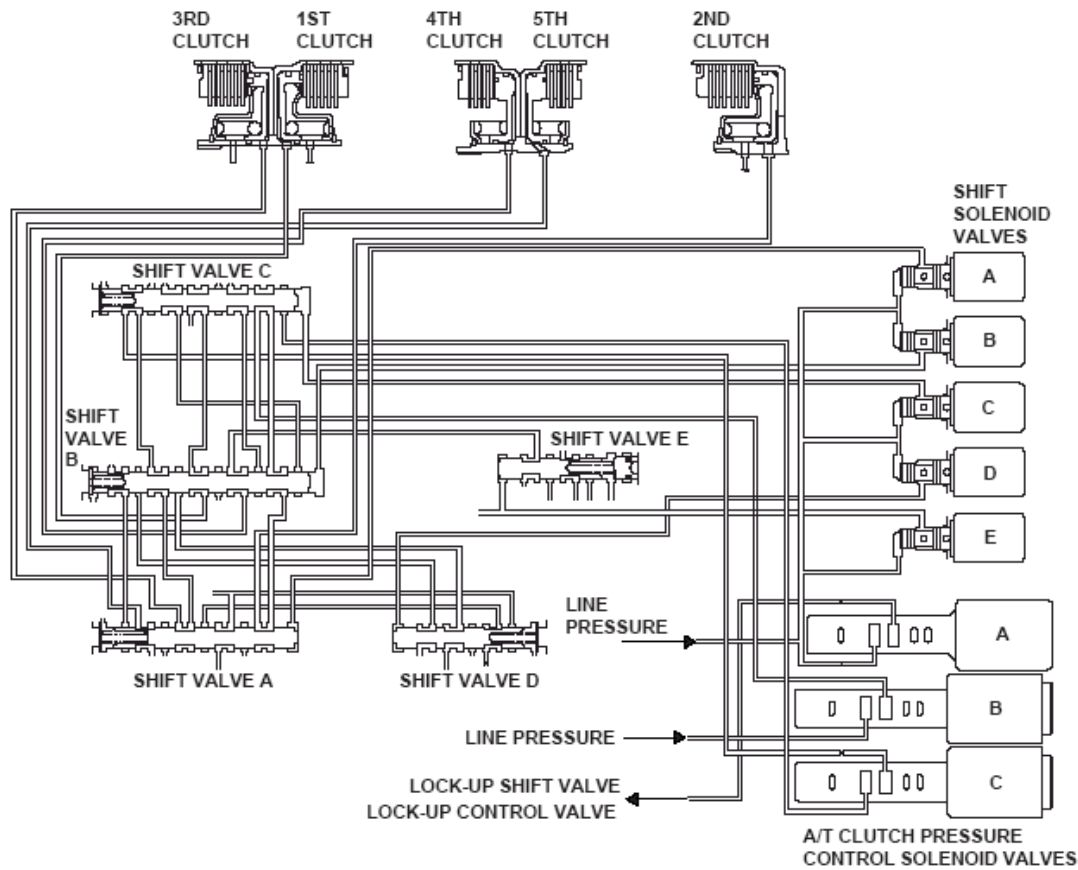
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0776 (77): ADVANCED DIAGNOSTICS

**DTC P0776: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B STUCK OFF**



P0747-0770

**Fig. 133: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Clutch											
	1st Clutch	CPC A	LINE	CPC A		CPC A					
	2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A			
	3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C			
	4th Clutch							CPC B	CPC B	CPC B	
	5th Clutch									CPC C	CPC C

CPC: Clutch Pressure Control pressure

**Fig. 134: Shift Solenoid Valve Output (D Position)**

**General Description**

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft and countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in A/T clutch pressure control solenoid valve B or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds (symptom 1-A)
	1 second (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1)</sup>	-
Throttle position	6.0 % <sup>(2)</sup>	-
Battery voltage	11.0 V	-
Shift lever position	D	
Shift status	4th <sup>(1)</sup>	
	2nd --> 3rd <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0777, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 4th gear	Neutral
1-B	Shifting between 2nd gear and 3rd gear	A sudden increase in engine speed



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#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

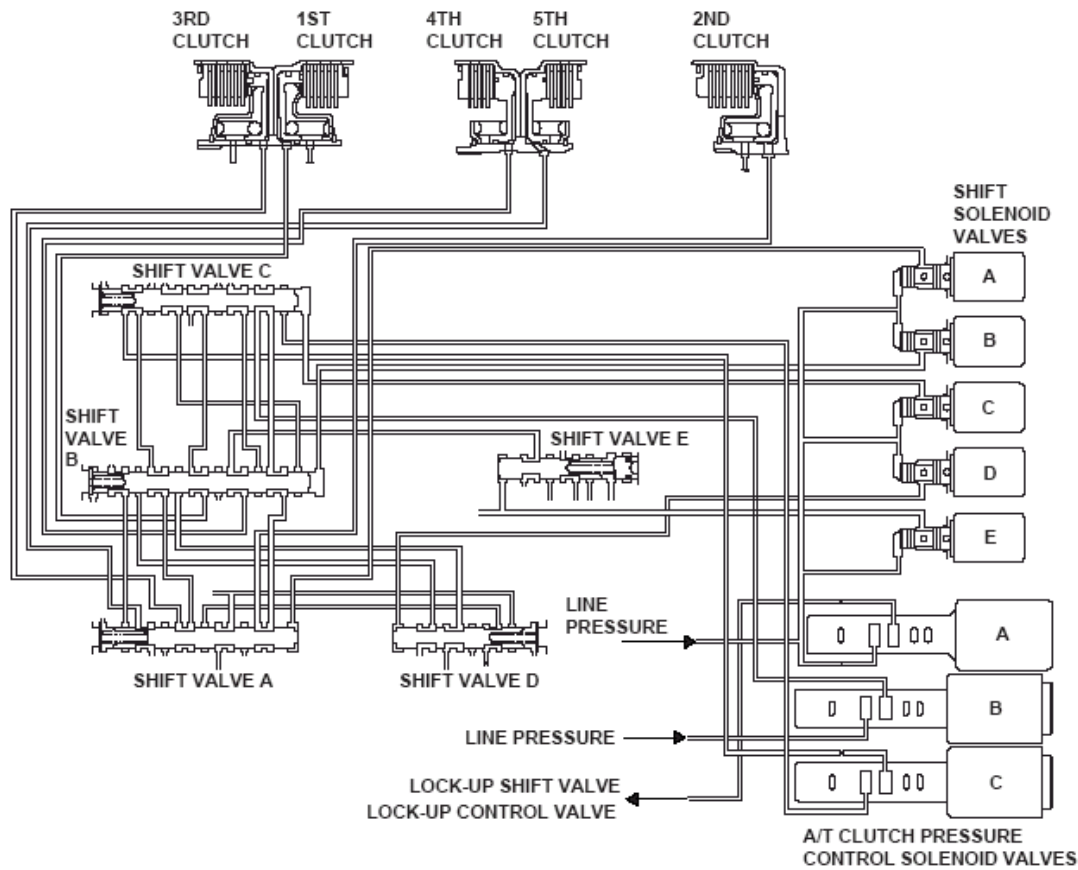
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## **DTC P0777 (77): ADVANCED DIAGNOSTICS**

### **DTC P0777: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B STUCK ON**

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P0747-0770

**Fig. 135: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Clutch											
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 136: Shift Solenoid Valve Output (D Position)**

### General Description

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft and countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in A/T clutch pressure control solenoid valve B or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds (symptom 1-A, 2-A)
	4 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	-4 °F (-20 °C) <sup>(1)</sup> , <sup>(3)</sup>	-
Throttle position	6.0 % or more, or fully closed	
Shift lever position	D	
Shift status	2nd --> 3rd <sup>(1)</sup>	
	1st <sup>(2)</sup>	
	4th --> 5th <sup>(3)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0780, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		
(3) Symptom 2-A		

#### Malfunction Threshold

One of these symptoms occurs.

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### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Shifting between 2nd gear and 3rd gear	Held in 2nd gear
1-B	Driving in 1st gear	Driving in 1st gear

### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
2-A	Shifting between 4th gear and 5th gear	Held in 4th gear

### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0780 (45): ADVANCED DIAGNOSTICS

### DTC P0780: SHIFT CONTROL SYSTEM

#### General Description

This fault code is a general (specified by SAE) DTC that is stored at a time the following DTC codes (P1730, P1731, P01732, P1733 and P1734) are detected.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	-

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DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	Refer to the specific DTC information. ( <b><u>P1730</u></b> , <b><u>P1731</u></b> , <b><u>P01732</u></b> , <b><u>P1733</u></b> , <b><u>P1734</u></b> )

### Enable Conditions

Refer to the specific DTC information. (**P1730**, **P1731**, **P01732**, **P1733**, **P1734**)

### Malfunction Threshold

One of these DTCs is stored.

P1730, P1731, P01732, P1733, P1734

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

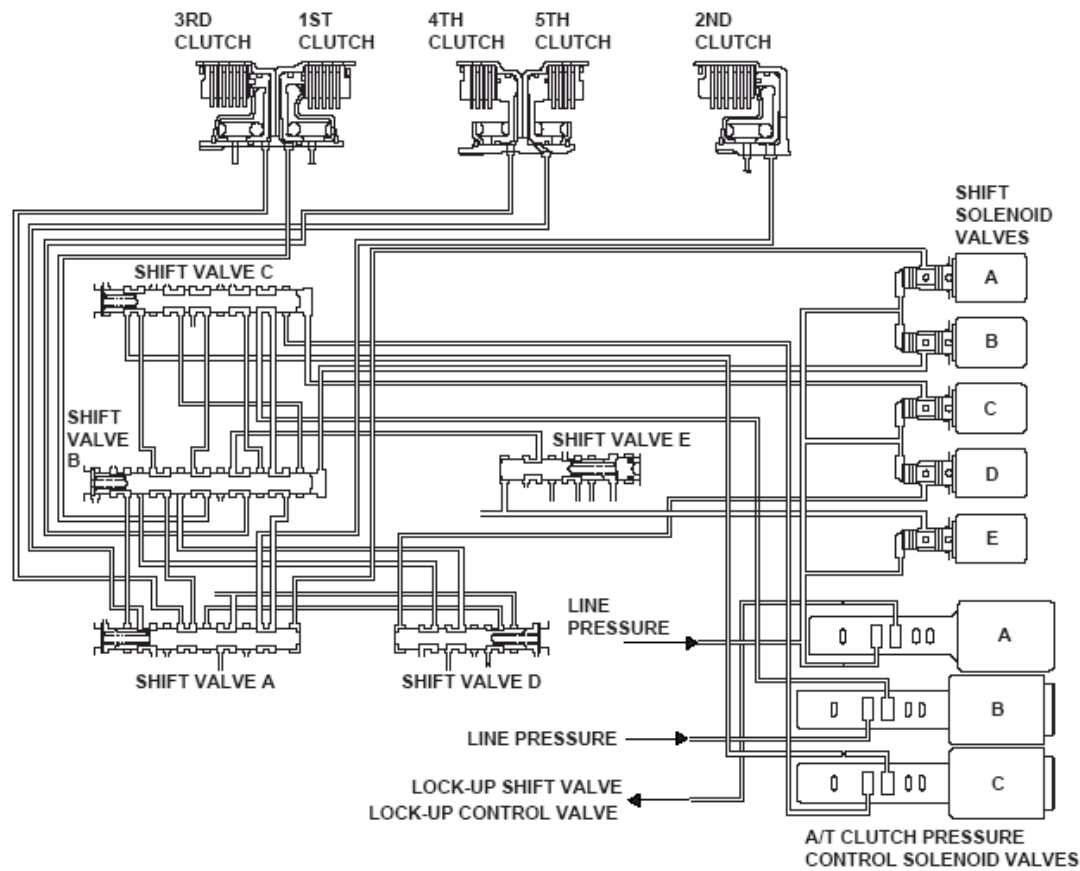
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0796 (78): ADVANCED DIAGNOSTICS

**DTC P0796: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C STUCK OFF**

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P0747-0770

**Fig. 137: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Clutch	1st Clutch	CPC A	LINE	CPC A		CPC A					
	2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A			
	3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C			
	4th Clutch							CPC B	CPC B	CPC B	
	5th Clutch									CPC C	CPC C

CPC: Clutch Pressure Control pressure

**Fig. 138: Shift Solenoid Valve Output (D Position)**

### General Description

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft and countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in A/T clutch pressure control solenoid valve C or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds (symptom 1-A, 1-B, 2-B)
	6 seconds (symptom 2-A)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1), (3), (4)</sup>	-
Battery voltage	11.0 V	-
Throttle position	6.0 % or more, or fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	3rd <sup>(1), (4)</sup>	
	2nd <sup>(2)</sup>	
	5th <sup>(3)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	
(1) Symptom 1-A		
(2) Symptom 1-B		
(3) Symptom 2-A		
(4) Symptom 2-B		

#### Malfunction Threshold

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One of these symptom combinations occurs:

- Symptom 1 occurs during the 1st drive cycle, and symptom 2 occurs during the 2nd drive cycle.
- Symptom 2 occurs during the 1st drive cycle, and symptom 1 occurs during the 2nd drive cycle.
- Symptom 2 occurs during both the 1st drive cycle and the 2nd drive cycle.

#### MALFUNCTION THRESHOLD - SYMPTOM 1

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 3rd gear	Neutral
1-B	Driving in 2nd gear	Driving in 2nd gear

#### MALFUNCTION THRESHOLD - SYMPTOM 2

Symptom	Gear position commanded by the PCM	Actual gear position
2-A	Driving in 5th gear	Neutral
2-B	Driving in 3rd gear	Neutral

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

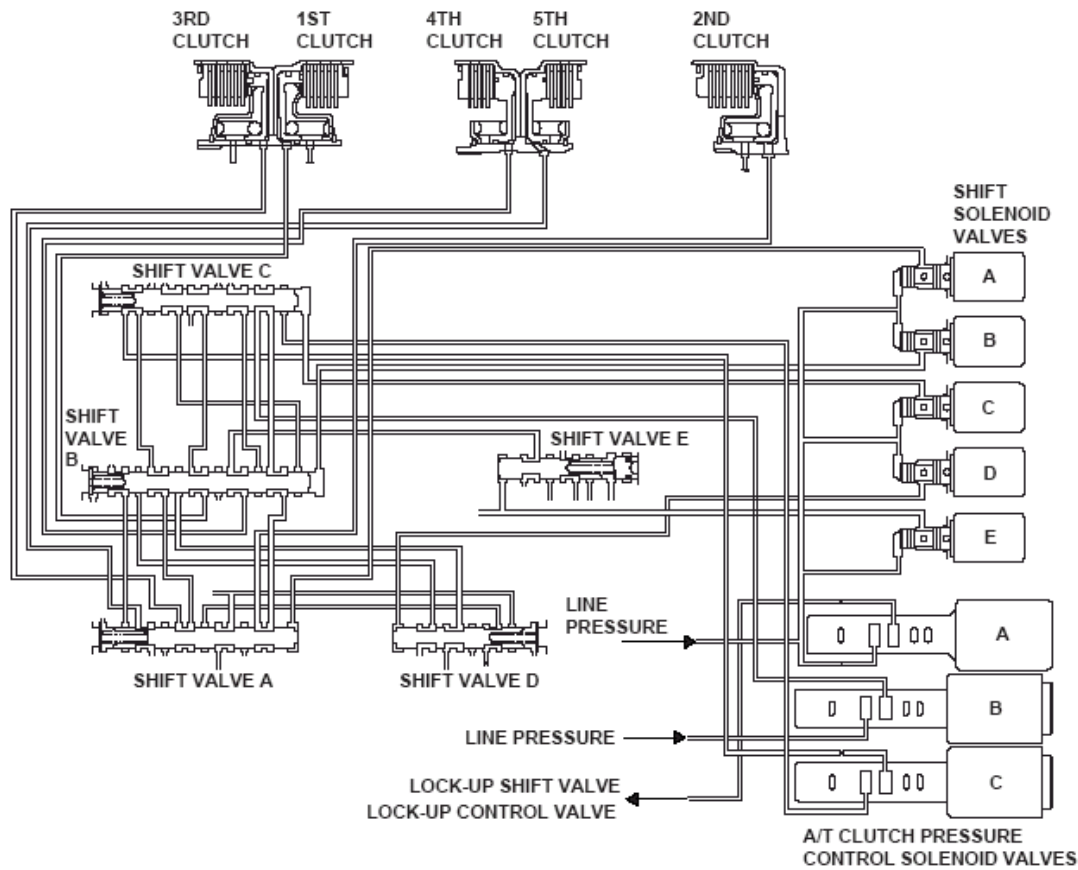
## DTC P0797 (78): ADVANCED DIAGNOSTICS

### DTC P0797: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C STUCK ON



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P0747-0770

**Fig. 139: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Clutch	1st Clutch	CPC A	LINE	CPC A		CPC A					
	2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A			
	3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C			
	4th Clutch							CPC B	CPC B	CPC B	
	5th Clutch									CPC C	CPC C

CPC: Clutch Pressure Control pressure

**Fig. 140: Shift Solenoid Valve Output (D Position)**

### General Description

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft and countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in A/T clutch pressure control solenoid valve C or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2.5 seconds
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
ATF temperature	-4 °F (-20 °C)	-
Shift lever position	D	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

This symptom occurs.

#### MALFUNCTION THRESHOLD - SYMPTOM 1

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Shifting between 3rd gear and 4th gear	Driving in 3rd gear

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

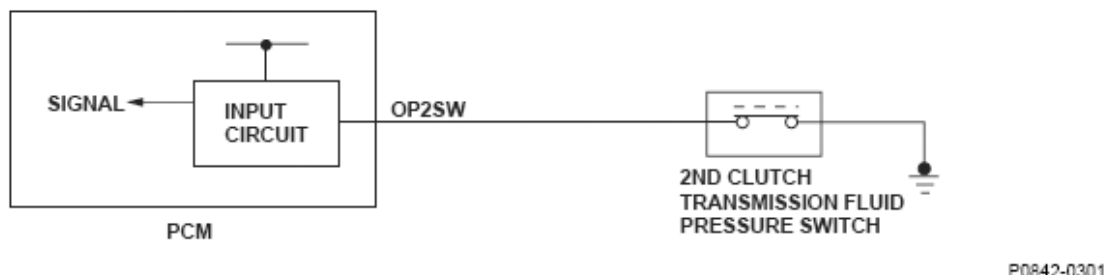
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

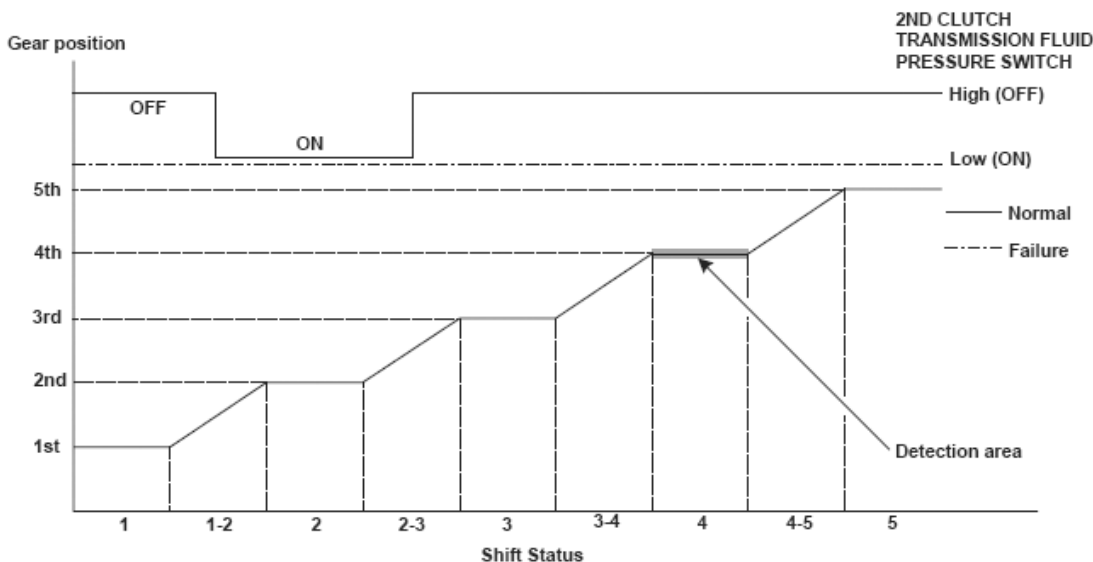
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0842 (25): ADVANCED DIAGNOSTICS**

**DTC P0842: SHORT IN 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH (CLUTCH) STUCK ON**



**Fig. 141: 2nd Clutch Transmission Fluid Pressure Switch Circuit Diagram**



**Fig. 142: Gear Position Versus Shift Status Graph**

**General Description**

The 2nd clutch transmission fluid pressure switch is installed in the hydraulic pressure circuit to the 2nd clutch. When hydraulic pressure is supplied to the 2nd clutch, the switch is turned ON. When hydraulic pressure is not supplied to the 2nd clutch, the switch is turned OFF. The signal of the 2nd clutch transmission fluid pressure switch is input to the powertrain control module (PCM). The PCM detects the hydraulic pressure supply conditions at the gear change to 2nd gear (1st --> 2nd, 3rd --> 2nd) to reduce the shock that occurs at the gear change.

If the 2nd clutch transmission fluid pressure switch is ON while driving the vehicle with the speed ratio of the countershaft to mainshaft other than 2nd (the ratio is Neutral or 4th), the PCM detects a 2nd clutch transmission fluid pressure switch failure and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0116, P0117, P0118, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0843, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

**Malfunction Threshold**

The input signal from the 2nd clutch transmission fluid pressure switch to the PCM is low when driving in 4th gear.

**Driving Pattern**

Start the engine, and drive the vehicle in D position and 4th gear for at least 2 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

## Diagnosis Details

### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

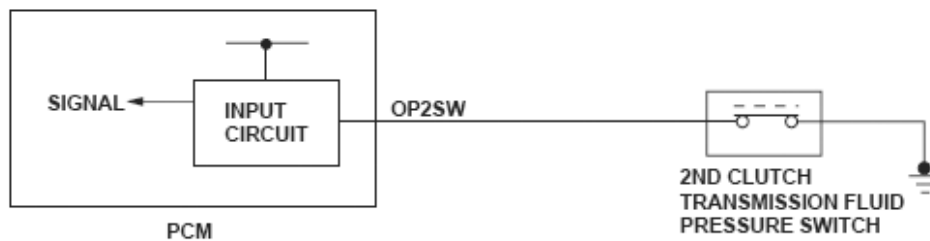
### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

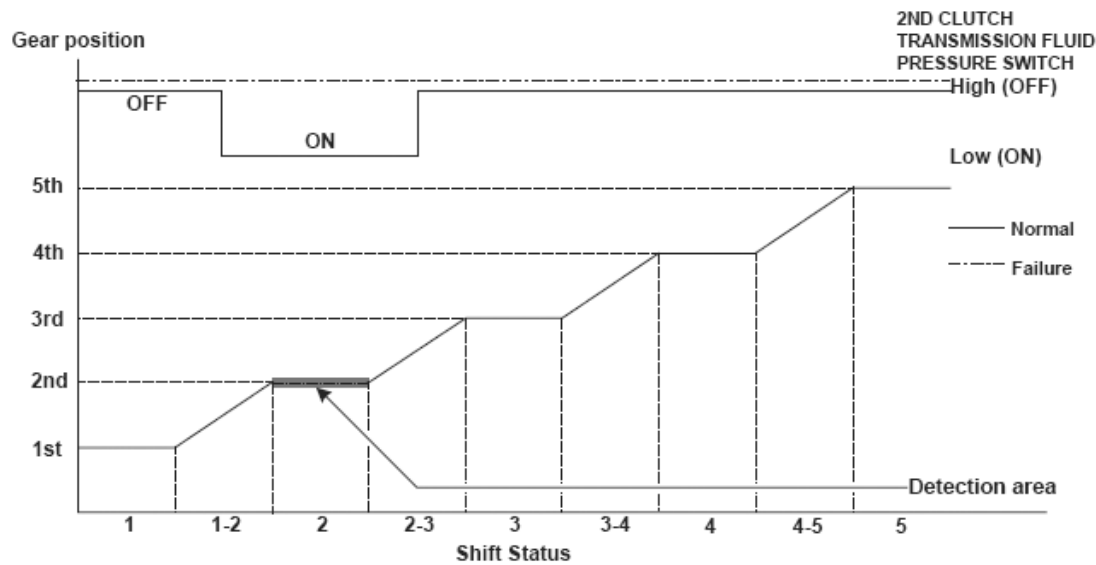
## DTC P0843 (25): ADVANCED DIAGNOSTICS

**DTC P0843: OPEN IN 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK OFF**



P0842-0301

**Fig. 143: 2nd Clutch Transmission Fluid Pressure Switch Circuit Diagram**



P0843-0370

**Fig. 144: Gear Position Versus Shift Status Graph**

**General Description**

The 2nd clutch transmission fluid pressure switch is installed in the hydraulic pressure circuit to the 2nd clutch. When hydraulic pressure is supplied to the 2nd clutch, the switch is turned ON. When hydraulic pressure is not supplied to the 2nd clutch, the switch is turned OFF. The signal of the 2nd clutch transmission fluid pressure switch is input to the powertrain control module (PCM). The PCM detects the hydraulic pressure supply conditions at the gear change to 2nd gear (1st --> 2nd, 3rd --> 2nd) to reduce the shock that occurs at the gear change. If the 2nd clutch transmission fluid pressure switch is OFF while driving with the rotation speed ratio of the input/output pulses in 2nd gear, the PCM detects a malfunction in the 2nd clutch transmission fluid pressure switch and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	11.0 V	-

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No active DTCs	P0116, P0117, P0118, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0842, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734
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#### Malfunction Threshold

The input signal from the 2nd clutch transmission fluid pressure switch to the PCM is high when driving in 2nd gear.

#### Driving Pattern

Start the engine, and drive the vehicle in D position and 2nd gear for at least 2 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

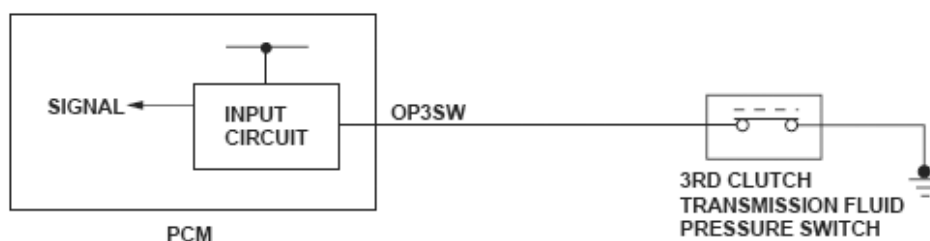
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0847 (26): ADVANCED DIAGNOSTICS

### DTC P0847: SHORT IN 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK ON

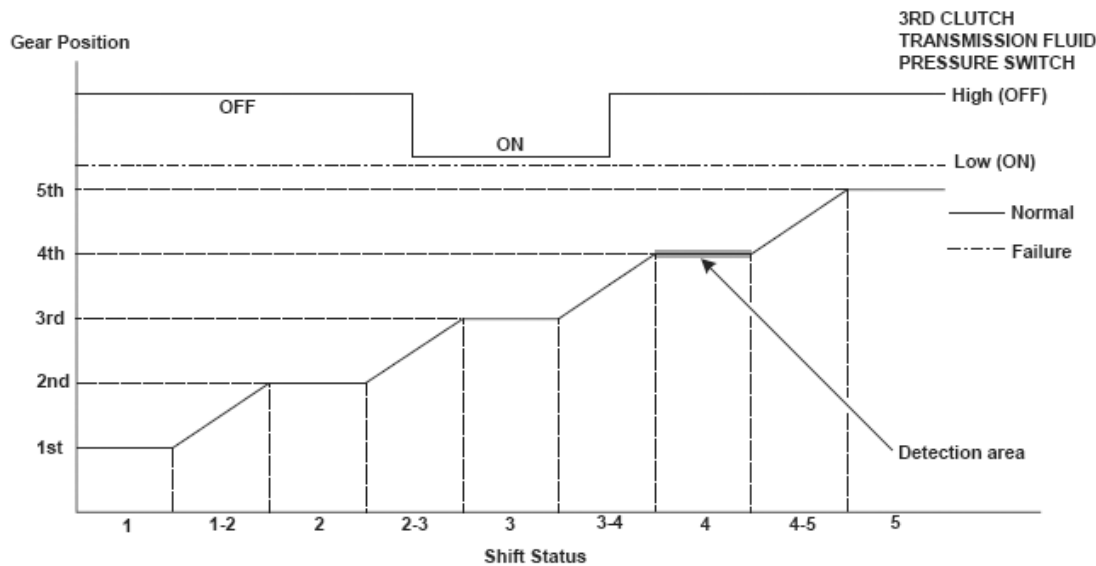


P0847-0301

**Fig. 145: 3rd Clutch Transmission Fluid Pressure Switch Circuit Diagram**

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0847-0370

**Fig. 146: Gear Position Versus Shift Status Graph**

#### General Description

The 3rd clutch transmission fluid pressure switch is installed in the hydraulic pressure circuit to the 3rd clutch. When hydraulic pressure is supplied to the 3rd clutch, the switch is turned ON. When hydraulic pressure is not supplied to the 3rd clutch, the switch is turned OFF. The signal of the 3rd clutch transmission fluid pressure switch is input to the powertrain control module (PCM). The PCM detects the hydraulic pressure supply conditions at the gear change to 3rd gear (2nd --> 3rd, 4th --> 3rd) to reduce the shock that occurs at the gear change.

If the 3rd clutch transmission fluid pressure switch is ON while driving the vehicle with the speed ratio of the countershaft to mainshaft in other than 3rd gear (the ratio is Neutral or 4th), the PCM detects a 3rd clutch transmission fluid pressure switch failure and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum



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Battery voltage	11.0 V	-
No active DTCs	P0116, P0117, P0118, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0848, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734	

#### Malfunction Threshold

The input signal from the 3rd clutch transmission fluid pressure switch to the PCM is low when driving in 4th gear.

#### Driving Pattern

Start the engine, and drive the vehicle in D position and 4th gear for at least 2 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the indicator

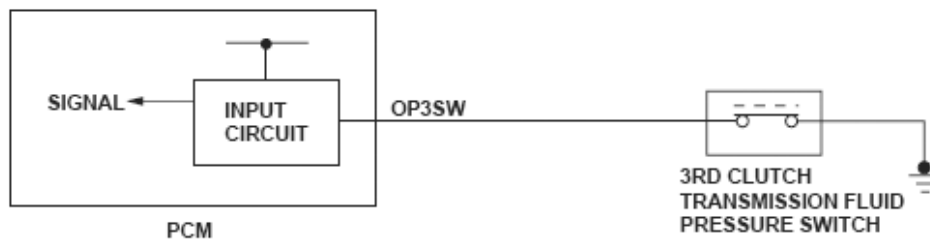
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0848 (26): ADVANCED DIAGNOSTICS)

### DTC P0848: OPEN IN 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK OFF

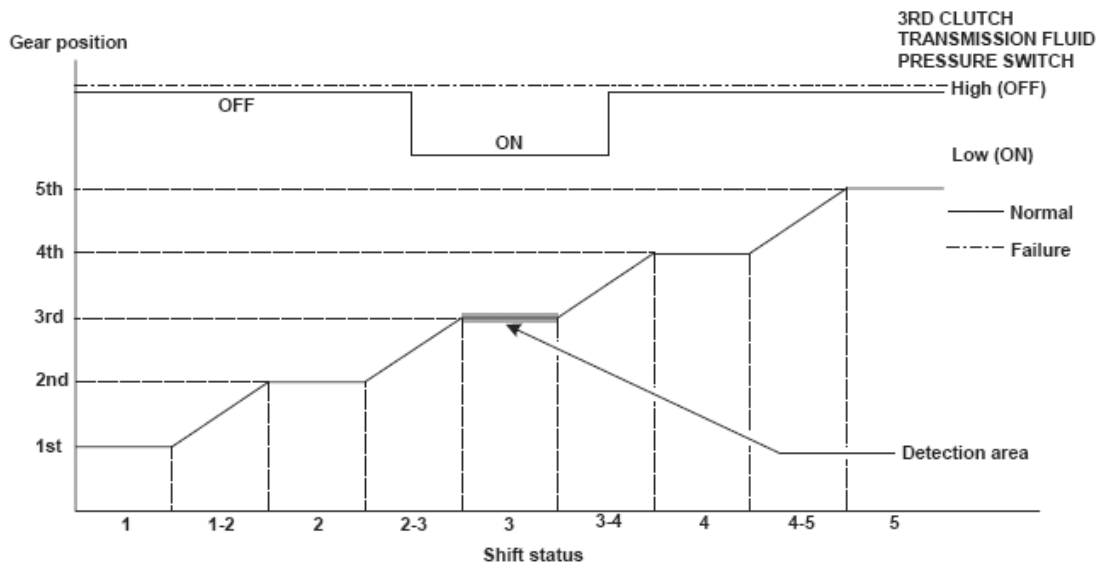


P0847-0301

**Fig. 147: 3rd Clutch Transmission Fluid Pressure Switch Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element



P0848-0370

**Fig. 148: Gear Position Versus Shift Status Graph**

#### General Description

The 3rd clutch transmission fluid pressure switch is installed in the hydraulic pressure circuit to the 3rd clutch. When hydraulic pressure is supplied to the 3rd clutch, the switch is turned ON. When hydraulic pressure is not supplied to the 3rd clutch, the switch is turned OFF. The signal of the 3rd clutch transmission fluid pressure switch is input to the powertrain control module (PCM). The PCM detects the hydraulic pressure supply conditions at the gear change to 3rd gear (2nd --> 3rd, 4th --> 3rd) to reduce the shock that occurs at the gear change. If the 3rd clutch transmission fluid pressure switch is OFF while driving with the rotation speed ratio of the input/output pulses in 3rd gear, the PCM detects a malfunction in the 3rd clutch transmission fluid pressure switch and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL OFF, D indicator blinks
OBD status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

No active DTCs	P0116, P0117, P0118, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0780, P0796, P0797, P0847, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P1730, P1731, P1732, P1733, P1734
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#### Malfunction Threshold

The input signal from the 3rd clutch transmission fluid pressure switch to the PCM is high when driving in 3rd gear.

#### Driving Pattern

Start the engine, and drive the vehicle in D position and 3rd gear for at least 2 seconds.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the indicator

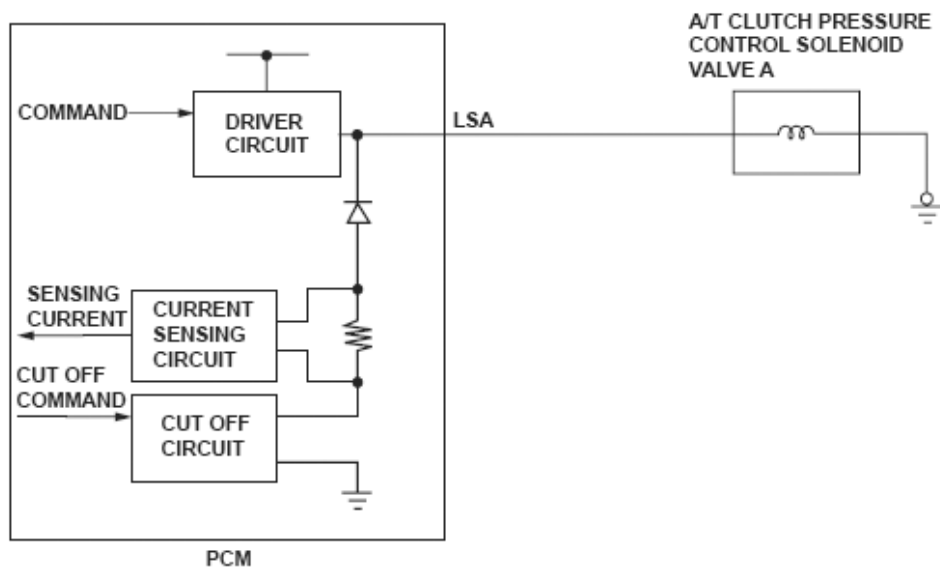
When a malfunction is detected, the D indicator blinks, and the DTC and the freeze frame data are stored in the PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

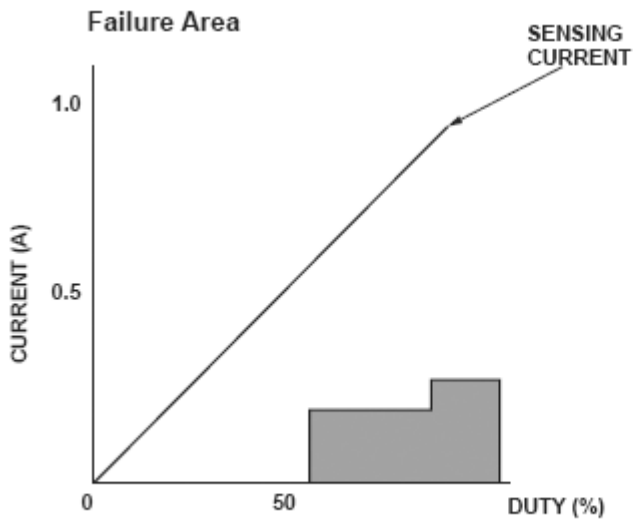
## DTC P0962 (16): ADVANCED DIAGNOSTICS

### DTC P0962: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CIRCUIT



P0962-0301

**Fig. 149: A/T Clutch Pressure Control Solenoid Valve A Circuit Diagram**



P0962-0371

**Fig. 150: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

**General Description**

A/T clutch pressure control solenoid valve A is used for clutch pressure control and lock-up control. A spool in A/T clutch pressure control solenoid valve A pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve A and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0979, P0980, P0982, P0983, P0963	

#### Malfunction Threshold

The measured current for the PCM's command value is as specified here for at least 1 second.

#### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
56.5 - 89	0.19 or less	Low Input
More than 89	0.27 or less	Low Input

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

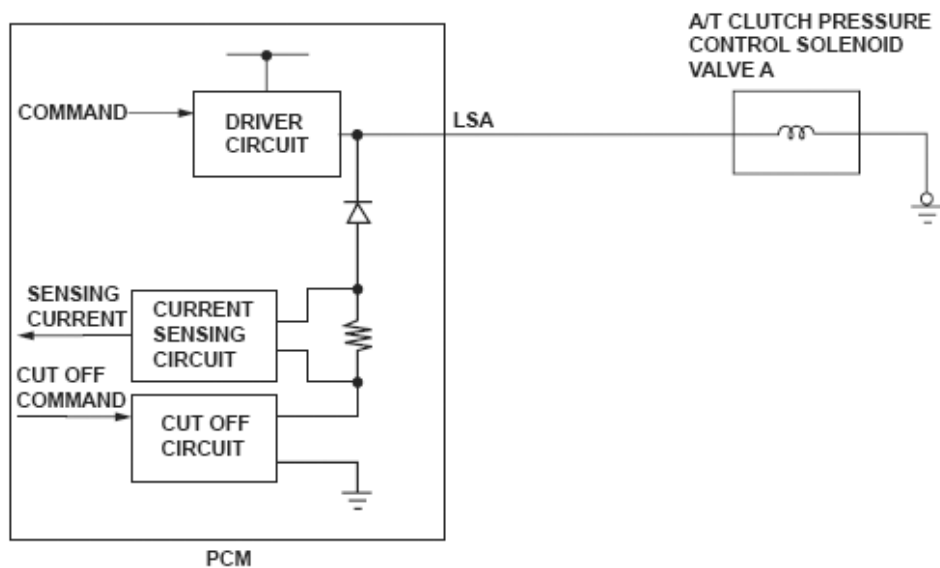
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

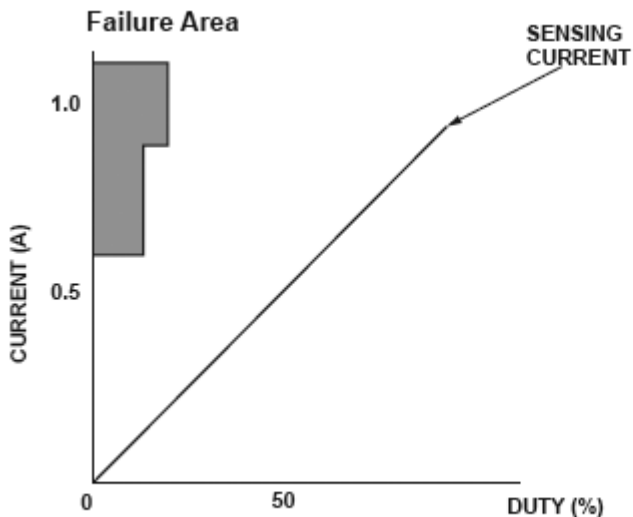
## DTC P0963 (16): ADVANCED DIAGNOSTICS

### DTC P0963: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A



P0962-0301

**Fig. 151: A/T Clutch Pressure Control Solenoid Valve A Circuit Diagram**



P0963-0371

**Fig. 152: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

**General Description**

A/T clutch pressure control solenoid valve A is used for clutch pressure control and lock-up control. A spool in A/T clutch pressure control solenoid valve A pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve A and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.

## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0979, P0980, P0982, P0983, P0962	

#### Malfunction Threshold

The measured current for the PCM's command value is as specified here for at least 1 second.

#### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
Less than 13.7	0.6 or more	High Input
13.7 - 20	0.9 or more	High Input

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

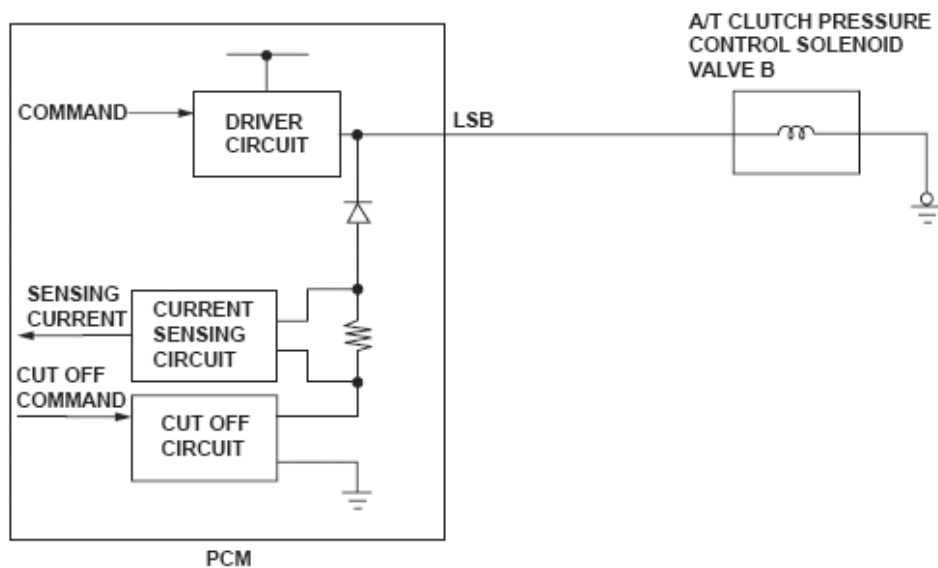
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

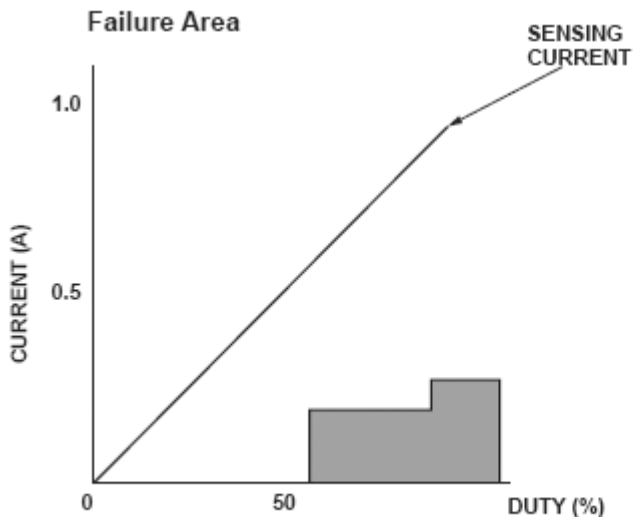
## DTC P0966 (23): ADVANCED DIAGNOSTICS

**DTC P0966: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CIRCUIT**



P0966-0301

**Fig. 153: A/T Clutch Pressure Control Solenoid Valve B Circuit Diagram**



P0962-0371

**Fig. 154: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

### General Description

A/T clutch pressure control solenoid valve B is used for clutch pressure control. A spool in A/T clutch pressure control solenoid valve B pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve B and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.



## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0967, P0970, P0971, P0973, P0974	

**Malfunction Threshold**

The measured current for the PCM's command value is as specified here for at least 1 second.

### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
56.5 - 89	0.9 or less	Low Input
More than 89	0.27 or less	Low Input

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

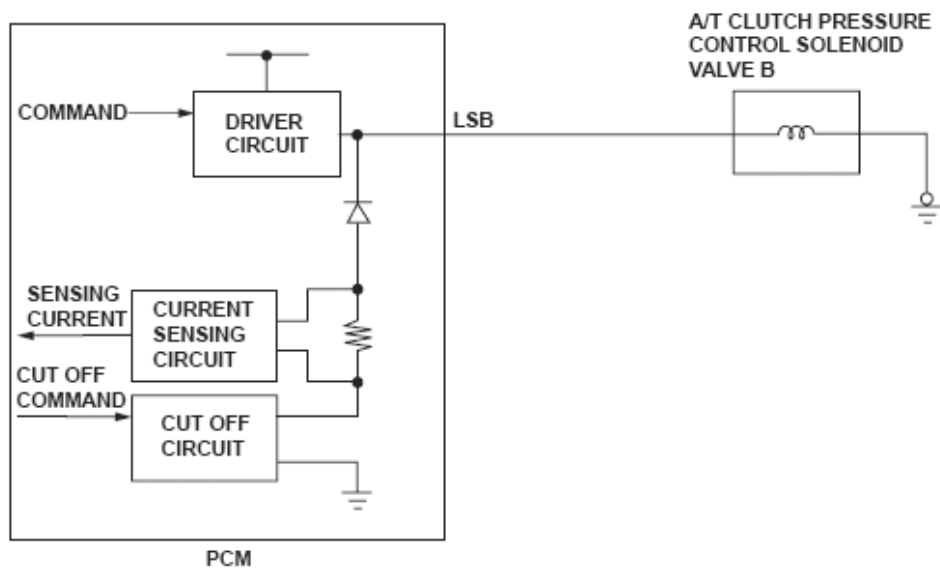
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

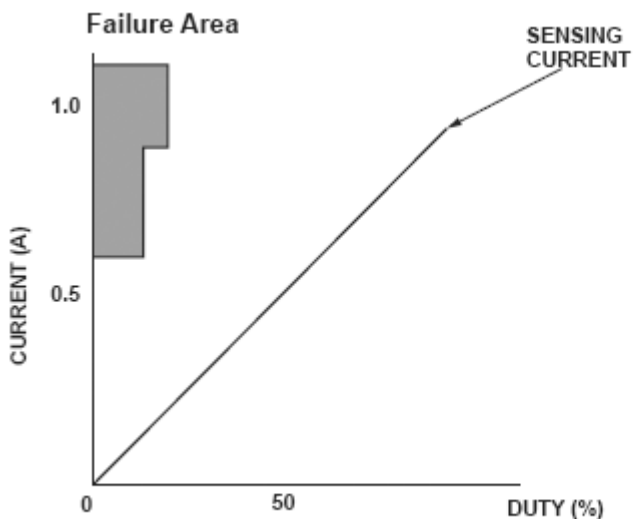
## DTC P0967 (23): ADVANCED DIAGNOSTICS

**DTC P0967: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B**



P0966-0301

**Fig. 155: A/T Clutch Pressure Control Solenoid Valve B Circuit Diagram**



P0963-0371

**Fig. 156: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

**General Description**

A/T clutch pressure control solenoid valve B is used for clutch pressure control. A spool in A/T clutch pressure control solenoid valve B pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve B and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.

## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0966, P0970, P0971, P0973, P0974	

#### Malfunction Threshold

The measured current for the PCM's command value is as specified here for at least 1 second.

#### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
Less than 13.7	0.6 or more	High Input
13.7 - 20	0.9 or more	High Input

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

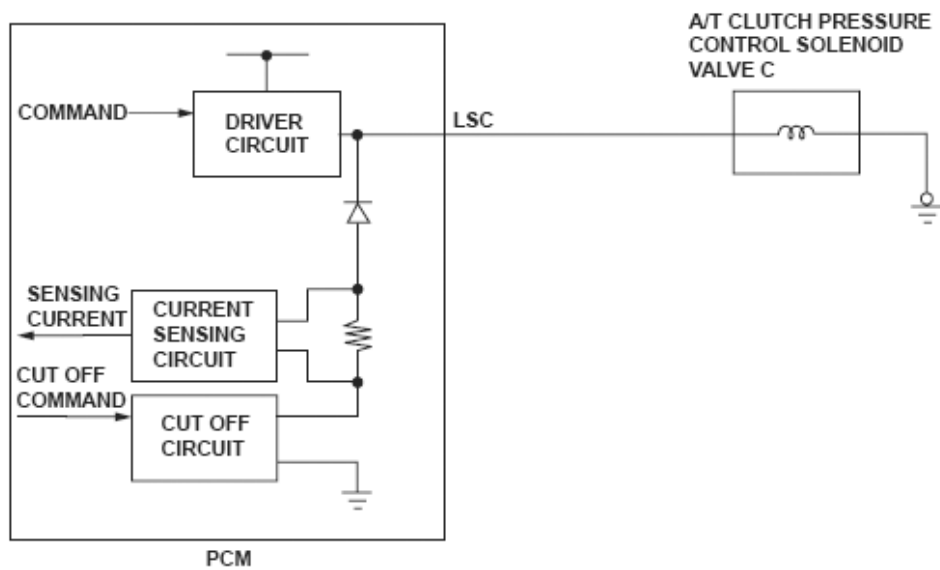
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

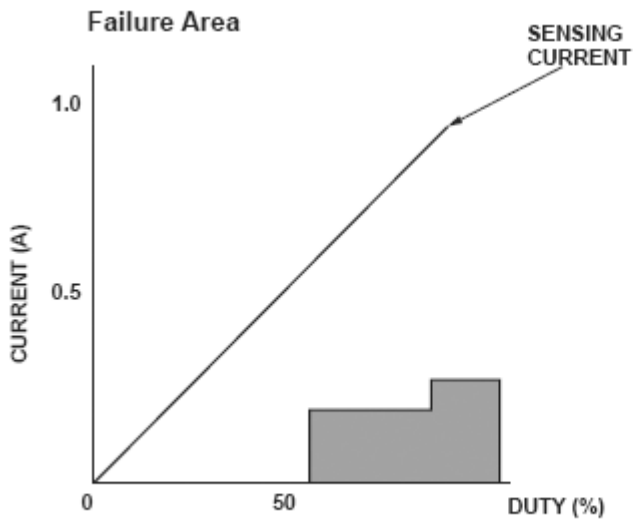
## DTC P0970 (29): ADVANCED DIAGNOSTICS

**DTC P0970: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CIRCUIT**



P0970-0301

**Fig. 157: A/T Clutch Pressure Control Solenoid Valve C Circuit Diagram**



P0962-0371

**Fig. 158: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

**General Description**

A/T clutch pressure control solenoid valve C is used for clutch pressure control. A spool in A/T clutch pressure control solenoid valve C pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve C and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0966, P0967, P0971, P0973, P0974	

#### Malfunction Threshold

The measured current for the PCM's command value is as specified here for at least 1 second.

#### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
56.5 - 89	0.19 or less	Low Input
More than 89	0.27 or less	Low Input

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

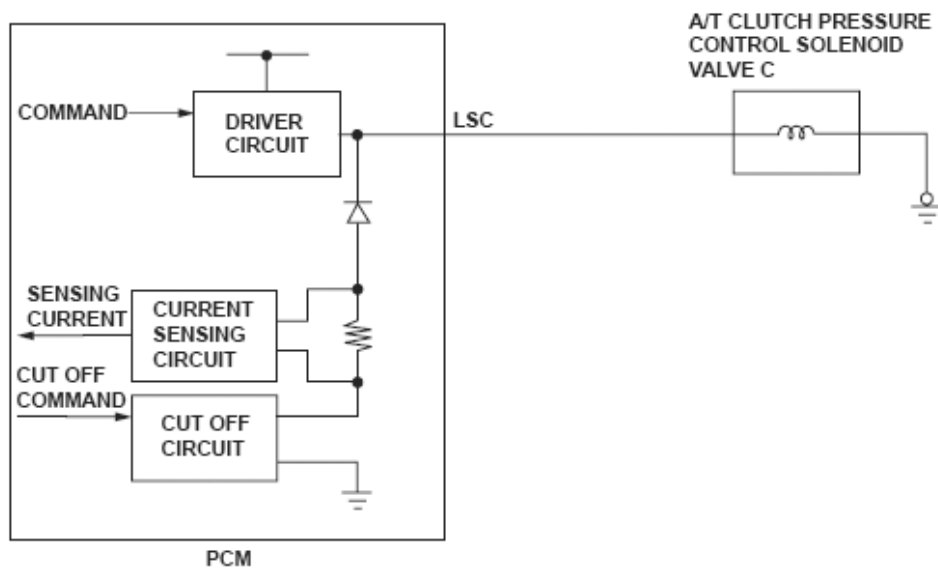
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

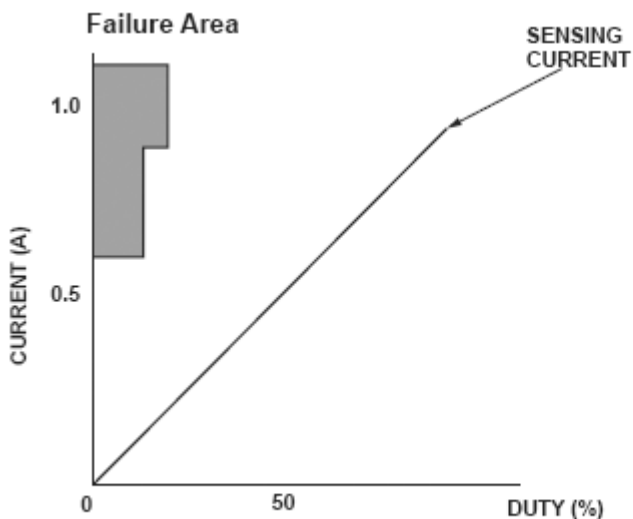
## DTC P0971 (29): ADVANCED DIAGNOSTICS

### DTC P0971: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C



P0970-0301

**Fig. 159: A/T Clutch Pressure Control Solenoid Valve C Circuit Diagram**



P0963-0371

**Fig. 160: A/T Clutch Pressure Control Solenoid Valve Failure Area Graph**

### General Description

A/T clutch pressure control solenoid valve C is used for clutch pressure control. A spool in A/T clutch pressure control solenoid valve C pushes a valve according to the duty cycle that is controlled by the powertrain control module (PCM) to pressurize fluid so the hydraulic pressure is proportional to the current. The PCM measures the current flowing through A/T clutch pressure control solenoid valve C and uses feedback control to compensate the difference between the actual current and the commanded one. If the measured current for the PCM output duty cycle is not within a specified range (open or short), a malfunction is detected and a DTC is stored.

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
State of the engine	Running	
No active DTCs	P0966, P0967, P0970, P0973, P0974	

#### Malfunction Threshold

The measured current for the PCM's command value is as specified here for at least 1 second.

#### MALFUNCTION THRESHOLD VALUE

Duty (%)	Current (A)	Failure mode
Less than 13.7	0.6 or more	High Input
13.7 - 20	0.9 or more	High Input

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

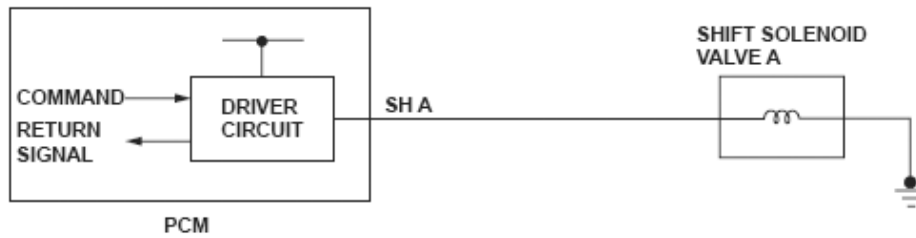
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0973 (7): ADVANCED DIAGNOSTICS

### DTC P0973: SHORT IN SHIFT SOLENOID VALVE A CIRCUIT



P0753-9801

**Fig. 161: Shift Solenoid Valve A Circuit Diagram**

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 162: Shift Solenoid Valve Driving Signal Combination Table**

**General Description**

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn ON the shift solenoid valve, and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks



## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

OBD Status | PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0966, P0967, P0970, P0971, P0974	

### Malfunction Threshold

The return signal does not match the command to turn ON shift solenoid valve A for at least 1 second.

### Driving Pattern

Start the engine, and drive the vehicle with the 1st gear in D position for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

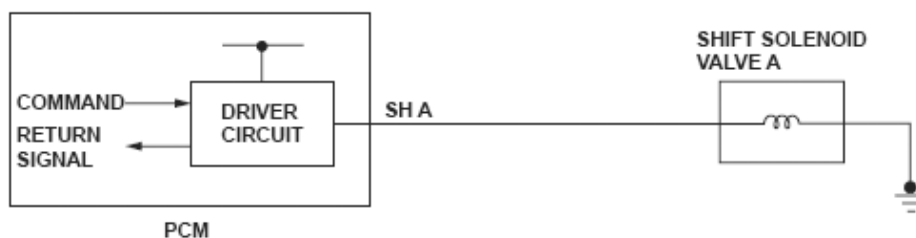
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0974 (7): ADVANCED DIAGNOSTICS

### DTC P0974: OPEN IN SHIFT SOLENOID VALVE A CIRCUIT



## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

**Fig. 163: Shift Solenoid Valve A Circuit Diagram**

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 164: Shift Solenoid Valve Driving Signal Combination Table**

### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn OFF the shift solenoid valve, and a DTC is stored.

### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0966, P0967, P0970, P0971, P0973	

**Malfunction Threshold**

The return signal does not match the command to turn OFF shift solenoid valve A for at least 1 second.

**Driving Pattern**

Start the engine, shift to P position, and wait for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

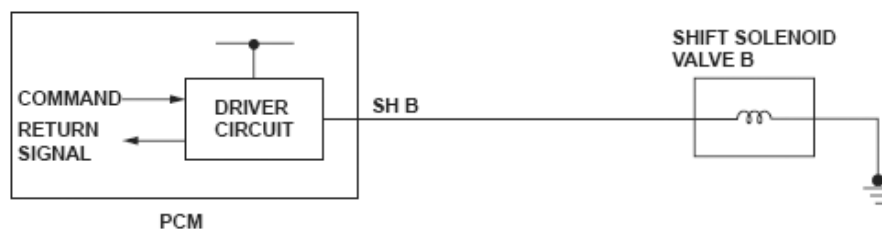
**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0976 (8): ADVANCED DIAGNOSTICS****DTC P0976: SHORT IN SHIFT SOLENOID VALVE B CIRCUIT**

P0758-0201

**Fig. 165: Shift Solenoid Valve B Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 166: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn ON the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0977, P0985, P0986	

#### Malfunction Threshold

The return signal does not match the command to turn ON shift solenoid valve B for at least 1 second.

### Driving Pattern

Start the engine, shift to P position, and wait for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

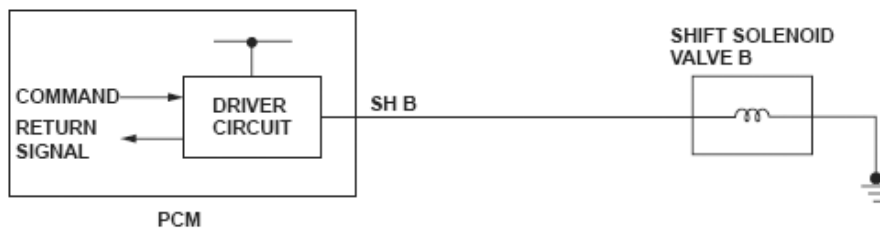
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0977 (8): ADVANCED DIAGNOSTICS

### DTC P0977: OPEN IN SHIFT SOLENOID VALVE B CIRCUIT



P0758-0201

**Fig. 167: Shift Solenoid Valve B Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 168: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn OFF the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0976, P0985, P0986	

#### Malfunction Threshold

The return signal does not match the command to turn OFF shift solenoid valve B for at least 1 second.

### Driving Pattern

Start the engine, drive the vehicle so that it shifts from 1st to 3rd gear in D position, then drive the vehicle in 3rd gear for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

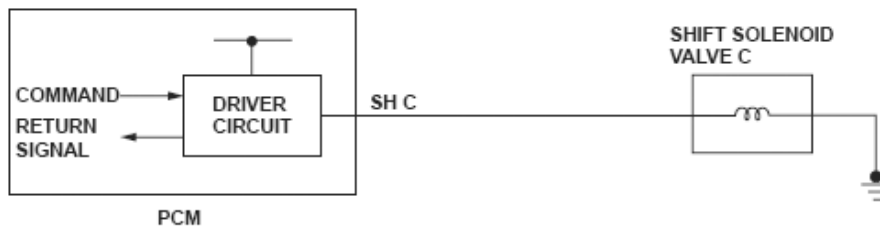
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0979 (22): ADVANCED DIAGNOSTICS

### DTC P0979: SHORT IN SHIFT SOLENOID VALVE C CIRCUIT



P0763-0201

**Fig. 169: Shift Solenoid Valve C Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 170: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn ON the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0962, P0963, P0980, P0982, P0983	

#### Malfunction Threshold



The return signal does not match the command to turn ON shift solenoid valve C for at least 1 second.

**Driving Pattern**

Start the engine, and drive the vehicle in 1st gear in D position for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

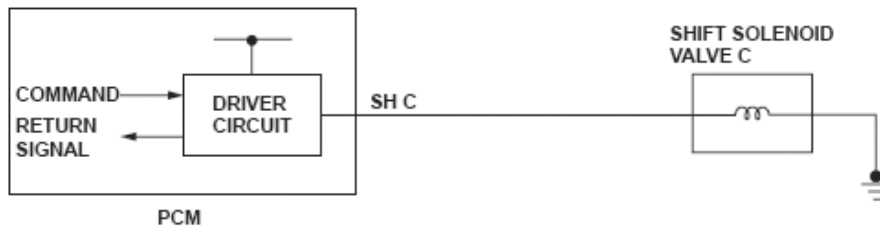
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0980 (22): ADVANCED DIAGNOSTICS**

**DTC P0980: OPEN IN SHIFT SOLENOID VALVE C CIRCUIT**



P0763-0201

**Fig. 171: Shift Solenoid Valve C Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 172: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn OFF the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0962, P0963, P0979, P0982, P0983	

#### Malfunction Threshold

The return signal does not match the command to turn OFF shift solenoid valve C for at least 1 second.

### Driving Pattern

Start the engine, shift to P position, and wait for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

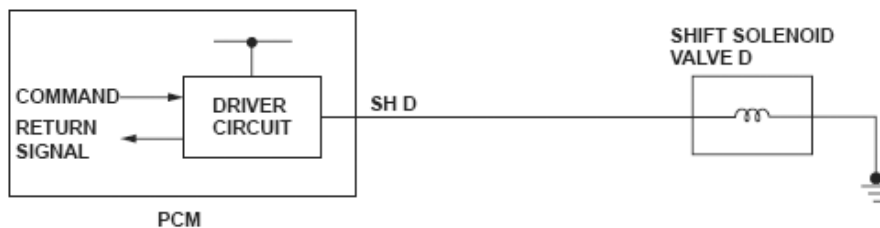
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0982 (60): ADVANCED DIAGNOSTICS

### DTC P0982: SHORT IN SHIFT SOLENOID VALVE D CIRCUIT



P0768-0201

**Fig. 173: Shift Solenoid Valve D Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 174: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn ON the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0962, P0963, P0979, P0980, P0983	

#### Malfunction Threshold

The return signal does not match the command to turn ON shift solenoid valve D for at least 1 second.

**Driving Pattern**

Start the engine, and drive the vehicle in 2nd gear in D position for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

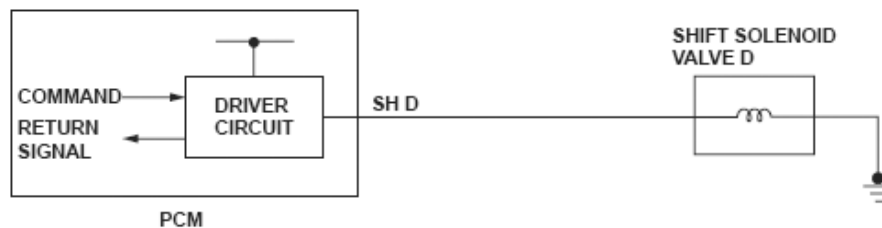
**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0983 (60): ADVANCED DIAGNOSTICS****DTC P0983: OPEN IN SHIFT SOLENOID VALVE D CIRCUIT**

P0768-0201

**Fig. 175: Shift Solenoid Valve D Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 176: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn OFF the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0962, P0963, P0979, P0980, P0982	

#### Malfunction Threshold

The return signal does not match the command to turn OFF shift solenoid valve D for at least 1 second.

### Driving Pattern

Start the engine, shift to P position, and wait for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

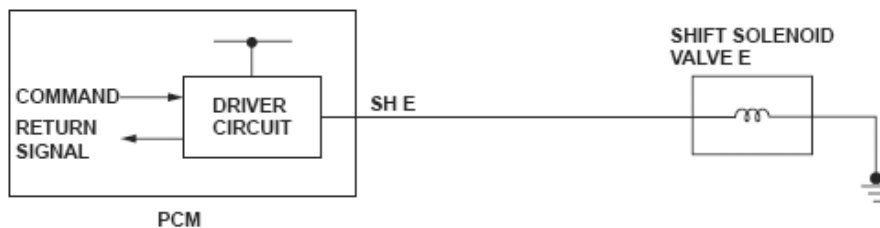
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P0985 (61): ADVANCED DIAGNOSTICS

### DTC P0985: SHORT IN SHIFT SOLENOID VALVE E CIRCUIT



P0773-0201

**Fig. 177: Shift Solenoid Valve E Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 178: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn ON the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0976, P0977, P0986	

#### Malfunction Threshold



The return signal does not match the command to turn ON shift solenoid valve E for at least 1 second.

**Driving Pattern**

Start the engine, shift to P position, and wait for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

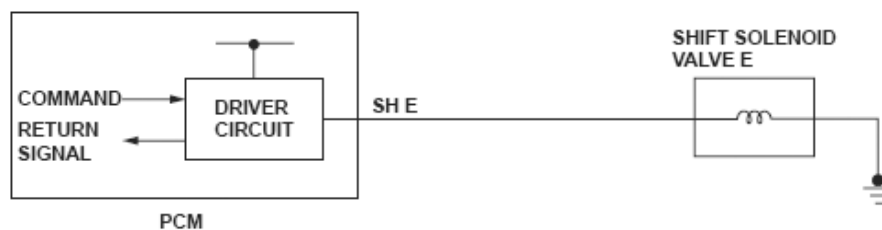
**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P0986 (61): ADVANCED DIAGNOSTICS****DTC P0986: OPEN IN SHIFT SOLENOID VALVE E CIRCUIT**

P0773-0201

**Fig. 179: Shift Solenoid Valve E Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Shift solenoid valve Gear position	Shift solenoid valve A	Shift solenoid valve B	Shift solenoid valve C	Shift solenoid valve D	Shift solenoid valve E
Park	OFF	ON	OFF	OFF	ON
Reverse	ON	ON	OFF	OFF	ON
Neutral	OFF	ON	ON	OFF	OFF
1st	ON	ON	ON	OFF	OFF
1st - 2nd	OFF	ON	ON	OFF	OFF
2nd	OFF	ON	OFF	ON	OFF/ON
2nd - 3rd	OFF	ON	ON	ON	OFF/ON
3rd	OFF	OFF	ON	OFF	OFF/ON
3rd - 4th	OFF	OFF	OFF	OFF	OFF/ON
4th	ON	OFF	OFF	OFF	OFF/ON
4rd - 5th	ON	OFF	OFF	ON	OFF/ON
5th	ON	OFF	ON	ON	OFF/ON

**Fig. 180: Shift Solenoid Valve Driving Signal Combination Table**

#### General Description

When shift solenoid valves A, B, C, D, and E are turned ON, the hydraulic pressure circuit opens. The hydraulic pressure circuit supplies/discharges hydraulic pressure to/from each clutch according to the combination of the ON/OFF status of those valves and the shift valves. The powertrain control module (PCM) commands the driver circuit to turn on the shift solenoid valve. The circuit diagnoses malfunctions such as a circuit short or open, and sends back a return signal during the PCM's command. When the return signal does not match the PCM command, a malfunction is detected by the PCM. The malfunction is detected when the return signal does not match the PCM command to turn OFF the shift solenoid valve, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-
No active DTCs	P0976, P0977, P0985	

#### Malfunction Threshold

The return signal does not match the command to turn OFF shift solenoid valve E for at least 1 second.

### Driving Pattern

Start the engine, and drive the vehicle in 2nd gear in D position for at least 1 second.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

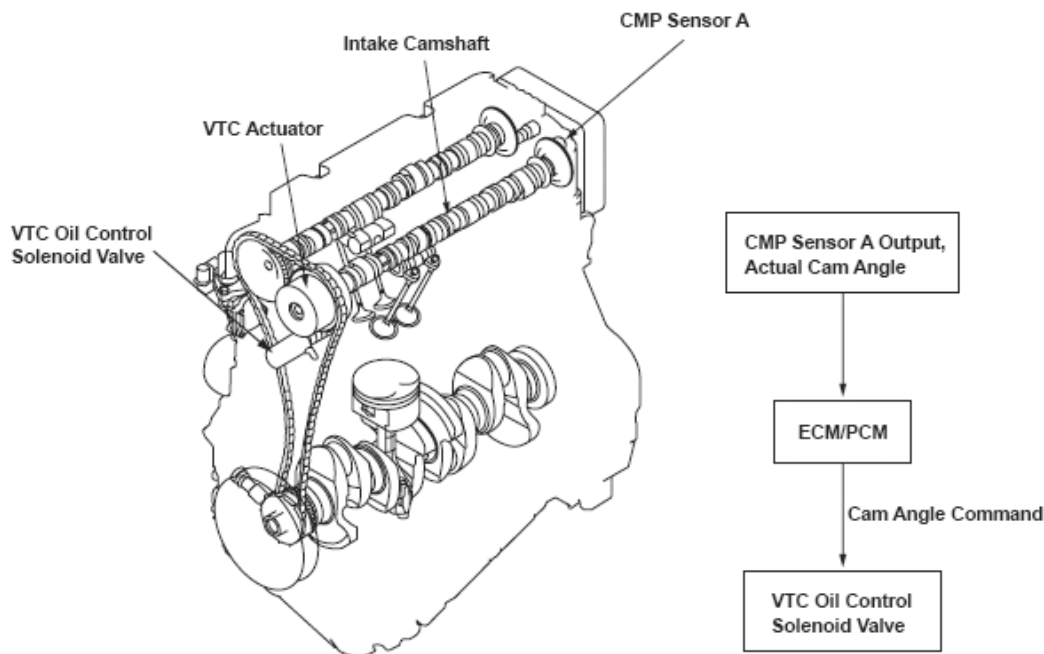
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1009 (56): ADVANCED DIAGNOSTICS

### DTC P1009: VARIABLE VALVE TIMING CONTROL (VTC) ADVANCE MALFUNCTION



**Fig. 181: Identifying Variable Valve Timing Control Components Location With Flow Diagram****General Description**

The variable valve timing control (VTC) system controls the phase of the intake camshaft. It uses oil pressure to operate the VTC actuator so the valve timing is optimized depending on driving conditions. The engine control module (ECM)/powertrain control module (PCM) monitors the phase control command and the actual timing of the camshaft by using camshaft position (CMP) sensor A. If an over-advanced camshaft phase (compared to the directed value) continues or when the camshaft phase is otherwise abnormal, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status****MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	0.5 second or more, up to 3 seconds
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions****ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time after starting the engine	0.5 second	-
No active DTCs	P0335, P0339, P0340, P0341, P0344	
Other	After restarting the engine with the intake camshaft angle 10 ° for 0.5 second or more	

**Malfunction Threshold**

When the camshaft phase value is not 24.0 ° or less within the monitored area (camshaft phase control directed value plus failure judgment value) after 3 seconds have passed, or when the camshaft phase value is 20.0 ° or less and continues for 3 seconds or more, even when the VTC does not actuate.

**Driving Pattern**

Start the engine. Let it idle.

**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

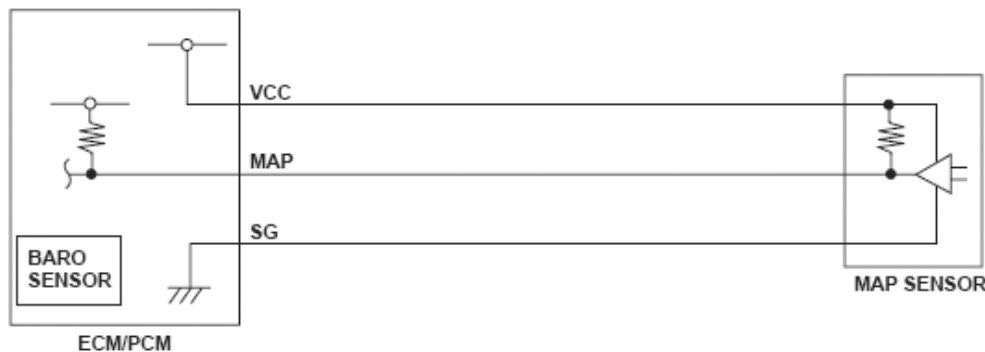
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

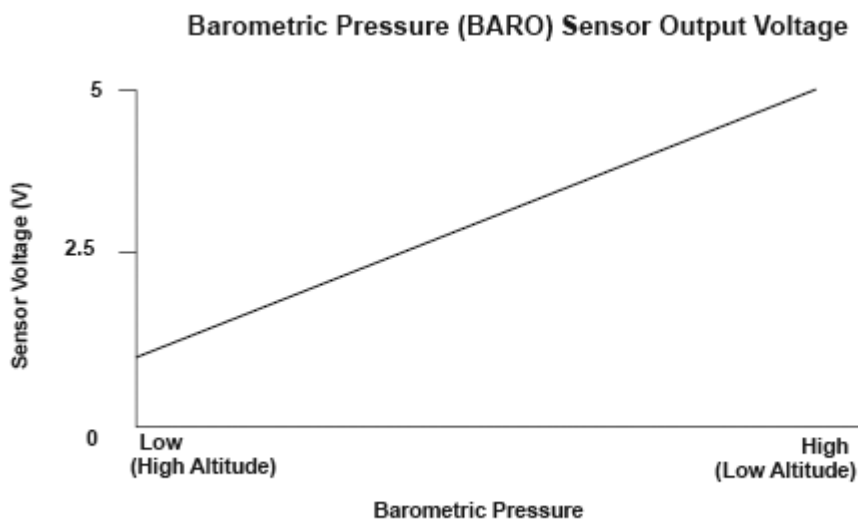
**DTC P1109 (13): ADVANCED DIAGNOSTICS**

**DTC P1109: BAROMETRIC PRESSURE (BARO) SENSOR CIRCUIT OUT OF RANGE-HIGH**



P1107-9602

**Fig. 182: Barometric Pressure (BARO) Sensor Circuit Diagram**



P1108-9671

**Fig. 183: Barometric Pressure (BARO) Sensor Output Voltage - Graph**

**General Description**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

The barometric pressure (BARO) sensor is built into the engine control module (ECM)/powertrain control module (PCM), and it monitors atmospheric pressure. The ECM/PCM estimates appropriate intake airflow from the manifold absolute pressure (MAP) sensor output voltage and BARO sensor output voltage. When BARO sensor output voltage is within the specified range, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P2228, P2229

#### Malfunction Threshold

The BARO sensor output voltage is between 3.59 V to 4.49 V for at least 2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

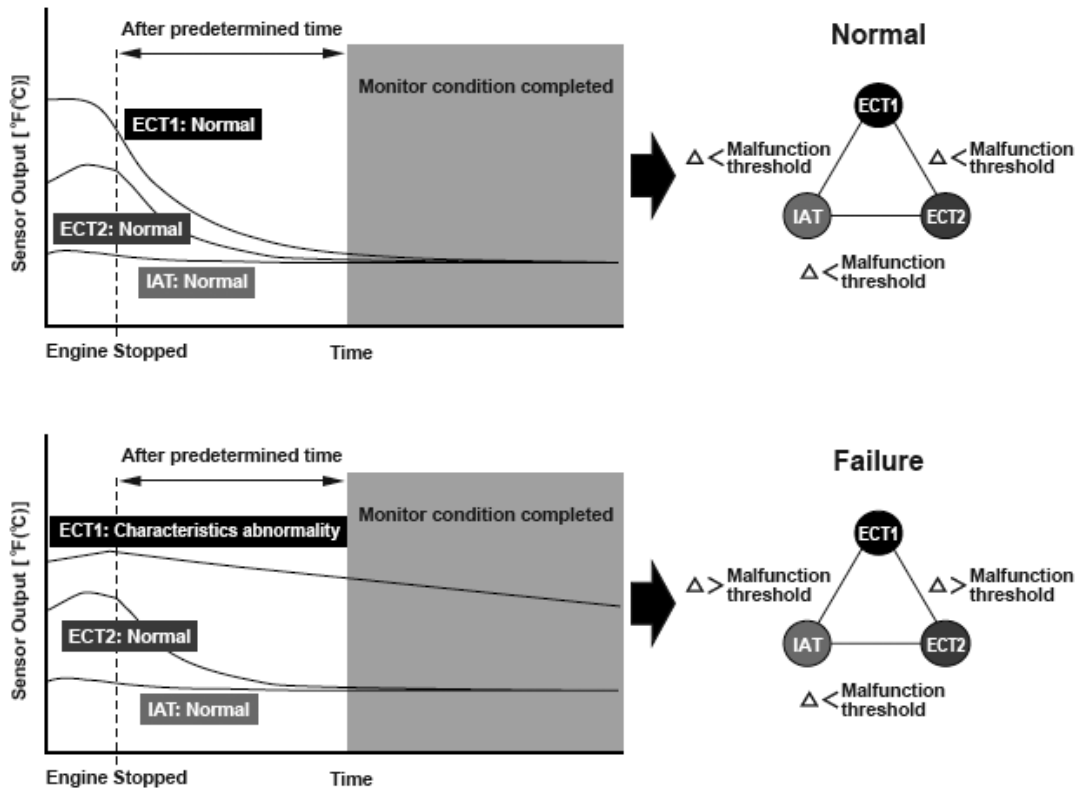
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1116 (86): ADVANCED DIAGNOSTICS

### DTC P1116: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 PERFORMANCE PROBLEM



P0111-0570

**Fig. 184: Intake Air Temperature (IAT) Sensor Circuit Range/Performance - Graph**

**General Description**

Two engine coolant temperature sensors and one intake air temperature sensor are used by the engine control module (ECM)/powertrain control module (PCM).

When the engine is stopped and enough time has passed, the temperature of the engine will equal the ambient temperature.

When an inappropriate temperature is detected after comparing the temperature readings of each sensor, a malfunction in the corresponding sensor is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

**Enable Conditions**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine off time	6 hours	-
No active DTCs	P0111, P0112, P0113, P0116, P0117, P0118, P0125, P2183, P2184, P2185, P2610	

#### Malfunction Threshold

A malfunction is detected if these three conditions are present after the engine and the ignition switch have been off for at least 6 hours before restarting the engine.

- When the temperature difference between the IAT and ECT1 is 61 °F (34 °C) or more.
- When the temperature difference between the IAT and ECT2 is 28 °F (16 °C) or more.
- When the temperature difference between the ECT2 and ECT1 is 60 °F (33 °C) or more.

#### Driving Pattern

1. Turn the ignition off, and wait at least 6 hours.
2. Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

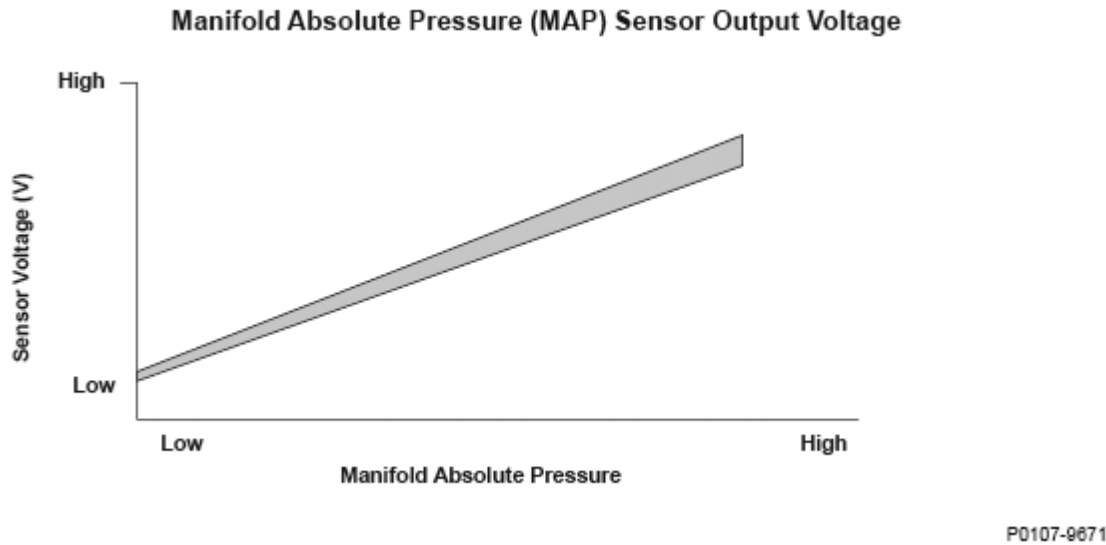
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

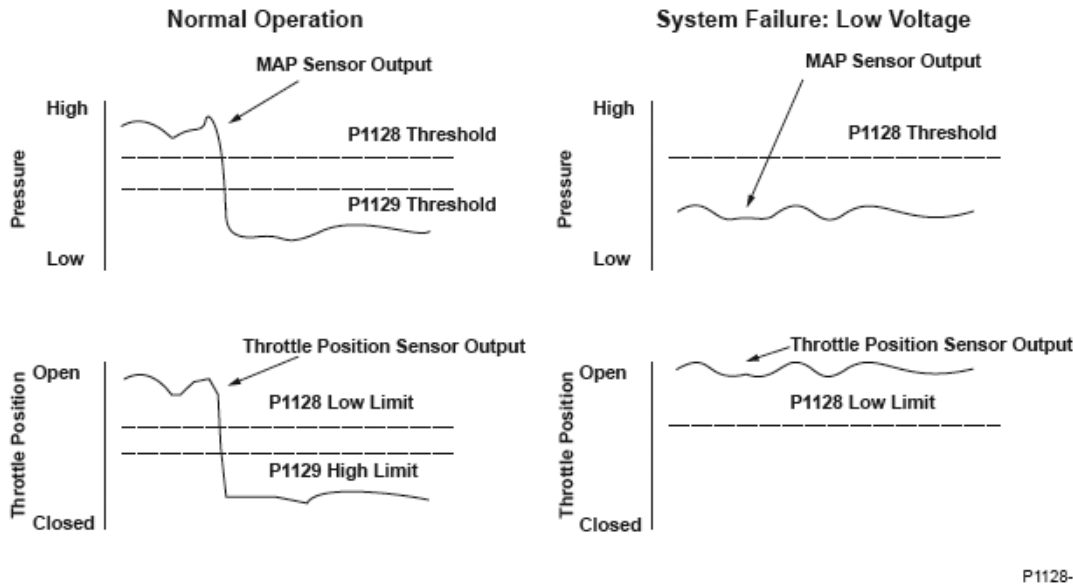
## DTC P1128 (5): ADVANCED DIAGNOSTICS

### DTC P1128: MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR SIGNAL LOWER THAN EXPECTED





**Fig. 185: Manifold Absolute Pressure (MAP) Sensor Output Voltage - Graph**



**Fig. 186: Manifold Absolute Pressure (MAP) Sensor Normal Operation And System Failure - Graph**

**General Description**

The manifold absolute pressure (MAP) sensor senses manifold absolute pressure (vacuum) and converts it into electrical signals. The MAP sensor outputs low signal voltage at high-vacuum (idling) and high signal voltage at low-vacuum (throttle valve wide open).

The engine control module (ECM)/powertrain control module (PCM) compares a predetermined MAP value at a given throttle position and manifold absolute pressure to the output voltage value of the MAP sensor.

If the MAP sensor outputs lower voltage than expected, the ECM/PCM detects a malfunction and stores a DTC.

## 2007 Honda Element EX

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#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	2 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after the VTEC system changes	2 seconds	-
Engine coolant temperature	34 °F (1 °C)	-
Engine speed	1,400 rpm	-
Vehicle speed	15 mph (24 km/h)	-
Throttle position	1,000 rpm	13.4 °
	3,000 rpm	28.1 °
Fuel feedback	Other than during fuel cut-off operation	
No active DTCs	P0107, P0108, P0117, P0118, P0122, P0123, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0341, P0506, P0507, P1129, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2227, P2228, P2229, P2646, P2647, P2648, P2649, U0107	

#### Malfunction Threshold

The MAP sensor output is 28 kPa (8.4 in.Hg, 215 mmHg)\* or less for at least 2 seconds when atmospheric pressure is 52 kPa (15.4 in.Hg, 392 mmHg).

\*: Depending on atmospheric pressure.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed of 15 mph (24 km/h) or more with a throttle position as specified under Enable Conditions for at least 2 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

## Diagnosis Details

### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

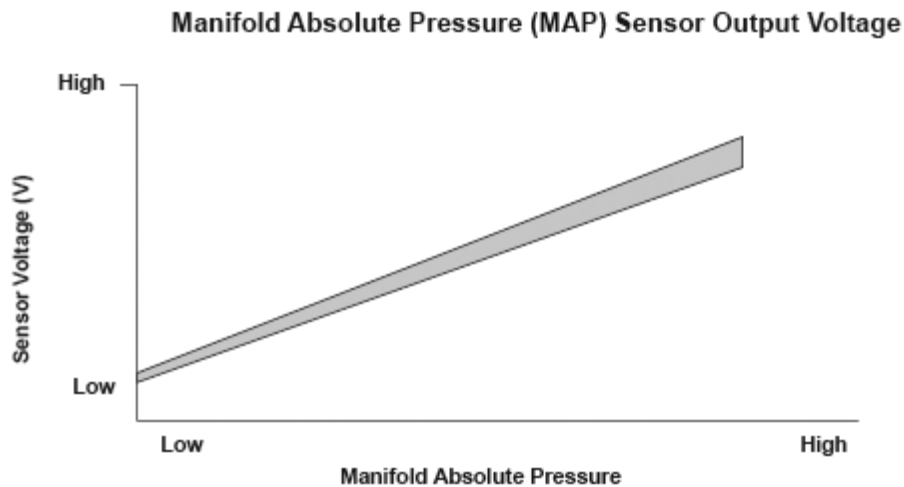
### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

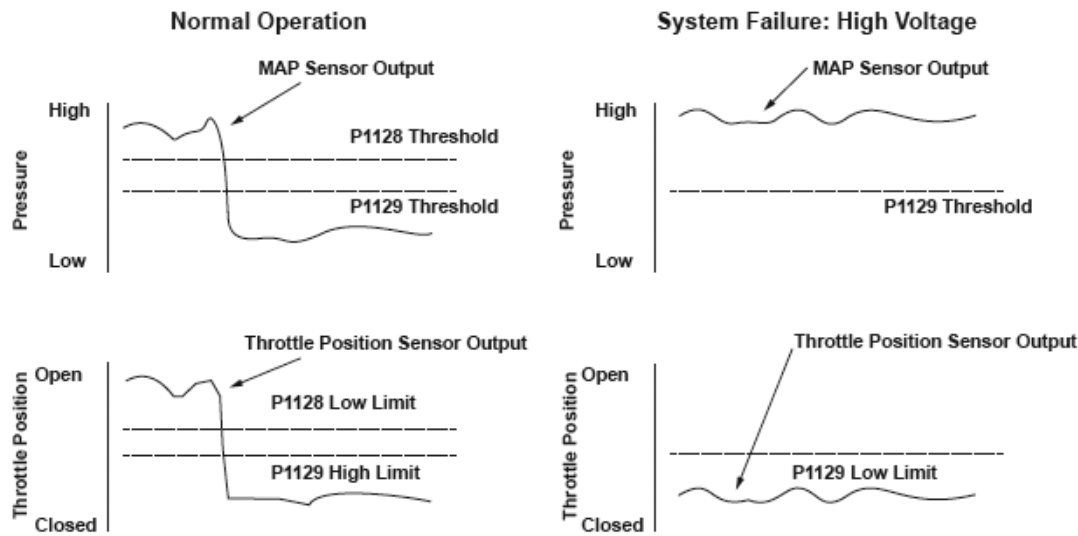
## DTC P1129 (5): ADVANCED DIAGNOSTICS

### DTC P1129: MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR SIGNAL HIGHER THAN EXPECTED



P0107-9671

**Fig. 187: Manifold Absolute Pressure (MAP) Sensor Output Voltage - Graph**



P1129-9771

**Fig. 188: Manifold Absolute Pressure (MAP) Sensor Normal Operation And System Failure - Graph**

**General Description**

The manifold absolute pressure (MAP) sensor senses manifold absolute pressure (vacuum) and converts it into electrical signals. The MAP sensor outputs low signal voltage at high-vacuum (throttle valve closed) and high signal voltage at low-vacuum (throttle valve wide open).

The engine control module (ECM)/powertrain control module (PCM) compares a predetermined MAP value at a given throttle position and manifold absolute pressure to the output voltage value of the MAP sensor.

If the MAP sensor outputs high voltage during fuel cut-off operation for deceleration with the throttle valve fully closed, which should make the manifold absolute pressure lower, the ECM/PCM detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	2 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Elapsed time after		

## 2007 Honda Element EX

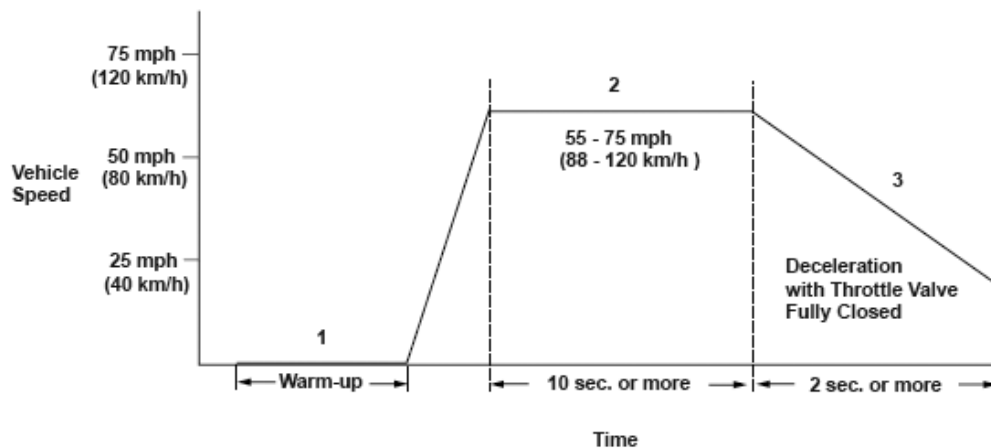
### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

the VTEC system changes	2 seconds	-
Engine coolant temperature	34 °F (1 °C)	-
Engine speed	1,400 rpm	5,700 rpm
Vehicle speed	15 mph (24 km/h)	-
Fuel feedback	During deceleration	
Throttle position	Fully closed	
No active DTCs	P0010, P0011, P0107, P0108, P0112, P0113, P0117, P0118, P0122, P0123, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0341, P0443, P0496, P0497, P0506, P0507, P1009, P1128, P145C, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2646, P2647, P2648, P2649, U0107	

#### Malfunction Threshold

The MAP sensor output is 37 kPa (10.9 in.Hg, 277 mmHg) or more for at least 2 seconds.

#### Driving Pattern



P1129-0050

**Fig. 189: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
  2. Drive the vehicle at a steady speed between 55 - 75 mph (88 - 120 km/h) for at least 10 seconds.
  3. Then, decelerate with the throttle valve fully closed for at least 2 seconds.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

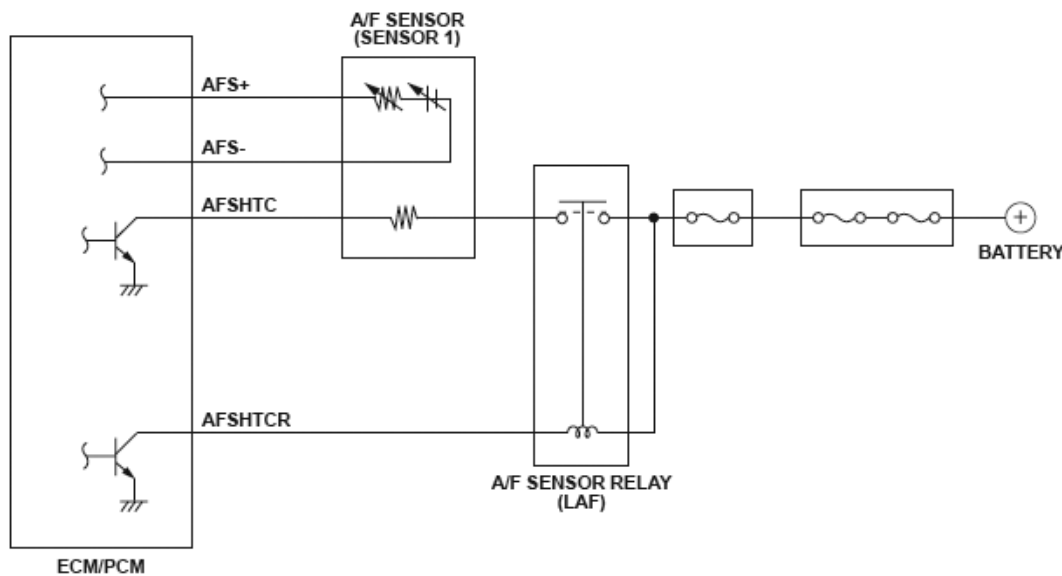
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1157 (48): ADVANCED DIAGNOSTICS

### DTC P1157: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) AFS CIRCUIT HIGH VOLTAGE



P0135-0700

**Fig. 190: Air/Fuel Ratio (A/F) Sensor 1 Circuit Diagram**

#### General Description

The air/fuel ratio (A/F) sensor (sensor 1) is installed in the exhaust system and detects oxygen content in the exhaust gas.

The A/F sensor outputs voltage to the engine control module (ECM)/powertrain control module (PCM). A heater for the sensor element is embedded in the A/F sensor (sensor 1). When activated, it heats the sensor to stabilize and speed up the detection of oxygen content by controlling current flow through the heater. The current diminishes as the voltage applied to the element reaches a certain range because the amount of oxygen that passes through the diffusion layer is limited. The current is proportional to the oxygen content in the exhaust gas, so the air/fuel ratio is detected by the measurement of the current. The ECM/PCM compares the set

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target air/fuel ratio to the detected air/fuel ratio and adjusts the fuel injection duration.

If the A/F sensor (sensor 1) voltage is low, the air/fuel ratio is lean, and the ECM/PCM uses A/F feedback control to issue a Rich command. If the A/F sensor (sensor 1) voltage is high, the air/fuel ratio is rich, and the ECM/PCM uses A/F feedback control to issue a Lean command.

If the element is not activated for a set time when power is drawn by the A/F sensor (sensor 1) heater, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	68 °F(20 °C)	-
Battery voltage	10.5 V	-
State of the engine	Running	
No active DTCs	P0117, P0118, P0134, P0135, P2195, P2238, P2252	
Others	After applying current to the air/fuel ratio sensor (sensor 1) heater for at least 17.5 seconds	

#### Malfunction Threshold

The A/F sensor (sensor 1) heater element resistance is 250 ohms or more for at least 5 seconds.

#### Driving Pattern

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

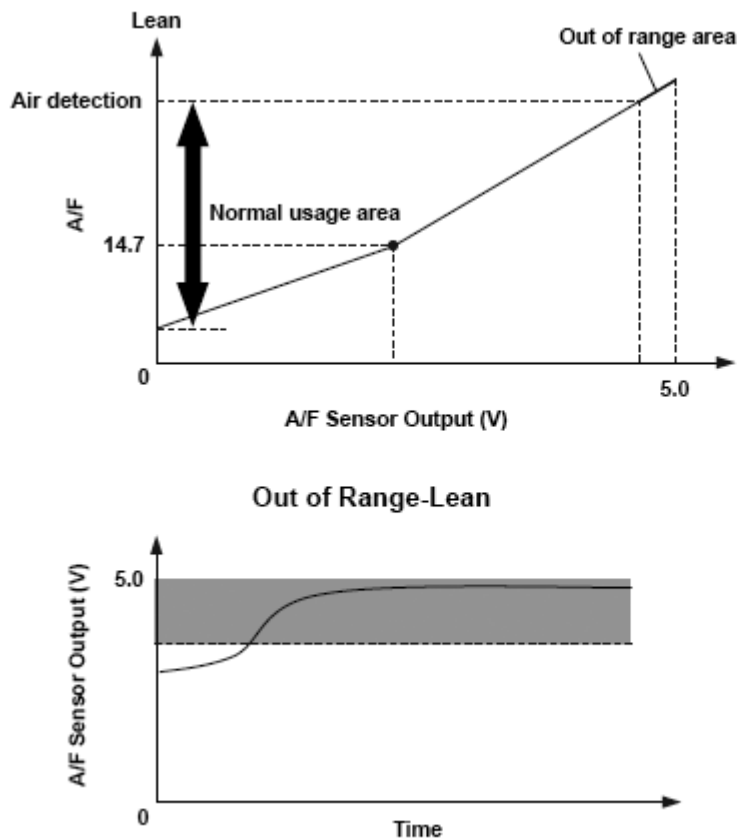
### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1172 (61): ADVANCED DIAGNOSTICS

### DTC P1172: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) CIRCUIT OUT OF RANGE HIGH



P1172-0570

**Fig. 191: Air/Fuel Ratio (A/F) Sensor Output Voltage - Graph**

### General Description

If a malfunction causes the air/fuel sensor value sent to the engine control module (ECM)/powertrain control module (PCM) to deviate from the normal control area, the air/fuel (A/F) sensor may still become active after the engine starts, but the air/fuel feedback does not start normally and the emissions deteriorate. When the A/F sensor output is out of the normal area, and this condition continues after the A/F sensor is active, the ECM/PCM detects a malfunction and a DTC is stored.



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**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	7 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

### ENABLE CONDITIONS

Condition	
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0496, P0497, P1128, P1129, P1157, P145C, P2195, P2238, P2252

**Malfunction Threshold**

A malfunction is detected when the A/F sensor output voltage is 4.9 V or more.

**Driving Pattern**

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

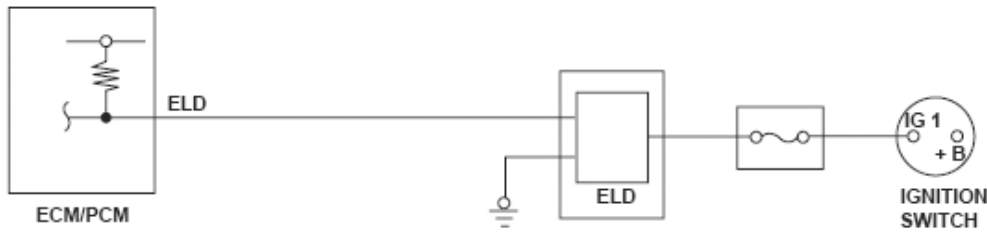
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1297 (20): ADVANCED DIAGNOSTICS

**DTC P1297: ELECTRICAL LOAD DETECTOR (ELD) CIRCUIT LOW VOLTAGE**



P1297-0101

**Fig. 192: Electrical Load Detector (ELD) Circuit Diagram**

**General Description**

The electrical load detector (ELD) is built into the under-hood fuse/relay box. It monitors the current fed to the ignition switch and sends a signal to the engine control module (ECM)/powertrain control module (PCM). If the ELD output voltage is extremely low, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	10.0 V	-
Ignition switch	ON	
No active DTCs	P1298	

**Malfunction Threshold**

The ELD output voltage is 0.27 V or less for at least 5 seconds.

**Diagnosis Details**

**Conditions for illuminating the indicator**

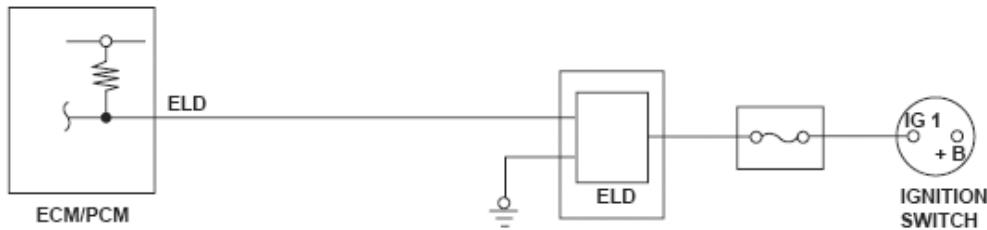
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1298 (20): ADVANCED DIAGNOSTICS

### DTC P1298: ELECTRICAL LOAD DETECTOR (ELD) CIRCUIT HIGH VOLTAGE



P1297-0101

**Fig. 193: Electrical Load Detector (ELD) Circuit Diagram**

#### General Description

The electrical load detector (ELD) is built into the under-hood fuse/relay box. It monitors the current fed to the ignition switch and sends a signal to the engine control module (ECM)/powertrain control module (PCM). If the ELD output voltage is extremely high, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	10.0 V	-
Ignition switch	ON	
No active DTCs	P1297	

#### Malfunction Threshold

The ELD output voltage is 4.57 V or more for at least 5 seconds.

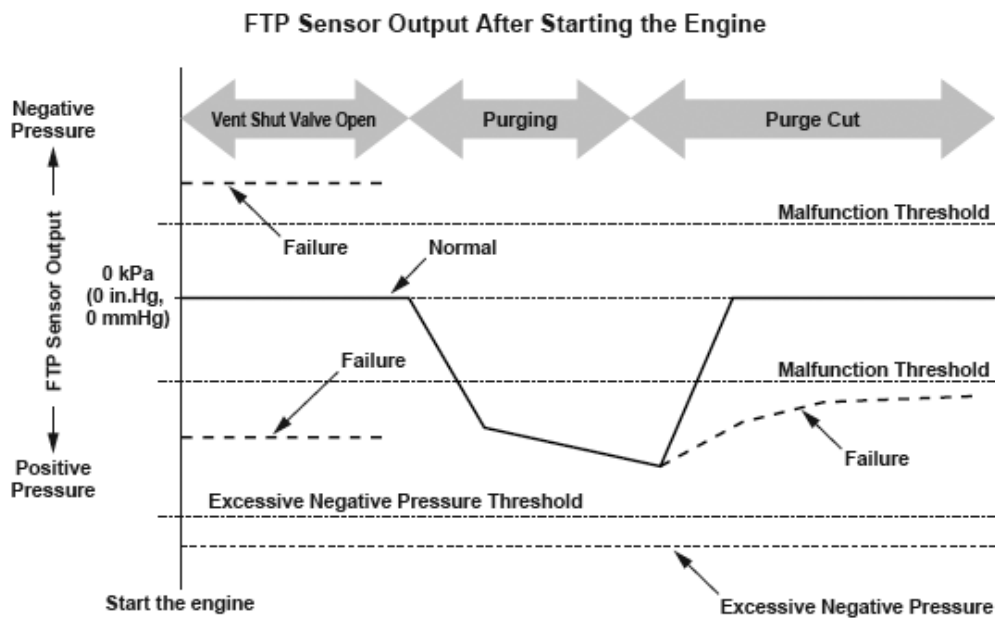
#### Diagnosis Details

**Conditions for illuminating the indicator**

When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

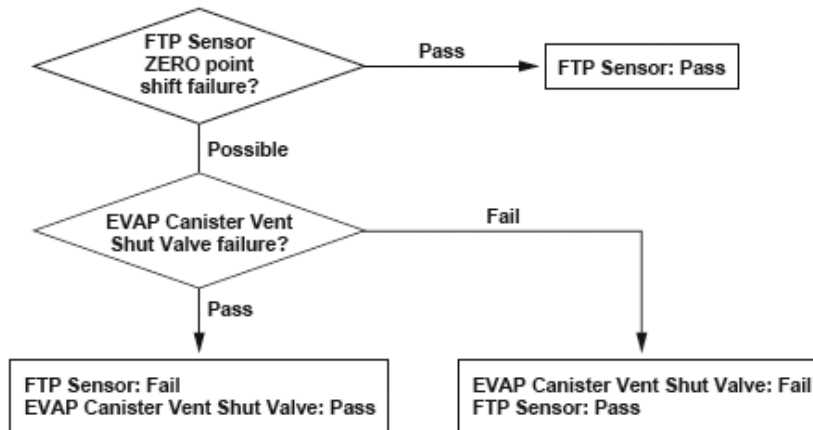
The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P1454 (91): ADVANCED DIAGNOSTICS****DTC P1454: FUEL TANK PRESSURE (FTP) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM**

P1454-0570

**Fig. 194: FTP Sensor Output After Starting Engine**

**Malfunction Judgment Flowchart of FTP Sensor and EVAP Canister Vent Shut Valve**



P1454-0371

**Fig. 195: Malfunction Judgement Flow Chart Of FTP Sensor And EVAP Canister Vent Shut Valve**

**General Description**

The fuel tank pressure is about 0 kPa (0 in.Hg, 0 mmHg) when starting a cold engine. When the fuel tank pressure (FTP) sensor output value is out of a specified range and the engine control module (ECM)/powertrain control module (PCM) judges that there's no other cause [no evaporative emission (EVAP) canister vent shut valve failure, etc.] of the FTP sensor zero point shift, the ECM/PCM detects an FTP sensor malfunction.

However, if the FTP sensor output when starting the engine is a prescribed negative value or less (excessive negative pressure is detected), the malfunction judgment should be done as follows because it is difficult to distinguish the FTP sensor zero point shift (P1454) from the EVAP canister vent shut valve failure (P2422).

1. If either Temporary DTC P1454 or P2422 is not stored, the ECM/PCM stores both DTCs.
2. If both P1454 and P2422 Temporary DTCs are stored and an excessive negative pressure is detected, both P1454 and P2422 DTCs are stored.
3. If either Temporary DTC P1454 or P2422 is stored and an excessive negative pressure is detected, the ECM/PCM stores the DTC of the temporary DTC that was stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	P0452, P0453, P2422 are judged as OK
Duration	8 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

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Condition	Minimum	Maximum
Elapsed time after starting the engine	10 seconds	-
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0451, P0452, P0453, P0496, P0497, P0498, P0499, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252, P2422	
Others	The EVAP canister vent shut valve has not been closing	
	Stopping the purge control	

#### Malfunction Threshold

- The FTP sensor output fluctuates by 0.7 kPa (0.2 in.Hg, 5 mmHg) or more, or -0.7 kPa (-0.2 in.Hg, -5 mmHg) or less, for at least 8 seconds.
- The FTP sensor output value is -1.3 kPa (-0.3 in.Hg, -10 mmHg) or less for at least 8 seconds.

#### Confirmation Procedure with the HDS

Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

#### Driving Pattern

Start the engine, and let it idle until the radiator fan comes on.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

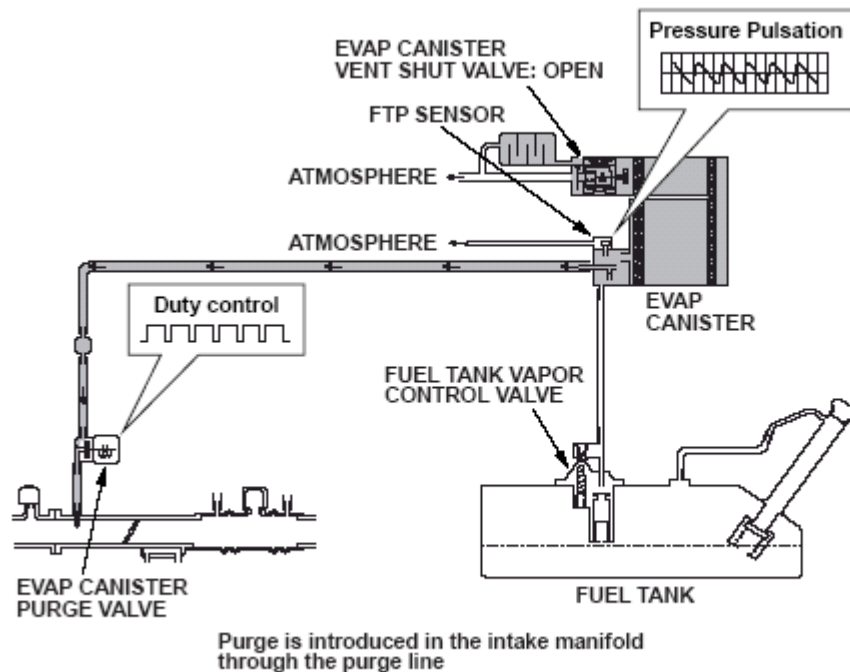
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P145C (90): ADVANCED DIAGNOSTICS

### DTC P145C: EVAPORATIVE EMISSION (EVAP) SYSTEM MALFUNCTION



P145C-0770

**Fig. 196: Evaporative Emission (EVAP) System Diagram**

### General Description

The fuel (vapor) vaporized in the fuel tank is stored in the canister temporarily and introduced in the engine through the evaporative emission (EVAP) canister purge valve. The engine control module (ECM)/powertrain control module (PCM) controls the vapor amount introduced in the engine by repeating switching the power of the EVAP canister purge valve at a constant frequency according to the condition of the engine.

#### < STEP 1 >

The EVAP canister purge valve drives normally (EVAP canister purge valve OPEN OK) and detects that the purge flow is normal when the pulse of the EVAP canister purge valve drive cycle is transmitted to fuel tank pressure (FTP) sensor by the purge flow (pulse method).

OK determination: Pulse exists (P145C OK)

- P0497 Purge flow OK
- P0496 EVAP canister purge valve Open fix OK

NG determination: No pulse (P145C NG)

- Either purge flow P0497 abnormality or P0496 EVAP canister purge valve OPEN failure.
- In this case, classify the failure part according to < STEP 2 >.

#### < STEP 2 >

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In case there is no pulse, it is determined either no purge flow or EVAP canister purge valve OPEN fix as follows:

When the FTP sensor fluctuates from negative pressure condition to atmospheric pressure side after the ignition is turned off: P0496 EVAP canister purge valve OPEN fix

When there is no fluctuation of the FTP sensor: P0497 purge flow NG

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	31 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Low load duration time	10 seconds	-
Engine coolant temperature before EVAP purge control starts	131 °F (55 °C)	-
MAP value	-	54 kPa (16.1 in.Hg, 410 mmHg)
Battery voltage	10.5 V	-
EVAP canister purge valve Duty	30 %	80 %
Fuel trim	0.69	1.47
Fuel feedback	Closed loop at stoichiometric	
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0443, P0451, P0452, P0453, P0496, P0498, P0499, P1128, P1129, P1157, P1172, P1454, P2195, P2227, P2228, P2229, P2238, P2252, P2422	

#### Malfunction Threshold

The pulse method from the fuel tank pressure sensor is 0.01 % or less for at least 31 seconds.

#### Confirmation Procedure with the HDS

Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.



**Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Let the engine idle for at least 92 seconds.
3. Turn off the ignition for at least 10 seconds.

**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

**Conditions for clearing the MIL**

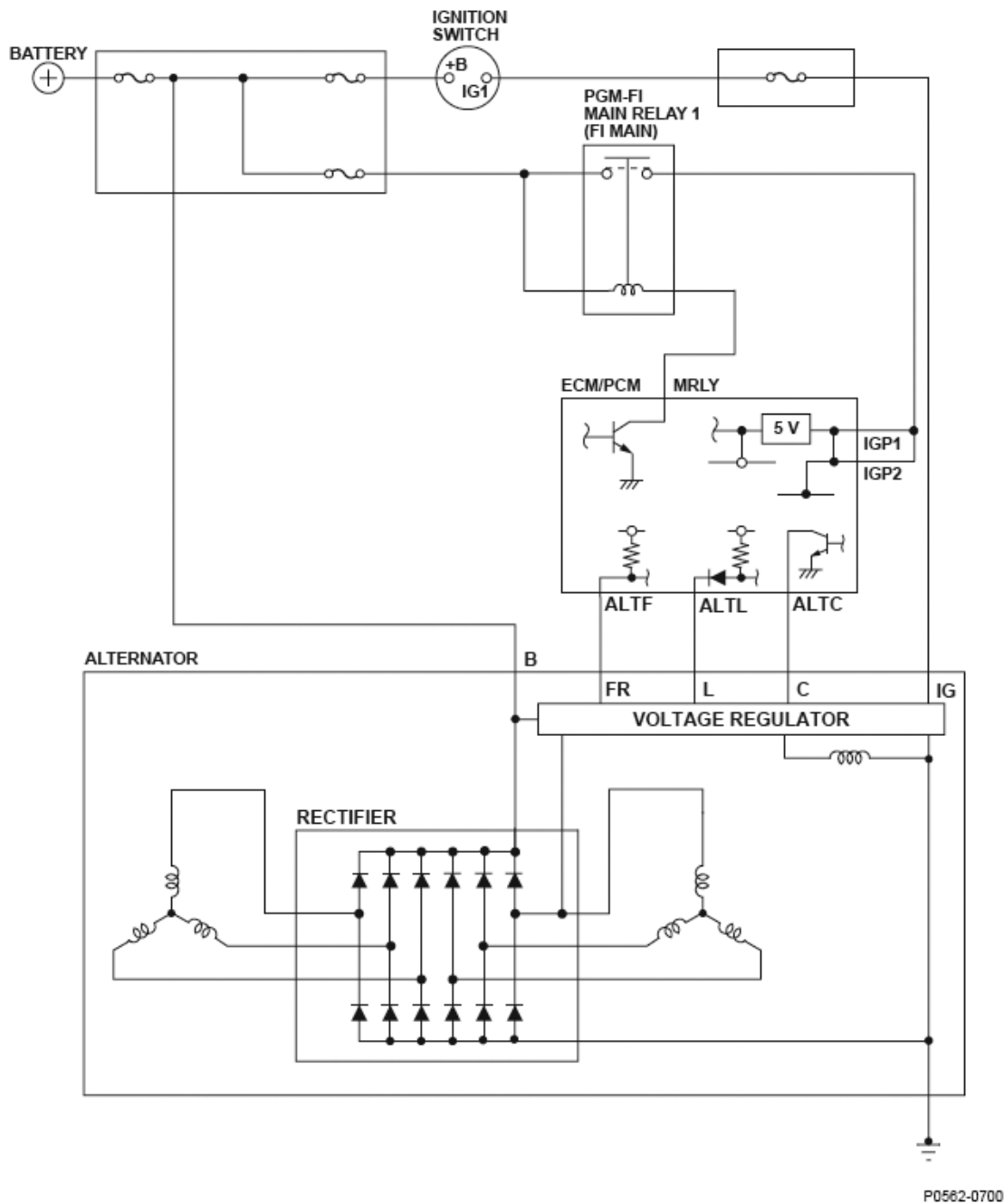
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P1549 (34): ADVANCED DIAGNOSTICS****DTC P1549: CHARGING SYSTEM HIGH VOLTAGE**

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**Fig. 197: Charging System Circuit Diagram**

### General Description

The alternator is driven by the engine, and it generates electricity to supply the necessary power to the electrical system and to charge the battery. The alternator voltage target values of 14.5 V and 12.5 V are achieved by switching the alternator control mode (controlled by the engine control module (ECM)/powertrain control module (PCM)). The alternator output signal is sent to the ECM/PCM, and it varies according to the battery's state of charge, the electrical load, and the engine speed.

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### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

When the IGP terminal voltage of the ECM/PCM is a set value or more for a set time, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	60 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

**Enable Conditions**

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	-

**Malfunction Threshold**

The IGP terminal voltage is 16.0 V or more for at least 60 seconds.

**Diagnosis Details**

**Conditions for illuminating the indicator**

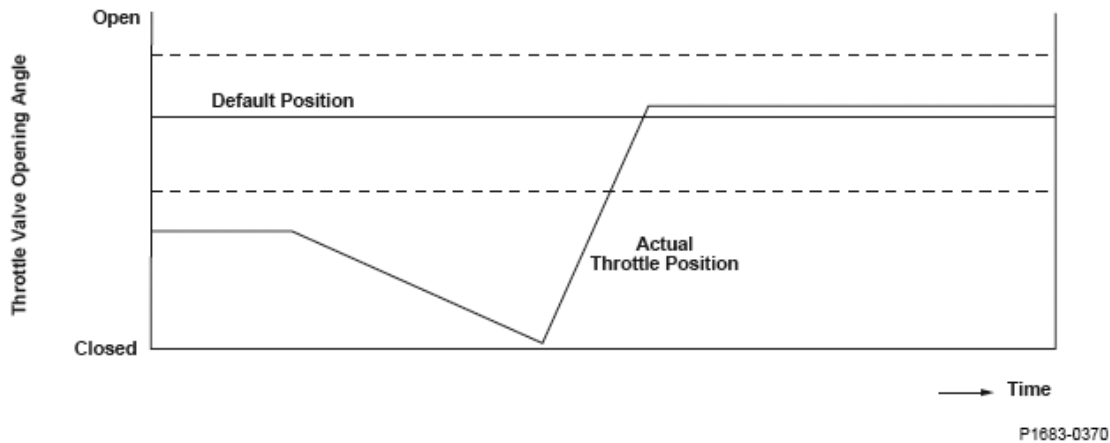
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1683 (40): ADVANCED DIAGNOSTICS

**DTC P1683: THROTTLE VALVE DEFAULT POSITION SPRING PERFORMANCE PROBLEM**



**Fig. 198: Throttle Valve Default Position - Graph**

**General Description**

The electronic throttle control system controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM). The throttle valve default position spring is attached to the throttle valve gear. It opens the throttle valve to improve starting performance in cold conditions, or to retain minimum running performance in case of an electronic throttle control system failure.

If the throttle valve does not return to the default position when the throttle actuator control module moves the throttle actuator to the default position from the fully closed position, a malfunction is detected and the malfunction data is transmitted to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction in the throttle valve default position spring, and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	2.5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	6.0 V	-
Engine coolant temperature	158 °F (70 °C)	-
Ignition switch	OFF	

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No active DTCs

P0117, P0118, P2101, P2108, P2118, P2135, P2176, U0107

#### Malfunction Threshold

The throttle valve is at a position greater than +5 ° from the fully closed position, or at a position lower than +3 ° from the fully closed position, for at least 2.5 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Turn off the ignition switch.
3. Turn on the ignition switch.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

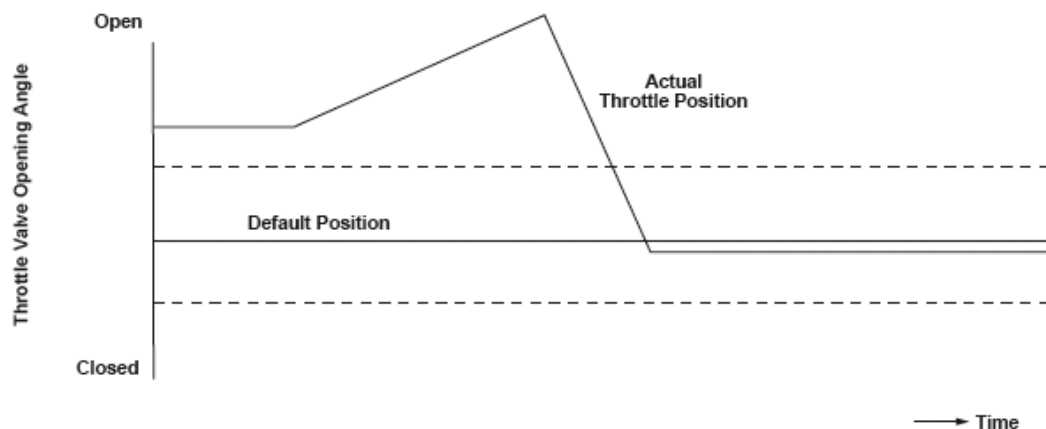
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1684 (40): ADVANCED DIAGNOSTICS

### DTC P1684: THROTTLE VALVE RETURN SPRING PERFORMANCE PROBLEM



**Fig. 199: Throttle Valve Default Position - Graph****General Description**

The electronic throttle control system controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM). The throttle valve return spring is attached to the throttle valve gear to return the throttle valve to the default position.

If the throttle valve does not return to the default position when the throttle actuator control module moves the throttle actuator to the default position from the middle position, a malfunction is detected and the malfunction data is transmitted to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction in the throttle valve return spring and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status****MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	2.5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions****ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	6.0 V	-
Engine coolant temperature	158 °F (70 °C)	-
Ignition switch	OFF	
No active DTCs	P0117, P0118, P2101, P2108, P2118, P2135, P2176, U0107	

**Malfunction Threshold**

The throttle valve opening angle is 17 ° or more, or 11 ° or less, for at least 2.5 seconds.

**Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Turn off the ignition switch.
3. Turn on the ignition switch.

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### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

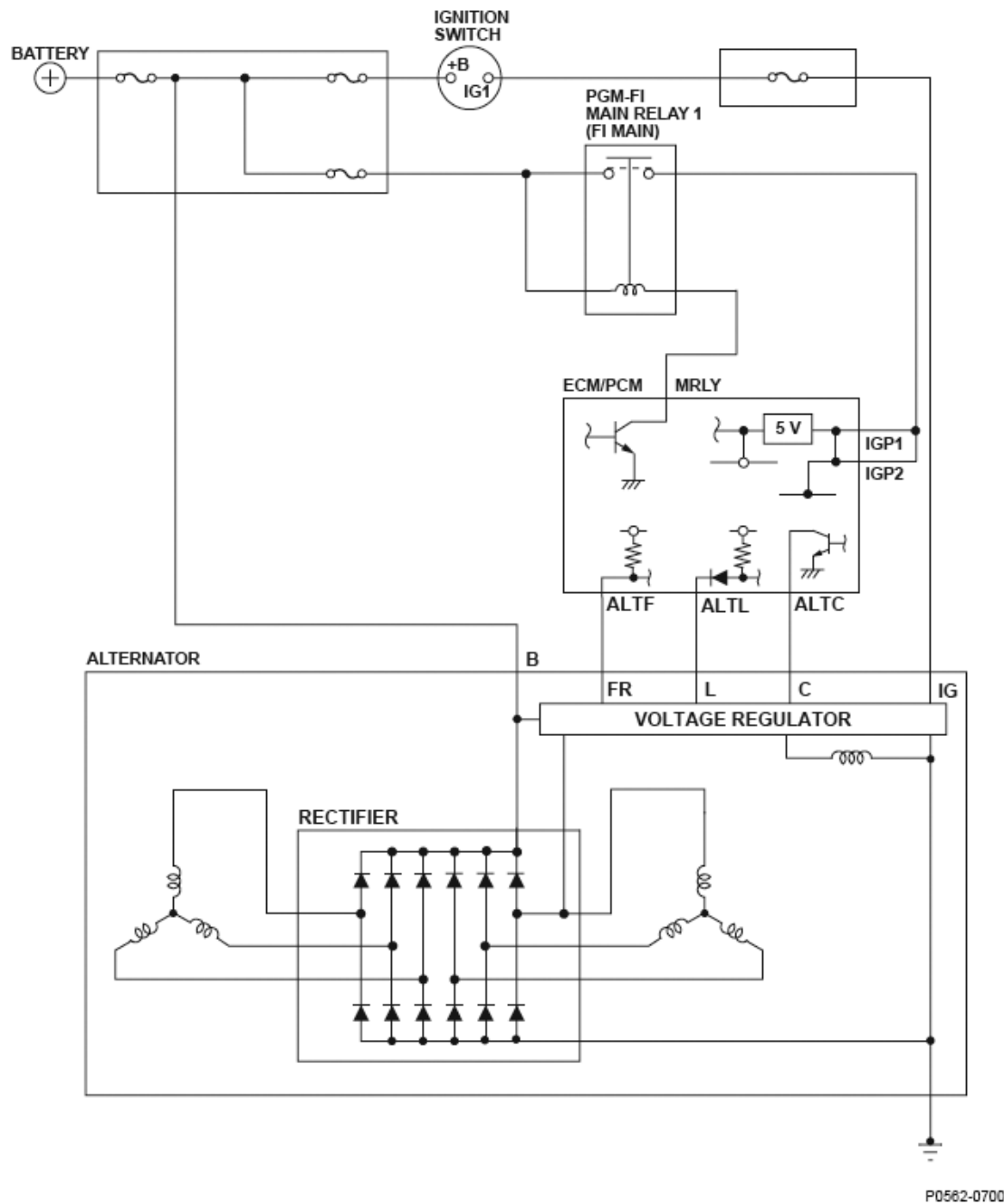
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

### **DTC P16BB (116): ADVANCED DIAGNOSTICS**

**DTC P16BB: ALTERNATOR B TERMINAL CIRCUIT LOW VOLTAGE**



**Fig. 200: Charging System Circuit Diagram**

**General Description**

The alternator is driven by the engine, and it generates electricity to supply the necessary power to the electrical system and to charge the battery. The alternator voltage target values of 14.5 V and 12.5 V are achieved by switching the alternator control mode (controlled by the engine control module (ECM)/powertrain control module (PCM)). The alternator output signal is sent to the ECM/PCM, and it varies according to the battery's state of charge, the electrical load, and the engine speed.



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When the engine speed is a specified value and the IGP terminal voltage is below a set value when the alternator is in the 14.5 V mode, and the alternator power generation amount is within the set range, and this condition continues more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	60 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	3,000 rpm
Alternator control mode	14.5 V mode	

#### Malfunction Threshold

The IGP terminal voltage is 12.0 V or less, and the alternator power generation amount is within 1.0 % to 50.0 %, for at least 60 seconds.

#### Driving Pattern

1. Start the engine.
2. Maintain an engine speed of 500 rpm to 3,000 rpm.
3. Turn on the headlights (high beam) and rear window defogger.

#### Diagnosis Details

##### Conditions for illuminating the indicator

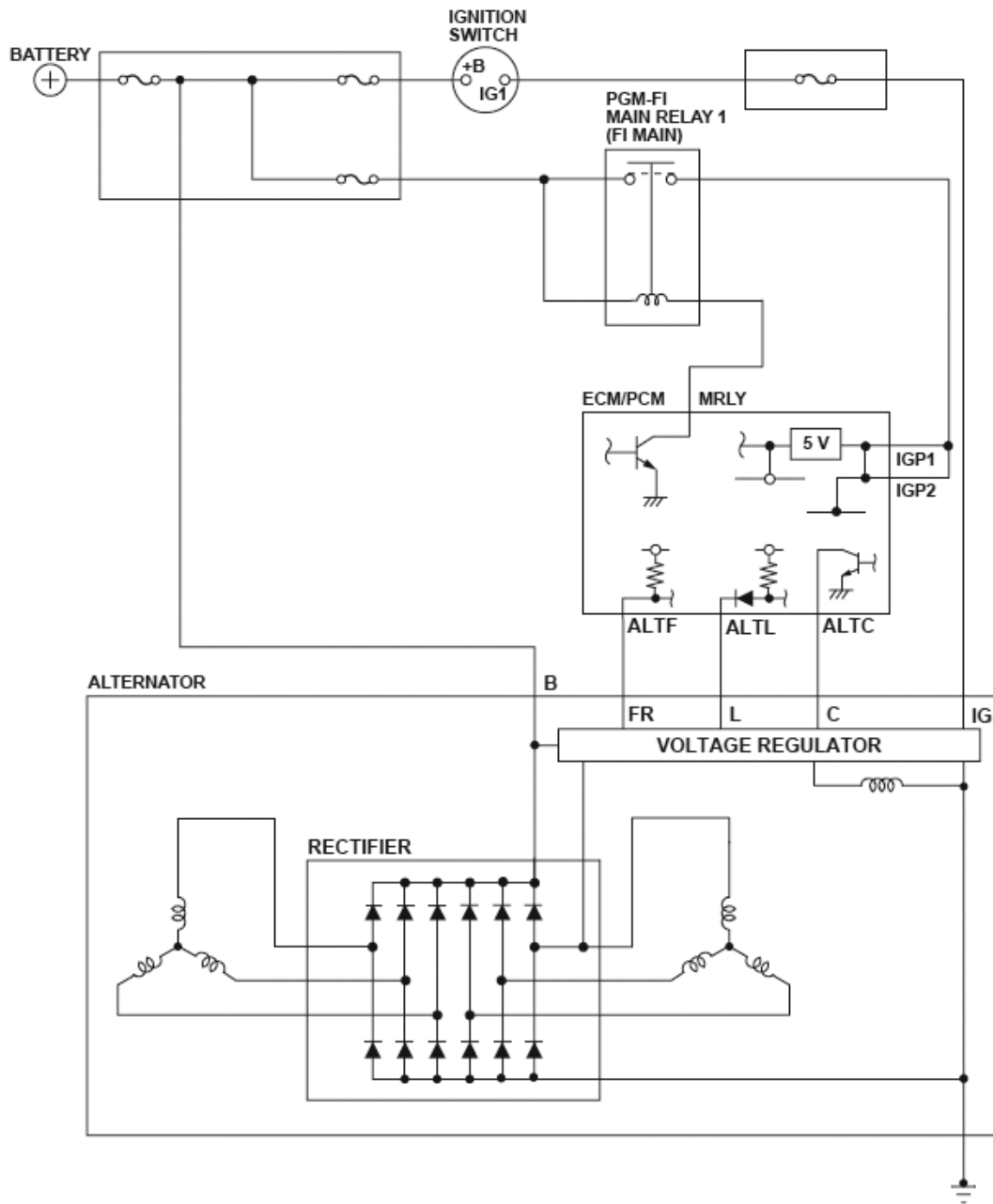
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P16BC (116): ADVANCED DIAGNOSTICS

**DTC P16BC: ALTERNATOR FR TERMINAL CIRCUIT/IGP CIRCUIT LOW VOLTAGE**



P0562-0700

**Fig. 201: Charging System Circuit Diagram**

**General Description**

The alternator is driven by the engine, and it generates electricity to supply the necessary power to the electrical load and to charge the battery. The alternator voltage target values of 14.5 V and 12.5 V are achieved by switching the alternator control mode (controlled by the engine control module (ECM)/powertrain control

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module (PCM)). The alternator output signal is sent to the ECM/PCM, and it varies according to the battery's state of charge, the electrical load, and the engine speed.

When the engine speed is a specified value and the IGP terminal voltage is below a set value when the alternator is in the 14.5 V mode, and the alternator power generation amount is a set range or less, and this condition continues more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	60 seconds or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine speed	500 rpm	3,000 rpm
Alternator control mode	14.5 V mode	

#### Malfunction Threshold

The IGP terminal voltage is 12.0 V or less, and the alternator power generation amount is 0.5 % or less, for at least 60 seconds.

#### Driving Pattern

1. Start the engine.
2. Maintain an engine speed of 500 rpm to 3,000 rpm.
3. Turn on the headlights (high beam) and rear window defogger.

#### Diagnosis Details

##### Conditions for illuminating the indicator

When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

##### Conditions for clearing the DTC

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1717 (62): ADVANCED DIAGNOSTICS

### DTC P1717: OPEN IN TRANSMISSION RANGE SWITCH ATP RVS SWITCH CIRCUIT



P0705-0700

**Fig. 202: Transmission Range Switch Circuit Diagram**

#### TRANSMISSION RANGE SWITCH CONTACT POINT INPUT MATRIX

Shift lever position	Input per switch							
	P	R	RVS	N	D	2	1	FWD
P	O	X	O	X	X	X	X	X
R	X	O	O	X	X	X	X	X
N	X	X	O	O	X	X	X	X
D	X	X	X	X	O	X	X	O
2	X	X	X	X	X	O	X	O
1	X	X	X	X	X	X	O	O

O: Closed X: Open

#### General Description

The transmission range switch is attached to the control shaft. Operating the shift lever makes the control shaft rotate via the shift cable. The A/T gear position indicator indicates which position is selected according to the Low/High signal combinations which vary based on shift lever position. The control shaft changes the position of the transmission range switch, activates the manual valve, and switches hydraulic pressure to shift the transmission through forward/neutral/reverse. The transmission range switch signal is used to determine the shift schedule. The voltage is 12 V (High) at the powertrain control module (PCM) input terminal when each transmission range switch position is open, and it is 0 V (Low) when each switch is closed. If the RVS switch is OPEN with the shift lever in the R position while shifting between the P, R, and N positions, the PCM detects a RVS switch OPEN failure and a DTC is stored.

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**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	320 milliseconds or more
DTC Type	Two drive cycles, MIL OFF, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	11.0 V	-

**Malfunction Threshold**

No RVS signal is detected with the shift lever in the R position while shifting between the P, R, and N positions.

**Driving Pattern**

1. Start the engine, and shift to the P, R, and N positions.
2. Shift to the R position, and wait for at least 320 milliseconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1730 (45): ADVANCED DIAGNOSTICS

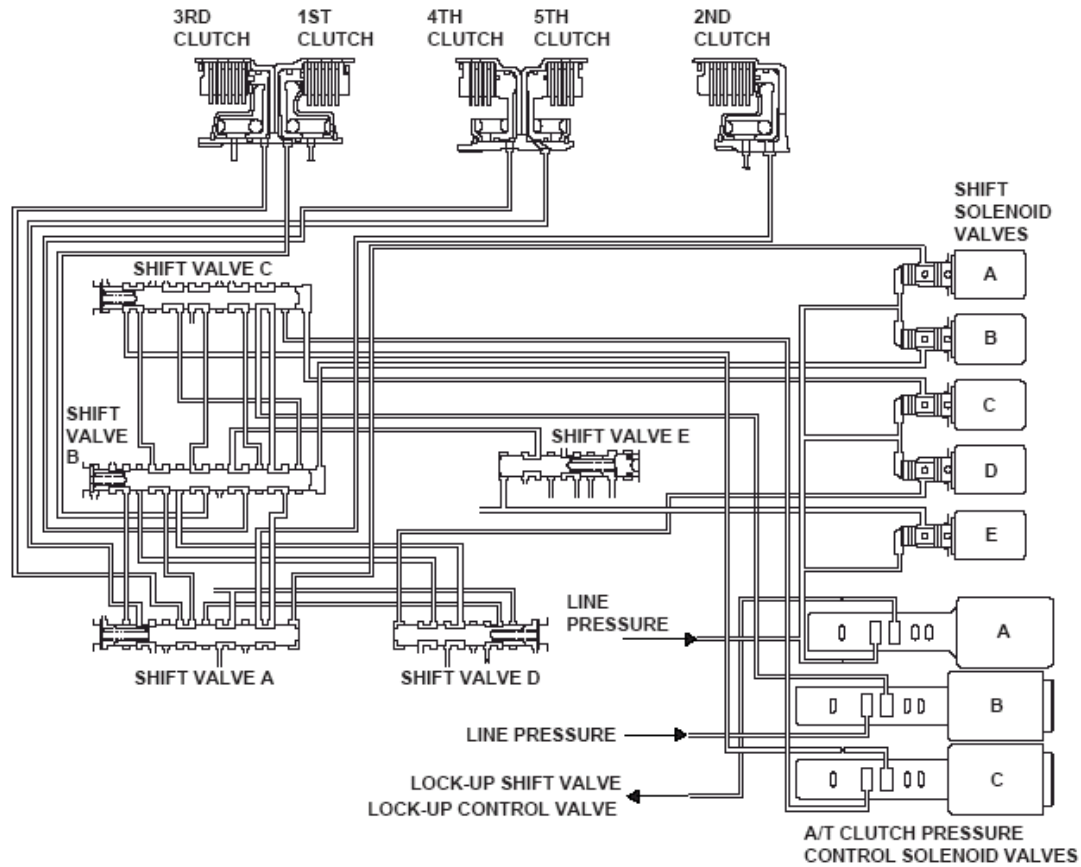
**DTC P1730: PROBLEM IN SHIFT CONTROL SYSTEM:**

- Shift Solenoid Valves A or D Stuck OFF
- Shift Solenoid Valve B Stuck ON

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- Shift Valves A, B, or D Stuck



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**Fig. 203: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Clutch										
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 204: Shift Solenoid Valve Output (D Position)**

### General Description

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Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft to countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in the shift solenoid valve or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	6 seconds (symptom 1-A)
	3 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1)</sup>	-
Battery voltage	11.0 V	-
Throttle position	6.0 % or more, or fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	5th <sup>(1)</sup>	
	3rd <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 5th gear	Neutral

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1-B

Driving in 3rd gear

Driving in 3rd gear

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

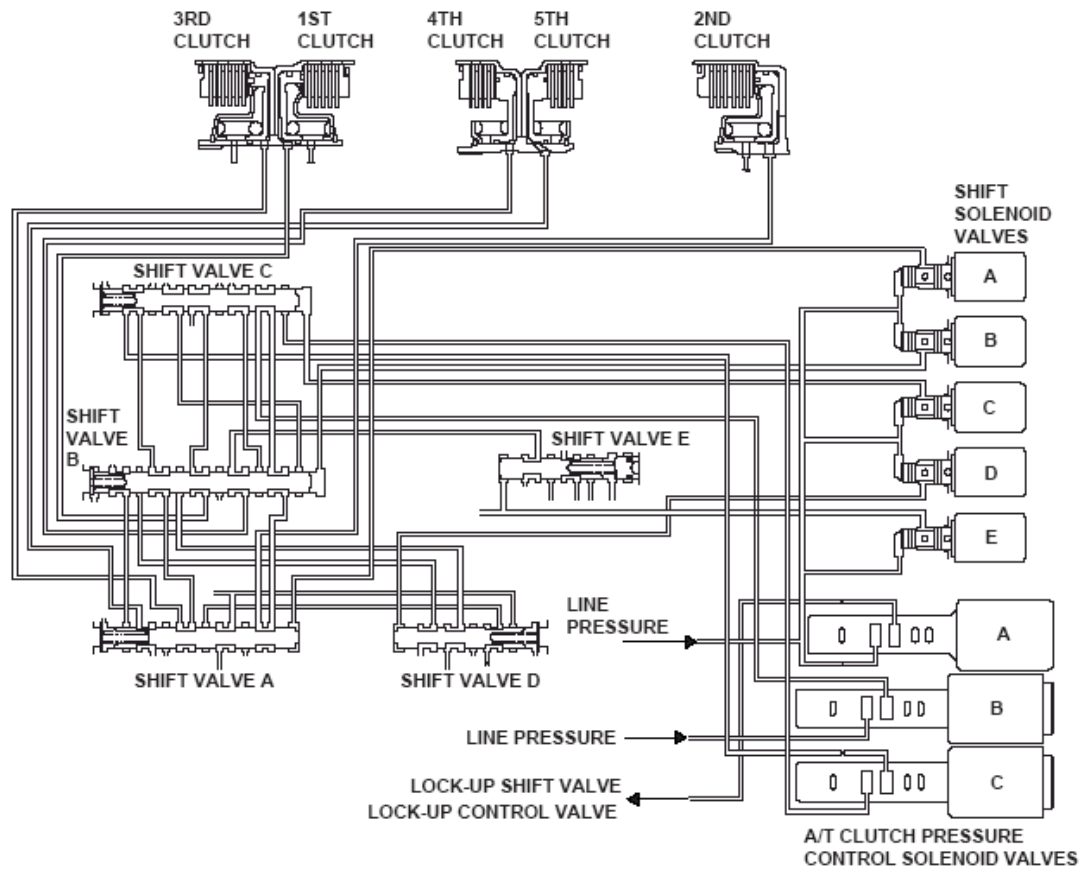
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1731 (45): ADVANCED DIAGNOSTICS

### DTC P1731: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valve E Stuck ON
- Shift Valve E Stuck
- A/T Clutch Pressure Control Solenoid Valve A Stuck OFF





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**Fig. 205: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 206: Shift Solenoid Valve Output (D Position)**

**General Description**

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft to countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in the A/T clutch pressure control solenoid valve, the shift solenoid valve, or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds (symptom 1-A)
	1 second (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	-	6 mph (9 km/h) <sup>(1)</sup>
Throttle position	6.0 % <sup>(2)</sup>	-
Battery voltage	11.0 V	-
ATF temperature	-	248 °F (120 °C) <sup>(1)</sup>
Shift lever position	D	
Shift status	Neutral --> 1st <sup>(1)</sup>	
	1st --> 2nd <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOMS

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	1st gear shifting from the N position	Neutral

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1-B

Shifting between 1st gear and 2nd gear

A sudden increase in engine speed

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

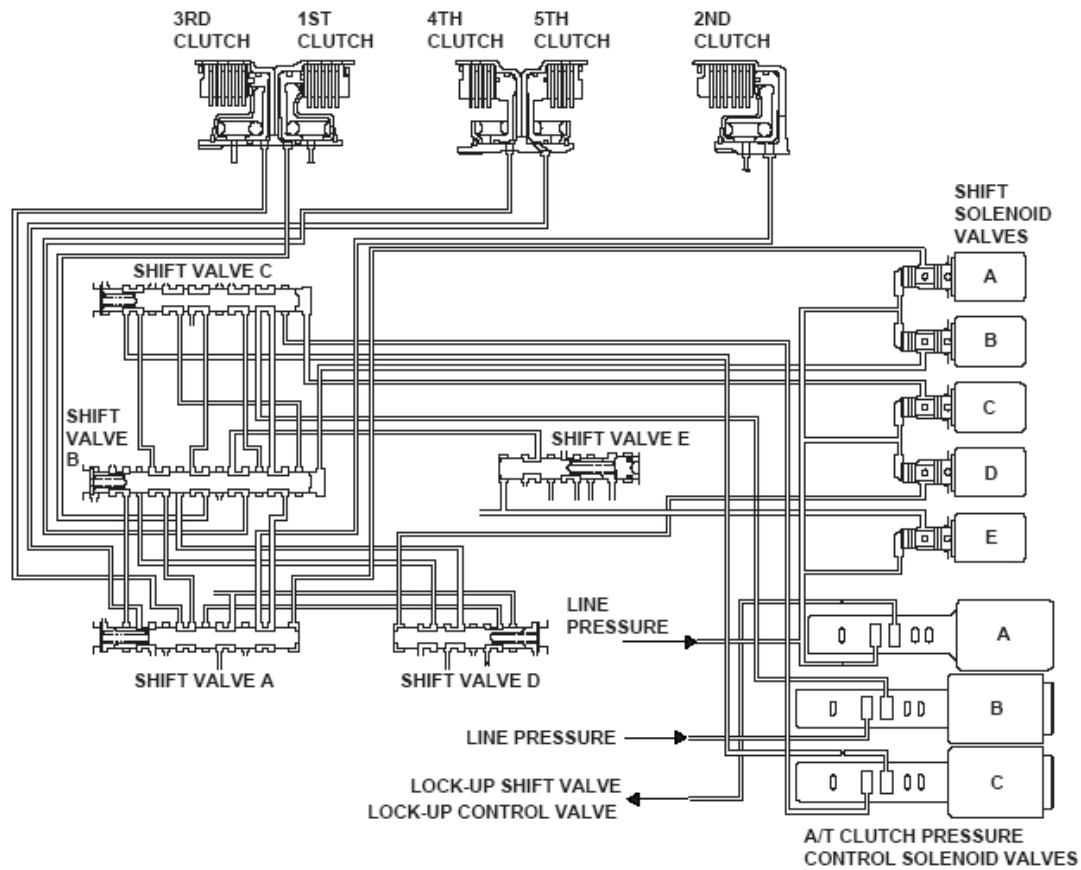
## DTC P1732 (45): ADVANCED DIAGNOSTICS

### DTC P1732: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valves B or C Stuck ON
- Shift Valves B or C Stuck

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**Fig. 207: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Clutch	1st Clutch	CPC A	LINE	CPC A		CPC A					
	2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A			
	3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C			
	4th Clutch							CPC B	CPC B	CPC B	
	5th Clutch									CPC C	CPC C

CPC: Clutch Pressure Control pressure

**Fig. 208: Shift Solenoid Valve Output (D Position)**

### General Description

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

## 2007 Honda Element EX

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft to countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in the shift solenoid valve or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds (symptom 1-A)
	2.5 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1)</sup>	-
Throttle position	6.0 % <sup>(2)</sup>	-
Battery voltage	11.0 V	-
Shift lever position	D	
Shift status	4th <sup>(1)</sup>	
	2nd --> 3rd <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOM

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 4th gear	Neutral
1-B	Shifting between 2nd gear and 3rd gear	Shifting between 2nd gear and 3rd gear

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#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

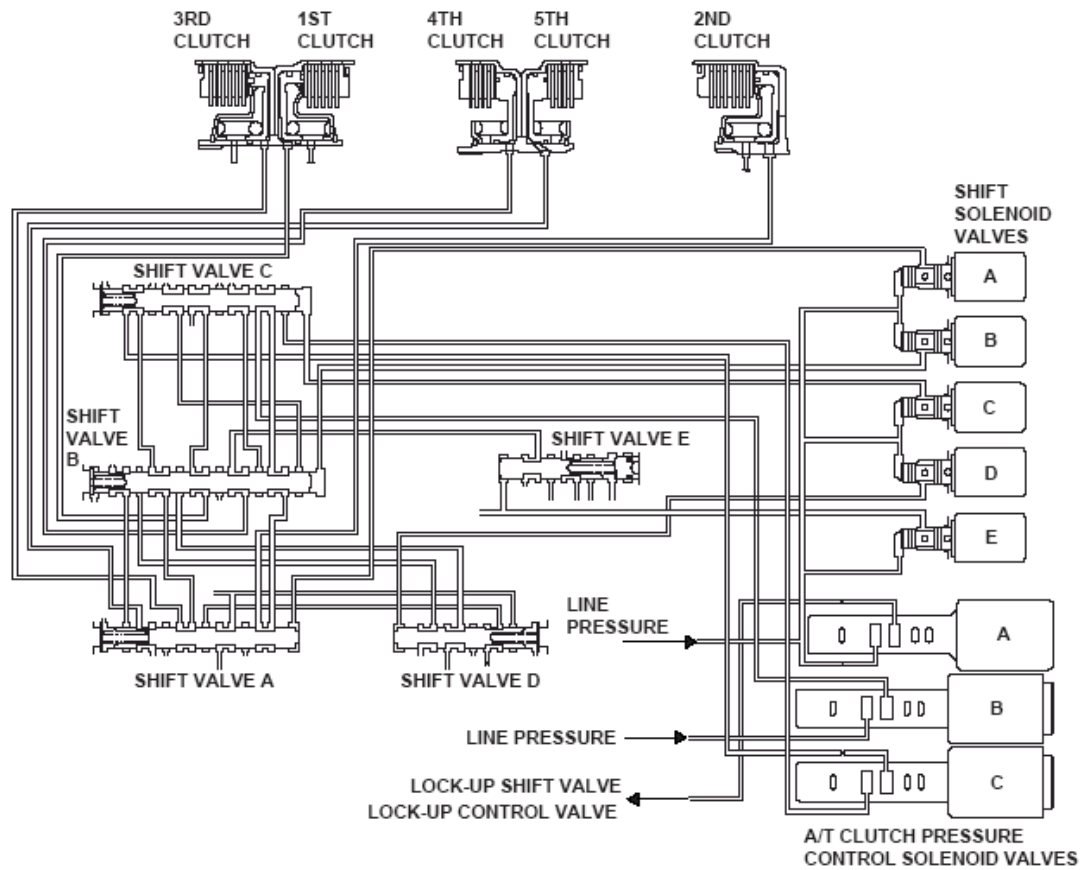
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P1733 (45): ADVANCED DIAGNOSTICS

### DTC P1733: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valve D Stuck ON
- Shift Valve D Stuck
- A/T Clutch Pressure Control Solenoid Valve C Stuck OFF



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**Fig. 209: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 210: Shift Solenoid Valve Output (D Position)**

**General Description**

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft to countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in the A/T clutch pressure control solenoid valve, the shift solenoid valve, or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	3 seconds
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	2 mph (4 km/h) <sup>(1)</sup>	-
Battery voltage	11.0 V	-
Throttle position	6.0 % or more, or fully closed <sup>(2)</sup>	
Shift lever position	D	
Shift status	3rd <sup>(1)</sup>	
	2nd <sup>(2)</sup>	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOM

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	Driving in 3rd gear	Neutral
1-B	Driving in 2nd gear	Driving in 2nd gear

#### Driving Pattern



Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details****Conditions for illuminating the MIL**

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

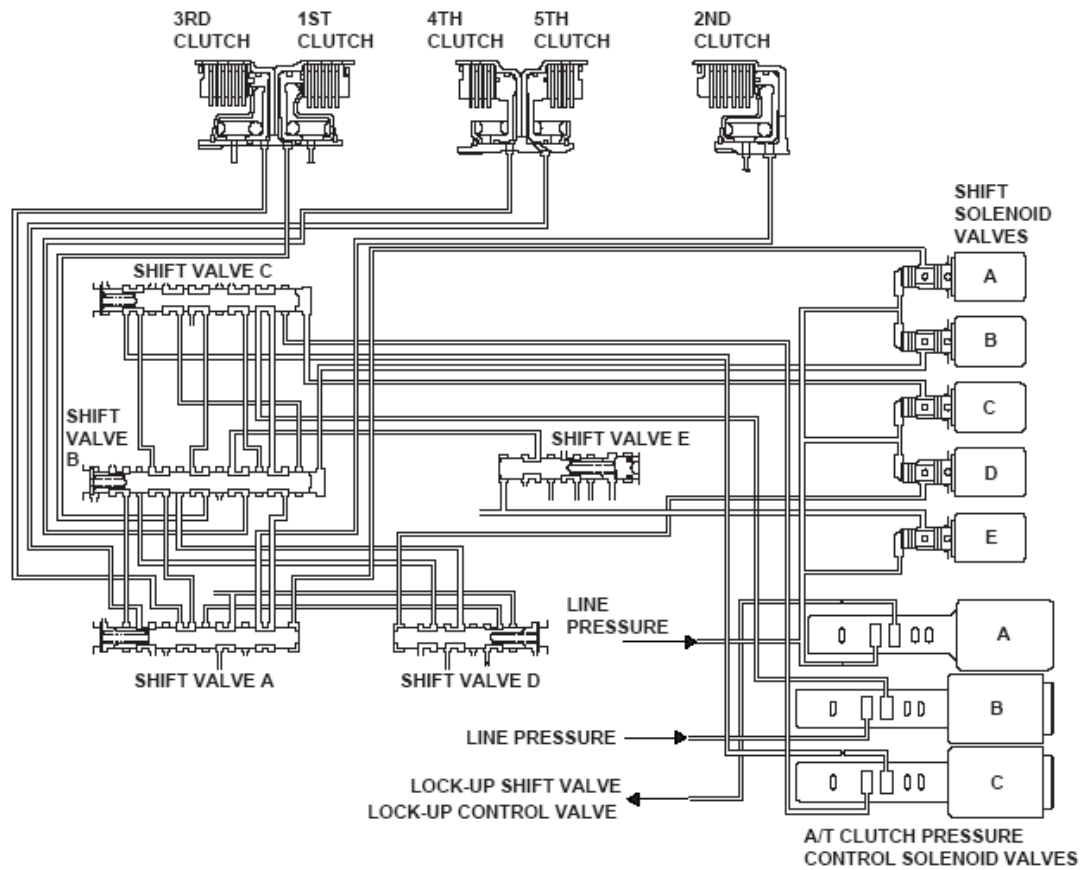
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P1734 (45): ADVANCED DIAGNOSTICS****DTC P1734: PROBLEM IN SHIFT CONTROL SYSTEM:**

- Shift Solenoid Valves B or C Stuck ON
- Shift Valves B or C Stuck



P0747-0770

**Fig. 211: A/T Clutch Pressure Control Solenoid Valves Circuit Diagram**

Shift solenoid valve	A	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
	B	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
	C	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON
	D	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
	E	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1st Clutch	CPC A	LINE	CPC A		CPC A						
2nd Clutch	CPC B		CPC B	LINE	CPC B		CPC A				
3rd Clutch	CPC C		CPC C		CPC C	CPC C	CPC C				
4th Clutch							CPC B	CPC B	CPC B		
5th Clutch									CPC C	CPC C	

CPC: Clutch Pressure Control pressure

**Fig. 212: Shift Solenoid Valve Output (D Position)**

**General Description**

Hydraulic pressure to each clutch is controlled by the shift valve. The shift valve activates according to the ON/OFF status of shift solenoid valves A, B, C, D, and E. Hydraulic pressure supply in D position is shown

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above. The line pressure or the clutch pressure control pressure (CPC A, CPC B, or CPC C) is supplied to each clutch by the shift valve activated. The powertrain control module (PCM) computes the actual ratio of mainshaft to countershaft revolutions. If a difference between the actual ratio and the commanded gear occurs when shifting to each gear position, a malfunction in the shift solenoid valve or the hydraulic system is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds (symptom 1-A)
	3 seconds (symptom 1-B)
DTC Type	Two drive cycles, MIL ON, D indicator blinks
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Vehicle speed	-	2 mph (4 km/h) <sup>(1)</sup>
	2 mph (4 km/h) <sup>(2)</sup>	-
Battery voltage	11.0 V	-
Shift lever position	D	
Shift status	1st	
No active DTCs	P0122, P0123, P0705, P0706, P0716, P0717, P0718, P0721, P0722, P0723, P0747, P0752, P0756, P0757, P0761, P0771, P0776, P0777, P0796, P0797, P0962, P0963, P0966, P0967, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986	
(1) Symptom 1-A		
(2) Symptom 1-B		

#### Malfunction Threshold

#### MALFUNCTION THRESHOLD SYMPTOM

Symptom	Gear position commanded by the PCM	Actual gear position
1-A	1st gear (with the vehicle stationary)	Neutral
1-B	Driving in 1st gear	Neutral

#### Driving Pattern

Start the engine, and accelerate the vehicle until the transmission shifts into 5th gear in D position.

- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

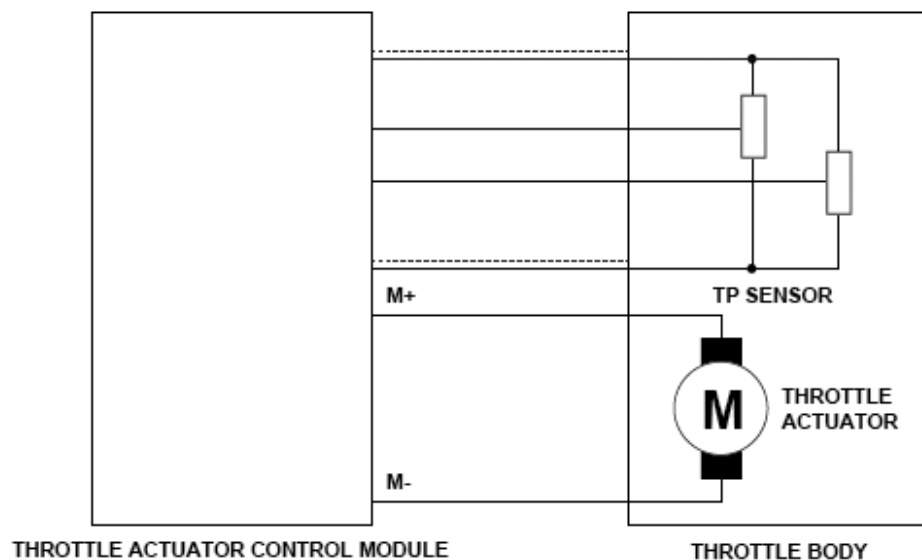
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2101 (40): ADVANCED DIAGNOSTICS

### DTC P2101: THROTTLE ACTUATOR SYSTEM MALFUNCTION



P2101-0570

**Fig. 213: Throttle Actuator System - Communication Diagram**

#### General Description

The electronic throttle control system (ETCS) controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine

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control module (ECM)/powertrain control module (PCM).

The APP sensor is operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor and transmitted to the ECM/PCM to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensor A installed in the throttle body.

The throttle actuator control module compares the throttle valve target opening angle and the actual throttle valve opening angle from TP sensor A, and when the difference exceeds the specification, the throttle actuator control module transmits the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects the malfunction of the throttle actuator system and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.25 seconds or more <sup>(1)</sup> , 0.5 seconds or more <sup>(2)</sup>
DTC Type	One drive cycle, MIL ON
OBD Status	N/A
(1) Throttle valve closed direction	
(2) Throttle valve open direction	

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	6.0 V	-
Ignition switch	ON	
No active DTCs	P2108, P2118, P2135, P2176, U0107	

#### Malfunction Threshold

One of the conditions in this table must be met for at least 0.25 seconds\* (0.5 seconds\*\*).

#### MALFUNCTION THRESHOLD CONDITIONS

Throttle valve target position	Difference between the throttle valve target position and the actual throttle valve position
2 °	4 ° or more

6 °	5.4 ° or more
10 °	5.7 ° or more
15 °	6 ° or more
90 °	6 ° or more

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

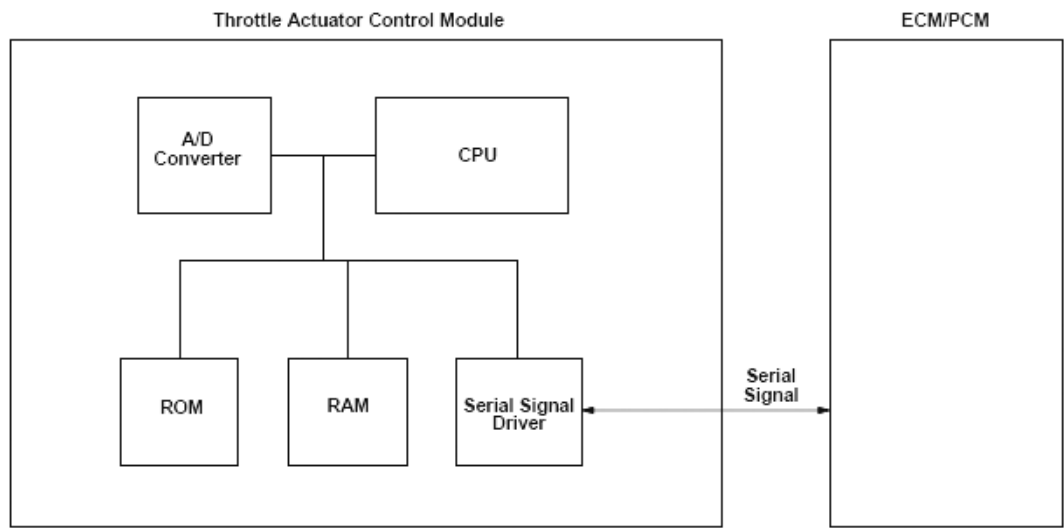
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2108 (40): ADVANCED DIAGNOSTICS**

**DTC P2108: THROTTLE ACTUATOR CONTROL MODULE PROBLEM**



P2108-0470

**Fig. 214: Communication Diagram Between Throttle Actuator Control Module And ECM/PCM**

**General Description**

The electronic throttle control system controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the

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throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM). The APP sensor is operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor and transmitted to the ECM/PCM to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensor A installed in the throttle body.

The CPU in the throttle actuator control module performs self-diagnosis for the ROM, the RAM, and the A/D converter. If internal data is found to be abnormal, a malfunction is detected and the malfunction data is transmitted to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction in the throttle actuator control module and stores a DTC. When the ECM/PCM monitors the serial signal between the ECM/PCM and the throttle actuator control module and finds disagreement on these signals, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	8.0 V	-
Ignition switch	ON	
No active DTCs	P2101, P2118, P2135, P2176, U0107	

#### Malfunction Threshold

One of these conditions must be met for at least 0.2 seconds.

- Data read from the ROM is abnormal.
- Data read from the RAM is abnormal.
- The A/D converter standard voltage is not a specified value.
- The serial signals between the ECM/PCM and the throttle actuator control module don't agree.

#### Diagnosis Details

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#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

#### Conditions for clearing the MIL

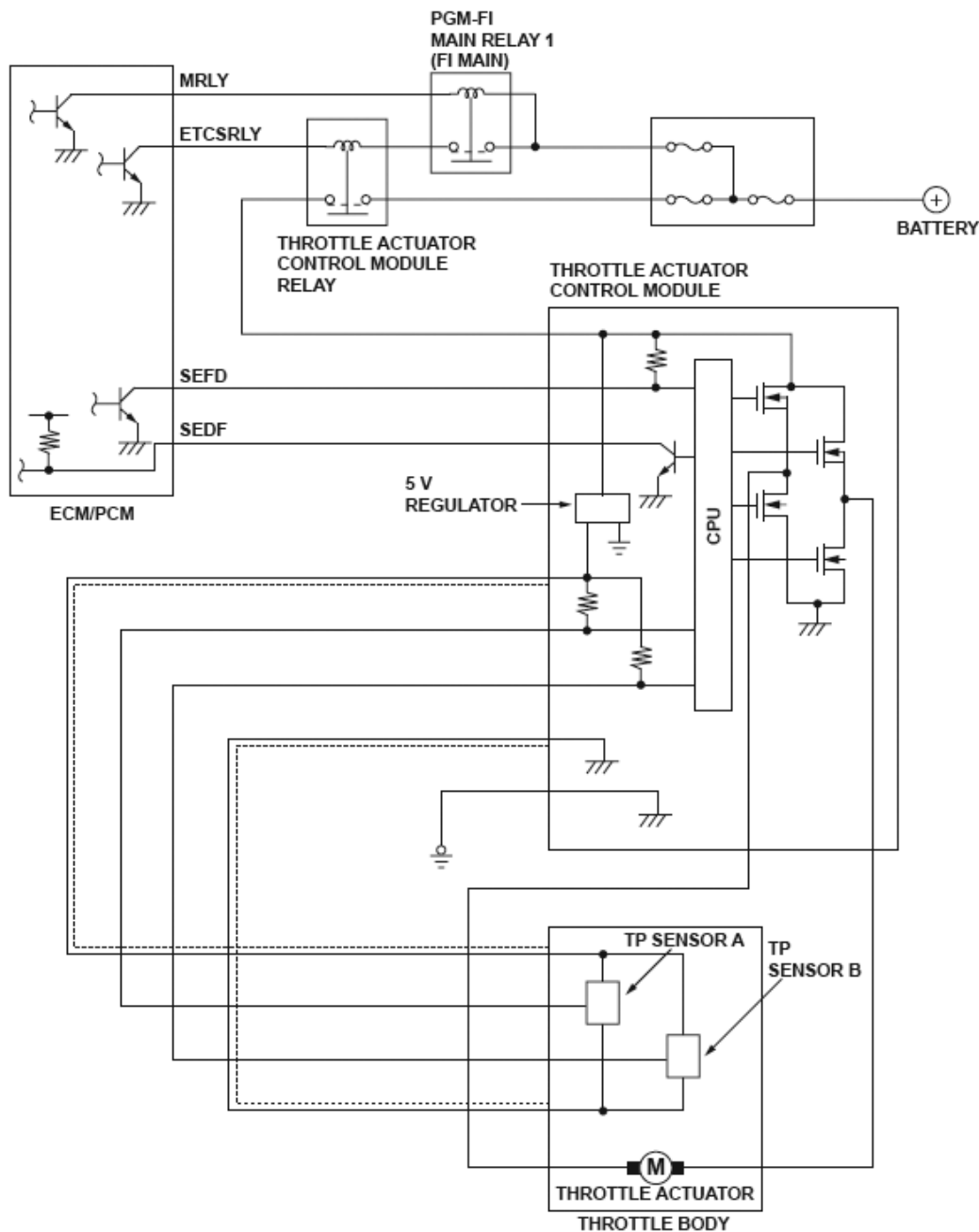
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## **DTC P2118 (40): ADVANCED DIAGNOSTICS**

### **DTC P2118: THROTTLE ACTUATOR CURRENT RANGE/PERFORMANCE PROBLEM**





P0122-0700

**Fig. 215: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

The electronic throttle control system (ETCS) controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM).

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The APP sensor is operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor and transmitted to the ECM/PCM to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensor A installed in the throttle body.

When the output voltage to the throttle actuator exceeds the specification for a set time, the throttle actuator control module detects a malfunction and transmits the malfunction data to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction of the throttle actuator system and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	6.0 V	-
Ignition switch	ON	
No active DTCs	P2101, P2108, P2135, P2176, U0107	

#### Malfunction Threshold

The current flow to the throttle actuator is 16 A or more for at least 0.2 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

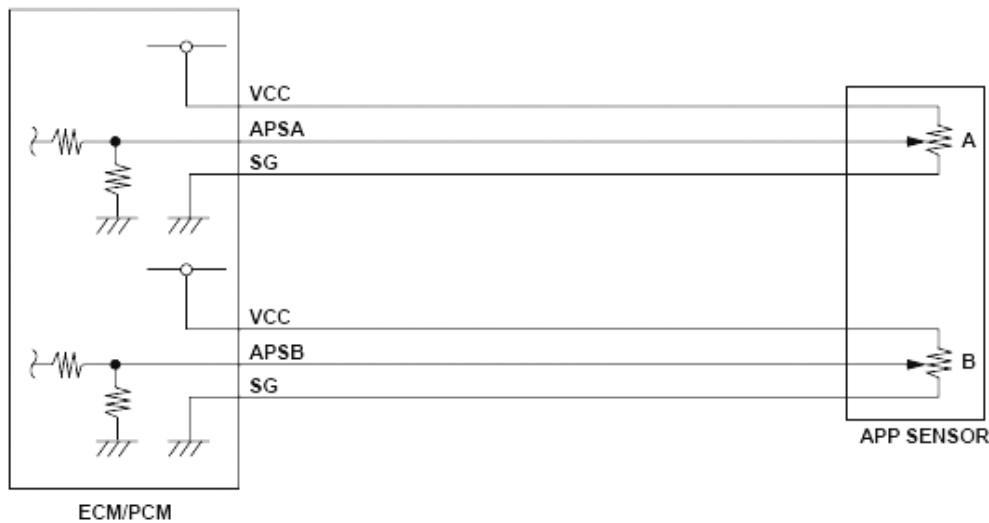
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2122 (37): ADVANCED DIAGNOSTICS

### DTC P2122: ACCELERATOR PEDAL POSITION (APP) SENSOR A (THROTTLE POSITION SENSOR D) CIRCUIT LOW VOLTAGE



P2122-0401

**Fig. 216: Accelerator Pedal Position Sensor - Circuit Diagram**

#### General Description

Accelerator pedal position (APP) sensor A is a part of the electronic throttle control system, and it is used to convert the position of the accelerator pedal into electrical signals. Based on these signals, the engine control module (ECM)/powertrain control module (PCM) controls the throttle actuator so that the throttle position agrees with the accelerator pedal position. If the signal voltage from APP sensor A is a set value or less, the ECM/PCM detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P2123

**Malfunction Threshold**

The APP sensor A output voltage is 0.1 V or less for at least 0.2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

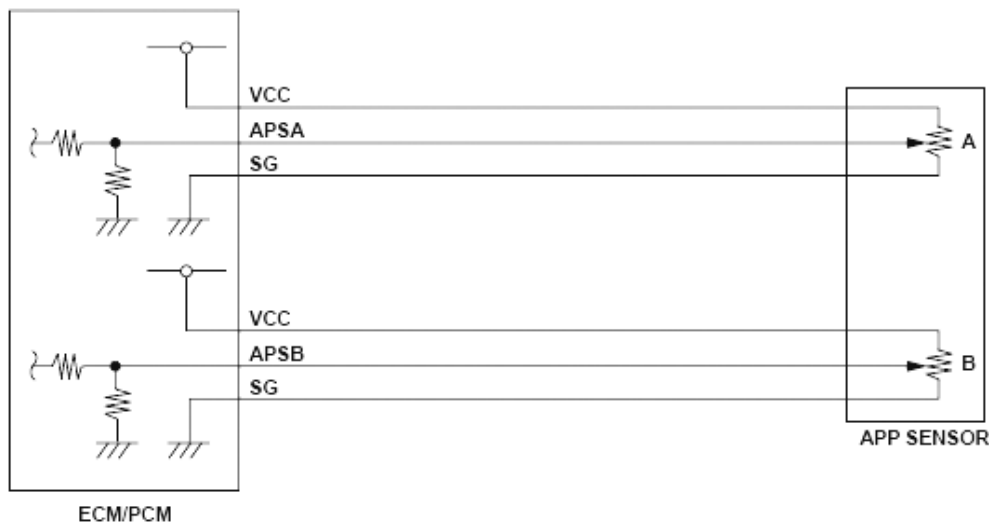
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2123 (37): ADVANCED DIAGNOSTICS**

**DTC P2123: ACCELERATOR PEDAL POSITION (APP) SENSOR A (THROTTLE POSITION SENSOR D) CIRCUIT HIGH VOLTAGE**



P2122-0401

**Fig. 217: Accelerator Pedal Position Sensor - Circuit Diagram**

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### General Description

Accelerator pedal position (APP) sensor A is a part of the electronic throttle control system, and it is used to convert the position of the accelerator pedal into electrical signals. Based on these signals, the engine control module (ECM)/powertrain control module (PCM) controls the throttle actuator so that the throttle position agrees with the accelerator pedal position. If the signal voltage from APP sensor A is a set value or more, the ECM/PCM detects a malfunction and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P2122

#### Malfunction Threshold

The APP sensor A output voltage value is 4.85 V or more for at least 0.2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

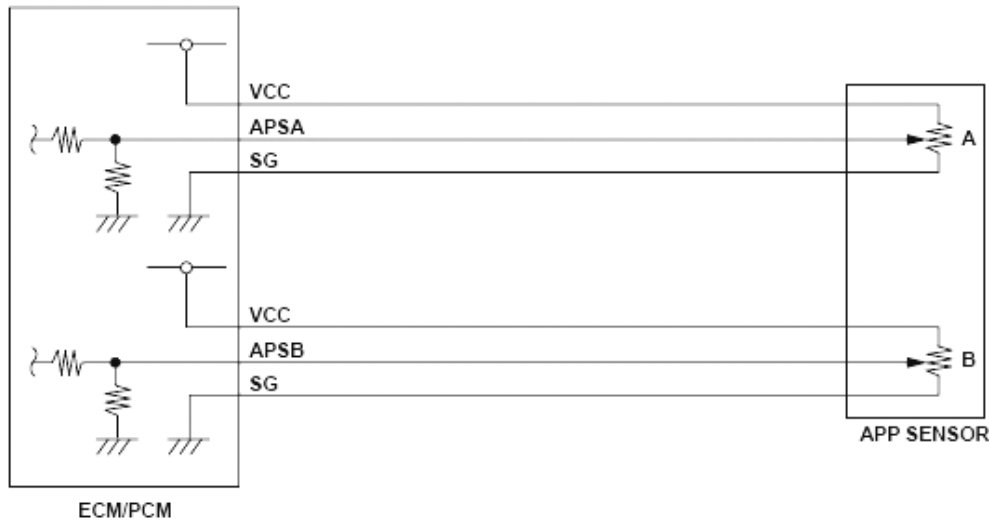
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2127 (37): ADVANCED DIAGNOSTICS

### DTC P2127: ACCELERATOR PEDAL POSITION (APP) SENSOR B (THROTTLE POSITION

**SENSOR E) CIRCUIT LOW VOLTAGE**



P2122-0401

**Fig. 218: Accelerator Pedal Position Sensor - Circuit Diagram**

**General Description**

Accelerator pedal position (APP) sensor B is a part of the electronic throttle control system, and it is used to convert the position of the accelerator pedal into electrical signals. Based on these signals, the engine control module (ECM)/powertrain control module (PCM) controls the throttle actuator so that the throttle position agrees with the accelerator pedal position. If the signal voltage from APP sensor B is a set value or less, the ECM/PCM detects a malfunction and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	0.2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P2128

**Malfunction Threshold**

The APP sensor B output voltage value is 0.1 V or less for at least 0.2 seconds.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

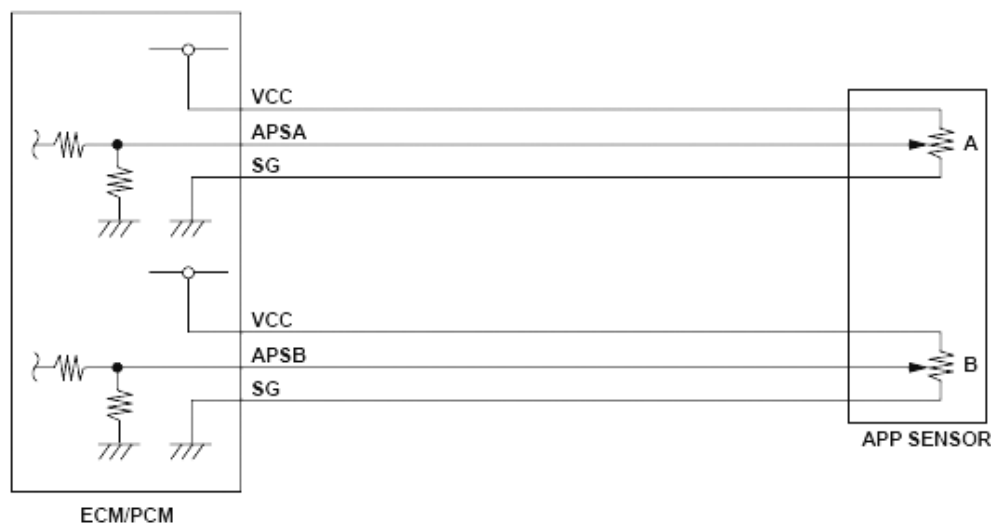
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2128 (37): ADVANCED DIAGNOSTICS

### DTC P2128: ACCELERATOR PEDAL POSITION (APP) SENSOR B (THROTTLE POSITION SENSOR E) CIRCUIT HIGH VOLTAGE



P2122-0401

**Fig. 219: Accelerator Pedal Position Sensor - Circuit Diagram**

### General Description

Accelerator pedal position (APP) sensor B is a part of the electronic throttle control system, and it is used to convert the position of the accelerator pedal into electrical signals. Based on these signals, the engine control module (ECM)/powertrain control module (PCM) controls the throttle actuator so that the throttle position agrees with the accelerator pedal position. If the signal voltage from APP sensor B is a set value or more, the ECM/PCM detects a malfunction and stores a DTC.

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**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

### ENABLE CONDITIONS

<b>Condition</b>	
State of the engine	Running
No active DTCs	P2127

**Malfunction Threshold**

The APP sensor B output voltage value is 4.0 V or more for at least 0.2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

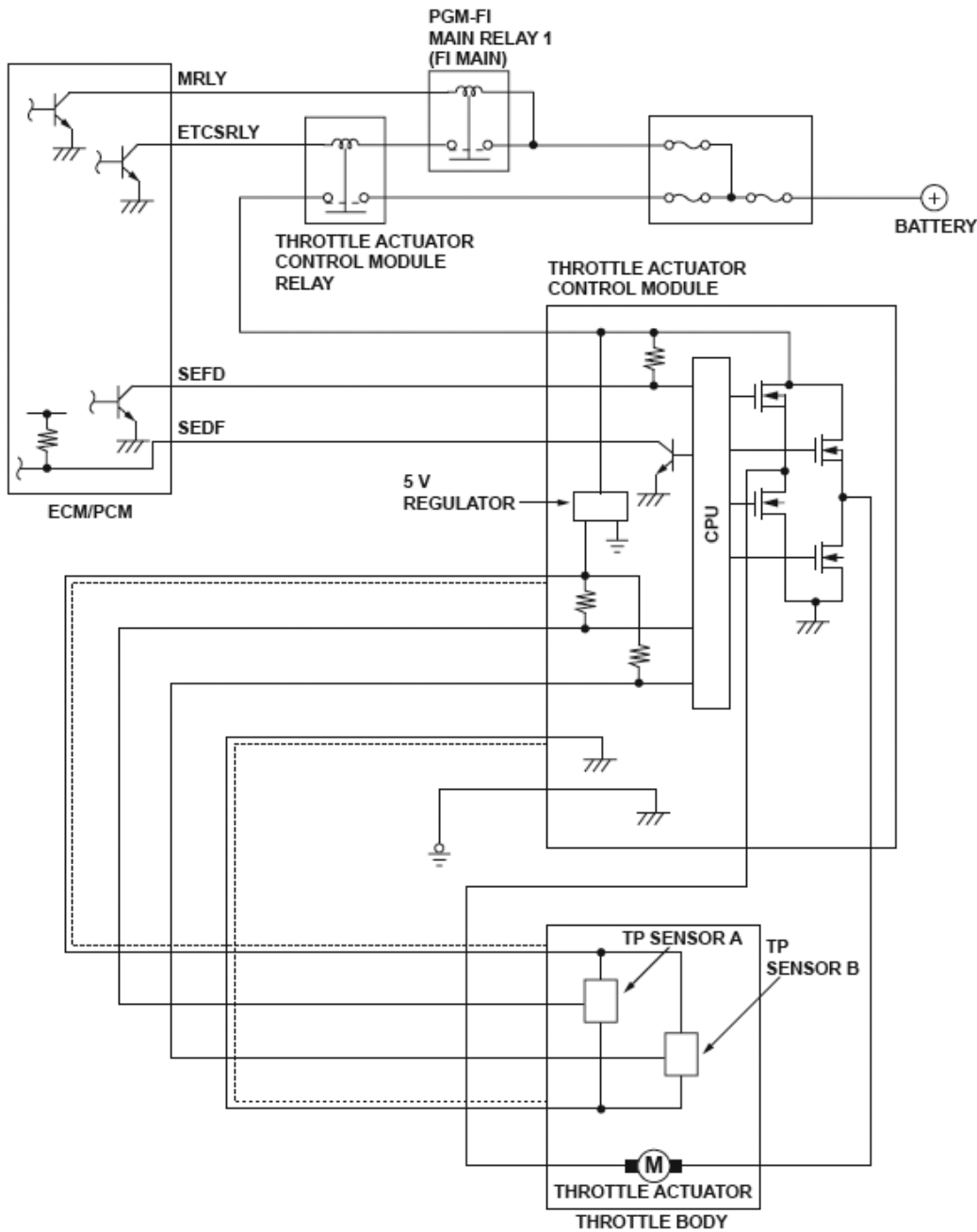
## DTC P2135 (7): ADVANCED DIAGNOSTICS

**DTC P2135: THROTTLE POSITION (TP) SENSOR A/B INCORRECT VOLTAGE CORRELATION**



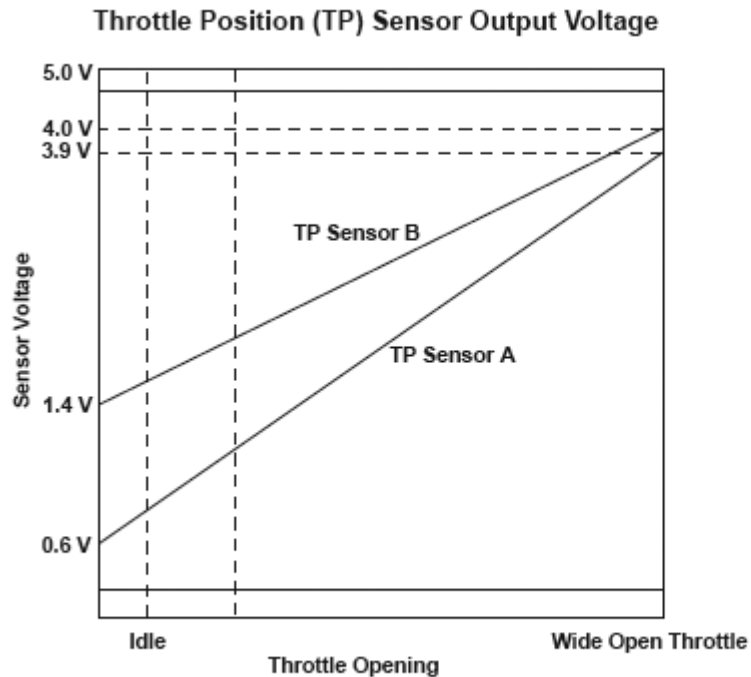
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P0122-0700

**Fig. 220: Throttle Position (TP) Sensor Circuit Diagram**



P2135-0371

**Fig. 221: Throttle Position (TP) Sensor Output Voltage - Graph**

### General Description

The electronic throttle control system (ETCS) controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM).

The APP sensor is operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor and transmitted to the ECM/PCM to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensor A installed in the throttle body.

The throttle actuator control module compares the voltages and the throttle valve positions of TP sensor A and TP sensor B. If the difference of the voltages or the throttle valve positions is a certain value or less for a set time, the throttle actuator control module detects a malfunction and the malfunction data is transmitted to the ECM/PCM. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction in the relationship between TP sensor A and TP sensor B, and stores a DTC.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

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#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.2 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
TP sensor B voltage	-	2.3 V
Ignition switch	ON	
No active DTCs	P0122, P0123, P0222, P0223, P2101, P2108, P2118, P2176, U0107	
Other	After the throttle valve fully closed position registration is completed	

#### Malfunction Threshold

One of these conditions must be met for at least 0.2 second.

- The difference between the TP sensor A voltage and the TP sensor B voltage is 200 mV (5 °) or less.
- The difference between the throttle valve positions that TP sensor A and TP sensor B determined exceeds the value shown in this table.

#### MALFUNCTION THRESHOLD VALUE

Throttle valve position determined by TP sensor A	Difference between TP sensor A and TP sensor B
0 °	1.8 ° or more
83.3 °	14.7 ° or more

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

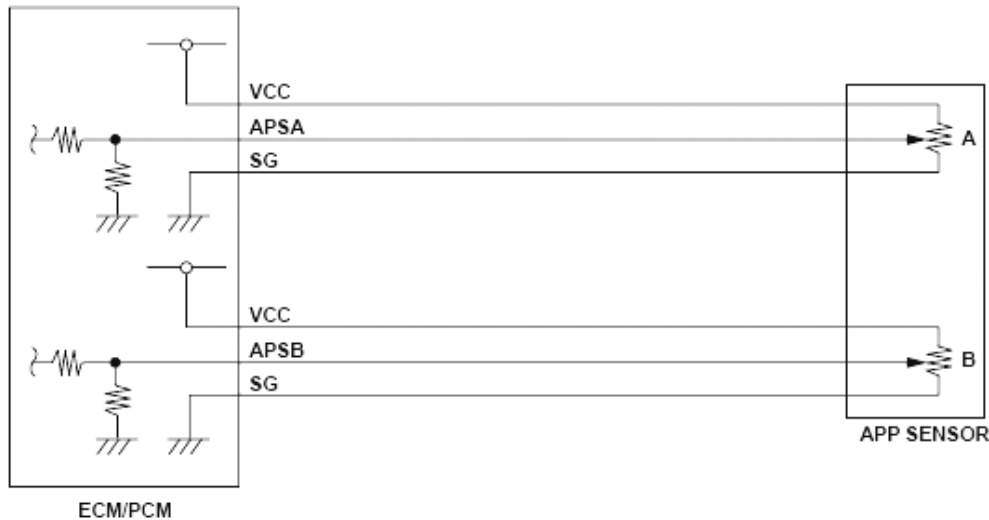
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

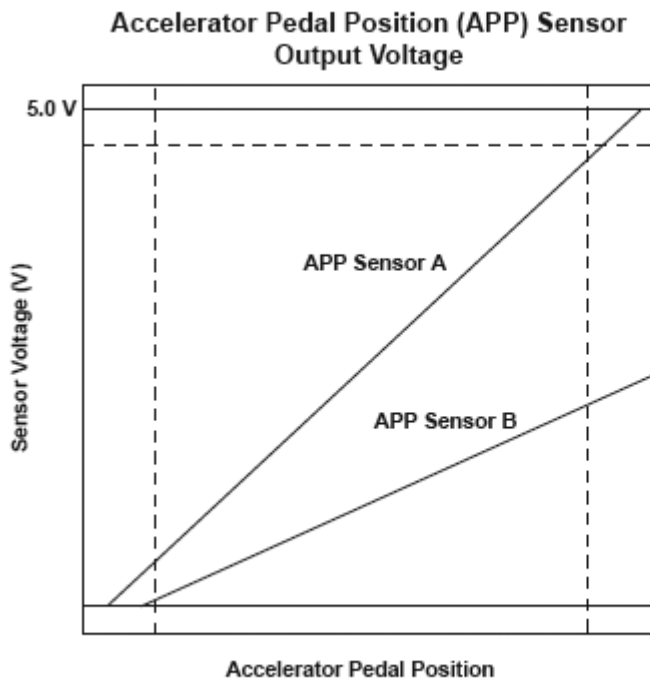
## DTC P2138 (37): ADVANCED DIAGNOSTICS

### DTC P2138: ACCELERATOR PEDAL POSITION (APP) SENSOR A/B (THROTTLE POSITION SENSOR D/E) INCORRECT VOLTAGE CORRELATION



P2122-0401

**Fig. 222: Accelerator Pedal Position Sensor - Circuit Diagram**



P2138-0371

**Fig. 223: Accelerator Pedal Position (APP) Sensor Output Voltage - Graph**

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#### General Description

Accelerator pedal position (APP) sensor A and accelerator pedal position (APP) sensor B are potentiometers, and they are installed in the engine compartment.

The APP sensors A and B are operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in APP sensors A and B and transmitted to the engine control module (ECM)/powertrain control module (PCM) to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

APP sensor A is for the primary control, and APP sensor B is a back-up of APP sensor A in case it malfunctions. Both sensors compare their output voltage to each other for malfunction detection.

When the voltage difference of APP sensor B is out of a fixed range for a set period of time, the ECM/PCM detects a malfunction, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.3 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P2122, P2123, P2127, P2128

#### Malfunction Threshold

One of these conditions must be met for at least 0.3 seconds.

- If the APP sensor B voltage exceeds the range from 0 V or less to 0.361 V or more when the APP sensor A voltage is 0.361 V.
- If the APP sensor B voltage exceeds the range from 2.319 V or less to 2.681 V or more when the APP sensor A voltage is 4.995 V.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the

ECM/PCM memory.

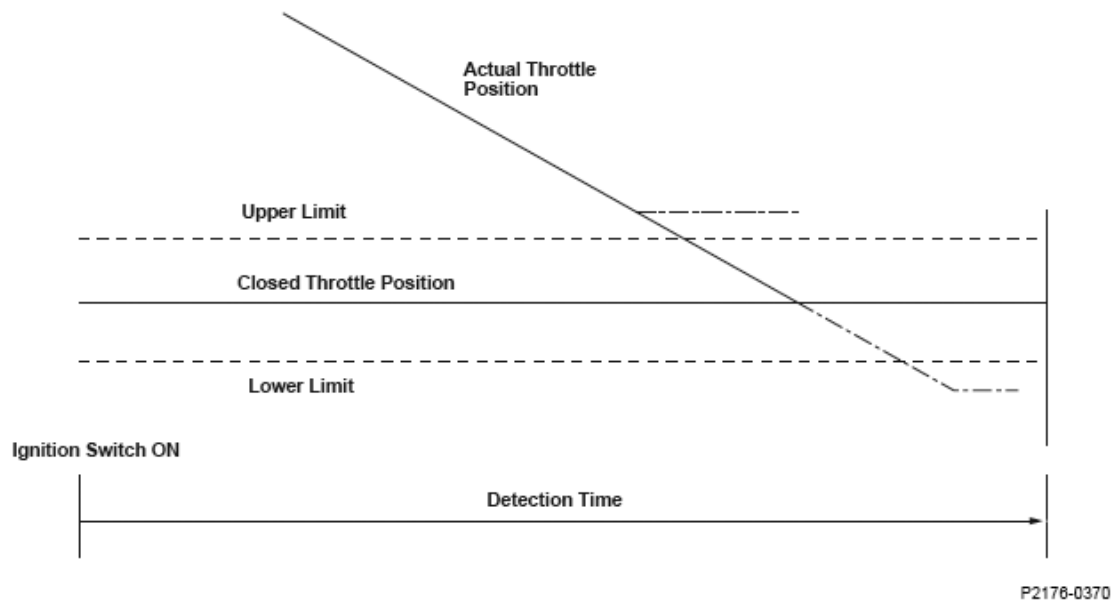
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2176 (40): ADVANCED DIAGNOSTICS

### DTC P2176: THROTTLE ACTUATOR CONTROL SYSTEM IDLE POSITION NOT LEARNED



**Fig. 224: Identifying Throttle Actuator Positions**

#### General Description

The electronic throttle control system controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, the throttle actuator control module relay, the accelerator pedal position (APP) sensor, and the engine control module (ECM)/powertrain control module (PCM). The APP sensor is operated via the throttle cable to determine the accelerator opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor and transmitted to the ECM/PCM to compute the target position. The target position signal is then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensor A installed in the throttle body.

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The throttle actuator control module transmits a signal to the throttle actuator and moves the throttle valve to the fully closed position to register the throttle valve fully closed position after the ignition switch is turned ON.

The throttle actuator control module detects the malfunction of the throttle actuator control system, and it transmits a malfunction signal to the ECM/PCM when the registration of the throttle valve fully closed position is not completed within a predetermined time or the registered value is out of predetermined range after the ignition switch is turned ON. When the ECM/PCM receives the malfunction data from the throttle actuator control module, the ECM/PCM detects a malfunction in the throttle actuator control system and stores a DTC.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	0.7 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	6.0 V	-
Ignition switch	ON	
No active DTCs	P0122, P0123, P0222, P0223, P2101, P2108, P2118, P2135, U0107	
Other	Engine is stopped and ignition switch is not in the ON position	

#### Malfunction Threshold

Either condition must be met for at least 0.7 seconds.

- The registration of the throttle valve fully closed position is not completed within a predetermined time after the ignition switch is turned ON.
- The registered value of the throttle valve fully closed position is  $0.74 \text{ V}^{*1}$ ,  $1.61 \text{ V}^{*2}$ , or more, or  $0.49 \text{ V}^{*1}$ ,  $1.37 \text{ V}^{*2}$ , or less.

\*1 : TP sensor A

\*2 : TP sensor B

#### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the

ECM/PCM memory.

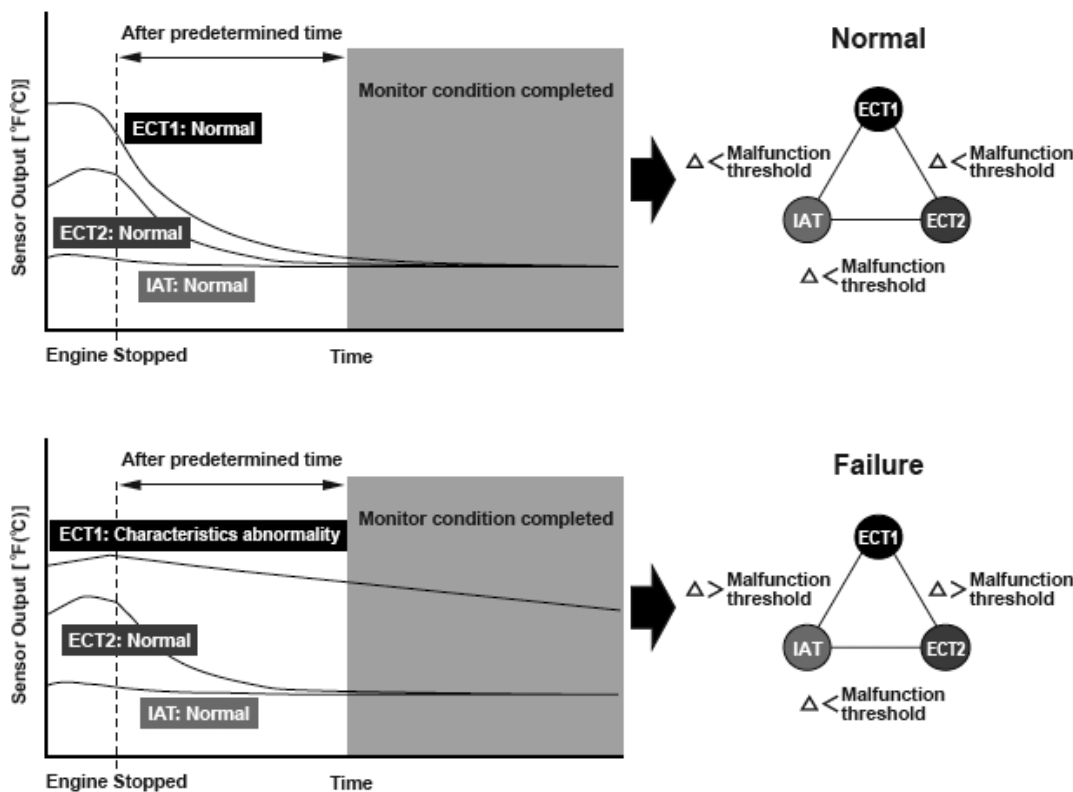
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2183 (192): ADVANCED DIAGNOSTICS**

**DTC P2183: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 2 RANGE/PERFORMANCE PROBLEM**



PD111-0570

**Fig. 225: Intake Air Temperature (IAT) Sensor Circuit Range/Performance - Graph**

**General Description**

Two engine coolant temperature sensors and one intake air temperature sensor are used by the engine control module (ECM)/powertrain control module (PCM).

When the engine is stopped and enough time has passed, the temperature of the engine will equal the ambient



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temperature. When an inappropriate temperature is detected after comparing the temperature readings of each sensor, a malfunction in the corresponding sensor is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine off time	6 hours	-
No active DTCs	P0111, P0112, P0113, P0116, P0117, P0118, P0125, P1116, P2184, P2185, P2610	

#### Malfunction Threshold

A malfunction is detected if these three conditions are present after the engine and the ignition switch have been off for at least 6 hours before restarting the engine.

- When the temperature difference between the IAT and ECT1 is 61 °F (34 °C) or more.
- When the temperature difference between the IAT and ECT2 is 28 °F (16 °C) or more.
- When the temperature difference between the ECT2 and ECT1 is 60 °F (33 °C) or more.

#### Driving Pattern

1. Turn the ignition off, and wait at least 6 hours.
2. Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

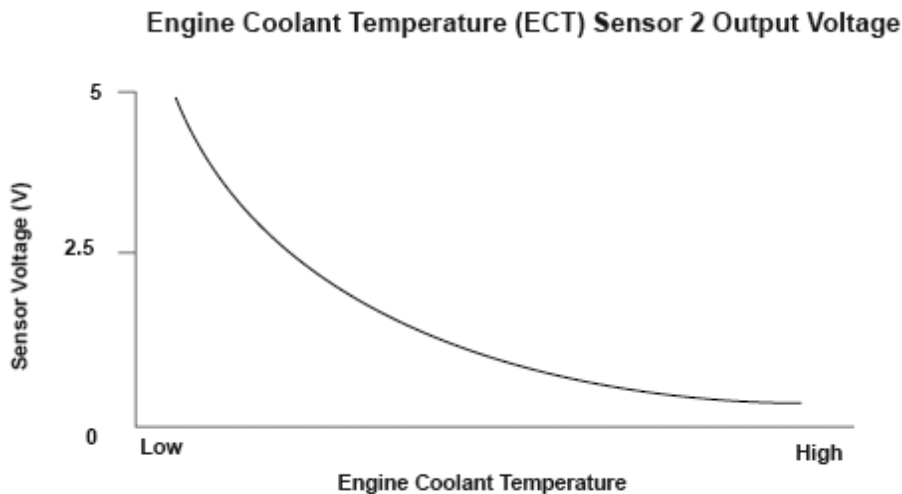
## DTC P2184 (192): ADVANCED DIAGNOSTICS

### DTC P2184: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 2 CIRCUIT LOW VOLTAGE



P2184-0501

**Fig. 226: Engine Coolant Temperature (ECT) Sensor 2 Circuit Diagram**



P2184-0570

**Fig. 227: Engine Coolant Temperature Sensor Output Voltage - Graph**

#### General Description

The engine coolant temperature (ECT) sensor 2 is a thermistor attached to the radiator. The ECM/PCM applies voltage (about 5 V) to the ECT2 signal circuit through a pull up resistor. As the engine coolant temperature cools, ECT sensor 2 resistance increases, and the ECM/PCM detects a high signal voltage. As the engine coolant warms, the sensor resistance decreases, and the ECM/PCM detects a low ECT2 signal voltage.

If the ECT sensor 2 output voltage is less than a set value when the engine coolant temperature is high, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

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### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

### Enable Conditions

### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P2185

### Malfunction Threshold

The ECT sensor 2 output voltage is 0.08 V or less for at least 2 seconds.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

#### Conditions for clearing the MIL

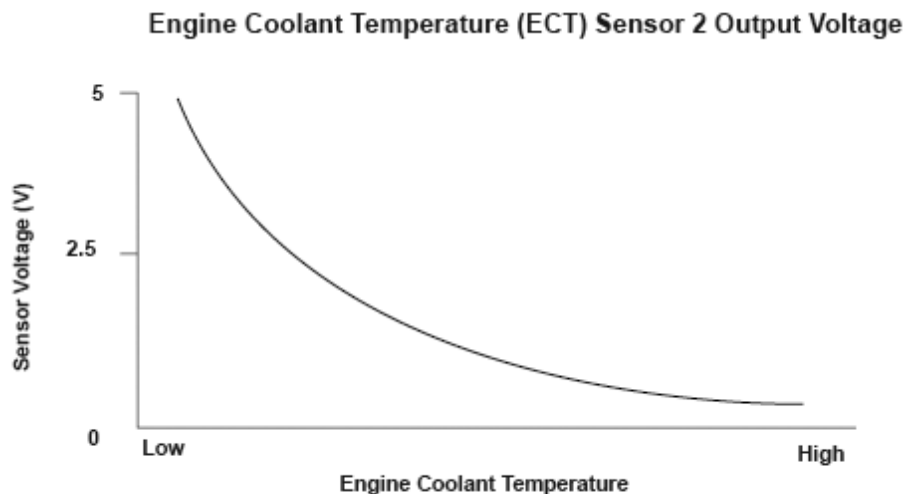
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2185 (192): ADVANCED DIAGNOSTICS

### DTC P2185: ENGINE COOLANT TEMPERATURE (ECT) SENSOR 2 CIRCUIT HIGH VOLTAGE



**Fig. 228: Engine Coolant Temperature (ECT) Sensor 2 Circuit Diagram**

P2184-0570

**Fig. 229: Engine Coolant Temperature Sensor Output Voltage - Graph****General Description**

The engine coolant temperature (ECT) sensor 2 is a thermistor attached to the radiator. The ECM/PCM applies voltage (about 5 V) to the ECT2 signal circuit through a pull up resistor. As the engine coolant temperature cools, ECT sensor 2 resistance increases, and the ECM/PCM detects a high signal voltage. As the engine coolant warms, the sensor resistance decreases, and the ECM/PCM detects a low ECT2 signal voltage.

If the ECT sensor 2 output voltage is more than a set value when the engine coolant temperature is low, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status****MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions****ENABLE CONDITIONS**

<b>Condition</b>	
Ignition switch	ON
No active DTCs	P2184

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#### Malfunction Threshold

The ECT sensor 2 output voltage is 4.92 V or more for at least 2 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

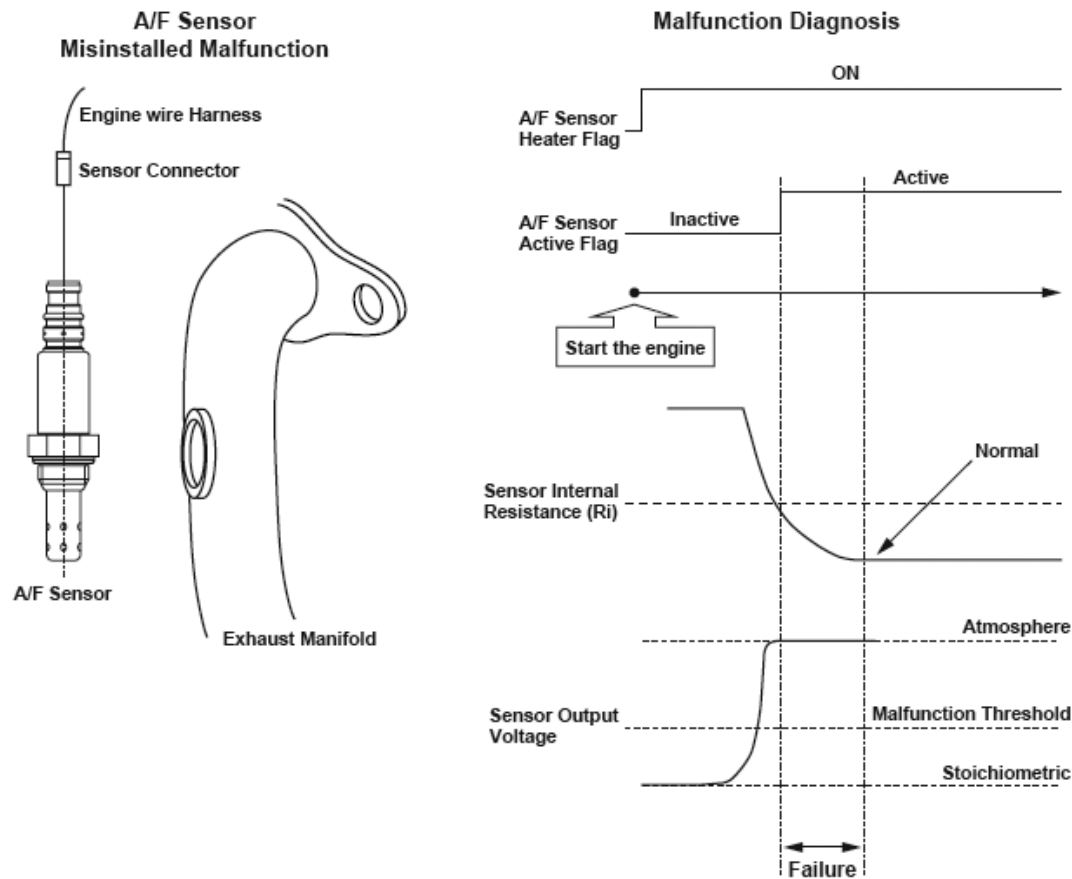
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## **DTC P2195 (48): ADVANCED DIAGNOSTICS**

### **DTC P2195: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) SIGNAL STUCK LEAN**



P2195-0470

**Fig. 230: Identifying Air/Fuel Ratio Sensor With Malfunction Diagnosis**

**General Description**

When the air/fuel ratio (A/F) sensor (sensor 1) is properly connected to the engine wire harness, but not installed in the exhaust pipe, the A/F feedback is not done properly even if the A/F sensor is active after starting the engine. Thus, the exhaust emissions increase.

When the A/F sensor output stays out of the normal range after the A/F sensor becomes active, the engine control module (ECM)/powertrain control module (PCM) detects that the A/F sensor is not properly installed and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	7 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Fuel feedback	Other than during fuel cut-off operation
No active DTCs	P0134, P0135, P0171, P0300, P0301, P0302, P0303, P0304, P1157, P1172, P2238, P2252

#### Malfunction Threshold

A/F sensor output voltage is 3.67 V or more for at least 7 seconds.

#### Driving Pattern

Start the engine, then let it idle for at least 2 minutes.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

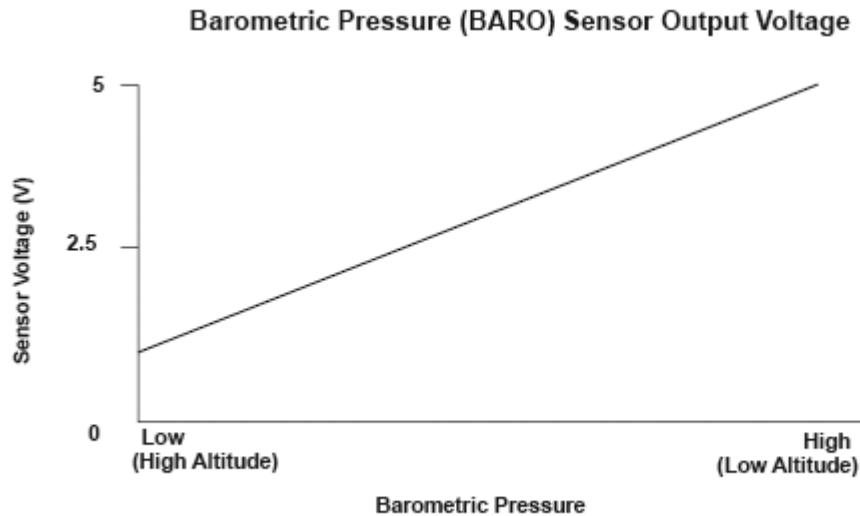
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

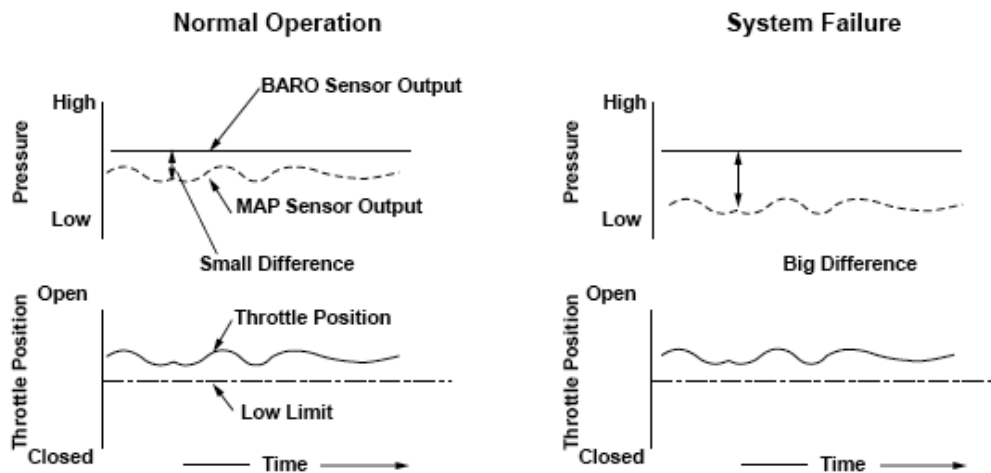
## DTC P2227 (13): ADVANCED DIAGNOSTICS

### DTC P2227: BAROMETRIC PRESSURE (BARO) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM



P1108-9671

**Fig. 231: Barometric Pressure (BARO) Sensor Output Voltage - Graph**



P1108-9771

**Fig. 232: Barometric Pressure (BARO) Sensor Normal Operation And System Failure - Graph**

### General Description

The barometric pressure (BARO) sensor is built into the engine control module (ECM)/powertrain control module (PCM) and monitors atmospheric pressure. When the throttle valve is wide open, the manifold absolute pressure (MAP) sensor output is nearly equal to the BARO sensor output. Making use of this characteristic, a malfunction can be detected in the BARO sensor output.

If the throttle position is beyond a value stored in the ECM/PCM that is used to detect "wide-open throttle," and if the difference between the MAP sensor output and the BARO sensor output is equal to or greater than a set value, a malfunction in the BARO sensor output is detected and a DTC is stored.

**Monitor Execution. Sequence. Duration. DTC Type. OBD Status**



## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	2.5 seconds or more
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

#### ENABLE CONDITIONS

Condition		Minimum	Maximum
Throttle position	1,000 rpm	13.0 °	-
	3,000 rpm	28.0 °	
No active DTCs		P0107, P0108, P0117, P0118, P0122, P0123, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0341, P0506, P0507, P1128, P1129, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2228, P2229, P2646, P2647, P2648, P2649, U0107	

#### Malfunction Threshold

The difference between the BARO sensor output and the MAP sensor output is 28 kPa (8.1 in.Hg, 204 mmHg) or more for at least 2.5 seconds.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Drive the vehicle with the throttle position as specified under Enable Conditions for at least 2.5 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

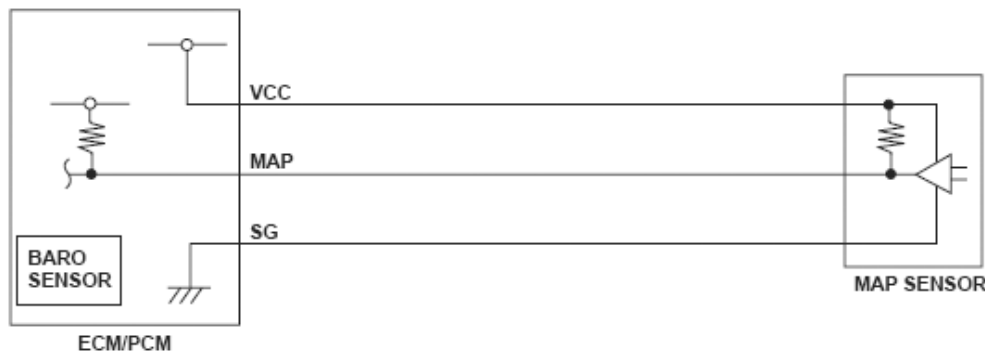
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

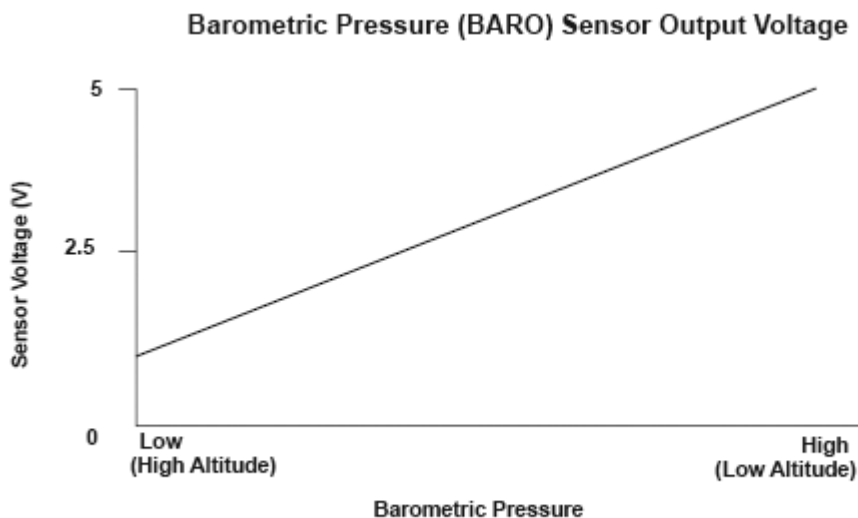
## DTC P2228 (13): ADVANCED DIAGNOSTICS

### DTC P2228: BAROMETRIC PRESSURE (BARO) SENSOR CIRCUIT LOW VOLTAGE



P1107-9602

**Fig. 233: Barometric Pressure (BARO) Sensor Circuit Diagram**



P1106-9671

**Fig. 234: Barometric Pressure (BARO) Sensor Output Voltage - Graph**

#### General Description

The barometric pressure (BARO) sensor is built into the engine control module (ECM)/powertrain control module (PCM), and it monitors atmospheric pressure. The ECM/PCM estimates appropriate intake airflow from the manifold absolute pressure (MAP) sensor output voltage and BARO sensor output voltage. If the BARO sensor output voltage is a specified value or less, the ECM/PCM detects a malfunction and a DTC is stored.

## 2007 Honda Element EX

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**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P1109, P2229

**Malfunction Threshold**

The BARO sensor output voltage is 1.31 V or less for at least 2 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

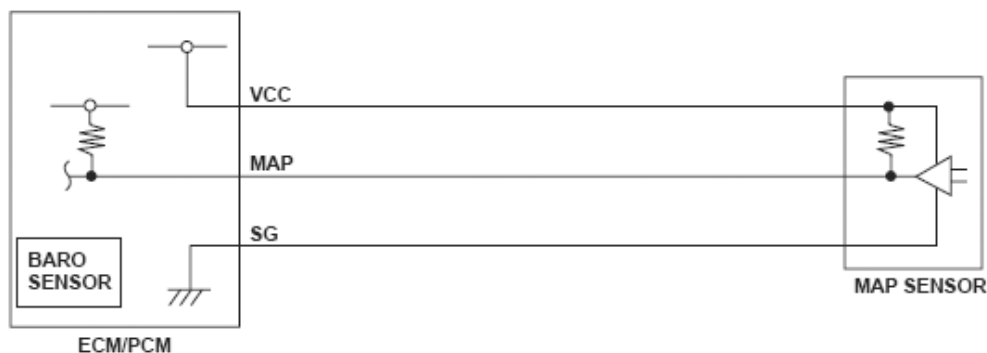
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

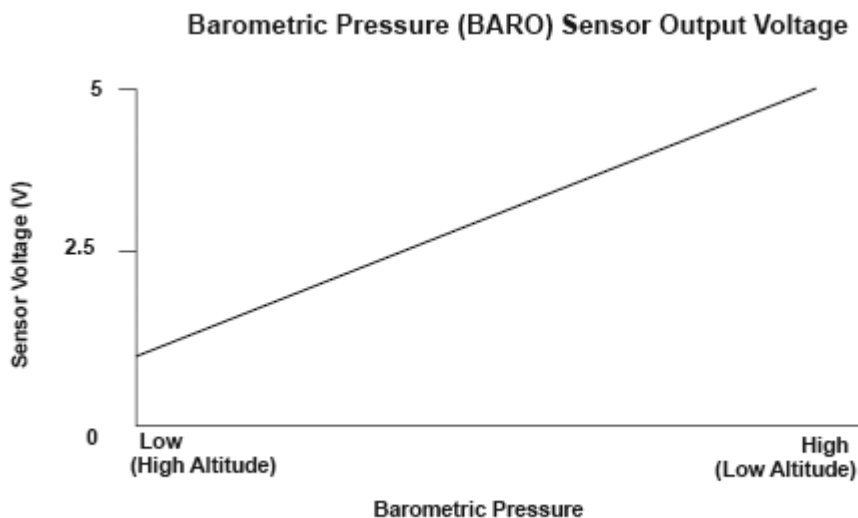
## DTC P2229 (13): ADVANCED DIAGNOSTICS

**DTC P2229: BAROMETRIC PRESSURE (BARO) SENSOR CIRCUIT HIGH VOLTAGE**



P1107-9802

**Fig. 235: Barometric Pressure (BARO) Sensor Circuit Diagram**



P1106-9671

**Fig. 236: Barometric Pressure (BARO) Sensor Output Voltage - Graph**

**General Description**

The barometric pressure (BARO) sensor is built into the engine control module (ECM)/powertrain control module (PCM), and it monitors atmospheric pressure. The ECM/PCM estimates appropriate intake airflow from the manifold absolute pressure (MAP) sensor output voltage and BARO sensor output voltage. If the BARO sensor output voltage is a specified value or more, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	2 seconds or more
DTC Type	One drive cycle, MIL ON

## 2007 Honda Element EX

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OBD Status

N/A

### Enable Conditions

#### ENABLE CONDITIONS

Condition	
Ignition switch	ON
No active DTCs	P1109, P2228

### Malfunction Threshold

The BARO sensor output voltage value is 4.49 V or more for at least 2 seconds.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

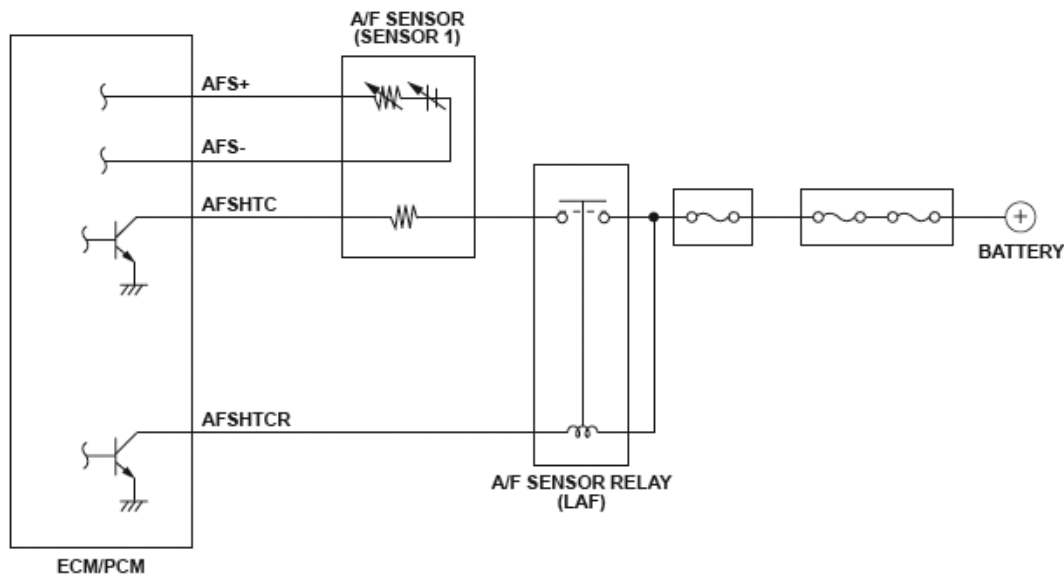
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2238 (48): ADVANCED DIAGNOSTICS

**DTC P2238: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) AFS+ CIRCUIT LOW VOLTAGE**



P0135-0700

**Fig. 237: Air/Fuel Ratio (A/F) Sensor 1 Circuit Diagram**

**General Description**

The air/fuel ratio (A/F) sensor (sensor 1) is installed in the exhaust system and detects oxygen content in the exhaust gas. The A/F sensor transmits a signal to the engine control module (ECM)/powertrain control module (PCM). A heater for the sensor element is embedded in the A/F sensor (sensor 1). It heats the sensor to stabilize and speed up the detection of oxygen content. The increase in current through the heater levels off as the voltage applied to the electrode reaches a certain range because the amount of oxygen that goes through the diffusion layer is limited. The current is proportional to oxygen content in the exhaust gas, so the air/fuel ratio is detected by the measurement of the current. The ECM/PCM compares a set target air/fuel ratio with the detected air/fuel ratio and controls the fuel injection duration.

If the A/F sensor (sensor 1) voltage is low, the air/fuel ratio is lean, and the ECM/PCM uses A/F feedback control to issue a Rich command. If the A/F sensor (sensor 1) voltage is high, the air/fuel ratio is rich, and the ECM/PCM uses A/F feedback control to issue a Lean command.

If the element is not activated or the ECM/PCM terminal voltage is a set value or less for a set time when power is applied to the A/F sensor (sensor 1) heater, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

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### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	68 °F (20 °C)	-
Battery voltage	10.5 V	-
State of the engine	Running	
No active DTCs	P0117, P0118, P0134, P0135, P1157, P2195, P2252	

### Malfunction Threshold

The AFS+ terminal voltage is 0.4 V or less for at least 5 seconds.

### Driving Pattern

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 2 minutes.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

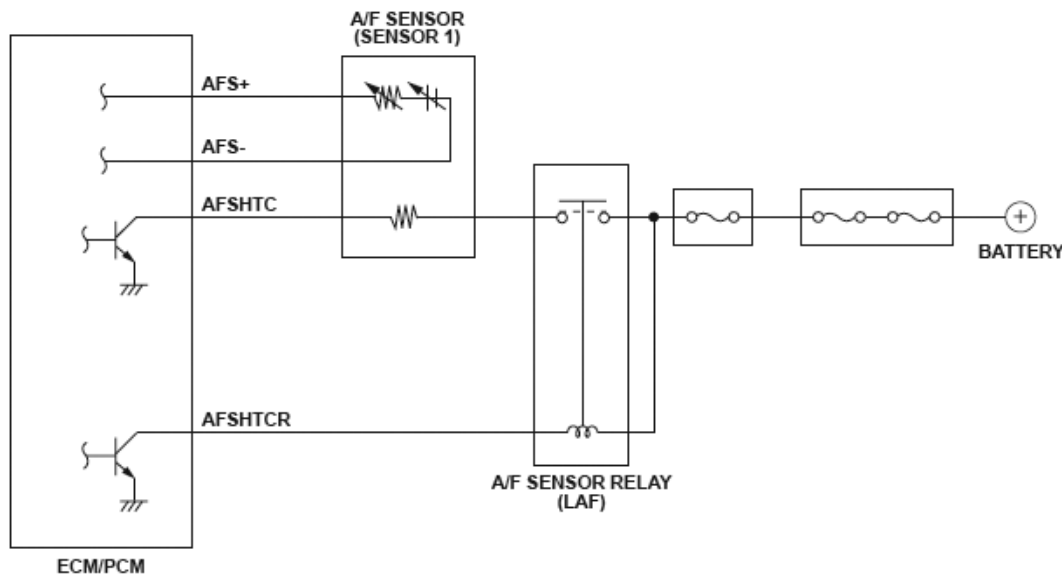
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2252 (48): ADVANCED DIAGNOSTICS

**DTC P2252: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) AFS-CIRCUIT LOW VOLTAGE**



P0135-0700

**Fig. 238: Air/Fuel Ratio (A/F) Sensor 1 Circuit Diagram**

**General Description**

The air/fuel ratio (A/F) sensor (sensor 1) is installed in the exhaust system and detects oxygen content in the exhaust gas. The A/F sensor transmits a signal to the engine control module (ECM)/powertrain control module (PCM). A heater for the sensor element is embedded in the A/F sensor (sensor 1). It heats the sensor to stabilize and speed up the detection of oxygen content. The increase in current through the heater levels off as the voltage applied to the electrode reaches a certain range because the amount of oxygen that goes through the diffusion layer is limited. The current is proportional to oxygen content in the exhaust gas, so the air/fuel ratio is detected by the measurement of the current. The ECM/PCM compares a set target air/fuel ratio with the detected air/fuel ratio and controls the fuel injection duration.

If the A/F sensor (sensor 1) voltage is low, the air/fuel ratio is lean, and the ECM/PCM uses A/F feedback control to issue a Rich command. If the A/F sensor (sensor 1) voltage is high, the air/fuel ratio is rich, and the ECM/PCM uses A/F feedback control to issue a Lean command.

If the element is not activated or the ECM/PCM terminal voltage is a set value or less for a set time when power is applied to the A/F sensor (sensor 1) heater, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)



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### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	68 °F (20 °C)	-
Battery voltage	10.5 V	-
State of the engine	Running	
No active DTCs	P0117, P0118, P0134, P0135, P1157, P2195, P2238	

### Malfunction Threshold

The AFS-terminal voltage is 0.4 V or less for at least 5 seconds.

### Driving Pattern

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 2 minutes.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

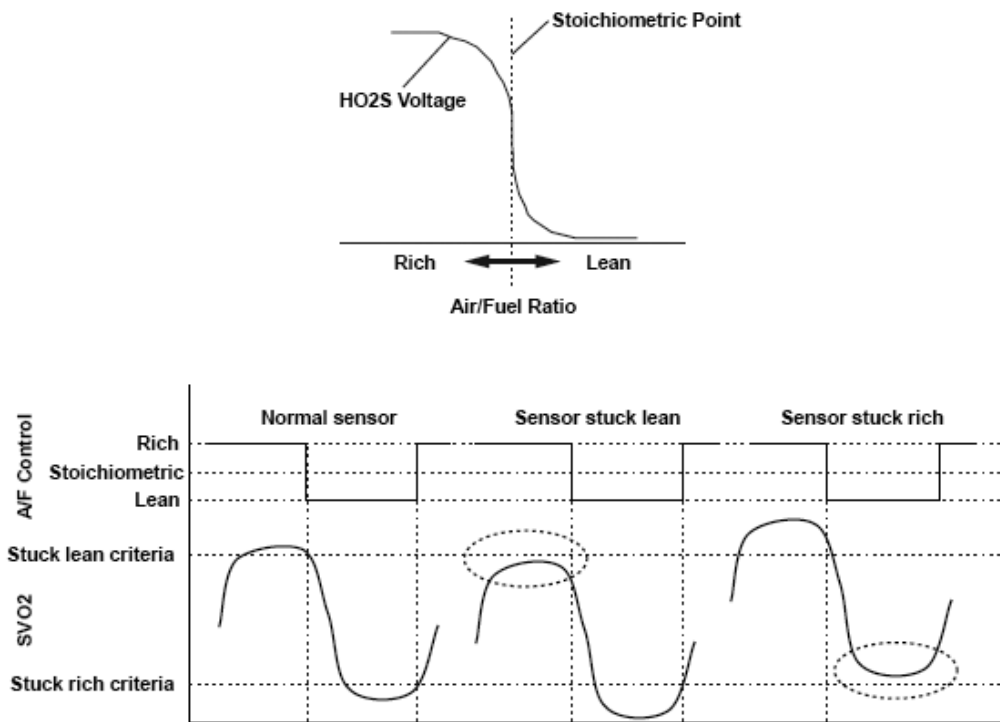
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2270 (63): ADVANCED DIAGNOSTICS

**DTC P2270: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2))  
CIRCUIT SIGNAL STUCK LEAN**



P2270-0570

**Fig. 239: Secondary Heated Oxygen Sensor Air Fuel Ratio - Graph**

**General Description**

The secondary HO2S detects the oxygen concentration in the exhaust gas downstream of the three-way catalyst (TWC).

The sensor output voltage characteristics are similar to the air/fuel ratio (A/F) sensor. The oxygen concentration is detected after the TWC during fuel feedback control using the A/F sensor, and it optimizes the fuel feedback control to maximize the effect of the TWC. If, after current is applied to the secondary HO2S heater, the secondary HO2S does not fluctuate and the output is stuck within the specified area, a malfunction is detected and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	None
Duration	24.6 seconds or less
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

**Enable Conditions**

## 2007 Honda Element EX

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### ENABLE CONDITIONS

Condition	Minimum	Maximum	
Elapsed time that secondary HO2S activity is not monitored after starting the engine	15 seconds	-	
Elapsed time after the fuel cut-off	-	185 seconds	
Engine coolant temperature	156 °F (69 °C)	-	
Intake air temperature	-13 °F (-25 °C)	-	
Engine speed	A/T	1,300 rpm	2,600 rpm
	M/T	1,825 rpm	3,400 rpm
MAP value	27 kPa (7.9 in.Hg, 200 mmHg)	79 kPa (23.6 in.Hg, 600 mmHg)	
Vehicle speed	30 mph (48 km/h)	-	
Fuel trim	0.69	1.47	
Fuel feedback	Closed loop		
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0117, P0118, P0133, P0134, P0135, P0137, P0138, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2238, P2252, P2646, P2647, P2648, P2649, P2A00		

### Malfunction Threshold

The secondary HO2S output voltage is 0.650 V or less.

### Driving Pattern

1. Start the engine. Let it idle until the radiator fan comes on.
2. Drive the vehicle at a steady speed of 35 mph (57 km/h) or more for at least 24.6 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

### Diagnosis Details

#### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

#### Conditions for clearing the MIL

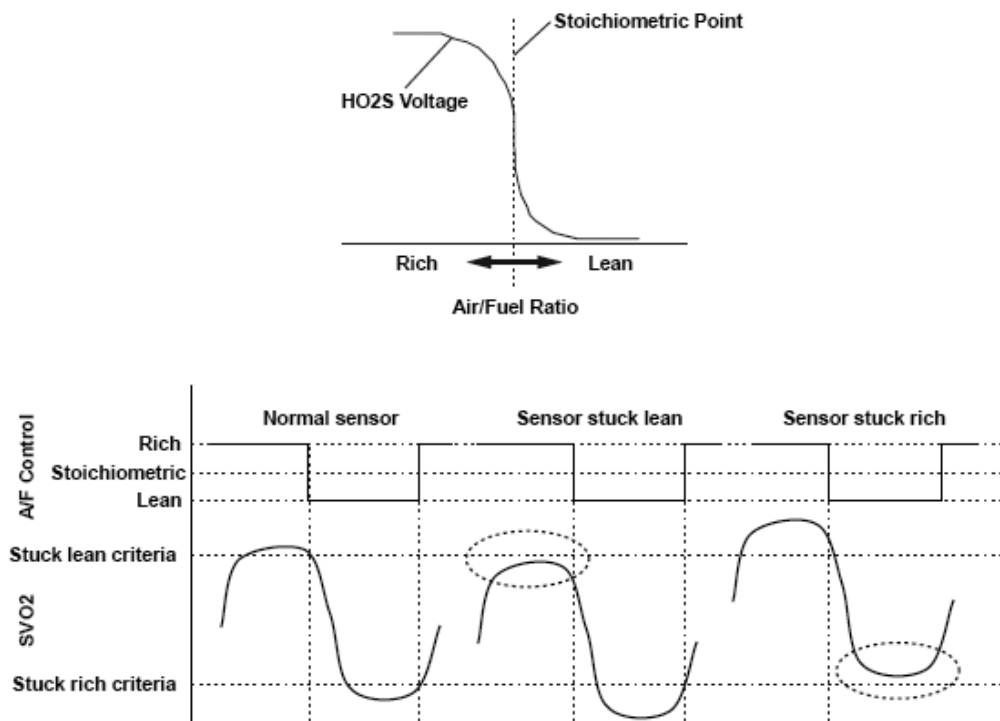
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic

runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2271 (63): ADVANCED DIAGNOSTICS

### DTC P2271: SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S (SENSOR 2)) CIRCUIT SIGNAL STUCK RICH



P2270-0570

**Fig. 240: Secondary Heated Oxygen Sensor Air Fuel Ratio - Graph**

#### General Description

The secondary HO2S detects the oxygen concentration in the exhaust gas downstream of the three-way catalyst (TWC).

The sensor output voltage characteristics are similar to the air/fuel ratio (A/F) sensor. The oxygen concentration is detected after the TWC during fuel feedback control using the A/F sensor, and it optimizes the fuel feedback control to maximize the effect of the TWC. If, after current is applied to the secondary HO2S heater, the secondary HO2S does not fluctuate and the output is stuck within the specified area, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	24.6 seconds or less
DTC Type	Two drive cycles, MIL ON
OBD Status	PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum	
Elapsed time that secondary HO2S activity is not monitored after starting the engine	15 seconds	-	
Elapsed time after the fuel cut-off	-	185 seconds	
Engine coolant temperature	156 °F (69 °C)	-	
Intake air temperature	-13 °F (-25 °C)	-	
Engine speed	A/T	1,300 rpm	2,600 rpm
	M/T	1,825 rpm	3,400 rpm
MAP value	27 kPa (7.9 in.Hg, 200 mmHg)	79 kPa (23.6 in.Hg, 600 mmHg)	
Vehicle speed	30 mph (48 km/h)	-	
Fuel trim	0.69	1.47	
Fuel feedback	Closed loop		
No active DTCs	P0010, P0011, P0101, P0102, P0103, P0107, P0108, P0111, P0112, P0113, P0117, P0118, P0133, P0134, P0135, P0137, P0138, P0141, P0171, P0172, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0340, P0341, P0344, P0443, P0496, P0497, P1009, P1128, P1129, P1157, P1172, P145C, P2195, P2238, P2252, P2270, P2646, P2647, P2648, P2649, P2A00		

#### Malfunction Threshold

The secondary HO2S output voltage is 0.293 V or more.

#### Driving Pattern

1. Start the engine. Let it idle until the radiator fan comes on.
2. Drive the vehicle at a steady speed of 35 mph (57 km/h) or more for at least 24.6 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

## Diagnosis Details

### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

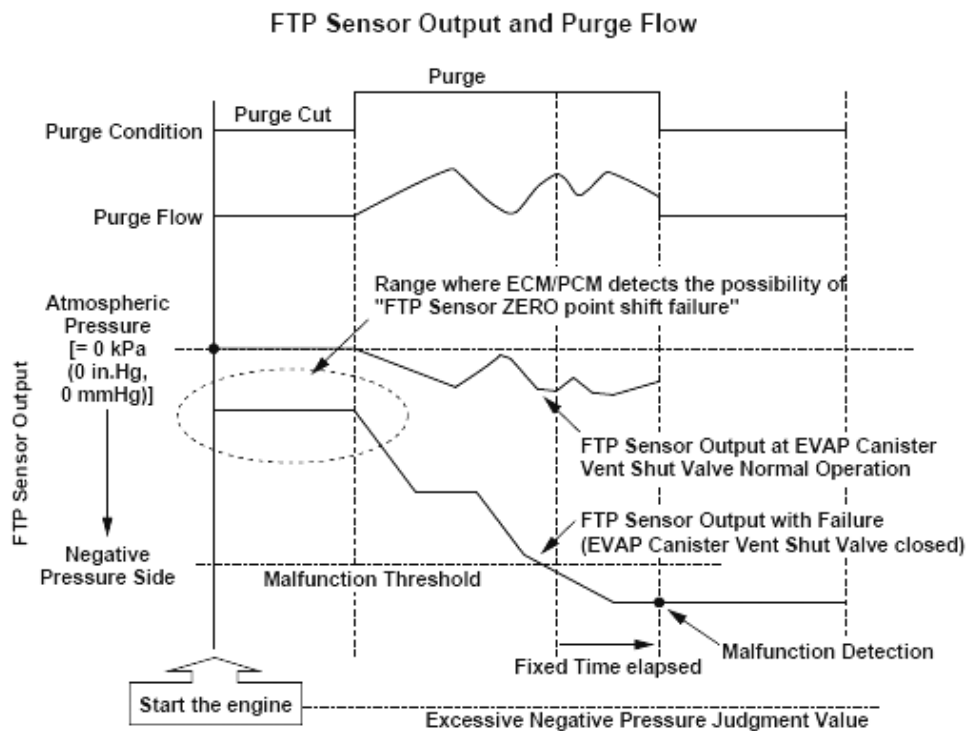
### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2422 (117): ADVANCED DIAGNOSTICS

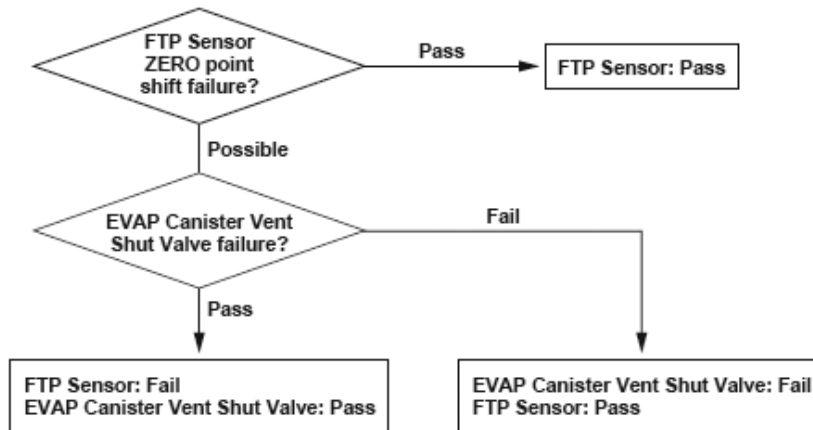
### DTC P2422: EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE STUCK CLOSED MALFUNCTION



P2422-0371

**Fig. 241: FTP Sensor Output And Purge Flow**

**Malfunction Judgment Flowchart of FTP Sensor and EVAP Canister Vent Shut Valve**



P1454-0371

**Fig. 242: Malfunction Judgement Flow Chart Of FTP Sensor And EVAP Canister Vent Shut Valve**

**General Description**

The fuel tank pressure (FTP) sensor output indicates about atmospheric pressure 0 kPa (0 in.Hg, 0 mmHg) before purge starts since the evaporative emission (EVAP) canister vent shut valve is normally open (open to the atmosphere). The sensor indicates a negative pressure value (vacuum) during purging.

When the FTP sensor indicates vacuum after starting the engine, there is the possibility of an FTP sensor zero point shift failure or an EVAP canister vent shut valve stuck closed failure. So the engine control module (ECM)/powertrain control module (PCM) monitors the FTP sensor output after purge starts. The ECM/PCM detects a malfunction of the EVAP canister vent shut valve if the output indicates excessive vacuum.

However, if the fuel tank internal pressure is below the specified value (excessive vacuum is detected) when starting the engine, the malfunction detection should be done as follows because it is difficult to distinguish the FTP sensor range problem (P1454) from the EVAP canister vent shut valve stuck closed (P2422).

1. If neither Temporary DTC (P1454 nor P2422) is stored, both DTCs are stored.
2. If both Temporary DTCs (P1454 and P2422) are stored and excessive vacuum is detected, both DTCs are stored.
3. If either Temporary DTC (P1454 or P2422) is stored and excessive vacuum is detected, the ECM/PCM stores the DTC of the Temporary DTC that was stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Once per driving cycle
Sequence	P0452, P0453 are judged as OK
Duration	1.04 <sup>(1)</sup> , 8 <sup>(2)</sup> seconds or more
DTC Type	Two drive cycles, MIL ON

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OBD Status | PASSED/FAILED/NOT COMPLETED (STILL TESTING)

(1) Elapsed time after the FTP sensor output exceeds the malfunction threshold.

(2) Excessive negative pressure is detected.

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine**	10 seconds	-
Engine coolant temperature <sup>(1)</sup>	131 °F (55 °C)	-
Battery voltage	10.5 V	-
Fuel feedback	Closed loop	
No active DTCs	P0101, P0102, P0103, P0107, P0108, P0117, P0118, P0134, P0135, P0300, P0301, P0302, P0303, P0304, P0335, P0339, P0351, P0352, P0353, P0443, P0451, P0452, P0496, P0497, P0498, P0499, P1128, P1129, P1157, P1172, P145C, P2195, P2227, P2228, P2229, P2238, P2252	
Others	The EVAP canister vent shut valve has not been closing	
	Stopping the purge control	

(1) Condition to start the purge control.

#### Malfunction Threshold

The output from the fuel tank pressure sensor is -4 kPa (-1.0 in.Hg, -25 mmHg)\*, -2 kPa (-0.4 in.Hg, -10 mmHg)\*\* or less for at least 1.04\*, 8\*\* seconds.

\*: Elapsed time after the FTP sensor output exceeds the malfunction threshold.

\*\*: Excessive negative pressure is detected.

#### Confirmation Procedure with the HDS

Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

#### Driving Pattern

Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

#### Diagnosis Details

#### Conditions for illuminating the MIL



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When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

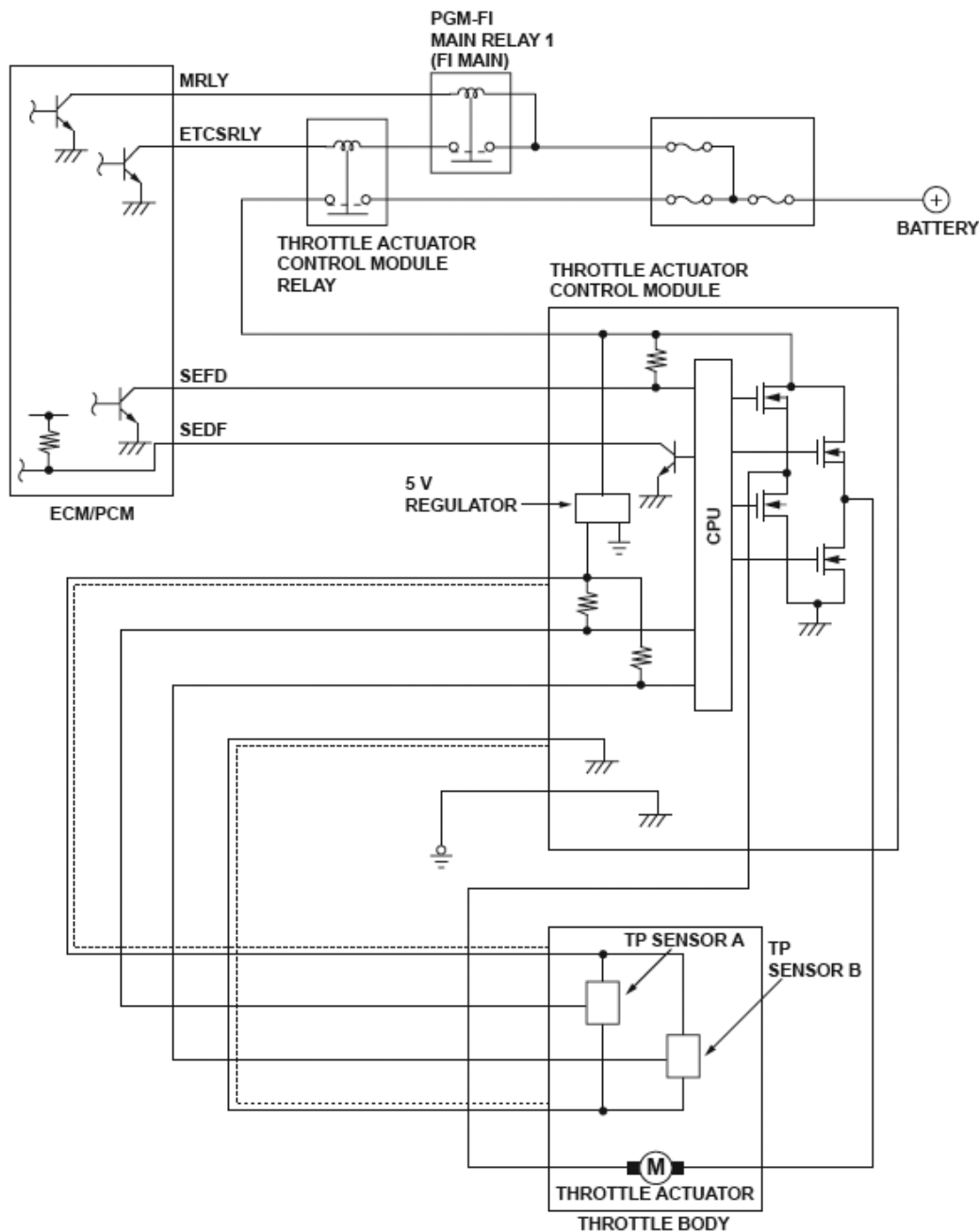
#### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## **DTC P2552 (40): ADVANCED DIAGNOSTICS**

### **DTC P2552: THROTTLE ACTUATOR CONTROL MODULE RELAY MALFUNCTION**



P0122-0700

**Fig. 243: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

The electronic throttle control system (ETCS) controls the throttle valve opening. The system is composed of the throttle actuator, the throttle valve, throttle position (TP) sensors A and B, the throttle actuator control module, and the throttle actuator control module relay in the throttle body.

The accelerator pedal position (APP) sensor is operated via the throttle cable to determine the accelerator

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opening value when the driver presses the accelerator pedal. The accelerator pedal opening value is converted to a signal in the APP sensor, transmitted to the engine control module (ECM)/powertrain control module (PCM), and then transmitted to the throttle actuator control module.

The throttle actuator control module determines the throttle valve target position according to the signal received and operates the throttle actuator to move the throttle valve to the target position. The actual throttle valve position is determined by TP sensors A and B installed in the throttle body.

The ECM/PCM detects the malfunction of the throttle actuator control module relay ON, and a DTC is stored if the serial signal from the throttle actuator control module is input for more than a set time after the throttle actuator control module relay is turned OFF and throttle actuator control module operation is stopped.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	2.0 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	8.0 V	-
Ignition switch	OFF	
No active DTCs	P1684, P2101, P2108, P2118, P2135, P2176, U0107	

#### Malfunction Threshold

The serial signal is input from the throttle actuator control module for at least 2.0 seconds after the throttle actuator control module relay is turned OFF.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

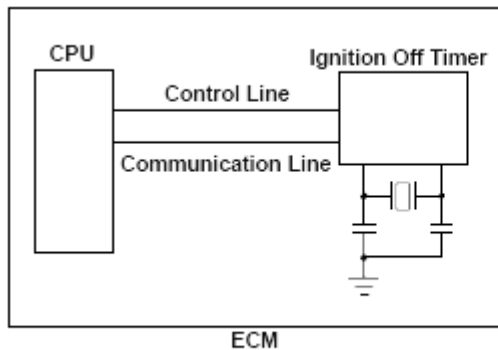
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2610 (132): ADVANCED DIAGNOSTICS

### DTC P2610: ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) IGNITION OFF INTERNAL TIMER PERFORMANCE PROBLEM



P2610-0610

**Fig. 244: Engine Control Module/Powertrain Control Module Communication Diagram**

#### General Description

The engine control module (ECM)/powertrain control module (PCM) has a built-in ignition off timer that measures the duration of time from ignition off to the next ignition on. The measured duration is used for evaporative emission (EVAP) leak detection and temperature assumption of the catalytic converter.

The CPU in the ECM/PCM accesses the ignition off timer when reading the measured duration. When the access process fails, a malfunction is detected and a DTC is stored. When an abnormality is found in the read data, a malfunction is detected and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

<b>Condition</b>	
Ignition switch	

ON<sup>(1)</sup>

(1) Ignition switch on when a battery is disconnected and connected again is excluded.

**Malfunction Threshold**

The access process to the ignition off timer fails, or a malfunction is found in the read data for at least 10 seconds.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

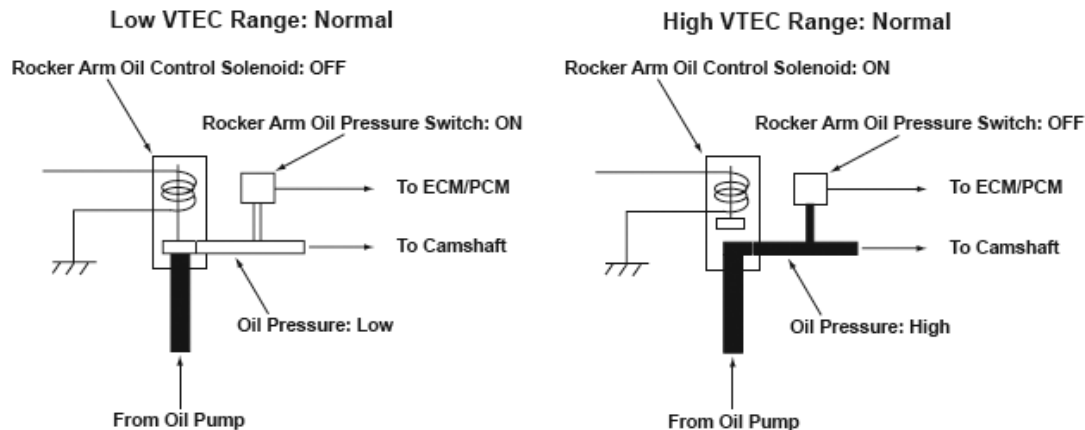
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2646 (22): ADVANCED DIAGNOSTICS**

**DTC P2646: ROCKER ARM OIL PRESSURE SWITCH CIRCUIT LOW VOLTAGE**



P2646-0770

**Fig. 245: Rocker Arm Oil Pressure Flow Diagram**

**ROCKER ARM OIL PRESSURE SWITCH CONDITIONS**

Logic Decision	Rocker Arm Oil Pressure Switch	

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	'ON'	'OFF'
Rocker Arm Oil Control Solenoid Command 'ON'	Failure	Normal
Rocker Arm Oil Control Solenoid Command 'OFF'	Normal	Failure

#### General Description

The VTEC system activates the rocker arm oil control solenoid by command from the engine control module (ECM)/powertrain control module (PCM), and it charges/discharges the hydraulic circuit of the VTEC mechanism that switches valve timing between Low and High. The ECM/PCM monitors oil pressure in the hydraulic circuit of the VTEC mechanism using the rocker arm oil pressure switch downstream of the rocker arm oil control solenoid. If there is a difference between the oil pressure condition in the hydraulic circuit that is determined by the ECM/PCM command and the oil pressure condition that is determined by the status of the rocker arm oil pressure switch, the system is considered faulty, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Engine coolant temperature	50 °F (10 °C)	-
Engine speed (High lift cam operation)	4,000 rpm	-
Vehicle speed	7 mph (10 km/h)	-
Battery voltage	10.5 V	-
Gear position	Other than P or N position	
No active DTCs	P2648, P2649	

#### Malfunction Threshold

When the rocker arm oil control solenoid is ON, the rocker arm oil pressure switch remains ON.

#### Confirmation Procedure with the HDS

Do the VTEC TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator

fan comes on.

2. Drive the vehicle in a lower gear at 4,000 rpm or more with a MAP value of 12 kPa (3.6 in.Hg, 90 mmHg) or more for at least 10 seconds.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

**Diagnosis Details**

**Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

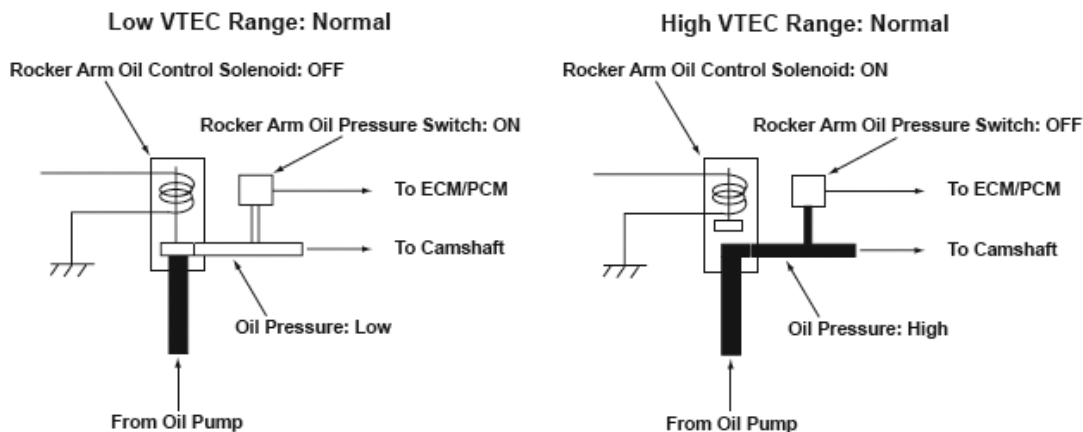
**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2647 (22): ADVANCED DIAGNOSTICS**

**DTC P2647: ROCKER ARM OIL PRESSURE SWITCH CIRCUIT HIGH VOLTAGE**



P2646-0770

**Fig. 246: Rocker Arm Oil Pressure Flow Diagram**

**ROCKER ARM OIL PRESSURE SWITCH CONDITIONS**

Logic Decision	Rocker Arm Oil Pressure Switch	
	'ON'	'OFF'
Rocker Arm Oil Control Solenoid Command 'ON'	Failure	Normal
Rocker Arm Oil Control Solenoid Command 'OFF'	Normal	Failure

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#### General Description

The VTEC system activates the rocker arm oil control solenoid by command from the engine control module (ECM)/powertrain control module (PCM), and it charges/discharges the hydraulic circuit of the VTEC mechanism that switches valve timing between Low and High. The ECM/PCM monitors oil pressure in the hydraulic circuit of the VTEC mechanism using the rocker arm oil pressure switch downstream of the rocker arm oil control solenoid. If there is a difference between the oil pressure condition in the hydraulic circuit that is determined by the ECM/PCM command and the oil pressure condition that is determined by the status of the rocker arm oil pressure switch, the system is considered faulty, and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

##### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	10 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### Enable Conditions

##### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	10.5 V	-
No active DTCs	P2648, P2649	
Other	At idle	

#### Malfunction Threshold

Low lift cam operation

When the rocker arm oil control solenoid is OFF, the rocker arm oil pressure switch remains OFF.

#### Confirmation Procedure with the HDS

Do the VTEC TEST in the INSPECTION MENU with the HDS.

#### Driving Pattern

Start the engine, and let it idle for at least 10 seconds.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the



ECM/PCM memory.

**Conditions for clearing the MIL**

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC P2648 (21): ADVANCED DIAGNOSTICS**

**DTC P2648: ROCKER ARM OIL CONTROL SOLENOID CIRCUIT LOW VOLTAGE**



P2648-0805

**Fig. 247: Rocker Arm Oil Control Solenoid Circuit Diagram**

**General Description**

The VTEC system activates the rocker arm oil control solenoid by command from the engine control module (ECM)/powertrain control module (PCM), and it charges/discharges the hydraulic circuit of the VTEC mechanism that switches valve timing between low and high. If the return signal is OFF (low) when the ECM/PCM outputs the ON (high) signal to the rocker arm oil control solenoid, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1.1 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

**Enable Conditions**

**ENABLE CONDITIONS**

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## 2007 Honda Element EX

### 2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

Condition	Minimum	Maximum
Battery voltage	10.0 V	-
No active DTCs	P2649	

#### Malfunction Threshold

The return signal is OFF (low) for at least 1.1 seconds when the ECM/PCM outputs the ON (high) signal to the rocker arm oil control solenoid.

#### Driving Pattern

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
  2. Drive the vehicle in a lower gear at 4,000 rpm or more with a manifold absolute pressure (MAP) value of 12 kPa (3.5 in.Hg, 90 mmHg) or more for at least 10 seconds.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2649 (21): ADVANCED DIAGNOSTICS

### DTC P2649: ROCKER ARM OIL CONTROL SOLENOID CIRCUIT HIGH VOLTAGE



## 2007 Honda Element EX

2007 ENGINE PERFORMANCE Advanced Diagnostics - Element

### **Fig. 248: Rocker Arm Oil Control Solenoid Circuit Diagram**

#### **General Description**

The VTEC system activates the rocker arm oil control solenoid by command from the engine control module (ECM)/powertrain control module (PCM), and it charges/discharges the hydraulic circuit of the VTEC mechanism that switches valve timing between low and high. If the return signal is ON (high) when the ECM/PCM outputs the OFF (low) signal to the rocker arm oil control solenoid, the ECM/PCM detects a malfunction and a DTC is stored.

#### **Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

##### **MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1.1 seconds or more
DTC Type	One drive cycle, MIL ON
OBD Status	PASSED/FAILED/NOT COMPLETED (STILL TESTING)

#### **Enable Conditions**

##### **ENABLE CONDITIONS**

<b>Condition</b>	<b>Minimum</b>	<b>Maximum</b>
Battery voltage	10.0 V	-
State of the engine	Running	
No active DTCs	P2648	

#### **Malfunction Threshold**

The return signal is ON (high) for at least 1.1 seconds when the ECM/PCM outputs the OFF (low) signal to the rocker arm oil control solenoid.

#### **Driving Pattern**

Start the engine, and let it idle for at least 10 seconds.

#### **Diagnosis Details**

##### **Conditions for illuminating the MIL**

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### **Conditions for clearing the MIL**

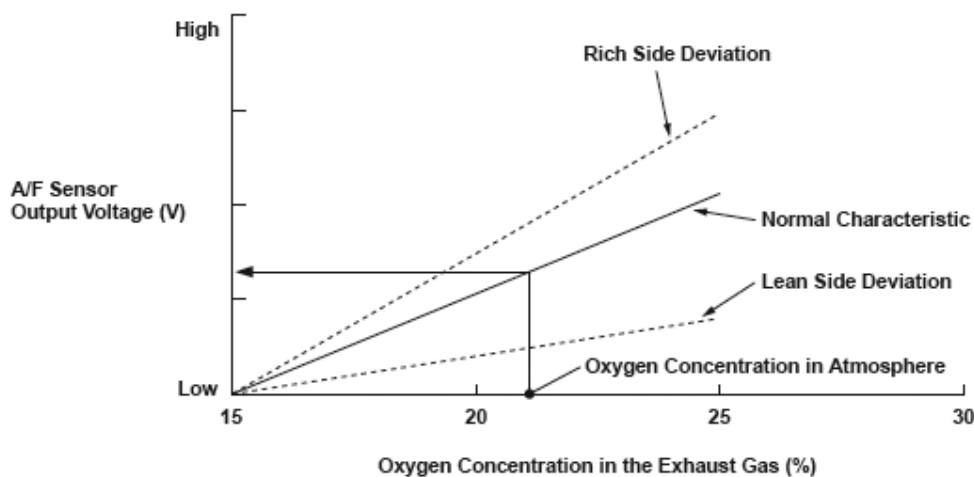
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic

runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC P2A00 (61): ADVANCED DIAGNOSTICS

### DTC P2A00: AIR/FUEL RATIO (A/F) SENSOR (SENSOR 1) CIRCUIT RANGE/PERFORMANCE PROBLEM



P1164-9871

**Fig. 249: Relationship Between A/F Sensor Output And Oxygen Concentration**

#### General Description

The air/fuel ratio (A/F) sensor has a linear signal output in relation to the oxygen concentration. The engine control module (ECM)/powertrain control module (PCM) computes the air/fuel ratio from A/F sensor output voltage and uses the fuel feedback control to improve exhaust emissions. The ECM/PCM monitors A/F sensor output voltage during deceleration with the throttle fully closed, and if the output voltage deviates greatly from normal oxygen concentration levels, it detects a malfunction and stores a DTC.

\* Output to the scan tool exhibits a relationship between the A/F sensor output and oxygen concentration, which is opposite to the characteristic shown in the graph. That is, a deviation toward the rich side increases the output voltage and one toward the lean side decreases the output voltage as the stoichiometric ratio is 0.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Once per driving cycle
Sequence	None
Duration	3.5 seconds or more
DTC Type	Two drive cycles, MIL ON

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OBD Status | PASSED/FAILED/EXECUTING/OUT OF (TEST) CONDITION

#### Enable Conditions

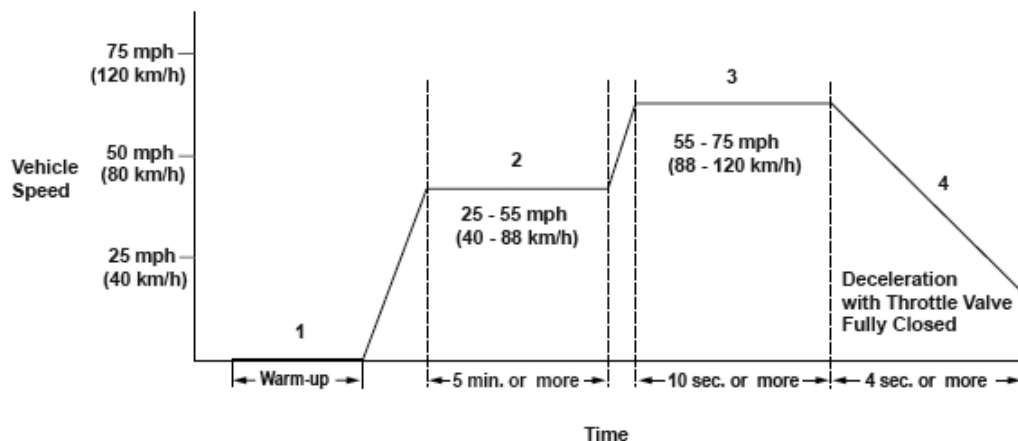
#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Elapsed time after starting the engine	60 seconds	-
Engine coolant temperature	157 °F (69 °C)	-
Intake air temperature	-13 °F (-25 °C)	-
Engine speed	A/T	2,650 rpm
	M/T	4,100 rpm
Vehicle speed	26 mph (41 km/h)	-
Fuel feedback	During deceleration	
No active DTCs	P0112, P0113, P0117, P0118, P0122, P0123, P0133, P0134, P0135, P0171, P0172, P0222, P0223, P0300, P0301, P0302, P0303, P0304, P0443, P0496, P0497, P1157, P1172, P145C, P2101, P2108, P2118, P2122, P2123, P2127, P2128, P2135, P2138, P2176, P2195, P2227, P2228, P2229, P2238, P2252, U0107	

#### Malfunction Threshold

The A/F sensor output voltage is 2.8 V or less, or 4.8 V or more.

#### Driving Pattern



P2A00-0350

**Fig. 250: Vehicle Driving Pattern**

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator

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fan comes on.

2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
  3. Then, drive immediately at a steady speed between 55 - 75 mph (88 - 120 km/h) for at least 10 seconds.
  4. Decelerate with the throttle valve fully closed for at least 4 seconds.
- If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
  - Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

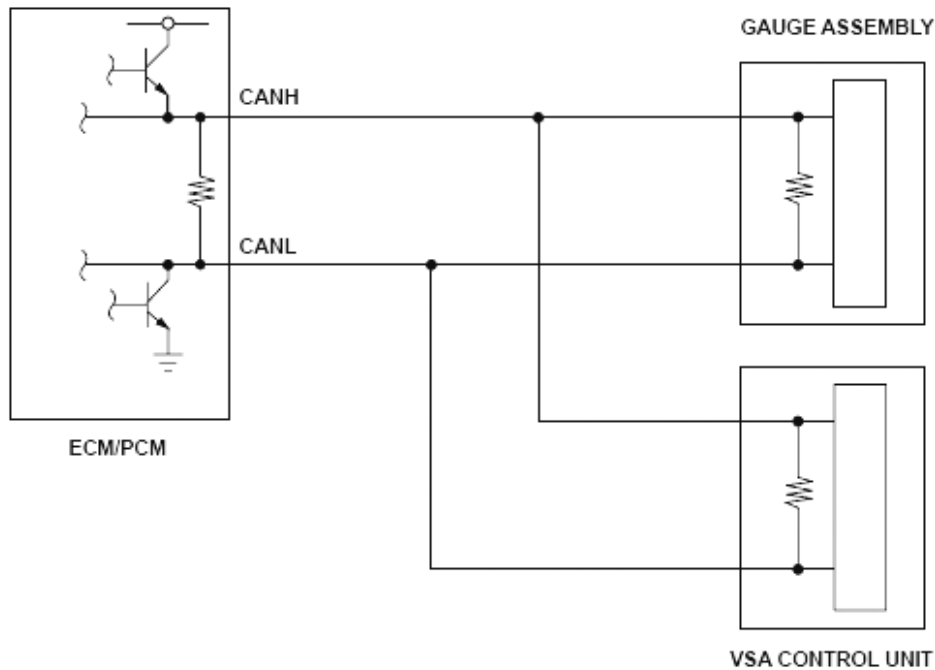
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC U0028 (126): ADVANCED DIAGNOSTICS

### DTC U0028: F-CAN MALFUNCTION (BUS-OFF)



U0073-0402

**Fig. 251: Communication Diagram Between ECM/PCM And Control Module**

**General Description**

The controller area network (CAN) transmits/receives pulsing signals to/from the control modules simultaneously by using two signal lines (CANH and CANL).

When the engine control module (ECM)/powertrain control module (PCM) does not receive the signals via the CAN lines for more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	9.0 V	-

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Elapsed time after the ignition switch is on	3 seconds	-
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#### Malfunction Threshold

The ECM/PCM does not receive any signals for at least 1 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

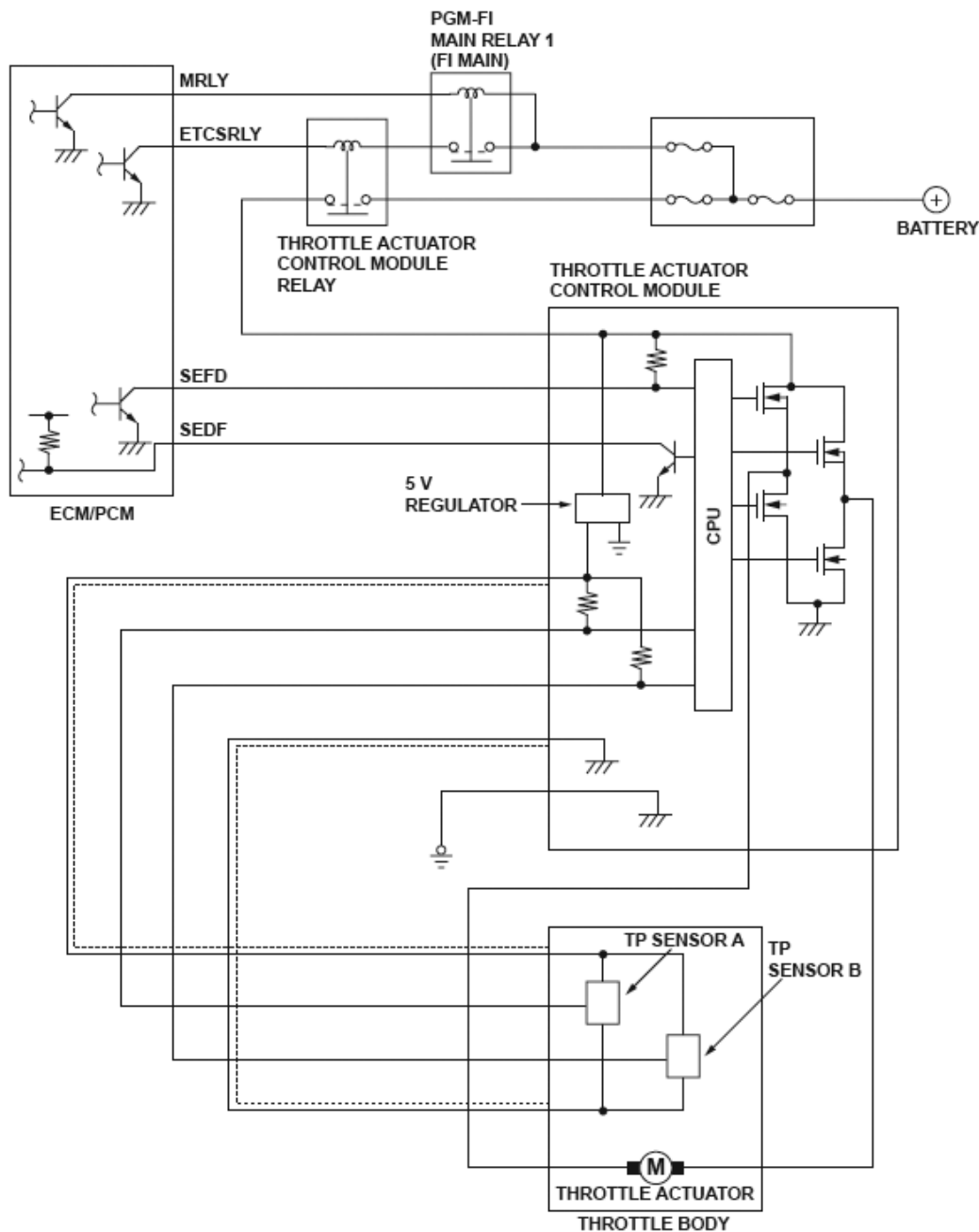
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC U0107 (30): ADVANCED DIAGNOSTICS

### DTC U0107: LOST COMMUNICATION WITH THROTTLE ACTUATOR CONTROL MODULE





P0122-0700

**Fig. 252: Throttle Position (TP) Sensor Circuit Diagram**

**General Description**

The engine control module (ECM)/powertrain control module (PCM) uses the serial signal line for two-way communication with the throttle actuator control module.

The ECM/PCM transmits the accelerator pedal position signal to the throttle actuator module, and the throttle actuator control module transmits the actual throttle valve position signal, or a malfunction signal, etc., to the

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ECM/PCM via this line.

When no serial signals from the throttle actuator control module are received or the serial signals are abnormal for more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

#### Monitor Execution, Sequence, Duration, DTC Type, OBD Status

#### MONITOR DESCRIPTION

Execution	Continuous
Sequence	None
Duration	0.25 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	8.0 V	-
Elapsed time after starting throttle actuator control module	1 second	-
No active DTCs	P2101, P2108, P2118, P2135, P2176	

#### Malfunction Threshold

One of these conditions must be met for at least 0.25 second.

- No serial signals from the throttle actuator control module are detected.
- The serial signals from the throttle actuator control module are abnormal.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

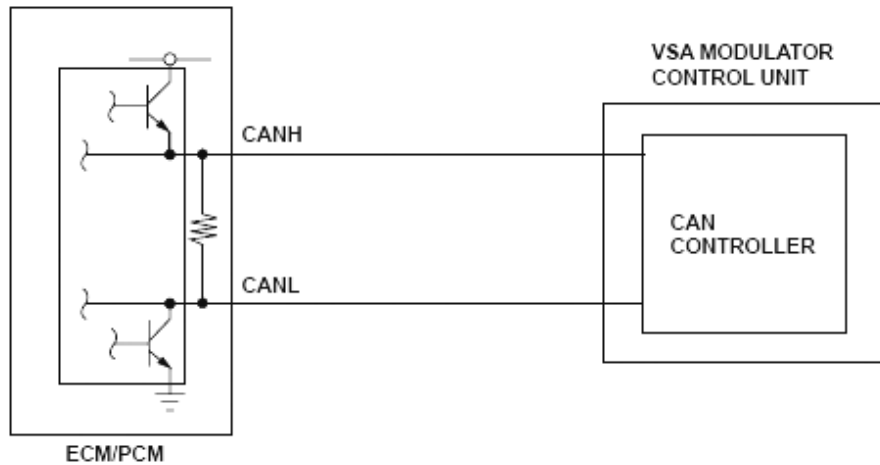
##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

## DTC U0122 (126): ADVANCED DIAGNOSTICS

**DTC U0122: F-CAN MALFUNCTION (VSA-ECM/PCM)**



U0073-0503

**Fig. 253: Communication Diagram Between ECM/PCM And Control Module**

**General Description**

The controller area network (CAN) transmits/receives pulsing signals to/from the control modules simultaneously by using two signal lines (CANH and CANL).

When the engine control module (ECM)/powertrain control module (PCM) does not receive the signals via the CAN lines for more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous
Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL OFF
OBD Status	N/A

**Enable Conditions**

**ENABLE CONDITIONS**

Condition	Minimum	Maximum
Battery voltage	9.0 V	-

**Malfunction Threshold**

The ECM/PCM does not receive any signals for at least 1 second.

**Diagnosis Details**

**Conditions for illuminating the indicator**

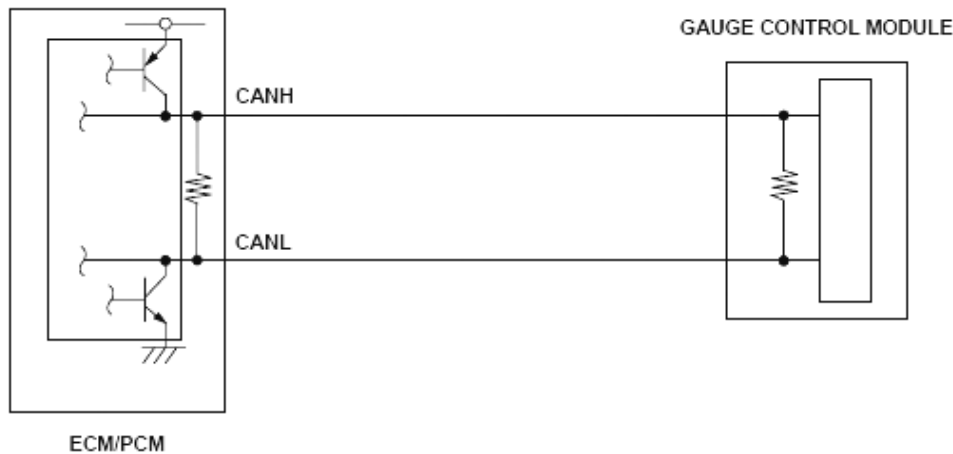
When a malfunction is detected, the DTC and the freeze frame data are stored in the ECM/PCM memory. The MIL does not come on.

**Conditions for clearing the DTC**

The DTC and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

**DTC U0155 (126): ADVANCED DIAGNOSTICS**

**DTC U0155: F-CAN MALFUNCTION (GAUGE CONTROL MODULE-ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM))**



U0073-0302

**Fig. 254: Communication Diagram Between ECM/PCM And Gauge Control Module**

**General Description**

The controller area network (CAN) transmits/receives pulsing signals to/from the control modules simultaneously by using two signal lines (CANH and CANL).

When the engine control module (ECM)/powertrain control module (PCM) does not receive the signals from the gauge control module via the CAN lines for more than a set time, the ECM/PCM detects a malfunction and a DTC is stored.

**Monitor Execution, Sequence, Duration, DTC Type, OBD Status**

**MONITOR DESCRIPTION**

Execution	Continuous

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Sequence	None
Duration	1 second or more
DTC Type	One drive cycle, MIL ON
OBD Status	N/A

#### Enable Conditions

#### ENABLE CONDITIONS

Condition	Minimum	Maximum
Battery voltage	9.0 V	-
No active DTCs	U0028	

#### Malfunction Threshold

The ECM/PCM does not receive any signals from the gauge control module for at least 1 second.

#### Diagnosis Details

##### Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

##### Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.