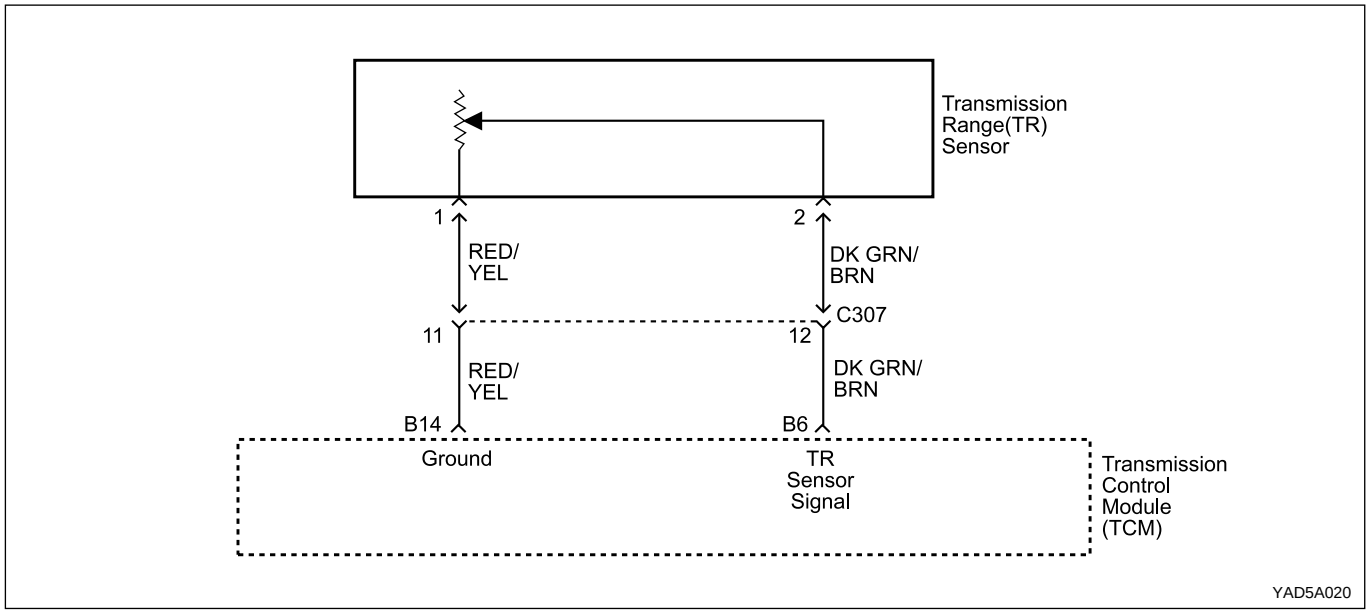


DIAGNOSTIC TROUBLE CODE (DTC) P0706
TRANSMISSION RANGE SENSOR CIRCUIT RANGE/PERFORMANCE

Circuit Description

The Transmission Range (TR) sensor is incorporated in the inhibitor switch mounted on the side of the transmis-sion case. The TR sensor Indicates to the TCM which gear position has been selected by way of a varying resistance.

The TR sensor signal has discrete values indicating the positions selected by the gear shift control lever (PRND321). The Transmission Control Module (TCM) re-ceives that signal with a voltage varying from 0 V to 5 V. DTC P0706 sets when the TR sensor signal is not feasi ble.

Conditions for Setting the DTC

- The engine temperature is greater than 60 °C (140 °F).
- The engine speed is greater than 2000 RPM and less than 4000 RPM.
- Engine load is greater than 60 %.
- DTCs P0707, P0708, P1703 and P1719 are not set.
- Transmission temperature is greater than 0 °C (32 °F) or if P0710 is present the engine coolant temperature is greater than 60 ° C (140 °F).
- The TR sensor indicates that the transmission is in a neutral state, however the engine output torque indicates that a drive gear load is present. This condition must be continuously present for 5 seconds.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate on the second consecutive driving cycle with the DTC present.
- The EOBD system will record operating conditions at the time the diagnostic fails. This information will be stored in the Failure Records buffer.
- TR signal is assumed to be in the Drive position.
- The transmission is limited to 2nd and R gears only. Namely 1st, 3rd and 4th gears are inhibited.
- Torque Converter Clutch (TCC) is disabled.

Conditions for Clearing the DTC

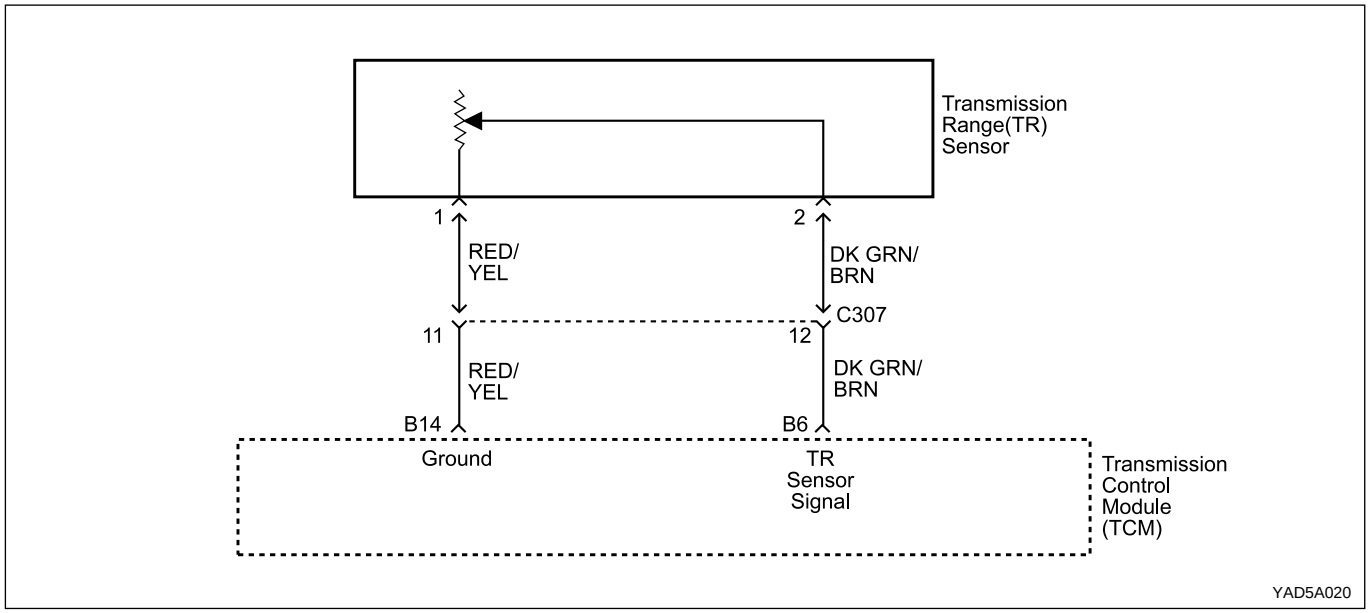
- The DTC will clear when the malfunction has not oc-curred for 30 seconds and TR is in P, R, N or D.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 ° C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and at the TR sensor connector. Look for possible bent, backed out, deformed or damaged ter-minals. Check for weak terminal tension as well. Also, check for chafed wires that could short to bare metal or other wiring. Inspect for broken wires inside the in-sulation.

DTC P0706 Transmission Range Sensor Circuit Range/Performance

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P0706?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Select Gear Lever Position on scan tool Data List. 2. Move the gear shift control lever through all of the gear ranges (P, R, N, D, 3, 2, 1). Does the scan tool display the correct gear lever positions?	-	Go to Step 6	Go to Step 4
4	1. Inspect the TR sensor for damage to its rotating part or its mountings. 2. Inspect the shaft driving the TR sensor for damage. Is a repair necessary?	-	Go to Step 5	Go to Step 6
5	Replace the TR sensor or driving shaft as appropriate. Is the acting complete?	-	Go to Step 7	-
6	Check for damage to the z-link within the transmission and repair as necessary. Is a repair necessary?	-	Go to Step 7	-
7	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 8	Go to Step 2
8	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P0707 TRANSMISSION RANGE SENSOR CIRCUIT LOW INPUT

Circuit Description

The Transmission Range (TR) sensor is incorporated in the inhibitor switch mounted on the side of the transmis sion case. The TR sensor Indicates to the TCM which gear position has been selected by way of a varying resistance.

The TR sensor signal has discrete values indicating the positions selected by the gear shift control lever (PRND321). The Transmission Control Module (TCM) re- ceives that signal with a voltage varying from 0 V to 5 V. DTC P0707 sets when the TR sensor signal is faulty, causing the gear lever position signal to be less than 0.87 V.

Conditions for Setting the DTC

- TR sensor signal is less than 0.87 V.
- The above condition must be continuously present for 100 milliseconds.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate on the second consecutive driving cycle with the DTC present.
- The EOBD system will record operating conditions at the time the diagnostic fails. This information will be stored in the Failure Records buffer.
- Transmission range is assumed to be in the Drive position.
- The transmission is limited to 2nd and R gears only. Namely 1st,3rd and 4th gears are inhibited.
- Torque Converter Clutch (TCC) is disabled.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 3 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- The voltage measured by the TCM across the TR sensor input terminals has been below on acceptable level for a significant length of time.
- This would typically be caused by a short to ground in the wiring to, or within, the inhibitor switch which has caused the signal at the TCM to read about 0 V.
- Inspect the wiring for poor electrical connections at the TCM and at the TR sensor connector. Look for possible bent, deformed or damaged terminals. Also, check for chafed wires that could short to bare metal or other wiring.
- In searching for a possible intermittent short or open condition, move or massage the wiring harness while observing the test equipment for a change.

Test Description

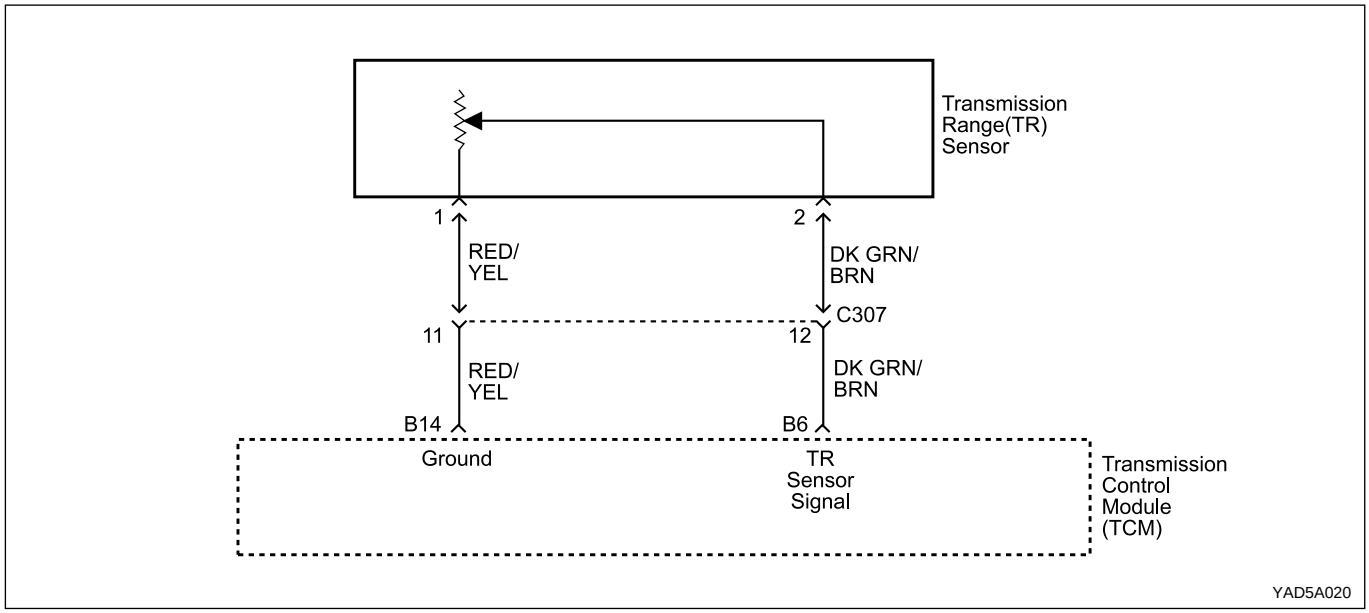
The number(s) below refer to the step number(s) on the

Diagnostic Table.

3. This step simulates a DTC P0708 condition. If the scan tool displays the specified value, the TR sensor signal circuit and the TCM are OK.

DTC P0707 Transmission Range Sensor Circuit Low Input

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Turn the ignition ON, with the engine OFF. 2. Install a scan tool. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. 5. Review the TR Sensor value on the scan tool. Is the TR Sensor value less than the specified value?	0.87 V	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the Transmission Range (TR) sensor connector. 3. Turn the ignition ON. Is the TR Sensor value greater than specified value?	4.12 V	Go to Step 4	Go to Step 5
4	Replace the TR sensor. Is the action complete?	-	Go to Step 10	-
5	With a test light connected to B+, probe the TR sensor signal circuit at terminal 2. Does the test light illuminate?	-	Go to Step 6	Go to Step 8
6	1. Turn the ignition OFF. 2. Disconnect the Transmission Control Module (TCM) connector B. 3. Turn the ignition ON. 4. With a test light connected to B+, probe the TR sensor signal circuit at terminal 2. Does the test light illuminate?	-	Go to Step 7	Go to Step 9
7	Repair the short to ground in the TR sensor signal circuit. Is a repair complete?	-	Go to Step 10	-
8	Check for a poor connection at the TR sensor connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 10	-
9	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 10	-
10	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 11	
11	Check if any DTCs are set. Are there any DTCs displayed or DTC previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P0708
TRANSMISSION RANGE SENSOR CIRCUIT HIGH INPUT

Circuit Description

The Transmission Range (TR) sensor is incorporated in the inhibitor switch mounted on the side of the transmission case. The TR sensor Indicates to the TCM which gear position has been selected by way of a varying resistance.

The TR sensor signal has discrete values indicating the positions selected by the gear shift control lever (PRND321). The Transmission Control Module (TCM) receives that signal with a voltage varying from 0 V to 5 V.

The transmission range sensor is faulty, causing the gear lever position signal to be greater than 4.12 V.

Conditions for Setting the DTC

- TR sensor signal is greater than 4.12 V.
- The above condition must be continuously present for 100 milliseconds.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate on the second consecutive driving cycle with the DTC present.
- The EOBD system will record operating conditions at the time the diagnostic fails. This information will be stored in the Failure Records buffer.
- Transmission range (gear lever) is assumed to be in the Drive position.
- The transmission is limited to 2nd and R gears only. Namely 1st,3rd and 4th gears are inhibited.
- Torque Converter Clutch (TCC) is disabled.
- Manually initiated downshifts will not be available.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 3 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- The voltage measured by the TCM across the shift lever input terminals has been above an acceptable level for a significant length of time.
- This would typically be caused by a loose connection or an open or short to B+ in the wiring to, or within, the inhibitor switch which has caused the signal at the TCM to read 5 V.
- If the DTC sets when an accessory is operated, check for a poor connection or excessive current draw.
- Inspect the wiring for poor electrical connections at the TCM and at the TR sensor connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also, check for chafed wires that could short to other wiring. Inspect for broken wires inside the insulation.
- In searching for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

4. This step simulates a DTC P0707 condition. If the scan tool displays the specified value, the TR sensor signal circuit and the TCM are OK.

DTC P0707 Transmission Range Sensor Circuit High Input

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Turn the ignition ON, with the engine OFF. 2. Install a scan tool. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. 5. Review the TR Sensor value on the scan tool. Is the TR Sensor value greater than the specified value?	4.12 V	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the Transmission Range (TR) sensor connector. 3. Turn the ignition ON. 4. With a test light connected to ground, probe the TR sensor signal circuit at terminal 2. Is the TR sensor value less than specified value?	0.87 V	Go to Step 4	Go to Step 7
4	With a test light connected to B+, probe the TR sensor ground circuit at terminal 1. Does the test light illuminate?	-	Go to Step 5	Go to Step 8
5	Check for a poor connection at the TR sensor connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 6
6	Replace the TR sensor. Is the action complete?	-	Go to Step 11	-
7	1. Turn the ignition OFF. 2. Disconnect the Transmission Control Module (TCM) connector B. 3. Check the TR sensor signal circuit at terminal 1 for an open or short to voltage and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9
8	Check the TR sensor ground circuit at terminal 1 for an open and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9
9	Check for a poor connection at the TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-

DTC P0707 Transmission Range Sensor Circuit High Input (Cont'd)

Step	Action	Value(s)	Yes	No
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or DTCs previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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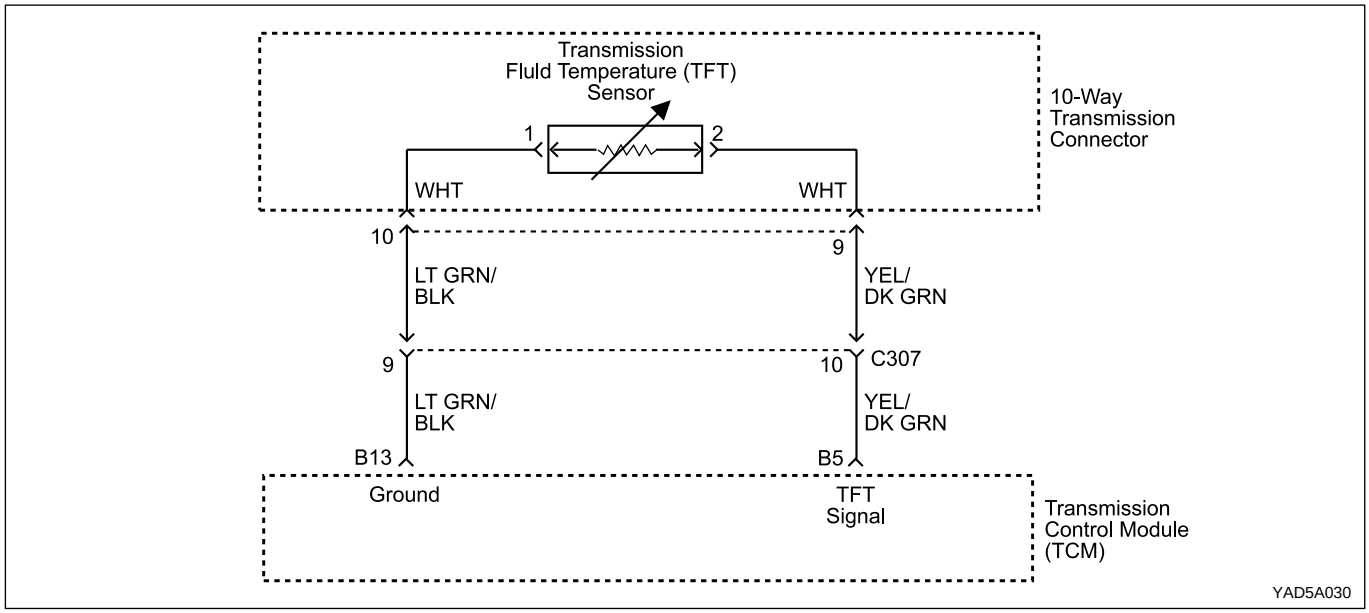

DIAGNOSTIC TROUBLE CODE (DTC) P0710 TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT MALFUNCTION

Circuit Description

The Transmission Fluid Temperature (TFT) sensor is a thermistor located in the solenoid wiring loom within the valve body of the transmission. This sensor is a typical Negative Temperature Coefficient (NTC) resistor with low temperatures producing a high resistance and high temperatures producing a low resistance.

If the transmission fluid temperature exceeds 135 °C (275 °F), the TCM will impose converter lock-up at lower vehicle speeds. Favour a lower gear to increase engine speed, and in some vehicles flashes the mode indicator lamp. This results in maximum oil flow through the external oil cooler and eliminates slippage in the torque converter. Both these actions combine to reduce the oil temperature in the transmission.

The DTC P0710 sets when the TFT sensor signal is not feasible.

Conditions for Setting the DTC

- Transmission fluid temperature sensor signal is greater than 4.88 volts (immediate detection).
- Transmission fluid temperature sensor signal is less than 0.21 volts (immediate detection).
- Transmission temperature has not changed by 2 °C in 15 minutes since ignition on and temperature is less than 20 °C or greater than 125 °C.

Action Taken When the DTC Sets

- Transmission fluid temperature is assumed to be 120 °C (248 °F).
- All shifts will be firm until the transmission has warmed up because a high transmission fluid temperature is assumed.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not oc curred for 3 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- The voltage measured by the TCM across the transmission fluid temperature input terminals has been outside acceptable levels.
- If the DTC sets when an accessory is operated, check for a poor connection or excessive current draw.
- Inspect the wiring for poor electrical connections at the TCM and at the 10-way transmission connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also, check for chafed wires that could short to bare metal or other wiring. Inspect for broken wires inside the insulation.
- In searching for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

5. This step simulates a DTC P0710 condition. If the scan tool displays the specified value, the TFT sensor signal circuit and the TCM are OK.

DTC P0710 Transmission Fluid Temperature Sensor Circuit Malfunction

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Select T/M Fluid Temperature on scan tool Data List. Is the TFT sensor value less than specified value?	0.21 V	Go to Step 4	Go to Step 3
3	Is the TFT sensor value greater than specified value?	4.88 V	Go to Step 7	Go to "Diagnostic Aids"
4	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector (additional DTCs will set). 3. Turn the ignition ON. Is the TFT sensor value greater than the specified value?	4.88 V	Go to Step 6	Go to Step 5
5	1. Turn the ignition OFF. 2. Disconnect the TCM connector B. 3. Turn the ignition ON. 4. With a test light connected to B+, probe the TFT sensor signal circuit, terminal 9 at the 10-way transmission connector. Does the test light illuminate?	-	Go to Step 8	Go to Step 14
6	Replace the TFT sensor. Is the action complete?	-	Go to Step 16	-
7	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector (additional DTCs will set). 3. Turn the ignition ON. 4. Jumper the TFT ground circuit terminal 10 to the TFT sensor signal circuit terminal 9 at the 10-way transmission connector. Is the TFT sensor value less than specified value?	0.21 V	Go to Step 6	Go to Step 9
8	Repair the short to ground in the TFT sensor signal circuit as necessary. Is the repair complete?	-	Go to Step 16	-
9	With a test light connected to B+, probe the TFT sensor ground circuit at terminal 10 at the 10-way transmission connector. Does the test light illuminate?	-	Go to Step 10	Go to Step 11
10	1. Turn the ignition OFF. 2. Disconnect the TCM connector B. 3. Turn the ignition ON. 4. Check the TFT sensor signal circuit, terminal 9 at the 10-way transmission connector for an open or short to voltage. Is a problem found?	-	Go to Step 13	Go to Step 14

DTC P0710 Transmission Fluid Temperature Sensor Circuit Malfunction (Cont'd)

Step	Action	Value(s)	Yes	No
11	1. Turn the ignition OFF. 2. Disconnect the TCM connector B. 3. Turn the ignition ON. 4. Check the TFT sensor ground circuit for an open. Is a problem found?	-	Go to Step 12	Go to Step 14
12	Repair the TFT ground circuit for an open. Is a repair complete?	-	Go to Step 16	-
13	Repair an open or short to voltage in the TFT sensor signal circuit as necessary. Is the repair complete?	-	Go to Step 16	-
14	Check for a poor connection at the 10-way transmission connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 16	Go to Step 15
15	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 16	-
16	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 17	Go to Step 2
17	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 3 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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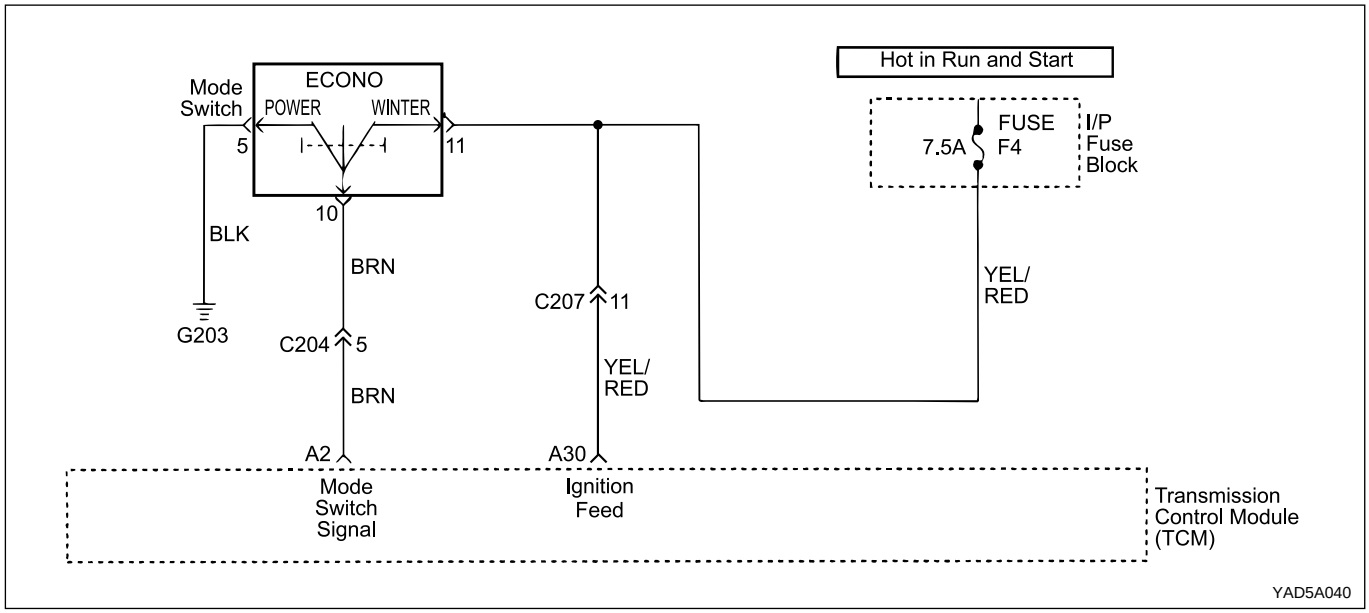

DIAGNOSTIC TROUBLE CODE (DTC) P0790 NORMAL/PERFORMANCE SWITCH CIRCUIT MALFUNCTION

Circuit Description

The driving mode selector switch is located on the center console and allows the driver to select the driving mode.

When NORMAL mode is selected upshifts will occur to maximize fuel economy. When POWER mode is selected, upshifts will occur to give maximum performance and the POWER mode indicator light is switched ON.

When WINTER mode is selected, starting in second gear is facilitated, the WINTER mode indicator light is switched ON and the POWER mode indicator light is switched OFF.

The DTC P0790 sets when an intermittent connection in the mode selector switch (mode switch) circuit has been detected. The mode switch input is rapidly changing states. The switching frequency is greater than 8.3 Hz.

Conditions for Setting the DTC

- The mode switching frequency is greater than 8.3 Hz.
- The above condition must be continuously present for 4 state changes.

Action Taken When the DTC Sets

- All shifts will occur as if the mode is set to NORMAL.
- The mode indicator will always be OFF indicating that NORMAL mode is selected.
- The mode indicator will not respond to the changes in switch setting.

Conditions for Clearing the DTC

- The DTC will clear after 3 seconds without the fault.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- This fault is caused by too many changes in the mode input signal over a period of time.
- Typical causes would be an intermittent connection in the switch or wiring or an intermittent short to ground in the wiring.

Test Description

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

3. Check mode switch signal circuit for an intermittent open / short
5. Check mode switch ground circuit for an intermittent open / short
8. Check mode switch feed circuit for an intermittent open / short

DTC P0790 Normal/Performance Switch Circuit Malfunction

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P0790?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the mode switch connector. Refer to Shift Control Lever in this section. 3. Turn the ignition ON. 4. Select Mode Switch on scan tool Data List. Is the Mode Switch value frequently changing?	-	Go to Step 4	Go to Step 5
4	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the mode switch signal circuit for an intermittent open or short and repair as necessary. Is a repair necessary?	-	Go to Step 13	Go to Step 10
5	Jumper the mode switch ground terminal 5 to the signal terminal 10. Is the Mode Switch value frequently changing?	-	Go to Step 6	Go to Step 7
6	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the mode switch ground circuit for an intermittent open and repair as necessary. Is a repair complete?	-	Go to Step 13	-
7	Check the fuse F4 for a malfunctioning and replace as necessary? Is a repair necessary?	-	Go to Step 13	Go to Step 8
8	Jumper the mode switch feed terminal 11 to the signal terminal 10. Is the Mode Switch value frequently changed?	-	Go to Step 9	Go to Step 11
9	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the mode switch feed circuit for an intermittent open and repair as necessary. Is a repair complete?	-	Go to Step 13	-
10	Check for a poor connection at the mode switch and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 13	Go to Step 12

DTC P0790 Normal/Performance Switch Circuit Malfunction (Cont'd)

Step	Action	Value(s)	Yes	No
11	Replace the mode switch. Refer to Shift Control Lever in this section. Is the action complete?	-	Go to Step 13	-
12	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 13	-
13	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 14	Go to Step 2
14	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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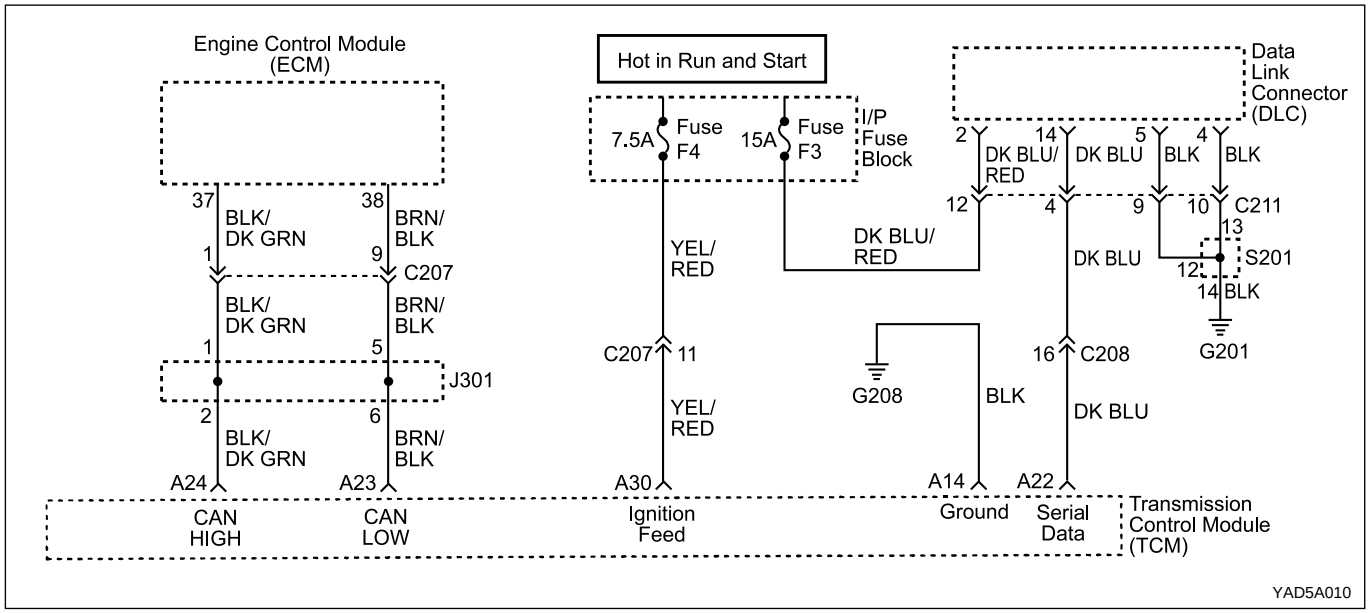


DIAGNOSTIC TROUBLE CODE (DTC) P1703
ENGINE SPEED SIGNAL ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator position etc. from ECM via CAN without any additional sensors.

The DTC P1703 sets when the engine speed signal via CAN is out of range or not feasible: The engine speed signal is greater than 7000 rpm or less than 0 rpm, or the indicated engine speed is low while other signals indicate the car is moving (i.e. the vehicle speed has increased more than 125 rpm).

Conditions for Setting the DTC

- Immediately upon the test indicating malfunction as follows.
- The engine speed signal is greater than 7000 rpm or less than 0 rpm under the precondition that DTC P1719 is not set.
- The indicated engine speed is low while other signals indicate the car is moving, i.e. the vehicle speed has increased more than 125 rpm under the following precondition;
  - Driving gear is selected.
  - The applied throttle is greater than 5 %.
  - The engine speed is less than 550 rpm.
  - DTCs P0706, P0707, P0708, P1704, P1719 and 1721 are not set.

Action Taken When the DTC Sets

- Fault detection of some other signals will not possible.

Conditions for Clearing the DTC

- The DTC will clear after 30 seconds without the fault.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and ECM connectors. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- When ECM finds a fault on the engine speed signals, ECM will adopt a default mode and send the default value and trouble message to TCM via CAN.

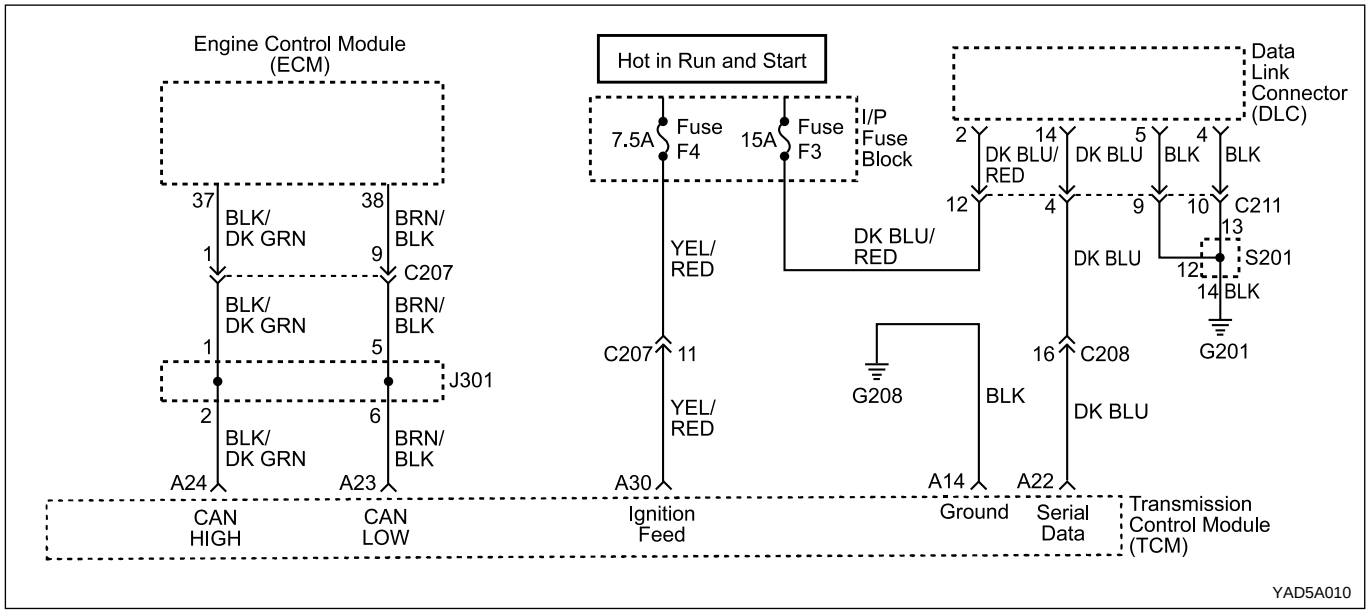
Test Description

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

3. Check if there are any DTCs related to the engine speed sensor on the ECM side.
4. Check for a poor connection at the ECM and TCM connectors.

DTC P1703 Engine Speed Signal Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1703?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Check if there are any DTCs related to the engine speed sensor on the ECM side. Are any DTCs related to engine speed sensor found?	-	Go to *Section 1F, Engine Controls*	Go to Step 4
4	Check for a poor connection at the ECM connector or TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 6	Go to Step 5
5	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 6	-
6	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 7	Go to Step 2
7	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1704
SHAFT SPEED SIGNAL ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator position etc. from ECM via CAN without any additional sensors.

The DTC P1704 sets when the indicated drive shaft speed signal via CAN is out of range or not feasible or a shaft speed of 0 is present while other signals indicate the vehicle is being driven.

Conditions for Setting the DTC

- Immediately upon the test indicating malfunction as follows.
- The shaft speed signal is greater than 9000 rpm or less than 0 rpm under the precondition that DTC P1719 is not set.
- The shaft speed indicates 0 rpm while all other signals indicate the car is moving under the following precondition;
  - Driving gear is selected.
  - The transmission range sensor has not recently changed state.
  - The engine speed is greater than 2800 rpm.
  - DTCs P0706, P0707, P0708, P1703 and P1719 are not set.
- The shaft speed has dropped from above 2100 rpm to 0 rpm within 20ms.

Action Taken When the DTC Sets

- All skip downshifts disabled and fourth gear will be in-hibited.
- The torque converter will be unlocked at all times.
- Gears are selected by the shift control lever but all downshifts are inhibited by engine speed limits to prevent over-revving.
- D position selects 3rd gear.
- 1st and 2nd gears can be manually selected.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds and a non-zero speed is detected.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and ECM connectors. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.

- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- When ECM finds a fault on the vehicle speed signals, ECM will adopt a default mode and send the default value and trouble message to TCM via CAN.

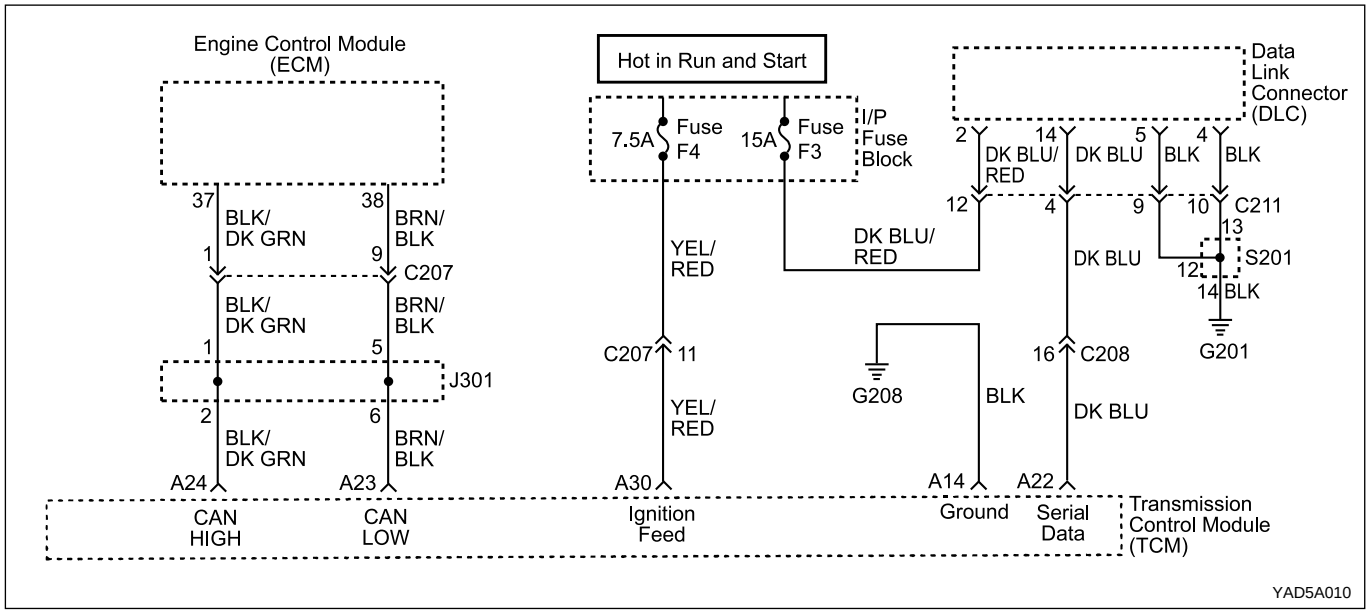
Test Description

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

3. Check if there are any DTCs related to the vehicle speed sensor on the ECM side.
4. Check a poor connection at the ECM and TCM connectors.

DTC P1704 Shaft Speed Signal Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1704?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Check if there are any DTCs related to the vehicle speed sensor on the ECM side. Are any DTCs related to vehicle speed sensor found?	-	Go to *Section 1F, Engine Controls*	Go to Step 4
4	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 5	-
5	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 6	Go to Step 2
6	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1708
TCM SUPPLY VOLTAGE LOW

Circuit Description

The battery voltage monitoring input is connected to the positive side of the battery. This signal is taken from the main supply to the TCM.

If the battery voltage at the TCM falls below the threshold value, DTC P1708 will be set and the transmission will adopt a low voltage mode of operating in which shifts into first gear are inhibited. All other shifts are attempted but may not occur because of the reduced voltage. This condition normally occurs only when the battery is in poor condition.

When system voltage recovers, the TCM will resume normal operation after a 30 seconds delay period.

Conditions for Setting the DTC

- The engine speed is greater than 550 RPM.
- A driving gear is selected or one of DTCs P0706, P0707 and P0708 is set.
- The indicated supply voltage falls below a linear temperature characteristic threshold or below that required to operate the CPU. If the TCM measures the supply voltage at less than that required for it to be operating, the DTC sets immediately.

Action Taken When the DTC Sets

- 1st gear is inhibited.
- S6 is inhibited.
- S5 standby current is zero.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- The minimum operating voltage depends on the transmission temperature but is typically between 8-9 V for a warm transmission.
- If the DTC sets when an accessory is operated, check for a poor connection.
- Look for possible bent, backed out, deformed or dam-aged terminals. Check for weak terminal tension as well. Also, check for chafed wires that could short to bare metal or other wiring. Inspect for broken wires inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

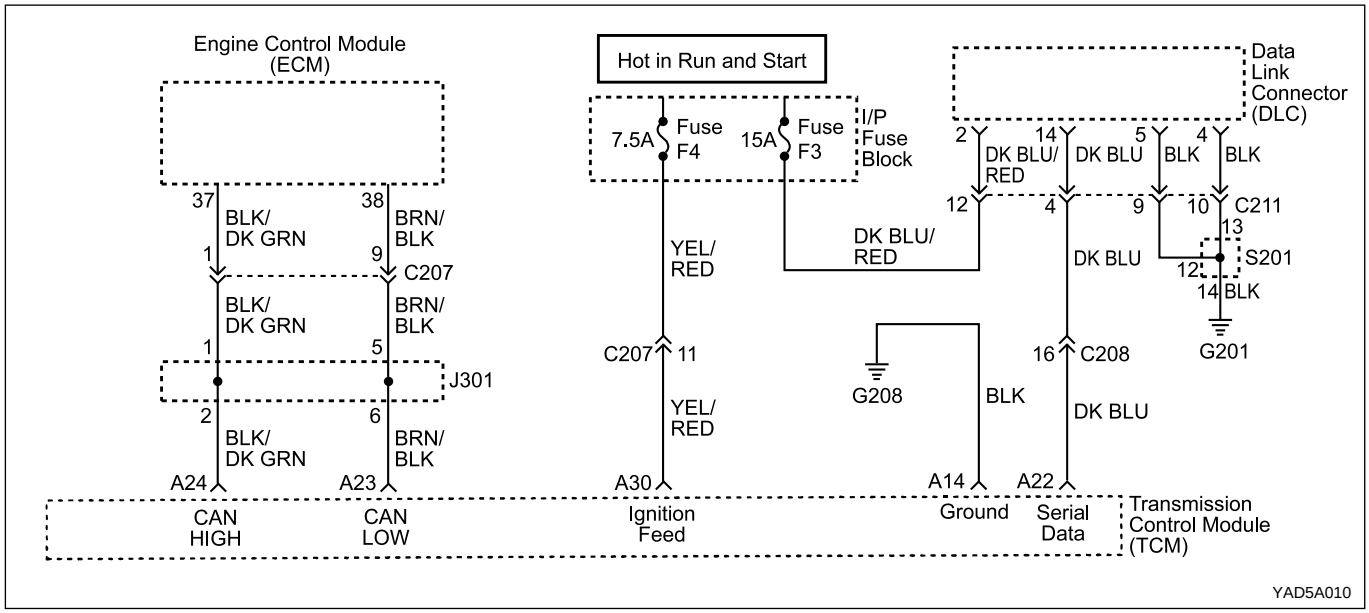
Test Description

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

4. Check if the generator is malfunctioning under load condition.
8. Check the ignition feed circuit for excessive resistance.

DTC P1708 TCM Supply Voltage Low

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1708?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Isolate the driven wheels from the ground and apply the hand brake. 2. Start the engine and allow it to idle. 3. Move the gear lever to Drive. 4. Select the Ignition Voltage on the scan tool Data List. Is the Ignition Voltage less than the specified value?	10 V	Go to Step 4	Go to Step 10
4	While running the engine at the specified value, measure the battery voltage at the battery using a DVM. Is the battery voltage greater than the specified value?	Idle in Drive 12 V	Go to Step 5	Go to *Section 1E, Engine Electrical*
5	Check the fuse F4 for a malfunction and replace as necessary? Is a repair necessary?	-	Go to Step 10	Go to Step 6
6	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Start the engine and raise the engine speed to specified value. 4. While running the engine at the specified value, measure the ignition voltage at the ignition feed circuit terminal A30 using a DVM. Is the ignition voltage greater than the specified value?	Idle in Drive 10 V	Go to Step 7	Go to Step 8
7	Check for a malfunctioning connection at the TCM harness terminals and repair as necessary. Is a repair necessary?	-	Go to Step 10	Go to Step 9
8	Repair the poor connection (high resistance) at the ignition feed circuit. Is the action complete?	-	Go to Step 10	-
9	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 10	-
10	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 11	Go to Step 2
11	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1709
TCM SUPPLY VOLTAGE HIGH

Circuit Description

The battery voltage monitoring input is connected to the positive side of the battery. This signal is taken from the main supply to the TCM.

If the battery voltage is greater than 16.5 V, DTC P1709 will be set and the transmission will adopt limp home mode and all solenoids are turned OFF.

Conditions for Setting the DTC

- The indicated supply voltage is greater than 16.5 V.
- The malfunction triggers immediately after this condi-tion exists.

Action Taken When the DTC Sets

- All solenoids are turned OFF while the high battery voltage condition is detected.
- The transmission goes into Limp Home Mode (LHM).

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- The voltage measured by the TCM corresponding to the battery supply voltage has been outside the range of the maximum operating voltage of 16.5 V.
- Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also, check for chafed wires that could short to bare metal or other wiring. Inspect for broken wires inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

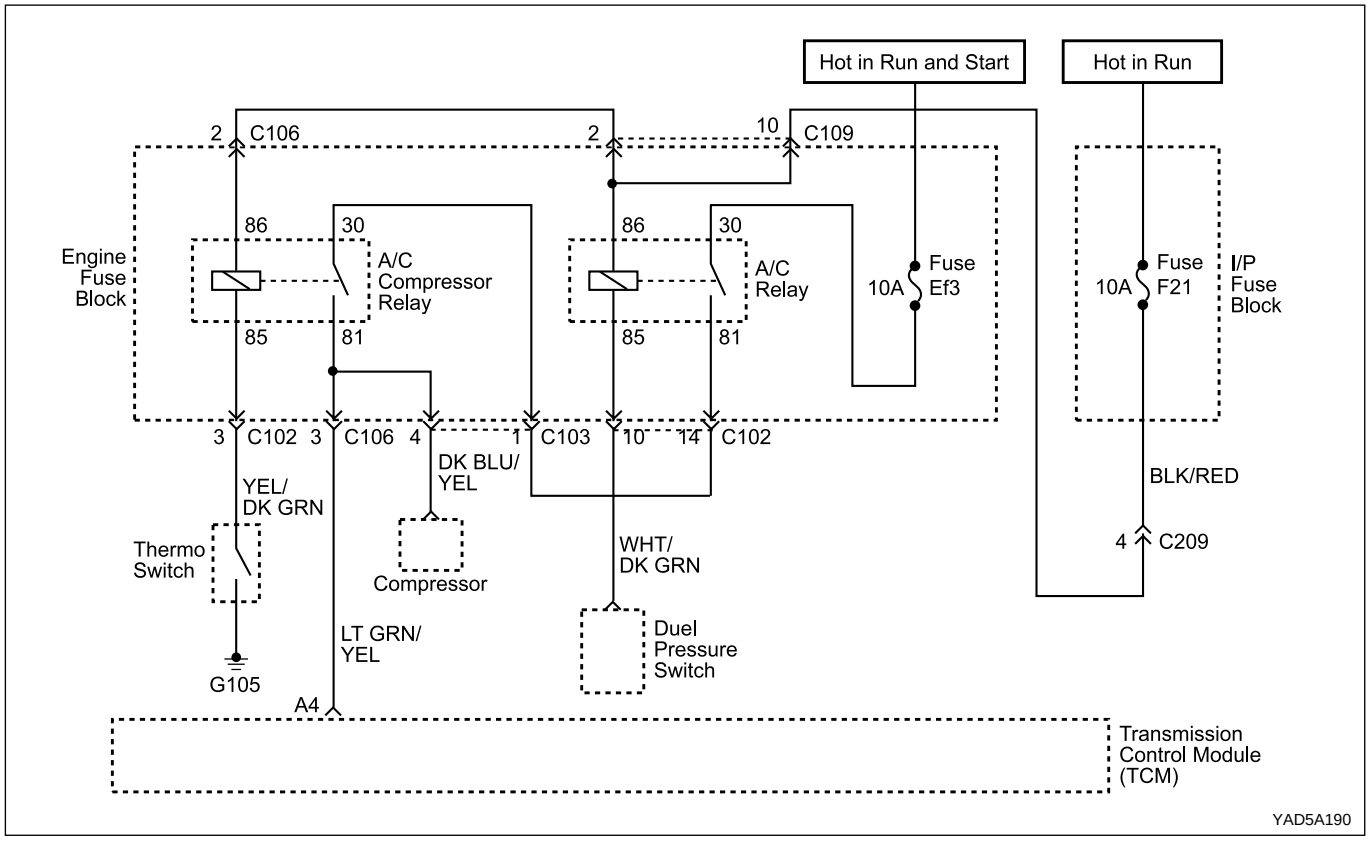
Test Description

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

4. Checks if the generator is malfunctioning under load conditions.
5. Check connection of other connectors.

DTC P1709 TCM Supply Voltage High

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1709?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Start the engine and raise the engine speed to the specified value. 2. Select the Ignition Voltage on the scan tool Data List. Is the Ignition Voltage greater than the specified value?	1500 rpm 16.5 V	Go to Step 4	Go to Step 8
4	While running the engine at the specified value, measure the battery voltage at the battery using a DVM. Is the battery voltage less than the specified value?	2000 rpm 16.5 V	Go to Step 5	Go to *Section 1E, Engine Electrical*
5	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Start the engine and raise the engine speed to the specified vale. 4. While running the engine at the specified value, measure the ignition voltage at the ignition feed circuit terminal A30 with respect to the ground terminal A14. Is the ignition voltage greater than the specified value?	1500 rpm 16.5 V	Go to Step 6	Go to Step 7
6	Check the wiring harness from the fuse F4 to TCM terminal A30 and from the ground G208 to TCM terminal A14 for damage.	-	Go to Step 8	-
7	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 8	-
8	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 9	Go to Step 2
9	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1710
AIR CONDITIONING SWITCH CIRCUIT MALFUNCTION

Circuit Description

The Air Conditioning Switch circuit indicates the state of the air conditioning compressor clutch (on or off). This signal is available to the TCM only on vehicles fitted with air conditioning.

The DTC 1710 sets when an intermittent connection in the air conditioning switch circuit has been detected. The switch input is rapidly changing states and the switching frequency is greater than 8.3 Hz.

Conditions for Setting the DTC

- The mode switching frequency is greater than 8.3 Hz.
- The above condition must be continuously present for 4 state changes.

Action Taken When the DTC Sets

- The TCM does not compensate for torque variation due to air conditioning compressor clutch activation.

Conditions for Clearing the DTC

- The DTC will clear after 3 seconds without the fault.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- This fault is caused by too many changes in the mode input signal over a period of time.
- Typical causes would be an intermittent connection in the switch or wiring or an intermittent short to ground in the wiring.

DTC P1710 Air Conditioning Switch Circuit Malfunction

Step	Action	Value(s)	Yes	No
1	Perform a TCM Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1710.	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the air conditioning compressor relay connector. 3. Turn the ignition ON. 4. Select Air Conditioning Compressor Switch on scan tool Data List. Is the value frequently changing?	-	Go to Step 4	Go to Step 5
4	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the air conditioning compressor signal circuit for an intermittent open or short and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 8
5	1. Jumper the air conditioning compressor relay connector terminal 30 and 87. 2. Turn the air conditioning switch ON. Is the air conditioning compressor switch value frequently changing?	-	Go to Step 6	Go to Step 7
6	1. Turn the ignition OFF. 2. Disconnect the TCM connector B. 3. Check the air conditioning compressor signal circuit for an intermittent open and repair as necessary. Is a repair complete?	-	Go to Step 11	-
7	Check the fuse Ef3 for a malfunctioning and replace as necessary? Is a repair necessary	-	Go to Step 11	Go to Step 9
8	Check for a poor connection at the air conditioning compressor relay and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
9	Replace the air conditioning compressor relay. Is the action complete?	-	Go to Step 11	-
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-

DTC P1710 Air Conditioning Switch Circuit Malfunction (Cont'd)

Step	Action	Value(s)	Yes	No
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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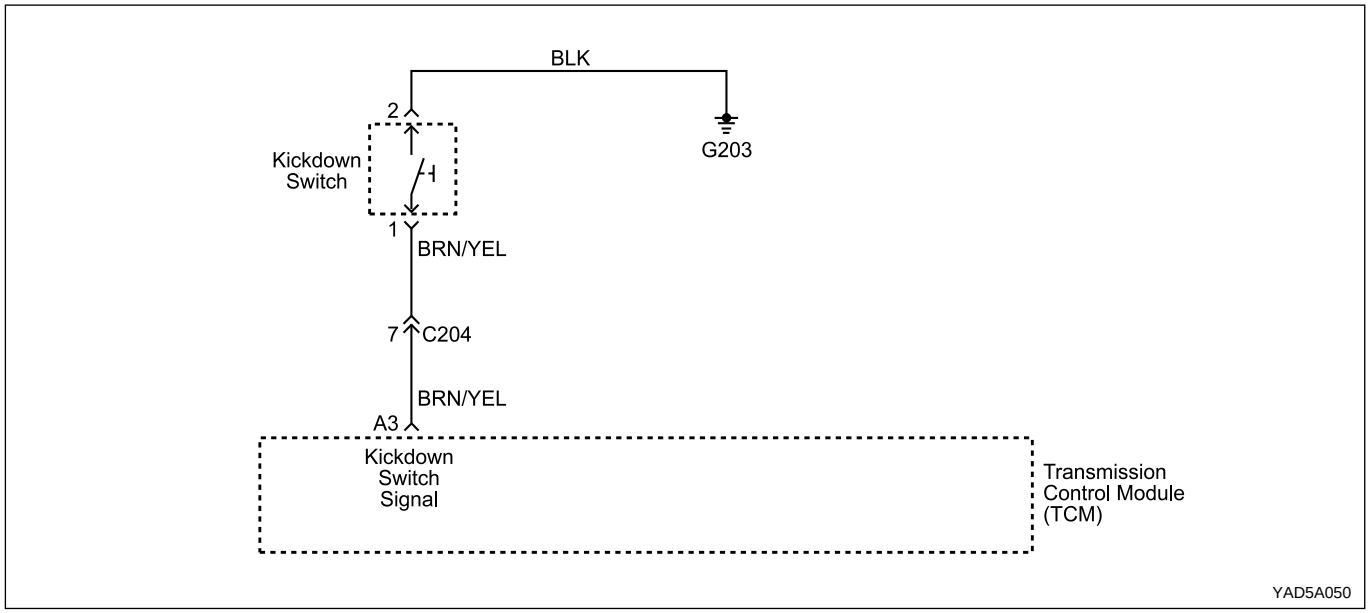

DIAGNOSTIC TROUBLE CODE (DTC) P1712 KICKDOWN SWITCH CIRCUIT MALFUNCTION

Circuit Description

The Kickdown Switch is used to signal the TCM that the driver requires kickdown indicating the driver pressed the accelerator to the floor. When this switch is used in high range non-winter mode driving, the POWER light comes ON.

The DTC sets when the kickdown switch has an intermittent connection or is stuck ON. Kickdown Switch is closed when other signals indicate otherwise, i.e. the accelerator pedal is released and the engine is running. Or the switch is cycling open/closed more rapidly than the normal operation allows.

Conditions for Setting the DTC

- DTCs P1703, P1713 and P1719 are not set.
- Kickdown Switch is closed when other signals indicate otherwise, i.e. the accelerator pedal is released and the engine is running.
- The switch is cycling open/closed more rapidly than normal operation allows : 10 state changes in less than 30 milliseconds.

Action Taken When the DTC Sets

- Kickdown Switch feature is disabled while the fault exists.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Typical causes would be an short circuit within the switch, or a short circuit to ground in the wiring to the switch.
- Inspect the wiring for poor electrical connections at the TCM and at the Kickdown Switch connector. Look for possible bent, backed out, deformed or damagednterminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

4. Checks if the kickdown signal circuit is malfunctioning.
7. Checks if the kickdown ground circuit is malfunctioning.
8. Check resistance between Kickdown Switch terminal 4 and 2.
12. Check connections of other connectors.

DTC P1712 Kickdown Switch Circult Malfunction

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Select the Kickdown Switch on the scan tool. Is the Kickdown Switch value frequently changed ON/OFF or continuously ON?	-	Go to Step 4	Go to Step 3
3	Push the accelerator pedal fully to the Kickdown Switch. Is the Kickdown Switch value frequently changed OFF/ON?	-	Go to Step 7	Go to "Diagnostic Aids"
4	1. Turn the ignition OFF. 2. Disconnect the Kickdown Switch connector. Refer to the Kickdown Switch in this section. 3. Turn the ignition ON, with the engine OFF. Is the Kickdown Switch value frequently changed ON/OFF or continuously ON?	-	Go to Step 5	Go to Step 8
5	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the Kickdown Switch signal circuit from Kickdown Switch connector terminal 1 to TCM terminal A3 for a short to ground. Is a short to ground found?	-	Go to Step 6	Go to Step 14
6	Repair the short to ground or an open in the Kickdown Switch signal circuit. Is the action complete?	-	Go to Step 15	-
7	1. Turn the ignition OFF. 2. Disconnect the Kickdown Switch connector. Refer to the Kickdown Switch in this section. 3. With a test light connected to B+, probe the Kickdown Switch ground circuit, terminal 2. Does the test light illuminate?	-	Go to Step 10	Go to Step 11
8	Check the resistance between Kickdown Switch terminal 1 and 2 when pushing the switch and not pushing. Is the resistance within the specified value?	Push: less than 5 Ω No push: Open Loop	Go to "Diagnostic Aids"	Go to Step 9
9	Replace the Kickdown Switch. Is the action complete?	-	Go to Step 15	-
10	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Check the Kickdown Switch signal circuit from Kickdown Switch connector terminal 1 to TCM terminal A3 for an open. Is an open founded?	-	Go to Step 6	Go to Step 12
11	Repair the open in the Kickdown Switch ground circuit. Is the action complete?	-	Go to Step 15	-

DTC P1712 Kickdown Switch Circult Malfunction (Cont'd)

Step	Action	Value(s)	Yes	No
12	Check for a poor connection at the Kickdown Switch connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 15	Go to Step 13
13	Check the resistance between kickdown switch terminal 1 and 2 when pushing the switch. Is the resistance within the specified value and steady?	less than 5 Ω	Go to Step 14	Go to Step 9
14	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 15	-
15	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 16	Go to Step 2
16	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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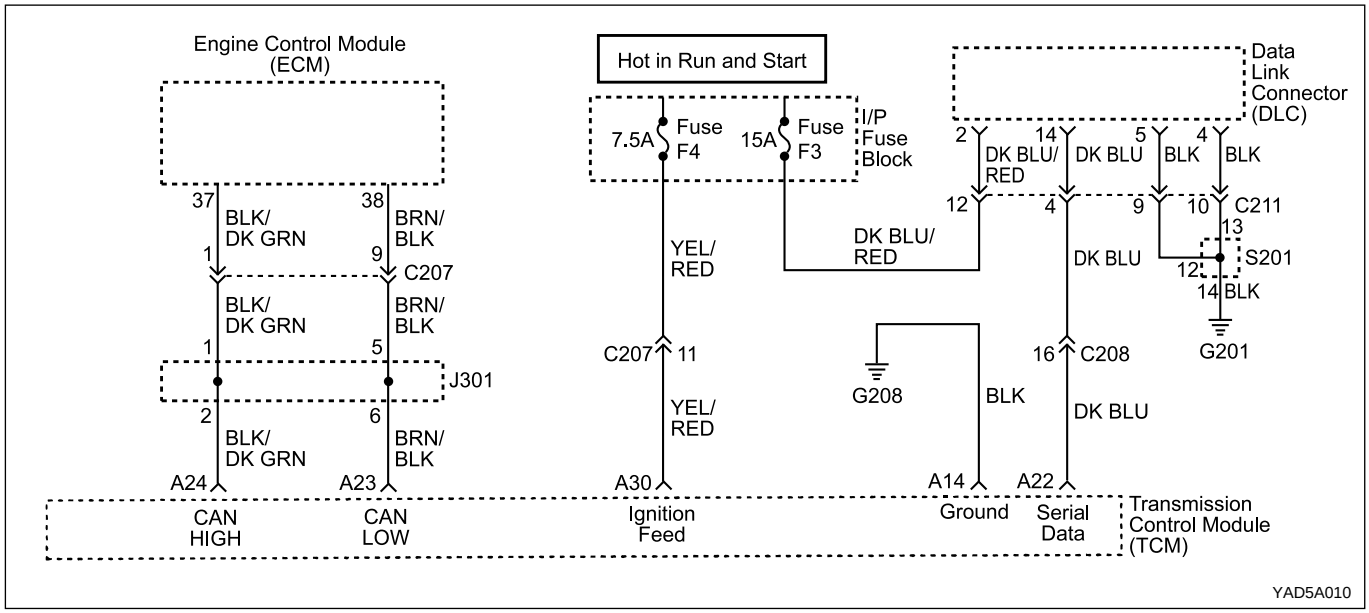


DIAGNOSTIC TROUBLE CODE (DTC) P1713
PEDAL SIGNAL ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator pedal position etc. from ECM via CAN without any additional sensors.

The DTC P1713 sets when the accelerator pedal signal via CAN is out of range. The accelerator pedal signal is greater than 254 steps.

Conditions for Setting the DTC

- DTCs P1719 is not set.
- The accelerator pedal signal is greater than 254 steps. The malfunction is triggered immediately after this condition exists.

Action Taken When the DTC Sets

- 4th gear is inhibited.
- Torque Converter Clutch (TCC) is inhibited.
- Default value is adopted for shift point decisions.
- Accelerator pedal is not used for P, R, or N B2 activation decisions.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and ECM connectors. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- When ECM finds a fault on the accelerator pedal signals, ECM will adopt a default mode and send the default value and trouble message to TCM via CAN.

Test Description

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

3. Check if there are any DTCs related to the accelerator pedal sensor on the ECM side.
4. Check for a poor connection at the ECM and TCM connectors.

DTC P1713 Pedal Signal Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1713?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Check if there are any DTCs related to the accelerator pedal sensor on the ECM side. Are any DTCs related to accelerator pedal sensor found?	-	Go to *Section 1F, Engine Controls*	Go to Step 4
4	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 5	-
5	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 6	Go to Step 2
6	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

DIAGNOSTIC TROUBLE CODE (DTC) P1714 EEPROM VEHICLE CODE ERROR

System Description

The Electrically Erasable Programmable Read-Only Memory (EEPROM) is a permanent memory chip that is physically soldered within the Transmission Control Module (TCM) The EEPROM contains the program and the calibration information required for transmission and transmission diagnostics operation.

The DTC P1714 sets when the vehicle ID stored in EEPROM is out of range when checked on initialization. The EEPROM Vehicle identification Number (VIN) value does not lie within the range 0-13.

Conditions for Setting the DTC

- DTC P1720 is not set.
- The vehicle type is not recognized. The EEPROM Vehicle Identification Number (VIN) value does not lie within the range 0-13. The malfunction is triggered immediately after this condition exists.

Action Taken When the DTC Sets

- If CAN is detected, OBD N32D VIN is selected. Or If CAN is not detected, P29 STi VIN is selected.
- Shift quality may by degraded.

Conditions for Clearing the DTC

- This DTC can only be cleared by reprogramming the EEPROM with the correct vehicle code and than cycling power to the TCM. This is a factor procedure.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Test Description

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

3. Perform the vehicle coding.

DTC P1714 EEPROM Vehicle Code Error

Step	Action	Value(s)		No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1714?	-	Go to Step 3	Go to Step 6
3	1. Select the required VIN on TCM Coding of scan tool. 2. Perform the vehicle coding. 3. Turn the ignition OFF. 4. Turn the ignition ON, with the engine OFF. Does the scan tool display P1714?	-	Go to Step 4	Go to Step 5
4	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 5	-
5	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 6	Go to Step 2
6	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

DIAGNOSTIC TROUBLE CODE (DTC) P1715 VPS OFFSET ERROR

Circuit Description

The VPS is used to regulate the clutch and band pressures during a shift. The TCM compares TP voltage, engine rpm and other inputs to determine the pressure appropriate for a given shift. The TCM will regulate pressure by applying a varying amperage to the Variable Pressure Solenoid (VPS) valve. The applied amperage can vary from 0 to 1.275 amps. The TCM then monitors the amperage at the return line.

This VPS offsets calibrate the accuracy between actual and expected VPS current.

The DTC P1715 sets when the VPS offset value stored in EEPROM is out of range when checked on initialization. The VPS offset is greater than 120 mA from nominal.

Conditions for Setting the DTC

- DTC P1720 is not set.
- The VPS offset is greater than 120 mA from nominal. The malfunction is triggered immediately after this condition exists.

Action Taken When the DTC Sets

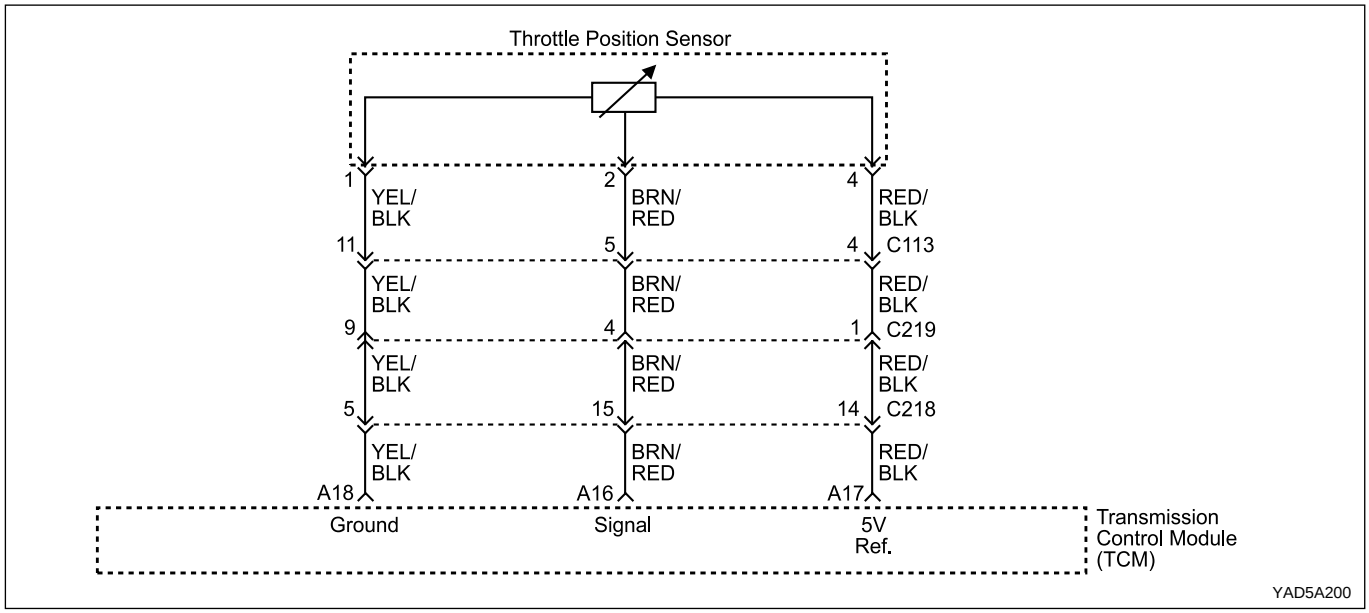
- Default values are used which are typical of the calibrated values.
- Shift quality may be degraded.

Conditions for Clearing the DTC

- This DTC can only be cleared by recalibrating the VPS and then cycling power to the TCM. This is a factory procedure.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

DTC P1715 VPS Offset Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1715?	-	Go to Step 3	Go to Step 5
3	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 4	-
4	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 5	Go to Step 2
5	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TABLE CODE (DTC) 1716
THROTTLE NOT LEARNT ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator etc. from ECM via CAN without any additional sensors.

The DTC P1716 sets when the throttle signal via CAN is out of range. The throttle is greater than 254 steps.

Conditions for Setting the DTC

- The minimum & maximum throttle positions have not been learnt by the TCU.

Action Taken When the DTC Sets

- The minimum & maximum throttle positions are set to their factory default values.
- Incorrect sensitivity to driver demand.
- Incorrect gear shift points.

Conditions for Clearing the DTC

- Throttle learns 0% position. This value must be greater than 0.2 V.

Diagnostic Aids

- This fault indicates that the TCU has not learnt the throttle position correctly since installation in the vehicle or that the throttle setting have been cleared by a diagnostic tool.

Test Description

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

4. The “Throttle Position Calibration Procedure” needs to be carried out. This is given in this section.

DTC P1716 Throttle Not Learnt Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1716?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Check if there are any DTCs related to the throttle position sensor. Are any DTCs related to throttle position sensor found?	-	Go to applicable DTC table	Go to Step 4
4	Fulfill the Throttle Clearing and Throttle Position Calibration. Is the repair complete?	-	Go to Step 6	Go to Step 5
5	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 6	-
6	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 7	Go to Step 2
7	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

DIAGNOSTIC TROUBLE CODE (DTC) P1717 RAM ERROR

Circuit Description

A normal function of the Transmission Control Module (TCM) programming is to perform an internal check that verifies the integrity of the RAM memory allocations.

The DTC P1717 sets when the Random Access Memory (RAM) is not operating correctly when checked on initialization. An area of RAM has failed a read/ write test.

Conditions for Setting the DTC

- An area of RAM has failed a read/ write test.
- Immediately after the above condition occurs.

Action Taken When the DTC Sets

- Adopt Limp Home Mode (LHM)
- Outputs are disabled.
- The transmission adopts the third gear LHM strategy of operation, independent of the vehicle speed. The operation of TCM under this condition is difficult to predict. Its operation may be erratic.

Conditions for Clearing the DTC

- The DTC will clear if the malfunction is not present after cycling the ignition.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- When DTC P1717 sets, the replacement of TCM is recommended.

DTC P1717 RAM Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. Does the scan tool display P1717?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 4	-
4	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 5	Go to Step 2
5	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

DIAGNOSTIC TROUBLE CODE (DTC) P1718 ROM ERROR

Circuit Description

A normal function of the Transmission Control Module (TCM) programming is to perform an internal check that verifies the integrity of the ROM memory allocations. This function is called a checksum.

The DTC P1718 sets when the Read Only Memory (ROM), program memory, is corrupted when checked on initialization. The calculated checksum disagrees with the stored checksum.

Conditions for Setting the DTC

- TCM has been powered ON for greater than 7 seconds.
- The calculated checksum disagrees with the stored checksum. The malfunction is triggered immediately after this condition exists.

Action Taken When the DTC Sets

- Adopt Limp Home Mode (LHM)
- The transmission adopts the third gear LHM strategy of operation, independent of the vehicle speed. The operation of TCM under this condition cannot be predicted. Its operation may be erratic.

Conditions for Clearing the DTC

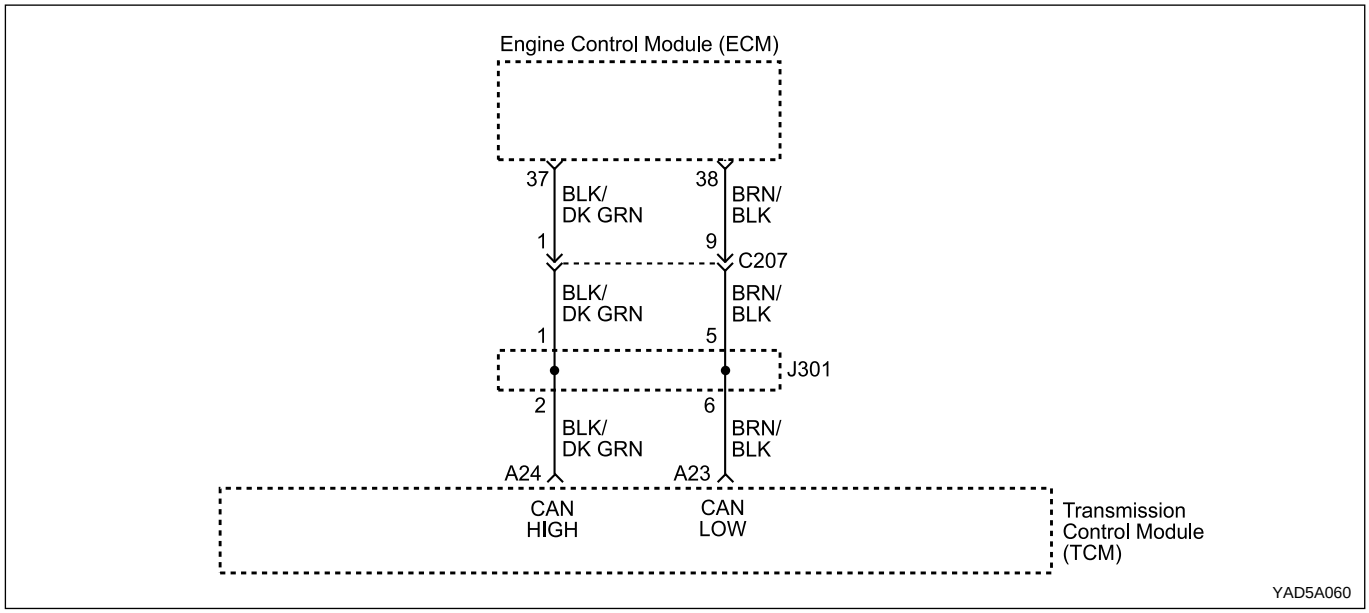
- The DTC will clear if the malfunction is not present after cycling the ignition.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- When DTC P1718 sets, the replacement of TCM is recommended.

DTC P1718 ROM Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. Does the scan tool display P1718?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 4	-
4	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 5	Go to Step 2
5	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1719 CAN BUS ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator position etc. from ECM via CAN without any additional sensors.

The DTC P1719 sets when the information required by TCM is not available on the CAN. One or more CAN messages used by the TCM is timed out, i.e. not refreshed for 1 second.

Conditions for Setting the DTC

- One or more CAN messages used by the TCM are timed out, i.e. not refreshed for 1 second.

Action Taken When the DTC Sets

- TCM uses default values for all CAN dependent signals.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and ECM connectors. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

6. Check for a poor connection at the ECM and TCM connectors.

DTC P1719 CAN Bus Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1719?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the TCM connector A. 3. Disconnect the Engine Control Module (ECM) connector. 4. Check the wiring harness from ECM connector terminal 38 to TCM connector terminal A23 for an open or a short. Is a problem found?	-	Go to Step 4	Go to Step 5
4	Repair the malfunctioning wiring harness. Is a repair complete?	-	Go to Step 10	-
5	Check the wiring harness from ECM connector terminal 37 to TCM connector terminal A24 for an open or a short. Is a problem found?	-	Go to Step 4	Go to Step 6
6	Check for a poor connection at the ECM connector or TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 10	Go to Step 7
7	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 8	-
8	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 10	Go to Step 9
9	1. Turn the ignition OFF. 2. Replace the TCM with the original.	-	Go to *Section 1F, Engine Control*	-
10	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 11	Go to Step 2
11	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

DIAGNOSTIC TROUBLE CODE (DTC) P1720 EEPROM ERROR

System Description

The Electrically Erasable Programmable Read-Only Memory (EEPROM) is a permanent memory chip that is physically soldered within the Transmission Control Module (TCM) The EEPROM contains the calibration information required for transmission and transmission diagnostics operation. When the EEPROM malfunctions, DTC P1720 will set. The EEPROM memory is corrupted and the calculated checksum disagrees with the stored checksum or an EEPROM communication failure has occurred when checked on initialization.

Conditions for Setting the DTC

- The calculated checksum disagrees with the stored checksum or an EEPROM communication failure has occurred when checked on initialization.
- Immediately after the above condition occurs.

Action Taken When the DTC Sets

- If CAN is detected, OBD N32D VIN is selected. Or If CAN is not detected, P29 STi VIN is selected.
- Default values are used which are typical of calibrated values.
- Shift quality may be degraded.

Conditions for Clearing the DTC

- The DTC will only clear if the malfunction is not present after cycling the ignition.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- When DTC 1720 is set, it is likely the TCM will need replacing.

DTC P1720 EEPROM Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1720?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 4	-
4	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 5	Go to Step 2
5	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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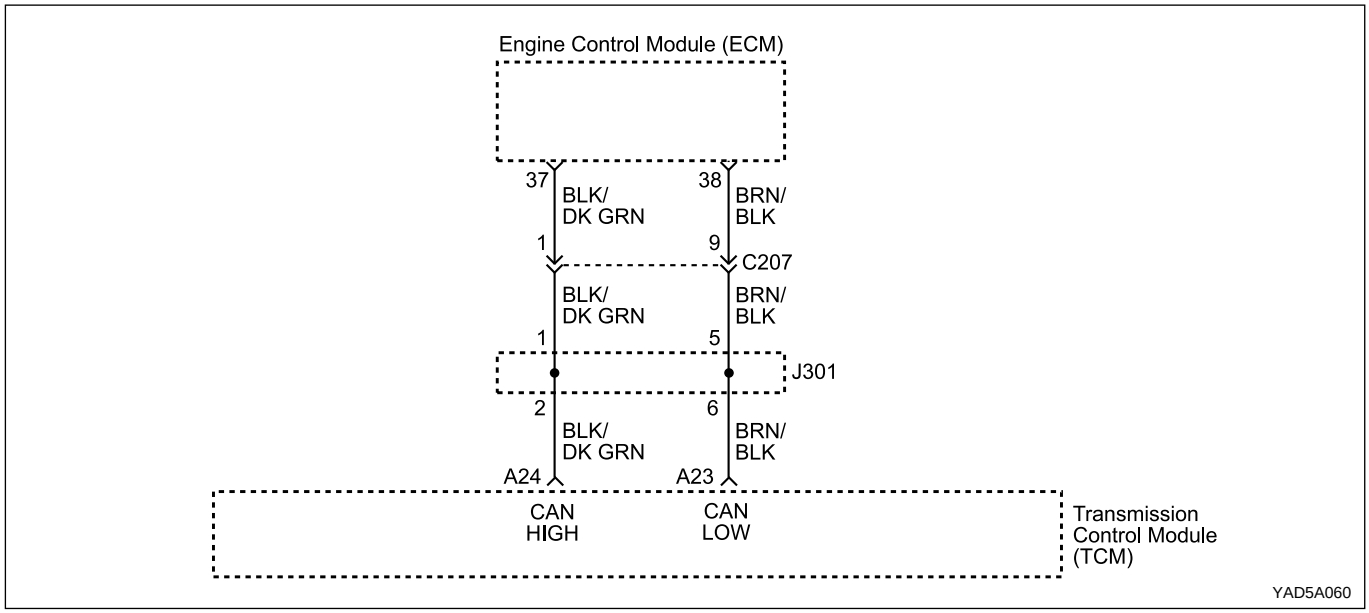


DIAGNOSTIC TROUBLE CODE (DTC) P1721 THROTTLE SIGNAL ERROR

Circuit Description

The Controller Area Network (CAN) connects various control modules by using a twisted pair of wires, to share common information. This results in a reduction of sensors and wiring. TCM obtains the actual engine speed and throttle position, vehicle speed and accelerator etc. from ECM via CAN without any additional sensors.

The DTC P1721 sets when the throttle signal via CAN is out of range. The throttle is greater than 254 steps.

Conditions for Setting the DTC

- DTC P1719 is not set.
- The throttle is greater than 254 steps. The malfunction triggers immediately after the above condition occurs.

Action Taken When the DTC Sets

- The throttle signal is defaulted to 100 %.
- Shift quality is degraded.
- All shifts will be firm as full throttle and hence high engine torque is assumed.
- Line pressure will always stay high (S6 OFF) to cope with the assumed high throttle/ torque.
- Manual 1 gear selection is inhibited.

Conditions for Clearing the DTC

- The DTC will clear if the malfunction is not present for 30 seconds.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM and ECM connectors. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- When ECM finds a fault on the throttle signals, ECM will adopt a default mode and send the default value and trouble message to TCM via CAN.

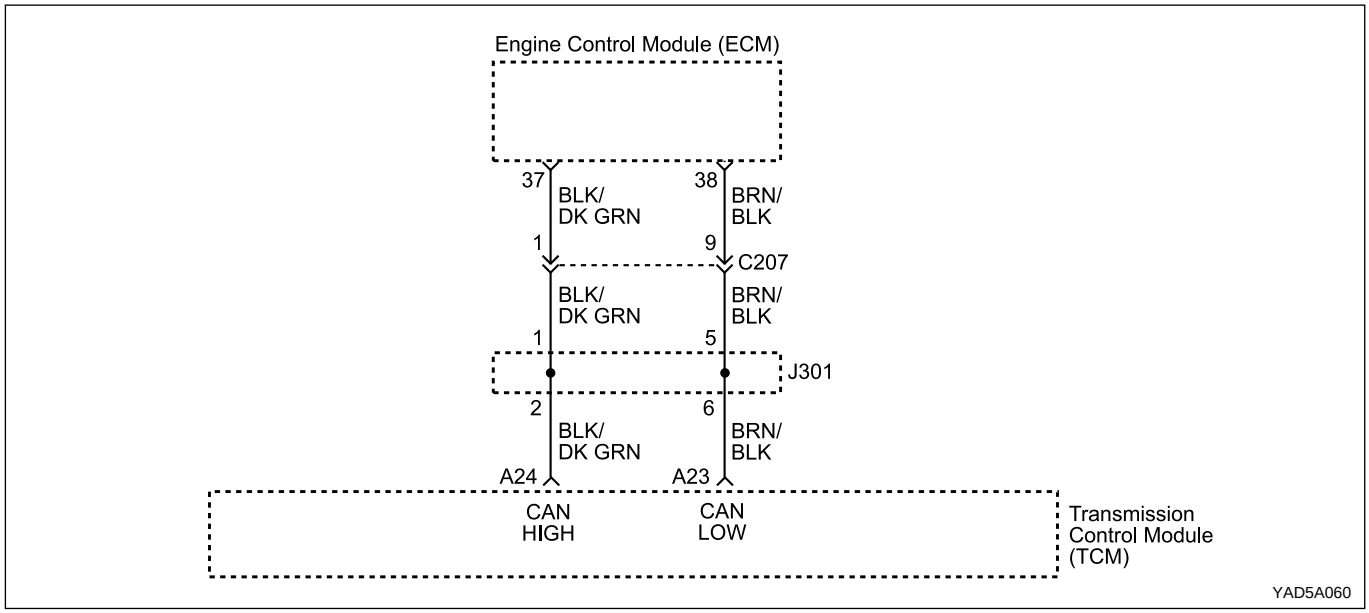
Test Description

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

3. Check if there are any DTCs related to the throttle position sensor on the ECM side.
4. Check for a poor connection at the ECM and TCM connectors.

DTC P1721 Throttle Signal Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1721?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Check if there are any DTCs related to the throttle position sensor on the ECM side. Are any DTCs related to throttle position sensor found?	-	Go to *Section 1F, Engine Controls*	Go to Step 4
4	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 5	-
5	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 6	Go to Step 2
6	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete



DIAGNOSTIC TROUBLE CODE (DTC) P1722 VEHICLE TYPE DETERMINATION ERROR

Circuit Description

The Electrically Erasable Programmable Read-Only Memory (EEPROM) is a permanent memory chip that is physically soldered within the Transmission Control Module (TCM) The EEPROM contains the program and the calibration information required for the transmission and transmission diagnostics operation.

The DTC P1722 sets when TCM is unable to determine the vehicle type from EEPROM or CAN. CAN vehicle type information is in error or unavailable in time.

By definition, there must by on EEPROM fault (P1720) or an EEPROM vehicle code error (P1714) to cause the TCM to try and determine the vehicle code by other means.

The DTC P1722 is a reflection of the significance of the problem caused by the other error.

Conditions for Setting the DTC

- EEPROM information is in error or unreliable.
- Vehicle type information on the CAN is not present or in error.
- The above condition exists for 1 second after power up.

Action Taken When the DTC Sets

- If CAN is detected, OBD N32D VIN is selected. Or If CAN is not detected, P29 STi VIN is selected.
- Shift quality may be degraded.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred after ignition cycle.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- Inspect the wiring for poor electrical connections at the TCM connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change

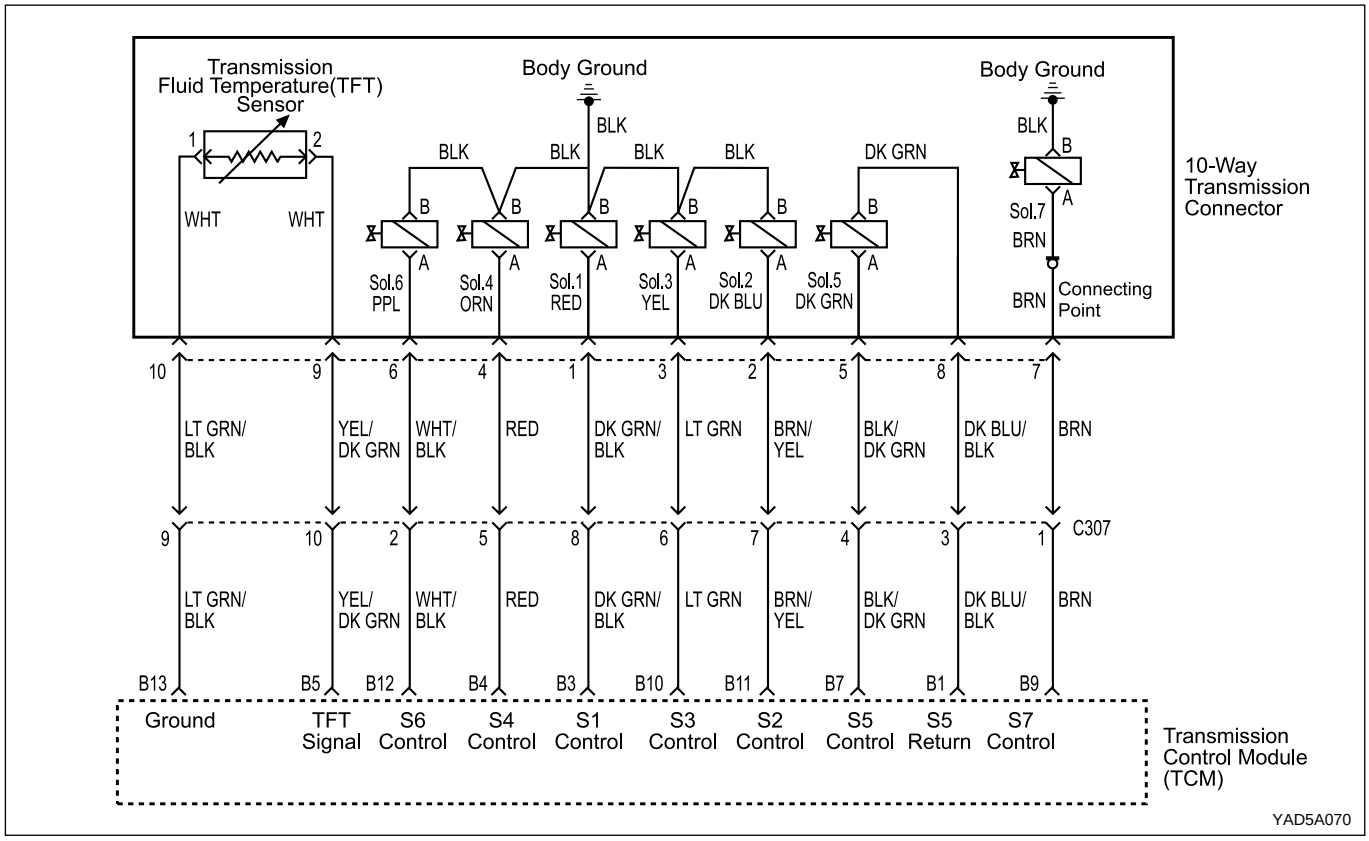
Test Description

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

3. If there are any other DTCs like P1714 or P1720, troubleshoot those prior to P1722.

DTC P1722 Vehicle Type Determination Error

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. Does the scan tool display P1722?	-	Go to Step 3	Go to "Diagnostic Aids"
3	Does the scan tool display DTC P1714.	-	Go to applicable DTC table	Go to DTC P1720 table



DIAGNOSTIC TROUBLE CODE (DTC) P1733 SOLENOID 1 CIRCUIT OPEN

Circuit Description

The solenoid 1 is used to control fluid flow acting on the 1-2 shift valve. The solenoid 1 is a normally open ON/ OFF type solenoid that is used in conjunction with the solenoid 2 to allow four different shifting combinations. Refer to Solenoid Logic for Static Gear States. The solenoid is attached to the valve body within the transmission. Voltage is supplied directly to the solenoid through the Transmission Control Module (TCM).

The DTC P1733 sets when the Solenoid 1 (S1) circuit is open or the switched leg of the solenoid 1 is shorted to battery positive.

Conditions for Setting the DTC

- DTCs P1717 and P1718 are not set.
- S1 is OFF.
- S2 is OFF.
- The solenoid 1's driver Integrated Chip (IC) status indicates a faulty circuit. This condition must be continuously present for 60 milliseconds.

Action Taken When the DTC Sets

- The solenoid 1 is always OFF.
- TCM adopts a Limp Home Mode (LHM) operation.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred after ignition cycle.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- During the TCM's testing, solenoid 1 is turned OFF/ ON by a very small (4 millisecond) pulse. This pulse is too short for the solenoid to react so the transmission operation is not affected.
- The solenoid feedback voltage is measured before the (4 millisecond) pulse and again during the pulse. If the difference is outside the acceptable limits the relevant fault is recorded.
- Typical causes would be an open circuit in the wiring to or within the solenoid, or a short circuit to power in the wiring to or within the solenoid.
- If several faults of solenoids are present, check the wiring or connectors that are common to the selected solenoids, especially the earth connections.

- Inspect the wiring for poor electrical connections at the TCM and at the 10-way transmission connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- Solenoid Logic for Static Gear States

Gear	S1	S2
1st	ON	ON
2nd	OFF	ON
3rd	OFF	OFF
4th	ON	OFF
Reverse	OFF	OFF
Neutral	OFF	OFF
Park	OFF	OFF

Test Description

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

3. Checks if the S1 circuit in the transmission is malfunctioning.
4. Check cable in the transmission for open / short.
6. Check resistance between S1 terminal A and B. Standard value is 22 - 30 Ω.
9. Check poor connections of other connectors

DTC P1733 Solenoid 1 Circuit Open

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1733?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector. (additional DTCs will set) 3. Connect Solenoid/Thermistor Electrical Tester (STET) to the 10-way transmission connector of transmission side and to the good ground. 4. Turn the mode knob of STET to 1 and push the red button. Does the bulb of open circuit on the solenoids side of STET illuminate?	-	Go to Step 4	Go to Step 8
4	1. Remove the valve cover. Refer to the Transmission in this section. 2. Check the wiring harness from 10-way transmission connector to Solenoid 1 (S1) on the valve body for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 5
5	Check the S1 ground circuit for an open and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 6

DTC P1733 Solenoid 1 Circuit Open (Cont'd)

Step	Action	Value(s)	Yes	No
6	Using a Digital Volt Meter (DVM), measure the resistance between S1 terminal A and B. Is the resistance within the specified value?	22 - 30 Ω	Go to "Diagnostic Aids"	Go to Step 7
7	Replace the S1. Is the action complete?	-	Go to Step 11	-
8	1. Disconnect the TCM connector B. 2. Check the wiring harness from 10-way transmission connector terminal 1 to TCM terminal B3 for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9
9	Check for a poor connection at the 10-way transmission connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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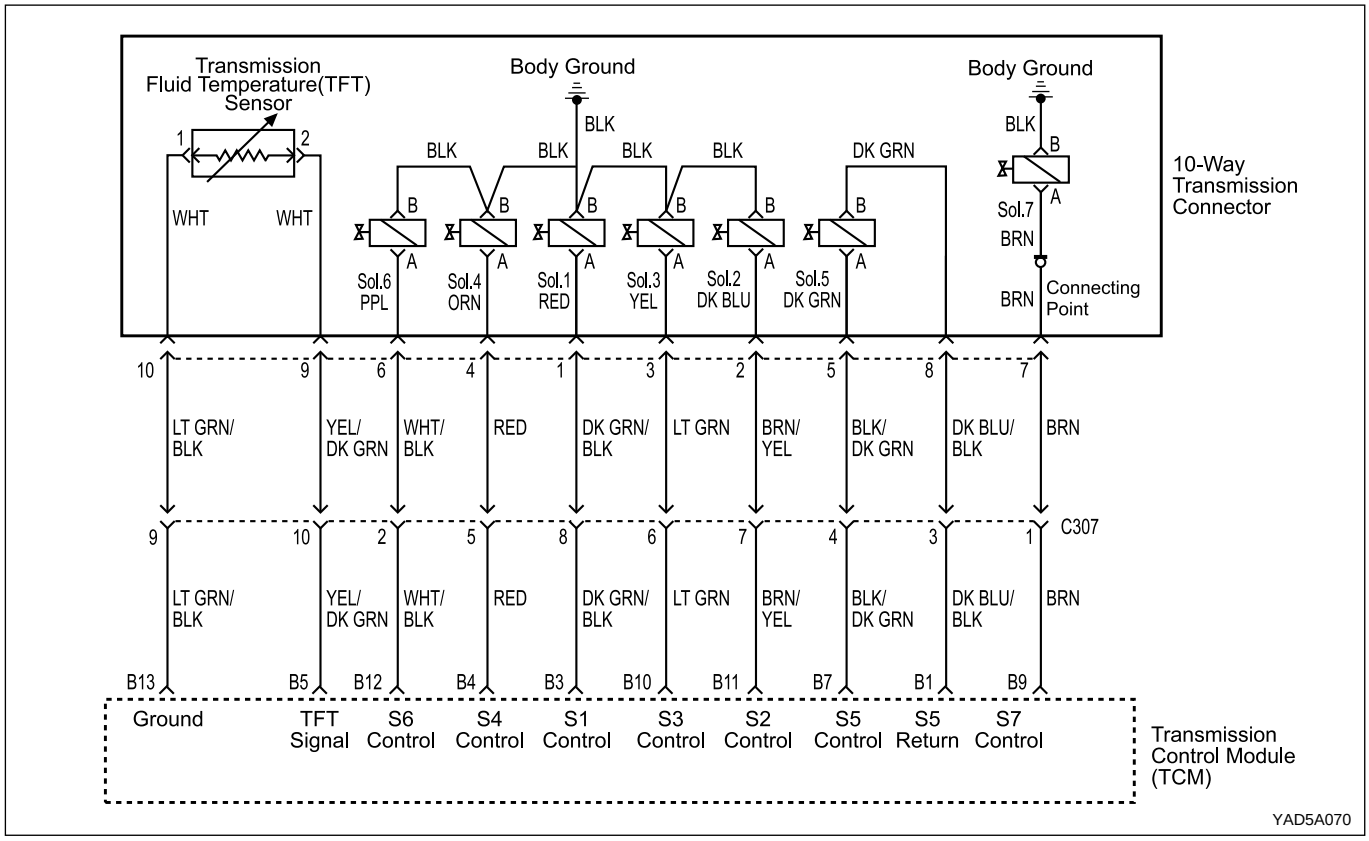

DIAGNOSTIC TROUBLE CODE (DTC) P1734 SOLENOID 2 CIRCUIT OPEN

Circuit Description

The solenoid 2 is used to control fluid flow acting on the 2-3 shift valve. The solenoid 2 is a normally open ON/ OFF type solenoid that is used in conjunction with the solenoid 1 to allow four different shifting combinations. Refer to Solenoid Logic for Static Gear States.

The solenoid is attached to the valve body within the transmission. Voltage is supplied directly to the solenoid through the Transmission Control Module (TCM).

The DTC P1734 sets when the Solenoid 2 (S2) circuit is open or the switched leg of the solenoid 2 is shorted to battery positive.

Conditions for Setting the DTC

- DTCs P1717 and P1718 are not set.
- S2 is OFF.
- S1 is OFF.
- The solenoid 2's driver Integrated Chip (IC) status indicates a faulty circuit. This condition must be continuously present for 60 milliseconds.

Action Taken When the DTC Sets

- The solenoid 2 is always OFF.
- TCM adopts a Limp Home Mode (LHM) operation.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred after ignition cycle.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- During the TCM's testing, solenoid 2 is turned OFF/ ON by a very small (4 millisecond) pulses. This pulse is too short for the solenoid to react so the transmission operation is not affected.
- The solenoid feedback voltage is measured before the (4 millisecond) pulse and again during the pulse. If the difference is outside the acceptable limits the relevant fault is recorded.
- Typical causes would be an open circuit in the wiring to or within the solenoid, or a short circuit to power in the wiring to or within the solenoid.
- If several faults of solenoids are present, check the wiring or connectors that are common to the selected solenoids, especially the earth connections.

- Inspect the wiring for poor electrical connections at the TCM and at the 10-way transmission connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.
- Solenoid Logic for Static Gear States

Gear	S1	S2
1st	ON	ON
2nd	OFF	ON
3rd	OFF	OFF
4th	ON	OFF
Reverse	OFF	OFF
Neutral	OFF	OFF
Park	OFF	OFF

Test Description

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

3. Checks if the S2 circuit in the transmission is malfunctioning.
4. Check cable in the transmission for open / short.
6. Check resistance between S2 terminal A and B. Standard value is 22 - 30 Ω.
9. Check connections of other connectors

DTC P1734 Solenoid 2 Circuit Open

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1734?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector. (additional DTCs will set) 3. Connect Solenoid/Thermistor Electrical Tester (STET) to the 10-way transmission connector of transmission side and to the good ground. 4. Turn the mode knob of STET to 2 and push the red button. Does the bulb of open circuit on the solenoids side of STET illuminate?	-	Go to Step 4	Go to Step 8
4	1. Remove the valve cover. Refer to the Transmission in this section. 2. Check the wiring harness from 10-way transmission connector to Solenoid 2 (S2) on the valve body for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 5
5	Check the S2 necessarycircuit for an open and repair as necessary. Is a repair complete?	-	Go to Step 11	Go to Step 6

DTC P1734 Solenoid 2 Circuit Open (Cont'd)

Step	Action	Value(s)	Yes	No
6	Using a Digital Volt Meter (DVM), measure the resistance between S2 terminal A and B. Is the resistance within the specified value?	22 - 30 Ω	Go to "Diagnostic Aids"	Go to Step 7
7	Replace the S2. Is the action complete?	-	Go to Step 11	-
8	1. Disconnect the TCM connector B. 2. Check the wiring harness from 10-way transmission connector terminal 2 to TCM terminal B11 for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9
9	Check for a poor connection at the 10-way transmission connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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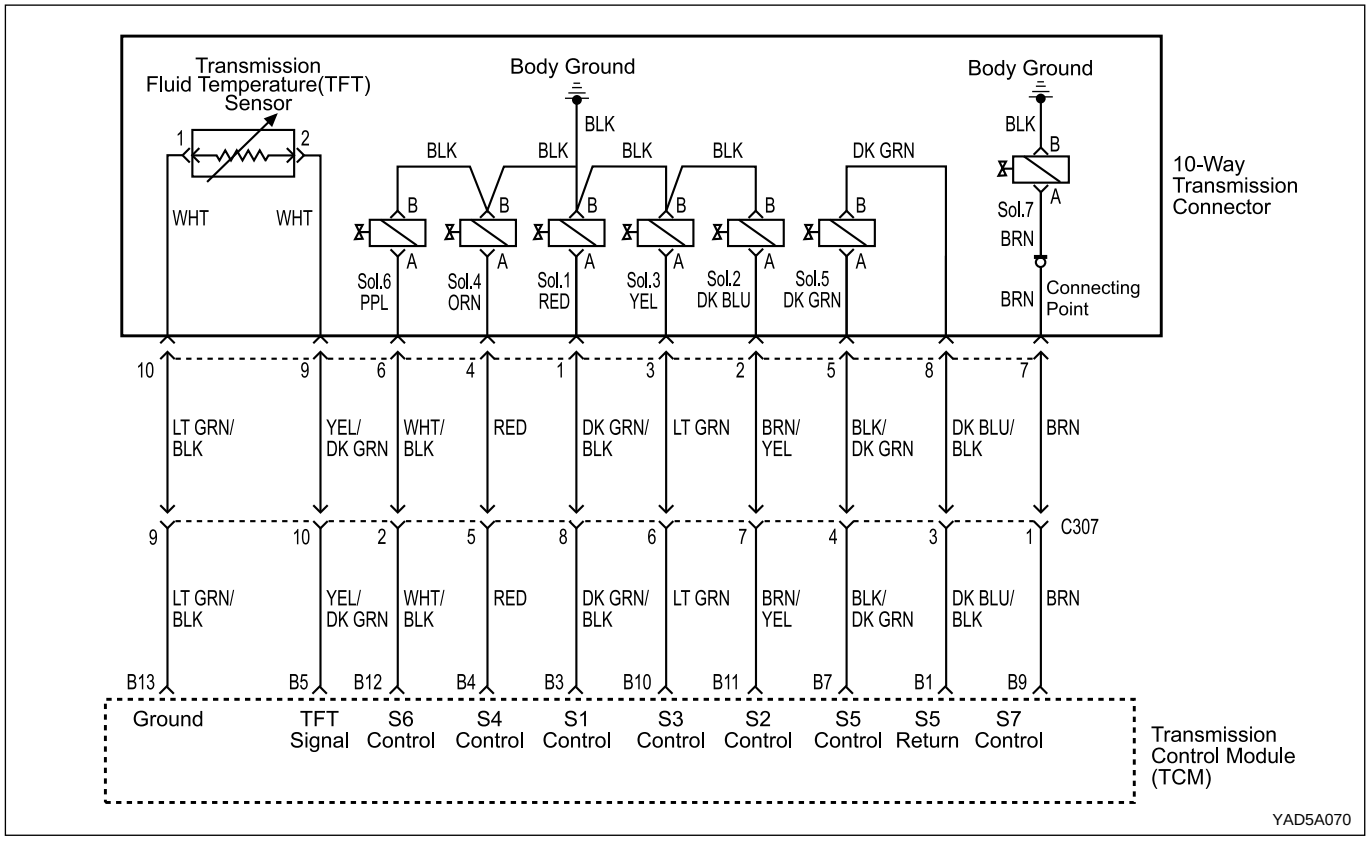

DIAGNOSTIC TROUBLE CODE (DTC) P1735 SOLENOID 3 CIRCUIT OPEN

Circuit Description

The solenoid 3 is a normally open ON/OFF type solenoid that is used in conjunction with the solenoid 4 to control the shift quality and sequencing.

The solenoid 3 switches the clutch regulator valve OFF or ON and is attached to the valve body within the transmission. Voltage is supplied directly to the solenoid through the Transmission Control Module (TCM).

The DTC P1735 sets when the Solenoid 3 (S3) circuit is open or the switched leg of the solenoid 3 is shorted to battery positive. The solenoid 3's driver Integrated Chip (IC) status indicates a faulty circuit.

Conditions for Setting the DTC

- DTCs P1717 and P1718 are not set.
- S3 is OFF.
- S7 is OFF.
- The solenoid 3's driver Integrated Chip (IC) status indicates a faulty circuit. This condition must be continuously present for 60 milliseconds.

Action Taken When the DTC Sets

- The solenoid 3 is always OFF.
- The 1 $\rightarrow$ 3, 1 $\rightarrow$ 4, 2 $\rightarrow$ 3, 2 $\rightarrow$ 4, 3 $\rightarrow$ 1, 3 $\rightarrow$ 2, 4 $\rightarrow$ 2 and 4 $\rightarrow$ 1 shift quality is degraded.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred after ignition cycle.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- During the TCM's testing, solenoid 3 is turned OFF/ ON by a very small (4 millisecond) pulses. This pulse is too short for the solenoid to react so the transmis-sion operation is not affected.
- The solenoid feedback voltage is measured before the (4 millisecond) pulse and again during the pulse. If the difference is outside the acceptable limits the relevant fault is recorded.
- Typical causes would be an open circuit in the wiring to or within the solenoid, or a short circuit to power in the wiring to or within the solenoid.
- If several faults of solenoids are present, check the wiring or connectors that are common to the selected solenoids, especially the earth connections.

- Inspect the wiring for poor electrical connections at the TCM and at the 10-way transmission connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire in-side the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

3. Checks if the S3 circuit in the transmission is malfunctioning.
4. Check cable in the transmission for open / short.
6. Check resistance between S3 terminal A and B. Standard value is 22 - 30 Ω.
9. Check connections of other connectors

DTC P1735 Solenoid 3 Circuit Open

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1735?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector. (additional DTCs will set) 3. Connect Solenoid/Thermistor Electrical Tester (STET) to the 10-way transmission connector of transmission side and to the good ground. 4. Turn the mode knob of STET to 3 and push the red button. Does the bulb of open circuit on the solenoids side of STET illuminate?	-	Go to Step 4	Go to Step 8
4	1. Remove the valve cover. Refer to the Transmission in this section. 2. Check the wiring harness from 10-way transmission connector to Solenoid 3 (S3) on the valve body for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 5
5	Check the S3 ground circuit for an open and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 6
6	Using a Digital Volt Meter (DVM), measure the resistance between S3 terminal A and B. Is the resistance within the specified value?	22 - 30 Ω	Go to "Diagnostic Aids"	Go to Step 7
7	Replace the S3. Is the action necessary?	-	Go to Step 11	-
8	1. Disconnect the TCM connector B. 2. Check the wiring harness from 10-way transmission connector terminal 3 to TCM terminal B10 for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9

DTC P1735 Solenoid 3 Circuit Open (Cont'd)

Step	Action	Value(s)	Yes	No
9	Check for a poor connection at the 10-way transmission connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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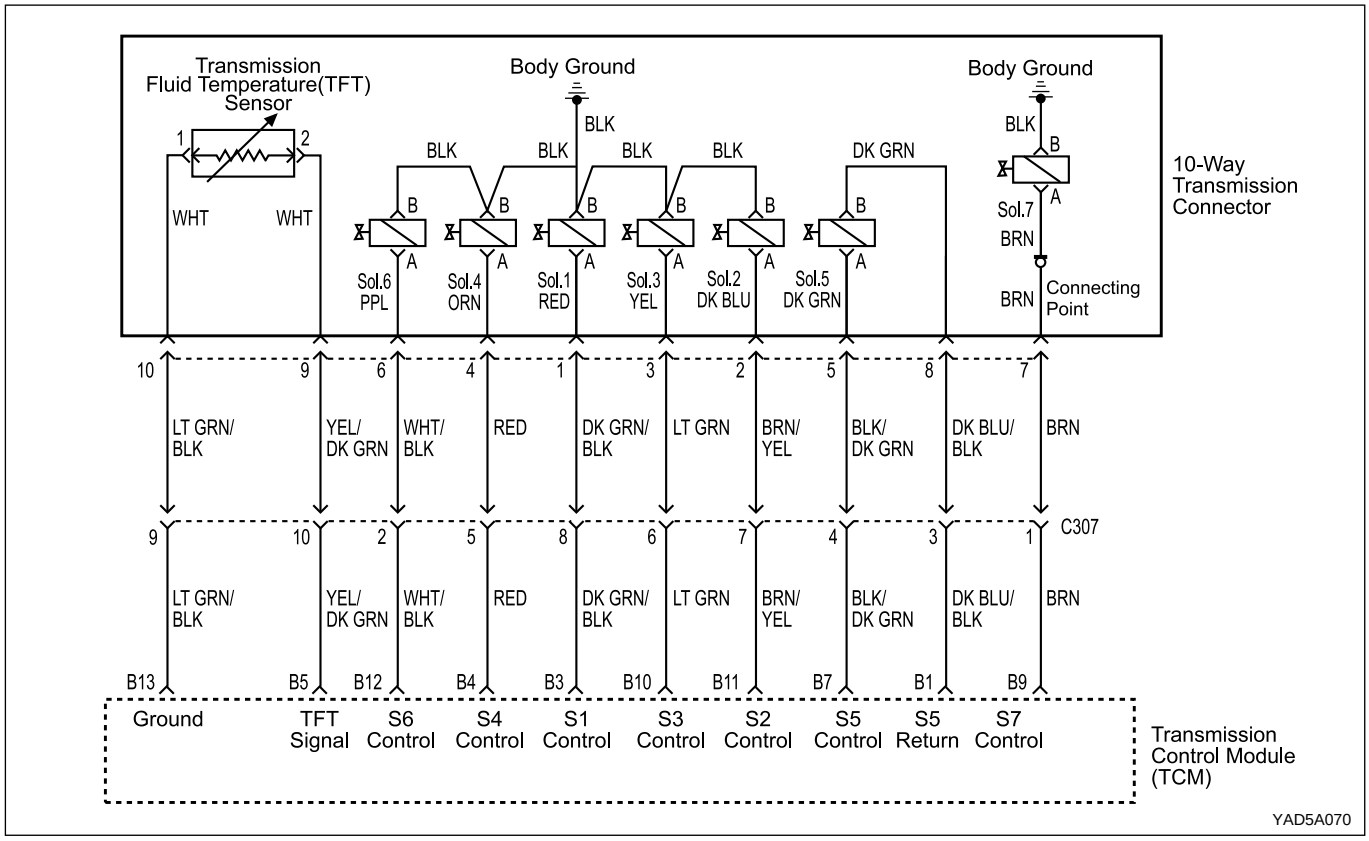

DIAGNOSTIC TROUBLE CODE (DTC) P1736 SOLENOID 4 CIRCUIT OPEN

Circuit Description

The solenoid 4 is a normally open ON/OFF type solenoid that is used in conjunction with the solenoid 3 to control the shift quality and sequencing.

The solenoid 4 switches the clutch regulator valve OFF or ON and is attached to the valve body within the transmission. Voltage is supplied directly to the solenoid through the Transmission Control Module (TCM).

The DTC P1736 sets when the Solenoid 4 (S4) circuit is open or the switched leg of the solenoid 4 is shorted to battery positive. The solenoid 4's driver Integrated Chip (IC) status indicates a faulty circuit.

Conditions for Setting the DTC

- DTCs P1717 and P1718 are not set.
- S4 is OFF.
- S6 is OFF.
- The solenoid 3's driver Integrated Chip (IC) status indicates a faulty circuit. This condition must be continuously present for 60 milliseconds.

Action Taken When the DTC Sets

- The solenoid 4 is always OFF.
- The 1 → 2, 1 → 4, 2 → 3, 2 → 4, 3 → 2 (all including manual), 3 → 4, 4 → 1 and 4 → 3 shift quality is degraded.

Conditions for Clearing the DTC

- The DTC will clear when the malfunction has not occurred after ignition cycle.
- A history DTC will clear after 40 TCM power-up cycles with a warm transmission (>50 °C) and without a fault.
- History DTCs can be cleared by using a scan tool.

Diagnostic Aids

- During the TCM's testing, solenoid 4 is turned OFF/ ON by a very small (4 millisecond) pulses. This pulse is too short for the solenoid to react so the transmission operation is not affected.
- The solenoid feedback voltage is measured before the (4 millisecond) pulse and again during the pulse. If the difference is outside the acceptable limits the relevant fault is recorded.
- Typical causes would be an open circuit in the wiring to or within the solenoid, or a short circuit to power in the wiring to or within the solenoid.
- If several faults of solenoids are present, check the wiring or connectors that are common to the selected solenoids, especially the earth connections.

- Inspect the wiring for poor electrical connections at the TCM and at the 10-way transmission connector. Look for possible bent, backed out, deformed or damaged terminals. Check for weak terminal tension as well. Also check for chafed wires that could short to bare metal or other wiring. Inspect for broken wire inside the insulation.
- If diagnosing for a possible intermittent short or open condition, move or massage the wiring harness while observing test equipment for a change.

Test Description

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

3. Checks if the S4 circuit in the transmission is malfunctioning.
4. Check cable in the transmission for open / short.
6. Check resistance between S4 terminal A and B. Standard value is 22 - 30 Ω.
9. Check connections of other connectors

DTC P1736 Solenoid 4 Circuit Open

Step	Action	Value(s)	Yes	No
1	Perform a Transmission Control Module (TCM) Diagnostic System Check. Is the check performed?	-	Go to Step 2	Go to "TCM Diagnostic System Check"
2	1. Install the scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Record and then clear DTCs. 4. Operate the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool display P1736?	-	Go to Step 3	Go to "Diagnostic Aids"
3	1. Turn the ignition OFF. 2. Disconnect the 10-way transmission connector. (additional DTCs will set) 3. Connect Solenoid/Thermistor Electrical Tester (STET) to the 10-way transmission connector of transmission side and to the good ground. 4. Turn the mode knob of STET to 4 and push the red button. Does the bulb of open circuit on the solenoids side of STET illuminate?	-	Go to Step 4	Go to Step 8
4	1. Remove the valve cover. Refer to the Transmission in this section. 2. Check the wiring harness from 10-way transmission connector to Solenoid 4 (S4) on the valve body for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 5
5	Check the S4 ground circuit for an open and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 6
6	Using a Digital Volt Meter (DVM), measure the resistance between S4 terminal A and B. Is the resistance within the specified value?	22 - 30 Ω	Go to "Diagnostic Aids"	Go to Step 7
7	Replace the S4. Is the action necessary?	-	Go to Step 11	-
8	1. Disconnect the TCM connector B. 2. Check the wiring harness from 10-way transmission connector terminal 4 to TCM terminal B4 for an open or short to positive and repair as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 9

DTC P1736 Solenoid 4 Circuit Open (Cont'd)

Step	Action	Value(s)	Yes	No
9	Check for a poor connection at the 10-way transmission connector and TCM connector and repair the malfunctioning terminals as necessary. Is a repair necessary?	-	Go to Step 11	Go to Step 10
10	1. Turn the ignition OFF. 2. Replace the TCM. Is the action complete?	-	Go to Step 11	-
11	1. Using the scan tool, clear the DTCs. 2. Road test the vehicle within the conditions for setting this DTC as specified in the text. Does the scan tool indicate that this diagnostic has run and passed?	-	Go to Step 12	Go to Step 2
12	Check if any DTCs are set. Are there any DTCs displayed or previously recorded at Step 2 that have not been diagnosed?	-	Go to applicable DTC table	System OK, Check Complete

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