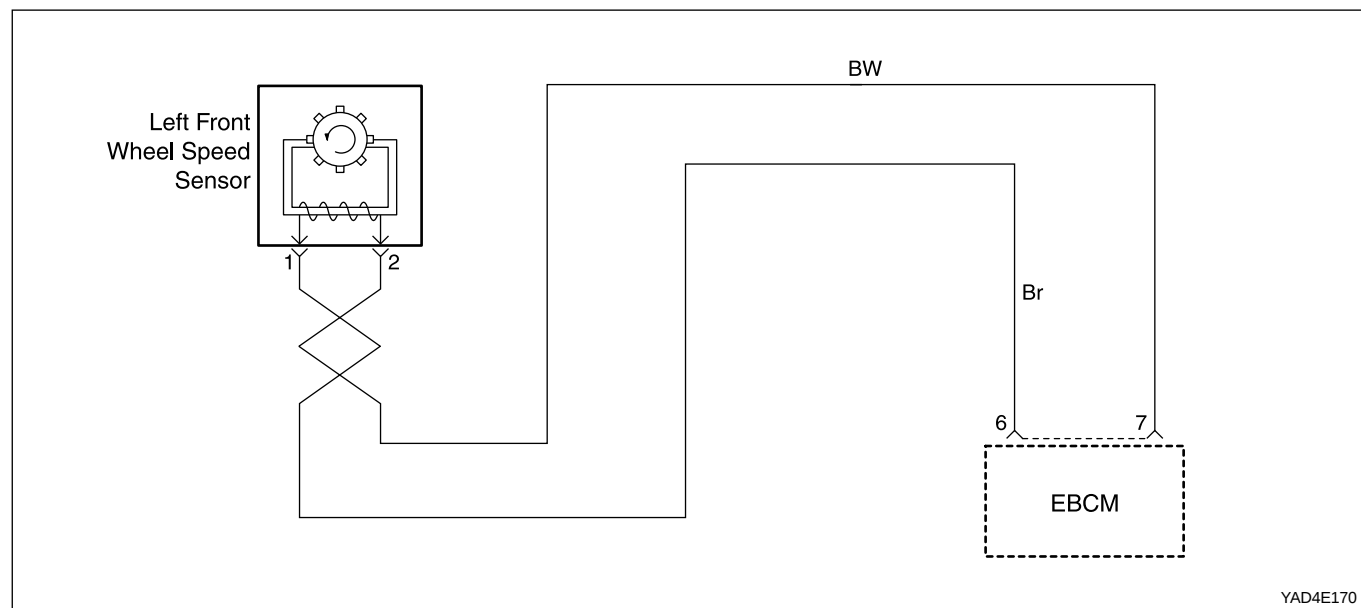




YAD4E170

DIAGNOSTIC TROUBLE CODE (DTC) 035 LEFT FRONT WHEEL SPEED SENSOR FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
6. This step tests the wiring for a short to voltage.
8. This step tests the wiring for a short to ground.
10. This step tests for an open or a high resistance in the wiring.

Diagnostic Aids

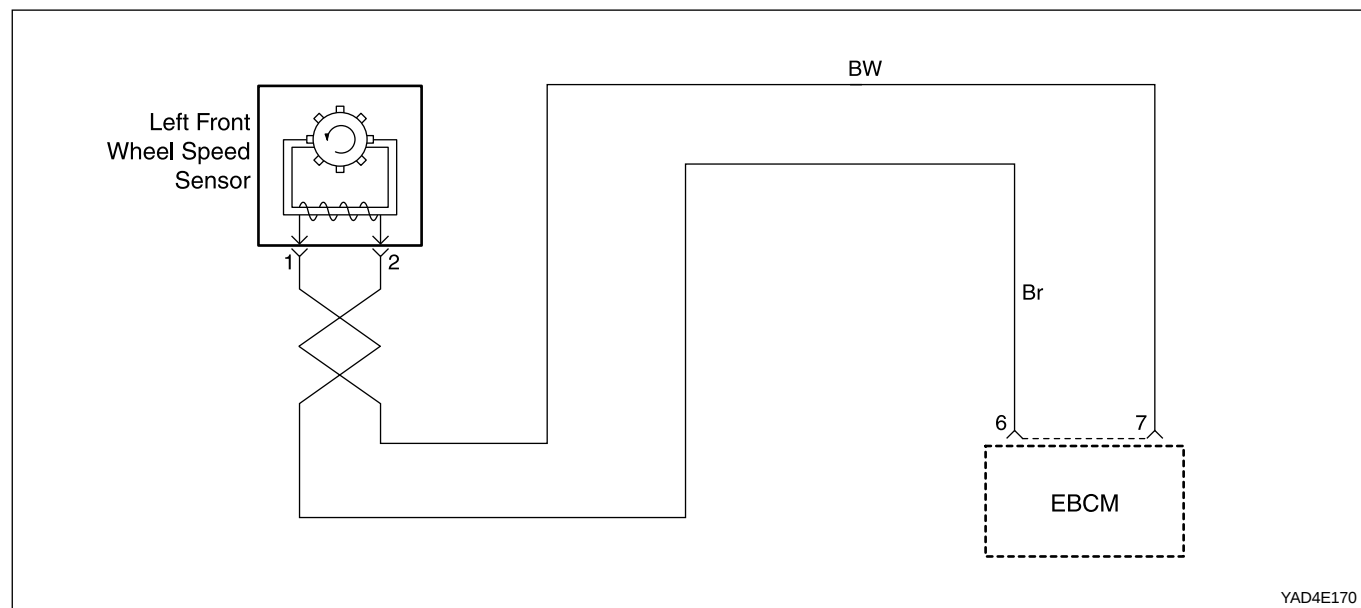
Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

Use the scan tool to monitor wheel speeds during a road test. Watch the wheel speeds being displayed on the scan tool to see if any of the readings are unusual, such as one sensor varying in speed from the other three, a signal going intermittently high or low, etc. If this does not identify the intermittent, wet the speed sensor harness on the underside of the vehicle and perform a road test, monitoring wheel speeds with the scan tools.

DTC 035 - Left Front Wheel Speed Sensor Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the left front wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Switch the DVM to the AC mV. 2. Measure the voltage output between the wheel speed sensor terminals while rotating the wheel about 1 revolution per second. Is the output within the specified value?	≈ 70 mV	Go to Step 10	Go to Step 9
5	Replace the speed sensor or the toothed wheel, as required. Is the repair complete?	-	System OK	-
6	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 7	Go to Step 8
7	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
8	1. Turn the ignition to LOCK. 2. Measure the resistance to ground from terminal 6 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 7 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	Go to Step 9	Go to Step 10
9	Repair the short to ground in the affected circuit. Is the repair complete?	-	System OK	-
10	1. Measure the resistance between terminal 7 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 6 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 11	Go to Step 12
11	Repair the open or the high resistance in the affected circuit, as required. Is the repair complete?	-	System OK	-
12	Replace the ABS unit. Is the repair complete?	-	System OK	-



YAD4E170

DIAGNOSTIC TROUBLE CODE (DTC) 07 - LEFT FRONT WHEEL SPEED SENSOR CONTINUITY FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
4. This step tests the wiring for a short to voltage.
6. This step tests the wiring for a short to ground.
8. This step tests for an open or high resistance in the wiring.

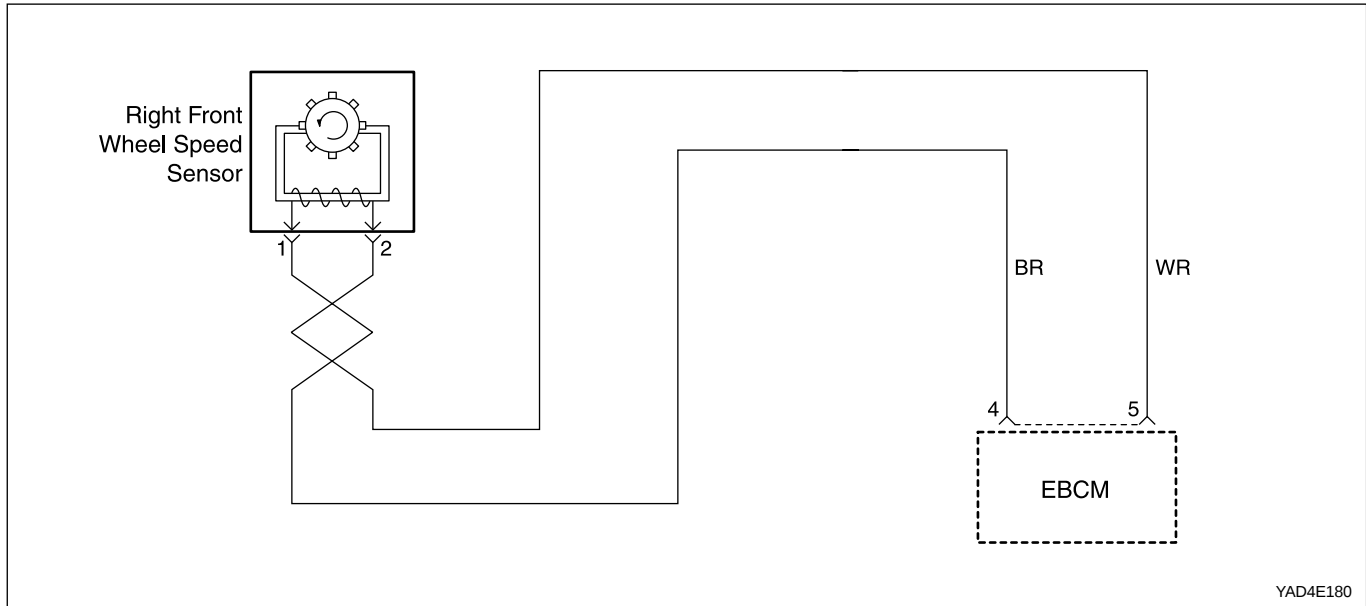
Diagnostic Aids

Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

DTC 07 - Left Front Wheel Speed Sensor Continuity Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the left front wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 5	Go to Step 6
5	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
6	1. Turn the ignition go LOCK. 2. Measure the resistance to ground from terminal 6 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 7 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	Go to Step 7	Go to Step 8
7	Repair the short to ground in the affected circuit. Is the repair complete?	-	System OK	-
8	1. Measure the resistance between terminal 6 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 7 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 9	Go to Step 10
9	Repair the open or high resistance in the affected circuit as required. Is the repair complete?	-	System OK	-
10	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 040 - RIGHT FRONT WHEEL SPEED SENSOR FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
6. This step tests the wiring for a short to voltage.
8. This step tests the wiring for a short to ground.
10. This step tests for an open or a high resistance in the wiring.

Diagnostic Aids

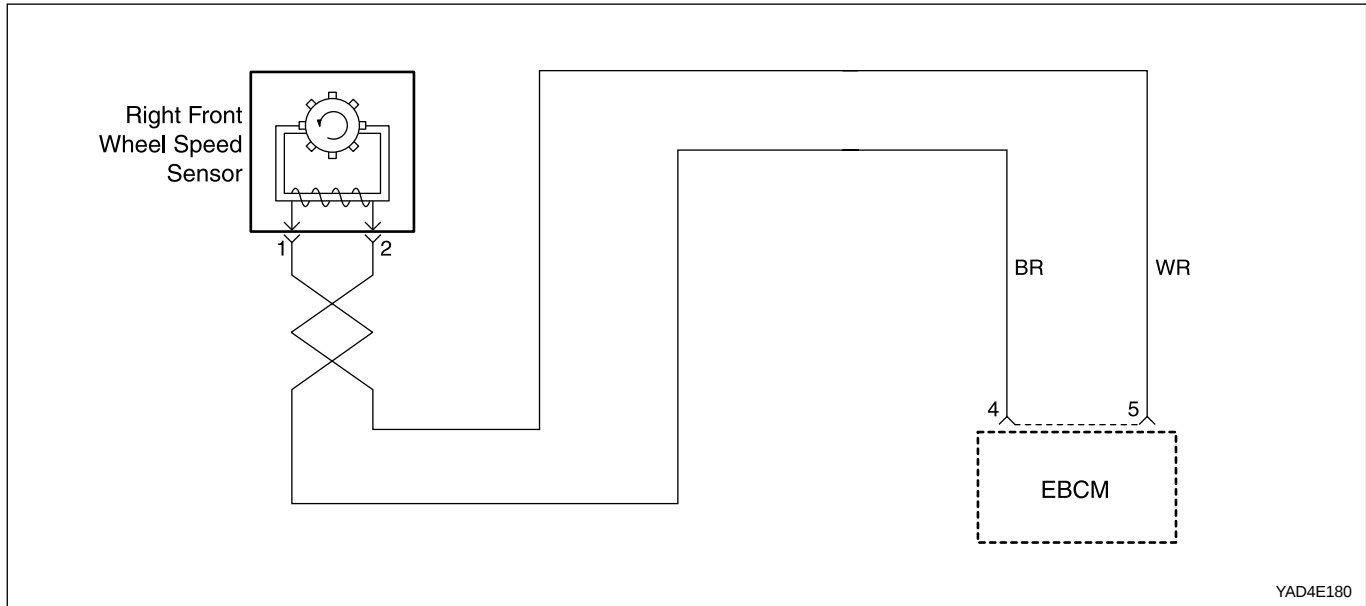
Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

Use the scan tool to monitor wheel speeds during a road test. Watch the wheel speeds being displayed on the scan tool to see if any of the readings are unusual, such as one sensor varying in speed from the other three, a signal going intermittently high or low, etc. If this does not identify the intermittent, wet the speed sensor harness on the underside of the vehicle and perform a road test, monitoring wheel speeds with the scan tools.

DTC 040 - Right Front Wheel Speed Sensor Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the right front wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Switch the DVM to the AC mV. 2. Measure the voltage output between the wheel speed sensor terminals while rotating the wheel about 1 revolution per second. Is the output within the specified value?	≈ 70 mV	Go to Step 6	Go to Step 5
5	Replace the speed sensor or the toothed wheel, as required. Is the repair complete?	-	System OK	-
6	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 7	Go to Step 8
7	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
8	1. Turn the ignition to LOCK. 2. Measure the resistance to ground from terminal 4 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 5 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	Go to Step 9	Go to Step 9	Go to Step 10
9	Repair the short to ground in the affected circuit. Is the repair complete?	-	System OK	-
10	1. Measure the resistance between terminal 4 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 5 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 11	Go to Step 12
11	Repair the open or high resistance in the affected circuit, as required. Is the repair complete?	-	System OK	-
12	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 08 - RIGHT FRONT WHEEL SPEED SENSOR CONTINUITY FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
4. This step tests the wiring for a short to voltage.
6. This step tests the wiring for a short to ground.
8. This step tests for an open or high resistance in the wiring.

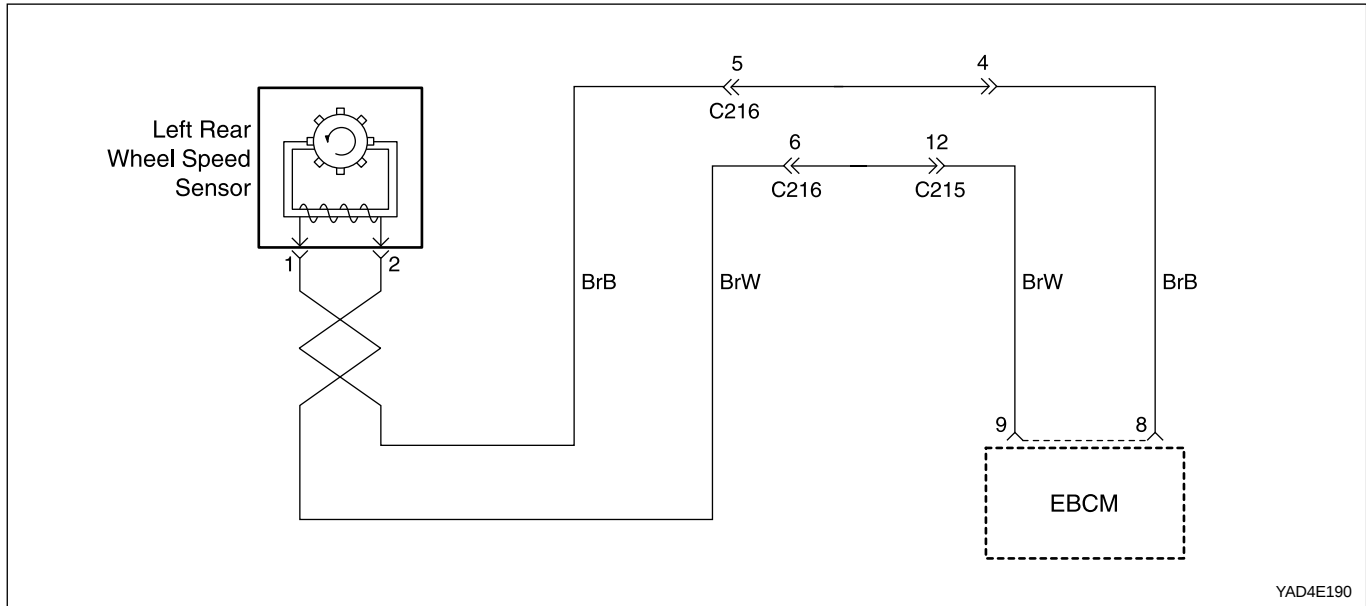
Diagnostic Aids

Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

DTC 08 - Right Front Wheel Speed Sensor Continuity Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the right front wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 5	Go to Step 6
5	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
6	1. Turn the ignition go LOCK. 2. Measure the resistance to ground from terminal 4 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 5 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	System OK	Go to Step 7
7	1. Measure the resistance between terminal 4 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 5 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 8	Go to Step 9
8	Repair the open or high resistance in the affected circuit as required. Is the repair complete?	-	System OK	-
9	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 045 - LEFT REAR WHEEL SPEED SENSOR FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective or disconnected.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
4. This step tests the wiring for a short to voltage.
6. This step tests the wiring for a short to ground.
8. This step tests for an open or a high resistance in the wiring.

Diagnostic Aids

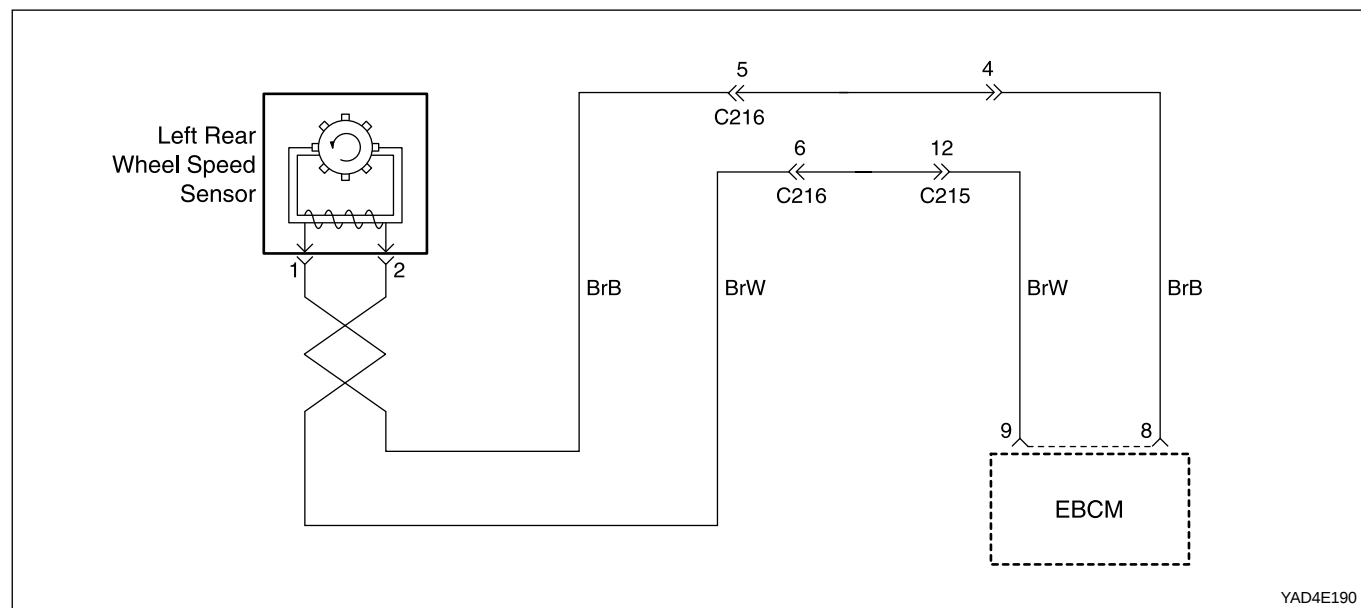
Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

Use the scan tool to monitor wheel speeds during a road test. Watch the wheel speeds being displayed on the scan tool to see if any of the readings are unusual, such as one sensor varying in speed from the other three, a signal going intermittently high or low, etc. If this does not identify the intermittent, wet the speed sensor harness on the underside of the vehicle and perform a road test, monitoring the wheel speeds with the scan tool.

DTC 045 - Left Rear Wheel Speed Sensor Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the left rear wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Switch the DVM to the AC mV. 2. Measure the voltage output between the wheel speed sensor terminals while rotating the wheel about 1 revolution per second. Is the output within the specified value?	≈ 70 mV	Go to Step 6	Go to Step 5
5	Replace the speed sensor or the toothed wheel, as required. Is the repair complete?	-	System OK	-
6	1. Disconnect the from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 7	Go to Step 8
7	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
8	1. Turn the ignition to LOCK. 2. Measure the resistance to ground from terminal 8 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 9 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	Go to Step 9	Go to Step 10
9	Repair the short to ground in the affected circuit. Is the repair complete?	-	System OK	-
10	1. Measure the resistance between terminal 8 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 9 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 11	Go to Step 12
11	Repair the open or high resistance in the affected circuit, as required. Is the repair complete?	-	System OK	-
12	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) - LEFT REAR WHEEL SPEED SENSOR CONTINUITY FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
4. This step tests the wiring for a short to voltage.
6. This step tests the wiring for a short to ground.
8. This step tests for an open or high resistance in the wiring.

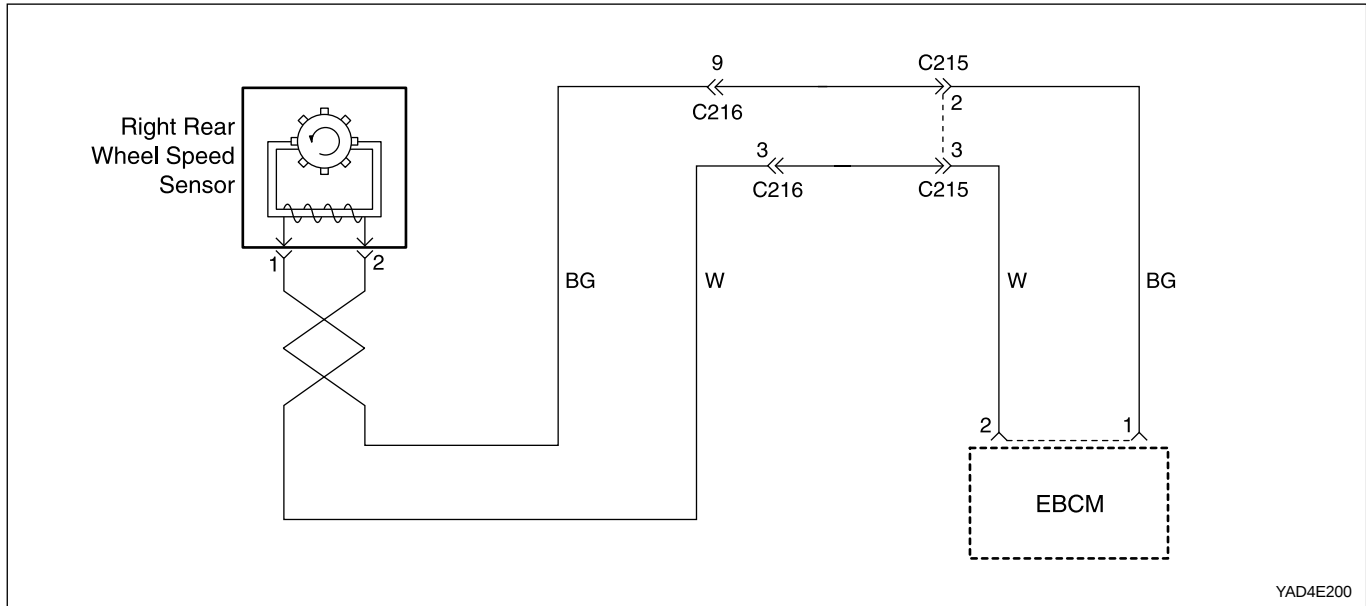
Diagnostic Aids

Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

DTC Right Front Wheel Speed Sensor Continuity Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the left rear wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °C)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 5	Go to Step 6
5	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
6	1. Turn the ignition go LOCK. 2. Measure the resistance to ground from terminal 8 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 9 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	System OK	Go to Step 7
7	1. Measure the resistance between terminal 8 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 9 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 8	Go to Step 9
8	Repair the open or high resistance in the affected circuit as required. Is the repair complete?	-	System OK	-
9	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 050 - RIGHT REAR WHEEL SPEED SENSOR FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective or disconnected.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
6. This step tests the wiring for a short to voltage.
8. This step tests the wiring for a short to ground.
10. This step tests for an open or a high resistance in the wiring.

Diagnostic Aids

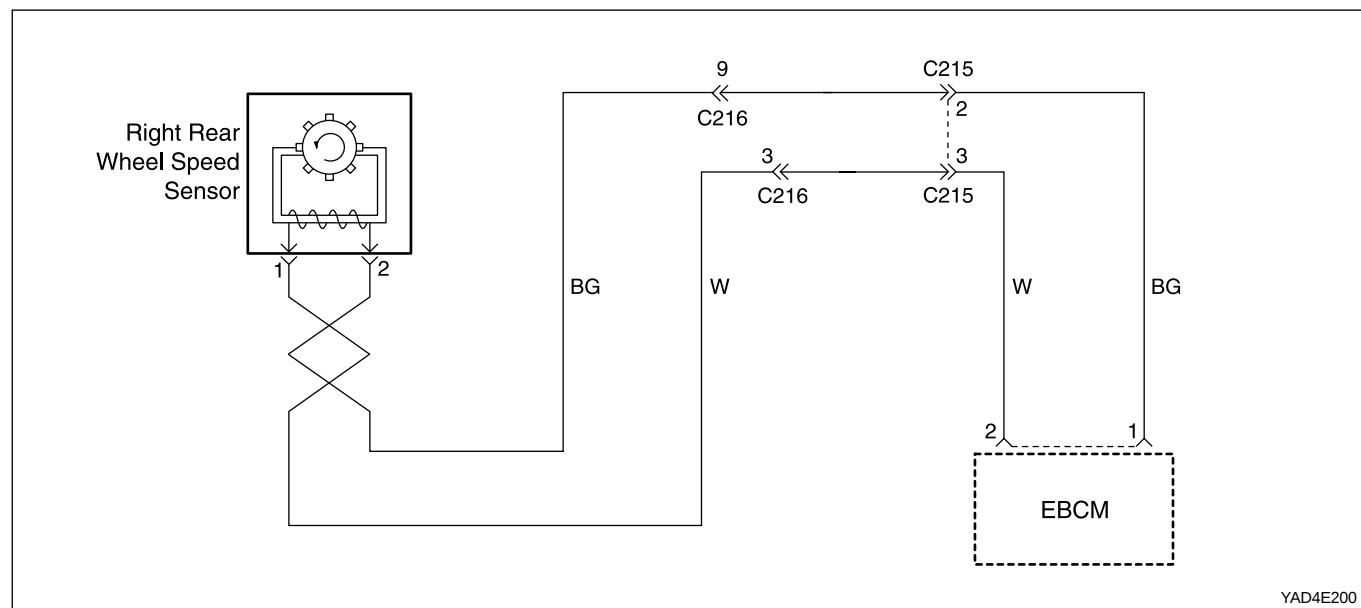
Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

You can use the scan tool to monitor wheel speeds during a road test. Watch the wheel speeds being displayed on the scan tool to see if any of the readings are unusual, such as one sensor varying in speed from the other three, a signal going intermittently high or low, etc. If this does not identify the intermittent, wet the speed sensor harness on the underside of the vehicle and perform a road test, monitoring the wheel speeds with the scan tool.

DTC 050 - Right Rear Wheel Speed Sensor Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the right rear wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °F)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Switch the DVM to the AC mV. 2. Measure the voltage output between the wheel speed sensor terminals while rotating the wheel about 1 revolution per second. Is the output within the specified value?	≈ 70 mV	Go to Step 6	Go to Step 5
5	Replace the speed sensor or the toothed wheel, as required. Is the repair complete?	-	System OK	-
6	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 7	Go to Step 8
7	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
8	1. Turn the ignition to LOCK. 2. Measure the resistance to ground from terminal 1 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 2 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	Go to Step 9	Go to Step 10
9	Repair the short to ground in the affected circuit. Is the repair complete?	-	System OK	-
10	1. Measure the resistance between terminal 1 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 2 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 11	Go to Step 12
11	Repair the open or high resistance in the affected circuit, as required. Is the repair complete?	-	System OK	-
12	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) - RIGHT REAR WHEEL SPEED SENSOR CONTINUITY FAULT

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine the wheel speed. The voltage generated depends on the air gap between the sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This procedure checks for a malfunctioning wheel speed sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The wheel speed sensor is defective or disconnected.
- There is a problem in the wiring.
- There is a problem with a connector.

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins an examination for a defective wheel speed sensor.
6. This step tests the wiring for a short to voltage.
8. This step tests the wiring for a short to ground.
10. This step tests for an open or high resistance in the wiring.

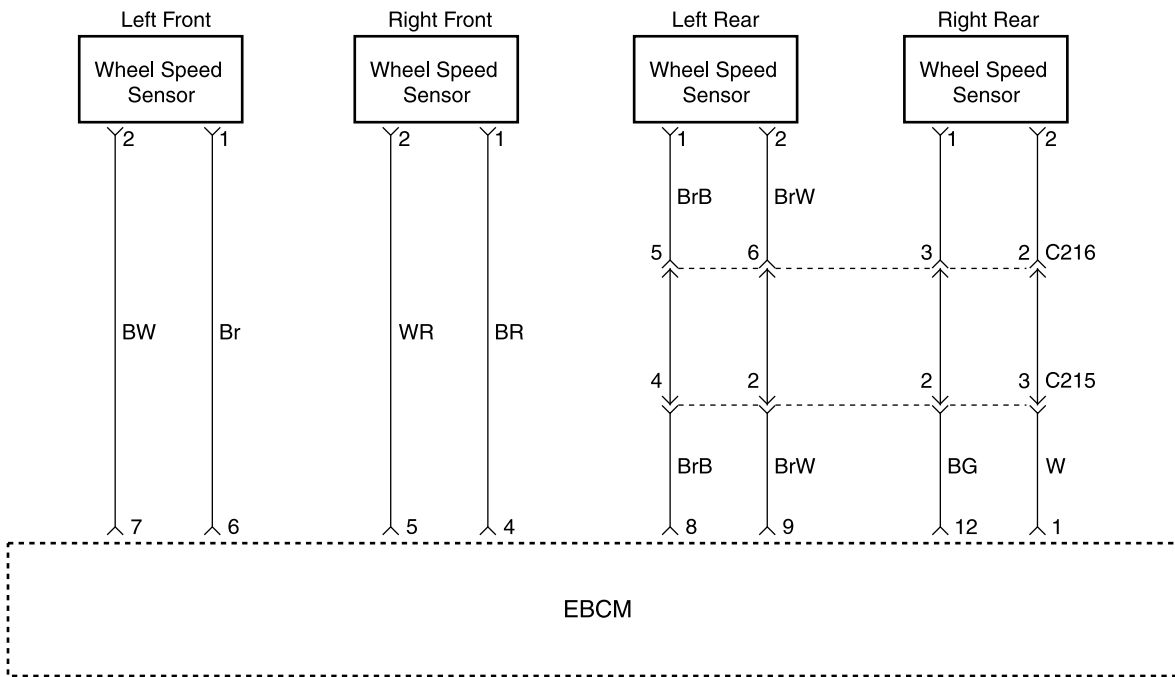
Diagnostic Aids

Be sure that the speed sensor wiring is properly routed and retained. This will help to prevent false signals due to the pickup of electrical noise.

It is very important to perform a thorough inspection of the wiring and the connectors. Failure to inspect the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

Right Rear Wheel Speed Sensor Continuity Fault

Step	Action	Value	Yes	No
1	Examine the wheel speed sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition to LOCK. 2. Disconnect the right rear wheel speed sensor connector. 3. Use a digital voltmeter (DVM) to measure the resistance between the sensor terminals. Is the resistance within the specified value at approximately 25 °C (77 °C)?	1280 - 1920 Ω	Go to Step 4	Go to Step 3
3	Replace the wheel speed sensor. Is the repair complete?	-	System OK	-
4	1. Disconnect the harness from the EBCM. 2. Connect a DVM between ground and one terminal of the wheel speed connector. 3. Turn the ignition to ON. 4. Repeat the above test for the other terminal of the wheel speed connector. Is the voltage for either of these terminals within the specified value?	> 1 V	Go to Step 5	Go to Step 6
5	Repair the short to voltage in the affected circuit. Is the repair complete?	-	System OK	-
6	1. Turn the ignition go LOCK. 2. Measure the resistance to ground from terminal 1 at the harness EBCM connector. 3. Measure the resistance to ground from terminal 2 at the harness EBCM connector. Is the resistance at either circuit less than the specified value?	∞	System OK	Go to Step 7
7	1. Measure the resistance between terminal 1 at the harness EBCM connector and the harness wheel speed sensor connector. 2. Measure the resistance between terminal 2 at the harness EBCM connector and the harness wheel speed sensor connector. Is the resistance on either circuit within the specified value?	> 5 Ω	Go to Step 8	Go to Step 9
8	Repair the open or high resistance in the affected circuit as required. Is the repair complete?	-	System OK	-
9	Replace the ABS unit. Is the repair complete?	-	System OK	-



YAD4E210

DIAGNOSTIC TROUBLE CODE (DTC) 245 - WHEEL SPEED SENSOR FREQUENCY ERROR

Circuit Description

The toothed wheel generates a voltage pulse as it moves past the wheel speed sensor. Each tooth-gap-tooth series on the wheel generates the pulses. The electronic brake control module (EBCM) uses the frequency of these pulses to determine wheel speed. The voltage generated depends on the air gap between the wheel speed sensor and the toothed wheel, and on the wheel speed.

Diagnosis

This DTC will set when the EBCM cannot identify which wheel speed sensor is causing the malfunction. It is necessary to check all wheel speed sensors and associated wiring to determine the cause of the DTC.

Cause

- Incorrect number of teeth on the toothed wheel.
- Damaged or broken teeth on the toothed wheel.
- Open or short in speed wheel speed sensor wiring.

Action Taken When the DTC Sets

Antilock brake system (ABS) action is disabled and the ABS warning lamp is ON.

Test Description

The number(s) below refer to Step(s) on the diagnostic table.

1. This step begins the examination of the front wheel speed sensor sensors.
3. This step checks for a problem with one of the front toothed rings.
5. This step checks the front wheel speed sensors.
7. This step checks for shorts in a front wheel speed sensor harness.
9. This step checks for opens in a front wheel speed sensor harness.
11. This step begins a check of the rear wheel speed sensors.
13. This step checks for a problem with one of the rear toothed rings.
15. This step checks the rear wheel speed sensors.
17. This step checks for shorts in a rear wheel speed sensor harness.
19. This step checks for opens in a rear wheel speed sensor harness.

Diagnostic Aids

DTC 11 may be set by running the scan tool auto test if the throttle angle readings are not updating while in the data list mode. If this is the case, clear the DTCs, disconnect the scan tool, and road test the vehicle to at least 25 km/h (15 mph) to see if the DTC resets.

Check the toothed wheels for any large grooves, gouges, marks, etc. that might influence the tooth's signal at the wheel speed sensor. Also, check for a buildup of foreign material in the gaps between the

teeth in the toothed wheel, as this material may cause this malfunction.

A badly worn hub/bearing assembly may cause this malfunction. The wheel speed sensor-to-toothed wheel air gap may change excessively due to bearing play.

If an improper rear hub assembly or front outer constant velocity joint is installed, one with a toothed wheel containing the incorrect number of teeth, this DTC can set. Be sure that all the toothed wheels have 52 teeth.

DTC 245 - Wheel Speed Sensor Frequency Error

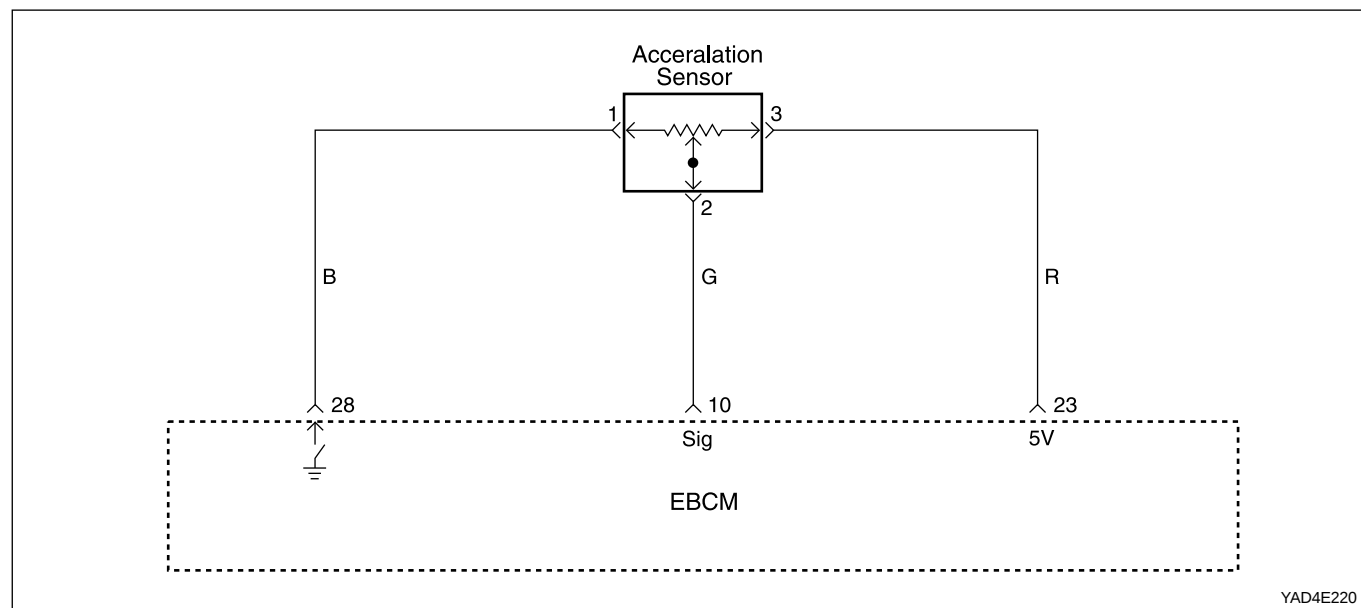
Step	Action	Value	Yes	No
1	Visually inspect the wiring for the front wheel speed sensors. Is there any damage?	-	Go to Step 2	Go to Step 3
2	Repair or replace components, as required. Is the repair complete?	-	System OK	-
3	Check that the correct outer constant velocity (CV) joints are installed on the vehicle, They should have speed rings with 52 teeth. Is one of these incorrect?	-	Go to Step 4	Go to Step 5
4	Replace the incorrect outer CV joint with the proper unit. Is the repair complete?	-	System OK	-
5	1. Disconnect the wheel speed sensor harnesses from the wheel speed sensor connectors. 2. Measure the wheel speed sensor resistance at the wheel speed sensor connector terminals. Does the resistance fall within the specified values for both wheel speed sensors?	1280 - 1920 Ω	Go to Step 7	Go to Step 6
6	Replace the faulty wheel speed sensor. Is the repair complete?	-	System OK	-
7	1. Disconnect the ABS control module connector. 2. Check each wheel speed sensor harness for a short circuit between its wires with a digital ohmmeter attached to the two terminals at the harness side of the wheel speed sensor connector. 3. Also check each wheel speed sensor harness wire for a short to ground from the connector terminals. Is there any short circuit in either wheel speed sensor harness?	-	Go to Step 8	Go to Step 9
8	Repair the short circuit in the wiring or from a wiring harness to ground. Is the repair complete?	-	System OK	-
9	Check the continuity of the wiring in both front wheel speed sensor circuits between the EBCM connector and the wheel speed sensor connector on each side of the vehicle. - The left side uses terminals 7 and 6 at the EBCM connector. - The right side uses terminals 4 and 5 at the EBCM connector. Is continuity good for both harnesses?	-	Go to Step 11	Go to Step 10

DTC 245 - Wheel Speed Sensor Frequency Error (Cont'd)

Step	Action	Value	Yes	No
10	Repair the discontinuity found in the front wheel speed sensor harness or connector C110. Is the repair complete?	-	System OK	-
11	1. Visually inspect the wiring for the rear wheel speed sensors. 2. Check that the wheel speed sensors are properly mounted and that the retaining belts are properly tightened. Is there any damage?	-	System OK	Go to Step 12
12	Remove each wheel speed sensor from the rear axle and inspect the toothed ring through the wheel speed sensor mounting holes. • Make sure that the toothed ring has 52 teeth. • Check for any damaged or missing teeth. • Check that the ring is properly positioned under the wheel speed sensor. Is there any damage or other fault with either speed ring?	-	Go to Step 13	Go to Step 14
13	Replace the rear wheel hub with the proper unit. Is the repair complete?	-	System OK	-
14	1. Disconnect the rear wheel speed sensor harnesses from the wheel speed sensor connectors. 2. Measure the wheel speed sensor resistance at the wheel speed sensor connector terminals. Does the resistance fall within the specified values for both wheel speed sensors?	1280 - 1920 Ω	Go to Step 16	Go to Step 15
15	Replace the faulty wheel speed sensor. Is the repair complete?	-	System OK	-
16	1. The ABS control module connector should still be disconnected. Disconnect it now if it is not. 2. Check each wheel speed sensor harness for a short circuit between its wires with a digital ohmmeter attached to the two terminals at the harness side of the wheel speed sensor connector. 3. Also, check each wheel speed sensor harness wire for a short to ground from the connector terminals. Is there any short circuit in either wheel speed sensor harness?	-	Go to Step 17	Go to Step 18
17	Repair the short circuit in the wiring or from a wire to ground. Is the repair complete?	-	System OK	Go to Step 19
18	Check the continuity of the wiring in both rear wheel speed sensor circuits between the EBCM connector and the wheel speed sensor connector on each side of the vehicle. • The left side uses terminals 8 and 9 at the EBCM connector. • The right side uses terminals 2 and 1 at the EBCM connector. Is continuity good for both harnesses?	-	Go to Step 20	-

DTC 245 - Wheel Speed Sensro Frequency Error (Cont'd)

Step	Action	Value	Yes	No
19	Repair the discontinuity found in the rear wheel speed sensor harness. Is the repair complete?	-	System OK	-
20	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 930 - ACCELERATION SENSOR FAULT

Circuit Description

The acceleration sensor provides a voltage signal that changes in relation to the acceleration of vehicle. The signal voltage will vary from about 1.95 to 3.45 volt. The electronic brake control module (EBCM) monitor a signal voltage of deceleration in the vehicle.

Diagnosis

This procedure checks for a malfunctioning acceleration sensor, a short to ground or to voltage in the wiring or a contact problem in a connector.

Cause

- The vertical acceleration sensor is defective or disconnected.
- There is a problem in the wiring.
- There is a problem with a connector
- Wrong installed vertical acceleration sensor

Fail Action

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

2. This step checks for the voltage reference from the EBCM.
5. This step checks for the voltage signal from the acceleration sensor.

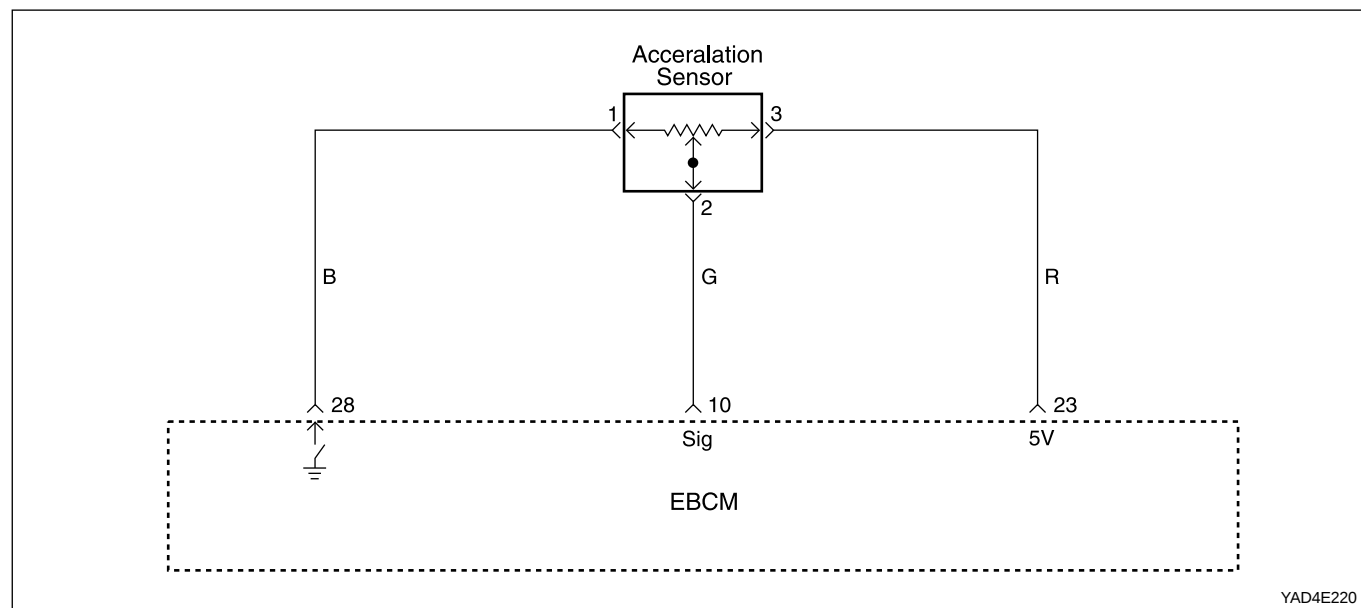
Diagnostic Aids

Be sure that the acceleration sensor wiring is properly routed and retained.

It is very important to perform a thorough inspection of the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction. You can use the scan tool to monitor acceleration sensor during a road test. Watch the acceleration sensor being display on the scan tool to see if any of the reading is unusual.

DTC 930 - Acceleration Sensor Fault

Step	Action	Value	Yes	No
1	Examine the acceleration sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition switch to ON. 2. Use a digital voltmeter (DVM) to measure the voltage between terminal 28 and 23 of EBCM. Is the voltage within the specified value?	4.75 - 5.25 V	Go to Step 5	Go to Step 4
3	Replace the acceleration sensor. Is the repair complete?	-	System OK	-
4	Repair the open in the affected circuit or replace the acceleration sensor, if necessary. Is the repair complete?	-	System OK	-
5	1. Place the acceleration sensor horizontally and let the acceleration sensor. 2. Turn the ignition switch to ON. 3. Use a digital voltmeter (DVM) to measure the voltage between terminal 28 and 10 of EBCM. Is the voltage within the specified value?	1.95 - 3.45 V	Go to Step 7	Go to Step 6
6	Repair the open in the affected circuit or replace the acceleration sensor, if necessary. Is the repair complete?	-	System OK	-
7	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) - ACCELERATION SENSOR CONTINUITY FAULT

Circuit Description

The acceleration sensor provides a voltage signal that changes in relation to the acceleration of vehicle. The signal voltage will vary from about 1.95 to 3.45 volt. The electronic brake control module (EBCM) monitor a signal voltage of deceleration in the vehicle.

Diagnosis

This procedure checks for a malfunctioning acceleration sensor, a short to ground or to voltage in the wiring, or a contact problem in a connector.

Cause

- The vertical acceleration sensor is defective or disconnected.
- There is a problem in the wiring.
- There is a problem with a connector
- Wrong installed vertical acceleration sensor

Action Taken When the DTC Sets

ABS action is disabled, and the ABS warning lamp is ON.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

2. This step checks for the voltage reference from the EBCM.
5. This step checks for the voltage signal from the acceleration sensor.

Diagnostic Aids

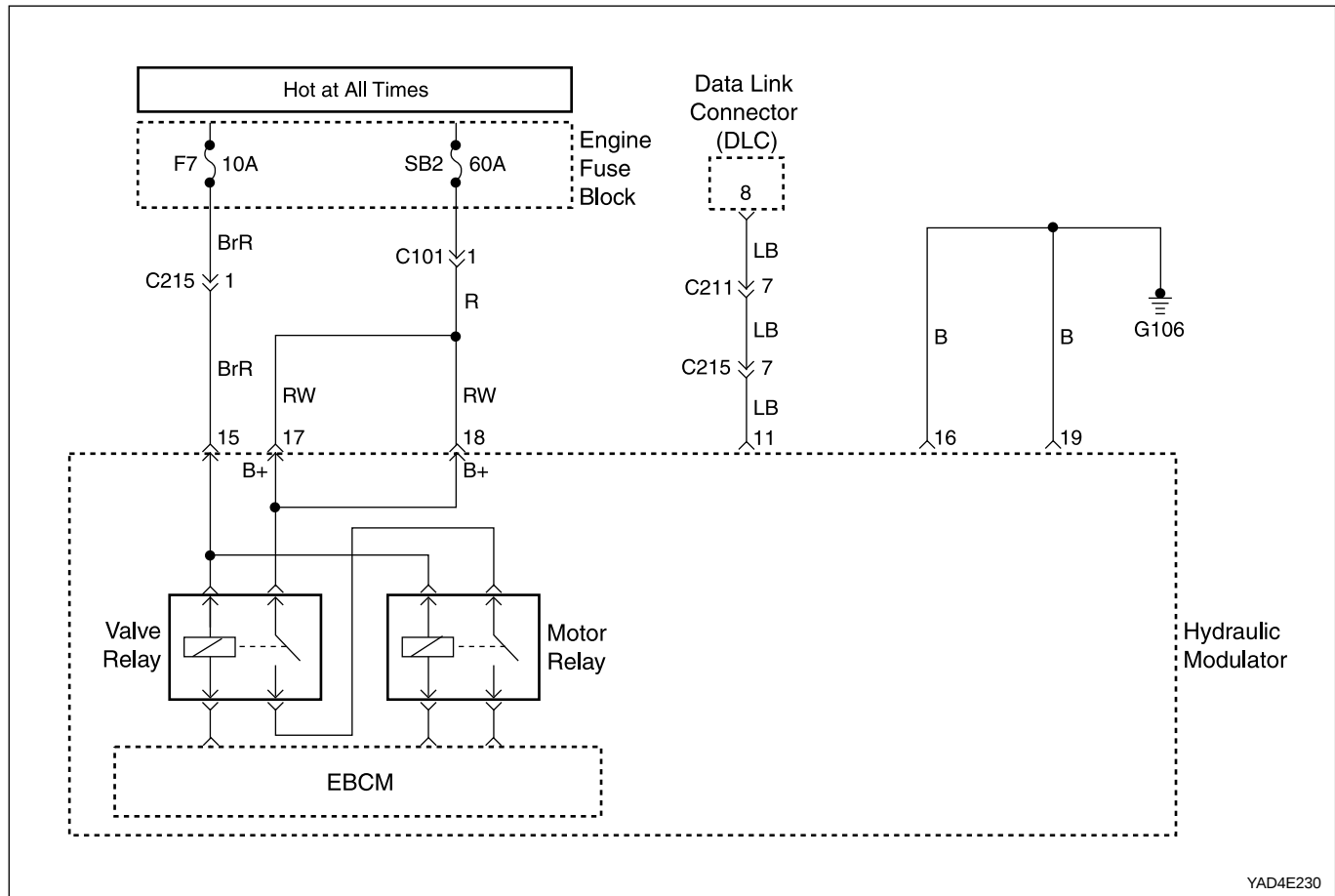
Be sure that the acceleration sensor wiring is properly routed and retained.

It is very important to perform a thorough inspection of the wiring and the connectors carefully and completely may result in misdiagnosis, causing part replacement with the reappearance of the malfunction.

You can use the scan tool to monitor acceleration sensor during a road test. Watch the acceleration sensor being display on the scan tool to see if any of the reading is unusual.

DTC - Acceleration Sensor Continuity Fault

Step	Action	Value	Yes	No
1	Examine the acceleration sensor. Are there any signs of physical damage?	-	Go to Step 3	Go to Step 2
2	1. Turn the ignition switch to ON. 2. Use a digital voltmeter (DVM) to measure the voltage between terminal 28 and 23 of EBCM. Is the voltage within the specified value?	4.75 - 5.25 V	Go to Step 5	Go to Step 4
3	Replace the acceleration sensor. Is the repair complete?	-	System OK	-
4	Repair the open in the affected circuit or replace the acceleration sensor, if necessary. Is the repair complete?	-	System OK	-
5	1. Place the acceleration sensor horizontally and let the acceleration sensor. 2. Turn the ignition switch to ON. 3. Use a digital voltmeter (DVM) to measure the voltage between terminal 28 and 10 of EBCM. Is the voltage within the specified value?	1.95 - 3.45 V	Go to Step 7	Go to Step 6
6	Repair the open in the affected circuit or replace the acceleration sensor, if necessary. Is the repair complete?	-	System OK	-
7	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODE (DTC) 060/065 - LEFT FRONT INLET AND OUTLET VALVE SOLENOID FAULT

Circuit Description

The solenoid valve coil circuits are supplied with power from the battery when the valve relay is energized. Switched ground is provided by the electronic brake control module (EBCM) to each coil.

Diagnosis

This procedure checks whether the left front inlet and outlet valves are functioning.

Cause

- A valve has failed.
- A solenoid coil is open or shorted.

Action Taken When the DTC Sets

ABS is disabled, and the ABS warning lamp is turned ON for the remainder of the ignition cycle. If the failure is intermittent, the EBCM will enable the system at the next ignition cycle and set a history DTC.

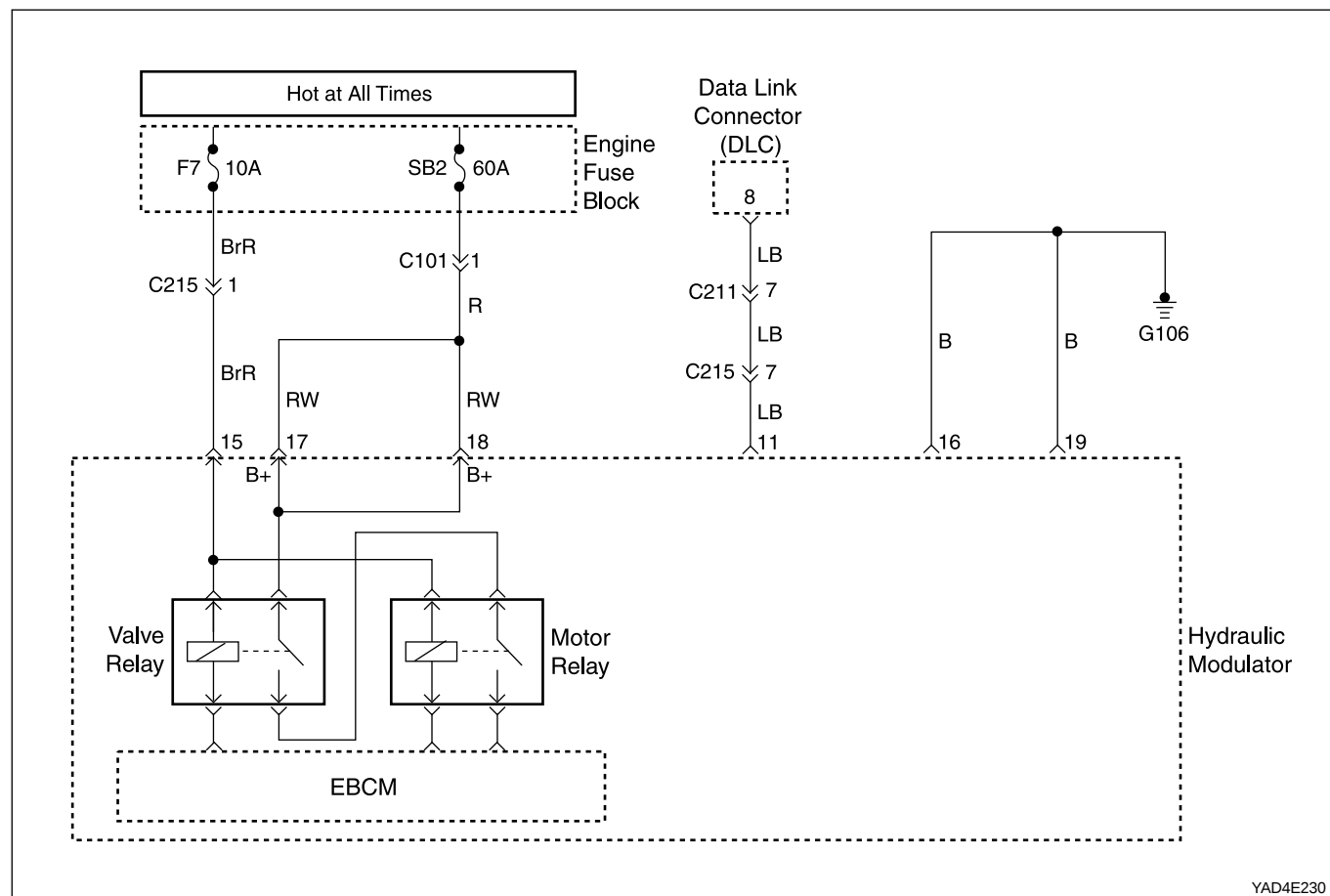
Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. This step begins the test of the inlet valve
3. This step tests the outlet valve.

DTC 060/065 - Left Front Inlet and Outlet Valve Solenoid Fault

Step	Action	Value	Yes	No
1	1. Raise and suitably support the vehicle at the corner being tested. 2. Turn the ignition to ON. 3. Install the scan tool to the data link connector (DLC) and select "Wheel front left" to begin the solenoid tests at that wheel. This will test both the inlet and the outlet valves. 4. When the scan tool indicates "Pressure hold," press and hold the brake pedal until the end of the test. 5. Have an assistant attempt to rotate the wheel. Can the wheel be rotated?	-	Go to Step 2	Go to Step 6
2	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure increase," have an assistant attempt to rotate the wheel again. Can the wheel be rotated now?	-	Go to Step 6	Go to Step 3
3	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure release on," have an assistant attempt to rotate the wheel again. Can the wheel be rotated?	-	Go to Step 4	Go to Step 6
4	1. Release brake pedal pressure when the scan tool indicates "Pressure release off" 2. Clear all DTCs. 3. Road test the vehicle. Does the DTC set again?	-	Go to Step 6	Go to Step 5
5	1. Check the wiring harness and connector terminals for an intermittent problem. 2. Repair any problem found. Is the repair complete?	-	System OK	-
6	Replace the ABS unit. Is the repair complete?	-	System OK	-



DIAGNOSTIC TROUBLE CODED (DTC) 070/075 - RIGHT FRONT INLET AND OUTLET VALVE SOLENOID FAULT

Circuit Description

The solenoid valve coil circuits are supplied with power from the battery when the valve relay is energized. Switched ground is provided by the electronic brake control module (EBCM) to each coil.

Diagnosis

This procedure checks whether the right front inlet and outlet valves are functioning.

Cause

- A solenoid coil is open or shorted.

Action Taken When the DTC Sets

ABS is disabled, and the ABS warning lamp is turned ON for the remainder of the ignition cycle. If the failure is intermittent, the EBCM will enable the system at the next ignition cycle and set a history DTC.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

- This begins the test of the inlet valve
- This tests the outlet valve.

DTC 070/075 - Right Front Inlet and Outlet Valve Solenoid Fault

Step	Action	Value	Yes	No
1	1. Raise and suitably support the vehicle at the corner being tested. 2. Turn the ignition to ON. 3. Install the scan tool to the data link connector (DLC) diagnostic and select "Wheel front right" to begin the solenoid tests at that wheel. This will test both the inlet and the outlet valves. 4. When the scan tool indicates "Pressure hold," press and hold the brake pedal until the end of the test. 5. Have an assistant attempt to rotate the wheel. Can the wheel be rotated?	-	Go to Step 2	Go to Step 6
2	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure increase," have an assistant attempt to rotate the wheel again. Can the wheel be rotated now?	-	Go to Step 6	Go to Step 3
3	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure release on," have an assistant attempt to rotate the wheel again. Can the wheel be rotated?	-	Go to Step 4	Go to Step 6
4	1. Release brake pedal pressure when the scan tool indicates "Pressure release off" 2. Clear all DTCs. 3. Road test the vehicle. Does the DTC set again?	-	Go to Step 6	Go to Step 5
5	1. Check the wiring harness and connector terminals for an intermittent problem. 2. Repair any problem found. Is the repair complete?	-	System OK	-
6	Replace the ABS unit. Is the repair complete?	-	System OK	-

SSANGYONG Y200

DTC 080/085 - Left Rear Inlet and Outlet Valve Solenoid Fault

Step	Action	Value	Yes	No
1	1. Raise and suitably support the vehicle. 2. Turn the ignition to ON. 3. Install the scan tool to the data link connector (DLC) and select "Wheel rear left" to begin the solenoid tests at that wheel. This will test both the inlet and the outlet valves. 4. When the scan tool indicates "Pressure hold," press and hold the brake pedal until the end of the test. 5. Have an assistant attempt to rotate the wheel. Can the wheel be rotated?	-	Go to Step 2	Go to Step 6
2	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure increase," have an assistant attempt to rotate the wheel again. Can the wheel be rotated now?	-	Go to Step 6	Go to Step 3
3	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure release on," have an assistant attempt to rotate the wheel again. Can the wheel be rotated?	-	Go to Step 4	Go to Step 6
4	1. Release brake pedal pressure when the scan tool indicates "Pressure release off." 2. Clear all DTCs. 3. Road test the vehicle. Does the DTC set again?	-	Go to Step 6	Go to Step 5
5	1. Check the wiring harness and connector terminals for an intermittent problem. 2. Repair any problem found. Is the repair complete?	-	System OK	-
6	Replace the ABS unit. Is the repair complete?	-	System OK	-

DTC 090/095 – Right Rear Inlet and Outlet Valve Solenoid Fault

Step	Action	Value	Yes	No
1	1. Raise and suitably support the vehicle. 2. Turn the ignition to ON. 3. Install the scan tool to the data link connector (DLC) and select "Wheel rear right" to begin the solenoid tests at that wheel. This will test both the inlet and the outlet valves. 4. When the scan tool indicates "Pressure hold," press and hold the brake pedal until the end of the test. 5. Have an assistant attempt to rotate the wheel. Can the wheel be rotated?	-	Go to Step 2	Go to Step 6
2	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure increase," have an assistant attempt to rotate the wheel again. Can the wheel be rotated now?	-	Go to Step 6	Go to Step 3
3	1. Maintain pressure on the brake pedal. 2. When the scan tool indicates "Pressure release on," have an assistant attempt to rotate the wheel again. Can the wheel be rotated?	-	Go to Step 4	Go to Step 6
4	1. Release brake pedal pressure when the scan tool indicates "Pressure release off." 2. Clear all DTCs. 3. Road test the vehicle. Does the DTC set again?	-	Go to Step 6	Go to Step 5
5	1. Check the wiring harness and connector terminals for an intermittent problem. 2. Repair any problem found. Is the repair complete?	-	System OK	-
6	Replace the ABS unit. Is the repair complete?	-	System OK	-