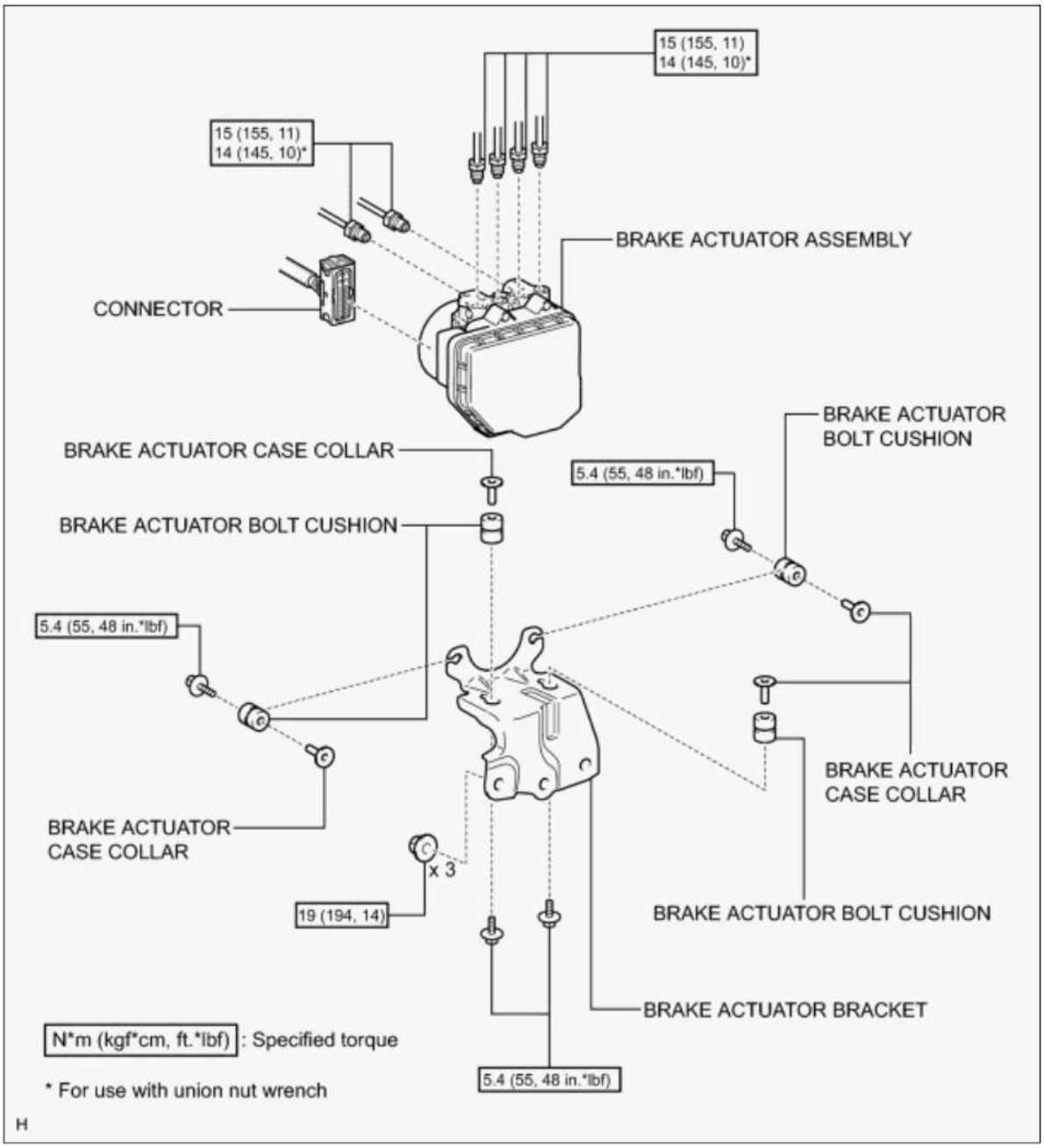
Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV100GX
Title: BRAKE CONTROL: BRAKE ACTUATOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION

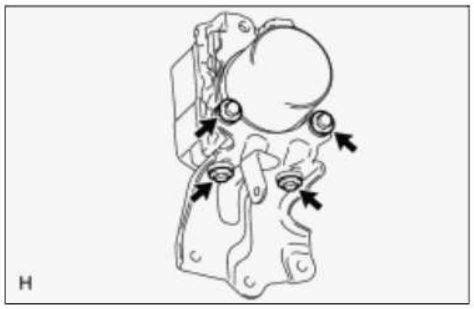


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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV300UX
Title: BRAKE CONTROL: BRAKE ACTUATOR: DISASSEMBLY (2011 RAV4)		

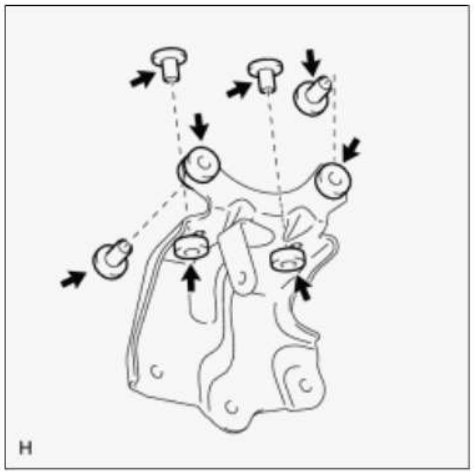
DISASSEMBLY

1. REMOVE BRAKE ACTUATOR BRACKET



(a) Remove the 4 bolts and bracket from the brake actuator.

2. REMOVE BRAKE ACTUATOR CASE COLLAR



(a) Remove the 4 brake actuator case collars from the brake actuator bolt cushions.

3. REMOVE BRAKE ACTUATOR BOLT CUSHION

(a) Remove the 4 brake actuator bolt cushions from the brake actuator bracket.

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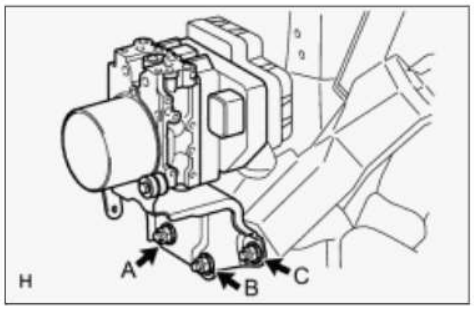
Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV001CX
Title: BRAKE CONTROL: BRAKE ACTUATOR: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL BRAKE ACTUATOR WITH BRACKET

NOTICE:

When installing a new brake actuator, do not remove the hole plug before connecting the brake tube. New actuators are filled with brake fluid.

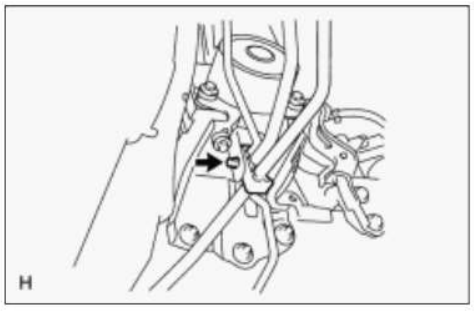


(a) Install the actuator with bracket with the 3 nuts.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

NOTICE:

- Tighten the 3 nuts uniformly in alphabetical order.
- Be careful not to damage the brake tubes.
- Do not drop the actuator. If dropped, replace it.



(b) Connect a new brake tube clamp to the bracket.

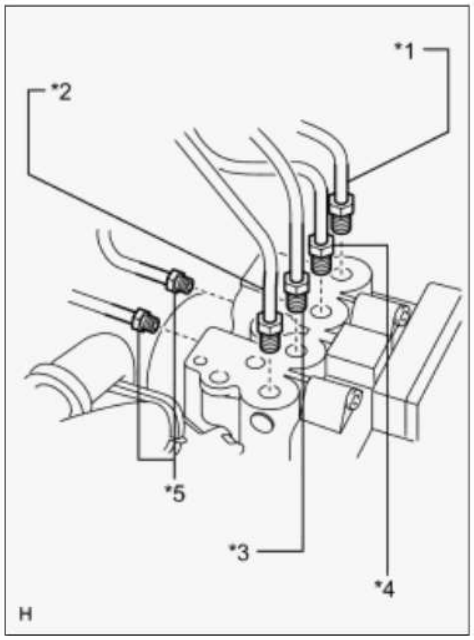
2. CONNECT BRAKE LINES

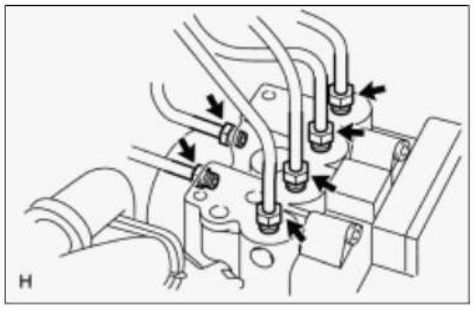
(a) Set each brake line in the correct position on the brake actuator as shown in the illustration.

HINT:

- *1: to front wheel RH
- *2: to front wheel LH
- *3: to rear wheel RH
- *4: to rear wheel LH
- *5: from master cylinder

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(b) Using a union nut wrench, connect the 6 brake lines to the correct locations on the actuator, as shown in the illustration.

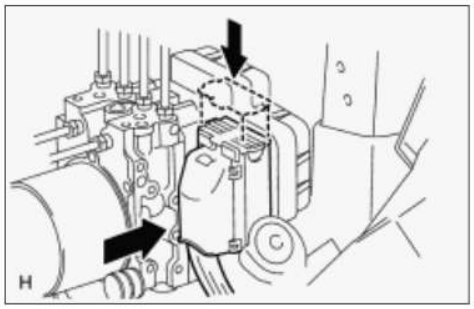
without union nut wrench - Torque: 15 N·m (155 kgf·cm, 11ft·lbf)

with union nut wrench - Torque: 14 N·m (145 kgf·cm, 10ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.8 in.).
- This torque value is effective when the union nut wrench is parallel to the torque wrench.

3. CONNECT CONNECTOR



(a) Connect the connector and push the lock lever downward.

4. BLEED BRAKE SYSTEM INFO

5. INSTALL COWL TOP VENTILATOR LOUVER BRACKET LH INFO

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6. INSTALL AIR CLEANER CASE (for 2AR-FE)

(a) Install the air cleaner case INFO .

7. INSTALL AIR CLEANER CASE (for 2GR-FE)

(a) Install the air cleaner case INFO .

8. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

9. CHECK BRAKE ACTUATOR ASSEMBLY WITH TECHSTREAM

(a) Check the brake actuator with the Techstream INFO .

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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV502OX
Title: BRAKE CONTROL: BRAKE ACTUATOR: ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

1. CONNECT TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Start the engine and idle it.

(c) Select the Active Test on the Techstream.

HINT:

Please refer to the Techstream operator's manual for further details.

2. CHECK ACTUATOR MOTOR OPERATION

NOTICE:

Do not keep a motor relay on for more than 5 seconds. When operating it consecutively, wait 20 seconds between each operation.

(a) Turn the motor relay on and check the actuator motor operation noise.

(b) Turn the motor relay off.

(c) Fully depress the brake pedal and hold it for approximately 15 seconds. Check that the initial depth of the pedal is maintained for the entire 15 seconds.

(d) Turn the motor relay on and check that the pedal does not pulsate.

(e) Turn the motor relay off and release the pedal.

3. CHECK BRAKE ACTUATOR SOLENOID (for Front Right Wheel)

NOTICE:

- Be sure to follow the procedures below when turning on a solenoid.
- Do not keep a solenoid on for more than 10 seconds. When operating it consecutively, wait 20 seconds between each operation.
- Do not keep a motor relay on for more than 5 seconds. When operating it consecutively, wait 20 seconds between each operation.

(a) With the brake pedal depressed as much as possible, perform the following operations.

(1) Turn the SFRH and SFRR solenoids on simultaneously, and check that the pedal cannot be depressed further.

(2) Turn the SFRH and SFRR solenoids off simultaneously, and check that the pedal can be depressed further.

(3) Turn the motor relay on. Check that the pedal returns to the "depressed as much as possible" position.

(b) Turn the motor relay off and release the pedal.

4. CHECK BRAKE ACTUATOR SOLENOID (for Front Left Wheel)

(a) Use the same procedures described for the front right wheel to check the solenoids of the front left wheel.

HINT:

Front left wheel: SFLH, SFLR

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5. CHECK BRAKE ACTUATOR SOLENOID (for Rear Right Wheel)

(a) Use the same procedures described for the front right wheel to check the solenoids of the rear right wheel.

HINT:

Rear right wheel: SRRH, SRRR

6. CHECK BRAKE ACTUATOR SOLENOID (for Rear Left Wheel)

(a) Use the same procedures described for the front right wheel to check the solenoids of the rear left wheel.

HINT:

Rear left wheel: SRLH, SRLR

7. CHECK AND CLEAR DTC

(a) Check and clear the DTC INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV400UX
Title: BRAKE CONTROL: BRAKE ACTUATOR: REASSEMBLY (2011 RAV4)		

REASSEMBLY

1. INSTALL BRAKE ACTUATOR BOLT CUSHION



(a) Install the 4 brake actuator bolt cushions to the brake actuator bracket.

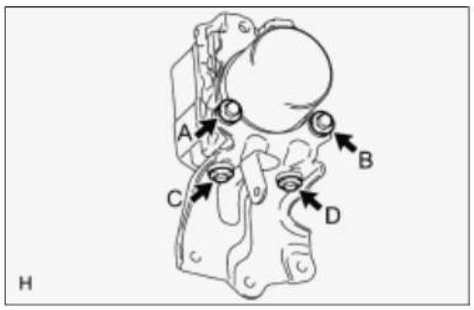
2. INSTALL BRAKE ACTUATOR CASE COLLAR

(a) Install the 4 brake actuator case collars to the brake actuator bolt cushions.

NOTICE:

Make sure the collars are in full contact with the cushions.

3. INSTALL BRAKE ACTUATOR BRACKET



(a) Install the brake actuator bracket to the brake actuator with the 4 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

NOTICE:

Tighten the 4 bolts uniformly in alphabetical order.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XV201AX
Title: BRAKE CONTROL: BRAKE ACTUATOR: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE AIR CLEANER CASE (for 2AR-FE)

(a) Remove the air cleaner case INFO .

3. REMOVE AIR CLEANER CASE (for 2GR-FE)

(a) Remove the air cleaner case INFO .

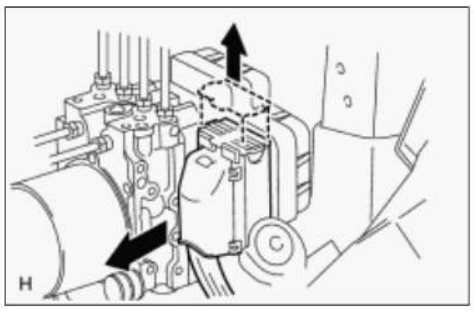
4. REMOVE COWL TOP VENTILATOR LOUVER BRACKET LH INFO

5. DRAIN BRAKE FLUID

NOTICE:

Wash off brake fluid immediately if it comes in contact with any painted surface.

6. DISCONNECT CONNECTOR

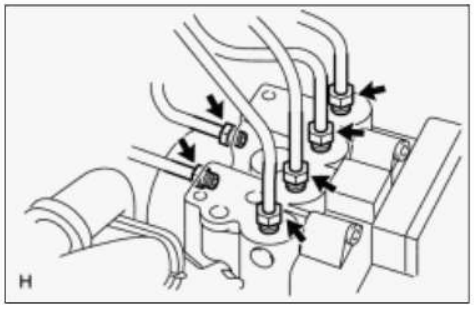


(a) Pull the lock lever upward and disconnect the connector.

NOTICE:

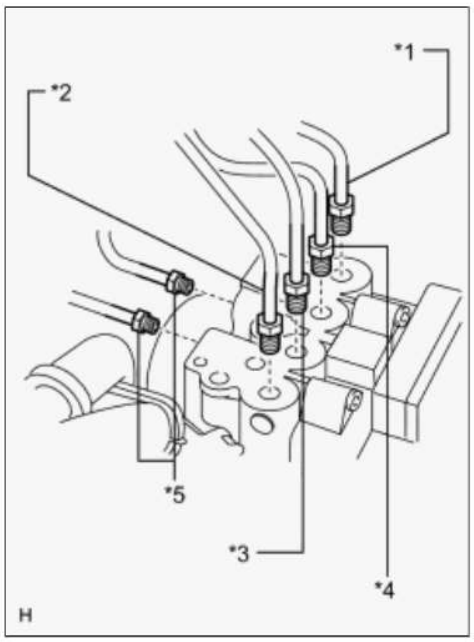
Be careful not to allow brake fluid to enter the removed connector.

7. DISCONNECT BRAKE LINES



(a) Using a union nut wrench, disconnect the 6 brake lines from the actuator.

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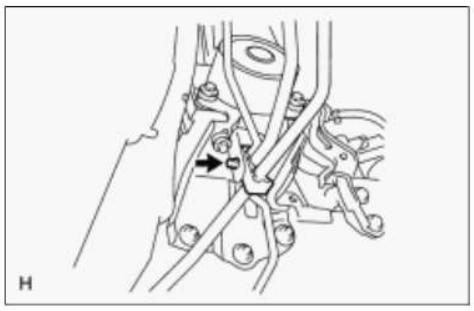


(b) Place tags or marks to identify the installation locations of each brake line.

HINT:

- *1: to front wheel RH
- *2: to front wheel LH
- *3: to rear wheel RH
- *4: to rear wheel LH
- *5: from master cylinder

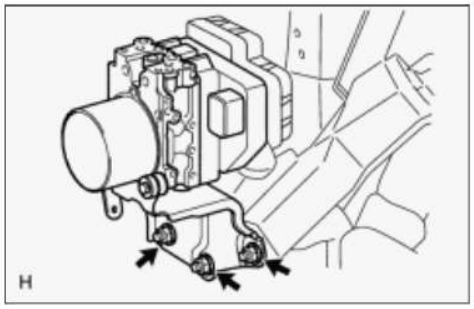
8. REMOVE BRAKE ACTUATOR WITH BRACKET



(a) Disconnect the brake tube clamp from the bracket.

NOTICE:

The clamp cannot be reused after they are detached from the bracket.



(b) Remove the 3 nuts and actuator with bracket.

NOTICE:

Be careful not to damage the brake tubes.

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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YMH00FX
Title: BRAKE CONTROL: BRAKE PEDAL LOAD SENSING SWITCH: ON-VEHICLE INSPECTION (2011 RAV4)		

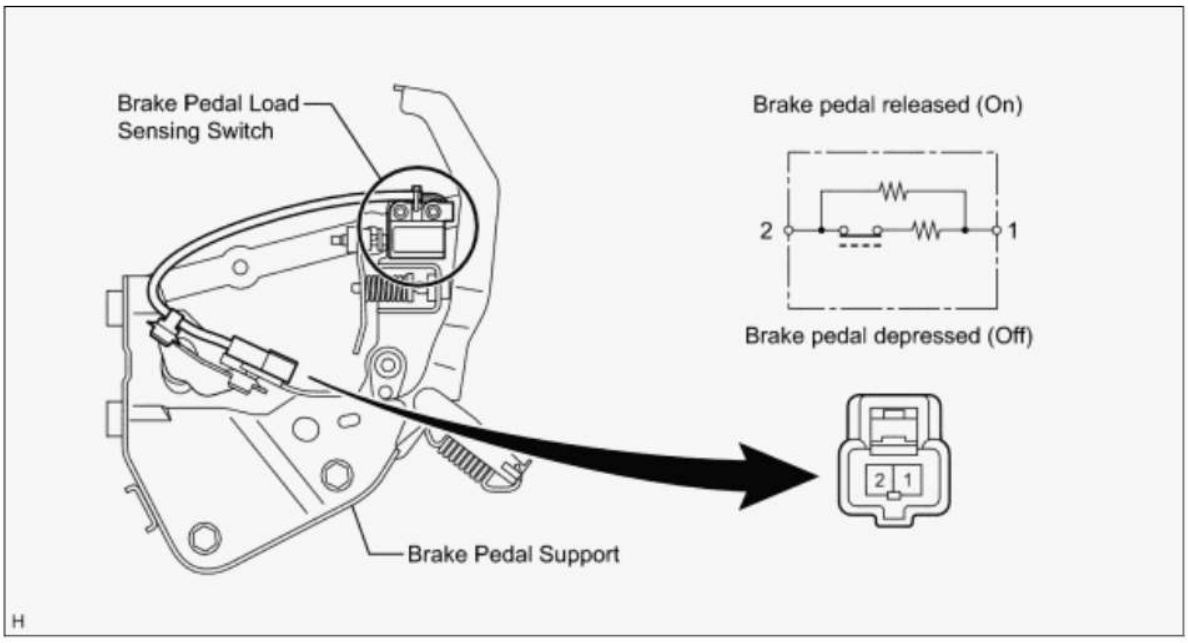
ON-VEHICLE INSPECTION

1. INSPECT BRAKE PEDAL LOAD SENSING SWITCH

HINT:

- Do not remove the brake pedal load sensing switch from the brake pedal support.
- When there is a malfunction in the brake pedal load sensing switch, replace the brake pedal support.

(a) Disconnect the brake pedal load sensing switch connector.



(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	Brake pedal depressed	Approx. 1 kΩ
	Brake pedal released	Approx. 213 Ω

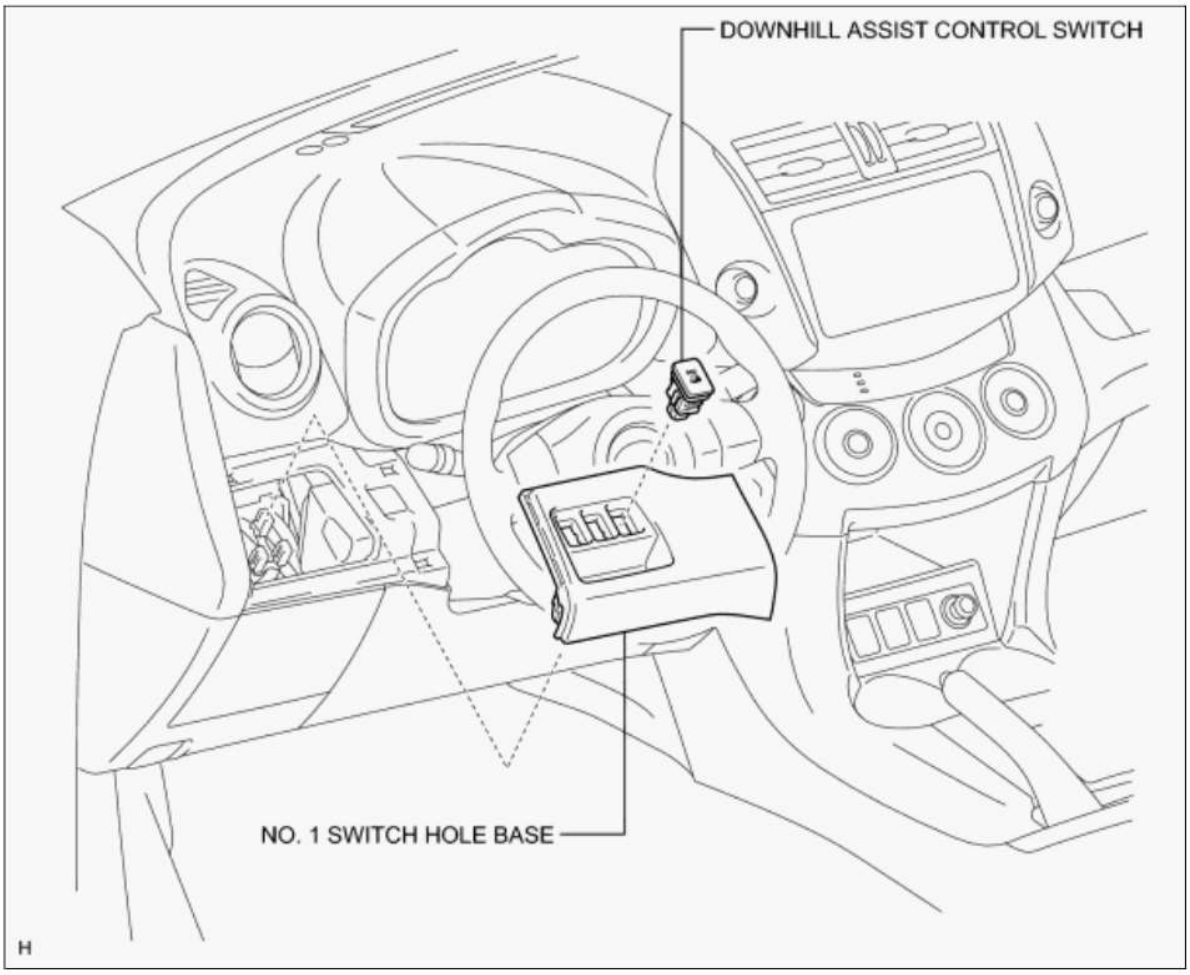
If the result is not as specified, replace the brake pedal support assembly INFO .

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000210000DX
Title: BRAKE CONTROL: DOWNHILL ASSIST CONTROL SWITCH: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION

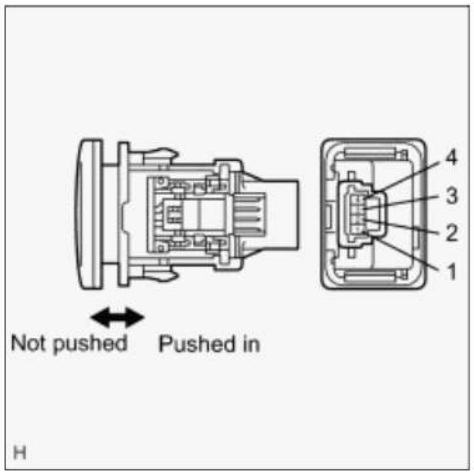


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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000020ZZ00IX
Title: BRAKE CONTROL: DOWNHILL ASSIST CONTROL SWITCH: INSPECTION (2011 RAV4)		

INSPECTION

1. CHECK DOWNHILL ASSIST CONTROL SWITCH



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - 4	Not pushed	10 kΩ or higher
	Pushed in	Below 25 Ω

If the result is not as specified, replace the switch.

(b) Apply battery voltage and check the illumination operation.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
Battery positive (+) → Terminal 3 Battery negative (-) → Terminal 2	Bulb illuminates

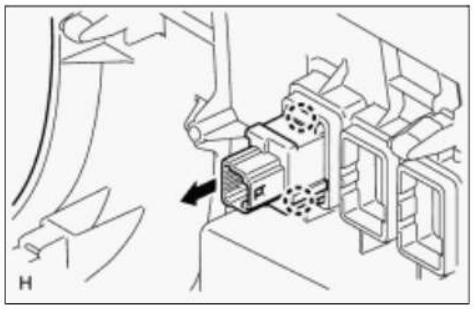
If the result is not as specified, replace the switch.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000020ZY00HX
Title: BRAKE CONTROL: DOWNHILL ASSIST CONTROL SWITCH: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL DOWNHILL ASSIST CONTROL SWITCH



(a) Attach the 2 claws to install the switch.

2. INSTALL NO. 1 SWITCH HOLE BASE

(a) Install the No. 1 switch hole base INFO .

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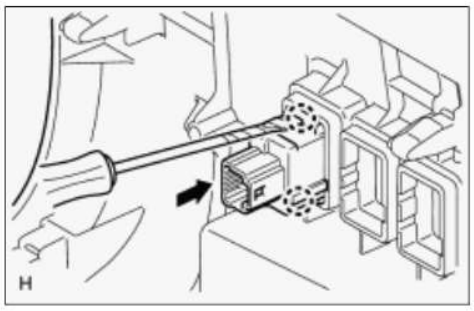
Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000210100HX
Title: BRAKE CONTROL: DOWNHILL ASSIST CONTROL SWITCH: REMOVAL (2011 RAV4)		

REMOVAL

1. REMOVE NO. 1 SWITCH HOLE BASE

(a) Remove the No. 1 switch hole base INFO .

2. REMOVE DOWNHILL ASSIST CONTROL SWITCH



(a) Detach the 2 claws and remove the switch.

HINT:

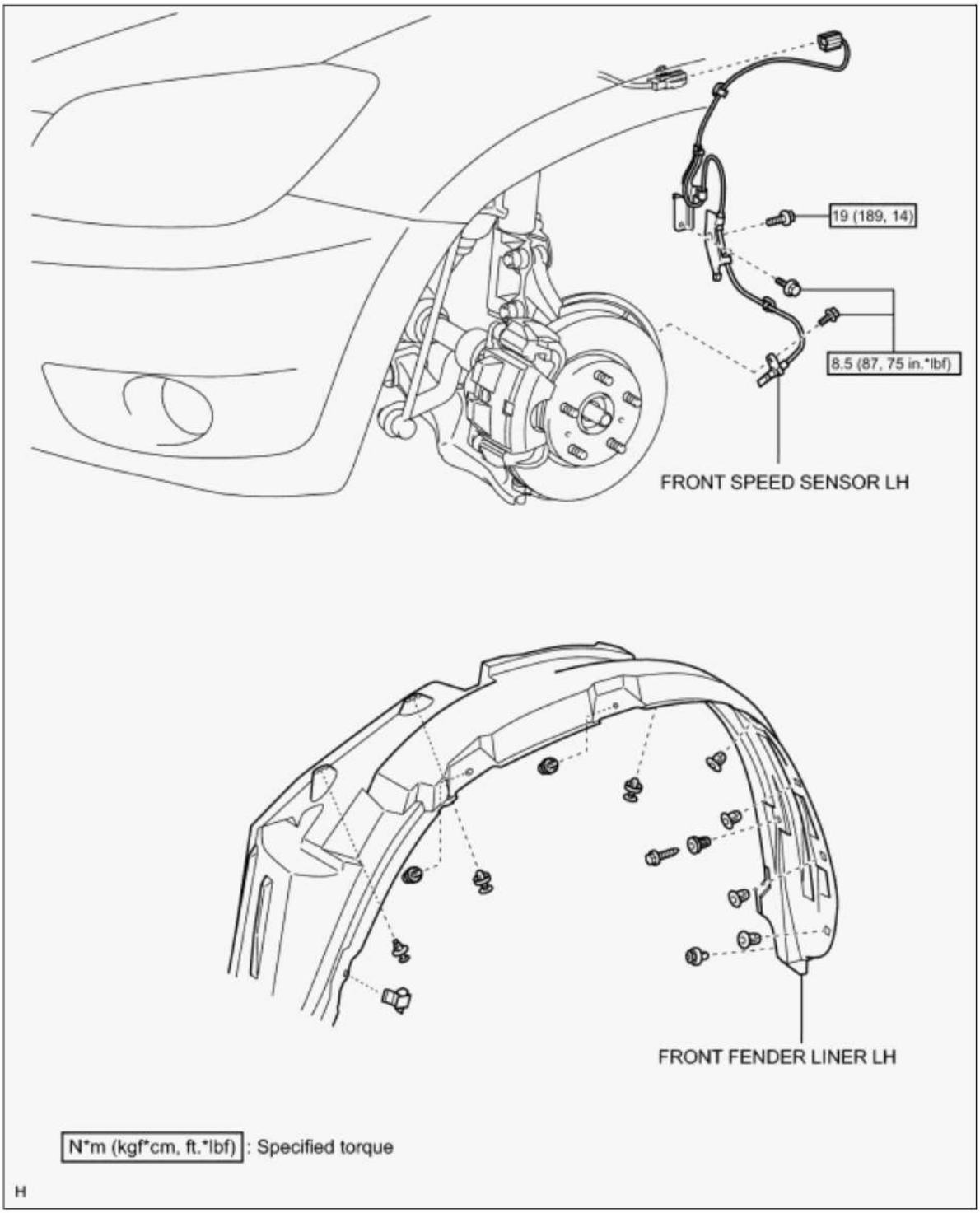
Tape the screwdriver tip before use.

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVD00EX
Title: BRAKE CONTROL: FRONT SPEED SENSOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YBA00FX
Title: BRAKE CONTROL: FRONT SPEED SENSOR: INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT FRONT SPEED SENSOR

(a) Check the speed sensor.

Under any of the following conditions, replace the sensor with a new one.

- The surface of the speed sensor is cracked, dented, or chipped.
- The connector or wire harness is scratched, cracked, or damaged.
- The speed sensor has been dropped.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000021XM009X
Title: BRAKE CONTROL: FRONT SPEED SENSOR: INSTALLATION (2011 RAV4)		

INSTALLATION

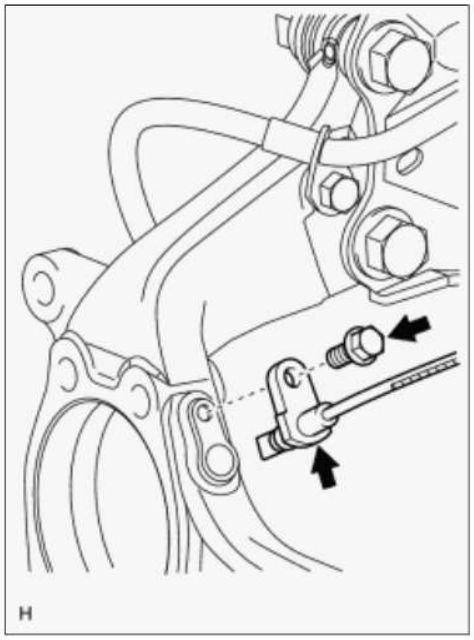
HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. INSTALL SPEED SENSOR FRONT LH

NOTICE:

To prevent interference with other parts, do not twist the painted line areas of the sensor wire when installing it.



(a) Set the sensor body into the knuckle, and then install the sensor with the bolt.

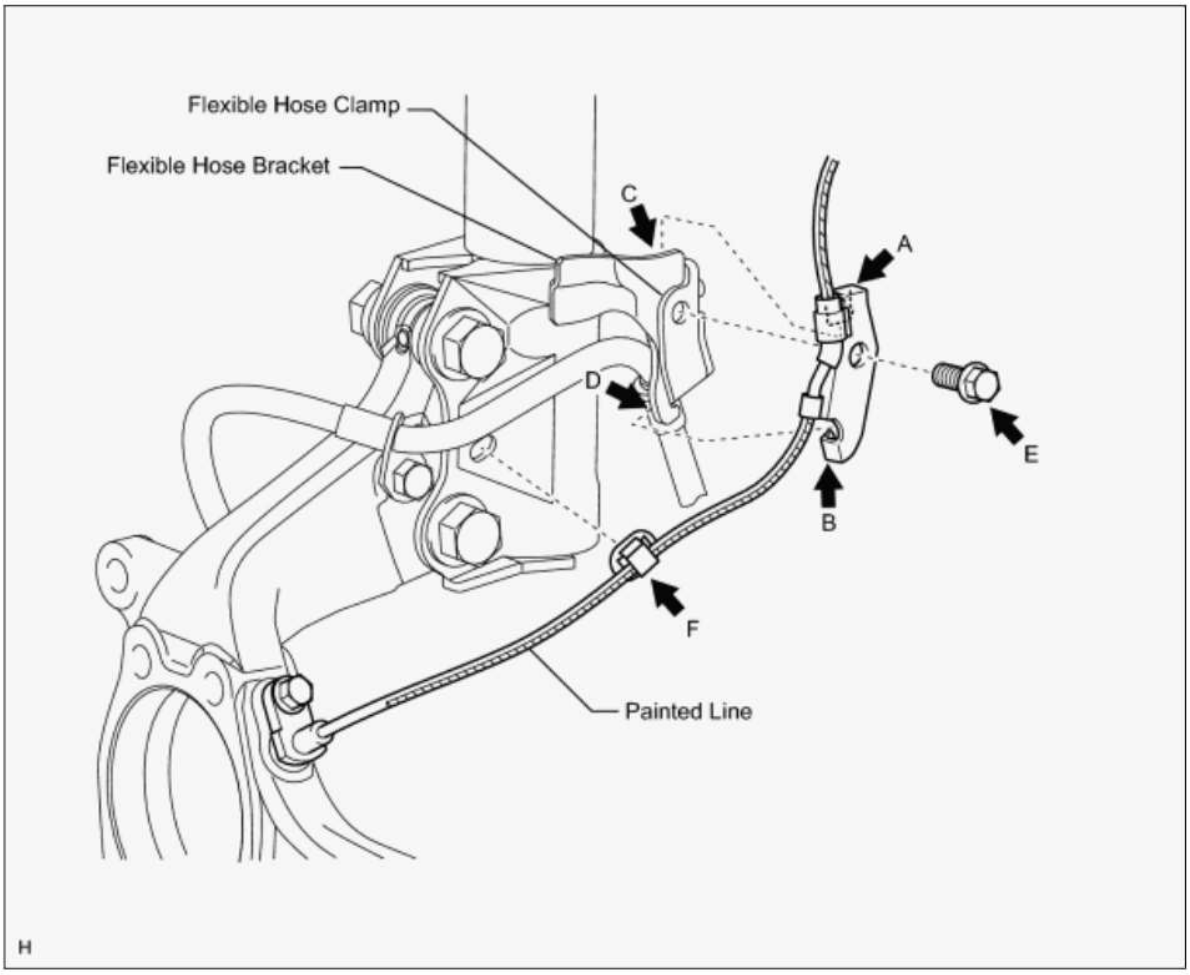
Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

NOTICE:

- Keep the sensor tip and sensor installation hole free from foreign matter.
- Firmly insert the sensor body into the knuckle before tightening the bolt.
- After installing the sensor to the knuckle, make sure that there is no clearance between the sensor stay and knuckle. Also make sure that no foreign matter is stuck between the parts.
- To prevent interference between the sensor and magnetic rotor, do not rotate the sensor body during or after the insertion of the sensor body to the knuckle.

(b) Install the sensor clamp and sensor clip as follows.

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(1) Simultaneously perform the following: 1) hang the hook part of the sensor clamp (labeled A) on the flexible hose bracket (labeled C); and 2) insert the hook part of the sensor clamp (labeled B) into the flexible hose bracket (labeled D).

NOTICE:

Do not twist the sensor wire when installing the clamp.

(2) Install the sensor clamp to the flexible hose clamp and flexible hose bracket with the bolt (labeled E).

Torque: 19 N·m (189 kgf·cm, 14ft·lbf)

(3) Insert the sensor clip (labeled F) into the hole on the absorber lower bracket.

(c) Install the sensor clamp and sensor clip as follows.

(1) Set the sensor clamp (labeled G) on the side member, and then install the bolt (labeled H).

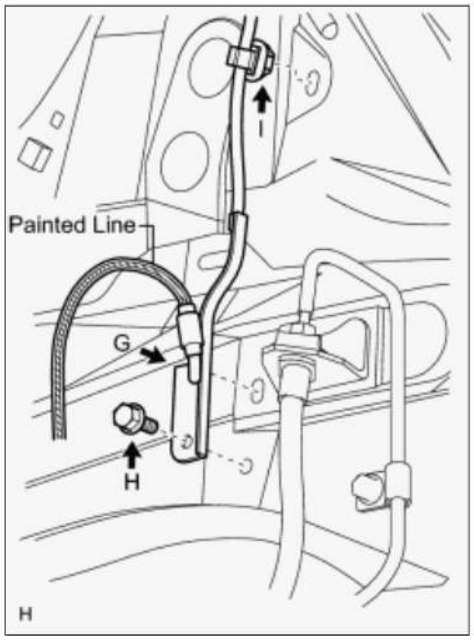
Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

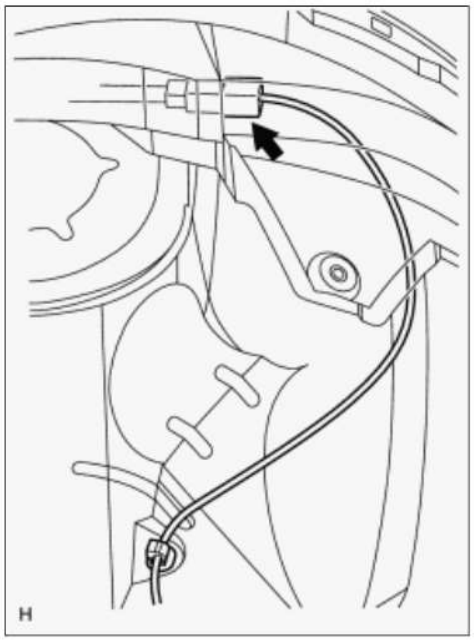
NOTICE:

Do not twist the sensor wire when installing the clamp.

(2) Insert the sensor clip (labeled I) into the hole on the apron.

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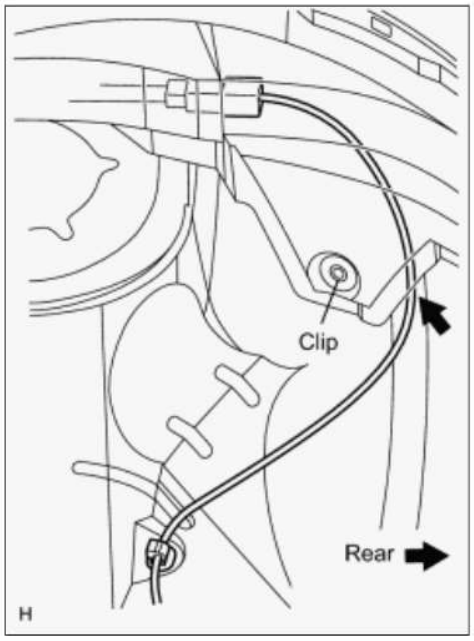
(d) Connect the sensor connector.

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2. INSTALL FRONT FENDER LINER LH

HINT:

Install the fender liner so that the sensor wire harness passes beyond the fender liner installation clip towards the rear side of the vehicle.



3. INSTALL FRONT WHEEL

Torque: 103 N·m (1050 kgf·cm, 76ft·lbf)

4. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

5. CHECK ABS SPEED SENSOR SIGNAL

(a) Check the speed sensor signal INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVE00FX
Title: BRAKE CONTROL: FRONT SPEED SENSOR: REMOVAL (2011 RAV4)		

REMOVAL

HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system..

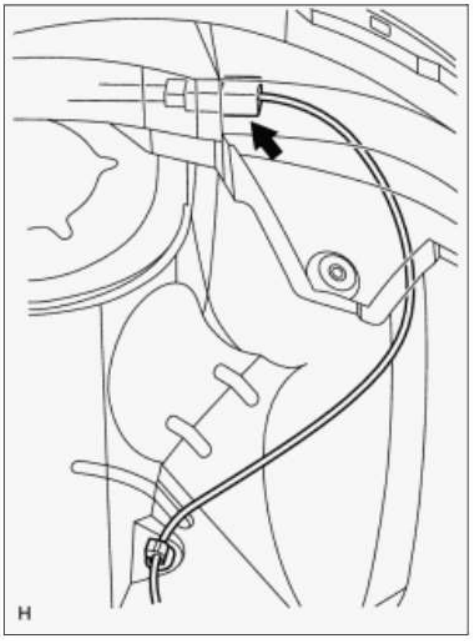
2. REMOVE FRONT WHEEL

3. REMOVE FRONT FENDER LINER LH

HINT:

It is not necessary to fully remove the fender liner. Partially remove it so that the speed sensor connector can be disconnected in a later step.

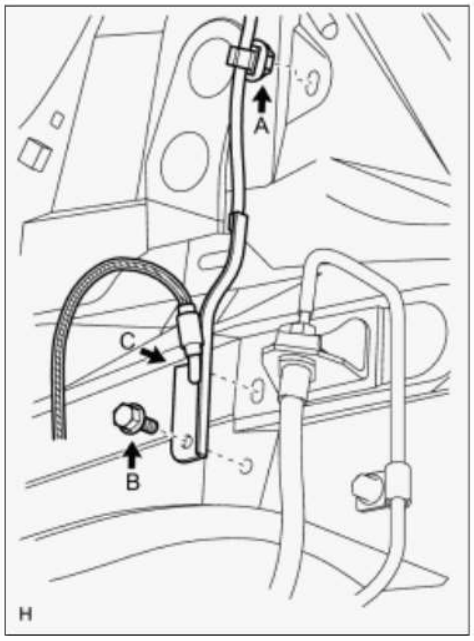
4. REMOVE FRONT SPEED SENSOR LH

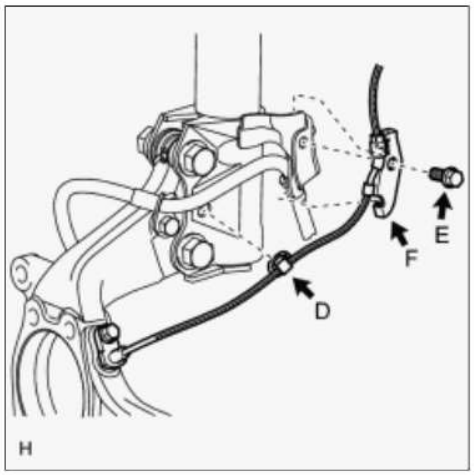


(a) Disconnect the sensor connector.

(b) Remove the sensor clip (labeled A), bolt (labeled B) and sensor clamp (labeled C).

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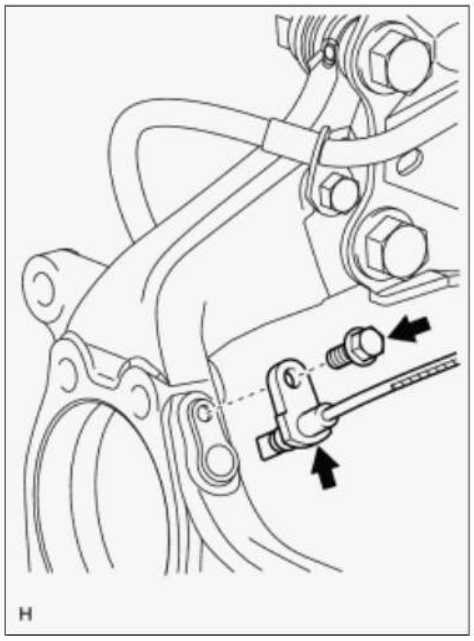
(c) Remove the sensor clip (labeled D), bolt (labeled E) and sensor clamp (labeled F).

(d) Remove the bolt and sensor body from the knuckle.

NOTICE:

Keep the sensor tip and sensor installation hole free from foreign matter.

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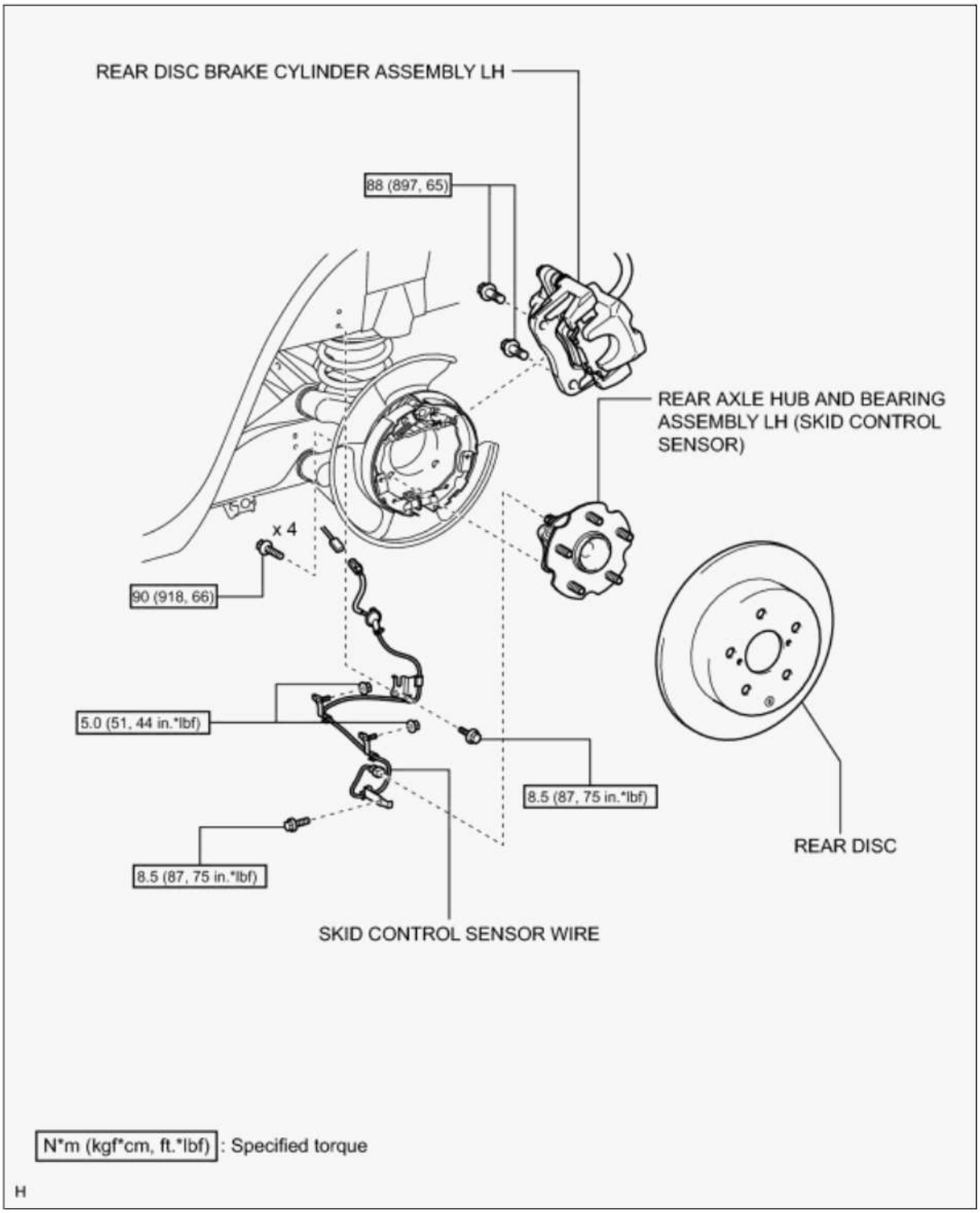


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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YCF00BX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 2WD): COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YCE00FX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 2WD): INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT SKID CONTROL SENSOR

(a) Check the skid control sensor.

Under any of the following conditions, replace the sensor with a new one.

- The surface of the skid control sensor is cracked, dented, or chipped.
- The skid control sensor has been dropped.

2. INSPECT SKID CONTROL SENSOR WIRE

(a) Check the sensor wire.

Under any of the following conditions, replace the sensor with a new one.

- The connector or wire harness is scratched, cracked, or damaged.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000021XN009X
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 2WD): INSTALLATION (2011 RAV4)		

INSTALLATION

HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. INSTALL REAR AXLE HUB AND BEARING ASSEMBLY LH (SKID CONTROL SENSOR)

(a) Install the rear axle hub and bearing LH INFO .

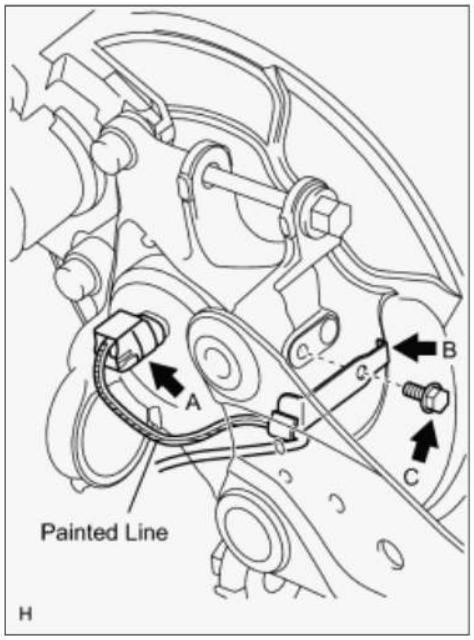
2. INSTALL REAR DISC INFO

3. INSTALL REAR DISC BRAKE CYLINDER ASSEMBLY LH INFO

4. INSTALL SKID CONTROL SENSOR WIRE

NOTICE:

To prevent interference with other parts, do not twist the painted line areas of the sensor wire when installing it.



(a) Connect the skid control sensor wire connector (labeled A) to the skid control sensor.

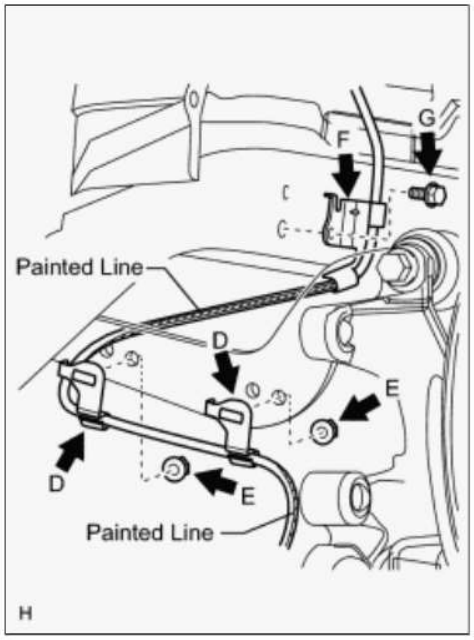
(b) Install the sensor clamp (labeled B) with the bolt (labeled C).

Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

NOTICE:

Do not twist the sensor wire when installing the clamp.

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(c) Install the 2 sensor clamps (labeled D) with the 2 nuts (labeled E).

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

NOTICE:

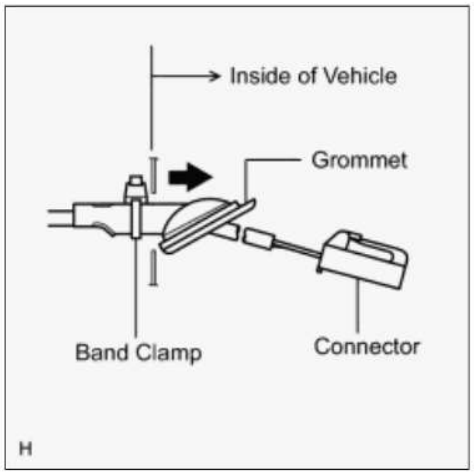
Do not twist the sensor wire when installing the clamps.

(d) Install the sensor clamp (labeled F) with the bolt (labeled G).

Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

NOTICE:

Do not twist the sensor wire when installing the clamp.



(e) Insert the connector and grommet into the inside of the vehicle through the hole in the wheel house.

NOTICE:

Make sure the grommet band clamp remains on the outside of the vehicle.

(f) Hold the grommet and pull it toward the outside of the vehicle. Then fix the grommet in place so that it is not tilted.

NOTICE:

- When pulling out the grommet, do not grip the sensor wire.
- Fix the grommet in place within the range shown in the

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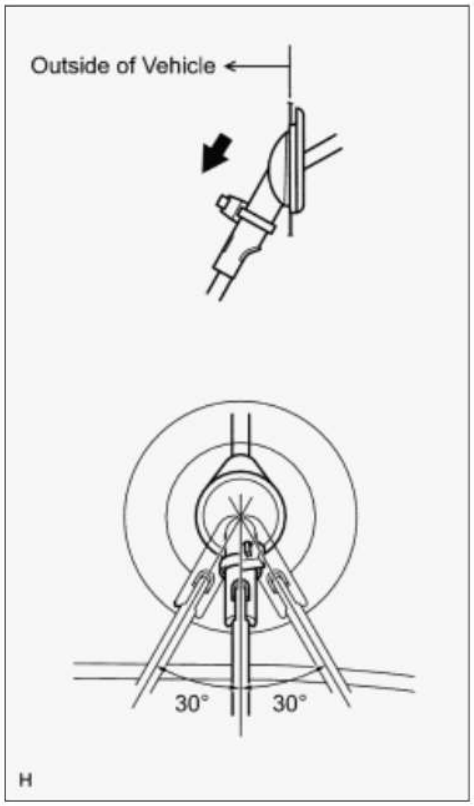
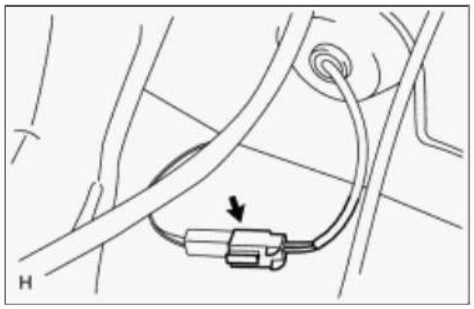


illustration.



(g) Connect the skid control sensor wire connector.

5. INSTALL DECK TRIM SIDE PANEL ASSEMBLY LH

(a) Install the deck trim side panel LH INFO .

6. INSTALL REAR WHEEL

Torque: 103 N·m (1050 kgf·cm, 76ft·lbf)

7. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

8. CHECK SPEED SENSOR SIGNAL

(a) Check the speed sensor signal INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YCG00KX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 2WD): REMOVAL (2011 RAV4)		

REMOVAL

HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

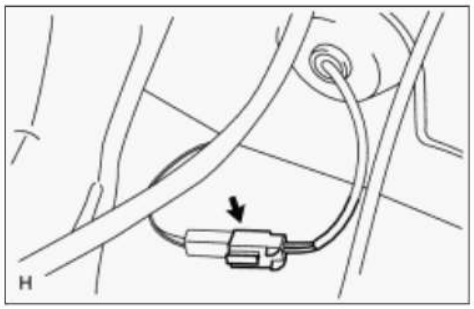
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE REAR WHEEL

3. REMOVE DECK TRIM SIDE PANEL ASSEMBLY LH

(a) Remove the deck trim side panel LH INFO .

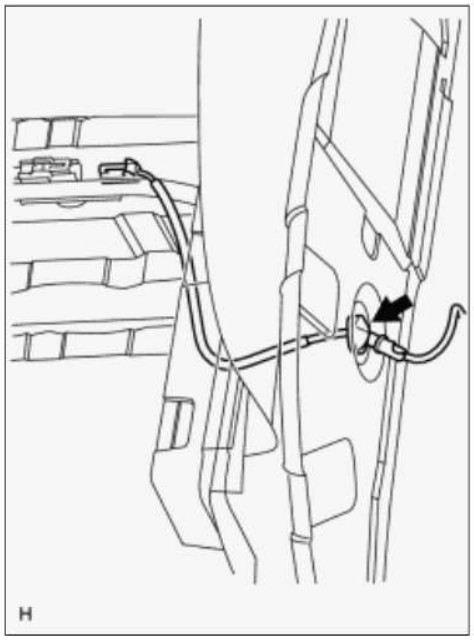
4. REMOVE REAR SPEED SENSOR WIRE

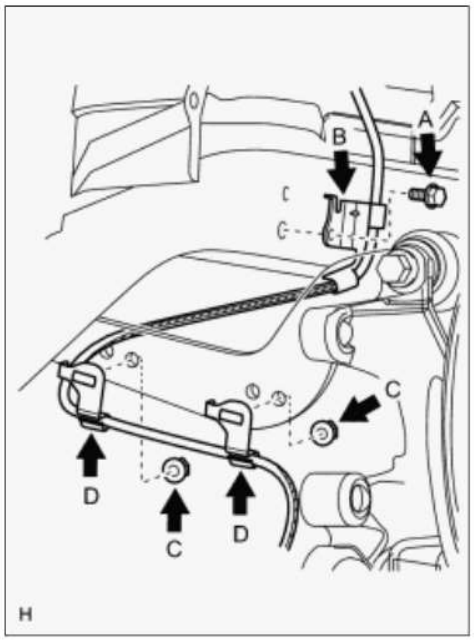


(a) Disconnect the skid control sensor wire connector.

(b) Disconnect the grommet of the skid control sensor wire from the hole of the wheel house.

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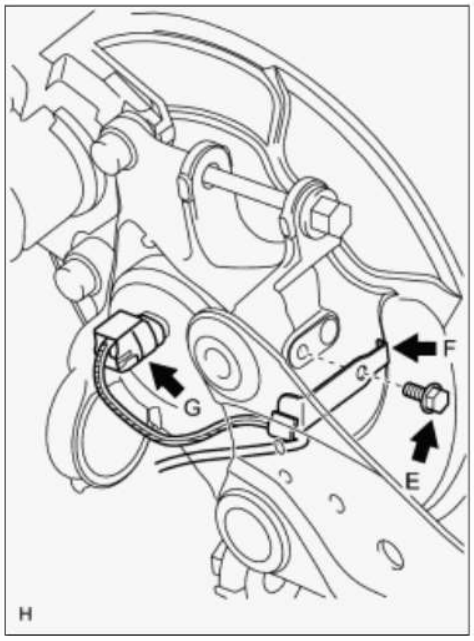


(c) Remove the bolt (labeled A) and sensor clamp (labeled B) from the side member.

(d) Remove the 2 nuts (labeled C) and 2 sensor clamps (labeled D) from the upper arm.

(e) Remove the bolt (labeled E) and sensor clamp (labeled F) from the carrier.

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(f) Disconnect the skid control sensor wire connector (labeled G) from the skid control sensor.

5. REMOVE REAR DISC BRAKE CYLINDER ASSEMBLY LH INFO

6. REMOVE REAR DISC INFO

7. REMOVE REAR AXLE HUB AND BEARING ASSEMBLY LH (SKID CONTROL SENSOR)

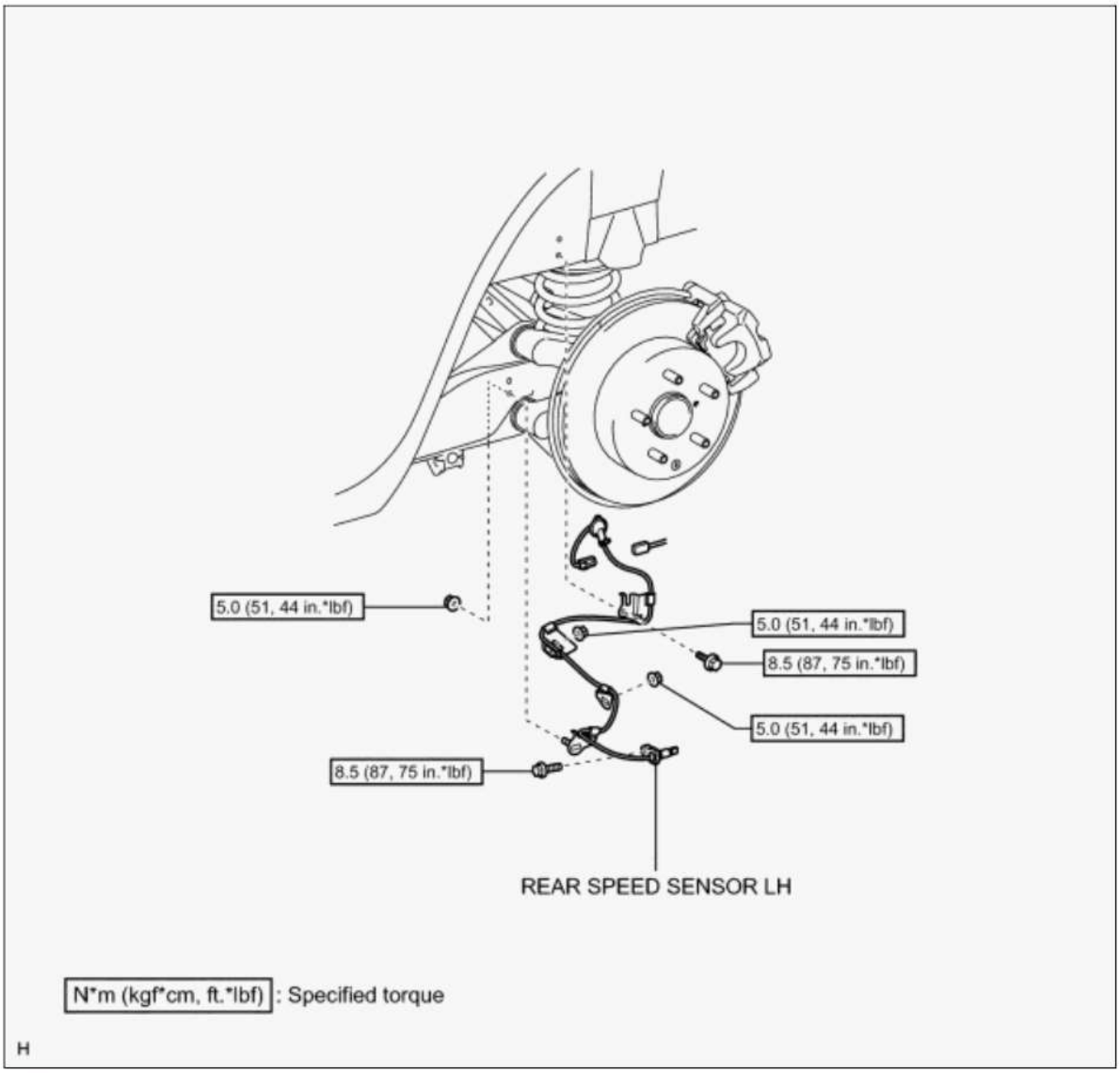
(a) Remove the rear axle hub and bearing LH INFO .

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVK00AX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 4WD): COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YBC00AX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 4WD): INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT REAR SPEED SENSOR

(a) Check the speed sensor.

Under any of the following conditions, replace the sensor with a new one.

- The surface of the speed sensor is cracked, dented, or chipped off.
- The connector or wire harness is scratched, cracked, or damaged.
- The speed sensor has been dropped.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000021XO006X
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 4WD): INSTALLATION (2011 RAV4)		

INSTALLATION

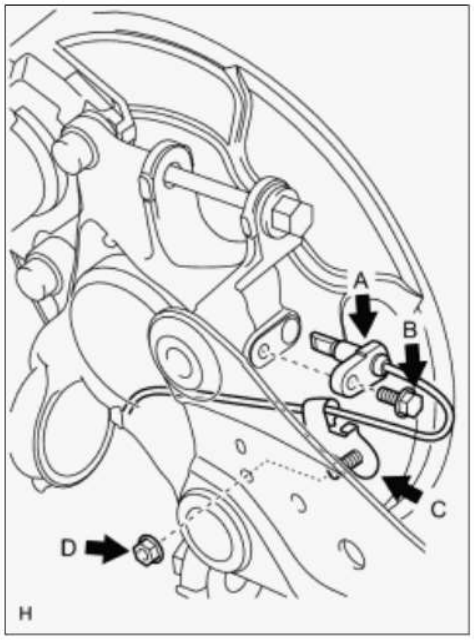
HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. INSTALL REAR SPEED SENSOR LH

NOTICE:

To prevent interference with other parts, do not twist the painted line areas of the sensor wire when installing it.



(a) Install the sensor (labeled A) with the bolt (labeled B).

Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

NOTICE:

- Keep the sensor tip and sensor installation hole free from foreign matter.
- To prevent interference with the bearing rotor, do not rotate the sensor body when inserting the sensor body or after inserting the sensor body.

(b) Install the sensor clamp (labeled C) with the nut (labeled D).

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

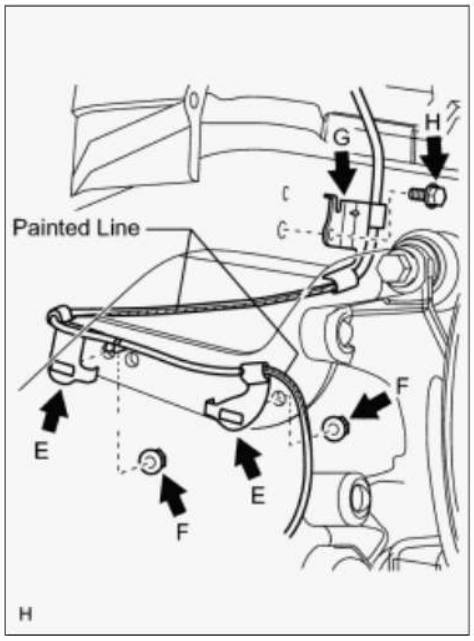
(c) Install the 2 sensor clamps (labeled E) with the 2 nuts (labeled F).

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

NOTICE:

Do not twist the sensor wire when installing the clamps.

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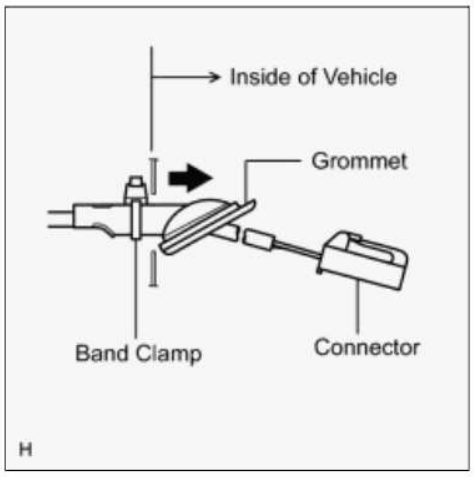


(d) Install the sensor clamp (labeled G) with the bolt (labeled H).

Torque: 8.5 N·m (87 kgf·cm, 75in·lbf)

NOTICE:

Do not twist the sensor wire when installing the clamp.



(e) Insert the connector and grommet into the inside of the vehicle through the passage hole in the wheel house.

NOTICE:

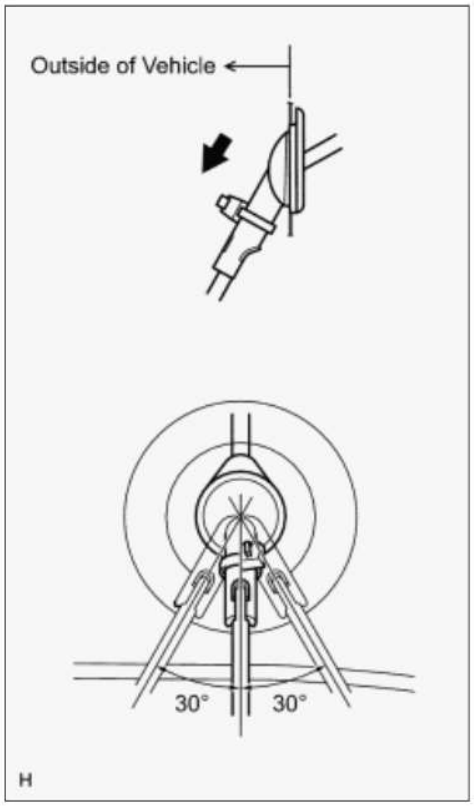
Make sure the grommet band clamp remains on the outside of the vehicle.

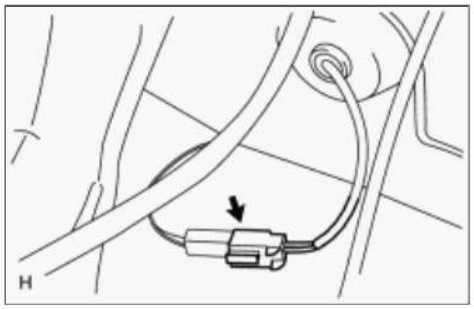
(f) Hold the grommet and pull it toward the outside of the vehicle. Then fix the grommet in place so that it is not tilted.

NOTICE:

- When pulling out the grommet, do not grip the sensor wire.
- Fix the grommet in place within the range shown in the illustration.

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(g) Connect the speed sensor connector.

2. INSTALL DECK TRIM SIDE PANEL ASSEMBLY LH

(a) Install the deck trim side panel LH INFO .

3. INSTALL REAR WHEEL

Torque: 103 N·m (1050 kgf·cm, 76ft·lbf)

4. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

5. CHECK SPEED SENSOR SIGNAL

(a) Check the speed sensor signal INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVL00BX
Title: BRAKE CONTROL: REAR SPEED SENSOR (for 4WD): REMOVAL (2011 RAV4)		

REMOVAL

HINT:

- Use the same procedure for the RH and LH sides.
- The procedures listed below are for the LH side.

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

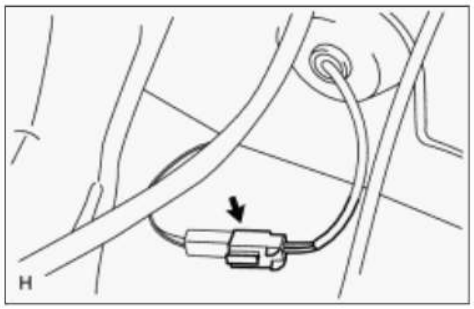
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE REAR WHEEL

3. REMOVE DECK TRIM SIDE PANEL ASSEMBLY LH

(a) Remove the deck trim side panel LH INFO .

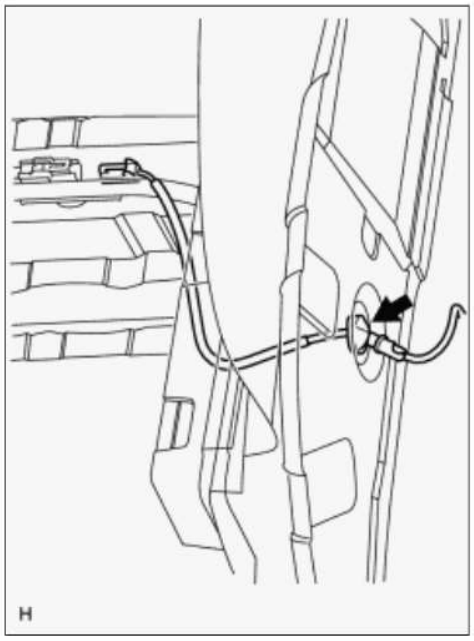
4. REMOVE REAR SPEED SENSOR LH

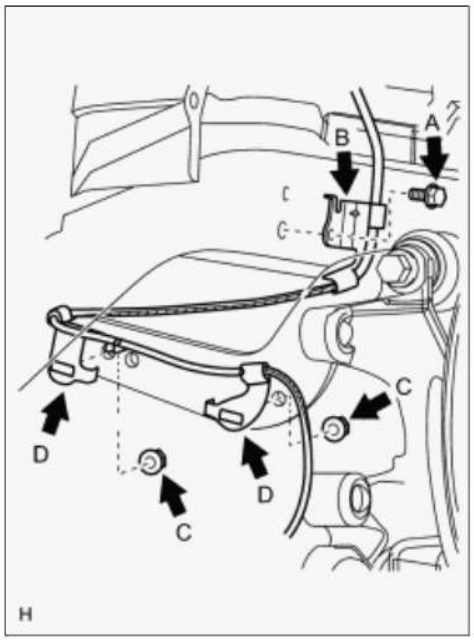


(a) Disconnect the speed sensor connector.

(b) Disconnect the grommet of the speed sensor wire from the hole of the wheel house.

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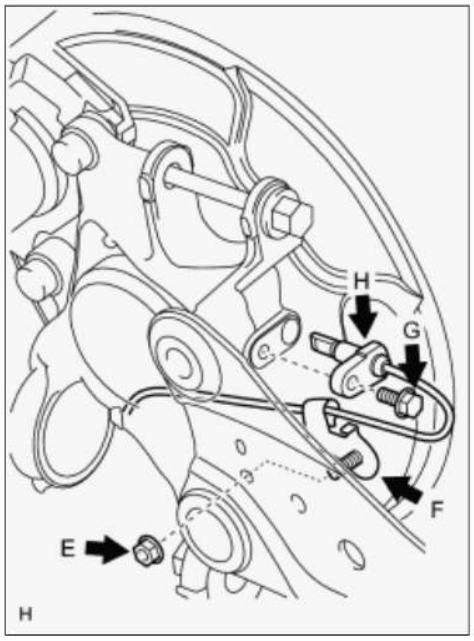


(c) Remove the bolt (labeled A) and sensor clamp (labeled B) from the side member.

(d) Remove the 2 nuts (labeled C) and 2 sensor clamps (labeled D) from the upper arm.

(e) Remove the nut (labeled E) and sensor clamp (labeled F) from the trailing arm.

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(f) Remove the bolt (labeled G) and sensor body (labeled H) from the carrier.

NOTICE:

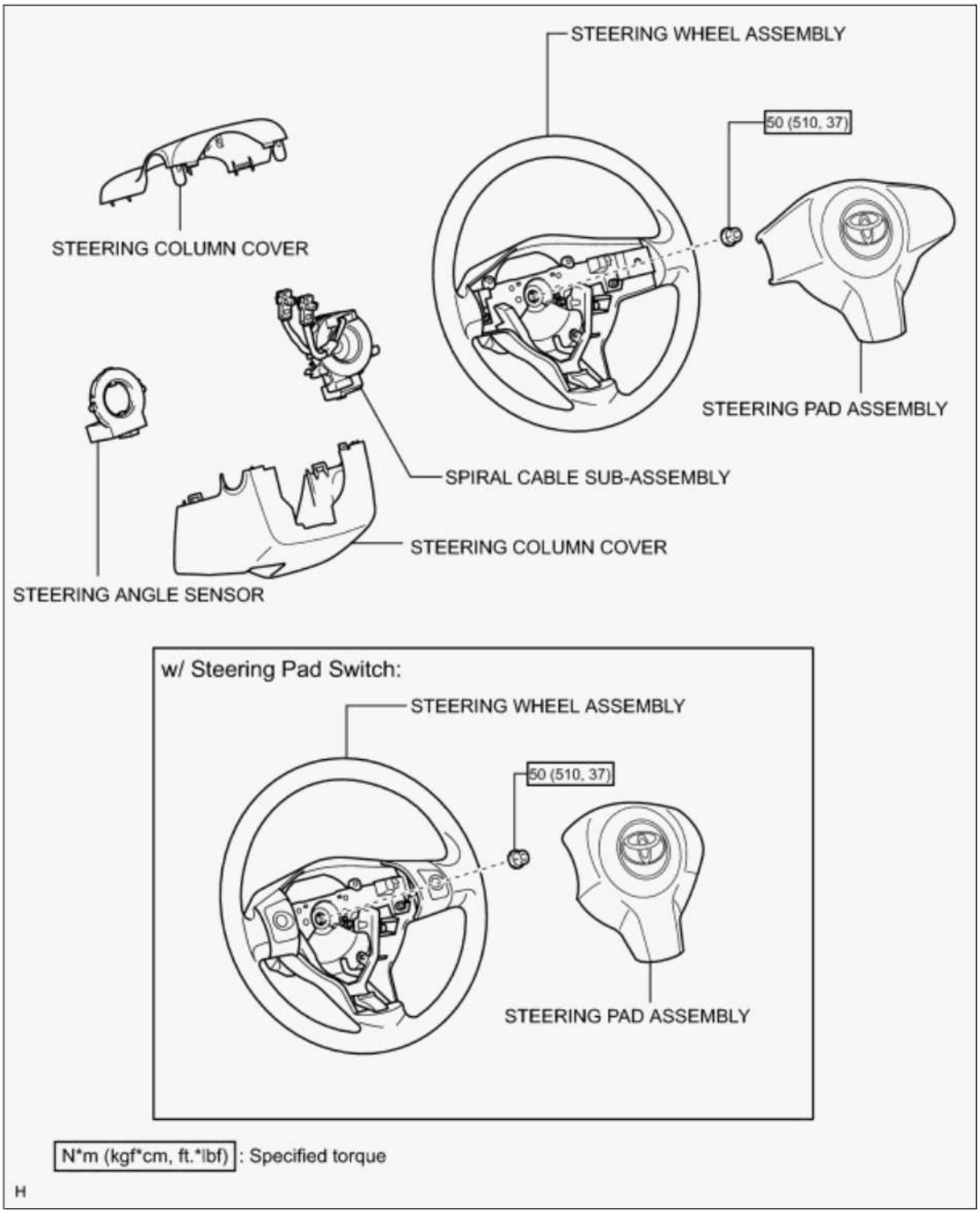
Keep the sensor tip and sensor installation hole free from foreign matter.

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVS00EX
Title: BRAKE CONTROL: STEERING ANGLE SENSOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YBH00EX
Title: BRAKE CONTROL: STEERING ANGLE SENSOR: INSPECTION (2011 RAV4)		

INSPECTION

1. CHECK STEERING ANGLE SENSOR

(a) Check the steering angle sensor.

Under any of the following conditions, replace the steering angle sensor with a new one.

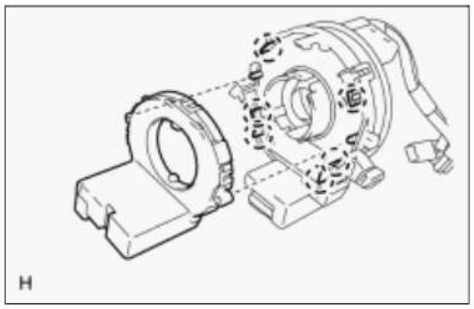
- The connector is scratched, cracked, or damaged.
- The steering angle sensor has been dropped, or the spiral cable sub-assembly has been dropped when the steering angle sensor is installed to the spiral cable sub-assembly.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVR00JX
Title: BRAKE CONTROL: STEERING ANGLE SENSOR: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL STEERING ANGLE SENSOR



(a) Align the holes of the sensor with the pins on the spiral cable, and attach the 6 claws to install the sensor to the spiral cable.

2. INSTALL SPIRAL CABLE SUB-ASSEMBLY INFO

3. INSTALL STEERING COLUMN COVER INFO

4. INSTALL STEERING WHEEL ASSEMBLY INFO

5. INSTALL STEERING PAD ASSEMBLY INFO

6. INSPECT STEERING WHEEL CENTER POINT

7. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When reconnecting the cable to the negative (-) battery terminal after installing the steering angle sensor, check that the front tires and steering wheel are kept aligned straight ahead before and after connecting the cable to the negative (-) battery terminal.

8. INSPECT STEERING PAD ASSEMBLY INFO

9. CHECK SRS WARNING LIGHT

(a) Check the SRS warning light INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVT00IX
Title: BRAKE CONTROL: STEERING ANGLE SENSOR: REMOVAL (2011 RAV4)		

REMOVAL

1. PRECAUTION

CAUTION:

Be sure to read the "PRECAUTION" thoroughly before servicing INFO .

2. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

3. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

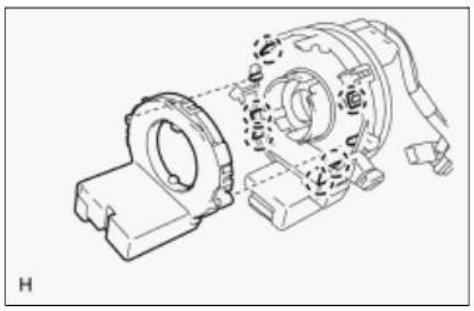
4. REMOVE STEERING PAD ASSEMBLY INFO

5. REMOVE STEERING WHEEL ASSEMBLY INFO

6. REMOVE STEERING COLUMN COVER INFO

7. REMOVE SPIRAL CABLE SUB-ASSEMBLY INFO

8. REMOVE STEERING ANGLE SENSOR



(a) Detach the 6 claws and remove the sensor from the spiral cable.

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000OSG02HX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: ABS Warning Light does not Come ON (2011 RAV4)		

ABS Warning Light does not Come ON

WIRING DIAGRAM

Refer to the ABS warning light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A

▼

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (ABS WARNING LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

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ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light	Warning light ON / OFF	Observe the combination meter.

OK:
The ABS warning light turns on or off.

NG ▶ **CHECK METER/GAUGE SYSTEM (HOW TO PROCEED WITH TROUBLESHOOTING)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000OSE02BX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: ABS Warning Light Remains ON (2011 RAV4)		

ABS Warning Light Remains ON

DESCRIPTION

If any of the following conditions are detected, the ABS warning light remains on:

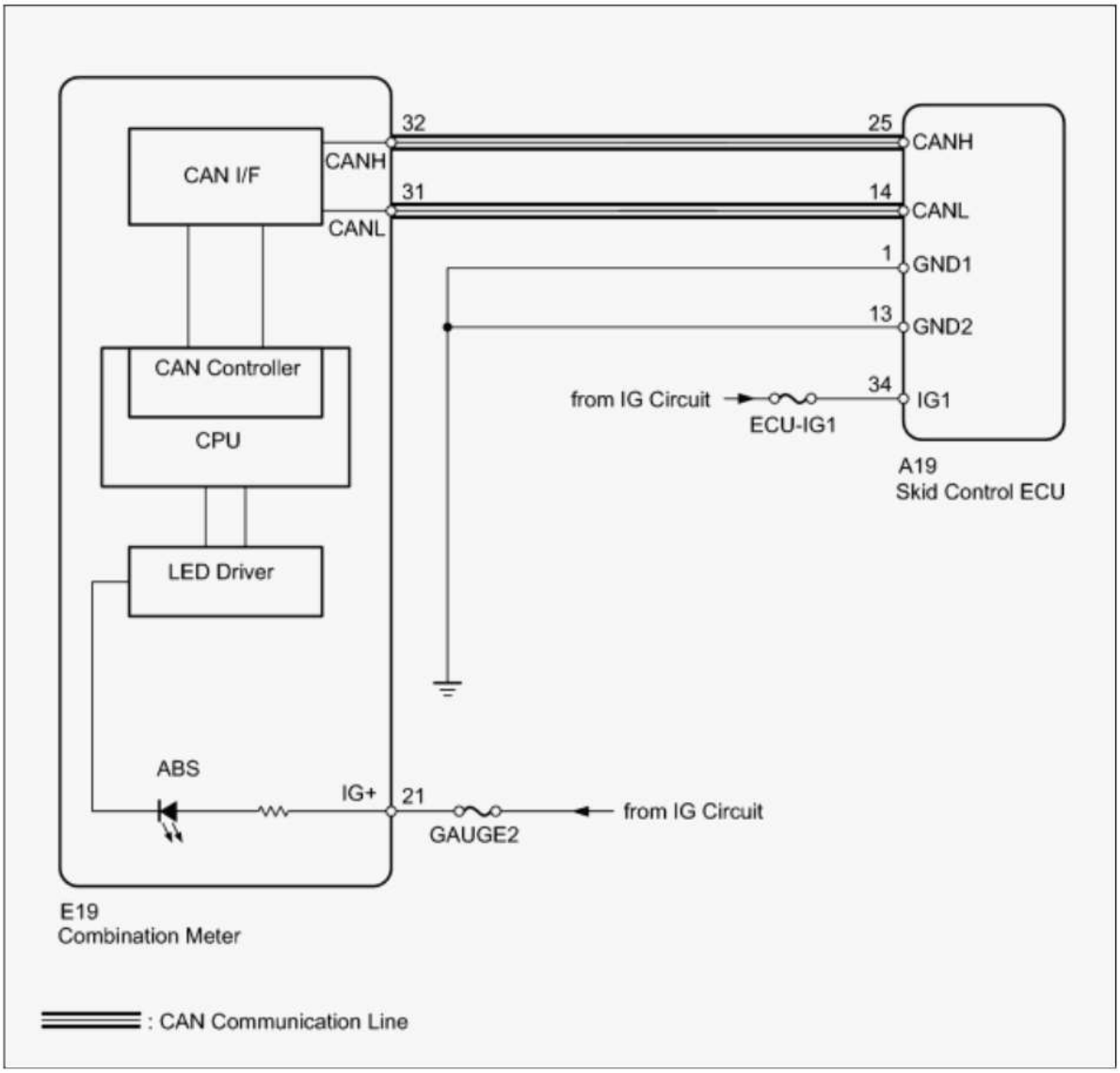
1. The ECU connectors are disconnected from the skid control ECU.
2. There is a malfunction in the skid control ECU internal circuit.
3. There is an open or short in the wire harness between the combination meter and the skid control ECU.

HINT:

The Techstream may not be used when there is a malfunction in the skid control ECU.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A

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RESULT	PROCEED TO
DTC is output.	B

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

A ▼

2.	**INSPECT SKID CONTROL ECU CONNECTOR**

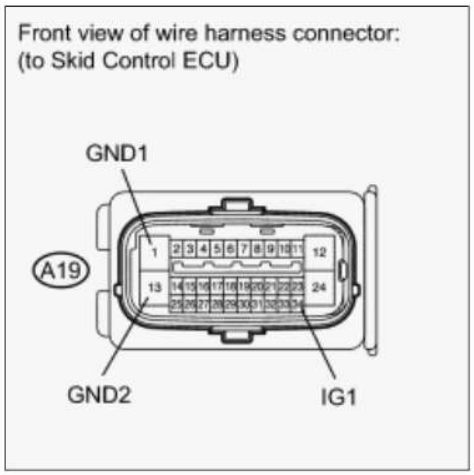
(a) Check if the skid control ECU connector is properly installed.

OK:
The skid control ECU connector is properly installed.

NG ▶ **CONNECT CONNECTOR TO ECU SECURELY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BATTERY AND BODY GROUND)**



(a) Disconnect the skid control ECU connector.

(b) Measure the resistance according to the value(s) in the table below.

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Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-1 (GND1) - Body ground	Always	Below 1 Ω
A19-13 (GND2) - Body ground	Always	Below 1 Ω

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-34 (IG1) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	PERFORM ACTIVE TEST USING TECHSTREAM (ABS WARNING LIGHT)

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light	Warning light ON / OFF	Observe the combination meter.

OK:

The ABS warning light is turned on or off.

HINT:

When the ABS warning light remains illuminated, an open in the wire harness of the combination meter or abnormalities in the meter circuit should be considered.

NG ▶ **CHECK METER/GAUGE SYSTEM (HOW TO PROCEED WITH TROUBLESHOOTING)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000022GR00CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: AUTO LSD Indicator Light does not Come ON (2011 RAV4)		

AUTO LSD Indicator Light does not Come ON

DESCRIPTION

Refer to the description of "AUTO LSD Indicator Light Remains ON" INFO .

WIRING DIAGRAM

Refer to the AUTO LSD indicator light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A

2.	**READ VALUE USING TECHSTREAM (TRAC/VSC OFF MODE)**

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(a) Check the Data List for proper functioning of the VSC OFF switch INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
TRAC/VSC Off Mode	VSC OFF switch / Normal, TRC OFF, unknown or VSC OFF	Normal: Normal mode TRC OFF: TRAC off mode VSC OFF: VSC off mode	-

OK:
Display changes according to switch operation.

NG ▶ **INSPECT TRACTION CONTROL SWITCH (VSC OFF SWITCH)**

OK ▼

3.	**PERFORM ACTIVE TEST USING TECHSTREAM (AUTO LSD INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Auto LSD Indicator Light	AUTO LSD indicator light	Indicator light ON / OFF	Observe the combination meter.

OK:
The AUTO LSD indicator light turns ON and OFF.

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▼

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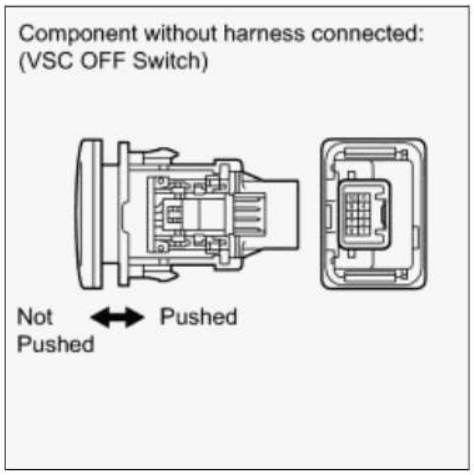
4.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

5.	**INSPECT TRACTION CONTROL SWITCH (VSC OFF SWITCH)**



(a) Remove the VSC OFF switch INFO .

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
6 - 9	Not pushed	10 kΩ or higher
	Pushed	Below 1Ω

NG ▶ **REPLACE TRACTION CONTROL SWITCH (VSC OFF SWITCH)**

OK ▼

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6.	**CHECK HARNESS AND CONNECTOR (VSC OFF SWITCH - SKID CONTROL ECU/BODY GROUND)**

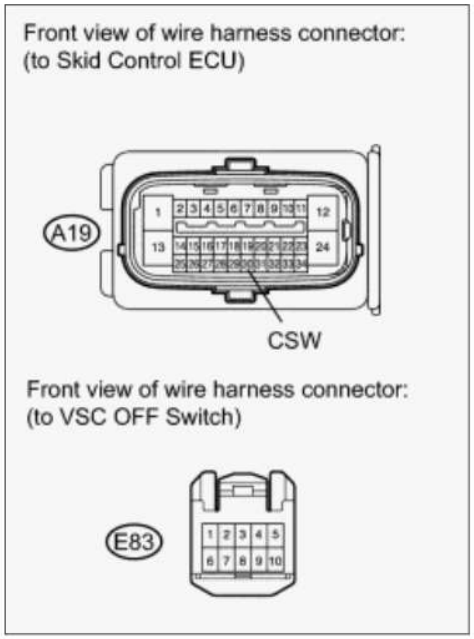
(a) Disconnect the skid control ECU connector.

(b) Disconnect the VSC OFF switch connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-30 (CSW) - E83-9	Always	Below 1 Ω
A19-30 (CSW) - Body ground	Always	10 kΩ or higher
E83-6 - Body ground	Always	Below 1 Ω



NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000022GQ00CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: AUTO LSD Indicator Light Remains ON (2011 RAV4)		

AUTO LSD Indicator Light Remains ON

DESCRIPTION

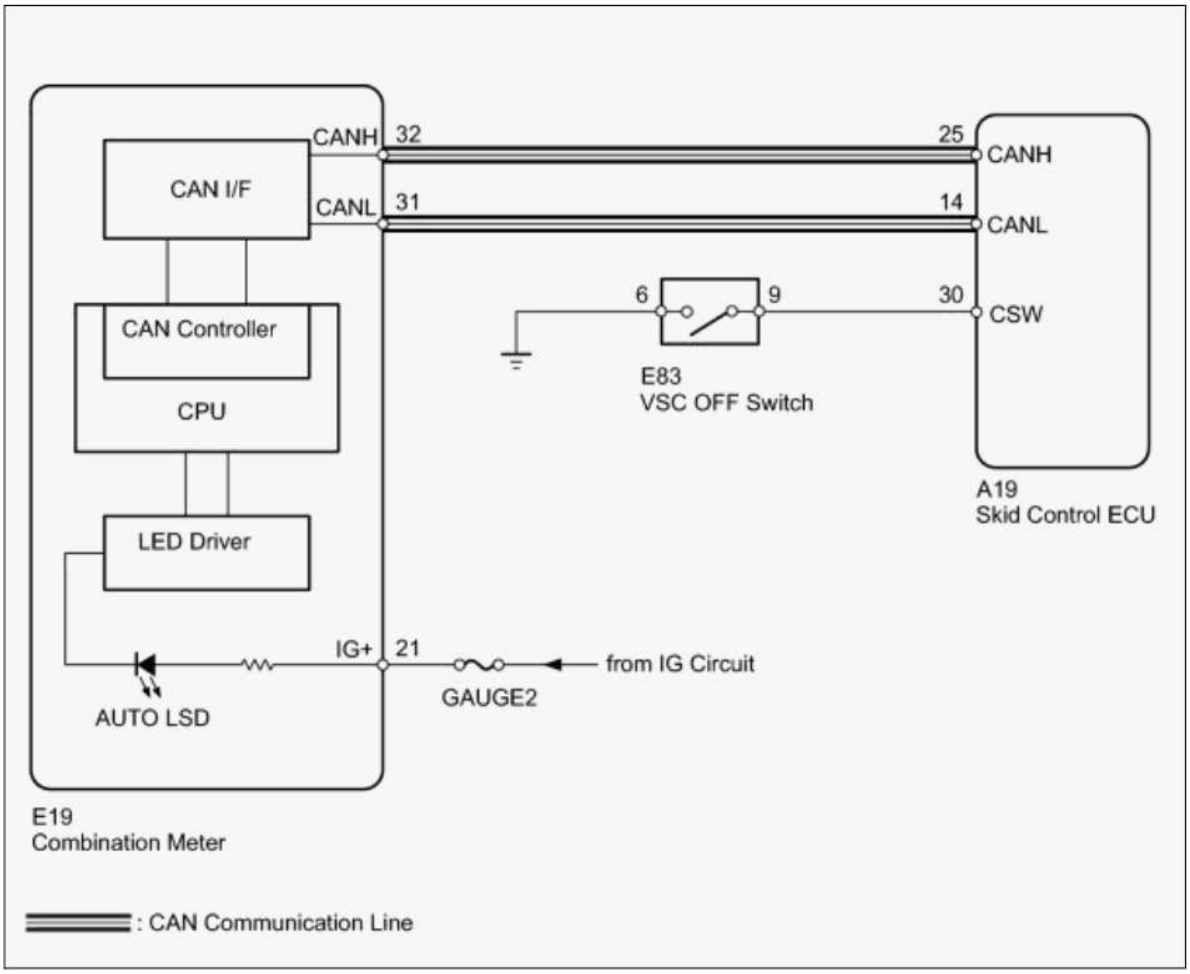
The AUTO LSD is a system for 2WD vehicles. When the VSC OFF switch is pushed on, the AUTO LSD function is available and the AUTO LSD indicator light illuminates.

HINT:

The AUTO LSD does not operate even if the VSC OFF switch is pressed under the following conditions:

- The TRAC or VSC system is faulty.
- The temperature inside the brake actuator assembly increases and the AUTO LSD operation is suspended.

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

OK:

The connector is securely connected.

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

A ▼

2.	**CHECK SKID CONTROL ECU CONNECTOR**

(a) Check if the skid control ECU connector is securely connected.

OK:

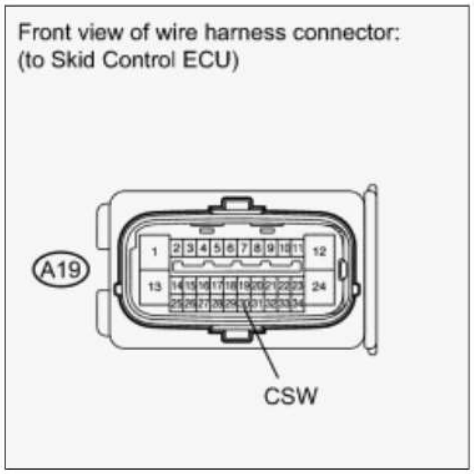
The connector is securely connected.

NG ▶ **CONNECT CONNECTOR CORRECTLY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BODY GROUND)**

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(a) Disconnect the skid control ECU connector.

(b) Measure the resistance according to the value(s) in the table below.

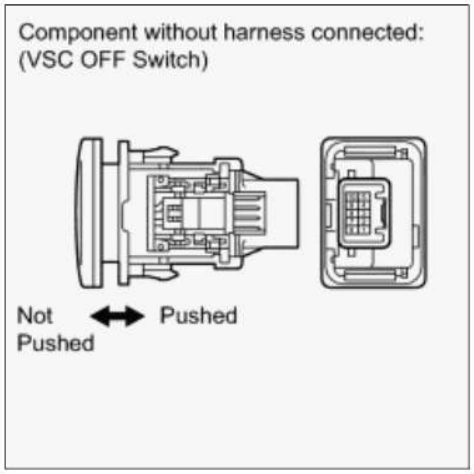
Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-30 (CSW) - Body ground	VSC OFF switch is not pushed	10 kΩ or higher
	VSC OFF switch is pushed	Below 1Ω

OK ▶ **INSPECT COMBINATION METER ASSEMBLY**

NG ▼

4.	**INSPECT TRACTION CONTROL SWITCH (VSC OFF SWITCH)**



(a) Remove the VSC OFF switch INFO .

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(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
6 - 9	Not pushed	10 kΩ or higher
	Pushed	Below 1Ω

NG ▶ **REPLACE TRACTION CONTROL SWITCH (VSC OFF SWITCH)**

OK ▼

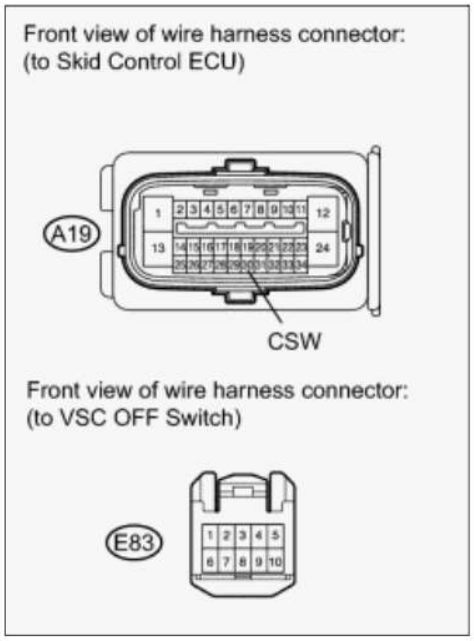
5.	**CHECK HARNESS AND CONNECTOR (VSC OFF SWITCH - SKID CONTROL ECU/BODY GROUND)**

(a) Disconnect the skid control ECU connector.

(b) Disconnect the VSC OFF switch connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-30 (CSW) - E83-9	Always	Below 1 Ω
A19-30 (CSW) - Body ground	Always	10 kΩ or higher
E83-6 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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6.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001CGO02CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Brake Warning Light does not Come ON (2011 RAV4)		

Brake Warning Light does not Come ON

WIRING DIAGRAM

Refer to the BRAKE warning light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A
▼

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (BRAKE WARNING LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

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ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Brake Warning Light	BRAKE warning light	Warning light ON / OFF	Observe the combination meter.

OK:
The BRAKE warning light turns on or off.

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

NG ▼

3.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001CGN02DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Brake Warning Light Remains ON (2011 RAV4)		

Brake Warning Light Remains ON

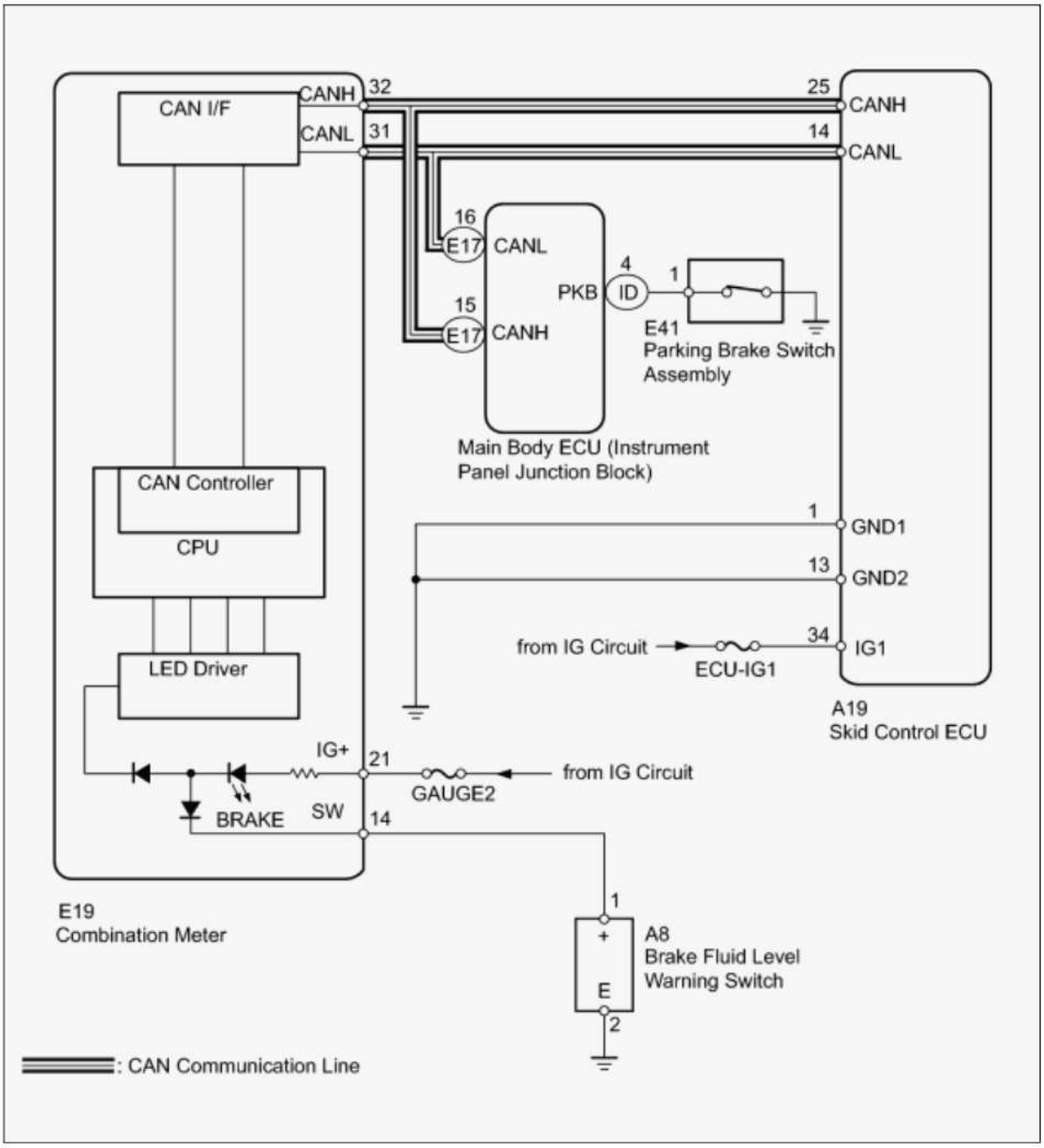
DESCRIPTION

If any of the following conditions are detected, the BRAKE warning light remains on:

1. The ECU connectors are disconnected from the skid control ECU.
2. The brake fluid level is insufficient.
3. The parking brake is applied.
4. The EBD is defective.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**PREPARE FOR INSPECTION**

(a) Check that both of the following conditions are satisfied.

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- The brake fluid level in the brake master cylinder reservoir is correct.
- The parking brake is released.

HINT:

When the ABS warning light remains illuminated, repair the malfunctions in the ABS system first.

NEXT

2.	**CHECK DTC FOR ABS**

(a) Check if any ABS DTCs are output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CIRCUITS INDICATED BY OUTPUT DTCS**

A

3.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

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A

4.	**INSPECT SKID CONTROL ECU CONNECTOR**

(a) Check if the skid control ECU connector is properly installed.

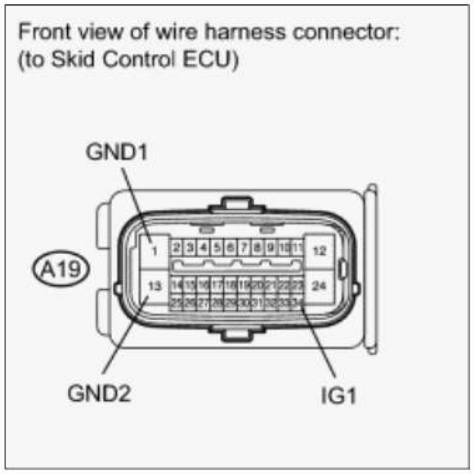
OK:

The skid control ECU connector is properly installed.

NG ▶ **CONNECT CONNECTOR TO ECU SECURELY**

OK

5.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BATTERY AND BODY GROUND)**



(a) Disconnect the skid control ECU connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-1 (GND1) - Body ground	Always	Below 1 Ω
A19-13 (GND2) - Body ground	Always	Below 1 Ω

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(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-34 (IG1) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**READ VALUE USING TECHSTREAM (PARKING BRAKE SWITCH)**

(a) Using the Data List, check for proper functioning of the parking brake switch.

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Parking Brake SW	Parking brake switch / ON or OFF	ON: Parking brake applied OFF: Parking brake released	-

OK:

When the parking brake lever is operated, the display changes as shown above.

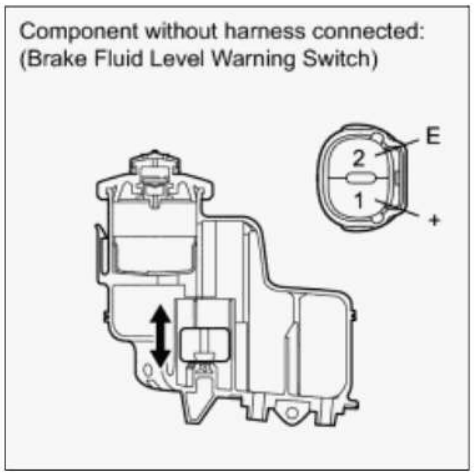
NG ▶ **INSPECT PARKING BRAKE SWITCH ASSEMBLY**

OK ▼

7.	**INSPECT BRAKE FLUID LEVEL WARNING SWITCH**

(a) Remove the reservoir tank cap and strainer.

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(b) Disconnect the brake fluid level warning switch connector.

(c) Measure the resistance according to the value(s) in the table below.

HINT:

A float is placed inside the reservoir. Its position can be changed by increasing or decreasing the brake fluid level.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (+) - 2 (E)	Float up (Switch off)	10 kΩ or higher
1 (+) - 2 (E)	Float down (Switch on)	Below 1 Ω

HINT:

If there is no problem after the above check is finished, adjust the brake fluid level to the MAX level.

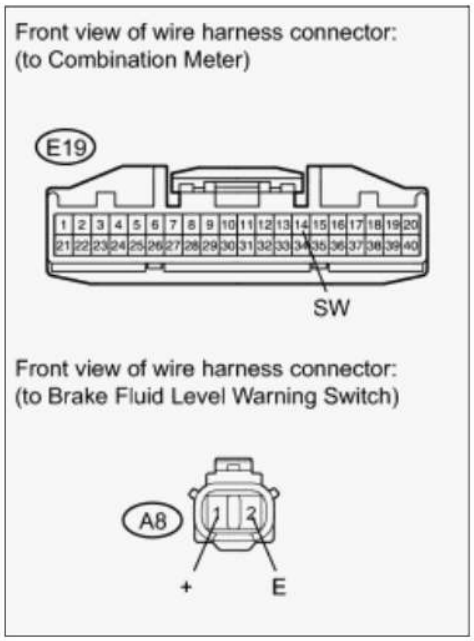
NG ▶ **REPLACE BRAKE MASTER CYLINDER RESERVOIR SUB-ASSEMBLY**

OK ▼

8.	**CHECK HARNESS AND CONNECTOR (BRAKE FLUID LEVEL WARNING SW - COMBINATION METER/BODY GROUND)**

(a) Disconnect the combination meter connector.

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(b) Disconnect the brake fluid level warning switch connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E19-14 (SW) - A8-1 (+)	Always	Below 1 Ω
E19-14 (SW) - Body ground	Always	10 kΩ or higher
A8-2 (E) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

9.	**INSPECT COMBINATION METER ASSEMBLY**

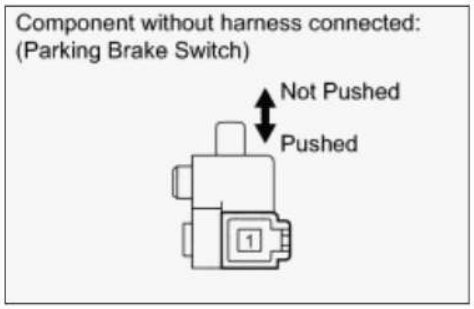
(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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10.	INSPECT PARKING BRAKE SWITCH ASSEMBLY



(a) Remove the parking brake switch INFO .

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - Body ground	Parking brake switch on (Switch pin not pushed)	Below 1 Ω
	Parking brake switch off (Switch pin pushed)	10 kΩ or higher

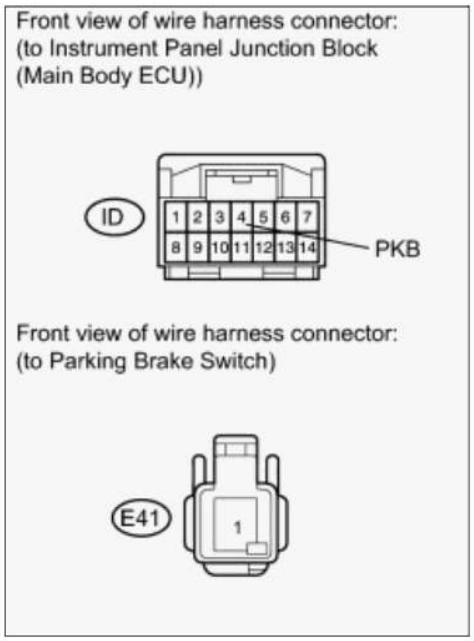
NG ▶ **REPLACE PARKING BRAKE SWITCH ASSEMBLY**

OK
▼

11.	CHECK HARNESS AND CONNECTOR (PARKING BRAKE SWITCH - JUNCTION BLOCK/BODY GROUND)

(a) Disconnect the junction block connector.

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(b) Disconnect the parking brake switch connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ID-4 (PKB) - E41-1	Always	Below 1 Ω
ID-4 (PKB) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE INSTRUMENT PANEL JUNCTION BLOCK**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XI807PX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C0226,C0236,C0246,C0256,C1225: SFR Solenoid Circuit (2011 RAV4)		

DTC	**C0226**	**SFR Solenoid Circuit**

DTC	**C0236**	**SFL Solenoid Circuit**

DTC	**C0246**	**SRR Solenoid Circuit**

DTC	**C0256**	**SRL Solenoid Circuit**

DTC	**C1225**	**SM Solenoid Circuit**

DESCRIPTION

These solenoids turn on when signals are received from the skid control ECU and they control the pressure acting on the wheel cylinders to control the braking force.

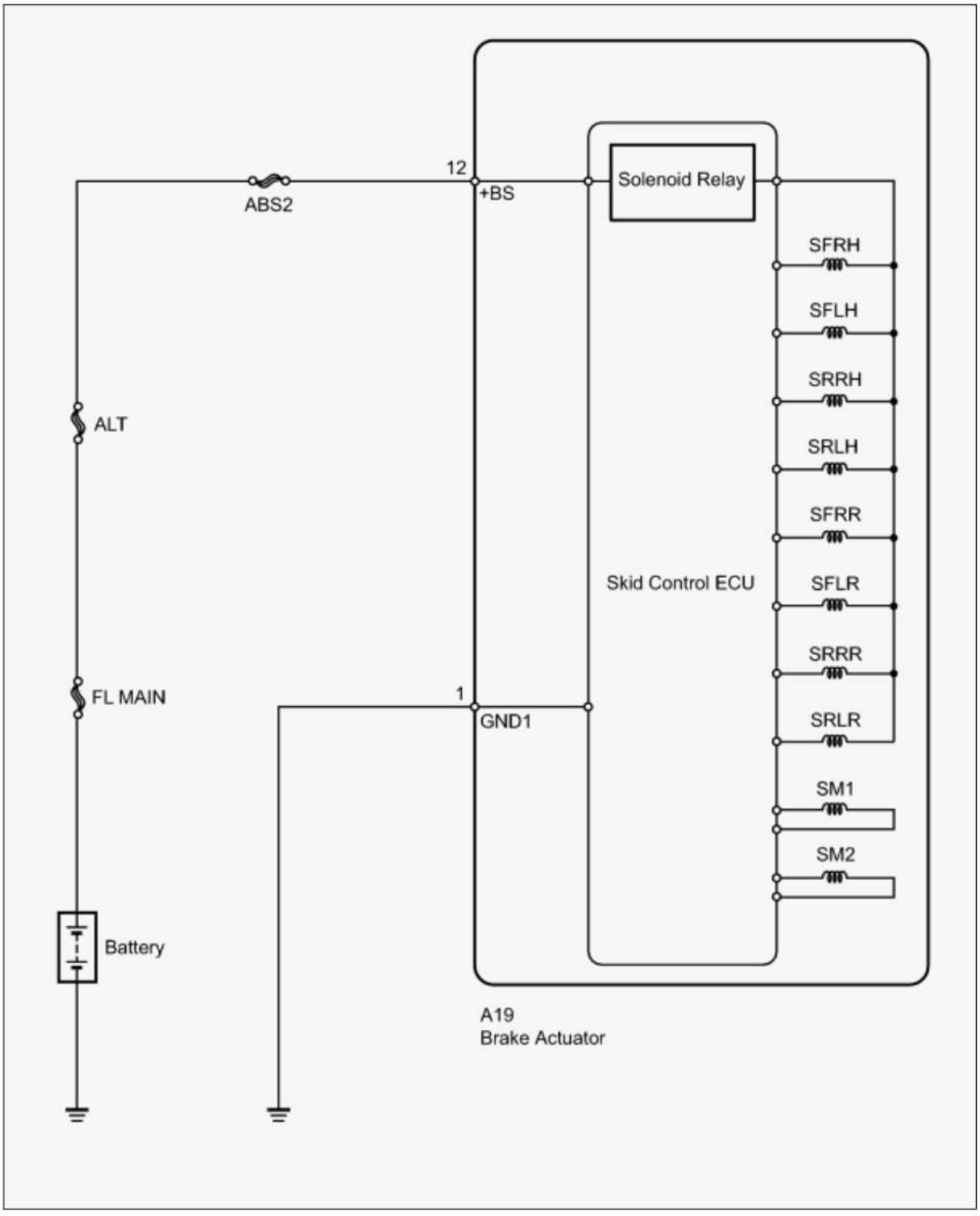
DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C0226 C0236 C0246 C0256	Open or short in the solenoid circuit continues for 0.05 seconds or more.	• Solenoid circuit • Brake actuator assembly
C1225	Any of the following is detected: 1. While switching solenoid (SM1 or SM2) is ON, overcurrent continues for 0.15 seconds or more. 2. While switching solenoid (SM1 or SM2) is OFF, an open circuit continues for 0.05 seconds or more. 3. While switching solenoid (SM1 or SM2) is ON, an open circuit continues for 0.05 seconds or more. 4. While switching solenoid (SM1 or SM2) is OFF, current continues to be applied for 0.1 seconds or more. 5. Short to GND in the switching solenoid (SM1 or SM2)	• SM1 or SM2 circuit • Brake actuator assembly

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
	continues for 0.1 seconds or more. 6. Switching solenoids SM1 and SM2 are shorted for 0.1 seconds or more.	

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

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1.	RECONFIRM DTC

HINT:

These codes are detected when a problem is determined in the brake actuator assembly.

The solenoid circuits are in the brake actuator assembly.

Therefore, solenoid circuit inspection and solenoid unit inspection cannot be performed. Be sure to check if any DTCs are output before replacing the brake actuator assembly.

(a) Clear the DTCs INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 20 km/h (12 mph) or more for 30 seconds or more.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C0226, C0236, C0246, C0256 and C1225) are not output.	A
DTCs (C0226, C0236, C0246, C0256 and/or C1225) are output.	B

HINT:

- If a speed signal of 6 km/h (4 mph) or more is input to the skid control ECU with the ignition switch ON and the stop light switch off, the ECU performs self diagnosis of the motor and solenoid circuits.
- If the normal system code is output (no trouble codes are output), slightly jiggle the connectors, wire harness, and fuses of the brake actuator assembly. Make sure that no DTCs are output.
- If any DTCs are output while jiggling a connector or wire harness of the brake actuator assembly (skid control ECU), inspect and repair the connector or wire harness.
- It is suspected that the DTCs were output due to a bad connection of the connector terminal.

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001JD6062X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C0273,C0274,C1361: Open in ABS Motor Relay Circuit (2011 RAV4)		

DTC	**C0273**	**Open in ABS Motor Relay Circuit**

DTC	**C0274**	**Short in ABS Motor Relay Circuit**

DTC	**C1361**	**Short in ABS Motor Fail Safe Relay Circuit**

DESCRIPTION

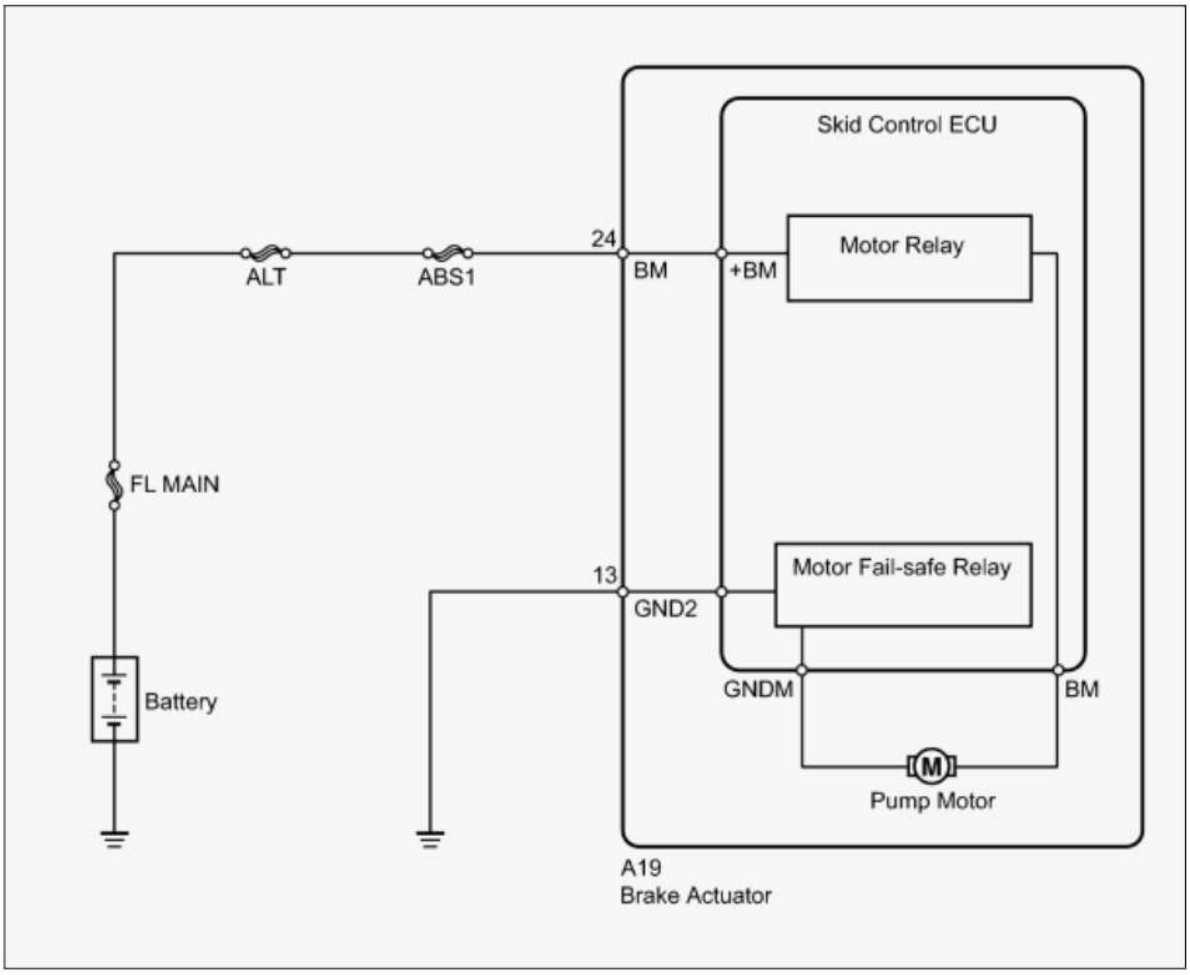
The motor relay supplies power to the pump motor. While the brake control system is activated, the ECU turns the motor relay on and operates the pump motor.

If the voltage supplied to the motor relay (+BM) is below the DTCs detection threshold due to low voltage from the battery or alternator, these DTCs may be stored.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C0273	Either of the following is detected: 1. All of the following conditions continue for 0.1 seconds or more. ○ The IG1 terminal voltage is between 9.5 and 17.2 V. ○ While initial check, or ABS, BA, TRAC or VSC is operating. ○ Relay contact remains open when the relay is ON. 2. Both of the following conditions continue for 0.1 seconds or more. ○ The IG1 terminal voltage is less than 9.5 V. ○ Relay contact remains open when the relay is ON.	• ABS1 H-fuse • Motor relay circuit • Brake actuator assembly (motor relay)
C0274	While the motor relay is OFF, the motor relay remains closed for 4 seconds or more.	• Motor relay circuit • Brake actuator assembly (motor relay)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1241 and/or C1417 is output together with C0273, C0274 and/or C1361, inspect and repair the trouble areas indicated by C1241 and/or C1417 first INFO or INFO).

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM (MOTOR RELAY)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Motor Relay	Motor relay	Relay ON / OFF	Operation sound of motor can be heard.

(d) Check for operating sound of the motor relay when operating it with the Techstream.

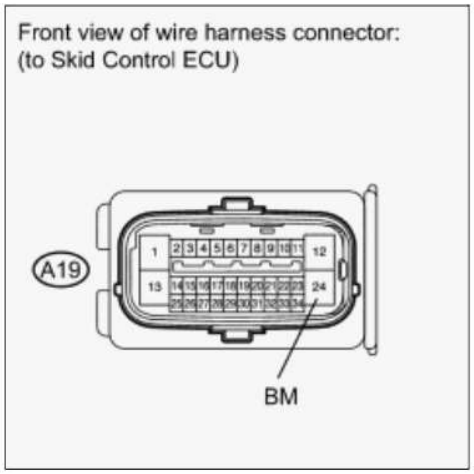
Result:

RESULT	PROCEED TO
Operating sound is not heard.	A
Operating sound is heard.	B

B ▶ **RECONFIRM DTC**

A ▼

2.	**INSPECT SKID CONTROL ECU (BM TERMINAL)**



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the skid control ECU connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

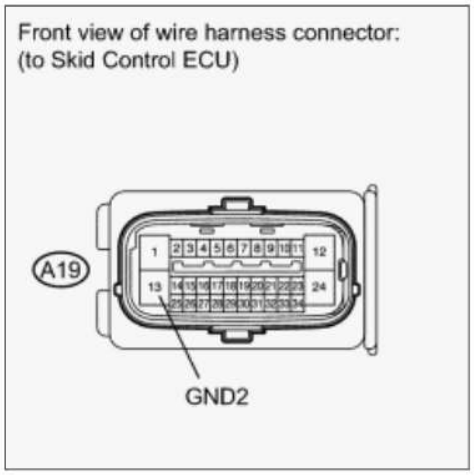
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-24 (BM) - Body ground	Always	11 to 14 V

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (BM CIRCUIT)**

OK ▼

3.	**INSPECT SKID CONTROL ECU (GND2 TERMINAL)**



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-13 (GND2) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND2 CIRCUIT)**

OK ▼

4.	**RECONFIRM DTC**

HINT:

This code is stored when a problem is identified in the brake actuator assembly.

The motor relay is in the brake actuator assembly.

Therefore, motor relay inspection and motor relay unit inspection cannot be performed. Be sure to check if the DTC is output before replacing the brake actuator assembly.

(a) Turn the ignition switch off.

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(b) Reconnect the skid control ECU connector.

(c) Clear the DTCs INFO .

(d) Start the engine.

(e) Drive the vehicle at a speed of 20 km/h (12 mph) or more for 30 seconds or more.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C0273, C0274 and C1361) are not output.	A
DTCs (C0273, C0274 and/or C1361) are output.	B

HINT:

- If a speed signal of 6 km/h (4 mph) or more is input to the skid control ECU with the ignition switch ON and the stop light switch off, the ECU performs self diagnosis of the motor and solenoid circuits.
- If the normal system code is output (no trouble codes are output), slightly jiggle the connectors, wire harness, and fuses of the brake actuator assembly. Make sure that no DTCs are output.
- If any DTCs are output while jiggling a connector or wire harness of the brake actuator assembly (skid control ECU), inspect and repair the connector or wire harness.
- It is suspected that the DTCs were output due to a bad connection of the connector terminal.

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XI706DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C0278,C0279: Open in ABS Solenoid Relay Circuit (2011 RAV4)		

DTC	**C0278**	**Open in ABS Solenoid Relay Circuit**

DTC	**C0279**	**Short in ABS Solenoid Relay Circuit**

DESCRIPTION

The solenoid relay supplies power to the ABS solenoids and TRAC solenoids.

The solenoid relay is turned on 1.5 seconds after the ignition switch is turned to ON, and is turned off if an open or short in the solenoid is detected by self diagnosis performed when the vehicle starts running.

The solenoid relay is housed in the skid control ECU in the actuator assembly.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C0278	Either of the following is detected: 1. Both of the following conditions continue for 0.2 seconds or more. ○ The IG1 terminal voltage is 9.5 V or higher. ○ The solenoid relay contact is open when the relay is on. 2. Both of the following conditions continue for 0.2 seconds or more. ○ The IG1 terminal voltage becomes below 9.5 V when the relay is turned on. ○ The relay contact remains open.	• ABS2 H-fuse • Solenoid relay circuit • Brake actuator assembly (solenoid relay)
C0279	Immediately after the ignition switch is turned to ON, the solenoid relay contact is closed for 4 seconds when the relay is turned off.	• Solenoid relay circuit • Brake actuator assembly (solenoid relay)

WIRING DIAGRAM

Refer to DTCs C0226, C0236, C0246, C0256 and C1225 INFO .

INSPECTION PROCEDURE

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NOTICE:

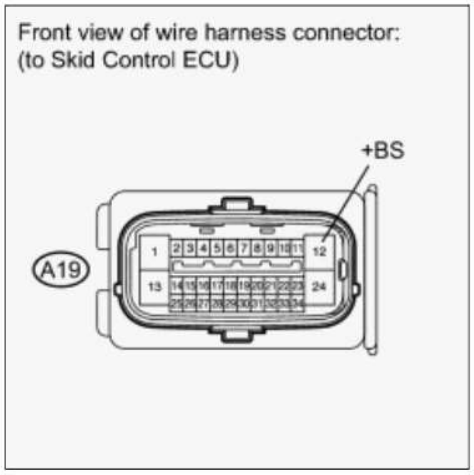
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1241 and/or C1417 is output together with C0278 and/or C0279, inspect and repair the trouble areas indicated by C1241 and/or C1417 first INFO or INFO).

PROCEDURE

1.	**INSPECT SKID CONTROL ECU (+BS TERMINAL)**



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the skid control ECU connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

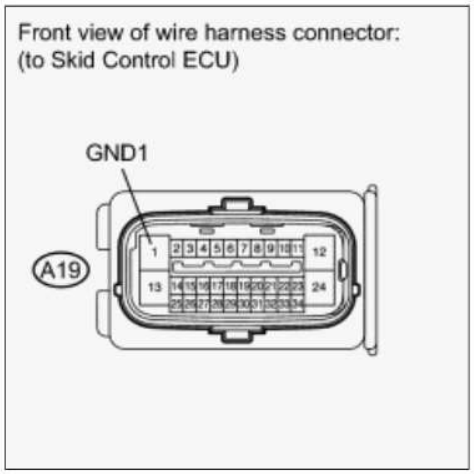
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-12 (+BS) - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (+BS CIRCUIT)**

OK ▼

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2.	INSPECT SKID CONTROL ECU (GND1 TERMINAL)



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-1 (GND1) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

3.	RECONFIRM DTC

HINT:

This code is stored when a problem is identified in the brake actuator assembly.

The solenoid circuit is in the brake actuator assembly.

Therefore, solenoid circuit inspection and solenoid unit inspection cannot be performed. Be sure to check if the DTC is output before replacing the brake actuator assembly.

(a) Reconnect the skid control ECU connector.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 20 km/h (12 mph) or more for 30 seconds or more.

(e) Check if the same DTC is output INFO .

Result:

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RESULT	PROCEED TO
DTCs (C0278 and C0279) are not output.	A
DTCs (C0278 and/or C0279) are output.	B

HINT:

- If a speed signal of 6 km/h (4 mph) or more is input to the skid control ECU with the ignition switch ON and the stop light switch off, the ECU performs self diagnosis of the motor and solenoid circuits.
- If the normal system code is output (no trouble codes are output), slightly jiggle the connectors, wire harnesses, and fuses of the brake actuator assembly. Make sure that no DTCs are output.
- If any DTCs are output while jiggling a connector or wire harness of the brake actuator assembly (skid control ECU), inspect and repair the connector or wire harness.
- It is suspected that the DTCs were output due to a bad connection of the connector terminal.

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001RFV069X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C0371,C1279: Yaw Rate Sensor (Test Mode DTC) (2011 RAV4)		

DTC	**C0371**	**Yaw Rate Sensor (Test Mode DTC)**

DTC	**C1279**	**Acceleration Sensor Output Voltage Malfunction (Test Mode DTC)**

DESCRIPTION

DTCs C0371 and C1279 can be cleared when the yaw rate and deceleration sensor sends a yaw rate and/or deceleration signal or when Test Mode ends. DTCs C0371 and C1279 are output only in Test Mode.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C0371	Detected only during Test Mode.	Yaw rate and deceleration sensor
C1279	Detected only during Test Mode.	• Sensor installation • Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION**

(a) Check that the yaw rate and deceleration sensor has been installed properly INFO .

OK:

The sensor should be tightened to the specified torque.

The sensor should not be installed in a tilted position.

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

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OK



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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XII057X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1201: Engine Control System Malfunction (2011 RAV4)		

DTC	**C1201**	**Engine Control System Malfunction**

DESCRIPTION

If a malfunction in the engine control system is detected, the operation of VSC and TRAC is prohibited by the fail-safe function. When the signals from the engine are input normally, the fail-safe control is canceled and the DTC is not stored.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1201	Engine control system malfunction signal continues for 1 second or more.	Engine control system

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK ENGINE CONTROL SYSTEM**

(a) for 2AR-FE:

Check if any engine control system DTC is output INFO .

(b) for 2GR-FE:

Check if any engine control system DTC is output INFO .

Result:

RESULT		PROCEED TO
DTC is not output.	for 2AR-FE	A
	for 2GR-FE	B
DTC is output.	for 2AR-FE	C
	for 2GR-FE	D

B ▶ **REPLACE ECM**

C ▶ **INSPECT ENGINE CONTROL SYSTEM (for DTC)**

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D ▶ INSPECT ENGINE CONTROL SYSTEM (for DTC)

A ▶ REPLACE ECM

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIJ037X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1203: ECM Communication Circuit Malfunction (2011 RAV4)		

DTC	**C1203**	**ECM Communication Circuit Malfunction**

DESCRIPTION

The circuit is used to send TRAC and VSC control information from the skid control ECU to the ECM, and engine control information from the ECM to the skid control ECU through the CAN communication system.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1203	Engine, drive source and destination variations that are sent from the ECM do not match the ones of the skid control ECU.	ECM

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK PART NUMBER (SKID CONTROL ECU AND ECM)**

(a) Check that the proper skid control ECU and ECM are installed.

Result:

RESULT		PROCEED TO
Proper ECUs are installed.	for 2AR-FE	A
	for 2GR-FE	B
Proper ECUs are not installed.		C

B ▶ **REPLACE ECM**

C ▶ **REPLACE ECUS WITH PROPER ONES**

A ▶ **REPLACE ECM**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIK05HX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1210,C1336: Zero Point Calibration of Yaw Rate Sensor Undone (2011 RAV4)		

DTC	**C1210**	**Zero Point Calibration of Yaw Rate Sensor Undone**

DTC	**C1336**	**Zero Point Calibration of Acceleration Sensor Undone**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are output.

The DTCs are also output when the calibration has not been completed.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1210	Zero point calibration of yaw rate sensor undone.	Yaw rate and deceleration sensor
C1336	Zero point calibration of acceleration sensor undone.	Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly or yaw rate sensor assembly, perform zero point calibration INFO **.**

HINT:

When U0123, U0124 and/or U0126 is output together with C1210 and/or C1336, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO **.**

PROCEDURE

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1.	PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSOR

(a) Perform zero point calibration of the yaw rate and deceleration sensor INFO .

NEXT

2.	PERFORM TEST MODE (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION**

OK ▶ **END**

3.	CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION

(a) Turn the ignition switch off.

(b) Check that the yaw rate and deceleration sensor has been installed properly INFO .

OK:
The sensor should be tightened to the specified torque.
The sensor should not be installed in a tilted position.

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

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OK

4.	READ VALUE USING TECHSTREAM (YAW RATE AND DECELERATION SENSOR)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Deceleration Sensor	Deceleration sensor 1 reading / min.: -18.525 m/s^2, max.: 18.387 m/s^2	-	Reading changes when vehicle is bounced
Deceleration Sensor 2	Deceleration sensor 2 reading / min.: -18.525 m/s^2, max.: 18.387 m/s^2	-	Reading changes when vehicle is bounced
Yaw Rate Sensor	Yaw rate sensor 1 reading / min.: -128 °/s, max.: 127 °/s	Vehicle stationary: 0 °/s Right turn: -128 to 0 °/s Left turn: 0 to 127 °/s	-

(d) Check that the yaw rate and deceleration sensor output value displayed on the Techstream.

OK:

The yaw rate and deceleration sensor output value is normal.

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ REPLACE YAW RATE SENSOR ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001RFV068X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1232,C1243,C1245: Acceleration Sensor Stuck Malfunction (2011 RAV4)		

DTC	**C1232**	**Acceleration Sensor Stuck Malfunction**

DTC	**C1243**	**Acceleration Sensor Stuck Malfunction**

DTC	**C1245**	**Acceleration Sensor Output Malfunction**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

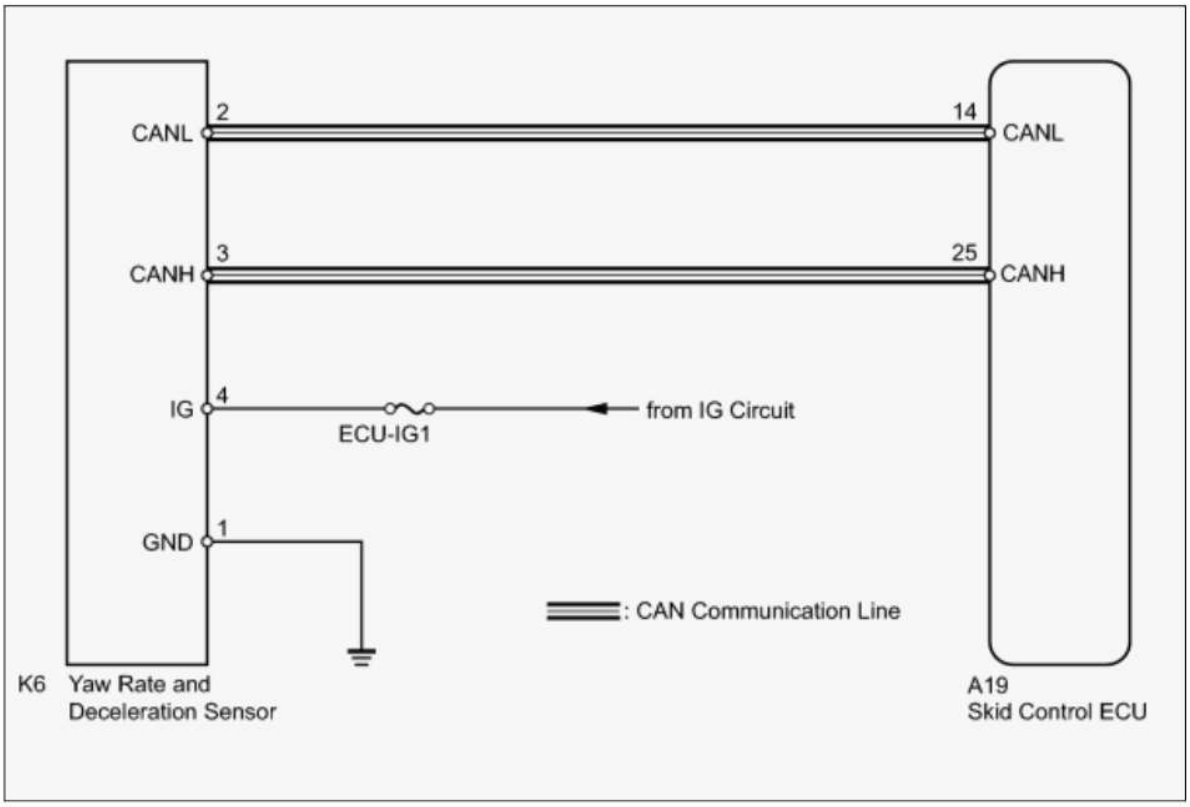
If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are stored.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1232	At a vehicle speed of 10 km/h (6 mph) or more, acceleration sensor output value does not change for 30 seconds or more.	• Sensor installation • Yaw rate and deceleration sensor
C1243	While the vehicle speed changes from 30 km/h (19 mph) to 0 km/h (0 mph), the condition that the value of acceleration sensor does not change by 0.0294 G or more occurs 16 times or more.	• Sensor installation • Yaw rate and deceleration sensor
C1245	At a vehicle speed of 30 km/h (19 mph) or more, the difference between the forward and backward G calculated from the acceleration sensor value and that calculated from the vehicle speed sensor exceeds 0.35 G for 60 seconds or more.	• Sensor installation • Yaw rate and deceleration

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
		sensor

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

HINT:

When U0123, U0124 and/or U0126 is output together with C1232, C1243, and/or C1245, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

1.	**CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION**

(a) Check that the yaw rate and deceleration sensor has been installed properly INFO .

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OK:

The sensor should be tightened to the specified torque.

The sensor should not be installed in a tilted position.

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

OK ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XW6083X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1241: Low Power Supply Voltage Malfunction (2011 RAV4)		

DTC	**C1241**	**Low Power Supply Voltage Malfunction**

DESCRIPTION

If a malfunction is detected in the power supply circuit, the skid control ECU (housed in the actuator assembly) stores this DTC and the fail-safe function prohibits ABS/TRAC/VSC operation.

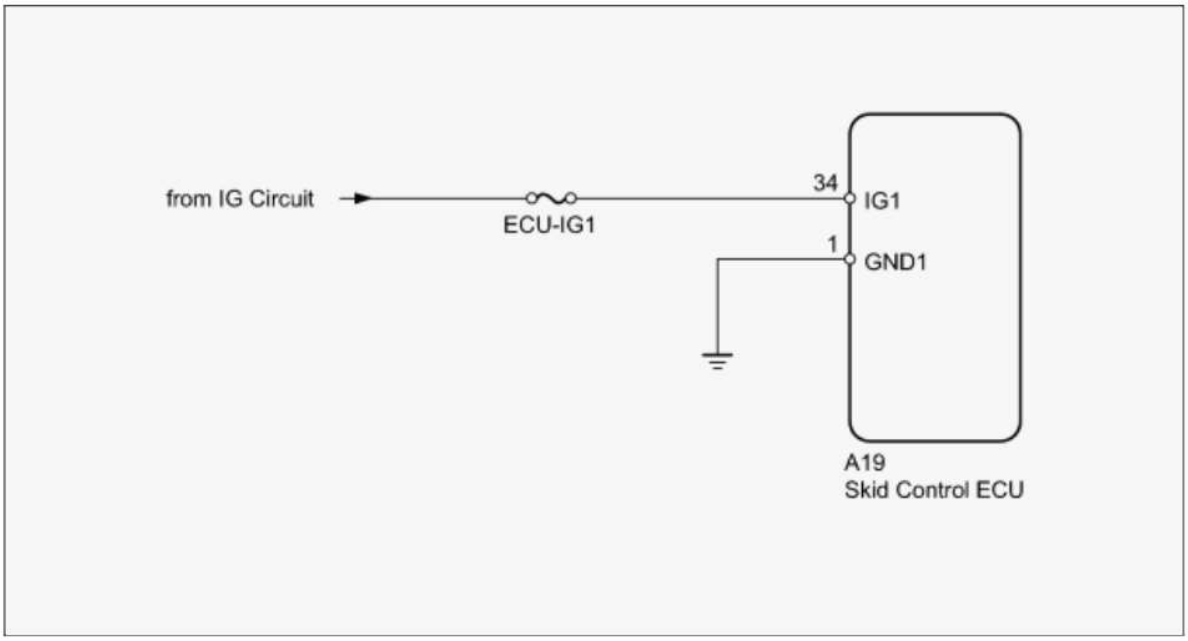
This DTC is stored when the IG1 terminal voltage deviates from the DTC detection condition due to a malfunction in the power supply or charging circuit such as the battery or alternator circuit, etc.

The DTC is canceled when the IG1 terminal voltage returns to normal.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1241	Any of the following is detected: 1. At a vehicle speed of 3 km/h (2 mph) or more, the IG1 terminal voltage is less than 9.5 V for 10 seconds or more. 2. When the solenoid relay remains on and the IG1 terminal voltage is less than 9.5 V, the relay contact is open for 0.22 seconds or more. 3. With the IG1 terminal voltage 9.5 V or less, the vehicle speed sensor power supply decreases for 60 seconds or more. 4. When the motor fail-safe relay is on after the motor relay turns on, the IG1 terminal voltage is 9.5 V or less and the actuator pump drive motor is off for 0.22 seconds or more.	• ECU-IG1 fuse • Battery • Charging system • Power source circuit • Internal power supply circuit of the skid control ECU

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WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK BATTERY**

(a) Check the battery voltage.

Standard voltage:
11 to 14 V
Result:

RESULT		PROCEED TO
OK		A
NG	for 2AR-FE	B
	for 2GR-FE	C

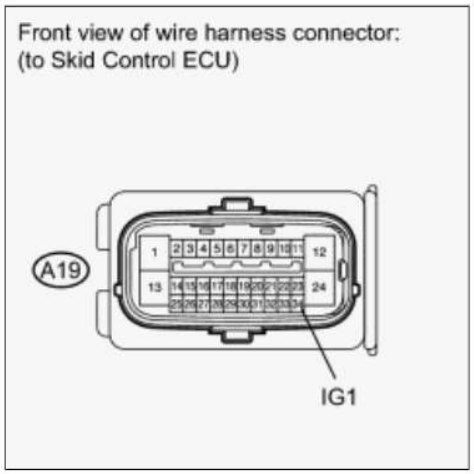
B ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

C ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

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A

2.	**INSPECT SKID CONTROL ECU (IG1 TERMINAL)**



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the skid control ECU connector.

(c) Turn the ignition switch to ON.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-34 (IG1) - Body ground	Ignition switch ON	11 to 14 V

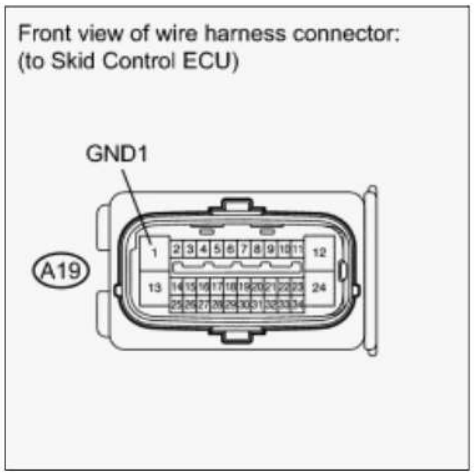
NG **REPAIR OR REPLACE HARNESS OR CONNECTOR (IG1 CIRCUIT)**

OK

3.	**INSPECT SKID CONTROL ECU (GND1 TERMINAL)**

(a) Turn the ignition switch off.

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(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-1 (GND1) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

4.	**RECONFIRM DTC**

(a) Reconnect the skid control ECU connector.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 20 km/h (12 mph) or more for 30 seconds or more.

(e) Check if the same DTC is recorded INFO .

Result:

RESULT	PROCEED TO
DTC (C1241) is not output.	A
DTC (C1241) is output.	B

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HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XI90C7X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1271,C1272,C1275,C1276: Low Output Signal of Front Speed Sensor RH (Test Mode DTC) (2011 RAV4)		

DTC	**C1271**	**Low Output Signal of Front Speed Sensor RH (Test Mode DTC)**

DTC	**C1272**	**Low Output Signal of Front Speed Sensor LH (Test Mode DTC)**

DTC	**C1275**	**Abnormal Change in Output Signal of Front Speed Sensor RH (Test Mode DTC)**

DTC	**C1276**	**Abnormal Change in Output Signal of Front Speed Sensor LH (Test Mode DTC)**

DESCRIPTION

DTCs C1271 to C1276 will be cleared when the speed sensor sends a vehicle speed signal or when Test Mode ends. DTCs from C1271 to C1276 are output only in Test Mode.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1271 C1272	Detected only during Test Mode.	• Front speed sensor RH/LH • Sensor installation • Speed sensor rotor
C1275 C1276	Detected only during Test Mode.	Speed sensor rotor

HINT:

- DTCs C1271 and C1275 are for the front speed sensor RH.
- DTCs C1272 and C1276 are for the front speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1401 and C1402 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

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PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (FR/FL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Speed Open	FR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Open	FL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

Result:

RESULT	PROCEED TO
There are momentary interruptions.	A
There are no momentary interruptions.	B
There is a constant open circuit.	C

HINT:

Perform the above inspection before removing the sensor and connector.

B ▶ **READ VALUE USING TECHSTREAM (FR/FL WHEEL SPEED)**

C ▶ **CHECK FRONT SPEED SENSOR INSTALLATION**

A ▼

2.	**REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - FRONT SPEED SENSOR)**

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(a) Turn the ignition switch off.

(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and the front speed sensor INFO .

(d) Check that there are no momentary interruptions.

NEXT

3.	**PERFORM TEST MODE (SIGNAL CHECK)**

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.

NG ▶ **READ VALUE USING TECHSTREAM (FR/FL WHEEL SPEED)**

OK ▶ **END**

4.	**READ VALUE USING TECHSTREAM (FR/FL WHEEL SPEED)**

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Wheel Speed	FR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer
FL Wheel Speed	FL wheel speed sensor reading /min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer

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(e) Check that there is no difference between the speed value output from the speed sensor displayed on the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:
The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

NG ▶ **CHECK FRONT SPEED SENSOR INSTALLATION**

OK ▼

5.	**PERFORM TEST MODE (SIGNAL CHECK)**

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.

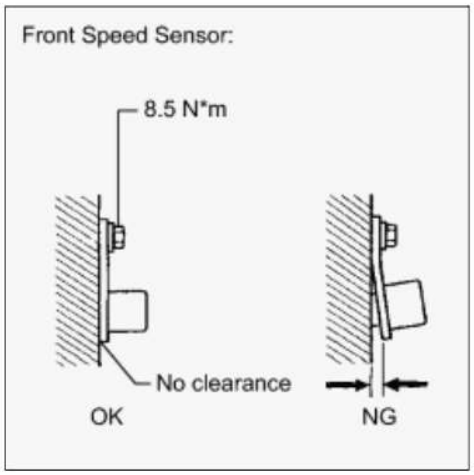
NG ▶ **CHECK FRONT SPEED SENSOR INSTALLATION**

OK ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

6.	**CHECK FRONT SPEED SENSOR INSTALLATION**

(a) Turn the ignition switch off.

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(b) Check the speed sensor installation INFO .

OK:

There is no clearance between the sensor and the front steering knuckle.

The installation bolt is tightened properly.

Torque

8.5 N*m (87 kgf*cm, 75 in.*lbf)

NG ▶ INSTALL FRONT SPEED SENSOR CORRECTLY

OK
▼

7.	CHECK FRONT SPEED SENSOR TIP

(a) Remove the front speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches, oil, or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ CLEAN OR REPLACE FRONT SPEED SENSOR

OK
▼

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8.	CHECK FRONT SPEED SENSOR ROTOR

(a) Remove the front axle hub sub-assembly INFO .

(b) Check the speed sensor rotor.

OK:

No scratches, oil, or foreign matter on the rotors.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

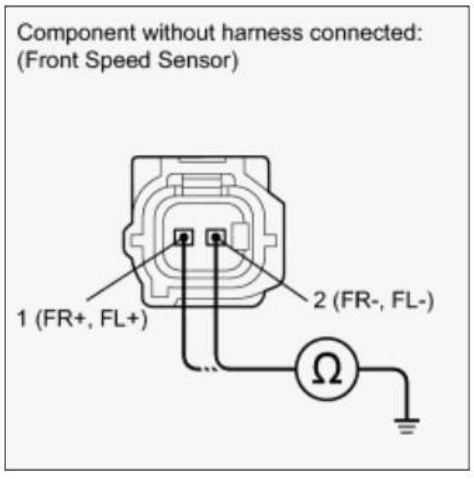
HINT:

If the speed sensor rotor needs to be replaced, replace it together with the front axle hub sub-assembly.

NG ▶ **CLEAN OR REPLACE FRONT SPEED SENSOR ROTOR (FRONT AXLE HUB SUB-ASSEMBLY)**

OK ▼

9.	INSPECT FRONT SPEED SENSOR



(a) Install the front speed sensor and front axle hub sub-assembly.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the front speed sensor connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

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for RH
for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FR+) - Body ground	Always	10 kΩ or higher
2 (FR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FL+) - Body ground	Always	10 kΩ or higher
2 (FL-) - Body ground	Always	10 kΩ or higher

NOTICE:

Check the speed sensor signal after replacement INFO .

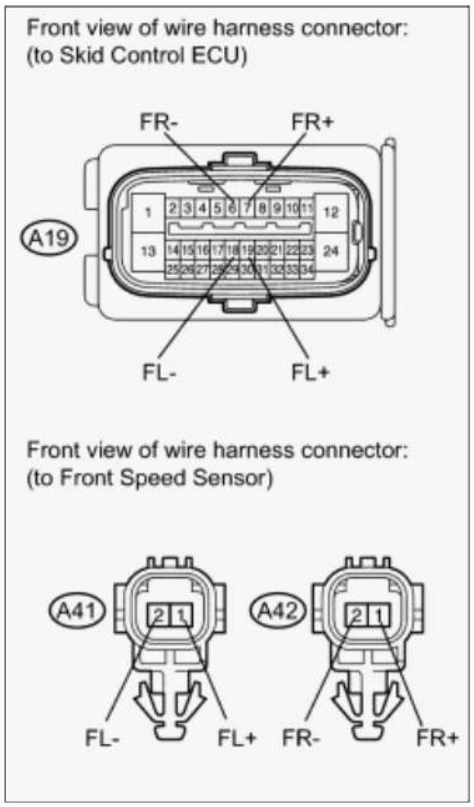
NG ▶ **REPLACE FRONT SPEED SENSOR**

OK
▼

10.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - FRONT SPEED SENSOR)**

(a) Make sure that there is no looseness in the locking part and connecting part of the connector.

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(b) Disconnect the skid control ECU connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-7 (FR+) - A42-1 (FR+)	Always	Below 1 Ω
A19-7 (FR+) - Body ground	Always	10 kΩ or higher
A19-6 (FR-) - A42-2 (FR-)	Always	Below 1 Ω
A19-6 (FR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-19 (FL+) - A41-1 (FL+)	Always	Below 1 Ω
A19-19 (FL+) - Body ground	Always	10 kΩ or higher
A19-18 (FL-) - A41-2 (FL-)	Always	Below 1 Ω
A19-18 (FL-) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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OK



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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003695010X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1273,C1274,C1277,C1278: Low Output Signal of Rear Speed Sensor RH (Test Mode DTC) (2011 RAV4)		

DTC	**C1273**	**Low Output Signal of Rear Speed Sensor RH (Test Mode DTC)**

DTC	**C1274**	**Low Output Signal of Rear Speed Sensor LH (Test Mode DTC)**

DTC	**C1277**	**Abnormal Change in Output Signal of Rear Speed Sensor RH (Test Mode DTC)**

DTC	**C1278**	**Abnormal Change in Output Signal of Rear Speed Sensor LH (Test Mode DTC)**

DESCRIPTION

DTCs C1273 to C1278 will be cleared when the speed sensor sends a vehicle speed signal or when Test Mode ends. DTCs from C1273 to C1278 are output only in Test Mode.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1273 C1274	Detected only during Test Mode.	• Rear speed sensor RH/LH • Sensor installation • Speed sensor rotor
C1277 C1278	Detected only during Test Mode.	Speed sensor rotor

HINT:

- DTCs C1273 and C1277 are for the rear speed sensor RH.
- DTCs C1274 and C1278 are for the rear speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1403 and C1404 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

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PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (RR/RL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Speed Open	RR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Open	RL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

Result:

RESULT	PROCEED TO
There are momentary interruptions.	A
There are no momentary interruptions.	B
There is a constant open circuit.	C

HINT:

Perform the above inspection before removing the sensor and connector.

B ▶ **READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)**

C ▶ **CHECK SKID CONTROL SENSOR/REAR SPEED SENSOR INSTALLATION**

A ▼

2.	**REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - REAR SPEED SENSOR)**

(a) Turn the ignition switch off.

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(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and the rear speed sensor INFO .

(d) Check that there are no momentary interruptions.

NEXT

3.	PERFORM TEST MODE (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.

NG ▶ **READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)**

OK ▶ **END**

4.	READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Wheel Speed	RR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.
RL Wheel Speed	RL wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.

(e) Check that there is no difference between the speed value output from the speed sensor displayed on

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the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:
The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

NG ▶ **CHECK SKID CONTROL SENSOR/REAR SPEED SENSOR INSTALLATION**

OK ▼

5.	**PERFORM TEST MODE (SIGNAL CHECK)**

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.

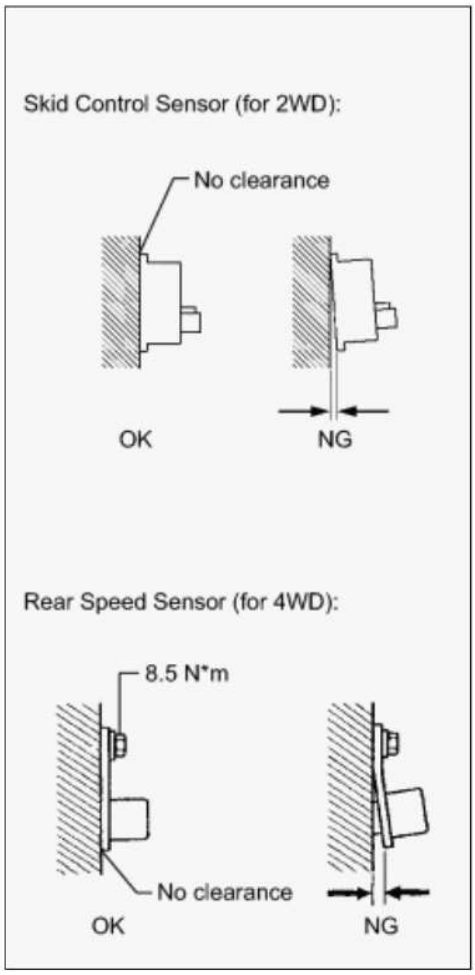
NG ▶ **CHECK SKID CONTROL SENSOR/REAR SPEED SENSOR INSTALLATION**

OK ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

6.	**CHECK SKID CONTROL SENSOR/REAR SPEED SENSOR INSTALLATION**

(a) Turn the ignition switch off.

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(b) for 2WD:

Check the skid control sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

(c) for 4WD:

Check the rear speed sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

The installation bolt is tightened properly.

Torque

8.5 N*m (87 kgf*cm, 75 in.*lbf)

Result:

RESULT		PROCEED TO
OK	for 4WD	A
	for 2WD	B
NG	for 2WD	C

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RESULT		PROCEED TO
	for 4WD	D

B ▶ **INSPECT SKID CONTROL SENSOR/REAR SPEED SENSOR**

C ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY**

D ▶ **INSTALL REAR SPEED SENSOR CORRECTLY**

A ▼

7.	CHECK REAR SPEED SENSOR TIP

(a) Remove the rear speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches, oil, or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ **CLEAN OR REPLACE REAR SPEED SENSOR**

OK ▼

8.	CHECK REAR SPEED SENSOR ROTOR

(a) Remove the rear axle hub and bearing assembly INFO .

(b) Check the speed sensor rotor.

OK:

No scratches, oil, or foreign matter on the rotors.

NOTICE:

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Check the speed sensor signal after cleaning or replacement INFO .

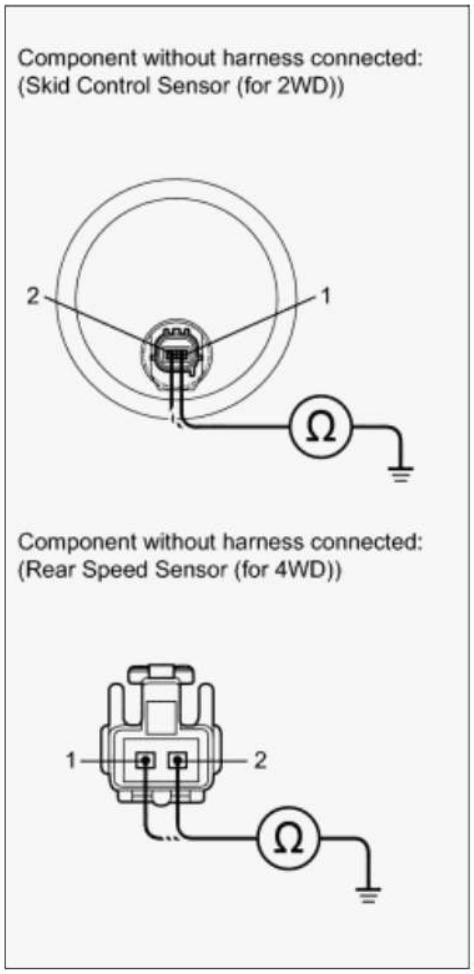
HINT:

If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly.

NG ▶ **CLEAN OR REPLACE REAR SPEED SENSOR ROTOR**

OK ▼

9.	**INSPECT SKID CONTROL SENSOR/REAR SPEED SENSOR**



(a) for 4WD:

Install the rear speed sensor and rear speed sensor rotor.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the sensor connector.

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(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - Body ground	Always	10 kΩ or higher
2 - Body ground	Always	10 kΩ or higher

Result:

RESULT		PROCEED TO
OK	for 2WD	A
	for 4WD	B
NG	for 2WD	C
	for 4WD	D

NOTICE:

Check the speed sensor signal after replacement INFO .

B ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - SKID CONTROL SENSOR/REAR SPEED SENSOR)**

C ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY**

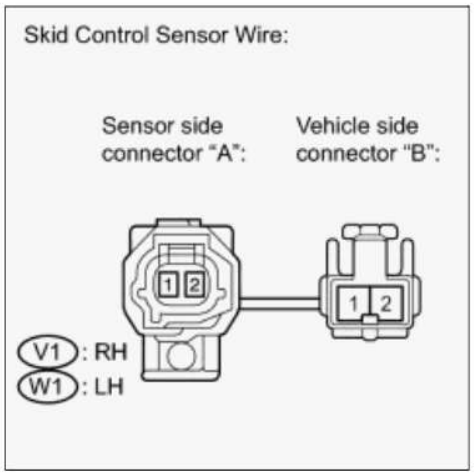
D ▶ **REPLACE REAR SPEED SENSOR**

A ▼

10.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)**

(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

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(b) Disconnect the skid control sensor wire.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V1 ("A"-2) - V1 ("B"-1)	Always	Below 1 Ω
V1 ("A"-2) - V1 ("B"-2)	Always	10 kΩ or higher
V1 ("A"-2) - Body ground	Always	10 kΩ or higher
V1 ("A"-1) - V1 ("B"-2)	Always	Below 1 Ω
V1 ("A"-1) - V1 ("B"-1)	Always	10 kΩ or higher
V1 ("A"-1) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
W1 ("A"-2) - W1 ("B"-1)	Always	Below 1 Ω
W1 ("A"-2) - W1 ("B"-2)	Always	10 kΩ or higher
W1 ("A"-2) - Body ground	Always	10 kΩ or higher
W1 ("A"-1) - W1 ("B"-2)	Always	Below 1 Ω
W1 ("A"-1) - W1 ("B"-1)	Always	10 kΩ or higher
W1 ("A"-1) - Body ground	Always	10 kΩ or higher

NOTICE:

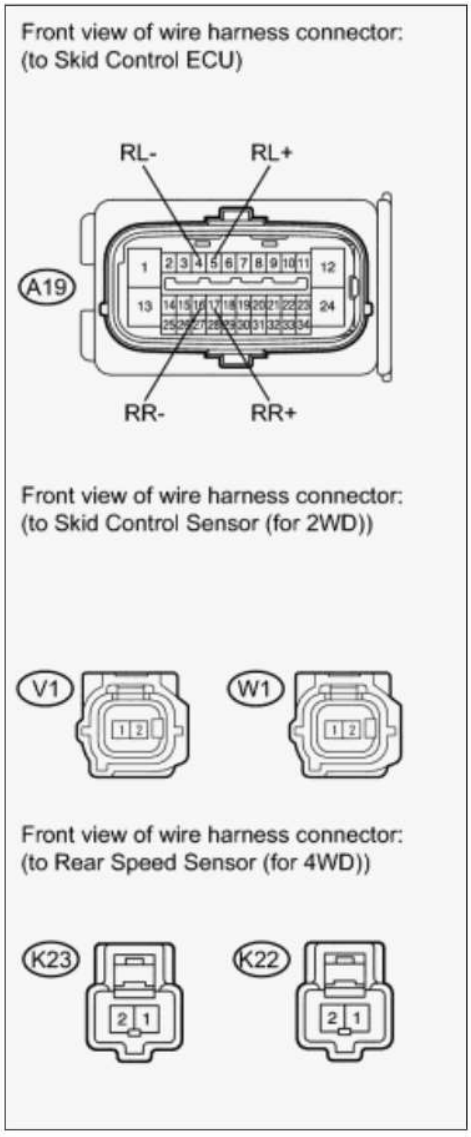
Check the speed sensor signal after replacement INFO .

NG ▶ REPLACE SKID CONTROL SENSOR WIRE

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OK

11.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - SKID CONTROL SENSOR/REAR SPEED SENSOR)**



(a) for 2WD:

Reconnect the skid control sensor wire.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the skid control ECU connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for 2WD RH

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for 4WD RH
for 2WD LH
for 4WD LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - V1-2	Always	Below 1 Ω
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - V1-1	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - K23-1	Always	Below 1 Ω
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - K23-2	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - W1-2	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - W1-1	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

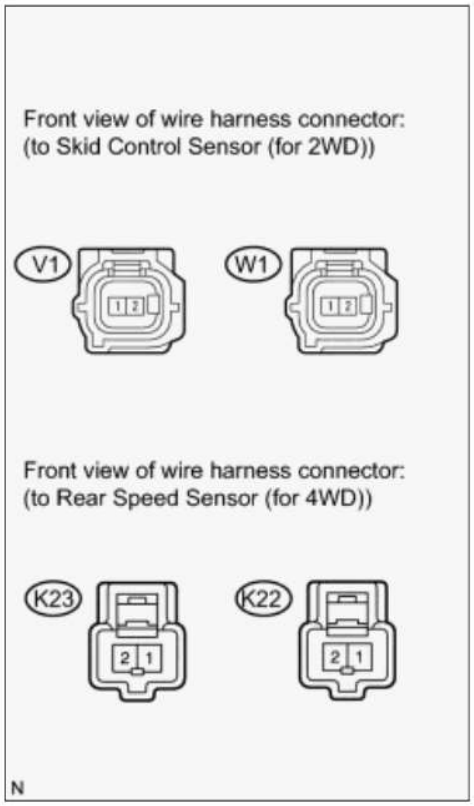
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - K22-1	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - K22-2	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK
▼

12.	**INSPECT SKID CONTROL ECU (SENSOR INPUT)**

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(a) Reconnect the skid control ECU connector.

(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

for 2WD RH

for 4WD RH

for 2WD LH

for 4WD LH

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
V1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K23-1 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
W1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K22-1 - Body ground	Ignition switch ON	8 to 14 V

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NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▼

13.	PERFORM TEST MODE (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:
All Test Mode DTCs are cleared.
Result:

RESULT		PROCEED TO
OK		A
NG	for 2WD	B
	for 4WD	C

B ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY**

C ▶ **REPLACE REAR SPEED SENSOR**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

14.	REPLACE REAR AXLE HUB AND BEARING ASSEMBLY

(a) Turn the ignition switch off.

(b) Replace the rear axle hub and bearing assembly (rear speed sensor and rotor) INFO .

HINT:

The rear speed sensor rotor is incorporated into the rear axle hub and bearing assembly.

If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly with rear speed sensor.

NOTICE:

Check the speed sensor signal after replacement INFO .

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NEXT



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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIG08HX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1281: Master Cylinder Pressure Sensor Output Malfunction (Test Mode DTC) (2011 RAV4)		

DTC	**C1281**	**Master Cylinder Pressure Sensor Output Malfunction (Test Mode DTC)**

DESCRIPTION

DTC C1281 will be cleared when the master cylinder pressure sensor sends a master cylinder pressure signal or when Test Mode ends. DTC C1281 is output only in Test Mode.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1281	Detected only during Test Mode.	• Stop light switch • Brake pedal load sensing switch • Master cylinder pressure sensor

WIRING DIAGRAM

Refer to DTCs C1425 and C1429 INFO and INFO).

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK STOP LIGHT OPERATION**

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **INSPECT STOP LIGHT CIRCUIT**

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OK

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ZRR07EX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1290: Steering Angle Sensor Zero Point Malfunction (2011 RAV4)		

DTC	**C1290**	**Steering Angle Sensor Zero Point Malfunction**

DESCRIPTION

The skid control ECU acquires steering angle sensor zero point every time the ignition switch is turned to ON and the vehicle is driven at 35 km/h (22 mph) or more for approximately 5 seconds. The ECU also stores the previous zero point.

If front wheel alignment or the steering wheel position is adjusted without disconnecting the negative battery terminal, or if yaw rate and deceleration sensor zero point is not acquired after the adjustments have been completed, the skid control ECU detects the difference between the previous zero point and newly acquired zero point and outputs this DTC to indicate a poor adjustment.

Warning operation for the steering angle sensor zero point malfunction will be canceled by turning the ignition switch off.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1290	The newly acquired steering angle sensor zero point vastly differs from the previous one.	• Yaw rate and deceleration sensor zero point calibration incomplete • Poor adjustment of the center position of the steering wheel • Poor adjustment of front wheel alignment

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSOR**

(a) Perform zero point calibration of the yaw rate and deceleration sensor INFO .

HINT:

- When the stored zero point of the yaw rate and deceleration sensor is cleared, steering angle sensor zero

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point will also be cleared.

- If the zero point and output value of the yaw rate and deceleration sensor and the output value of the speed sensors are not normal, steering angle sensor zero point cannot be acquired normally even if the vehicle is driven straight ahead at 35 km/h (22 mph) or more.

NEXT

2.	**CHECK STEERING ANGLE SENSOR ZERO POINT CALIBRATION**

(a) Turn the ignition switch off.

(b) Start the engine.

(c) Drive the vehicle straight ahead at 35 km/h (22 mph) or more for at least 5 seconds.

(d) Check that the center position of the steering wheel is correctly set while driving straight ahead.

HINT:

If front wheel alignment and steering position are adjusted as a result of an abnormal center position of the steering wheel, acquire yaw rate and deceleration sensor zero point again after adjusting front wheel alignment and steering position again.

OK:
The center position of the steering wheel is correctly set.

NG ▶ **ADJUST FRONT WHEEL ALIGNMENT OR STEERING POSITION**

OK

3.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 35 km/h (22 mph) or more and turn the steering wheel to the right and left.

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(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1290) is not output.	A
DTC (C1290) is output.	B

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIC06IX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1337: Diameter of the Tire is not Uniform (2011 RAV4)		

DTC	**C1337**	**Diameter of the Tire is not Uniform**

DESCRIPTION

The skid control ECU measures the speed of each wheel by receiving signals from the speed sensors.

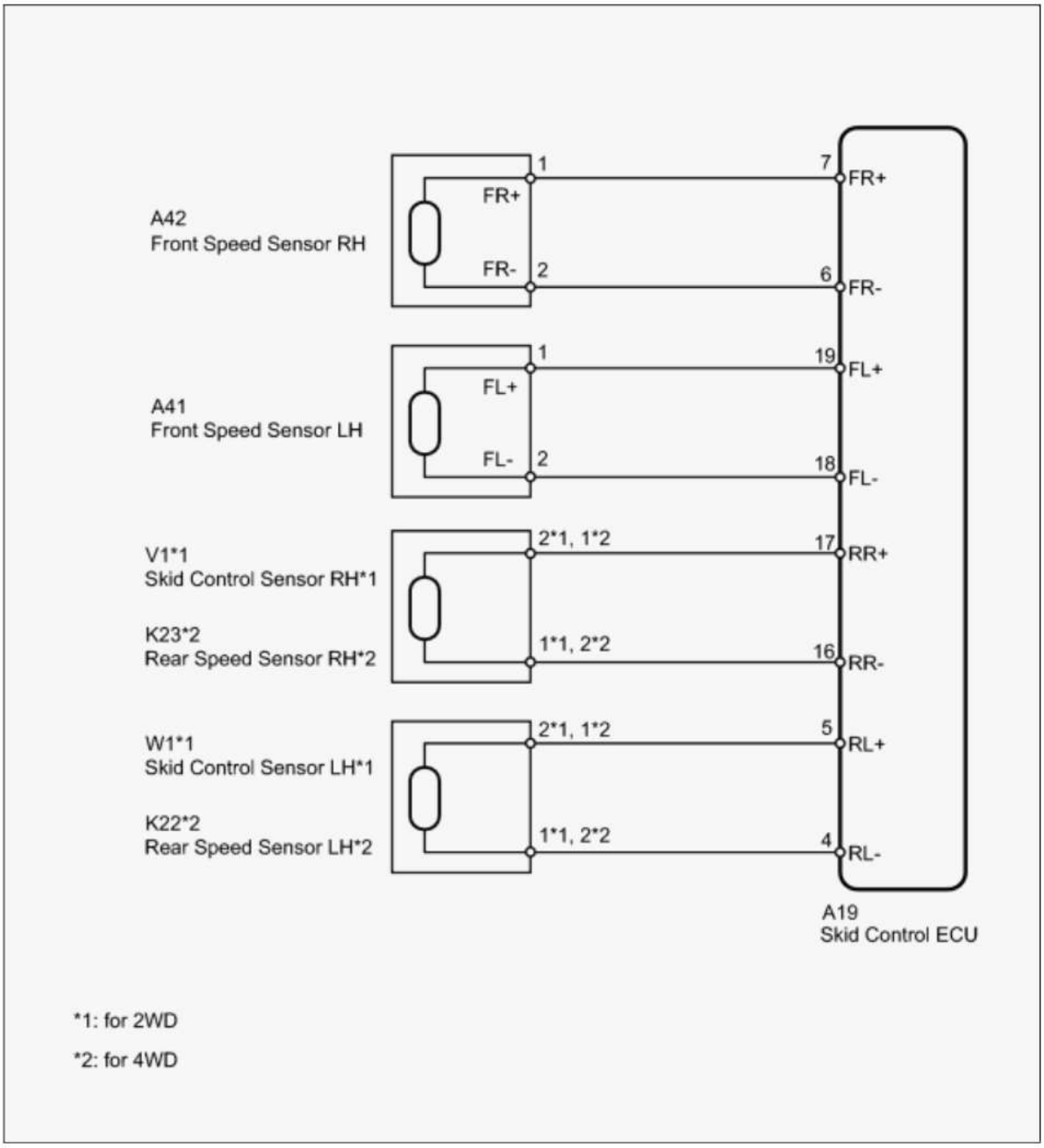
These signals are used for recognizing that all 4 wheels are operating properly.

Therefore, all wheel signals must be equal.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1337	The following occurs in 3 consecutive trips: At a vehicle speed of 20 km/h (12 mph) or more, there is a 20% difference or more in the average speed between the front wheels and rear wheels for 20 seconds or more.	• Tire and wheel size • Tire deformation • Speed sensor rotor • Speed sensor • Speed sensor circuit • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1401 to C1408 and/or C1413 to C1416 are output with C1337, inspect and repair the trouble areas indicated by C1401 to C1408 and/or C1413 to C1416 first INFO .

PROCEDURE

1.	CHECK TIRES

(a) Check the size and condition of all 4 wheels INFO .

HINT:

The DTC is output when tire deformation or a difference in tire size is detected.

OK:
The diameter of all 4 tires and air pressure are the same.

NG ▶ **REPLACE TIRES SO THAT ALL FOUR TIRES ARE SAME SIZE**

OK ▼

2.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 40 km/h (25 mph) or more for at least 60 seconds.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1337) is output.	A
DTC (C1337) is not output.	B

B ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

A ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000002N5H00IX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1379: Downhill Assist Control Switch Malfunction (Test Mode DTC) (2011 RAV4)		

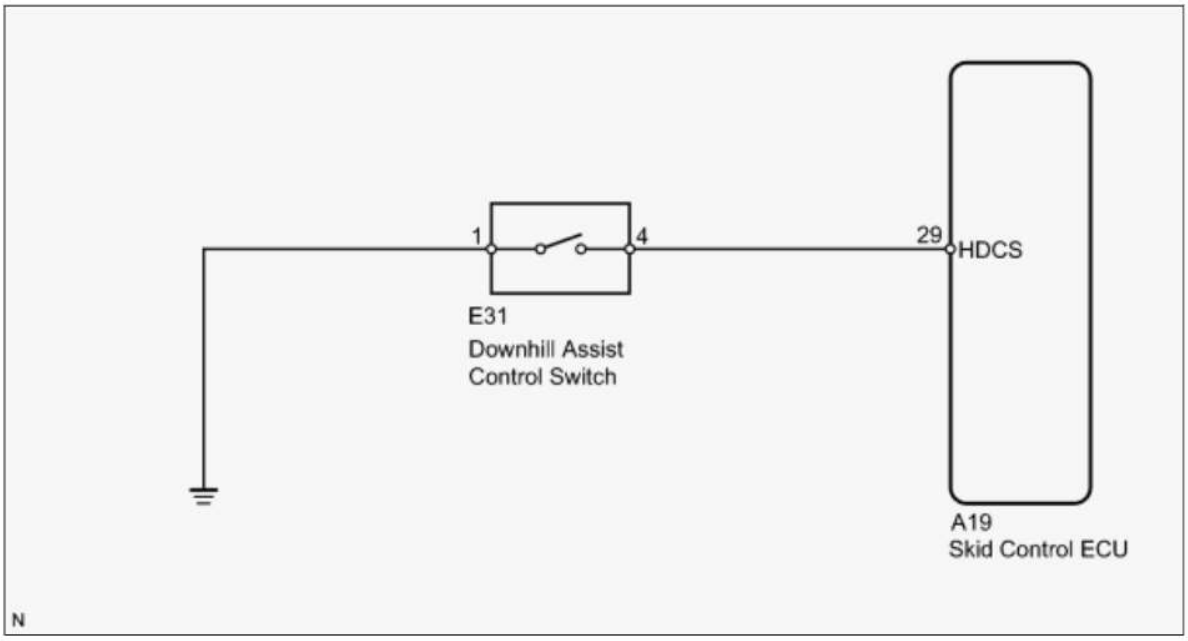
DTC	**C1379**	**Downhill Assist Control Switch Malfunction (Test Mode DTC)**

DESCRIPTION

DTC C1379 will be cleared when the downhill assist control switch sends a downhill assist control operation signal or when Test Mode ends. DTC C1379 is stored only in Test Mode.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1379	Stored only during Test Mode.	Downhill assist control switch

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

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1.	**READ VALUE USING TECHSTREAM (DOWNHILL ASSIST CONTROL SWITCH)**

(a) Check the Data List for proper functioning of the downhill assist control switch.

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Downhill Assist Control SW	Downhill assist control switch / ON or OFF	ON: Downhill assist control switch on OFF: Downhill assist control switch off	-

OK:

The Techstream displays ON or OFF according to downhill assist control switch operation.

NG ▶ **INSPECT DOWNHILL ASSIST CONTROL SWITCH**

OK ▼

2.	**PERFORM TEST MODE (SIGNAL CHECK)**

(a) Turn the ignition switch off.

(b) Perform the sensor check in the Test Mode procedure INFO .

OK:

All Test Mode DTCs are cleared.

HINT:

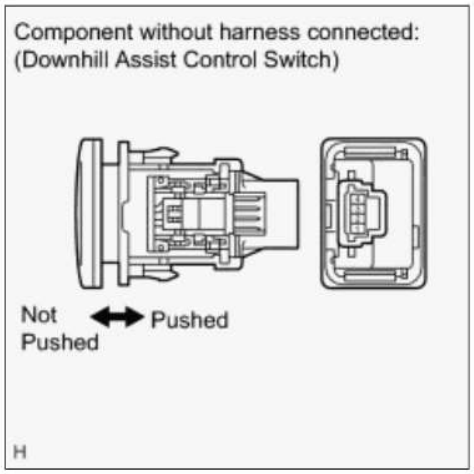
If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

3.	**INSPECT DOWNHILL ASSIST CONTROL SWITCH**

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(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the downhill assist control switch connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - 4	Switch is pushed	Below 1 Ω
	Switch is not pushed	10 kΩ or higher

NOTICE:

Check the downhill assist control switch signal after replacement INFO .

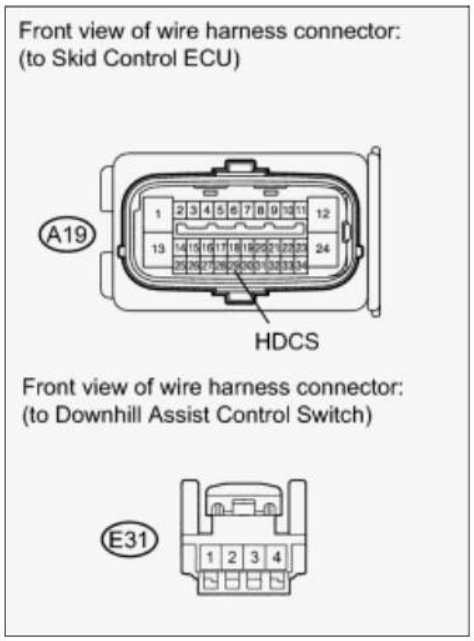
NG ▶ **REPLACE DOWNHILL ASSIST CONTROL SWITCH**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (DOWNHILL ASSIST CONTROL SW - SKID CONTROL ECU/BODY GROUND)**

(a) Disconnect the skid control ECU connector.

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(b) Disconnect the downhill assist control switch connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-29 (HDCS) - E31-4	Always	Below 1 Ω
A19-29 (HDCS) - Body ground	Always	10 kΩ or higher
E31-1 - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001N3L02MX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1380: Stop Light Control Relay Malfunction (2011 RAV4)		

DTC	**C1380**	**Stop Light Control Relay Malfunction**

DESCRIPTION

Upon receiving the downhill assist control or hill-start assist control operating signal from the skid control ECU, the relay contact turns on and the stop light comes on.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1380	Either of the following is detected: 1. When the voltage at the IG1 terminal is between 10 and 14 V and the stop light control relay drive output (STPO) is on, a signal has not been input to the STP terminal for 5 seconds or more. 2. When the voltage at the IG1 terminal is between 10 and 14 V and the stop light control relay drive output (STPO) is off, the signal at the STP is different from the input signal at the STP2 for 5 seconds or more.	• Stop light switch circuit • Stop light control relay (BRK) • Stop light control relay circuit • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM

Refer to DTC C1425 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1425 is output together with C1380, inspect and repair the trouble areas indicated by C1425 first INFO .

PROCEDURE

1.	**CHECK STOP LIGHT OPERATION**

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake

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pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **INSPECT STOP LIGHT CIRCUIT**

OK ▼

2.	**READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

(d) Check that the stop light switch condition observed on the Techstream changes according to brake pedal operation.

OK:

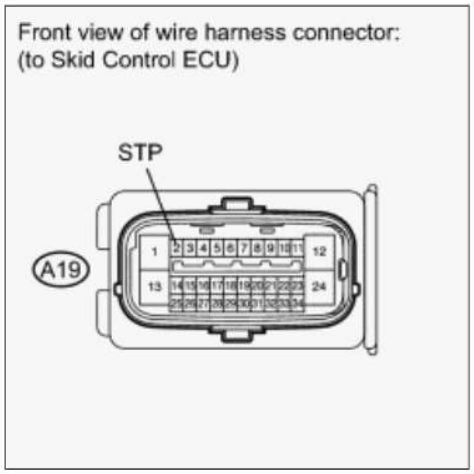
The Techstream displays ON or OFF according to brake pedal operation.

NG ▶ **INSPECT SKID CONTROL ECU (STP2 TERMINAL)**

OK ▼

3.	**INSPECT SKID CONTROL ECU (STP TERMINAL)**

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(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the skid control ECU connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-2 (STP) - Body ground	Stop light switch off (Brake pedal released)	Below 1.5 V
	Stop light switch on (Brake pedal depressed)	8 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP CIRCUIT)**

OK ▼

4.	**PERFORM ACTIVE TEST USING TECHSTREAM (STOP LIGHT RELAY)**

(a) Reconnect the skid control ECU connector.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Stop Light Relay	Stop light control relay (BRK)	Relay ON / OFF	Observe the stop lights.

(e) Check that the "ON" and "OFF" of the stop lights can be shown on the rear combination light by the Techstream.

OK:

The stop lights turn on or off in accordance with the Techstream.

NG ▶ **INSPECT STOP LIGHT CONTROL RELAY (BRK)**

OK ▼

5.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Perform a road test.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1380) is not output.	A
DTC (C1380) is output.	B

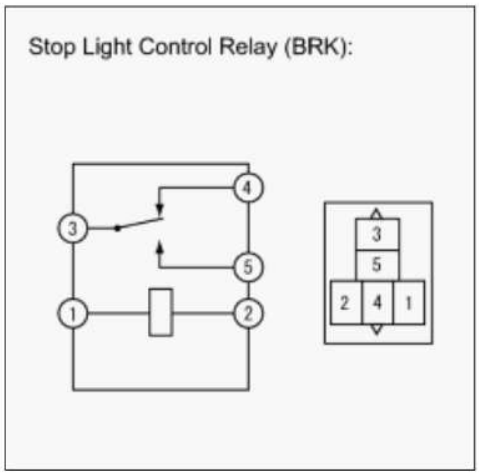
B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

6.	**INSPECT STOP LIGHT CONTROL RELAY (BRK)**

(a) Turn the ignition switch off.

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(b) Remove the stop light control relay (BRK).

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 4	Voltage is not applied between terminals 1 and 2	Below 1 Ω
3 - 5	Voltage is not applied between terminals 1 and 2	10 kΩ or higher
3 - 4	Voltage is applied between terminals 1 and 2	10 kΩ or higher
3 - 5	Voltage is applied between terminals 1 and 2	Below 1 Ω

NG ▶ **REPLACE STOP LIGHT CONTROL RELAY (BRK)**

OK ▼

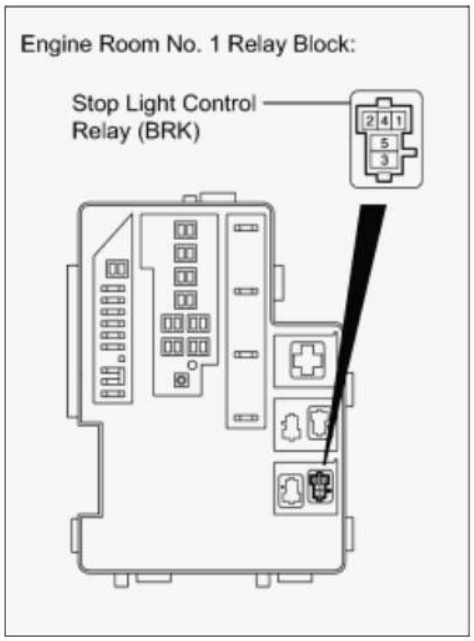
7.	**INSPECT ENGINE ROOM NO. 1 RELAY BLOCK (POWER SOURCE TERMINAL)**

(a) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
Stop light control relay (BRK) terminal 5 - Body ground	Always	11 to 14 V

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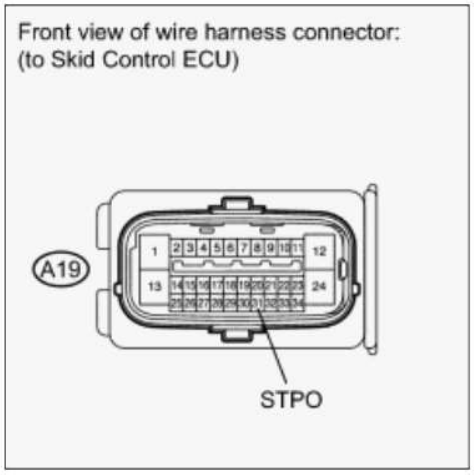


Stop light control relay (BRK) terminal 2 - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

8.	**INSPECT SKID CONTROL ECU (STPO TERMINAL)**



(a) Install the stop light control relay (BRK).

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the skid control ECU connector.

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(d) Turn the ignition switch to ON.

(e) Measure the voltage according to the value(s) in the table below.

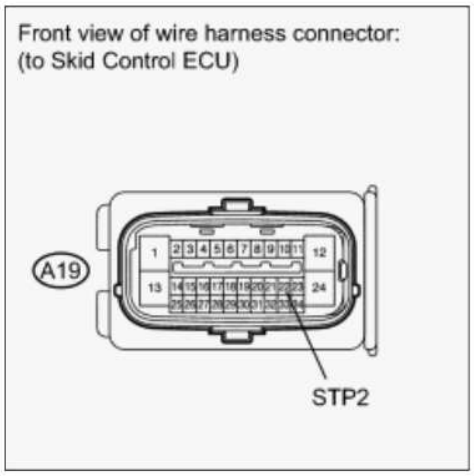
Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-31 (STPO) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STPO CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

9.	**INSPECT SKID CONTROL ECU (STP2 TERMINAL)**



(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the skid control ECU connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-22 (STP2) - Body ground	Stop light switch on (Brake pedal depressed)	8 to 14 V
	Stop light switch off (Brake pedal released)	Below 1.5 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP2 CIRCUIT)**

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OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001RFV06AX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1381: Acceleration Sensor Power Supply Voltage Malfunction (2011 RAV4)		

DTC	**C1381**	**Acceleration Sensor Power Supply Voltage Malfunction**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are stored.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1381	At a vehicle speed of more than 3 km/h (2 mph), an acceleration sensor power source malfunction signal is received for 10 seconds or more.	• Yaw rate and deceleration sensor power source circuit • Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

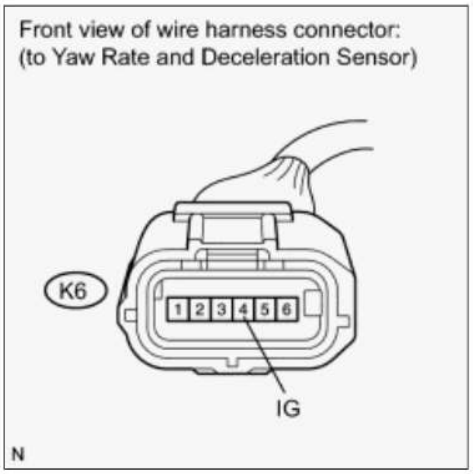
HINT:

When U0123, U0124 and/or U0126 is output together with C1381, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

1.	**INSPECT YAW RATE AND DECELERATION SENSOR (IG TERMINAL)**

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(a) Make sure that there is no looseness in the locking part and connecting part of the connector.

(b) Disconnect the yaw rate and deceleration sensor connector.

(c) Turn the ignition switch to ON.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K6-4 (IG) - Body ground	Ignition switch ON	11 to 14 V

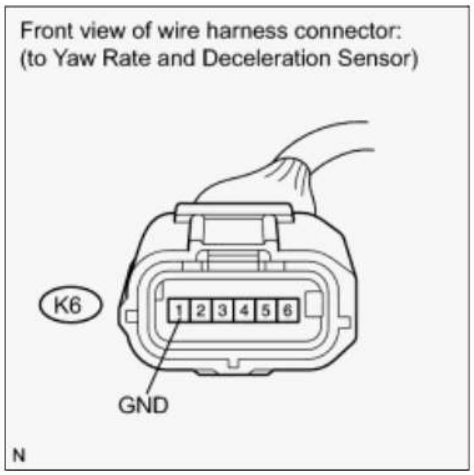
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (IG CIRCUIT)**

OK ▼

2.	**INSPECT YAW RATE AND DECELERATION SENSOR (GND TERMINAL)**

(a) Turn the ignition switch off.

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(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
K6-1 (GND) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND CIRCUIT)**

OK ▼

3.	**RECONFIRM DTC**

(a) Reconnect the yaw rate and deceleration sensor connector.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 3 km/h (2 mph) or more for at least 10 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1381) is not output.	A
DTC (C1381) is output.	B

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NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XI90C5X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1401,C1402: Front Speed Sensor RH Malfunction (2011 RAV4)		

DTC	**C1401**	**Front Speed Sensor RH Malfunction**

DTC	**C1402**	**Front Speed Sensor LH Malfunction**

DESCRIPTION

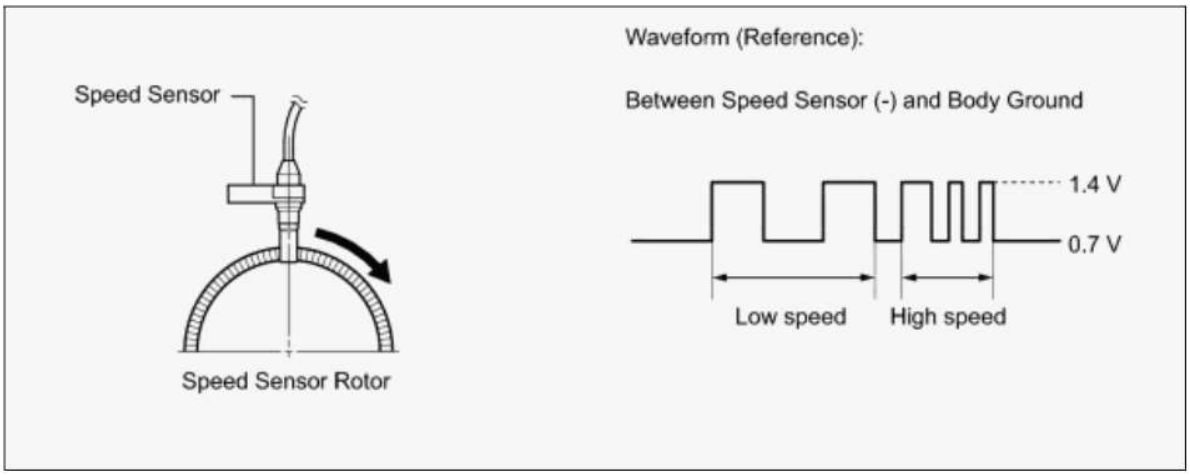
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1401 C1402	Any of the following is detected: 1. At a vehicle speed 10 km/h (6 mph) or more, output voltage from one of the speed sensors is less than that from the other sensors for 15 seconds or more (for 2WD) or for 30 seconds or more (for 4WD).	• Front speed sensor RH/LH • Speed

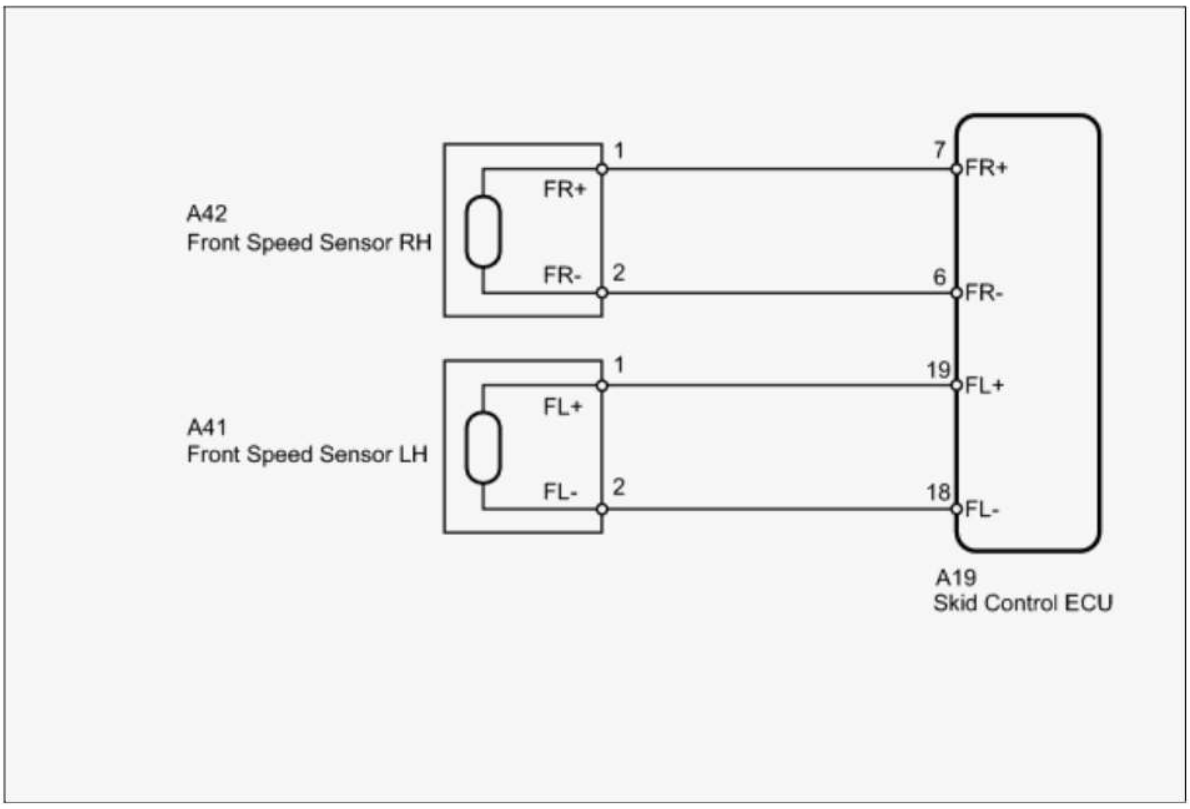
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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
	2. At a vehicle speed less than 10 km/h (6 mph), output from one of the speed sensors is 0 km/h (0 mph) for 1 second or more. 3. At a vehicle speed 10 km/h (6 mph) or more, outputs from both front speed sensors are 0 km/h (0 mph) for 15 seconds or more (for 2WD) or for 30 seconds or more (for 4WD).	sensor rotor

HINT:

- DTC C1401 is for the front speed sensor RH.
- DTC C1402 is for the front speed sensor LH.

WIRING DIAGRAM



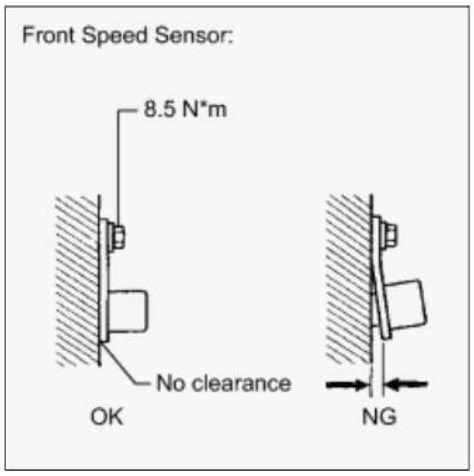
INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK FRONT SPEED SENSOR INSTALLATION**

(a) Check the speed sensor installation.

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OK:

There is no clearance between the sensor and the front steering knuckle.

The installation bolt is tightened properly.

Torque

8.5 N*m (87 kgf*cm, 75 in.*lbf)

NG ▶ **INSTALL FRONT SPEED SENSOR CORRECTLY**

OK ▼

2.	**CHECK FRONT SPEED SENSOR TIP**

(a) Remove the front speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches, oil, or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ **CLEAN OR REPLACE FRONT SPEED SENSOR**

OK ▼

3.	**CHECK FRONT SPEED SENSOR ROTOR**

(a) Remove the front axle hub sub-assembly INFO .

(b) Check the speed sensor rotor.

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OK:

No scratches, oil, or foreign matter on the rotors.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

HINT:

If the speed sensor rotor needs to be replaced, replace it together with the front axle hub sub-assembly.

NG ▶ **CLEAN OR REPLACE FRONT SPEED SENSOR ROTOR**

OK ▼

4.	**READ VALUE USING TECHSTREAM (FR/FL WHEEL SPEED)**

(a) Install the front speed sensor and front axle hub sub-assembly.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Wheel Speed	FR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.
FL Wheel Speed	FL wheel speed sensor reading /min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.

(e) Check that there is no difference between the speed value output from the speed sensor displayed on the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:

The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

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HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **REPLACE FRONT SPEED SENSOR**

OK ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

5.	**REPLACE FRONT SPEED SENSOR**

(a) Turn the ignition switch off.

(b) Replace the front speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

6.	**RECONFIRM DTC**

(a) Clear the DTCs INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 40 km/h (25 mph) or more for at least 60 seconds.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C1401 and C1402) are not output.	A
DTCs (C1401 and/or C1402) are output.	B

NOTICE:

Check the speed sensor signal after replacement INFO .

HINT:

- If the front speed sensor rotor needs to be replaced, replace it together with the front axle hub

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sub-assembly.

- If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ **REPLACE FRONT AXLE HUB SUB-ASSEMBLY**

A ▶ **END**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000369R01JX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1403,C1404: Rear Speed Sensor RH Malfunction (2011 RAV4)		

DTC	**C1403**	**Rear Speed Sensor RH Malfunction**

DTC	**C1404**	**Rear Speed Sensor LH Malfunction**

DESCRIPTION

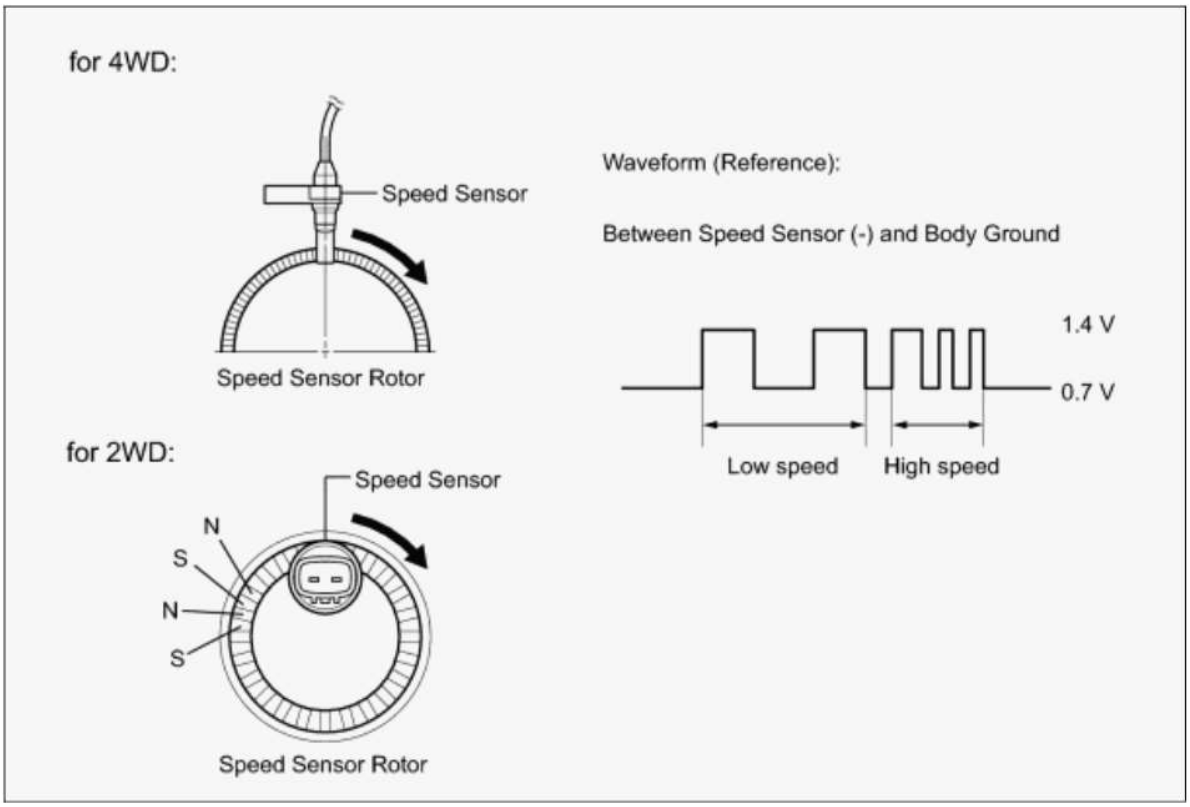
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



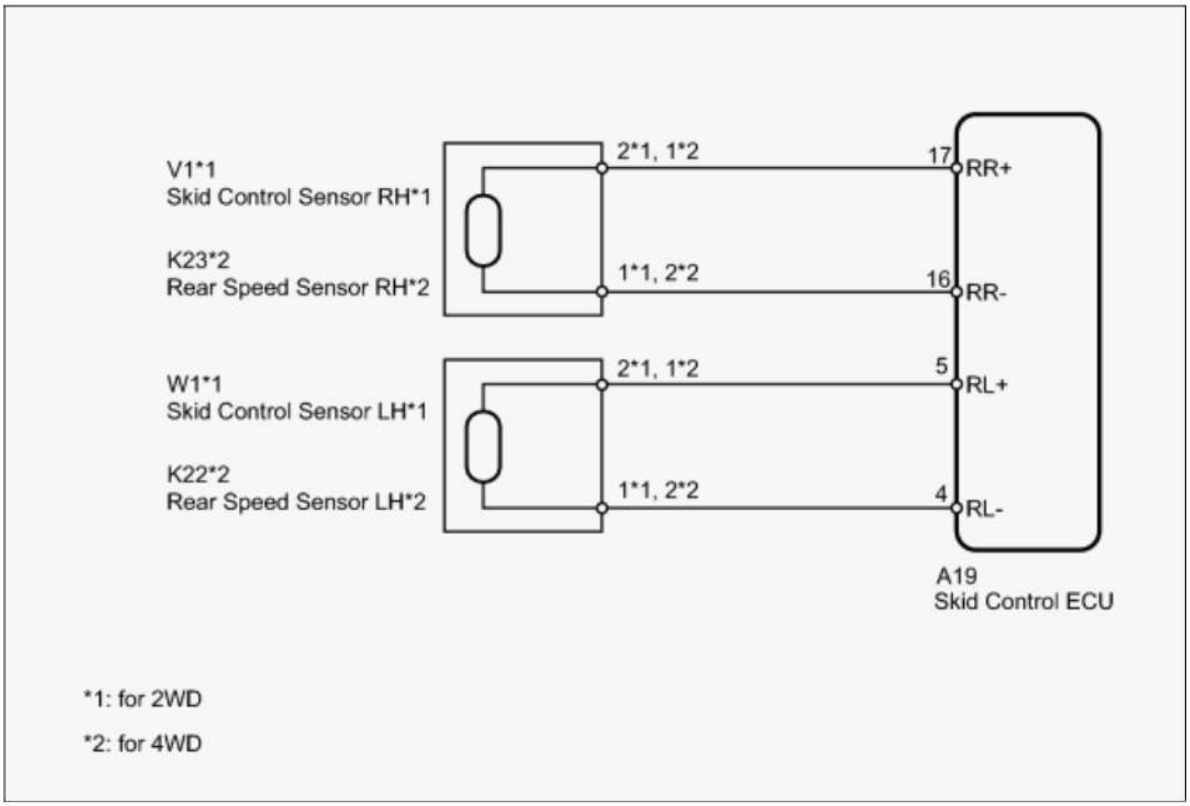
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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1403 C1404	Any of the following is detected: 1. At a vehicle speed 10 km/h (6 mph) or more, output voltage from one of the speed sensors is less than that from the other sensors for 15 seconds or more (for 2WD) or for 30 seconds or more (for 4WD). 2. At a vehicle speed less than 10 km/h (6 mph), output from one of the speed sensors is 0 km/h (0 mph) for 1 second or more. 3. At a vehicle speed less than 10 km/h (6 mph), outputs from both rear speed sensors are 0 km/h (0 mph) for a cumulative time of 200 seconds.	• Rear speed sensor RH/LH • Speed sensor rotor

HINT:

- DTC C1403 is for the rear speed sensor RH.
- DTC C1404 is for the rear speed sensor LH.

WIRING DIAGRAM

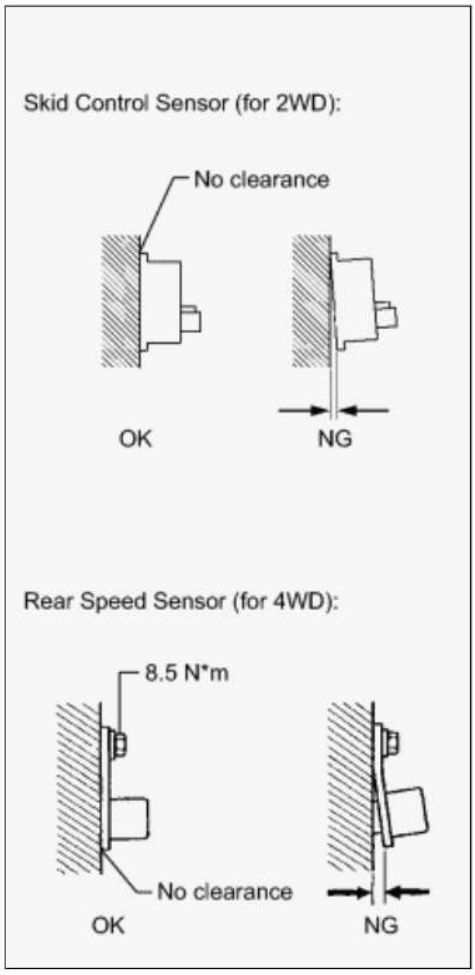


INSPECTION PROCEDURE

PROCEDURE

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1.	**CHECK SKID CONTROL SENSOR/REAR SPEED SENSOR INSTALLATION**



(a) for 2WD:

Check the skid control sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

(b) for 4WD:

Check the rear speed sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

The installation bolt is tightened properly.

Torque

8.5 N*m (87 kgf*cm, 75 in.*lbf)

Result:

RESULT		PROCEED TO
OK	for 4WD	A
	for 2WD	B
NG	for 2WD	C

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RESULT		PROCEED TO
	for 4WD	D

B ▶ READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)

C ▶ REPLACE REAR AXLE HUB AND BEARING ASSEMBLY

D ▶ INSTALL REAR SPEED SENSOR CORRECTLY

A ▼

2.	CHECK REAR SPEED SENSOR TIP

(a) Remove the rear speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches, oil, or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ CLEAN OR REPLACE REAR SPEED SENSOR

OK ▼

3.	CHECK REAR SPEED SENSOR ROTOR

(a) Remove the rear axle hub and bearing assembly INFO .

(b) Check the speed sensor rotor.

OK:

No scratches, oil, or foreign matter on the rotors.

NOTICE:

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Check the speed sensor signal after cleaning or replacement INFO .

HINT:

If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly.

NG ▶ **CLEAN OR REPLACE REAR SPEED SENSOR ROTOR**

OK ▼

4.	READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)

(a) for 4WD:

Install the rear speed sensor and rear axle hub and bearing assembly.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Wheel Speed	RR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.
RL Wheel Speed	RL wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.

(e) Check that there is no difference between the speed value output from the speed sensor displayed on the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:

The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

Result:

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RESULT		PROCEED TO
NG	for 4WD	A
	for 2WD	B
OK		C

NOTICE:

Check the speed sensor signal after replacement INFO .

HINT:

- The rear speed sensor rotor is incorporated into the rear axle hub and bearing assembly.

  If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly.
- If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY**

C ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

A ▼

5.	**REPLACE REAR SPEED SENSOR**

(a) Turn the ignition switch off.

(b) Replace the rear speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

6.	**RECONFIRM DTC**

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(a) Clear the DTCs INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 40 km/h (25 mph) or more for at least 60 seconds.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C1403 and C1404) are not output.	A
DTCs (C1403 and/or C1404) are output.	B

NOTICE:

Check the speed sensor signal after replacement INFO .

HINT:

- If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly.
- If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ REPLACE REAR AXLE HUB AND BEARING ASSEMBLY

A ▶ END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XI90C6X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1405,C1406: Open or Short in Front Speed Sensor RH Circuit (2011 RAV4)		

DTC	**C1405**	**Open or Short in Front Speed Sensor RH Circuit**

DTC	**C1406**	**Open or Short in Front Speed Sensor LH Circuit**

DESCRIPTION

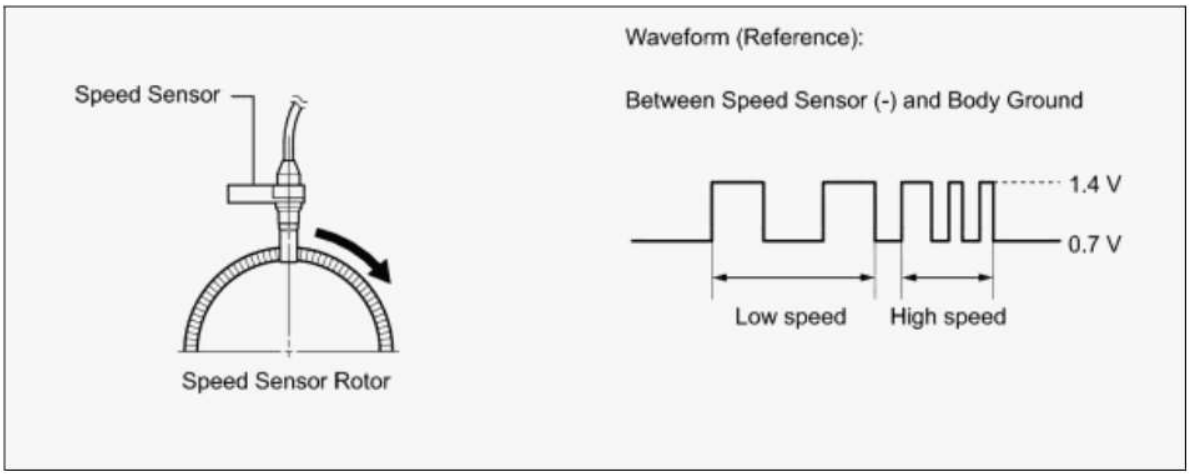
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1405 C1406	Either of the following is detected: 1. An open in the speed sensor signal circuit continues for 0.5 seconds or more. 2. With the IG1 terminal voltage 9.5 V or higher, the sensor power supply voltage decreases for 0.5 seconds	• Front speed sensor RH/LH • Speed sensor circuit • Brake actuator

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
	or more.	assembly (Skid control ECU)

HINT:

- DTC C1405 is for the front speed sensor RH.
- DTC C1406 is for the front speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1401 and C1402 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (FR/FL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Speed Open	FR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Open	FL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

OK:
There are no momentary interruptions.

HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - FRONT SPEED SENSOR)

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OK



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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000369301IX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1407,C1408: Open or Short in Rear Speed Sensor RH Circuit (2011 RAV4)		

DTC	**C1407**	**Open or Short in Rear Speed Sensor RH Circuit**

DTC	**C1408**	**Open or Short in Rear Speed Sensor LH Circuit**

DESCRIPTION

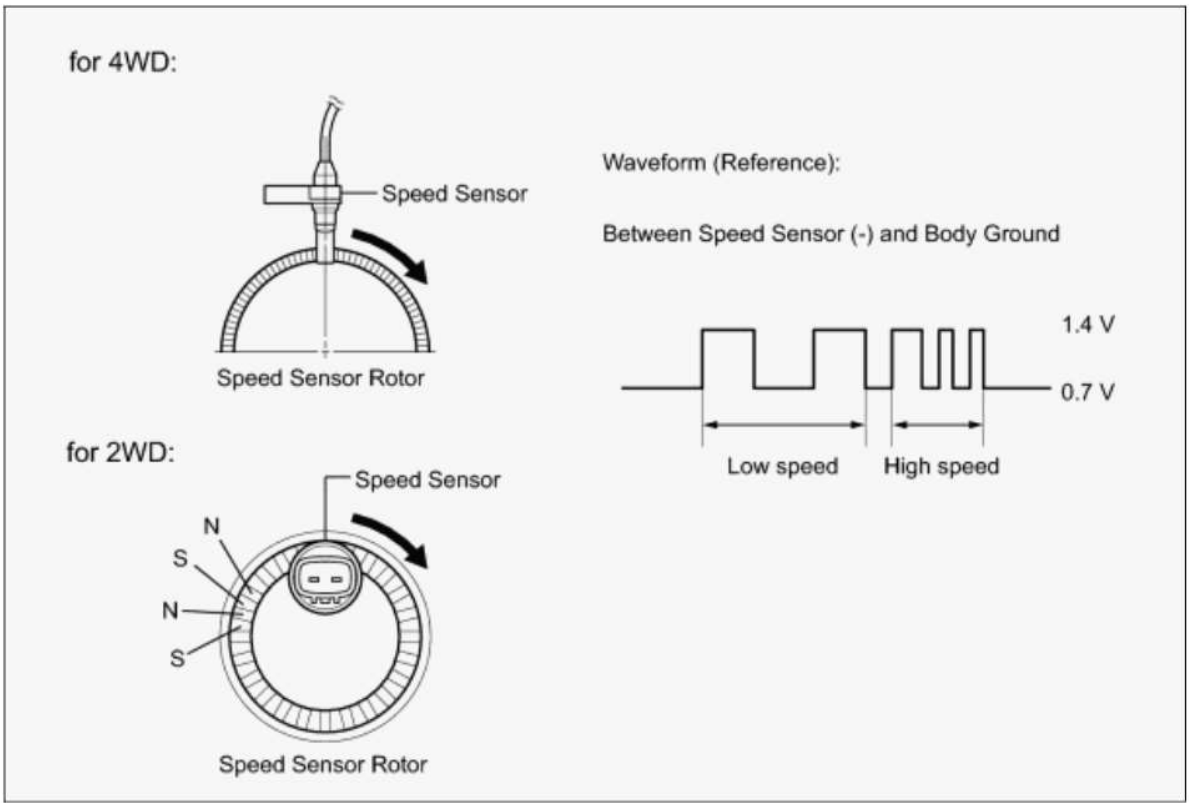
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1407 C1408	Either of the following is detected: 1. An open in the speed sensor signal circuit continues for 0.5 seconds or more. 2. With the IG1 terminal voltage 9.5 V or higher, the sensor power supply voltage decreases for 0.5 seconds or more.	• Rear speed sensor RH/LH • Speed sensor circuit • Brake actuator assembly (Skid control ECU)

HINT:

- DTC C1407 is for the rear speed sensor RH.
- DTC C1408 is for the rear speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1403 and C1404 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (RR/RL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Speed Open	RR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Open	RL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

Result:

RESULT	PROCEED TO

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RESULT		PROCEED TO
There are no momentary interruptions.		A
There are momentary interruptions.	2WD	B
	4WD	C

HINT:

Perform the above inspection before removing the sensor and connector.

B ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)**

C ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - REAR SPEED SENSOR)**

A

▼

2.	READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Wheel Speed	RR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.
RL Wheel Speed	RL wheel speed sensor reading /min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.

(e) Check that there is no difference between the speed value output from the speed sensor displayed on the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester

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(calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:

The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

Result:

RESULT		PROCEED TO
OK		A
NG	2WD	B
	4WD	C

B ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)**

C ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - REAR SPEED SENSOR)**

A ▼

3.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 40 km/h (25 mph) or more for at least 60 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C1407 and C1408) are not output.	A
DTCs (C1407 and/or C1408) are output.	B

HINT:

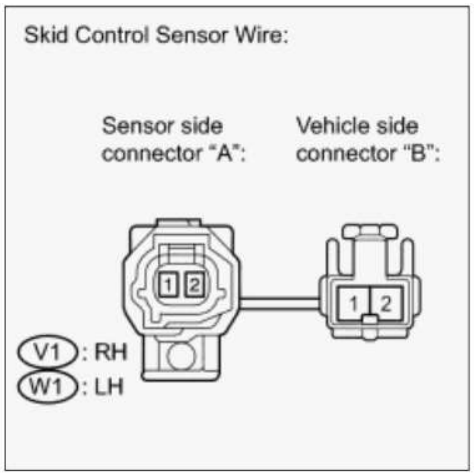
If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

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B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

4.	CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)



(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(c) Disconnect the skid control sensor wire.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V1 ("A"-2) - V1 ("B"-1)	Always	Below 1 Ω
V1 ("A"-2) - V1 ("B"-2)	Always	10 kΩ or higher
V1 ("A"-2) - Body ground	Always	10 kΩ or higher
V1 ("A"-1) - V1 ("B"-2)	Always	Below 1 Ω
V1 ("A"-1) - V1 ("B"-1)	Always	10 kΩ or higher
V1 ("A"-1) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
W1 ("A"-2) - W1 ("B"-1)	Always	Below 1 Ω
W1 ("A"-2) - W1 ("B"-2)	Always	10 kΩ or higher

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
W1 ("A"-2) - Body ground	Always	10 kΩ or higher
W1 ("A"-1) - W1 ("B"-2)	Always	Below 1 Ω
W1 ("A"-1) - W1 ("B"-1)	Always	10 kΩ or higher
W1 ("A"-1) - Body ground	Always	10 kΩ or higher

NOTICE:

Check the speed sensor signal after replacement INFO .

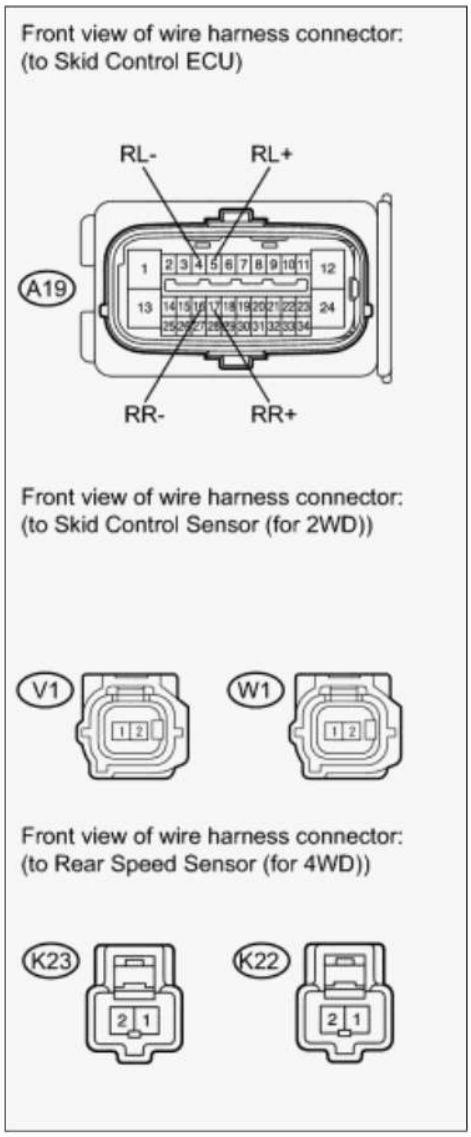
NG ▶ **REPLACE SKID CONTROL SENSOR WIRE**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - REAR SPEED SENSOR)**

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(a) Turn the ignition switch off.



(b) for 2WD:

Reconnect the skid control sensor wire.

(c) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(d) Disconnect the skid control ECU connector and the rear speed sensor connector.

(e) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for 2WD RH

for 4WD RH

for 2WD LH

for 4WD LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - V1-2	Always	Below 1 Ω

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - V1-1	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - K23-1	Always	Below 1 Ω
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - K23-2	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - W1-2	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - W1-1	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - K22-1	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - K22-2	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

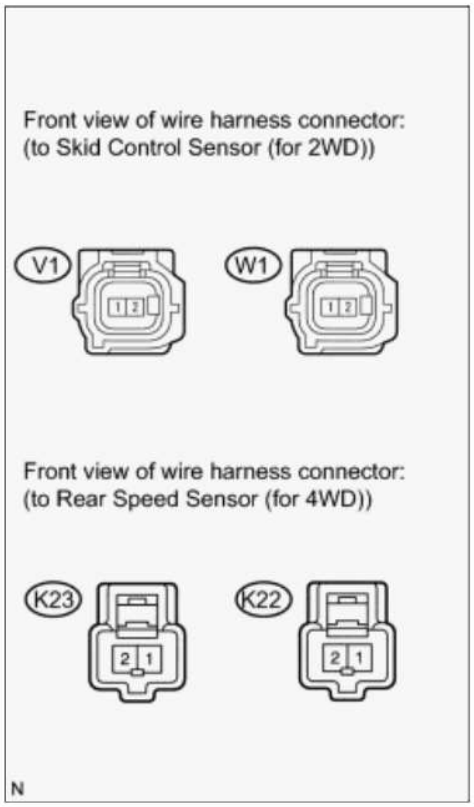
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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**INSPECT SKID CONTROL ECU (SENSOR INPUT)**

(a) Reconnect the skid control ECU connector.



(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

for 2WD RH

for 4WD RH

for 2WD LH

for 4WD LH

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
V1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K23-1 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
W1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K22-1 - Body ground	Ignition switch ON	8 to 14 V

Result:

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RESULT		PROCEED TO
OK	for 2WD	A
	for 4WD	B
NG		C

NOTICE:

Check the speed sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ **REPLACE REAR SPEED SENSOR**

C ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIA09SX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1413,C1414: Front Speed Sensor RH Output Malfunction (2011 RAV4)		

DTC	**C1413**	**Front Speed Sensor RH Output Malfunction**

DTC	**C1414**	**Front Speed Sensor LH Output Malfunction**

DESCRIPTION

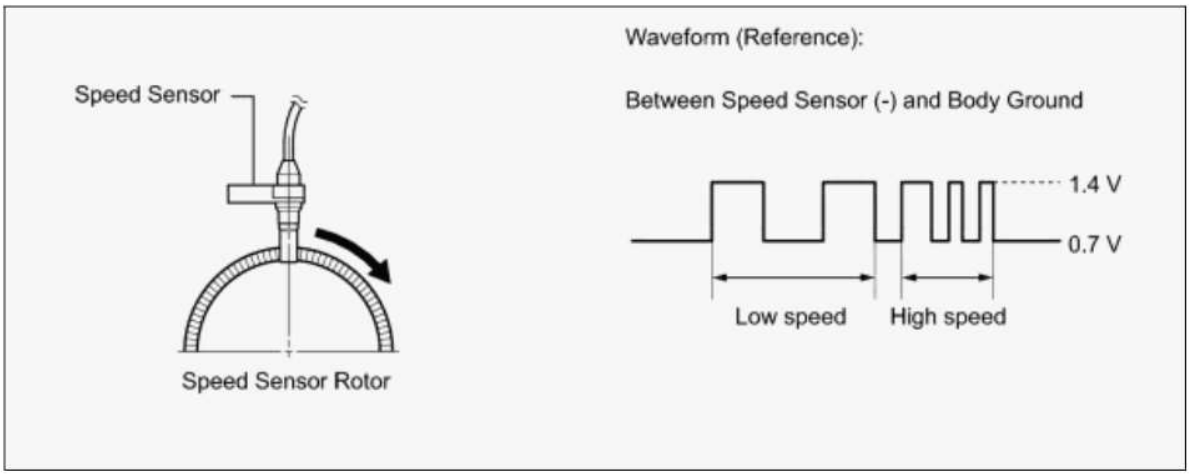
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1413 C1414	Any of the following is detected: 1. An open in the sensor signal circuit of a malfunctioning area occurs 255 times or more. 2. At a vehicle speed 20 km/h (12 mph) or more, noise occurs in the sensor signals of a malfunctioning wheel 75	• Front speed sensor RH/LH • Speed sensor circuit • Speed sensor rotor

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
	times or more within 5 seconds. 3. At a vehicle speed 10 km/h (6 mph) or more, noise occurs once per rotor rotation for 15 seconds or more.	• Brake actuator assembly (Skid control ECU)

HINT:

- DTC C1413 is for the front speed sensor RH.
- DTC C1414 is for the front speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1401 and C1402 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (FR/FL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Speed Open	FR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Open	FL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

OK:
There are no momentary interruptions.

HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ CHECK FRONT SPEED SENSOR INSTALLATION

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OK

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000369S01JX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1415,C1416: Rear Speed Sensor RH Output Malfunction (2011 RAV4)		

DTC	**C1415**	**Rear Speed Sensor RH Output Malfunction**

DTC	**C1416**	**Rear Speed Sensor LH Output Malfunction**

DESCRIPTION

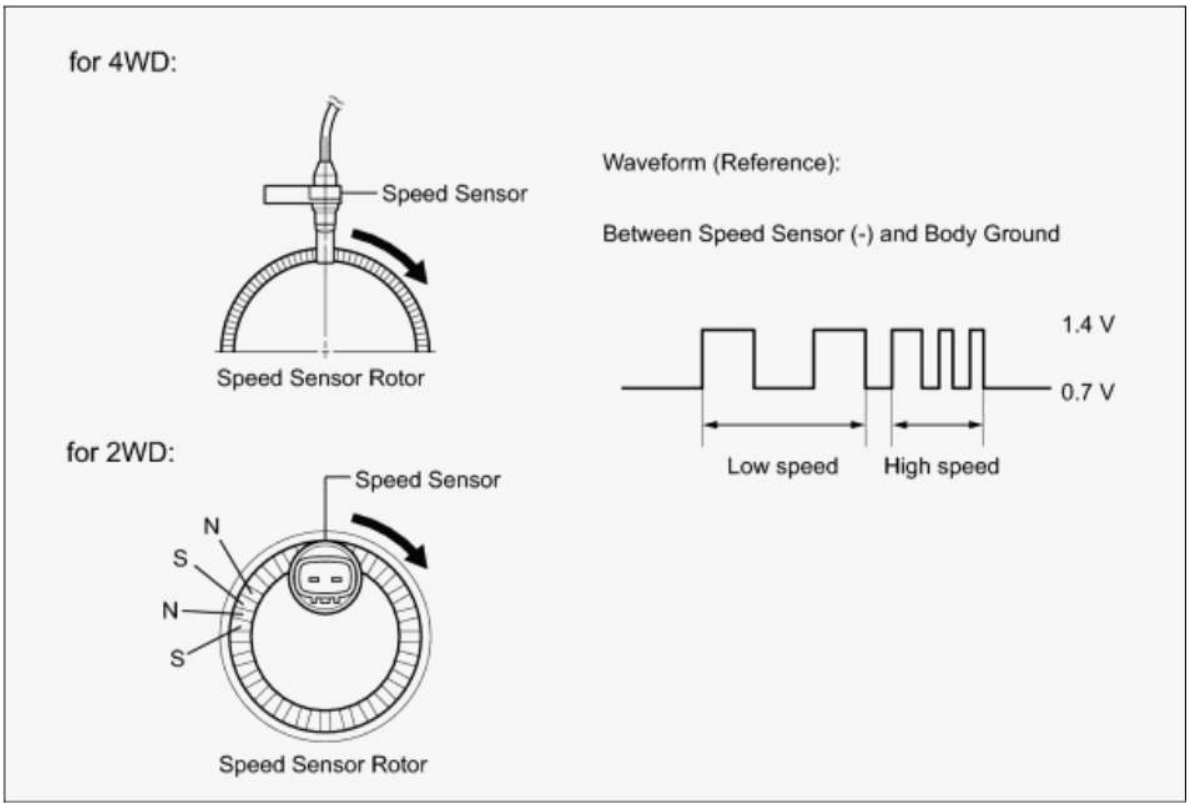
The speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU. These signals are used for ABS/VSC/TRAC control.

Speed sensor rotors have rows of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic change and sends a pulse signal to the skid control ECU.

HINT:

When the connectors between the speed sensor and skid control ECU are connected, the following waveform is output.



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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1415 C1416	Any of the following is detected: 1. An open in the sensor signal circuit of a malfunctioning area occurs 255 times or more. 2. At a vehicle speed 20 km/h (12 mph) or more, noise occurs in the sensor signals of a malfunctioning wheel 75 times or more within 5 seconds. 3. At a vehicle speed 10 km/h (6 mph) or more, noise occurs once per rotor rotation for 15 seconds or more.	• Rear speed sensor RH/LH • Speed sensor circuit • Speed sensor rotor • Brake actuator assembly (Skid control ECU)

HINT:

- DTC C1415 is for the rear speed sensor RH.
- DTC C1416 is for the rear speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1403 and C1404 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (RR/RL Speed Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Speed Open	RR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Open	RL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

OK:
There are no momentary interruptions.

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HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ **CHECK REAR SPEED SENSOR INSTALLATION**

OK ▼

2.	**READ VALUE USING TECHSTREAM (RR/RL WHEEL SPEED)**

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Start the engine.

(d) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Wheel Speed	RR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.
RL Wheel Speed	RL wheel speed sensor reading /min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer.

(e) Check that there is no difference between the speed value output from the speed sensor displayed on the Techstream and the speed value displayed on the speedometer when driving the vehicle.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire inflation, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:

The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

NG ▶ **CHECK REAR SPEED SENSOR INSTALLATION**

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OK

3.	RECONFIRM DTC

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 40 km/h (25 mph) or more for at least 60 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C1415 and C1416) are not output.	A
DTCs (C1415 and/or C1416) are output.	B

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

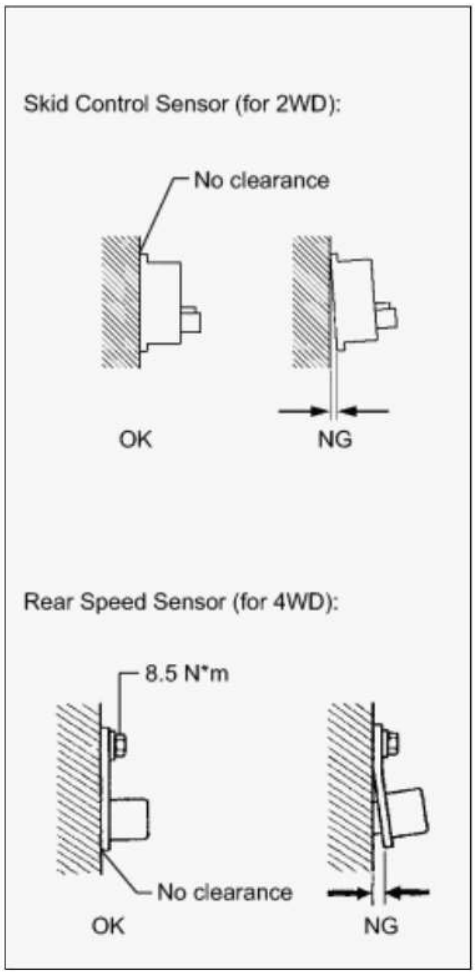
B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)

4.	CHECK REAR SPEED SENSOR INSTALLATION

(a) Turn the ignition switch off.

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(b) for 2WD:

Check the skid control sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

(c) for 4WD:

Check the rear speed sensor installation.

OK:

There is no clearance between the sensor and the rear axle carrier.

The installation bolt is tightened properly.

Torque

8.5 N*m (87 kgf*cm, 75 in.*lbf)

Result:

RESULT		PROCEED TO
OK	for 4WD	A
	for 2WD	B
NG	for 2WD	C

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RESULT		PROCEED TO
	for 4WD	D

B ▶ CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)

C ▶ REPLACE REAR AXLE HUB AND BEARING ASSEMBLY

D ▶ INSTALL REAR SPEED SENSOR CORRECTLY

A ▼

5.	CHECK REAR SPEED SENSOR TIP

(a) Remove the rear speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches, oil, or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ CLEAN OR REPLACE REAR SPEED SENSOR

OK ▼

6.	CHECK REAR SPEED SENSOR ROTOR

(a) Remove the rear axle hub and bearing assembly INFO .

(b) Check the speed sensor rotor.

OK:

No scratches, oil, or foreign matter on the rotors.

Result:

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RESULT	PROCEED TO
NG	A
OK	B

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

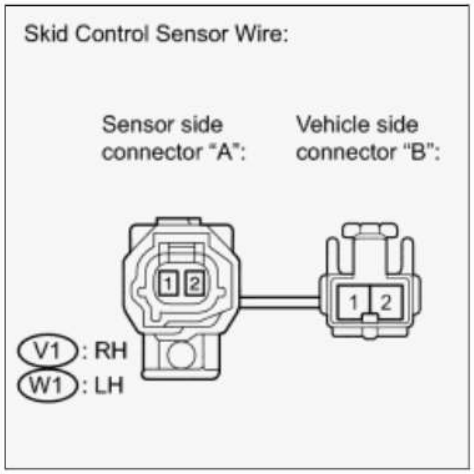
HINT:

If the rear speed sensor rotor needs to be replaced, replace it together with the rear axle hub and bearing assembly.

B ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - SKID CONTROL SENSOR/REAR SPEED SENSOR)**

A ▶ **CLEAN OR REPLACE REAR SPEED SENSOR ROTOR**

7.	CHECK HARNESS AND CONNECTOR (SKID CONTROL SENSOR WIRE)



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the skid control sensor wire.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V1 ("A"-2) - V1 ("B"-1)	Always	Below 1 Ω

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V1 ("A"-2) - V1 ("B"-2)	Always	10 kΩ or higher
V1 ("A"-2) - Body ground	Always	10 kΩ or higher
V1 ("A"-1) - V1 ("B"-2)	Always	Below 1 Ω
V1 ("A"-1) - V1 ("B"-1)	Always	10 kΩ or higher
V1 ("A"-1) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
W1 ("A"-2) - W1 ("B"-1)	Always	Below 1 Ω
W1 ("A"-2) - W1 ("B"-2)	Always	10 kΩ or higher
W1 ("A"-2) - Body ground	Always	10 kΩ or higher
W1 ("A"-1) - W1 ("B"-2)	Always	Below 1 Ω
W1 ("A"-1) - W1 ("B"-1)	Always	10 kΩ or higher
W1 ("A"-1) - Body ground	Always	10 kΩ or higher

NOTICE:

Check the speed sensor signal after replacement INFO .

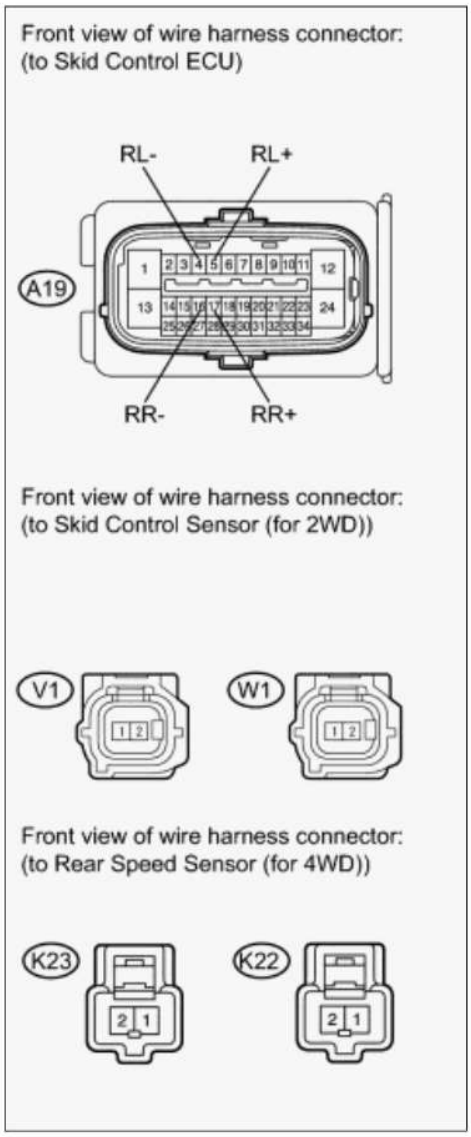
NG ▶ **REPLACE SKID CONTROL SENSOR WIRE**

OK ▼

8.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - SKID CONTROL SENSOR/REAR SPEED SENSOR)**

(a) Install the rear speed sensor and the rear speed sensor rotor.

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(b) for 2WD:

Reconnect the skid control sensor wire.

(c) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(d) Disconnect the skid control ECU connector and the rear speed sensor connector.

(e) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for 2WD RH

for 4WD RH

for 2WD LH

for 4WD LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - V1-2	Always	Below 1 Ω

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - V1-1	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-17 (RR+) - K23-1	Always	Below 1 Ω
A19-17 (RR+) - Body ground	Always	10 kΩ or higher
A19-16 (RR-) - K23-2	Always	Below 1 Ω
A19-16 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - W1-2	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - W1-1	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-5 (RL+) - K22-1	Always	Below 1 Ω
A19-5 (RL+) - Body ground	Always	10 kΩ or higher
A19-4 (RL-) - K22-2	Always	Below 1 Ω
A19-4 (RL-) - Body ground	Always	10 kΩ or higher

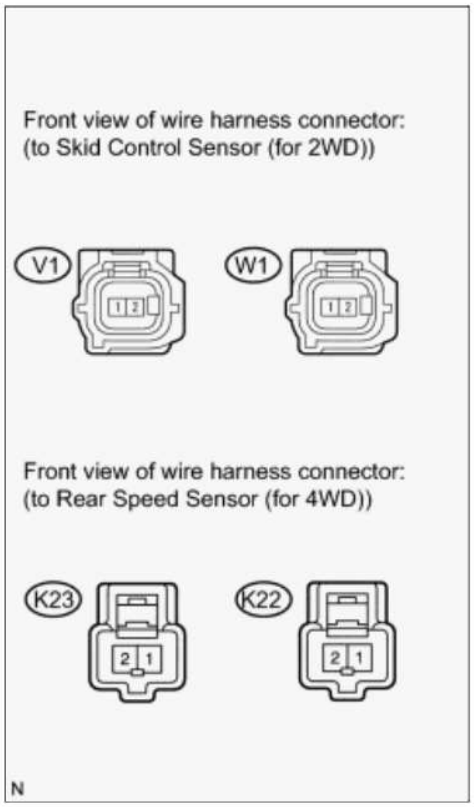
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

9.	**INSPECT SKID CONTROL ECU (SENSOR INPUT)**

(a) Reconnect the skid control ECU connector.

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(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

for 2WD RH

for 4WD RH

for 2WD LH

for 4WD LH

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
V1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K23-1 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
W1-2 - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
K22-1 - Body ground	Ignition switch ON	8 to 14 V

Result:

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RESULT		PROCEED TO
OK	for 2WD	A
	for 4WD	B
NG		C

NOTICE:

Check the speed sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ REPLACE REAR SPEED SENSOR

C ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ REPLACE REAR AXLE HUB AND BEARING ASSEMBLY

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000368W01IX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1417: High Power Supply Voltage Malfunction (2011 RAV4)		

DTC	**C1417**	**High Power Supply Voltage Malfunction**

DESCRIPTION

If a malfunction is detected in the power supply circuit, the skid control ECU (housed in the brake actuator assembly) stores this DTC and the fail-safe function prohibits ABS/VSC/TRAC operation.

This DTC is stored when the IG1 terminal voltage deviates from the DTC detection condition due to a malfunction in the power supply or charging circuit such as the battery or alternator circuit, etc.

This DTC is canceled when the IG1 terminal voltage returns to normal.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1417	The IG1 terminal voltage is 17.4 V or higher for 1 second or more.	• ECU-IG1 fuse • Battery • Charging system • Power source circuit • Internal power supply circuit of the skid control ECU

WIRING DIAGRAM

Refer to DTC C1241 INFO .

INSPECTION PROCEDURE

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK BATTERY**

(a) Check the battery voltage.

Standard voltage:
11 to 14 V

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Result:

RESULT		PROCEED TO
OK		A
NG	for 2AR-FE	B
	for 2GR-FE	C

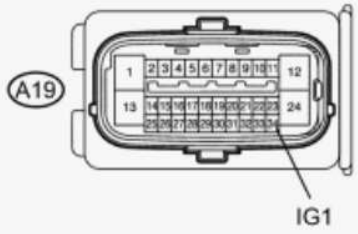
B ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

C ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

A

2.	**INSPECT SKID CONTROL ECU (IG1 TERMINAL)**

Front view of wire harness connector:
(to Skid Control ECU)



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the skid control ECU connector.

(c) Turn the ignition switch to ON.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-34 (IG1) - Body ground	Ignition switch ON	11 to 14 V

HINT:

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If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (IG1 CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000035P401FX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1419,C1435: Acceleration Sensor Internal Circuit (2011 RAV4)		

DTC	**C1419**	**Acceleration Sensor Internal Circuit**

DTC	**C1435**	**Yaw Rate Sensor Internal Circuit**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are stored.

These DTCs are also output when calibration has not been completed.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1419	A data malfunction signal is received from the deceleration sensor.	Yaw rate and deceleration sensor
C1435	A data malfunction signal is received from the yaw rate sensor.	Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

HINT:

When U0123, U0124 and/or U0126 is output together with C1419 and/or C1435, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

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1.	**REPLACE YAW RATE SENSOR ASSEMBLY**

(a) Replace the yaw rate sensor assembly INFO .

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NEXT END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000035P601FX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1420: Acceleration Sensor Malfunction (2011 RAV4)		

DTC	**C1420**	**Acceleration Sensor Malfunction**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are stored.

These DTCs are also output when calibration has not been completed.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1420	After the difference between GL1 and GL2 becomes 0.6 G or more with the vehicle stationary, the difference remains 0.4 G or more for 60 seconds or more.	• Sensor installation • Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

HINT:

When U0123, U0124 and/or U0126 is output together with C1420, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

1.	**CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION**

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(a) Check that the yaw rate and deceleration sensor has been installed properly INFO .

OK:

The sensor should be tightened to the specified torque.

The sensor should not be installed in a tilted position.

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

OK ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIG08FX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1421,C1423,C1424: Open or Short in Master Cylinder Pressure Sensor (2011 RAV4)		

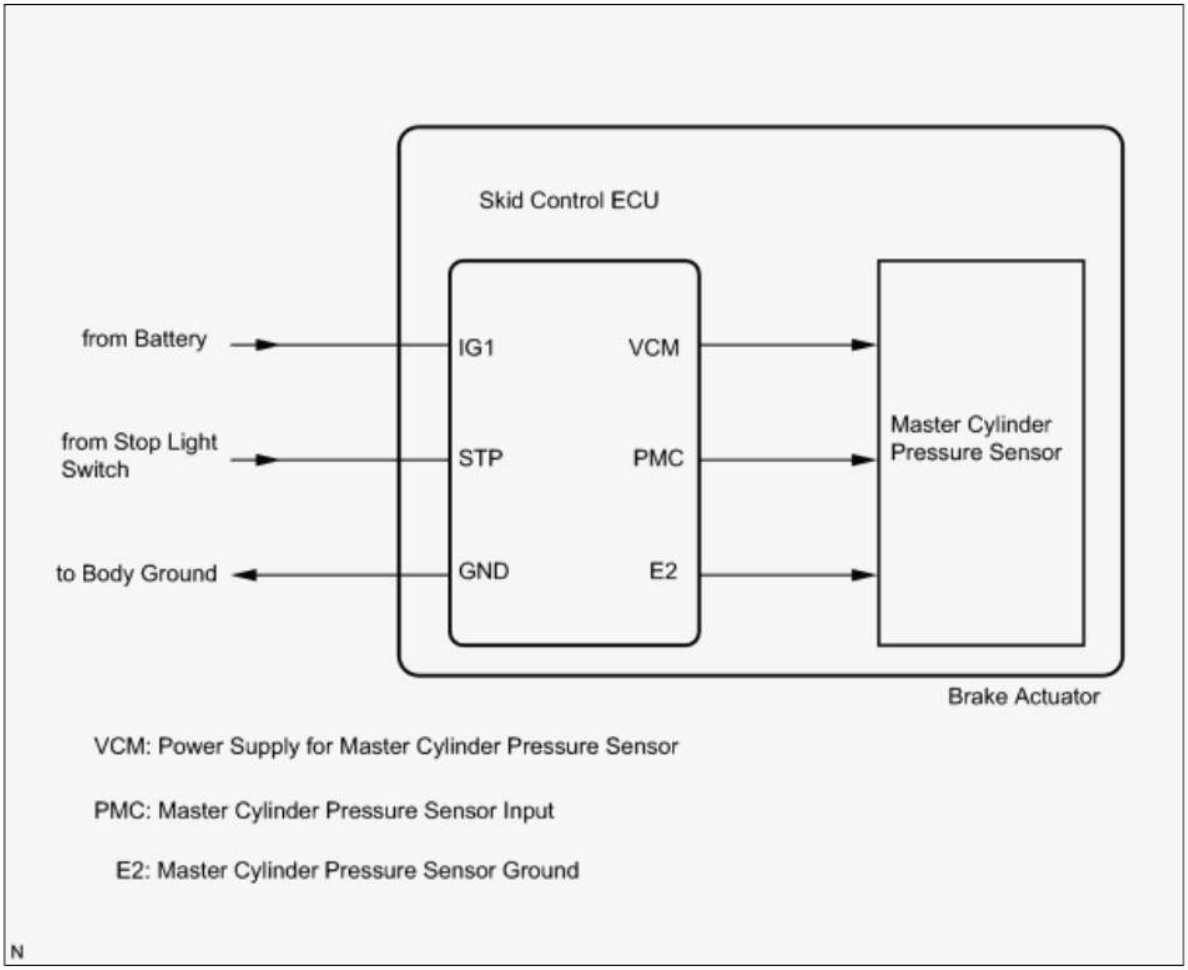
DTC	**C1421**	**Open or Short in Master Cylinder Pressure Sensor**

DTC	**C1423**	**Master Cylinder Pressure Sensor Zero Point Low Malfunction**

DTC	**C1424**	**Master Cylinder Pressure Sensor Output Malfunction**

DESCRIPTION

The master cylinder pressure sensor is connected to the skid control ECU in the brake actuator assembly.



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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1421	Either of the following is detected: 1. With the IG1 terminal voltage between 9.5 and 17.4 V, the VCM terminal voltage is not between 4.4 and 5.6 V for 1.2 seconds or more. 2. When the VCM terminal voltage is between 4.8 and 5.2 V, the PMC terminal voltage is not between 0.19 and 4.57 V for 1.2 seconds or more.	Brake actuator assembly (Master cylinder pressure sensor)
C1423	The PMC terminal voltage is less than 0.27 V for 5 seconds or more.	Brake actuator assembly (Master cylinder pressure sensor)
C1424	Any of the following is detected: 1. Noise occurs in the PMC terminal 7 times or more within 5 seconds. 2. When the vehicle speed drops from 40 km/h (25 mph) to 10 km/h (6 mph), the master cylinder pressure does not change by at least 0.048 MPa. 3. At a vehicle speed 7 km/h (4.3 mph) or more, the PMC terminal voltage is between 0.86 and 1.0 V and does not change by at least 0.048 MPa for 60 seconds or more. 4. At a vehicle speed 7 km/h (4.3 mph) or more, the PMC terminal voltage is 1.0 V or higher and does not change by at least 0.048 MPa for 30 seconds or more.	Brake actuator assembly (Master cylinder pressure sensor)

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**REPLACE BRAKE ACTUATOR ASSEMBLY**

(a) Replace the brake actuator assembly (master cylinder pressure sensor) INFO .

NEXT END

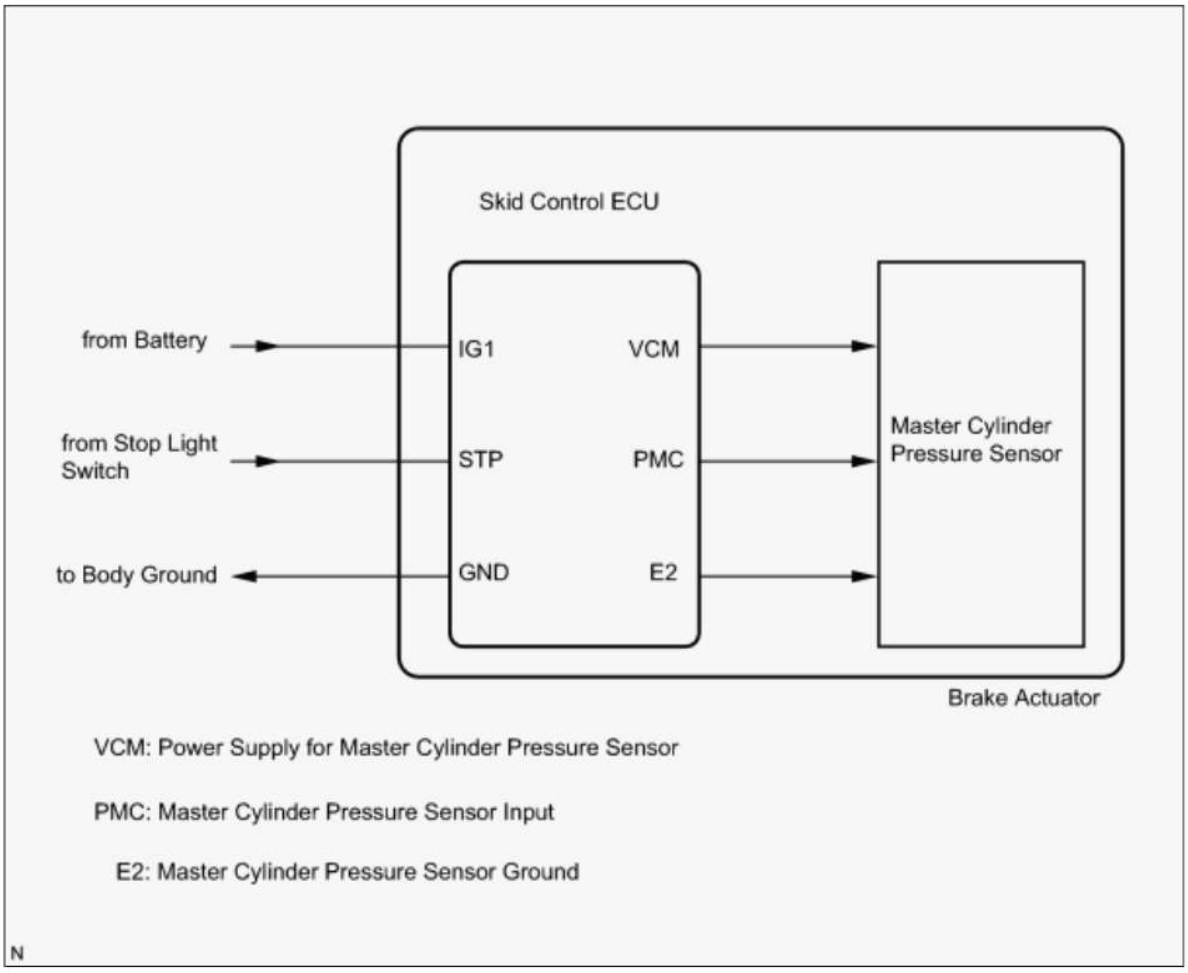
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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIG08GX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1422: Master Cylinder Pressure Sensor Zero Point High Malfunction (2011 RAV4)		

DTC	**C1422**	**Master Cylinder Pressure Sensor Zero Point High Malfunction**

DESCRIPTION

The master cylinder pressure sensor is connected to the skid control ECU in the brake actuator assembly.



DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1422	When the stop light switch is OFF, the PMC terminal voltage is more than 0.86 V for 5 seconds or more.	• Stop light switch • Stop light switch circuit • Master cylinder pressure sensor circuit

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
		• Brake actuator assembly (Master cylinder pressure sensor)

WIRING DIAGRAM

Refer to DTC C1425 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1425 is output together with C1422, inspect and repair the trouble areas indicated by C1425 first INFO .

PROCEDURE

1.	**CHECK STOP LIGHT OPERATION**

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ INSPECT STOP LIGHT CIRCUIT

OK ▼

2.	**READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)**

(a) Connect the Techstream to the DLC3.

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(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

(d) Check that the stop light condition observed on the Techstream changes according to brake pedal operation.

OK:

The Techstream displays ON or OFF according to brake pedal operation.

NG ▶ **INSPECT SKID CONTROL ECU (STP2 TERMINAL)**

OK ▼

3.	**CHECK BRAKE PEDAL AND STOP LIGHT SWITCH INSTALLATION**

(a) Turn the ignition switch off.

(b) Check the brake pedal height and stop light switch installation INFO .

OK:

The brake pedal height and stop light switch installation are normal.

NG ▶ **ADJUST BRAKE PEDAL OR STOP LIGHT SWITCH**

OK ▼

4.	**RECONFIRM DTC**

(a) Clear the DTCs INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 40 km/h (25 mph) or more and perform braking test (decelerate the

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vehicle by depressing the brake pedal).

(d) Check if the same DTC is output INFO .

Result:

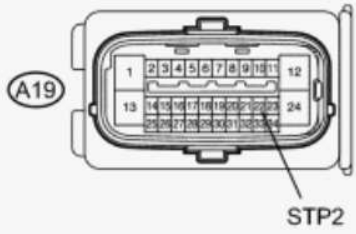
RESULT	PROCEED TO
DTC (C1422) is not output.	A
DTC (C1422) is output.	B

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

5.	**INSPECT SKID CONTROL ECU (STP2 TERMINAL)**

Front view of wire harness connector:
(to Skid Control ECU)



(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(c) Disconnect the skid control ECU connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A19-22 (STP2) - Body ground	Stop light switch on (Brake pedal depressed)	8 to 14 V
	Stop light switch off (Brake pedal released)	Below 1.5 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

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(STP2 CIRCUIT)

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIE0A3X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1425: Open in Stop Light Switch Circuit (2011 RAV4)		

DTC	**C1425**	**Open in Stop Light Switch Circuit**

DESCRIPTION

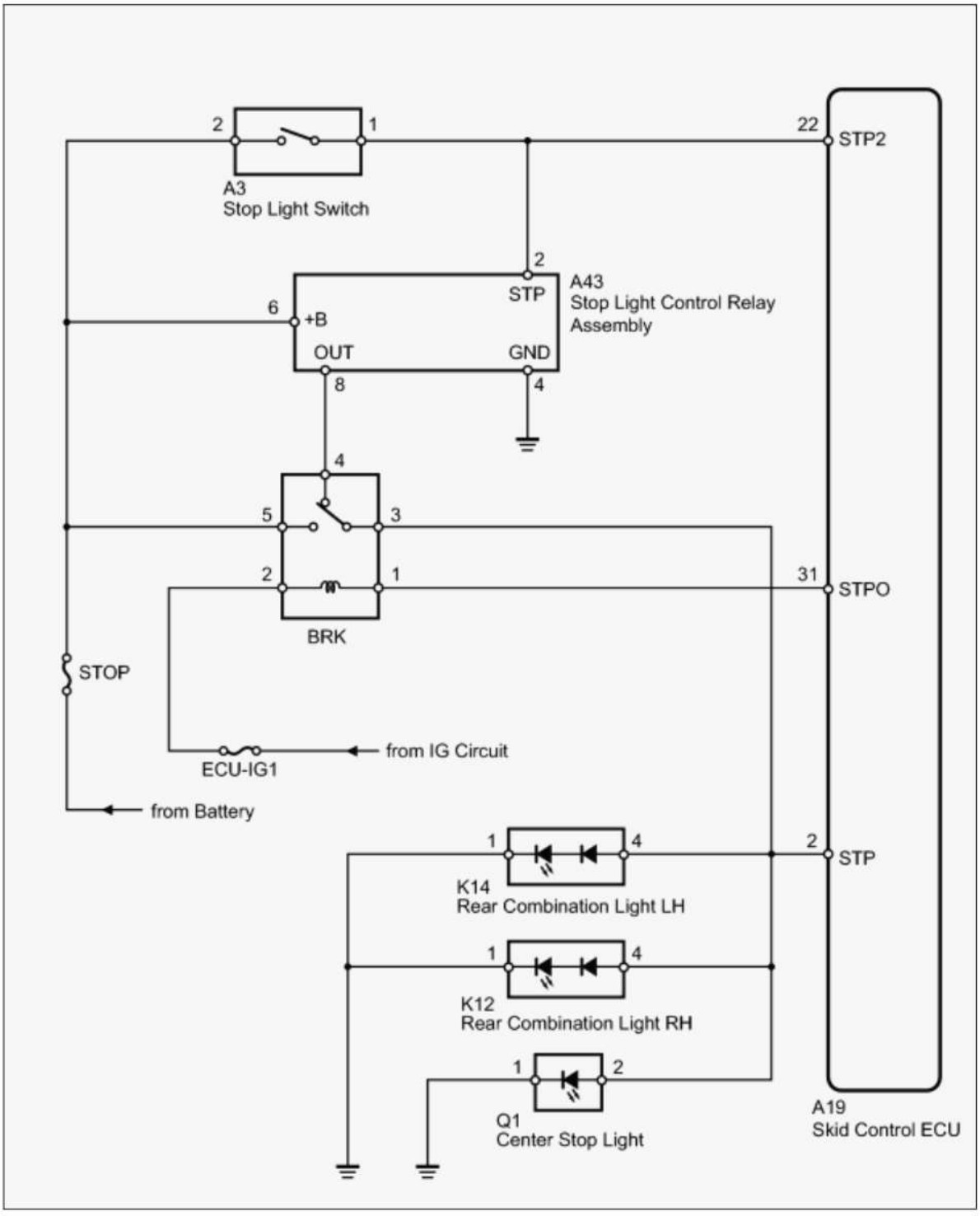
The skid control ECU (housed in the brake actuator assembly) inputs stop light switch signals and the condition of brake operation.

The skid control ECU has an open detection circuit, which outputs this DTC when detecting an open in the stop light input line or the ground line of the stop light circuit with the stop light switch off (brake pedal not depressed).

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1425	When IG1 terminal voltage is between 9.5 and 17.4 V, an open stop light switch circuit continues for 3 seconds or more.	• STOP fuse • Stop light switch • Stop light switch circuit • Stop light control relay • Stop light control relay circuit • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	CHECK STOP LIGHT OPERATION

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **INSPECT STOP LIGHT SWITCH (POWER SOURCE TERMINAL)**

OK ▼

2.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

(d) Check that the stop light switch display observed on the Techstream changes according to brake pedal operation.

OK:

The Techstream displays ON or OFF according to brake pedal operation.

NG ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - ENGINE ROOM NO. 1 RELAY BLOCK)**

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OK

3.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Depress the brake pedal several times to test the stop light circuit.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1425) is not output.	A
DTC (C1425) is output.	B

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

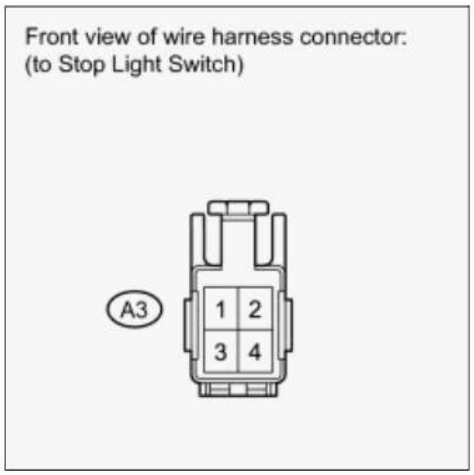
B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

4.	**INSPECT STOP LIGHT SWITCH (POWER SOURCE TERMINAL)**

(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

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(b) Disconnect the stop light switch connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A3-2 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

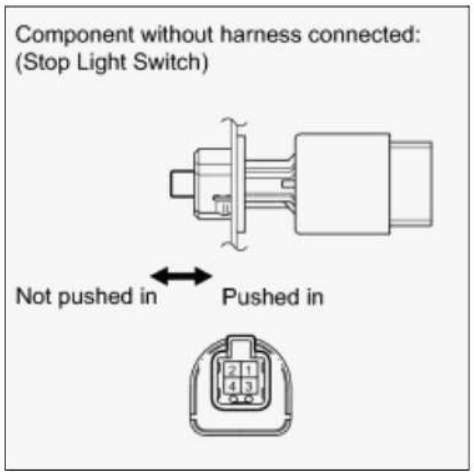
5.	**INSPECT STOP LIGHT SWITCH**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - 2	Switch pin not pushed in	Below 1 Ω
1 - 2	Switch pin pushed in	10 kΩ or higher

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NG ▶ **REPLACE STOP LIGHT SWITCH**

OK ▼

6.	**INSPECT SKID CONTROL ECU (STP2 TERMINAL)**

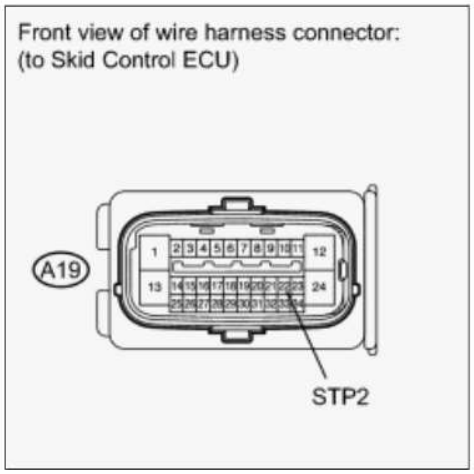
(a) Connect the stop light switch connector.

(b) Install the stop light control relay (BRK).

(c) Turn the ignition switch off.

(d) Make sure that there is no looseness in the locking part and connecting part of the connector.

(e) Disconnect the skid control ECU connector.



(f) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-22 (STP2) - Body ground	Brake pedal depressed ⟷ released	Output voltage changes

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP2 CIRCUIT)**

OK ▼

7.	**RECONFIRM DTC**

(a) Connect the skid control ECU connector.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Depress the brake pedal several times to test the stop light circuit.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1425) is not output.	A
DTC (C1425) is output.	B

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

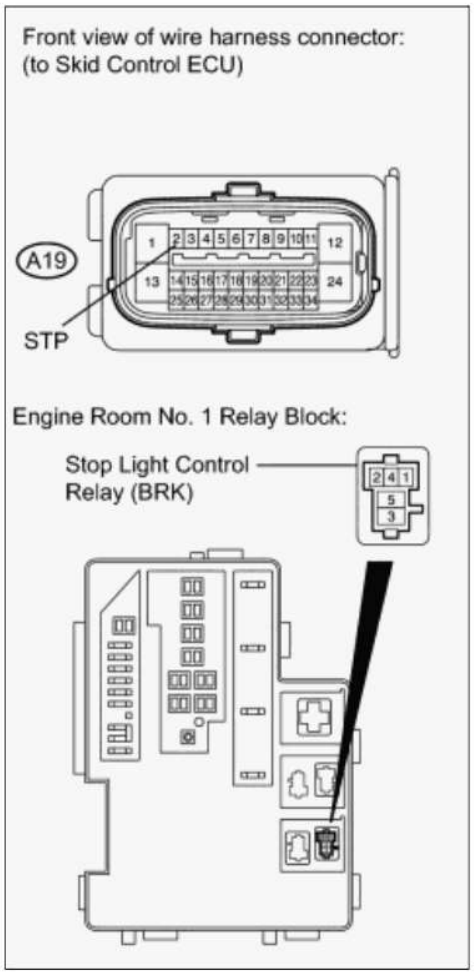
B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

8.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - ENGINE ROOM NO. 1 RELAY BLOCK)**

(a) Turn the ignition switch off.

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(b) Remove the stop light control relay (BRK).

(c) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(d) Disconnect the skid control ECU connector.

(e) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-2 (STP) - Stop light control relay (BRK) terminal 3	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIE0A2X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1426: Stop Light Switch OFF Stuck Malfunction (2011 RAV4)		

DTC	**C1426**	**Stop Light Switch OFF Stuck Malfunction**

DESCRIPTION

The skid control ECU (housed in the brake actuator assembly) inputs stop light switch signals and the condition of brake operation.

The skid control ECU has an open detection circuit, which outputs this DTC when detecting an open in the stop light input line or the ground line of the stop light circuit with the stop light switch off (brake pedal not depressed).

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1426	When the brake pedal load sensing switch is on, the master cylinder pressure is 2 MPa or more and the deceleration calculated from the vehicle speed is 0.2 G or more, the stop light switch is off for 2 seconds or more.	• STOP fuse • Stop light switch • Stop light switch circuit • Stop light control relay • Stop light control relay circuit • Brake actuator assembly (Skid control ECU)

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WIRING DIAGRAM

Refer to DTC C1425 INFO .

INSPECTION PROCEDURE

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following inspection procedure.
- When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK STOP LIGHT OPERATION**

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **INSPECT STOP LIGHT SWITCH (POWER SOURCE TERMINAL)**

OK ▼

2.	**READ VALUE ON TECHSTREAM (STOP LIGHT SWITCH)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Brake Pedal Load Sensing SW	Brake pedal load sensing switch / ON or OFF	ON: Brake pedal depressed beyond the specified point OFF: Brake pedal not depressed beyond the specified point	-

(d) Check that the stop light switch display and brake pedal load sensing switch display observed on the Techstream change according to brake pedal operation.

OK:

The Techstream displays ON or OFF according to brake pedal operation.

(e) Slowly depress the brake pedal, and check when the stop light switch and brake pedal load sensing switch turn ON.

OK:

First the stop light switch should turn ON, and then the brake pedal load sensing switch should turn ON.

Result:

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RESULT		PROCEED TO
OK		A
NG	Turning on of the stop light switch is not confirmed.	B
	The brake pedal load sensing switch turns on first.	C

B ▶ **CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - ENGINE ROOM NO. 1 RELAY BLOCK)**

C ▶ **CHECK BRAKE PEDAL AND STOP LIGHT SWITCH INSTALLATION**

A ▼

3.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Depress the brake pedal several times to test the stop light circuit.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1426) is not output.	A
DTC (C1426) is output.	B

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

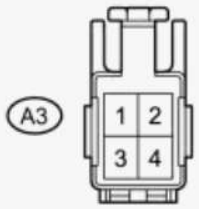
B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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4.	INSPECT STOP LIGHT SWITCH (POWER SOURCE TERMINAL)

Front view of wire harness connector:
(to Stop Light Switch)



(a) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(b) Disconnect the stop light switch connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A3-2 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

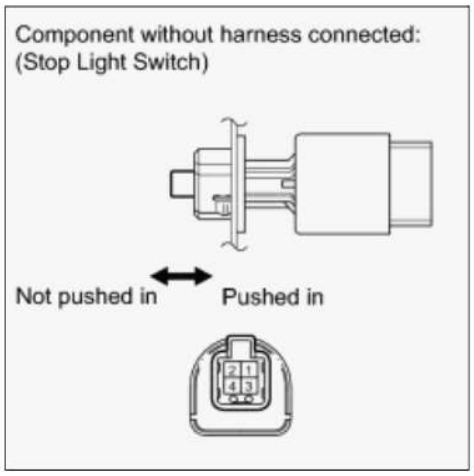
5.	INSPECT STOP LIGHT SWITCH

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION

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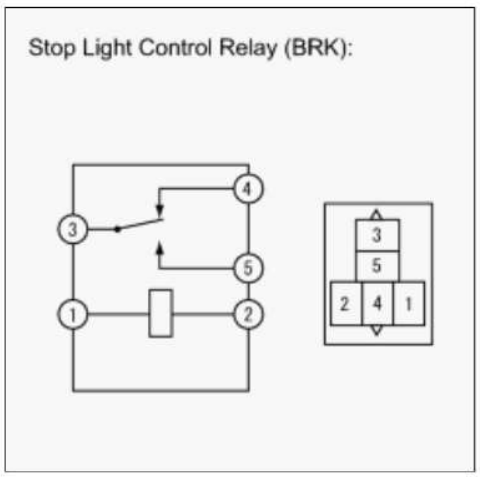


1 - 2	Switch pin not pushed in	Below 1 Ω
	Switch pin pushed in	10 kΩ or higher

NG ▶ **REPLACE STOP LIGHT SWITCH**

OK ▼

6.	**INSPECT STOP LIGHT CONTROL RELAY (BRK)**



(a) Remove the stop light control relay (BRK).

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 4	Voltage is not applied between terminals 1 and 2	Below 1 Ω

NG ▶ **REPLACE STOP LIGHT CONTROL RELAY (BRK)**

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OK



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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIF06QX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1427: Motor Malfunction (2011 RAV4)		

DTC	**C1427**	**Motor Malfunction**

DESCRIPTION

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1427	Actuator pump motor does not operate properly.	• Brake actuator assembly (Ground circuit) • Brake actuator assembly (Motor circuit)

WIRING DIAGRAM

Refer to DTCs C0273, C0274 and C1361 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM (MOTOR RELAY)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Motor Relay	Motor relay	Relay ON / OFF	Operation sound of motor can be heard.

(d) Check for operating sound of the motor relay when operating it with the Techstream.

Result:

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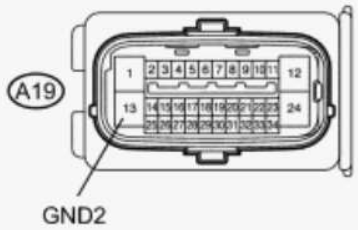
RESULT	PROCEED TO
Operating sound is not heard.	A
Operating sound is heard.	B

B ▶ **RECONFIRM DTC**

A ▼

2.	**INSPECT SKID CONTROL ECU (GND2 TERMINAL)**

Front view of wire harness connector:
(to Skid Control ECU)



(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(c) Disconnect the skid control ECU connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-13 (GND2) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND2 CIRCUIT)**

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OK

3.	**RECONFIRM DTC**

HINT:

This code is stored when a problem is identified in the brake actuator assembly.

The motor relay is in the brake actuator assembly.

Therefore, motor relay unit inspection cannot be performed. Be sure to check if the DTC is output before replacing the brake actuator assembly.

(a) Turn the ignition switch off.

(b) Reconnect the skid control ECU connector.

(c) Clear the DTCs INFO .

(d) Start the engine.

(e) Drive the vehicle at a speed of 20 km/h (12 mph) or more for 30 seconds or more.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1427) is not output.	A
DTC (C1427) is output.	B

HINT:

- If a speed signal of 6 km/h (4 mph) or more is input to the skid control ECU with the ignition switch ON and the stop light switch off, the ECU performs self diagnosis of the motor and solenoid circuits.
- If the normal system code is output (no trouble codes are output), slightly jiggle the connectors, wire harness, and fuses of the brake actuator assembly. Make sure that no DTCs are output.
- If any DTCs are output while jiggling a connector or wire harness of the brake actuator assembly (skid control ECU), inspect and repair the connector or wire harness.
- It is suspected that the DTCs were output due to a bad connection of the connector terminal.

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000368U019X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1428: Motor Circuit Malfunction (2011 RAV4)		

DTC	**C1428**	**Motor Circuit Malfunction**

DESCRIPTION

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1428	With the motor relay off and the motor fail-safe relay on, an open in the motor circuit continues for 2 seconds or more.	Brake actuator assembly (Motor circuit)

WIRING DIAGRAM

Refer to DTCs C0273, C0274 and C1361 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**REPLACE BRAKE ACTUATOR ASSEMBLY**

(a) Replace the brake actuator assembly INFO .

NEXT ▶ END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIR03SX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1429: Open or Short in Brake Pedal Load Sensing Switch (2011 RAV4)		

DTC	**C1429**	**Open or Short in Brake Pedal Load Sensing Switch**

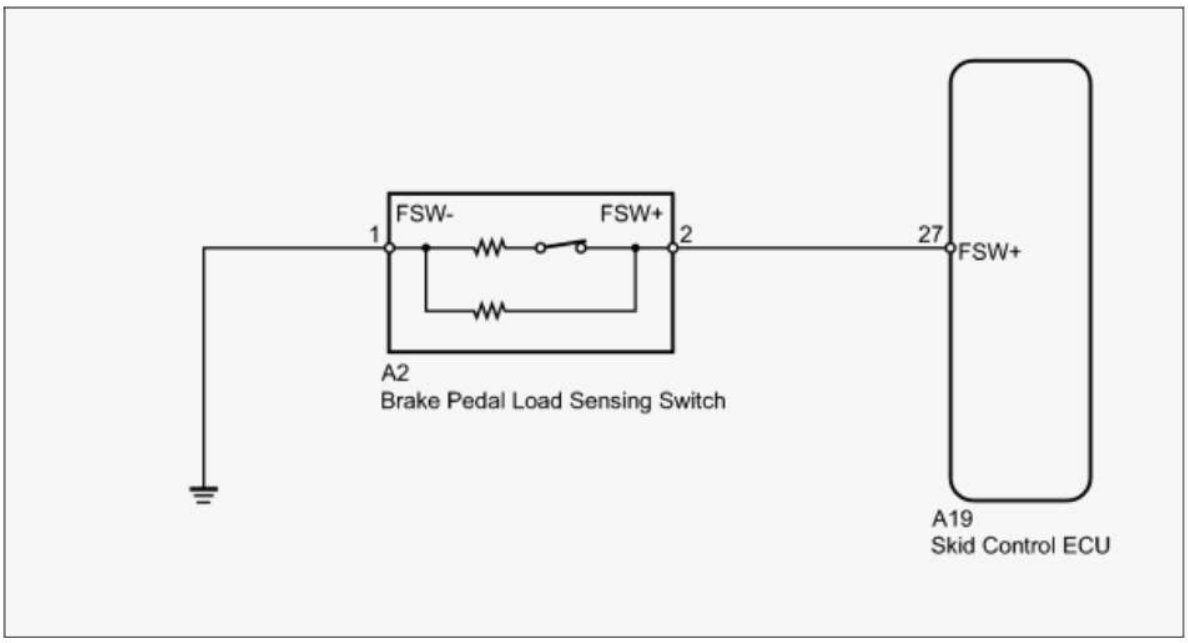
DESCRIPTION

The brake pedal load sensing switch operates when the brake pedal is depressed with force exceeding a predetermined level.

The skid control ECU detects if the brake pedal is depressed or not via this circuit.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1429	An open or short in the brake pedal load sensing switch continues for 0.3 seconds or more.	• Brake pedal load sensing switch • Brake pedal load sensing switch circuit • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

When C1425 is output together with C1429, inspect and repair the trouble areas indicated by C1425 first INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (BRAKE PEDAL LOAD SENSING SWITCH)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Brake Pedal Load Sensing SW	Brake pedal load sensing switch / ON or OFF	ON: Brake pedal depressed beyond the specified point OFF: Brake pedal not depressed beyond the specified point	-

(d) Check that the brake pedal load sensing switch display observed on the Techstream changes according to brake pedal operation.

OK:
The Techstream displays ON or OFF according to brake pedal operation.

NG ▶ INSPECT BRAKE PEDAL LOAD SENSING SWITCH

OK ▼

2.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

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(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Perform the road and braking test.

(e) Check if the same DTC is output INFO .

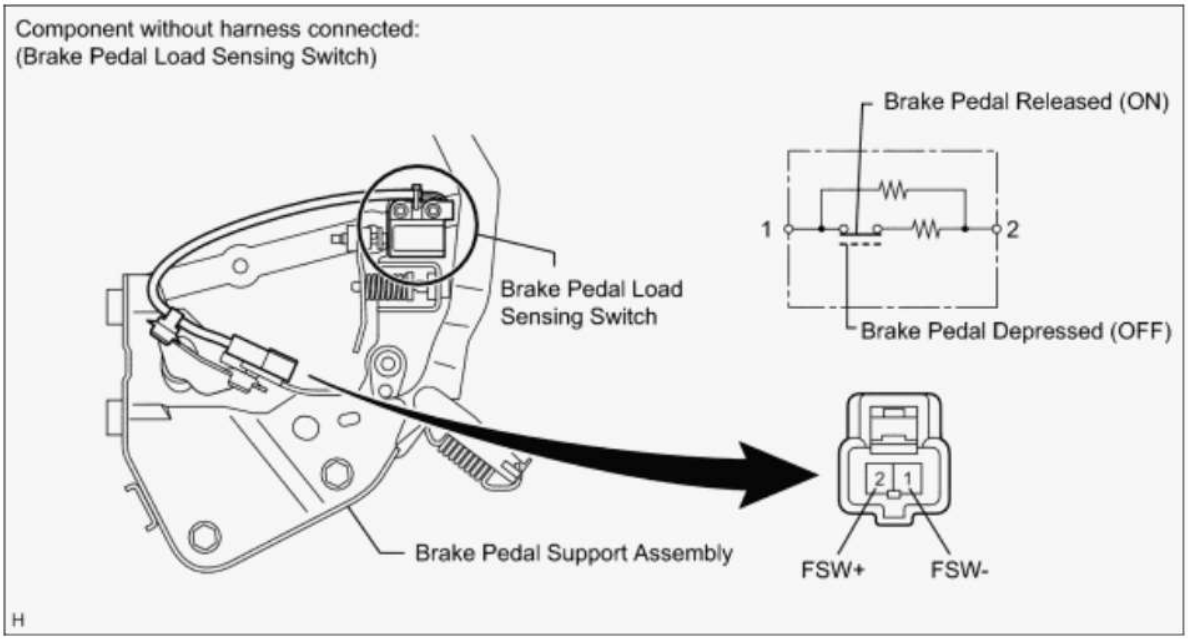
Result:

RESULT	PROCEED TO
DTC (C1429) is not output.	A
DTC (C1429) is output.	B

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

3.	**INSPECT BRAKE PEDAL LOAD SENSING SWITCH**



NOTICE:

- Do not remove the brake pedal load sensing switch from the brake pedal support assembly.
- When there is a malfunction in the brake pedal load sensing switch, replace the brake pedal support assembly.

(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

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(c) Disconnect the brake pedal load sensing switch connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
2 (FSW+) - 1 (FSW-)	Brake pedal load sensing switch off (Brake pedal depressed)	0.9 to 1.1 kΩ
	Brake pedal load sensing switch on (Brake pedal released)	192 to 234 Ω

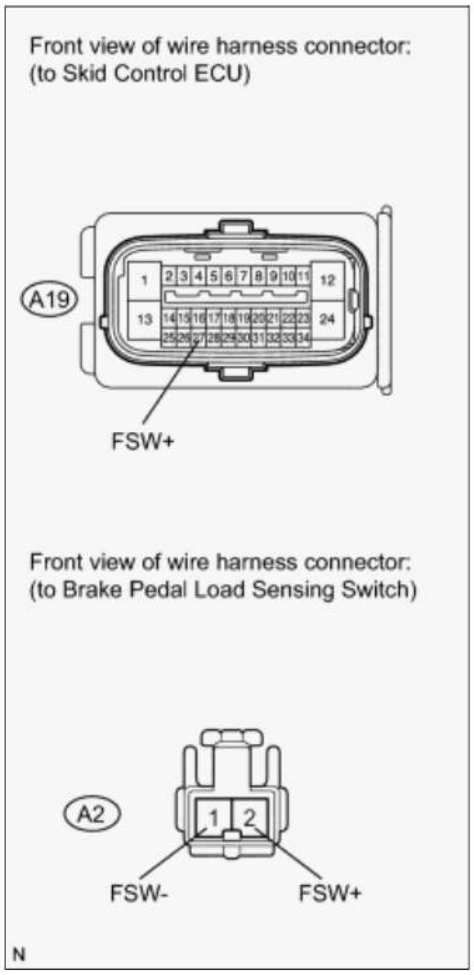
NG ▶ **REPLACE BRAKE PEDAL SUPPORT ASSEMBLY (BRAKE PEDAL LOAD SENSING SWITCH)**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BRAKE PEDAL LOAD SENSING SWITCH)**

(a) Make sure that there is no looseness in the locking part and connecting part of the connector.

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(b) Disconnect the skid control ECU connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-27 (FSW+) - A2-2 (FSW+)	Always	Below 1 Ω
A19-27 (FSW+) - Body ground	Always	10 kΩ or higher
A2-1 (FSW-) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIR03TX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1430,C1431: Brake Pedal Load Sensing Switch OFF Stuck Malfunction (2011 RAV4)		

DTC	**C1430**	**Brake Pedal Load Sensing Switch OFF Stuck Malfunction**

DTC	**C1431**	**Brake Pedal Load Sensing Switch ON Stuck Malfunction**

DESCRIPTION

The brake pedal load sensing switch operates when the brake pedal is depressed with force exceeding a predetermined level.

The skid control ECU detects if the brake pedal is depressed or not via this circuit.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1430	Either of the following is detected: 1. With the stop light switch on, the brake pedal load sensing switch off and the master cylinder pressure 6 MPa or more, the deceleration is 0.4 G or more for 1 second or more. 2. With the stop light switch on, the brake pedal load sensing switch off and the master cylinder pressure 6 MPa or more, the vehicle speed is 0 km/h (0 mph) for 5 seconds or more.	• Brake pedal load sensing switch • Brake pedal load sensing switch circuit
C1431	Either of the following is detected: 1. Immediately after the ignition switch is turned to ON, the brake pedal load sensing switch is on and the stop light switch is off for 10 seconds or more. 2. The condition that the brake pedal load sensing switch remains on while the vehicle speed increases from 0 km/h (0 mph) to 30 km/h (18 mph) occurs 5 times in succession.	• Brake pedal load sensing switch • Brake pedal load sensing switch circuit

WIRING DIAGRAM

Refer to DTC C1429 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

HINT:

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When C1425 is output together with C1430 and/or C1431, inspect and repair the trouble areas indicated by C1425 first INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH/BRAKE PEDAL LOAD SENSING SWITCH)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Brake Pedal Load Sensing SW	Brake pedal load sensing switch / ON or OFF	ON: Brake pedal depressed beyond the specified point OFF: Brake pedal not depressed beyond the specified point	-

(d) Check that the stop light switch display and brake pedal load sensing switch display observed on the Techstream change according to brake pedal operation.

OK:

The Techstream displays ON or OFF according to brake pedal operation.

(e) Slowly depress the brake pedal, and check when the stop light switch and brake pedal load sensing switch turn ON.

OK:

First the stop light switch should turn ON, and then the brake pedal load sensing switch should turn ON.

Result:

RESULT		PROCEED TO
OK		A
NG	Turning on of the brake pedal load sensing switch is not confirmed.	B
	The brake pedal load sensing switch turns on first.	C

B ▶ **INSPECT BRAKE PEDAL LOAD SENSING SWITCH**

C ▶ **CHECK BRAKE PEDAL AND STOP LIGHT SWITCH INSTALLATION**

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A

2.	RECONFIRM DTC

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Perform the road and braking test.

(e) Check if the same DTC is output INFO .

Result:

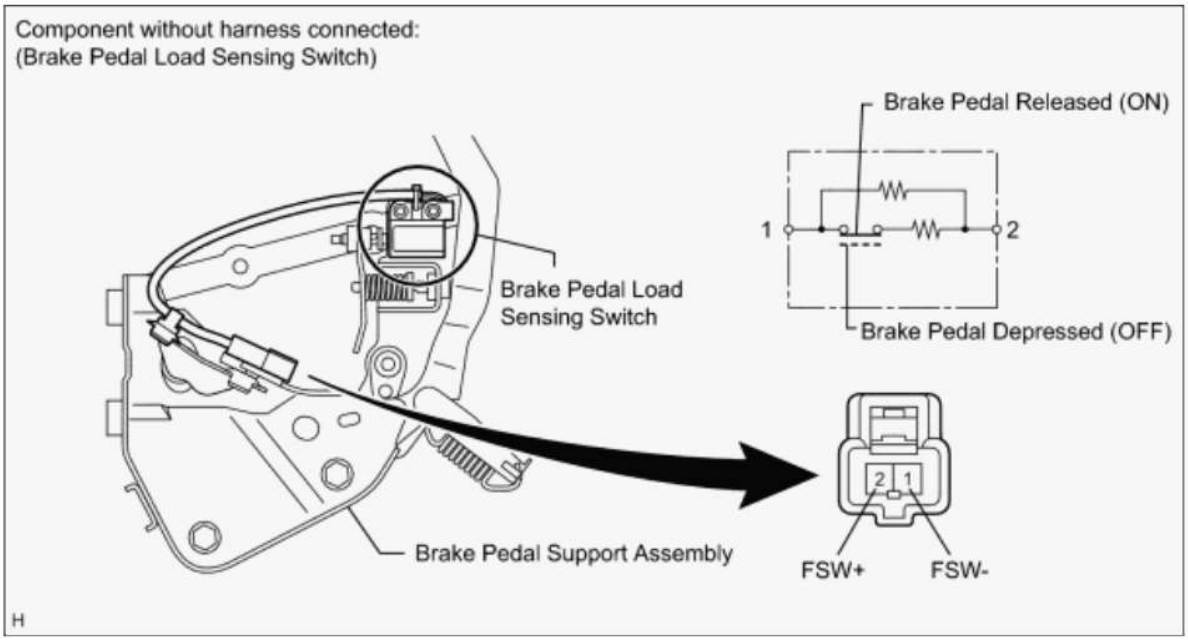
RESULT	PROCEED TO
DTCs (C1430 and C1431) are not output.	A
DTCs (C1430 and/or C1431) are output.	B

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)

3.	INSPECT BRAKE PEDAL LOAD SENSING SWITCH

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NOTICE:

- Do not remove the brake pedal load sensing switch from the brake pedal support assembly.
- When there is a malfunction in the brake pedal load sensing switch, replace the brake pedal support assembly.

(a) Turn the ignition switch off.

(b) Make sure that there is no looseness in the locking part and connecting part of the connector.

(c) Disconnect the brake pedal load sensing switch connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
2 (FSW+) - 1 (FSW-)	Brake pedal load sensing switch off (Brake pedal depressed)	0.9 to 1.1 kΩ
	Brake pedal load sensing switch on (Brake pedal released)	192 to 234 Ω

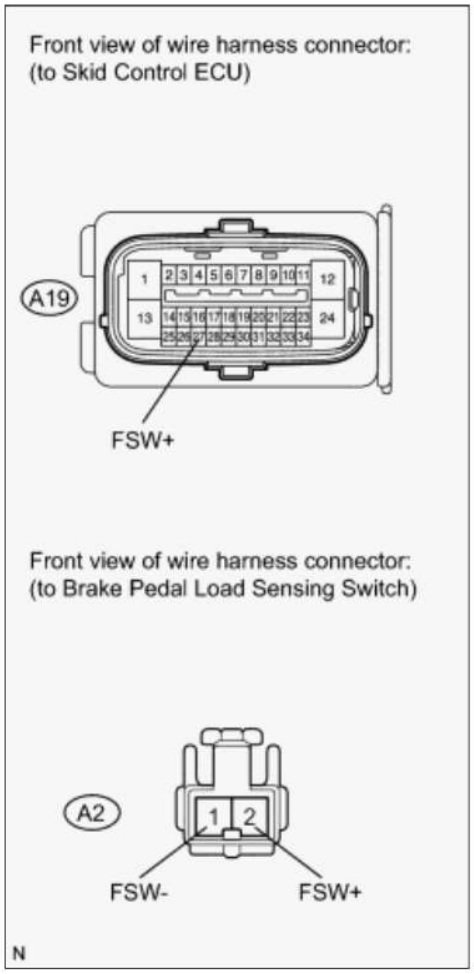
NG ▶ **REPLACE BRAKE PEDAL SUPPORT ASSEMBLY (BRAKE PEDAL LOAD SENSING SWITCH)**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BRAKE PEDAL LOAD**

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	SENSING SWITCH)



(a) Make sure that there is no looseness in the locking part and connecting part of the connector.

(b) Disconnect the skid control ECU connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-27 (FSW+) - A2-2 (FSW+)	Always	Below 1 Ω
A19-27 (FSW+) - Body ground	Always	10 kΩ or higher
A2-1 (FSW-) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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5.	CHECK BRAKE PEDAL AND STOP LIGHT SWITCH INSTALLATION

(a) Turn the ignition switch off.

(b) Check the brake pedal height and stop light switch installation INFO .

OK:
The brake pedal height and stop light switch installation are normal.

NG ▶ **ADJUST BRAKE PEDAL OR STOP LIGHT SWITCH**

OK ▶ **REPLACE BRAKE PEDAL SUPPORT ASSEMBLY (BRAKE PEDAL LOAD SENSING SWITCH)**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIM098X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1432: Steering Angle Sensor Power Source Voltage Malfunction (2011 RAV4)		

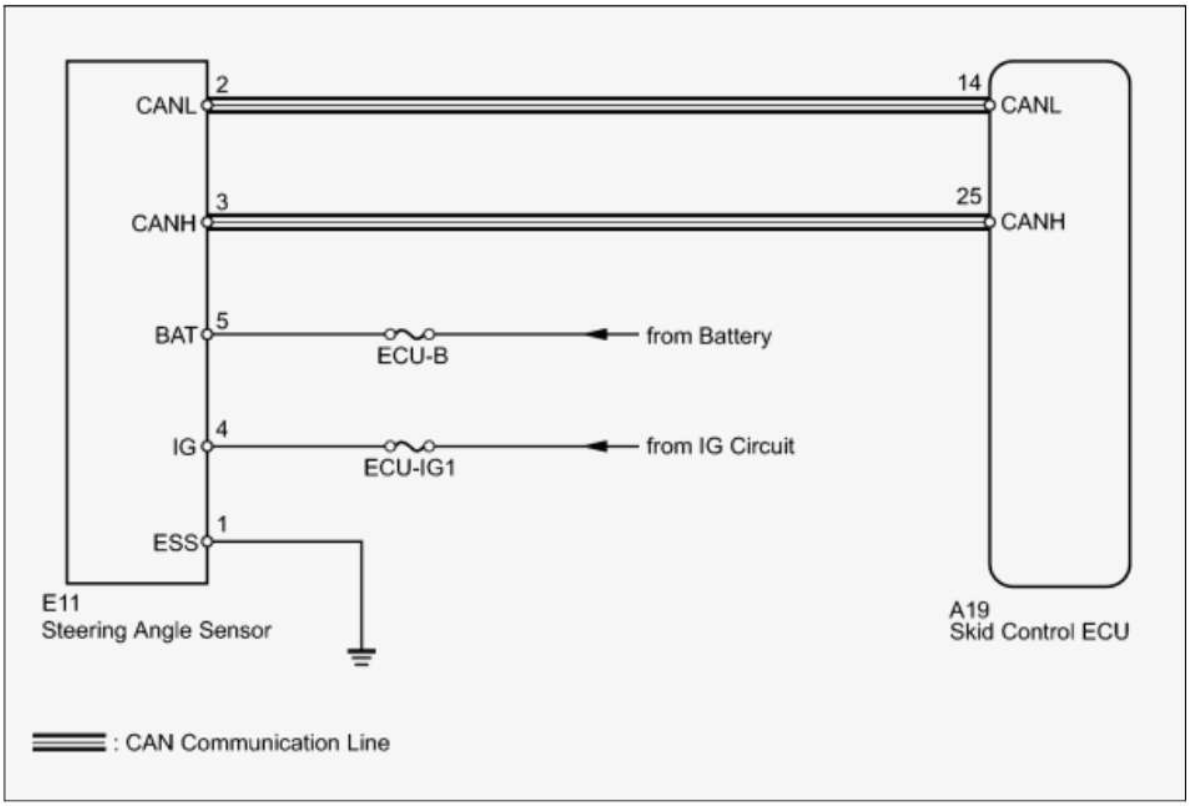
DTC	**C1432**	**Steering Angle Sensor Power Source Voltage Malfunction**

DESCRIPTION

Steering angle sensor signals are sent to the skid control ECU via the CAN communication system. When there is a malfunction in the CAN communication system, it is detected by the steering angle sensor zero point malfunction diagnostic function.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1432	Steering angle sensor power supply malfunction signal is received from steering angle sensor.	• Steering angle sensor power supply • Steering angle sensor

WIRING DIAGRAM



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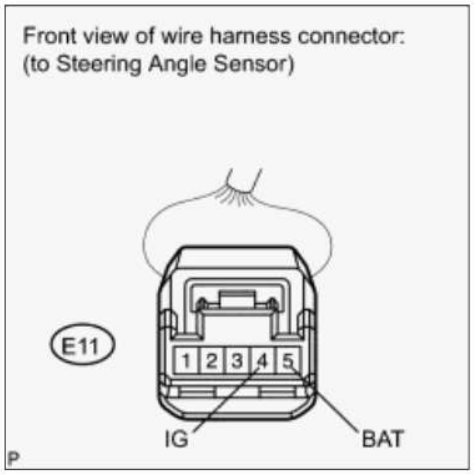
INSPECTION PROCEDURE

HINT:

- When U0073, U0123, U0124 and/or U0126 is output together with C1432, inspect and repair the trouble areas indicated by U0073, U0123, U0124 and/or U0126 first INFO .
- When the speed sensor or the yaw rate and deceleration sensor has trouble, DTCs for the steering angle sensor may be output even when the steering angle sensor is normal. When DTCs for the speed sensor or yaw rate and deceleration sensor are output together with DTCs for the steering angle sensor, inspect and repair the speed sensor and yaw rate and deceleration sensor first, and then inspect and repair the steering angle sensor.

PROCEDURE

1.	**INSPECT STEERING ANGLE SENSOR (POWER SOURCE TERMINAL)**



(a) Remove the steering wheel and the column cover lower.

(b) Make sure that there is no looseness in the locking part and connecting part of the connectors.

(c) Disconnect the steering angle sensor connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

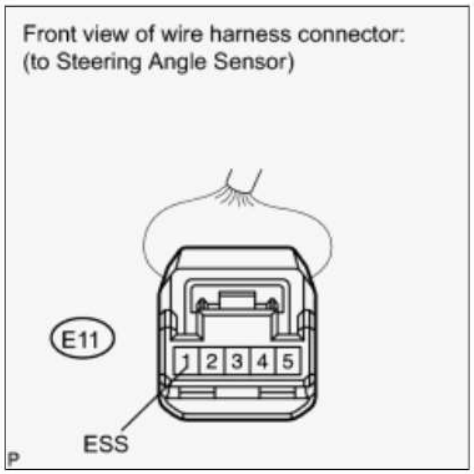
TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
E11-4 (IG) - Body ground	Ignition switch ON	11 to 14 V
E11-5 (BAT) - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

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OK

2.	**INSPECT STEERING ANGLE SENSOR (GROUND TERMINAL)**



(a) Turn the ignition switch off.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E11-1 (ESS) - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GROUND CIRCUIT)**

OK ▶ **REPLACE STEERING ANGLE SENSOR**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIM099X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1433: Steering Angle Sensor Internal Circuit (2011 RAV4)		

DTC	**C1433**	**Steering Angle Sensor Internal Circuit**

DESCRIPTION

Steering angle sensor signals are sent to the skid control ECU via the CAN communication system. When there is a malfunction in the CAN communication system, it is detected by the steering angle sensor zero point malfunction diagnostic function.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1433	Either of the following is detected: 1. With the IG1 terminal voltage 9.5 to 17.4 V, the skid control ECU receives an error signal from the steering angle sensor for 0.012 seconds. 2. An open in the sensor power supply circuit for 1 second or more.	Steering angle sensor

WIRING DIAGRAM

Refer to DTC C1432 INFO .

INSPECTION PROCEDURE

HINT:

- When U0073, U0123, U0124 and/or U0126 is output together with C1433, inspect and repair the trouble areas indicated by U0073, U0123, U0124 and/or U0126 first INFO .
- When any of the speed sensors or the yaw rate and deceleration sensor has trouble, DTCs for the steering angle sensor may be output even when the steering angle sensor is normal. When DTCs for the speed sensors or yaw rate and deceleration sensor are output together with DTCs for the steering angle sensor, inspect and repair the speed sensor and yaw rate and deceleration sensor first, and then inspect and repair the steering angle sensor.

PROCEDURE

1.	**REPLACE STEERING ANGLE SENSOR**

(a) Replace the steering angle sensor INFO .

HINT:

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If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NEXT END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XIM09AX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1434: Steering Angle Sensor Output Malfunction (2011 RAV4)		

DTC	**C1434**	**Steering Angle Sensor Output Malfunction**

DESCRIPTION

Steering angle sensor signals are sent to the skid control ECU via the CAN communication system. When there is a malfunction in the CAN communication system, it is detected by the steering angle sensor zero point malfunction diagnostic function.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1434	Error in communication between the skid control ECU and the steering angle sensor, or abnormal steering angle sensor zero point.	• Steering angle sensor power supply • Steering angle sensor

WIRING DIAGRAM

Refer to DTC C1432 INFO .

INSPECTION PROCEDURE

HINT:

- When U0073, U0123, U0124 and/or U0126 is output together with C1434, inspect and repair the trouble areas indicated by U0073, U0123, U0124 and/or U0126 first INFO .
- When any of the speed sensors or the yaw rate and deceleration sensor has trouble, DTCs for the steering angle sensor may be output even when the steering angle sensor is normal. When DTCs for the speed sensors or yaw rate and deceleration sensor are output together with DTCs for the steering angle sensor, inspect and repair the speed sensor and yaw rate and deceleration sensor first, and then inspect and repair the steering angle sensor.

PROCEDURE

1.	**CHECK DTC**

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

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(c) Turn the ignition switch to ON again and check that no CAN communication system DTC is output INFO .

(d) Start the engine.

(e) Drive the vehicle at a speed of 35 km/h (22 mph) and turn the steering wheel to the right and left and check that no speed sensor or yaw rate and deceleration sensor DTCs are output INFO .

Result:

RESULT	PROCEED TO
No CAN communication system, speed sensor, or yaw rate and deceleration sensor DTCs are output.	A
CAN communication system DTC is output.	B
Speed sensor or yaw rate and deceleration sensor DTC is output.	C

HINT:

- If there is a malfunction in any of the speed sensors or the yaw rate and deceleration sensor, an abnormal value may be output although the steering angle sensor is normal.
- If speed sensor and yaw rate and deceleration sensor DTCs are output simultaneously, repair these two sensors first and inspect the steering angle sensor.

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

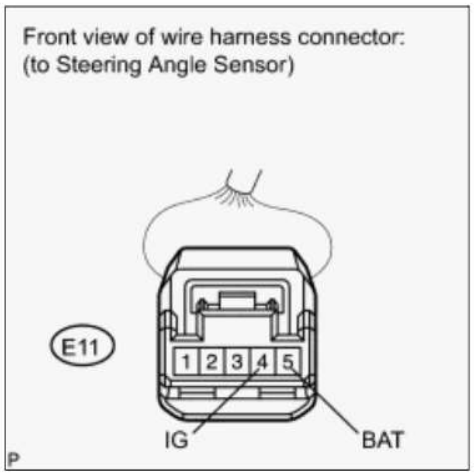
C ▶ **REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

A ▼

2.	**INSPECT STEERING ANGLE SENSOR (POWER SOURCE TERMINAL)**

(a) Turn the ignition switch off.

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(b) Remove the steering wheel and the column cover lower.

(c) Make sure that there is no looseness in the locking part and connecting part of the connector.

(d) Disconnect the steering angle sensor connector.

(e) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
E11-4 (IG) - Body ground	Ignition switch ON	11 to 14 V
E11-5 (BAT) - Body ground	Always	11 to 14 V

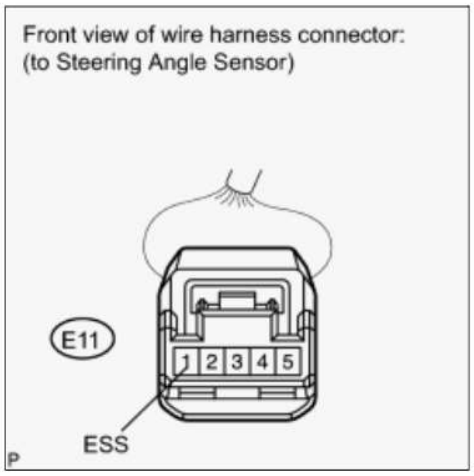
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

3.	**INSPECT STEERING ANGLE SENSOR (GROUND TERMINAL)**

(a) Turn the ignition switch off.

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(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E11-1 (ESS) - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GROUND CIRCUIT)**

OK ▶ **REPLACE STEERING ANGLE SENSOR**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000035P501DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1436: Yaw Rate Sensor Malfunction (2011 RAV4)		

DTC	**C1436**	**Yaw Rate Sensor Malfunction**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition using 2 circuits (GL1, GL2).

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the acceleration sensor) are stored.

These DTCs are also output when calibration has not been completed.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1436	Either of the following is detected: 1. With the vehicle stationary, the yaw rate and deceleration sensor output value is not 0 deg/s. 2. Abnormal comparison value.	Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTCs C1232, C1243 and C1245 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

HINT:

When U0123, U0124 and/or U0126 is output together with C1436, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (YAW RATE SENSOR)**

(a) Connect the Techstream to the DLC3.

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(b) Turn the ignition switch on (IG).

(c) Select the Data List mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Yaw Rate Sensor	Yaw rate sensor 1 reading / min.: -128 °/s, max.: 127 °/s	Vehicle stationary: 0 °/s Right turn: -128 to 0 °/s Left turn: 0 to 127 °/s	-

(d) Check that the yaw rate and deceleration sensor output value displayed on the Techstream.

Result:

RESULT		PROCEED TO
NG	The yaw rate and deceleration sensor output value is 0 deg/s when the vehicle is stationary, but the value fluctuates when turning.	A
	The yaw rate and deceleration sensor output value is not 0 deg/s when the vehicle is stationary.	B
OK		C

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

B ▶ REPLACE YAW RATE SENSOR ASSEMBLY

C ▶ CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)

A ▼

2.	**CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION**

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(a) Turn the ignition switch off.

(b) Check that the yaw rate and deceleration sensor has been installed properly INFO .

OK:
The sensor should be tightened to the specified torque.
The sensor should not be installed in a tilted position.

NOTICE:

Check the yaw rate and deceleration sensor signal after replacement INFO .

HINT:

If troubleshooting has been carried out according to the Problem Symptoms Table, refer back to the table and proceed to the next step INFO .

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

OK ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000YUO08QX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1437: Lost Communication with ECM (2011 RAV4)		

DTC	**C1437**	**Lost Communication with ECM**

DESCRIPTION

The skid control ECU receives signals from the ECM via the CAN communication system.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1437	When the IG1 terminal voltage is 10 V or higher and the vehicle speed is 15 km/h (9 mph) or more, data cannot be sent from the ECM for 2 seconds or more.	• Engine control system • CAN communication system (Skid control ECU to ECM) • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM

Refer to DTCs U0073, U0100, U0123, U0124 and U0126 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (EFI Communication Open)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
EFI Communication Open	EFI communication open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

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OK:

There are no momentary interruptions.

HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - ECM)**

OK ▼

2.	RECONFIRM DTC

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 15 km/h (9 mph) or more for 10 seconds or more.

(e) Check that no CAN communication system DTC is output INFO .

(f) Check if the same DTC is output INFO .

Result:

RESULT		PROCEED TO
DTC (C1437) is not output.		A
DTC (C1437) is output.	for 2GR-FE	B
	for 2AR-FE	C
DTC (CAN communication system DTC) is output.		D

B ▶ **INSPECT ENGINE CONTROL SYSTEM**

C ▶ **INSPECT ENGINE CONTROL SYSTEM**

D ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

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3.	REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - ECM)

(a) Turn the ignition switch off.

(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and the ECM INFO .

(d) Check that there is no momentary interruption.

NEXT

4.	RECONFIRM DTC

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 15 km/h (9 mph) or more for 10 seconds or more.

(e) Check that no CAN communication system DTC is output INFO .

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC (C1437) is not output.	A
DTC (C1437) is output.	B
DTC (CAN communication system DTC) is output.	C

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

C ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▶ **END**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003NJL03DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1439,C1445: Steering Angle Sensor Initialization Incomplete (2011 RAV4)		

DTC	**C1439**	**Steering Angle Sensor Initialization Incomplete**

DTC	**C1445**	**Vehicle Driven with Steering Angle Sensor not Initialized**

DESCRIPTION

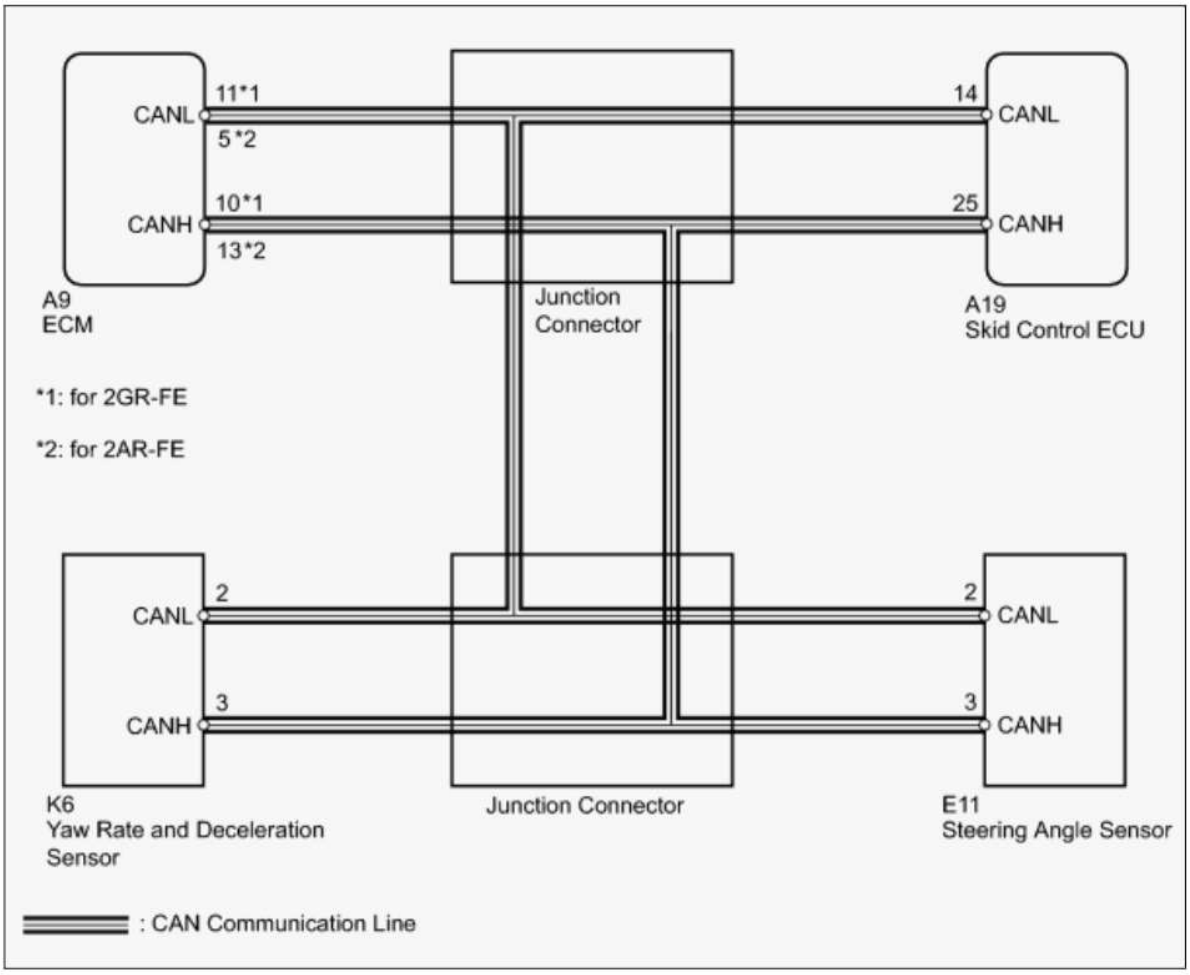
The skid control ECU acquires steering angle sensor zero point every time the ignition switch is turned to ON and the vehicle is driven at 40 km/h (25 mph) or more for approximately 10 seconds. The ECU also stores the previous zero point.

The steering angle sensor zero point malfunction warning will be canceled by turning the ignition switch off.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1439	After the steering angle sensor 0 calibration is cleared due to, for example, fluctuations in the power source, the steering angle 0 calibration cannot be obtained for 60 seconds of continuous driving.	• Steering angle sensor • Yaw rate and deceleration sensor • Brake actuator assembly (Skid control ECU)
C1445	Steering angle sensor 0 calibration cannot be obtained when the vehicle is driven without a record of steering angle sensor 0 calibration at a speed of 36 km/h (22 mph) or more for 30 seconds or more without the brake pedal being depressed.	• Steering angle sensor • Yaw rate and deceleration sensor • Brake actuator assembly (Skid control ECU)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- Before proceeding with the inspection, explain to the customer that the output DTC is related to temporary loss of the steering angle zero calibration, such as when the power voltage drops when the battery is removed, and confirm that this condition occurred.
- When U0073, U0123, U0124 and/or U0126 is output together with C1439 and/or C1445, inspect and repair the trouble areas indicated by U0073, U0123, U0124 and/or U0126 first INFO .
- When the speed sensor or the yaw rate and deceleration sensor has trouble, DTCs for the steering angle sensor may be output even when the steering angle sensor is normal. When DTCs for the speed sensor or yaw rate and deceleration sensor are output together with other DTCs for the steering angle sensor, inspect and repair the speed sensor and yaw rate and deceleration sensor first, and then inspect and repair the steering angle sensor INFO .
- When the steering angle sensor and/or yaw rate sensor assembly is replaced, perform zero calibration for the applicable sensor(s) INFO .
- When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK DTC**

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(a) Clear the DTC INFO .

(b) Turn the ignition switch off.

(c) Turn the ignition switch to ON again and check that no CAN communication system DTC is output.

(d) Drive the vehicle at a speed of 36 km/h (22 mph) and turn the steering wheel to the right and left and check that no speed sensor and yaw rate and deceleration sensor DTCs are output INFO .

Result:

RESULT		PROCEED TO
DTC is output.	C1439 or/and C1445	A
	Relating to CAN communication system	B
	Relating to speed sensor or yaw rate and deceleration sensor	C
DTC is not output.		D

HINT:

- If there is a malfunction in the speed sensor or the yaw rate and deceleration sensor, an abnormal value may be output although the steering angle sensor is normal.
- If the speed sensor and the yaw rate and deceleration sensor DTCs are output simultaneously, repair the sensors and inspect the steering angle sensor.
- If the same DTC C1439 and/or C1445 is not output again, the DTC may have been stored due to a temporary loss of the steering angle zero calibration, such as when the power voltage drops.

B ▶ **GO TO CAN COMMUNICATION SYSTEM**

C ▶ **REPAIR CIRCUITS INDICATED BY OUTPUT DTCS**

D ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

A ▼

2.	PERFORM STEERING ANGLE SENSOR ZERO POINT CALIBRATION

(a) Drive the vehicle straight ahead at 40 km/h (25 mph) or more for at least 10 seconds.

(b) Check that the centered position of the steering wheel is correctly set while driving straight ahead.

HINT:

If front wheel alignment and steering position are adjusted as a result of abnormal centered position of the

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steering wheel, acquire yaw rate and deceleration sensor zero point again after the adjustments are completed.

OK:
The centered position of the steering wheel is correctly set.

NEXT

3.	RECONFIRM DTC

(a) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is output.	A
DTC is not output.	B

HINT:

If the same DTC C1439 and/or C1445 is not output again, the DTC may have been stored due to a temporary loss of the steering angle zero calibration, such as when the power voltage drops.

B END

A

4.	READ VALUE USING TECHSTREAM (MOMENTARY INTERRUPTION)

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Yaw Rate Open	Yaw rate sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
	Deceleration sensor open detection /	Error: Momentary interruption	

OK:
There are no momentary interruptions

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HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - YAW RATE SENSOR/STEERING ANGLE SENSOR)**

OK
▼

5.	**REPLACE STEERING ANGLE SENSOR**

(a) Replace the steering angle sensor INFO .

NEXT
▼

6.	**PERFORM STEERING ANGLE SENSOR ZERO POINT CALIBRATION**

(a) Drive the vehicle straight ahead at 40 km/h (25 mph) or more for at least 10 seconds.

(b) Check that the centered position of the steering wheel is correctly set while driving straight ahead.

HINT:

If front wheel alignment and steering position are adjusted as a result of abnormal centered position of the steering wheel, acquire yaw rate and deceleration sensor zero point again after the adjustments are completed.

OK:
The centered position of the steering wheel is correctly set.

NEXT
▼

7.	**RECONFIRM DTC**

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(a) Clear the DTC INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 36 km/h (22 mph) or more and turn the steering wheel to the right and left.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is output.	A
DTC is not output.	B

B ▶ **END**

A ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

8.	**REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - YAW RATE SENSOR/STEERING ANGLE SENSOR)**

(a) Turn the ignition switch off.

(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and yaw rate and deceleration sensor/steering angle sensor INFO .

NEXT ▼

9.	**RECONFIRM DTC**

(a) Clear the DTC INFO .

(b) Start the engine.

(c) Drive the vehicle at a speed of 36 km/h (22 mph) or more and turn the steering wheel to the right and left.

(d) Check if the same DTC is output INFO .

Result:

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RESULT	PROCEED TO
DTC is output.	A
DTC is not output.	B

B ▶ **END**

A

10.	**REPLACE STEERING ANGLE SENSOR**

(a) Replace the steering angle sensor INFO .

NEXT

11.	**PERFORM STEERING ANGLE SENSOR ZERO POINT CALIBRATION**

(a) Drive the vehicle straight ahead at 40 km/h (25 mph) or more for at least 10 seconds.

(b) Check that the centered position of the steering wheel is correctly set while driving straight ahead.

HINT:

If front wheel alignment and steering position are adjusted as a result of abnormal centered position of the steering wheel, acquire yaw rate and deceleration sensor zero point again after the adjustments are completed.

OK:
The centered position of the steering wheel is correctly set.

NEXT

12.	**RECONFIRM DTC**

(a) Clear the DTC INFO .

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(b) Start the engine.

(c) Drive the vehicle at a speed of 35 km/h (22 mph) or more and turn the steering wheel to the right and left.

(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is output.	A
DTC is not output.	B

B ▶ **END**

A ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003NL202UX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1440: Steering Angle Sensor Unusual Bank Angle Detected (2011 RAV4)		

DTC	**C1440**	**Steering Angle Sensor Unusual Bank Angle Detected**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

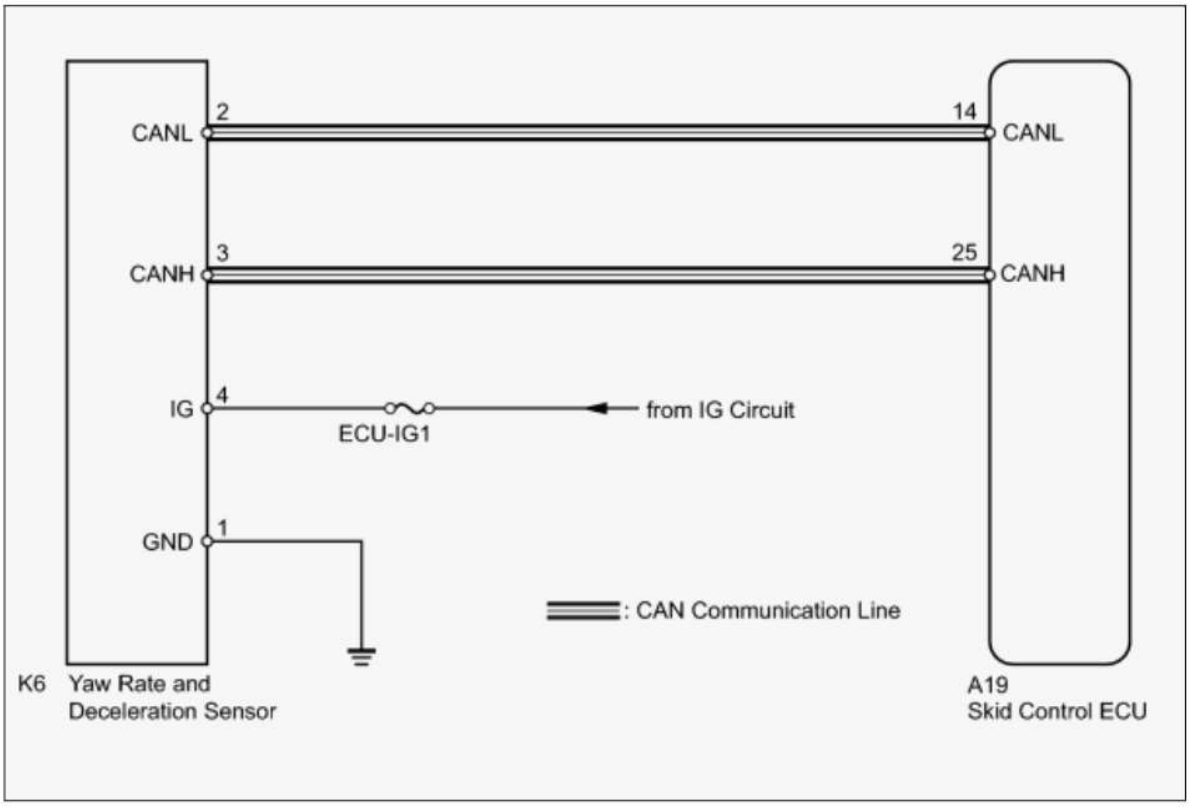
The yaw rate sensor has a built in deceleration sensor and detects the vehicle condition.

If there is trouble in the bus lines between the yaw rate and deceleration sensor and the CAN communication system, the DTCs U0123 (malfunction in CAN communication with the yaw rate sensor) and U0124 (malfunction in CAN communication with the deceleration sensor) are output.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1440	The skid control ECU detects that the vehicle is driving on a bank at an angle of 30 degrees or more.	Yaw rate and deceleration sensor

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- Before proceeding with the inspection, explain to the customer that the vehicle driving record shows that the vehicle was driven on a bank at an angle of 30°, and confirm that this condition occurred.
- When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

HINT:

When U0123, U0124 and/or U0126 is output together with C1440, inspect and repair the trouble areas indicated by U0123, U0124 and/or U0126 first INFO .

PROCEDURE

1.	**CHECK DTC**

(a) Clear the DTC INFO .

(b) Turn the ignition switch off.

(c) At a speed of 30 km/h (19 mph) or more, drive the vehicle, turn the steering wheel, and decelerate (depress the brake pedal) the vehicle.

(d) Turn the ignition switch to ON again and check that no CAN communication system DTC is output INFO .

Result:

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RESULT		PROCEED TO
DTC is output.	C1440	A
	Relating to CAN communication system	B
	Relating to yaw rate and deceleration sensor	C
DTC is not output.		D

HINT:

DTC C1440 may have been stored because the vehicle was driven on a bank at an angle of 30° or more.

B ▶ **GO TO CAN COMMUNICATION SYSTEM**

C ▶ **REPAIR CIRCUITS INDICATED BY OUTPUT DTCS**

D ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

A
▼

2.	CHECK YAW RATE AND DECELERATION SENSOR INSTALLATION

(a) Turn the ignition switch off.

(b) Check that the yaw rate and deceleration sensor has been installed properly INFO .

OK:
The sensor should be tightened to the specified torque.
The sensor should not be tilted.

NG ▶ **INSTALL YAW RATE AND DECELERATION SENSOR CORRECTLY**

OK
▼

3.	READ VALUE USING TECHSTREAM (MOMENTARY INTERRUPTION)

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(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Yaw Rate Open	Yaw rate sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Deceleration Open	Deceleration sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

OK:
There are no momentary interruptions

HINT:

Perform the above inspection before removing the sensor and connector.

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - YAW RATE AND DECELERATION SENSOR)**

OK ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

4.	**REPAIR OR REPLACE HARNESS OR CONNECTOR (SKID CONTROL ECU - YAW RATE AND DECELERATION SENSOR)**

(a) Turn the ignition switch off.

(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and yaw rate and deceleration sensor INFO .

NEXT ▼

5.	**RECONFIRM DTC**

(a) Clear the DTC INFO .

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(b) Turn the ignition switch off.

(c) At a speed of 30 km/h (19 mph) or more, drive the vehicle, turn the steering wheel, and decelerate (depress the brake pedal) the vehicle.

(d) Check if the same DTC is output INFO .

B ▶ **END**

A ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003QBA00GX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1441: Brake Booster Malfunction (2011 RAV4)		

DTC	**C1441**	**Brake Booster Malfunction**

DESCRIPTION

If the brake booster is damaged and does not provide braking support when depressing the brake pedal, the skid control ECU determines that the brake booster has a problem and stores DTC C1441 (Brake Booster Malfunction).

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1441	When the brake pedal load sensing switch and master cylinder pressure sensor are functioning normally and the brake pedal load sensing switch is judged as on, the pressure signal from the master cylinder pressure sensor does not indicate an increase.	Brake booster assembly

INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT VACUUM SYSTEM**

(a) Check the brake booster assembly INFO .

NEXT END

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003NL3037X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: C1442,C1443: Invalid Data Received from Acceleration Sensor (2011 RAV4)		

DTC	**C1442**	**Invalid Data Received from Acceleration Sensor**

DTC	**C1443**	**Invalid Data Received from Yaw Rate Sensor**

DESCRIPTION

The skid control ECU receives signals from the yaw rate and deceleration sensor via the CAN communication system.

The yaw rate sensor has a built-in deceleration sensor and detects the vehicle condition.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1442	An invalid data signal is transmitted continuously from the deceleration sensor for 10 seconds or more.	Yaw rate and deceleration sensor
C1443	An invalid data signal is transmitted continuously from the yaw rate sensor for 10 seconds or more.	Yaw rate and deceleration sensor

WIRING DIAGRAM

Refer to DTC C1440 INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the yaw rate sensor assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK DTC**

(a) Turn the ignition switch off.

(b) Clear the DTC INFO .

(c) Start and idle the engine for 60 seconds, and then stop the engine.

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(d) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs (C1442 and/or C1443) are output.	A
DTCs (C1442 and C1443) are not output.	B

B ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

A ▶ **REPLACE YAW RATE SENSOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K1O014X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: CALIBRATION (2011 RAV4)		

CALIBRATION

1. DESCRIPTION

(a) After replacing components relating to the VSC or performing "Front wheel alignment adjustment", clear and read the sensor calibration data.

(b) Follow the chart to perform calibration.

REPLACING PART / OPERATION	NECESSARY OPERATION
Skid Control ECU	Yaw rate and deceleration sensor zero point calibration.
Yaw Rate Sensor	1. Clearing zero point calibration data 2. Yaw rate and deceleration sensor zero point calibration
Front Wheel Alignment Adjustment	1. Clearing zero point calibration data 2. Yaw rate and deceleration sensor zero point calibration

2. PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSOR (When Using Techstream)

NOTICE:

- While obtaining the zero point, do not vibrate the vehicle by tilting, moving or shaking it and keep it stationary. (Do not start the engine.)
- Perform this on a level surface (with an inclination of less than 1°).

(a) Clear the zero point calibration data.

(1) Turn the ignition switch off and connect the Techstream to the DLC3.

(2) Turn the ignition switch to ON.

(3) Operate the Techstream to clear the data (select "Reset Memory").

HINT:

Refer to the Techstream operator manual for further details.

CAUTION:

If the ignition switch is turned to ON for more than 15 seconds with the shift lever in P after zero point of the yaw rate and deceleration sensor has been cleared, only the zero point of the yaw rate sensor will be stored. If the vehicle is driven under this condition, the skid control ECU will recognize that zero point calibration of the deceleration sensor is not completed and will indicate that there is a malfunction in the VSC system using the slip indicator light.

(b) Perform the following procedures for test mode.

(1) Check that the shift lever is in P and apply the parking brake.

(2) Turn the ignition switch off and connect the Techstream to the DLC3.

(3) Turn the ignition switch to ON.

(4) Set the Techstream to test mode (select "Test Mode").

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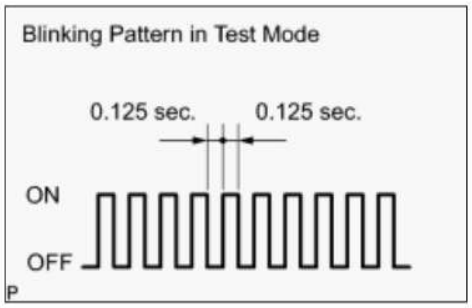
HINT:

Refer to the Techstream operator manual for further details.

(c) Obtain the zero point of the yaw rate and deceleration sensor.

(1) Keep the vehicle stationary on a level surface for 2 seconds or more.

(2) Check that the slip indicator light blinks as shown in the illustration.



HINT:

- If the slip indicator light does not blink, perform the zero point calibration again.
- The zero point calibration is performed only once after the system enters test mode.
- Calibration cannot be performed again until the stored data is cleared once.

(3) Turn the ignition switch off.

3. PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSOR (When not Using Techstream)

NOTICE:

- While obtaining the zero point, do not vibrate the vehicle by tilting, moving or shaking it and keep it stationary. (Do not start the engine.)
- Perform this on a level surface (with an inclination of less than 1°).

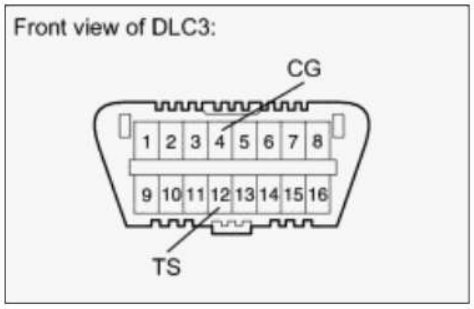
(a) Clear the zero point calibration data.

(1) Turn the ignition switch to ON.

(2) The warning lights and indicator lights come on for 3 seconds to indicate that the initial check is completed.

(3) Using SST, connect and disconnect terminals 12 (TS) and 4 (CG) of the DLC3 4 times or more within 8 seconds.

SST: 09843-18040



CAUTION:

If the ignition switch is turned to ON for more than 15 seconds with the shift lever in P after zero point of the yaw rate and deceleration sensor has been cleared, only the zero point of the yaw rate sensor will be stored. If the vehicle is driven under this condition, the skid control ECU will recognize that zero point calibration of the deceleration sensor is not completed and will indicate that there is a malfunction in the VSC system using the slip indicator light.

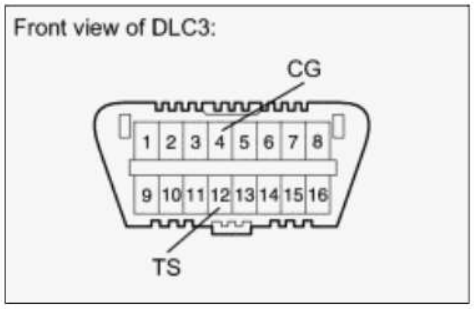
(4) Check that the slip indicator light comes on.

(b) Procedures for test mode.

(1) Turn the ignition switch off.

(2) Check that the shift lever is in P and apply the parking brake.

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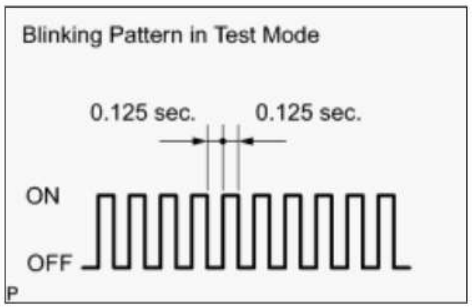
(3) Using SST, connect terminals 12 (TS) and 4 (CG) of the DLC3.

SST: 09843-18040

(c) Obtain the zero point of the yaw rate and deceleration sensor.

(1) Turn the ignition switch to ON.

(2) Keep the vehicle stationary on a level surface for 2 seconds or more.



(3) Check that the slip indicator light blinks as shown in the illustration.

HINT:

- If the slip indicator light does not blink, perform the zero point calibration again.
- The zero point calibration is performed only once after the system enters test mode.
- Calibration cannot be performed again until the stored data is cleared once.

(4) Turn the ignition switch off.

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XHS07AX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: CHECK FOR INTERMITTENT PROBLEMS (2011 RAV4)		

CHECK FOR INTERMITTENT PROBLEMS

1. CHECK FOR INTERMITTENT PROBLEMS

HINT:

A momentary interruption (open circuit) in the connectors and/or wire harness between the sensors and ECUs can be detected by using the ECU Data List function of the Techstream.

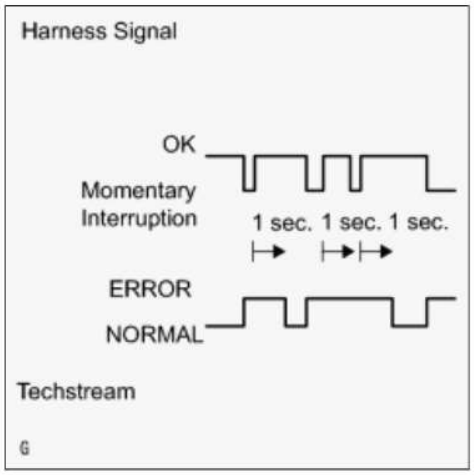
(a) Turn the ignition switch off and connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Follow the prompts on the Techstream to display the Data List and select areas where a momentary interruption should be monitored.

HINT:

- A momentary interruption (open circuit) cannot be detected for 3 seconds after the ignition switch is turned to ON (initial check).
- If the status remains on the Error display, check for continuity between the ECU and the sensors, or between ECUs.
- The Error display on the Techstream remains on for 1 second after the harness signal changes from a momentary interruption (open circuit) to normal condition.



ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Speed Open	FR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Open	FL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RR Speed Open	RR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal:	-

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		Normal	
RL Speed Open	RL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
EFI Communication Open	EFI communication open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Yaw Rate Open	Yaw rate sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Deceleration Open	Deceleration sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Steering Open	Steering angle sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Master Cylinder Open	Master cylinder pressure sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
IG Voltage Value Decreased	IG voltage value decrease detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
IG Voltage Value Increased	IG voltage value increase detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FR Speed Sensor Voltage Open	FR speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal:	-

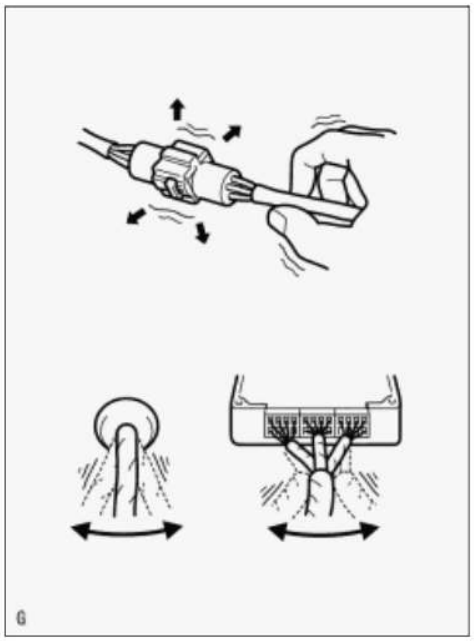
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		Normal	
FL Speed Sensor Voltage Open	FL speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RR Speed Sensor Voltage Open	RR speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Sensor Voltage Open	RL speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
M/C Pressure Sensor Noise	Master cylinder pressure sensor noise detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Brake Pedal Switch Open*	Brake pedal load sensing switch open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Yaw Rate Sensor Voltage Open	Yaw rate sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
EFI Communication Invalid	EFI communication invalid detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

*: w/ Booster Failure Compensation

(d) While observing the screen, gently jiggle the connector or wire harness between the ECU and sensors, or between ECUs. If the display changes, the connector and/or wire harness is in momentary interruption (open circuit). Repair or replace the connector and/or wire harness, as one of them is faulty.

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Last Modified: 9-7-2011	6.4 U	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONK01OX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: DATA LIST / ACTIVE TEST (2011 RAV4)		

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn the Techstream on.

(f) Enter the following menus: Chassis / ABS/VSC/TRAC / Data List.

(g) According to the display on the Techstream, read the "Data List".

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light / ON or OFF	ON: ABS warning light on OFF: ABS warning light off	-
Brake Warning Light	BRAKE warning light / ON or OFF	ON: BRAKE warning light on OFF: BRAKE warning light off	-
Downhill Assist Control Light*9	Downhill assist control indicator light / ON or OFF	ON: Downhill assist control switch on OFF: Downhill assist control switch off	-
Buzzer	Skid control buzzer / ON or OFF	ON: Buzzer on OFF: Buzzer off	-
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Parking Brake SW	Parking brake switch / ON or OFF	ON: Parking brake applied OFF: Parking brake released	-
Main Idle SW	Main idle switch / ON or OFF	ON: Accelerator pedal released OFF: Accelerator pedal depressed	-
Brake Pedal Load Sensing SW*10	Brake pedal load sensing switch / ON or OFF	ON: Brake pedal depressed beyond the specified point OFF: Brake pedal not depressed beyond the specified point	-
Gear Position	Gear position information / P,N, R, 1st-8th, Fail, Not R	Actual gear position	-
Shift Lever Position	Shift lever position information / P,N, R, D/M, 1st-6th/B, Fail	Actual shift lever position	-
Shift Information	Shift information / ON or OFF	ON: During gear change OFF: Not during gear change	-
Inspection Mode	Inspection mode / Other or Inspect	Other: Normal mode Inspect: Inspection mode	-
Number of IG ON (Inspection)	Number of ignition switch ON operations after entering the inspection mode / min.: 0, max.: 255	-	-
Downhill Assist Control SW*9	Downhill assist control switch / ON or OFF	ON: Downhill assist control switch on OFF: Downhill assist control switch off	-
Master Cylinder Sensor	Master cylinder pressure sensor 1 reading / min.: 0.00 V, max.: 5.00 V	When brake pedal released: 0.3 to 0.9 V	Reading increases when the brake pedal depressed.
Zero Point of M/C	Memorized zero point value of master cylinder pressure sensor / min.: -12.50 Mpa, max.: 12.40 Mpa	-	-
Deceleration Sensor	Deceleration sensor 1 reading / min.: -18.525 m/s^2, max.: 18.387 m/s^2	-	Reading changes when vehicle is bounced.

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Zero Point of Decele	Memorized zero point value of deceleration sensor 1 / min.: -25.10 m/s^2, max.: 24.90 m/s^2	-	-
Deceleration Sensor 2	Deceleration sensor 2 reading / min.: -18.525 m/s^2, max.: 18.387 m/s^2	-	Reading changes when vehicle is bounced.
Zero Point of Decele 2	Memorized zero point value of deceleration sensor 2 / min.: -25.10 m/s^2, max.: 24.90 m/s^2	-	-
Yaw Rate Sensor	Yaw rate sensor 1 reading / min.: -128 °/s, max.: 127 °/s	Vehicle stationary: 0 °/s Right turn: -128 to 0 °/s Left turn: 0 to 127 °/s	-
Zero Point of Yaw Rate	Memorized zero point value of yaw rate sensor 1 / min.: -128 °/sec, max.: 127 °/sec	-	-
Zero Point of Yaw Rate 2	Memorized zero point value of yaw rate sensor 2 / min.: -128 °/s, max.: 127 °/s	-	-
Steering Angle Sensor	Steering angle sensor reading / min.: -3276.8 °, max.: 3276.7 °	Left turn: Increase Right turn: Decrease	-
Zero Point of Steering Angle	Memorized zero point value of steering angle sensor / min.: -3276.8 °, max.: 3276.7 °	-	-
Lateral G	Lateral G / min.: -25.10 m/s^2, max.: 24.90 m/s^2	-	-
Forward and Rearward G	Forward and rearward G / min.: -25.10 m/s^2, max.: 24.90 m/s^2	-	-
Yaw Rate Value	Yaw rate value / min.: -128 °/s, max.: 127 °/s	-	-
Steering Angle Value	Steering angle value / min.: -3276.8 °, max.: 3276.7 °	-	-
Stop Light Relay	Stop light control relay / ON or OFF	ON: Relay on OFF: Relay off	-
Slip Indicator Light	Slip indicator light / ON or OFF	ON: Slip indicator light on OFF: Slip indicator light off	-
FR Wheel Speed	FR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326	Actual wheel speed	Similar to speed indicated on the

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
	km/h (202 mph)		speedometer
FL Wheel Speed	FL wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer
RR Wheel Speed	RR wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer
RL Wheel Speed	RL wheel speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer
Vehicle Speed	Maximum speed sensor reading / min.: 0 km/h (0 mph), max.: 326 km/h (202 mph)	Actual wheel speed	Similar to speed indicated on the speedometer
FR Wheel Acceleration	FR wheel acceleration / min.: -200.84 m/s^2, max.: 199.27 m/s^2	-	-
FL Wheel Acceleration	FL wheel acceleration / min.: -200.84 m/s^2, max.: 199.27 m/s^2	-	-
RR Wheel Acceleration	RR wheel acceleration / min.: -200.84 m/s^2, max.: 199.27 m/s^2	-	-
RL Wheel Acceleration	RL wheel acceleration / min.: -200.84 m/s^2, max.: 199.27 m/s^2	-	-
Stop Light Relay Output	Stop light control relay output / ON or OFF	ON: Relay output on OFF: Relay output off	-
Auto LSD Indicator Light*11	AUTO LSD indicator light / ON or OFF	ON: Traction control switch (VSC OFF switch) on OFF: Traction control switch (VSC OFF switch) off	-
FR Wheel ABS Ctrl Status	FR wheel ABS control status / ON or OFF	ON: During control OFF: Not during control	-
FL Wheel ABS Ctrl Status	FL wheel ABS control status / ON or OFF	ON: During control OFF: Not during control	-
RR Wheel ABS Ctrl Status	RR wheel ABS control status / ON or OFF	ON: During control OFF: Not during control	-
RL Wheel ABS Ctrl Status	RL wheel ABS control status / ON or OFF	ON: During control OFF: Not during control	-
RR Wheel EBD Ctrl Status	RR wheel EBD control status / ON or OFF	ON: During control OFF: Not during control	-
RL Wheel EBD Ctrl Status	RL wheel EBD control status / ON or OFF	ON: During control OFF: Not during control	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
BA Ctrl Status	BA control status / ON or OFF	ON: During control OFF: Not during control	-
TRC (TRAC) Ctrl Status	TRAC control status / ON or OFF	ON: During control OFF: Not during control	-
TRC (TRAC) Engine Ctrl Status	TRAC engine control status / ON or OFF	ON: During control OFF: Not during control	-
TRC (TRAC) Brake Ctrl Status	TRAC brake control status / ON or OFF	ON: During control OFF: Not during control	-
FR Wheel VSC Ctrl Status	FR wheel VSC control status / ON or OFF	ON: During control OFF: Not during control	-
FL Wheel VSC Ctrl Status	FL wheel VSC control status / ON or OFF	ON: During control OFF: Not during control	-
RR Wheel VSC Ctrl Status	RR wheel VSC control status / ON or OFF	ON: During control OFF: Not during control	-
RL Wheel VSC Ctrl Status	RL wheel VSC control status / ON or OFF	ON: During control OFF: Not during control	-
Engine Revolutions	Engine speed / min.: 0 rpm, max.: 65535 rpm	-	-
Real Engine Torque	Real engine torque / min.: -1024.0 Nm, max.: 1023.0 Nm	-	-
Accelerator Opening Angle %	Percentage of accelerator pedal opening angle / min.: 0.0%, max.: 128.0%	-	-
Solenoid Relay	Solenoid relay / ON or OFF	ON: Solenoid relay on OFF: Solenoid relay off	-
Electronically Controlled Brake system Motor Relay	Electronically Controlled Brake system motor relay / ON or OFF	ON: Motor relay on OFF: Motor relay off	-
Fail Safe Motor Relay	Fail-safe motor relay / ON or OFF	ON: Motor relay on OFF: Motor relay off	-
TR(A)C / VSC Solenoid (SM2)	TRAC / VSC solenoid (SM2) / ON or OFF	ON: Operates OFF: Does not operate	-
TR(A)C / VSC Solenoid (SM1)	TRAC / VSC solenoid (SM1) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SFRH)*1	ABS solenoid (SFRH) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SFRR)*2	ABS solenoid (SFRR) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SFLH)*3	ABS solenoid (SFLH) / ON or OFF	ON: Operates OFF: Does not operate	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ABS Solenoid (SFLR)*4	ABS solenoid (SFLR) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SRRH)*5	ABS solenoid (SRRH) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SRRR)*6	ABS solenoid (SRRR) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SRLH)*7	ABS solenoid (SRLH) / ON or OFF	ON: Operates OFF: Does not operate	-
ABS Solenoid (SFLR)*8	ABS solenoid (SRLR) / ON or OFF	ON: Operates OFF: Does not operate	-
FR Speed Open	FR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Open	FL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RR Speed Open	RR speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Open	RL speed sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
EFI Communication Open	EFI communication open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Yaw Rate Open	Yaw rate sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Deceleration Open	Deceleration sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Steering Open	Steering angle sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Master Cylinder Open	Master cylinder pressure sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
IG1 Voltage Value	IG1 voltage / Min.: 0.00 V, Max.: 20.00 V	Ignition switch ON: 11 to 14 V	-
MT Voltage Value	Motor driving monitor voltage / Min.: 0.00 V, Max.: 20.00 V	-	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
TRAC/VSC Off Mode	VSC OFF switch / Normal, TRC OFF, unknown or VSC OFF	Normal: Normal mode TRC OFF: TRAC off mode VSC OFF: VSC off mode	-
Number of DTC	Number of recorded DTCs/ min.: 0, max.: 255	-	-
IG Voltage Value Decreased	IG voltage value decrease detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
IG Voltage Value Increased	IG voltage value increase detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FR Speed Sensor Voltage Open	FR speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
FL Speed Sensor Voltage Open	FL speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RR Speed Sensor Voltage Open	RR speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
RL Speed Sensor Voltage Open	RL speed sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
M/C Pressure Sensor Noise	Master cylinder pressure sensor noise detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Brake Pedal Switch Open*10	Brake pedal load sensing switch open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Yaw Rate Sensor Voltage Open	Yaw rate sensor voltage open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
EFI Communication Invalid	EFI communication invalid detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

HINT:

- *1: SFRH (S: Solenoid, F: Front, R: Right, H: Holding)
- *2: SFRR (S: Solenoid, F: Front, R: Right, R: Reduction)
- *3: SFLH (S: Solenoid, F: Front, L: Left, H: Holding)
- *4: SFLR (S: Solenoid, F: Front, L: Left, R: Reduction)
- *5: SRRH (S: Solenoid, R: Rear, R: Right, H: Holding)

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- *6: SRRR (S: Solenoid, R: Rear, R: Right, R: Reduction)
- *7: SRLH (S: Solenoid, R: Rear, L: Left, H: Holding)
- *8: SRLR (S: Solenoid, R: Rear, L: Left, R: Reduction)
- *9: w/ Downhill Assist Control
- *10: w/ Booster Failure Compensation
- *11: for 2WD

2. PERFORM ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn the Techstream on.

(f) Enter the following menus: Chassis / ABS/VSC/TRAC / Active Test.

(g) According to the display on the Techstream, perform the Active Test.

HINT:

- The ignition switch must be turned to ON to proceed to the Active Test using the Techstream.
- The Active Tests of the ABS solenoid, ABS motor relay, ABS warning light and BRAKE warning light are available when the vehicle is stopped.
- The motors stop automatically after 5 seconds of activation to prevent them from being damaged. When the motors are driven repeatedly, certain intervals are required.
- Each solenoid stops automatically after 2 seconds of activation to prevent them from being damaged, and can be operated again after a certain interval.
- Do not depress the brake pedal while only the pressure reduction solenoid valves are on.
- Do not drive 2 or more solenoids simultaneously except to operate the pressure holding solenoid valves and pressure reduction solenoid valves of each wheel.

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light	Warming light ON/OFF	Observe the combination meter.
Brake Warning Light	BRAKE warning light	Warming light ON/OFF	Observe the combination meter.
Downhill Assist Control Light*1	Downhill assist control indicator light	Indicator light ON/OFF	Observe the combination meter.
Buzzer	Skid control buzzer	Buzzer ON/OFF	Buzzer can be heard.

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Solenoid Relay	Solenoid relay	Relay ON/OFF	-
Motor Relay	Motor relay	Relay ON/OFF	Operation sound of the motor can be heard.
Stop Light Relay	Stop light control relay (BRK)	Relay ON/OFF	Observe the stop lights.
ABS Solenoid (SRLR)	ABS solenoid (SRLR)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SRLH)	ABS solenoid (SRLH)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SRRR)	ABS solenoid (SRRR)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SRRH)	ABS solenoid (SRRH)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SFLR)	ABS solenoid (SFLR)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SFLH)	ABS solenoid (SFLH)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SFRR)	ABS solenoid (SFRR)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
ABS Solenoid (SFRH)	ABS solenoid (SFRH)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
VSC/TRAC Solenoid (SMR)	VSC/TRAC solenoid (SM2)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
VSC/TRAC Solenoid (SMF)	VSC/TRAC solenoid (SM1)	Solenoid ON/OFF	Operation sound of the solenoid (clicking sound) can be heard.
TRC(TRAC) OFF Indicator Light*3	TRAC OFF indicator Light	Indicator Light ON/OFF	Observe the combination meter.
VSC OFF Indicator Light	VSC OFF indicator light	Indicator light ON/OFF	Observe the combination meter.
Slip Indicator Light	Slip indicator light	Indicator light ON/OFF	Observe the combination meter.

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Auto LSD Indicator Light*2	AUTO LSD indicator light	Indicator light ON/OFF	Observe the combination meter.
ABS Solenoid	Selection of multiple holding solenoids (SFRH, SFLH, SRRH and SRLH) and pressure reduction solenoids (SFRR, SFLR, SRRR and SRLR) possible	Start/Stop	-
VSC/TRAC Solenoid	Selection of VSC/TRAC solenoids (SM1, SM2) possible	Start/Stop	-

HINT:

***1: w/ Downhill Assist Control**

***2: for 2WD**

***3: for 4WD**

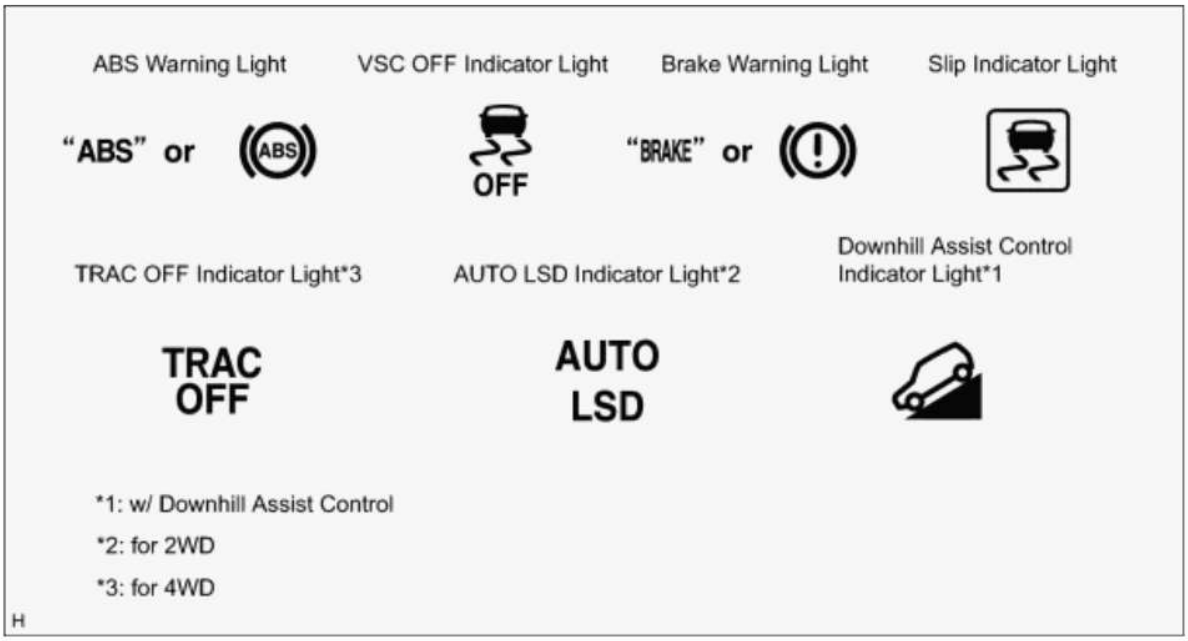
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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONI022X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: DIAGNOSIS SYSTEM (2011 RAV4)		

DIAGNOSIS SYSTEM

1. DIAGNOSIS

If the skid control ECU detects a malfunction, the ABS and BRAKE warning lights and the slip, VSC OFF, TRAC OFF, downhill assist control and AUTO LSD indicator lights come on in accordance with the trouble area to warn the driver.



HINT:

- The DTCs can be read by connecting SST (09843-18040) between the TC and CG terminals of the DLC3 and observing the blinking pattern of the ABS and slip indicator lights, or by using the Techstream INFO .
- This system has a sensor signal check function INFO .

2. CHECK WARNING LIGHT AND INDICATOR LIGHT

(a) Release the parking brake lever.

NOTICE:

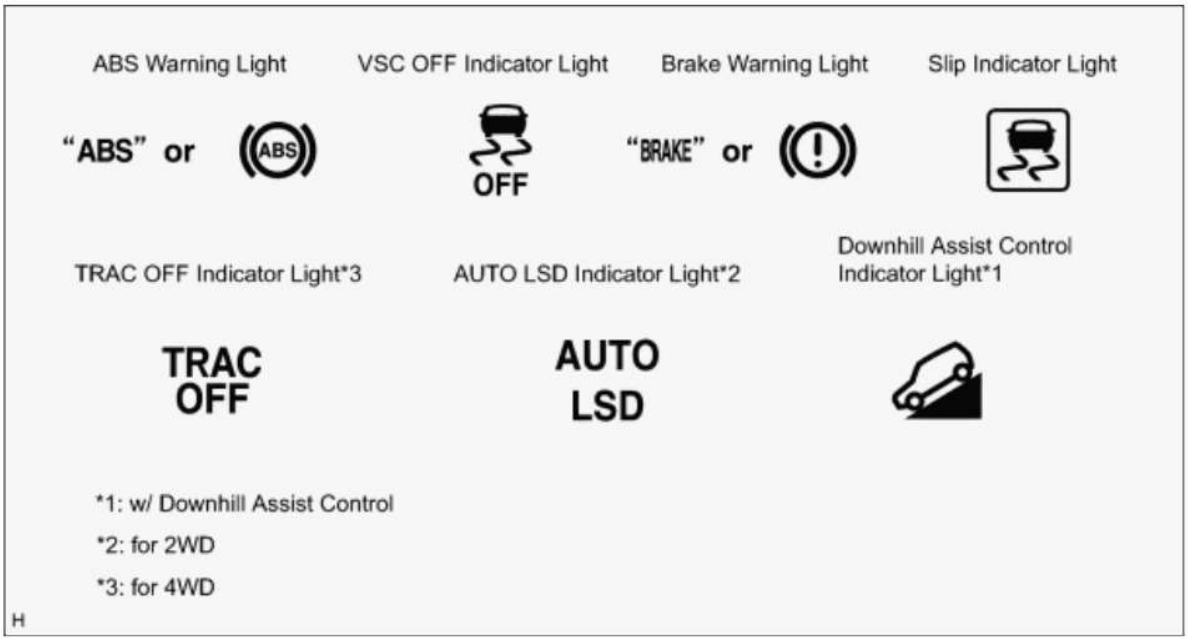
Before releasing the parking brake lever, set chocks to hold the vehicle for safety.

HINT:

When the parking brake is applied or the brake fluid level is low, the BRAKE warning light comes on.

(b) When the ignition switch is turned to ON, check that the ABS and BRAKE warning lights and the slip, VSC OFF, TRAC OFF, downhill assist control and AUTO LSD indicator lights come on and go off in about 3 seconds.

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HINT:

If the warning lights do not illuminate, check for combination meter and CAN communication system DTCs, since the skid control ECU and combination meter are connected by the CAN communication line.

If the warning light remains on, perform relevant troubleshooting procedures. The relevant troubleshooting procedures are in the sections listed in the table below.

SECTION TITLE	SEE PROCEDURE
ABS Warning Light Remains ON	INFO
VSC OFF Indicator Light Remains ON	INFO
BRAKE Warning Light Remains ON	INFO
Slip Indicator Light Remains ON	INFO
Downhill Assist Control Indicator Light Remains ON	INFO
AUTO LSD Indicator Light Remains ON	INFO
TRAC OFF Indicator Light Remains ON	INFO

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Last Modified: 9-7-2011	6.4 S	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000XHU05WX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2011 RAV4)		

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

Turn the ignition switch off before removing any parts.

HINT:

- If no abnormality is found when inspecting parts, inspect the skid control ECU and ground points for poor connections.
- If a trouble code is output during the DTC check, check the circuit indicated by the DTC. For details of each code, refer to the "See page" for the respective "DTC Code" in the DTC chart.
- When 2 or more DTCs are output, perform circuit inspection one by one until the problem is identified.
- For DTCs indicated by the warning light or indicator light, refer to the DTC charts in DTC Check/Clear.
- Inspect the fuses and relays before inspecting the trouble areas as shown in the table below.

DTC Chart for ABS:

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C0226	SFR Solenoid Circuit	1. SFRR or SFRH circuit 2. Brake actuator assembly	INFO
C0236	SFL Solenoid Circuit	1. SFLR or SFLH circuit 2. Brake actuator assembly	INFO
C0246	SRR Solenoid Circuit	1. SRRR or SRRH circuit 2. Brake actuator assembly	INFO
C0256	SRL Solenoid Circuit	1. SRLR or SRLH circuit 2. Brake actuator assembly	INFO
C0273*1	Open Circuit in ABS Motor Relay Circuit	1. ABS1 H-fuse 2. Motor relay circuit 3. Brake actuator assembly (motor relay)	INFO
C0274	Short Circuit in ABS Motor Relay Circuit	1. Motor relay circuit 2. Brake actuator assembly (motor relay)	INFO
C0278	Open Circuit in ABS Solenoid Relay Circuit	1. ABS2 H-fuse 2. Solenoid relay circuit 3. Brake actuator assembly (solenoid relay)	INFO
C0279	Short Circuit in ABS Solenoid Relay Circuit	1. Solenoid relay circuit 2. Brake actuator assembly (solenoid relay)	INFO
C1225	SA1 Solenoid Circuit	1. SM1 or SM2 circuit 2. Brake actuator assembly	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1241	Low or High Power Supply Voltage	1. ECU-IG1 fuse 2. Battery 3. Charging system 4. Power source circuit 5. Internal power supply circuit of the skid control ECU	INFO
C1243*1	Deceleration Sensor	1. Sensor installation 2. Yaw rate and deceleration sensor	INFO
C1245*1	Abnormal Output in Deceleration Sensor	1. Sensor installation 2. Yaw rate and deceleration sensor	INFO
C1337	Different Diameter Tire Malfunction	1. Tire and wheel size 2. Tire deformation 3. Speed sensor rotor 4. Speed sensor 5. Speed sensor circuit 6. Brake actuator assembly (Skid control ECU)	INFO
C1361	Abnormal Output in Deceleration Sensor	1. ABS1 H-fuse 2. Motor fail-safe relay circuit 3. Brake actuator assembly (motor fail-safe relay)	INFO
C1381	Abnormal Power Supply Voltage in Yaw Rate and / or Deceleration Sensor	1. Yaw rate and deceleration sensor power source circuit 2. Yaw rate and deceleration sensor	INFO
C1401*1	Malfunction Front Speed Sensor RH Circuit	1. Front speed sensor RH 2. Speed sensor rotor	INFO
C1402*1	Malfunction Front Speed Sensor LH Circuit	1. Front speed sensor LH 2. Speed sensor rotor	INFO
C1403*1	Malfunction Rear Speed Sensor RH Circuit	1. Rear speed sensor RH 2. Speed sensor rotor	INFO
C1404*1	Malfunction Rear Speed Sensor LH Circuit	1. Rear speed sensor LH 2. Speed sensor rotor	INFO
C1405*1	Open or Short in Front Speed Sensor RH Circuit	1. Front speed sensor RH 2. Speed sensor circuit 3. Brake actuator assembly (Skid control ECU)	INFO
C1406*1	Open or Short in Front Speed Sensor LH Circuit	1. Front speed sensor LH 2. Speed sensor circuit 3. Brake actuator assembly (Skid control ECU)	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1407*1	Open or Short in Rear Speed Sensor RH Circuit	1. Rear speed sensor RH 2. Speed sensor circuit 3. Brake actuator assembly (Skid control ECU)	INFO
C1408*1	Open or Short in Rear Speed Sensor LH Circuit	1. Rear speed sensor LH 2. Speed sensor circuit 3. Brake actuator assembly (Skid control ECU)	INFO
C1413*1	Front Speed Sensor RH Circuit Output	1. Front speed sensor RH 2. Speed sensor circuit 3. Speed sensor rotor 4. Brake actuator assembly (Skid control ECU)	INFO
C1414*1	Front Speed Sensor LH Circuit Output	1. Front speed sensor LH 2. Speed sensor circuit 3. Speed sensor rotor 4. Brake actuator assembly (Skid control ECU)	INFO
C1415*1	Rear Speed Sensor RH Circuit Output	1. Rear speed sensor RH 2. Speed sensor circuit 3. Speed sensor rotor 4. Brake actuator assembly (Skid control ECU)	INFO
C1416*1	Rear Speed Sensor LH Circuit Output	1. Rear speed sensor LH 2. Speed sensor circuit 3. Speed sensor rotor 4. Brake actuator assembly (Skid control ECU)	INFO
C1417	IG1 Voltage Supply too High	1. ECU-IG1 fuse 2. Battery 3. Charging system 4. Power source circuit 5. Internal power supply circuit of the skid control ECU	INFO
C1419	Deceleration Sensor Internal Circuit	Yaw rate and deceleration sensor	INFO
C1420	Malfunction in Deceleration Sensor	1. Sensor installation 2. Yaw rate and deceleration sensor	INFO
C1421*2	Open or Short in Master Cylinder Pressure Sensor	Brake actuator assembly (Master cylinder pressure sensor)	INFO
C1422*2	Master Cylinder Pressure Sensor Zero Point High	1. Stop light switch 2. Stop light switch circuit 3. Master cylinder pressure sensor circuit	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
		4. Brake actuator assembly (Master cylinder pressure sensor)	
C1423*2	Master Cylinder Pressure Sensor Zero Point Low	Brake actuator assembly (Master cylinder pressure sensor)	INFO
C1424*2	Master Cylinder Pressure Sensor Output	Brake actuator assembly (Master cylinder pressure sensor)	INFO
C1425*3	Open in Stop Switch Circuit	1. STOP fuse 2. Stop light switch 3. Stop light switch circuit 4. Stop light control relay 5. Stop light control relay circuit 6. Brake actuator assembly (Skid control ECU)	INFO
C1426	Stop Switch OFF Stuck Malfunction	1. STOP fuse 2. Stop light switch 3. Stop light switch circuit 4. Stop light control relay 5. Stop light control relay circuit 6. Brake actuator assembly (Skid control ECU)	INFO
C1427*1	Malfunction in Motor	1. Brake actuator assembly (Ground circuit) 2. Brake actuator assembly (Motor circuit)	INFO
C1428*1	Motor Circuit	Brake actuator assembly (Motor circuit)	INFO
C1429	Open or Short in Pedal Force Switch	1. Brake pedal load sensing switch 2. Brake pedal load sensing switch circuit 3. Brake actuator assembly (Skid control ECU)	INFO
C1430	Pedal Force Switch OFF Stuck	1. Brake pedal load sensing switch 2. Brake pedal load sensing switch circuit	INFO
C1431	Pedal Force Switch ON Stuck	1. Brake pedal load sensing switch 2. Brake pedal load sensing switch circuit	INFO
C1442	Invalid Data Received from Yaw Rate Sensor	Yaw rate and deceleration sensor	INFO
U0073	Control Module Communication Bus OFF	CAN communication system	INFO
U0124	Lost Communication with Lateral Acceleration Sensor Module	CAN communication system (Skid control ECU to yaw rate and deceleration sensor)	INFO

(*1 to *3):

Even after the trouble areas are repaired, the ABS warning light will not turn off unless one of the following

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operations is performed:

- (*1):
    a. Drive the vehicle at 20 km/h (12 mph) for 30 seconds or more and check that the ABS warning light turns off.
    b. Clear the DTCs.
- (*2):
    a. Turn the ignition switch to ON.
    b. Keep the vehicle stationary for 5 seconds or more and depress the brake pedal lightly 2 or 3 times.
    c. Drive the vehicle at the vehicle speed of 50 km/h (31 mph) and depress and hold the brake pedal firmly for approximately 3 seconds.
    d. Repeat the above operation 3 times or more and check that the ABS warning light turns off.
    e. Clear the DTCs.
- (*3):
    a. Turn the ignition switch to ON.
    b. Depress the brake pedal.
    c. Clear the DTCs.

HINT:

In some cases, the Techstream cannot be used when the ABS warning light remains on.

DTC Chart for VSC:

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1201	Engine Control System Malfunction	Engine control system	INFO
C1203	ECM Communication Circuit Malfunction	ECM	INFO
C1210	Zero Point Calibration of Yaw Rate Sensor Undone	Yaw rate and deceleration sensor	INFO
C1232	Deceleration Sensor	1. Sensor installation 2. Yaw rate and deceleration sensor	INFO
C1290	Abnormal Zero Point of Steering Angle Sensor	1. Yaw rate and deceleration sensor zero point calibration incomplete 2. Poor adjustment of the center position of the steering wheel 3. Poor adjustment of front wheel alignment	INFO
C1336	Zero Point Calibration of Deceleration Sensor Undone	Yaw rate and deceleration sensor	INFO
C1380	Stop Light Relay Malfunction	1. Stop light switch circuit 2. Stop light control relay 3. Stop light control relay circuit 4. Brake actuator assembly (Skid control ECU)	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1432	Steering Angle Sensor Power Source Voltage	1. Steering angle sensor power supply 2. Steering angle sensor	INFO
C1433	Steering Angle Sensor Internal Circuit	Steering angle sensor	INFO
C1434	Steering Angle Sensor Output	1. Steering angle sensor power supply 2. Steering angle sensor	INFO
C1435	Yaw Rate Sensor Internal Circuit	Yaw rate and deceleration sensor	INFO
C1436	Malfunction in Yaw Rate Sensor	Yaw rate and deceleration sensor	INFO
C1437	Lost Communication with Engine ECM	1. Engine control system 2. CAN communication system (Skid control ECU to ECM) 3. Brake actuator assembly (Skid control ECU)	INFO
C1439	Steering Angle Sensor Initialization Incomplete	1. Steering angle sensor 2. Yaw rate and deceleration sensor 3. Brake actuator assembly (Skid control ECU)	INFO
C1440	Steering Angle Sensor Unusual Bank Angle Detected	Yaw rate and deceleration sensor	INFO
C1441	Brake Booster Malfunction	Brake booster assembly	INFO
C1443	Invalid Data Received from Deceleration Sensor	Yaw rate and deceleration sensor	INFO
C1445	Vehicle Driven with Steering Angle Sensor not Initialized	1. Steering angle sensor 2. Yaw rate and deceleration sensor 3. Brake actuator assembly (Skid control ECU)	INFO
U0100	Lost Communication with ECM / PCM "A"	CAN communication system (Skid control ECU to ECM)	INFO
U0123	Lost Communication with Yaw Rate Sensor Module	CAN communication system (Skid control ECU to yaw rate and deceleration sensor)	INFO
U0126	Lost Communication with Steering Angle Sensor Module	CAN communication system (Skid control ECU to steering angle sensor)	INFO

HINT:

In some cases, the Techstream cannot be used when the slip indicator light remains on.

Test Mode DTC for ABS:

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1271	Low Output Signal of Right Front Speed Sensor (Test Mode DTC)	1. Front speed sensor RH 2. Sensor installation	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
		3. Speed sensor rotor	
C1272	Low Output Signal of Left Front Speed Sensor (Test Mode DTC)	1. Front speed sensor LH 2. Sensor installation 3. Speed sensor rotor	INFO
C1273	Low Output Signal of Right Rear Speed Sensor (Test Mode DTC)	1. Rear speed sensor RH 2. Sensor installation 3. Speed sensor rotor	INFO
C1274	Low Output Signal of Left Rear Speed Sensor (Test Mode DTC)	1. Rear speed sensor LH 2. Sensor installation 3. Speed sensor rotor	INFO
C1275	Abnormal Change in Output Signal of Right Front Speed Sensor (Test Mode DTC)	Speed sensor rotor	INFO
C1276	Abnormal Change in Output Signal of Left Front Speed Sensor (Test Mode DTC)	Speed sensor rotor	INFO
C1277	Abnormal Change in Output Signal of Right Rear Speed Sensor (Test Mode DTC)	Speed sensor rotor	INFO
C1278	Abnormal Change in Output Signal of Left Rear Speed Sensor (Test Mode DTC)	Speed sensor rotor	INFO
C1279	Abnormal Output Voltage in Deceleration (Test Mode DTC)	1. Sensor installation 2. Yaw rate and deceleration sensor	INFO
C1281	Abnormal Output in Master Cylinder Pressure Sensor (Test Mode DTC)	1. Stop light switch 2. Brake pedal load sensing switch 3. Master cylinder pressure sensor	INFO

Test Mode DTC for VSC:

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C0371	Yaw Rate Sensor (Test Mode DTC)	Yaw rate and deceleration sensor	INFO
C1379*	Downhill Assist Control Switch (Test Mode DTC)	Downhill assist control switch	INFO

*: w/ Downhill Assist Control

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001S0A00FX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Downhill Assist Control Indicator Light does not Come ON (2011 RAV4)		

Downhill Assist Control Indicator Light does not Come ON

DESCRIPTION

Refer to the description of "Downhill Assist Control Indicator Light Remains ON" INFO .

WIRING DIAGRAM

Refer to the downhill assist control indicator light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

A ▼

2.	**READ VALUE USING TECHSTREAM (DOWNHILL ASSIST CONTROL SWITCH)**

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(a) Check the Data List for proper functioning of the downhill assist control switch.

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Downhill Assist Control SW	Downhill assist control switch / ON or OFF	ON: Downhill assist control switch on OFF: Downhill assist control switch off	-

OK:

ON (downhill assist control switch is on) appears on the screen.

NG ▶ **INSPECT DOWNHILL ASSIST CONTROL SWITCH**

OK

▼

3.	**PERFORM ACTIVE TEST USING TECHSTREAM (DOWNHILL ASSIST CONTROL INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Downhill Assist Control Light	Downhill assist control indicator light	Indicator light ON / OFF	Observe the combination meter.

OK:

The downhill assist control indicator light turns ON and OFF.

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

NG

▼

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4.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

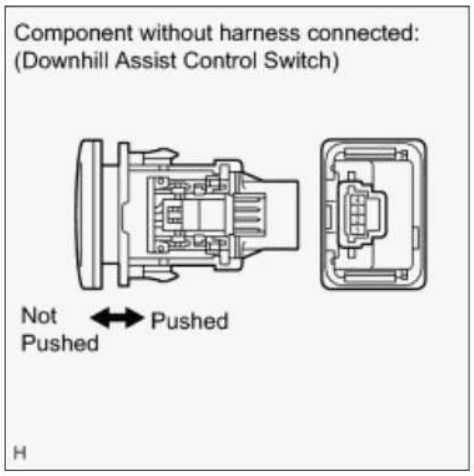
OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

5.	**INSPECT DOWNHILL ASSIST CONTROL SWITCH**

(a) Remove the downhill assist control switch INFO .

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
4 - 1	Switch is pushed	Below 1 Ω
	Switch is not pushed	10 kΩ or higher

NG ▶ **REPLACE DOWNHILL ASSIST CONTROL SWITCH**

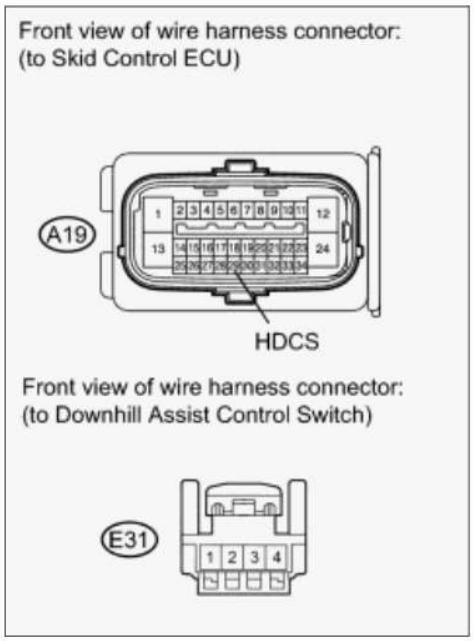
OK ▼

6.	**CHECK HARNESS AND CONNECTOR (DOWNHILL ASSIST CONTROL SW - SKID CONTROL ECU/BODY GROUND)**

(a) Disconnect the skid control ECU connector.

(b) Disconnect the downhill assist control switch connector.

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(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-29 (HDCS) - E31-4	Always	Below 1 Ω
A19-29 (HDCS) - Body ground	Always	10 kΩ or higher
E31-1 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001S0900FX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Downhill Assist Control Indicator Light Remains ON (2011 RAV4)		

Downhill Assist Control Indicator Light Remains ON

DESCRIPTION

When the downhill assist control switch is pushed on, the downhill assist control function is available and the downhill assist control indicator light illuminates.

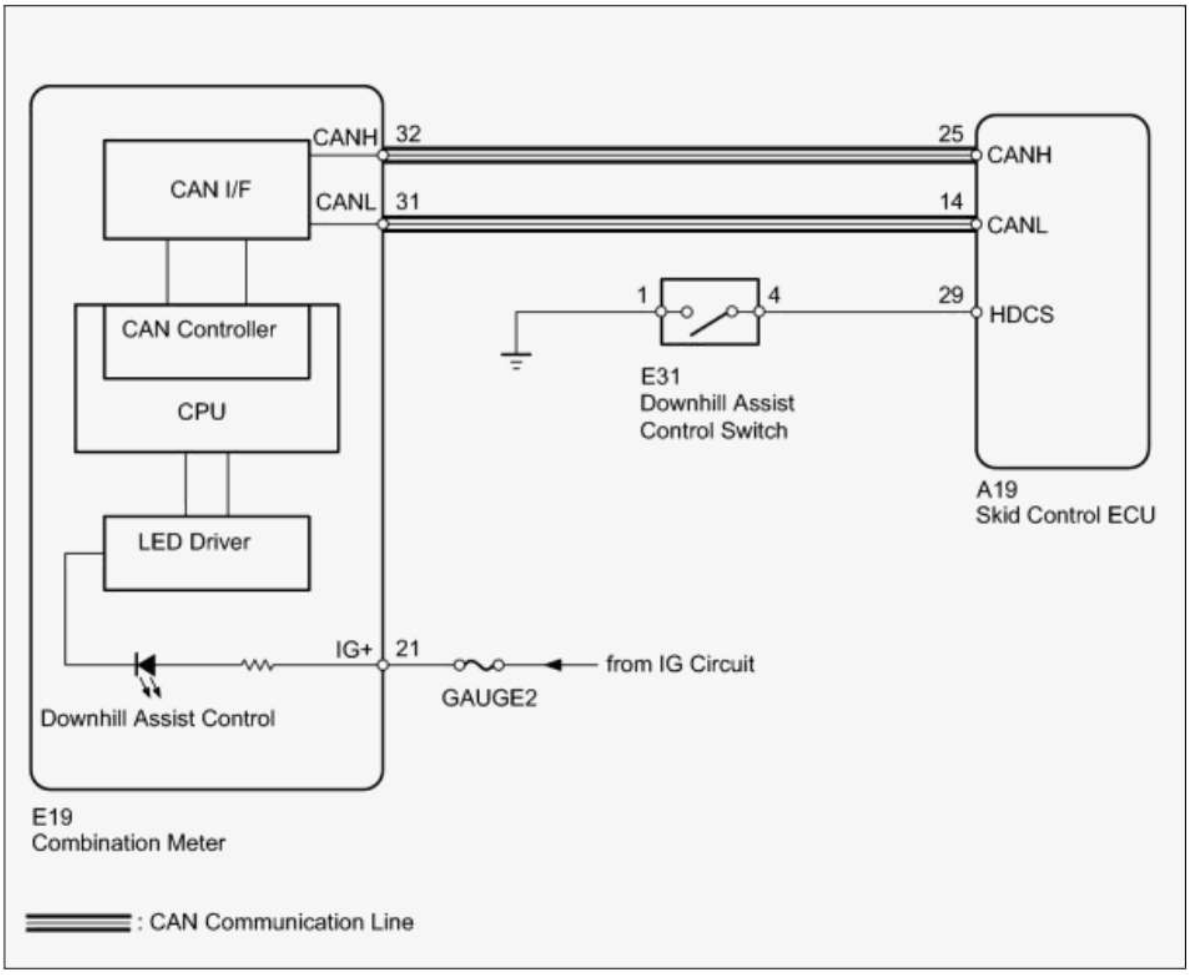
HINT:

Even if the downhill assist control switch is pressed, the downhill assist control indicator light will blink and downhill assist control will not be activated under the following conditions:

- Gear position is not L or R.
- The system is malfunctioning.
- The vehicle speed is 25 km/h (15 mph) or more.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONJ02NX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: DTC CHECK / CLEAR (2011 RAV4)		

DTC CHECK / CLEAR

1. CHECK DTC (When Using Techstream)

(a) Turn the ignition switch off and connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Read the DTCs by following the prompts on the Techstream screen.

HINT:

Refer to the Techstream operator manual for further details.

2. CLEAR DTC (When Using Techstream)

(a) Turn the ignition switch off and connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

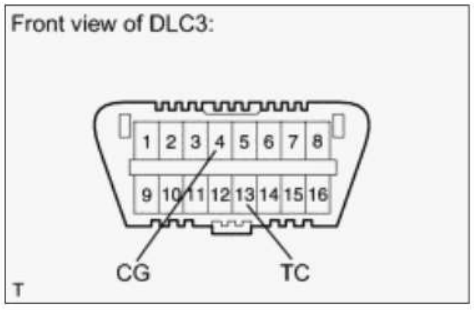
(c) Turn the Techstream on.

(d) Operate the Techstream to clear the DTCs.

HINT:

Refer to the Techstream operator manual for further details.

3. CHECK DTC (When not Using Techstream)



(a) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

SST: 09843-18040

(b) Turn the ignition switch to ON.

(c) Read DTCs from the ABS warning light and slip indicator light on the combination meter.

HINT:

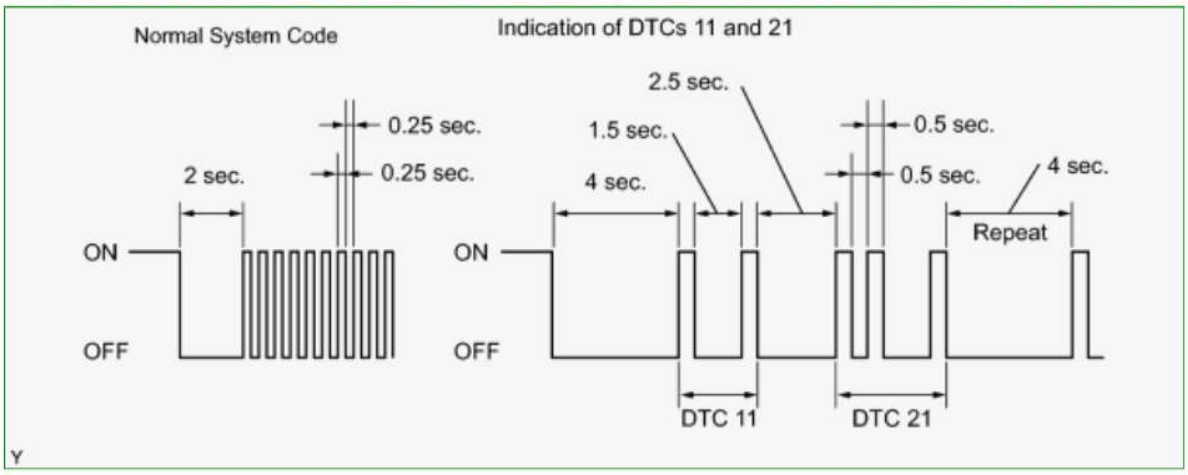
- If the ABS warning light and slip indicator light do not blink, perform relevant troubleshooting procedures. The relevant troubleshooting procedures are in the sections listed in the table below.

TROUBLE AREA	SEE PROCEDURE
ABS warning light circuit	INFO or INFO

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TROUBLE AREA	SEE PROCEDURE
Slip indicator light circuit	INFO or INFO
TC and CG terminal circuit	INFO

- As an example, the blinking patterns of the normal system code and DTCs 11 and 21 are shown below.



(d) Check the details of the DTCs.

DTC Chart for ABS:

ABS WARNING LIGHT DISPLAY	TECHSTREAM DISPLAY
11	C0278
12	C0279
13	C0273
14	C0274
21	C0226
22	C0236
23	C0246
24	C0256
25	C1225
31	C1401
	C1405
32	C1402
	C1406
33	C1403
	C1407
34	C1404
	C1408

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ABS WARNING LIGHT DISPLAY	TECHSTREAM DISPLAY
35	C1413
36	C1414
37	C1337
38	C1415
39	C1416
41	C1241
	C1417
43	C1243
44	C1419
	C1420
	C1442
45	C1245
46	C1421
	C1422
	C1423
	C1424
49	C1425
	C1426
51	C1427
	C1428
67	C1429
	C1430
	C1431
91	C1361
94	U0073
95	U0124
97	C1381

DTC Chart for VSC:

SLIP INDICATOR LIGHT DISPLAY	TECHSTREAM DISPLAY
31	C1432
	C1433
	C1434
32	C1232

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SLIP INDICATOR LIGHT DISPLAY	TECHSTREAM DISPLAY
34	C1435
	C1436
	C1443
36	C1210
39	C1336
43 (*1)	-
51	C1201
53	C1203
62	U0123
63	U0126
64	C1380
65	C1437
	U0100
66	C1290
	C1439
	C1445
98	C1440
	C1441

HINT:

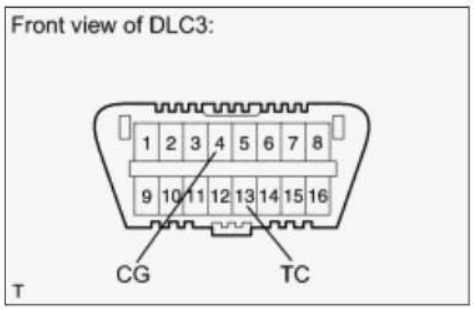
***1: This DTC is output when the VSC system detects a malfunction in the ABS.**

(e) After completing the check, disconnect SST from terminals 13 (TC) and 4 (CG) of the DLC3, and turn the ignition switch off.

HINT:

If 2 or more malfunctions are stored at the same time, the lowest numbered DTC is output first.

4. CLEAR DTC (When not Using Techstream)

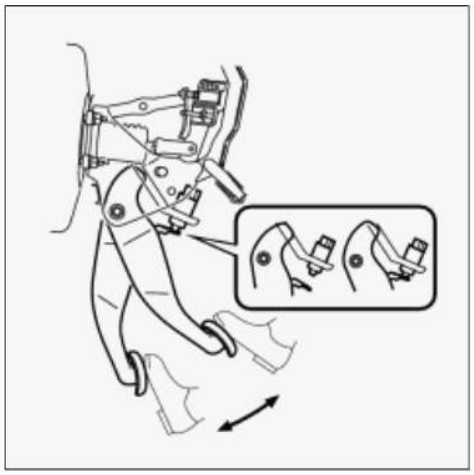


(a) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

SST: 09843-18040

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(b) Turn the ignition switch to ON.



(c) Clear the DTCs stored in the skid control ECU by depressing the brake pedal 8 times or more within 5 seconds.

(d) Check that the ABS warning light and slip indicator light come on.

(e) Remove SST from the terminals of the DLC3.

(f) Turn the ignition switch off.

HINT:

Clearing the DTCs cannot be performed by removing the cable from the negative (-) battery terminal or the ECU-IG1 fuse.

5. END OF DTC CHECK/CLEAR

(a) Turn the ignition switch to ON.

(b) Check that the ABS warning light and slip indicator light go off within approximately 3 seconds.

(c) Turn the ignition switch off.

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Last Modified: 9-7-2011	6.4 U	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONL01XX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: FAIL-SAFE CHART (2011 RAV4)		

FAIL-SAFE CHART

1. FAIL-SAFE OPERATION

- If there is a problem with any sensor signals or actuator, the skid control ECU prohibits the power supply to the brake actuator and informs the ECM of VSC system failure.

  The brake actuator turns off the solenoids and the ECM shuts off VSC control (traction control signal) from the skid control ECU accordingly, the result being that it is as if the ABS, TRAC and VSC systems were not installed.
- ABS control is prohibited, but EBD control continues as far as possible. If EBD control is impossible, the BRAKE warning light comes on to warn the driver INFO .
- If system components have any malfunctions before starting control, the operation stops immediately. If system components have any malfunctions during control, the control stops gradually so as not to trigger a sudden change in vehicle conditions.

  If it is impossible to control the systems, the warning/indicator lights come on to inform the driver of malfunctions in the systems INFO .

ABS, EBD and BA System

MALFUNCTION AREA	FAIL-SAFE OPERATION
ABS system	ABS, BA, TRAC and VSC control prohibited
BA system	ABS, BA, TRAC and VSC control prohibited
EBD system	ABS, EBD, BA, TRAC and VSC control prohibited

TRAC and VSC System:

MALFUNCTION AREA	FAIL-SAFE OPERATION
Engine control system (TRAC and VSC systems)	Before control: Disables control During control: Uses only the brakes to perform control
Brake control system (VSC system)	Before control: Disables control During control: Uses only the engine to perform control
Brake control system (TRAC system)	Before control: Disables control During control: Disables control (by gradually ending control)

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONM01QX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: FREEZE FRAME DATA (2011 RAV4)		

FREEZE FRAME DATA

1. FREEZE FRAME DATA

HINT:

- Whenever a DTC is stored or the brake system operates, the skid control ECU stores the current vehicle (sensor) state as freeze frame data.
- The skid control ECU stores the number of times (maximum: 31) the ignition switch has been turned from off to ON since the last time the brake system was activated. However, if the vehicle was stationary or running at a low speed (7 km/h [4.3 mph] or less), or if a DTC is stored, the skid control ECU stops counting.
- Freeze frame data at the time the brake system operates:

  The skid control ECU stores and updates the data whenever the brake system operates.

  When the ECU stores data at the time a DTC is stored, the data stored when the brake system operated is cleared.
- Freeze frame data at the time a DTC is stored:

  When the skid control ECU stores data at the time a DTC is stored, no updates will be performed until the data is cleared.

(a) Turn the ignition switch off and connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) From the display on the Techstream, select the Freeze Frame Data.

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM	REFERENCE VALUE
Elapsed Time after Freeze Trigger	Elapsed time after freeze frame data recorded	Min.: 0 msec Max.: 500 msec
Number of IG ON	Number of ignition switch ON operations since freeze frame data stored	0 to 31
Buzzer	Skid control buzzer signal	ON: Skid control buzzer on OFF: Skid control buzzer off
Stop Light SW	Stop light switch signal	ON: Stop light switch on OFF: Stop light switch off
Parking Brake SW	Parking brake switch signal	ON: Parking brake switch on OFF: Parking brake switch off
Gear Position	Gear position information	Fail 1st 2nd

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TESTER DISPLAY	MEASUREMENT ITEM	REFERENCE VALUE
		3rd 4th 5th P, N R Not R
Shift Lever Position	Shift lever position information	Fail 1st 2nd 3rd 4th 5th 6th/B D/M P, N R
Operated System	Operated system status	Non: No system activated ABS: ABS activated VSC: VSC activated TRAC: TRAC activated BA: BA activated HAB: HAB activated Fail: Fail-safe mode activated PB: PB activated HA-CTRL: Hill-start assist control activated Sys: System prohibited
Master Cylinder Sensor	Master cylinder pressure sensor reading	Brake pedal released: 0.3 V to 0.9 V Brake pedal depressed: 0.8 V to 4.5 V
M/C Sensor Grade	Master cylinder pressure sensor grade	Min.: -30 MPa/s Max.: 225 MPa/s
Yaw Rate Sensor	Yaw rate sensor reading	Min.: -128 °/s Max.: 127 °/s
Lateral G	Lateral G	Min.: -25.10 m/s^2 Max.: 24.90 m/s^2
Forward and Rearward G	Forward and backward G	Min.: -25.10 m/s^2 Max.: 24.90 m/s^2
FR Wheel Speed	FR wheel speed	Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)

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TESTER DISPLAY	MEASUREMENT ITEM	REFERENCE VALUE
FL Wheel Speed	FL wheel speed	Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)
RR Wheel Speed	RR wheel speed	Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)
RL Wheel Speed	RL wheel speed	Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)
Vehicle Speed	Vehicle speed	Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)
Vehicle Speed Grade	Vehicle speed grade	Min.: -25.10 m/s^2 Max.: 24.90 m/s^2
Real Engine Torque	Real engine torque	Min.: -1024.0 Nm Max.: 1023.0 Nm
Accelerator Opening Angle %	Accelerator pedal opening angle %	Min.: 0.0% Max.: 128.0%
Brake Pedal Load Sensing SW*	Brake pedal load sensing switch signal	ON: Brake pedal depressed OFF: Brake pedal released
Inspection Mode	Inspection mode	Other: Normal mode Inspect: Inspection mode
Steering Angle Sensor	Steering angle sensor reading	Left turn: Increase Right turn: Decrease
TRAC/VSC Off Mode	TRAC/VSC off mode / Normal, TRC OFF or VSC OFF	Normal: Normal mode TRC OFF: TRAC off mode VSC OFF: VSC off mode

*: w/ Booster Failure Compensation

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000102F01JX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2011 RAV4)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use these procedures to troubleshoot the vehicle stability control system.
- *: Use the Techstream.

1.	**VEHICLE BROUGHT TO WORKSHOP**

NEXT

2.	**INSPECT BATTERY VOLTAGE**

Standard voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

3.	**CHECK AND CLEAR DTC***

NEXT

4.	**PROBLEM SYMPTOM CONFIRMATION**

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Result:

RESULT	PROCEED TO
Symptom does not occur	A
Symptom occurs	B

B ▶ **Go to step 7**

A ▼

5.	**SYMPTOM SIMULATION**

NEXT ▼

6.	**CHECK COMMUNICATION FUNCTION OF CONTROLLER AREA NETWORK (CAN)***

(a) Using the Techstream, check for normal functioning of the CAN communication system.

(1) Perform bus check (communication malfunction DTC).

Result:

RESULT	PROCEED TO
DTC is not output	A
DTC is output	B

B ▶ **Go to CAN COMMUNICATION SYSTEM**

A ▼

7.	**CHECK FOR DTC***

Result:

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RESULT	PROCEED TO
DTC is not output	A
DTC is output	B

B ▶ **Go to step 10**

A ▼

8.	PROBLEM SYMPTOMS TABLE

Result:

RESULT	PROCEED TO
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B ▶ **Go to step 10**

A ▼

9.	OVERALL ANALYSIS AND TROUBLESHOOTING

(a) Terminals of ECU INFO

(b) Data List/Active Test INFO

NEXT ▶ **Go to step 11**

10.	CHECK FOR FLUID LEAKAGE

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NEXT

11.	REPAIR OR REPLACE

NEXT

12.	CONFIRMATION TEST

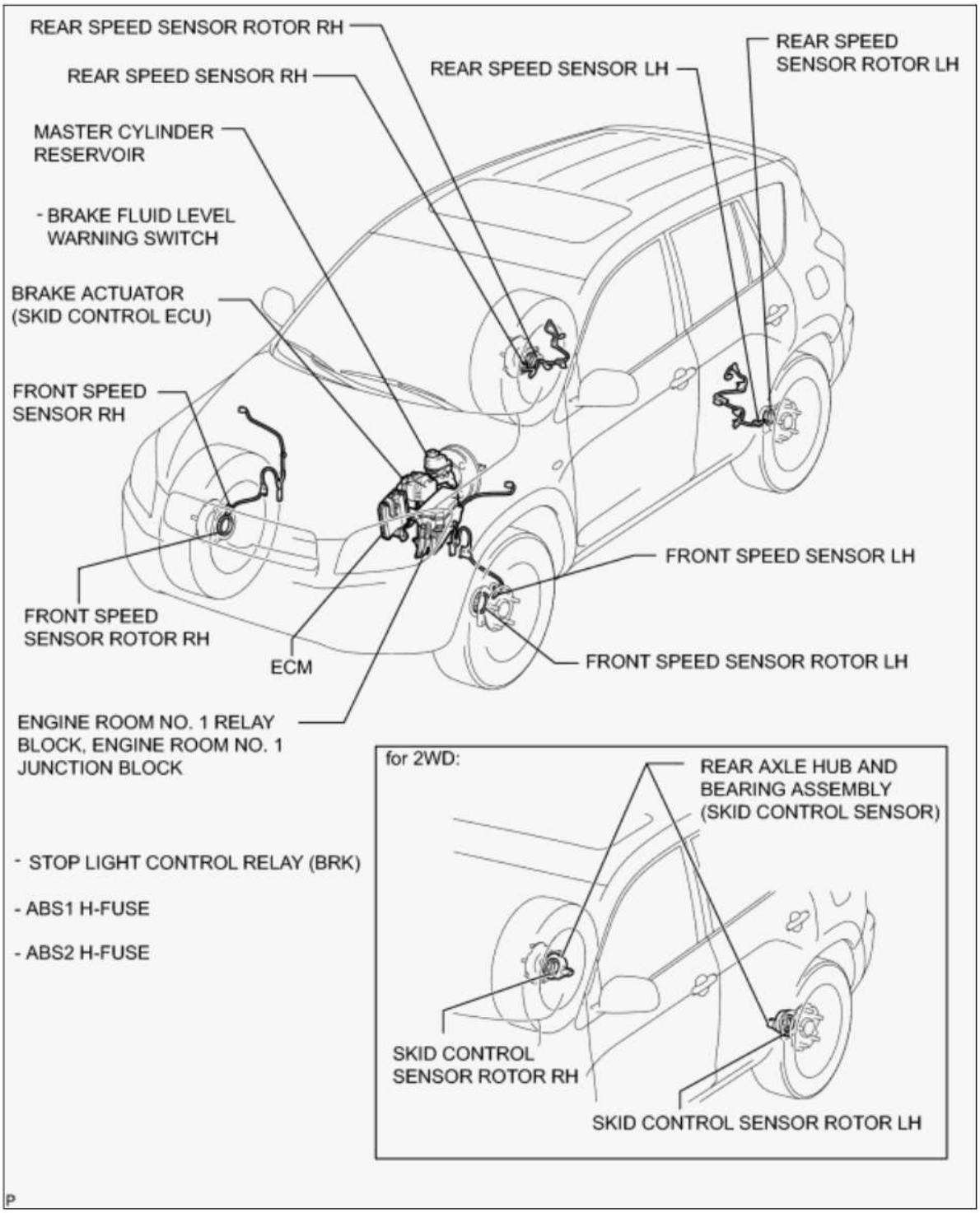
NEXT END

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Last Modified: 9-7-2011	6.4 R	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000022TX00CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: PARTS LOCATION (2011 RAV4)		

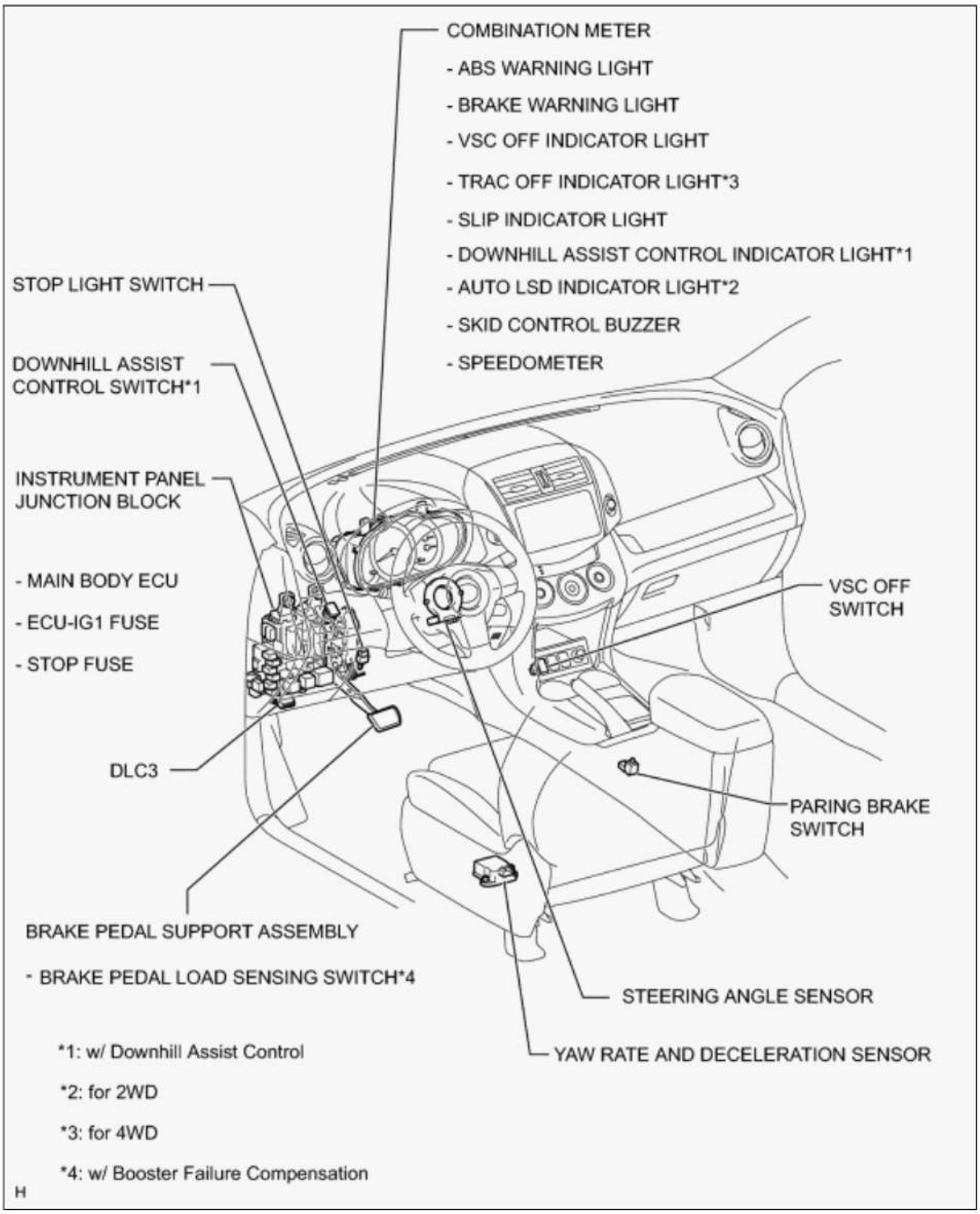
PARTS LOCATION

ILLUSTRATION



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ILLUSTRATION



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Last Modified: 9-7-2011	6.4 L	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONB022X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: PRECAUTION (2011 RAV4)		

PRECAUTION

1. TROUBLESHOOTING PRECAUTION

- When there are malfunctions in the contact points of the terminals or installation problems with any parts, removal and installation of the suspected problem parts may return the system to its normal condition either entirely or temporarily.
- In order to determine the location of the malfunction, be sure to check the conditions at the time the malfunction occurred through data such as DTC and freeze frame data outputs. Record this information before disconnecting any connectors and removing or installing any parts.
- Since the vehicle stability control system may be influenced by malfunctions in other systems, be sure to check for DTCs in other systems.
- Be sure to remove and install the brake actuator and each sensor with the ignition switch off, unless specified in the inspection procedures.
- When removing and installing the brake actuator and each sensor, be sure to check that the normal display is output during a test mode inspection and a DTC output inspection after reinstalling all the parts.
- After replacing the brake actuator and/or yaw rate sensor, be sure to perform yaw rate and deceleration sensor zero point calibration INFO .
- The CAN communication system is used for data communication between the skid control ECU, the steering angle sensor and the yaw rate sensor (the deceleration sensor is included). If there is trouble in the CAN communication line, the DTC of the communication line is output.
- If the DTC of the CAN communication line is output, repair the malfunction in the communication line and then troubleshoot the vehicle stability control system.
- Since the CAN communication line has its own length and route, it cannot be repaired temporarily with a bypass wire, etc.

2. CHASSIS DYNAMOMETER PRECAUTION

Enter Test Mode to disable TRAC and VSC control when using a chassis dynamometer INFO .

HINT:

- The vehicle may unexpectedly move off of the dynamometer due to TRAC and VSC operation.
- Pressing the VSC OFF switch does not disable TRAC and VSC operation completely.

NOTICE:

- Make sure that the slip indicator light is blinking (Test Mode is activated).
- Secure the vehicle with lock chains for safety.

3. IGNITION SWITCH EXPRESSION

HINT:

The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

EXPRESSION	IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)

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EXPRESSION	IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)
Ignition Switch off	Off	Off
Ignition Switch ON	ON	On (IG)
Ignition Switch ACC	ACC	On (ACC)
Engine Start	START	Start

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Last Modified: 9-7-2011	6.4 T	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000OS702RX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: PROBLEM SYMPTOMS TABLE (2011 RAV4)		

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

NOTICE:

When replacing the brake actuator or sensor, turn the ignition switch off.

Vehicle Stability Control System

SYMPTOM	SUSPECTED AREA	SEE PAGE
ABS, BA and/or EBD does not operate	Check for DTCs again and make sure that normal system code displayed.	INFO
	IG power source circuit	INFO
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Check brake actuator using Techstream (Check brake actuator operation using Active Test function). If abnormal, check hydraulic circuit for leakage.	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
ABS, BA and/or EBD does not operate efficiently	Check for DTCs again and make sure that normal system code displayed.	INFO
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Stop light switch circuit	INFO
	Check brake actuator using Techstream (Check brake actuator operation using Active Test function). If abnormal, check hydraulic circuit for leakage.	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
VSC and/or TRAC does not operate	Check for DTCs again and make sure that normal system code displayed.	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	IG power source circuit	INFO
	Check hydraulic circuit for leakage	-
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Yaw rate sensor circuit	INFO
	Steering angle sensor circuit	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
Sensor signal check cannot be performed	TS and CG terminal circuit	INFO
	Brake actuator (skid control ECU)	INFO
DTC check cannot be performed	Check for DTCs again and make sure that normal system code displayed.	INFO
	TC and CG terminal circuit	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
ABS warning light abnormal (Remains on)	ABS warning light circuit	INFO
	Brake actuator (skid control ECU)	INFO
ABS warning light abnormal (Does not come on)	ABS warning light circuit	INFO
	Brake actuator (skid control ECU)	INFO
VSC OFF indicator light abnormal (Remains on)	VSC OFF indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
VSC OFF indicator light abnormal (Does not come on)	VSC OFF indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
BRAKE warning light abnormal (Remains on)	BRAKE warning light circuit	INFO
	Brake actuator (skid control ECU)	INFO
BRAKE warning light abnormal (Does not come on)	BRAKE warning light circuit	INFO
	Brake actuator (skid control ECU)	INFO
Slip indicator light abnormal (Remains on)	Slip indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
Slip indicator light abnormal (Does not come on)	Slip indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
TRAC OFF indicator light (Remains	TRAC OFF indicator light circuit	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
on)	Brake actuator (skid control ECU)	INFO
TRAC OFF indicator light (Does not come on)	TRAC OFF indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
Skid control buzzer abnormal	Skid control buzzer circuit	INFO
	Brake actuator (skid control ECU)	INFO
Downhill assist control does not operate*1	Check for DTCs again and make sure that normal system code displayed.	INFO
	Downhill assist control indicator light circuit	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
Downhill assist control indicator light abnormal (Remains on)*1	Downhill assist control indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
Downhill assist control indicator light abnormal (Does not come on)*1	Downhill assist control indicator light circuit	INFO
	Brake actuator (skid control ECU)	INFO
Hill-start assist control does not operate*2	Brake actuator (skid control ECU)	INFO
AUTO LSD does not operate*3	Check for DTCs again and make sure that normal system code displayed.	INFO
	VSC OFF switch circuit	INFO
	AUTO LSD indicator light circuit	INFO
	If symptoms still occur even after above circuits in suspected areas inspected and proved to be normal, replace brake actuator (skid control ECU).	INFO
AUTO LSD indicator light abnormal (Remains on)*3	AUTO LSD indicator circuit	INFO
	Brake actuator (skid control ECU)	INFO
AUTO LSD indicator light abnormal (Does not come on)*3	AUTO LSD indicator circuit	INFO
	Brake actuator (skid control ECU)	INFO

HINT:

***1: w/ Downhill Assist Control**

***2: w/ Hill-start Assist Control**

***3: for 2WD**

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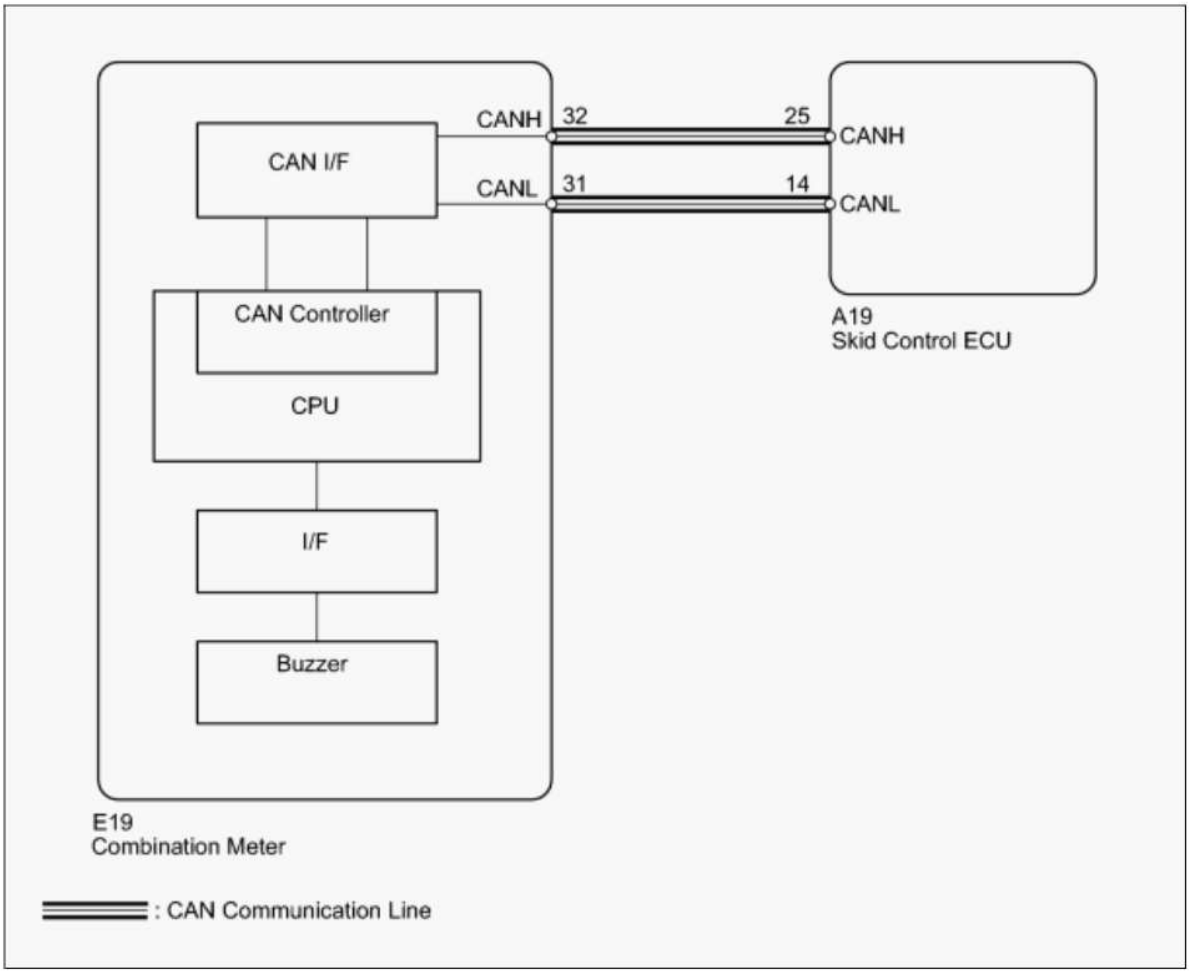
Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K2A00RX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Skid Control Buzzer Circuit (2011 RAV4)		

Skid Control Buzzer Circuit

DESCRIPTION

The skid control buzzer sounds while the VSC is activated.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform the zero point calibration INFO .

PROCEDURE

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1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

A ▼

2.	PERFORM ACTIVE TEST USING TECHSTREAM (BUZZER)

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Buzzer	Skid control buzzer	Buzzer ON / OFF	Buzzer can be heard.

OK:
The skid control buzzer can be heard.

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

NG ▼

3.	INSPECT COMBINATION METER ASSEMBLY

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(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K2E00VX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Slip Indicator Light does not Come ON (2011 RAV4)		

Slip Indicator Light does not Come ON

DESCRIPTION

Refer to the description of "Slip Indicator Light Remains ON" INFO .

WIRING DIAGRAM

Refer to the slip indicator light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform the zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A

▼

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (SLIP INDICATOR LIGHT)**

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(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Slip Indicator Light	Slip indicator light	Indicator light ON / OFF	Observe the combination meter.

OK:
The slip indicator light turns ON and OFF.

NG ▶ **INSPECT COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

3.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K2D00VX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: Slip Indicator Light Remains ON (2011 RAV4)		

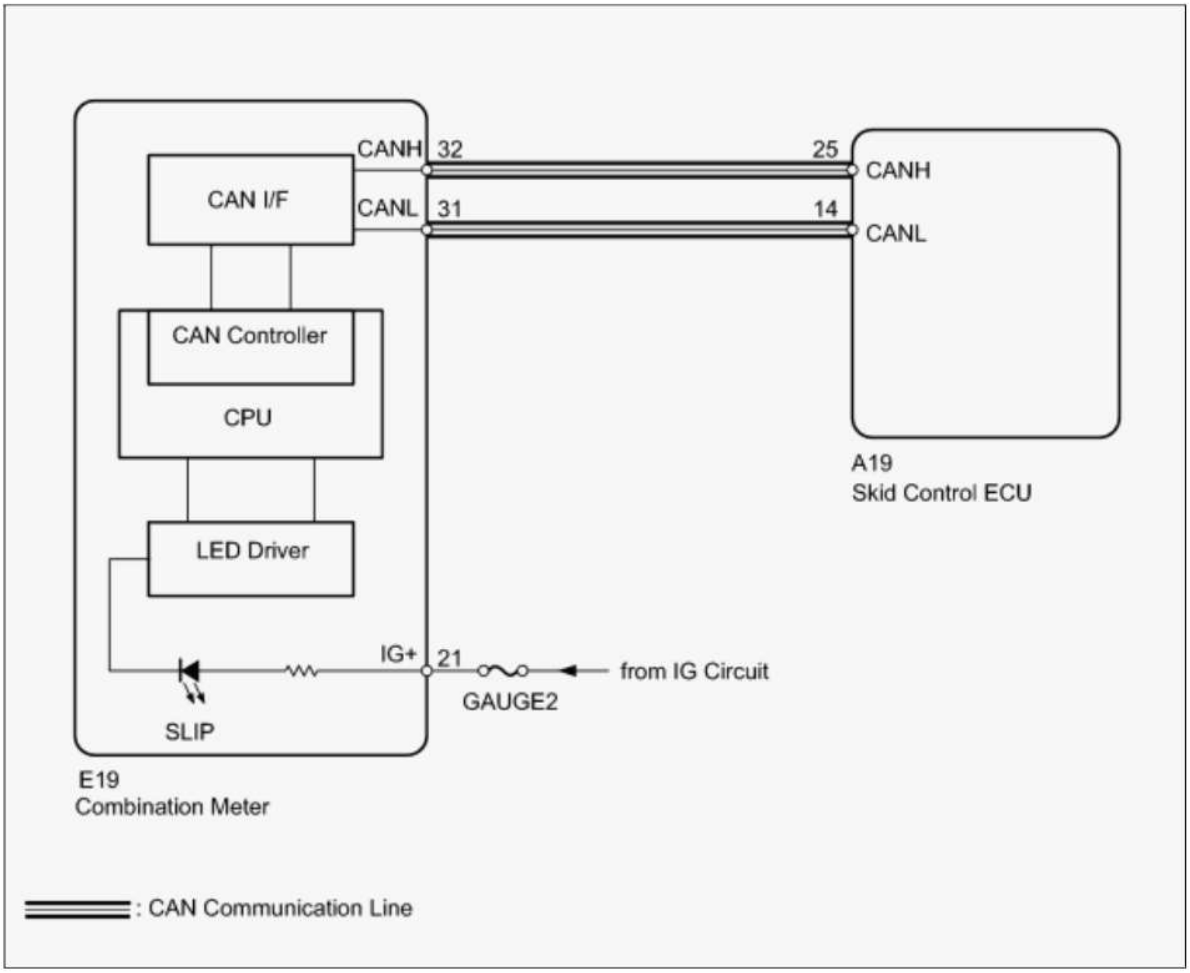
Slip Indicator Light Remains ON

DESCRIPTION

The slip indicator blinks during VSC and/or TRAC operation.

When the VSC/TRAC system fails, the slip indicator comes on to warn the driver.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform the zero point calibration INFO .

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PROCEDURE

1.	**PREPARE FOR INSPECTION**

(a) Check that the following condition is satisfied.

- The vehicle is not in inspection mode.

HINT:

Confirm if the vehicle is in the inspection mode or not by using the Techstream Data List.

NEXT

2.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CAN COMMUNICATION SYSTEM**

A

3.	**CHECK SKID CONTROL ECU CONNECTOR**

(a) Check if the skid control ECU connector is securely connected.

OK:

The connector is securely connected.

NG ▶ **CONNECT CONNECTOR CORRECTLY**

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OK

4.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONE02GX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: SYSTEM DESCRIPTION (2011 RAV4)		

SYSTEM DESCRIPTION

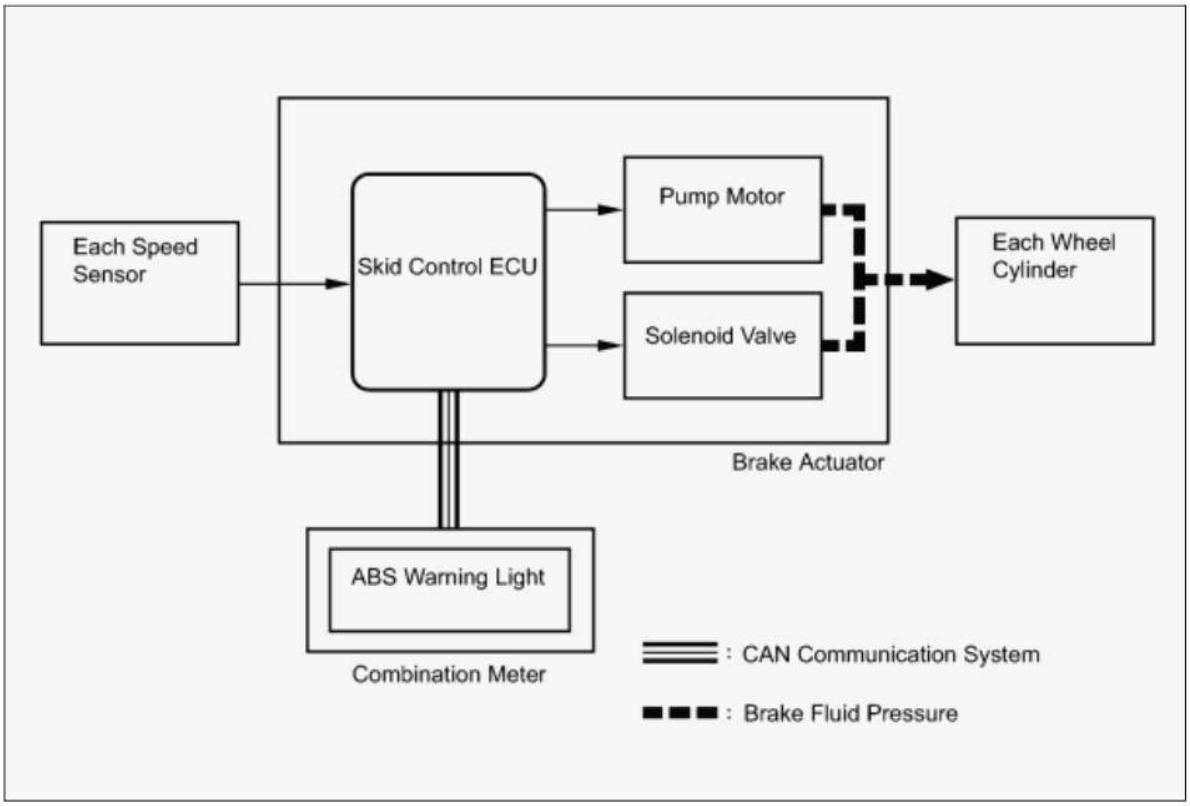
1. SYSTEM DESCRIPTION

HINT:

The skid control ECU is built into the brake actuator.

(a) ABS (Anti-lock Brake System):

The ABS helps prevent the wheels from locking when the brakes are applied firmly or when braking on a slippery surface.



(1) Operation description:

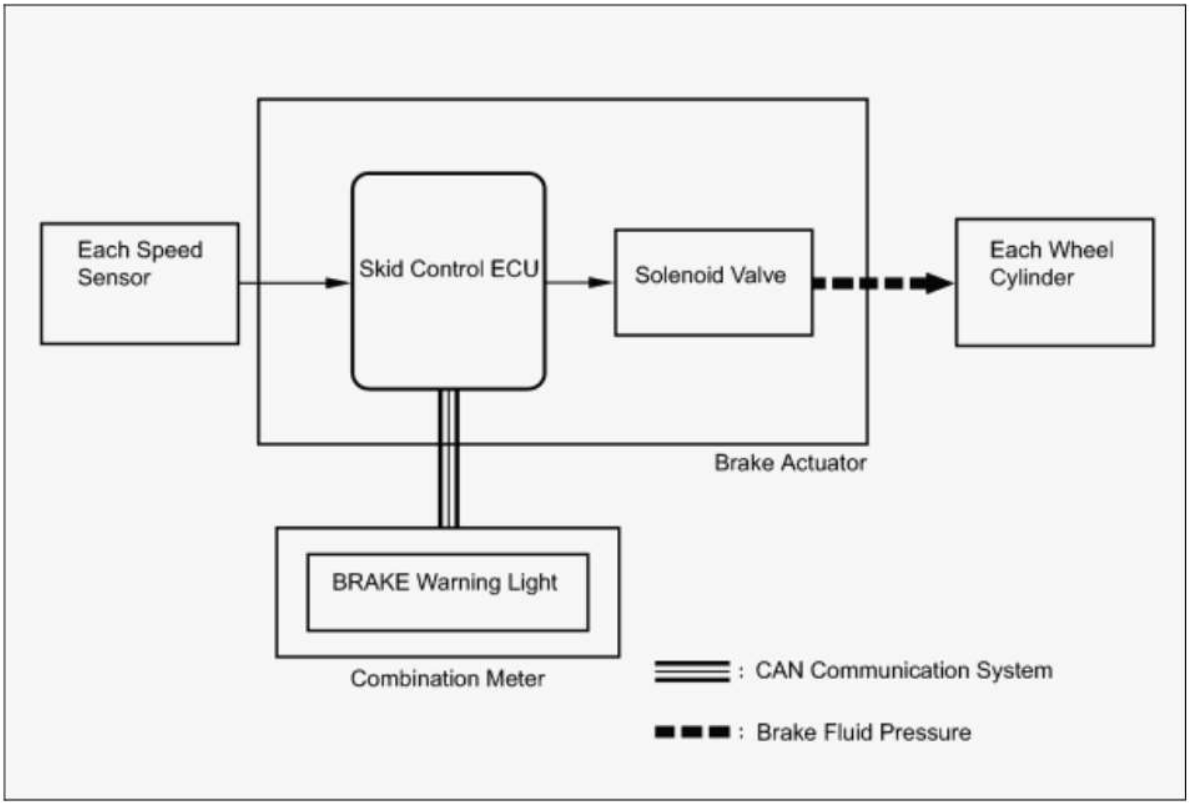
The skid control ECU detects wheel lock conditions by receiving vehicle speed signals from each speed sensor, and sends control signals to the pump motor and solenoid valve to prevent wheels from locking by controlling the brake fluid pressure of each wheel cylinder.

The ABS warning light comes on when the ABS system malfunctions.

(b) EBD (Electronic Brake Force Distribution):

The EBD control utilizes the ABS to create the proper brake force distribution between the front and rear wheels in accordance with the driving conditions and vehicle load. In addition, when the brakes are applied while cornering, it also controls the braking forces of the right and left wheels, helping to maintain vehicle stability.

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(1) Operation description:

The skid control ECU receives speed signals from each speed sensor to detect the slip conditions of the wheels and sends control signals to the solenoid.

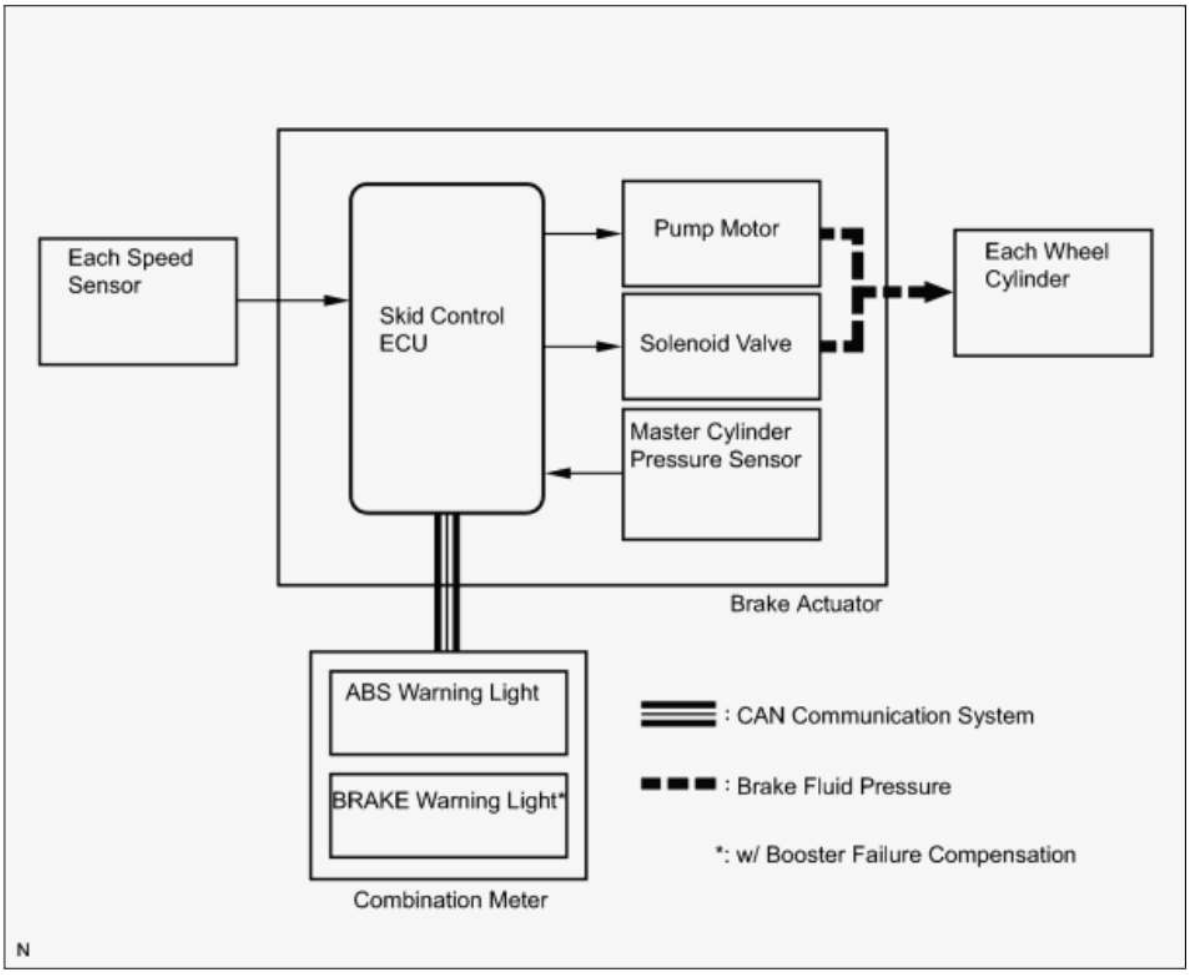
The solenoid valve controls the brake fluid pressure of each wheel cylinder and divides the control power properly between the front and rear wheels and the right and left wheels.

The BRAKE warning light comes on to indicate malfunctions in the EBD system.

(c) BA (Brake Assist):

The primary purpose of the brake assist system is to provide auxiliary brake force to assist drivers who cannot generate a large enough brake force during emergency braking, thus helping to maximize the braking performance of the vehicle.

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(1) Operation description:

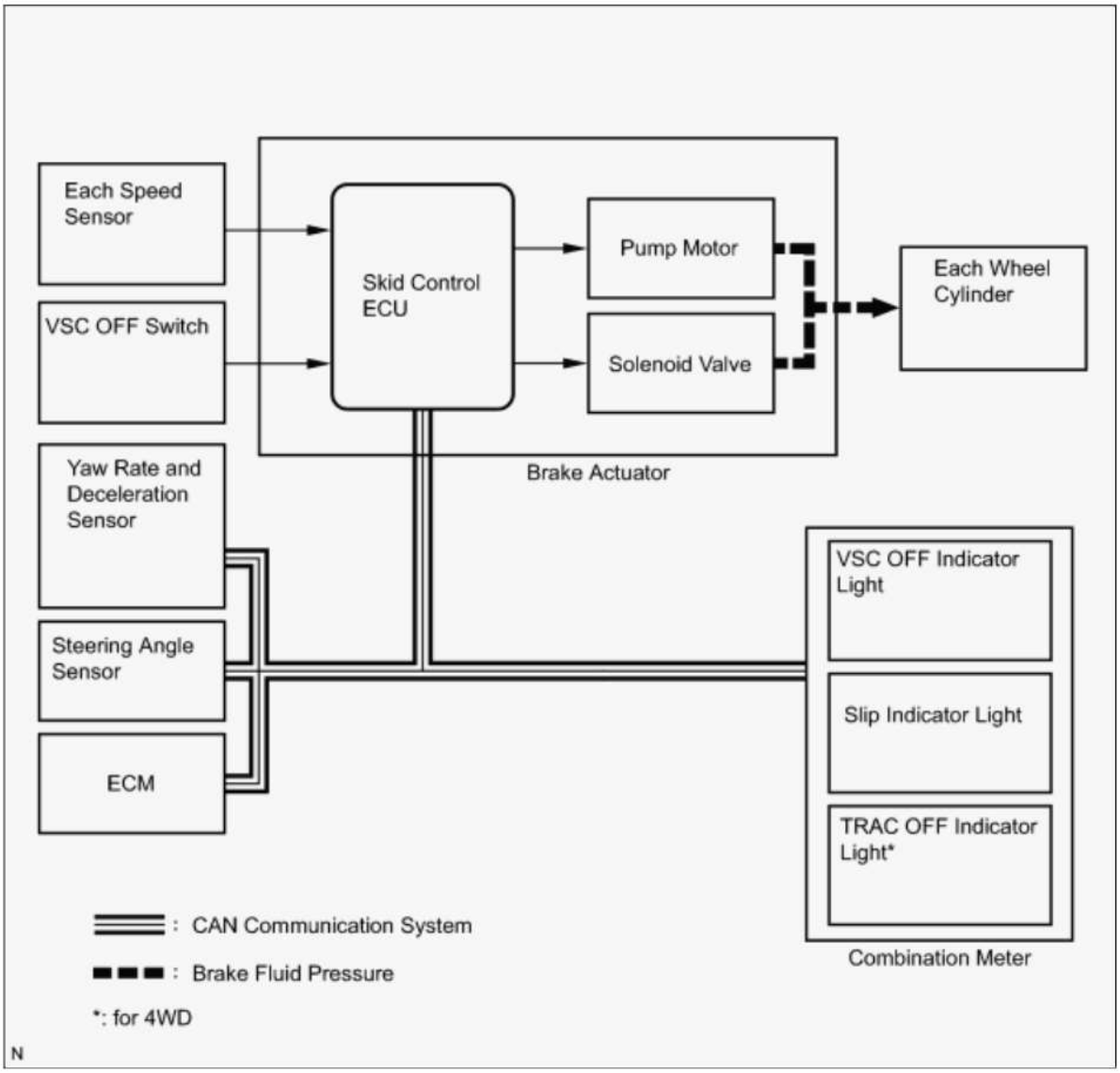
The skid control ECU receives speed signals from each speed sensor and the fluid pressure signal from the master cylinder pressure sensor to determine whether brake assist is necessary. If brake assist is deemed necessary, the skid control ECU sends control signals to the pump motor and solenoid. The pump and the solenoid valve then control the pressure applied to each wheel cylinder. The ABS warning light comes on to indicate malfunctions in the BA (brake assist) system.

w/ Booster Failure Compensation: The BRAKE warning light and ABS warning light come on to indicate malfunctions in the BA system.

(d) TRAC (Traction Control):

The TRAC system helps prevent the drive wheels from slipping if the driver presses down on the accelerator pedal excessively when starting off or accelerating on a slippery surface.

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(1) Operation description:

The skid control ECU detects the vehicle slip condition by receiving signals from each speed sensor and the ECM via CAN communication system. The skid control ECU controls engine torque with the ECM via CAN communication system and brake fluid pressure through the pump and solenoid valve. The slip indicator light blinks when the system is operating.

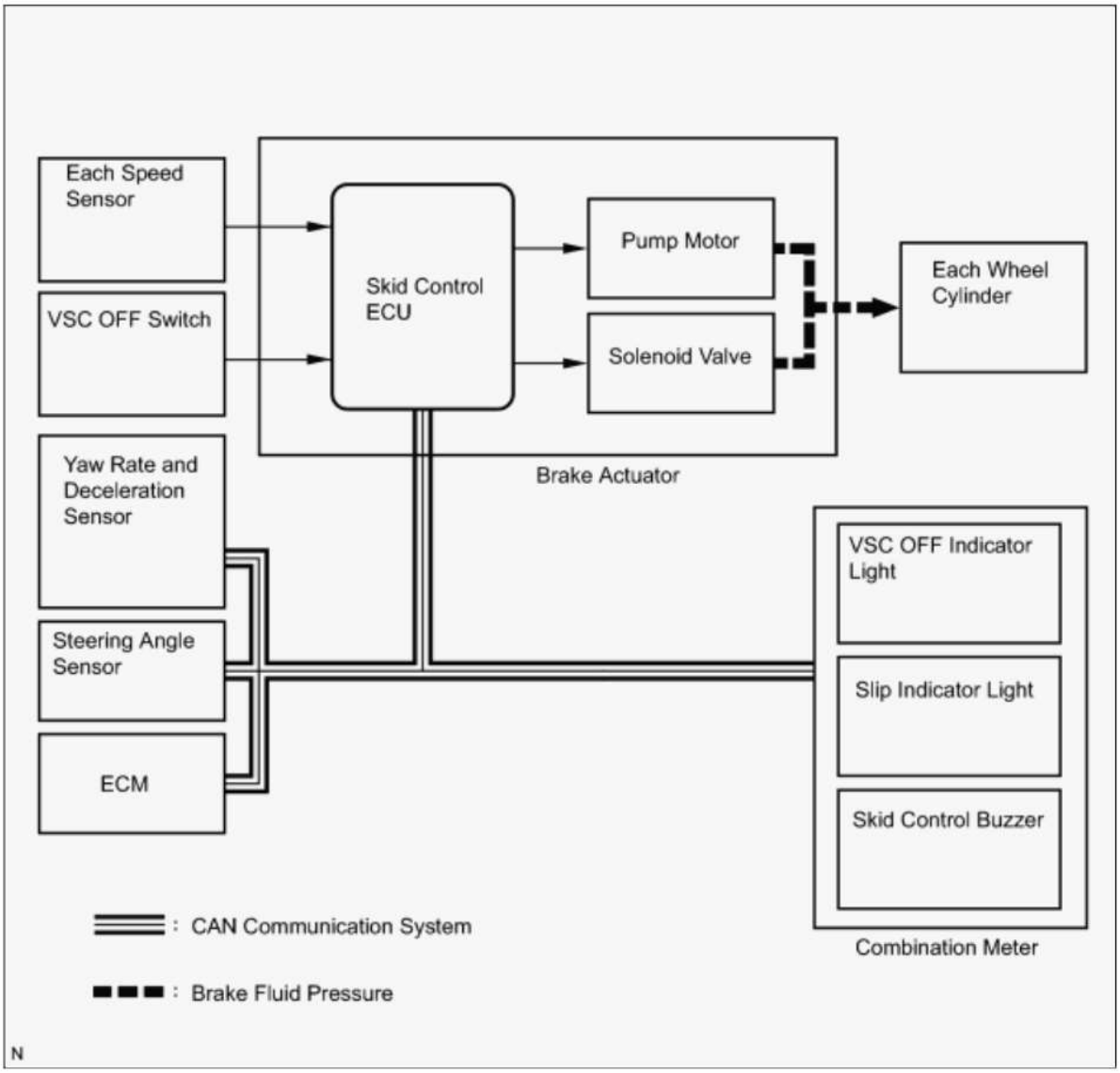
The slip indicator light comes on when the TRAC system malfunctions.

for 4WD: Momentarily pressing the VSC OFF switch stops traction control operation.

(e) VSC (Vehicle Stability Control):

The VSC system helps prevent the vehicle from slipping sideways when front or rear wheel skidding occurs while cornering.

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(1) Operation description:

The skid control ECU determines the vehicle condition by receiving signals from each speed sensor, the yaw rate and deceleration sensor and steering angle sensor. The skid control ECU controls engine torque with the ECM via CAN communication system and brake fluid pressure through the pump and solenoid valve. The slip indicator light blinks and the skid control buzzer sounds when the system is operating.

The slip indicator light comes on when the VSC system malfunctions.

Pushing the VSC OFF switch for 3 seconds or more stops VSC operation and the VSC OFF indicator light comes on.

(f) Downhill Assist Control:

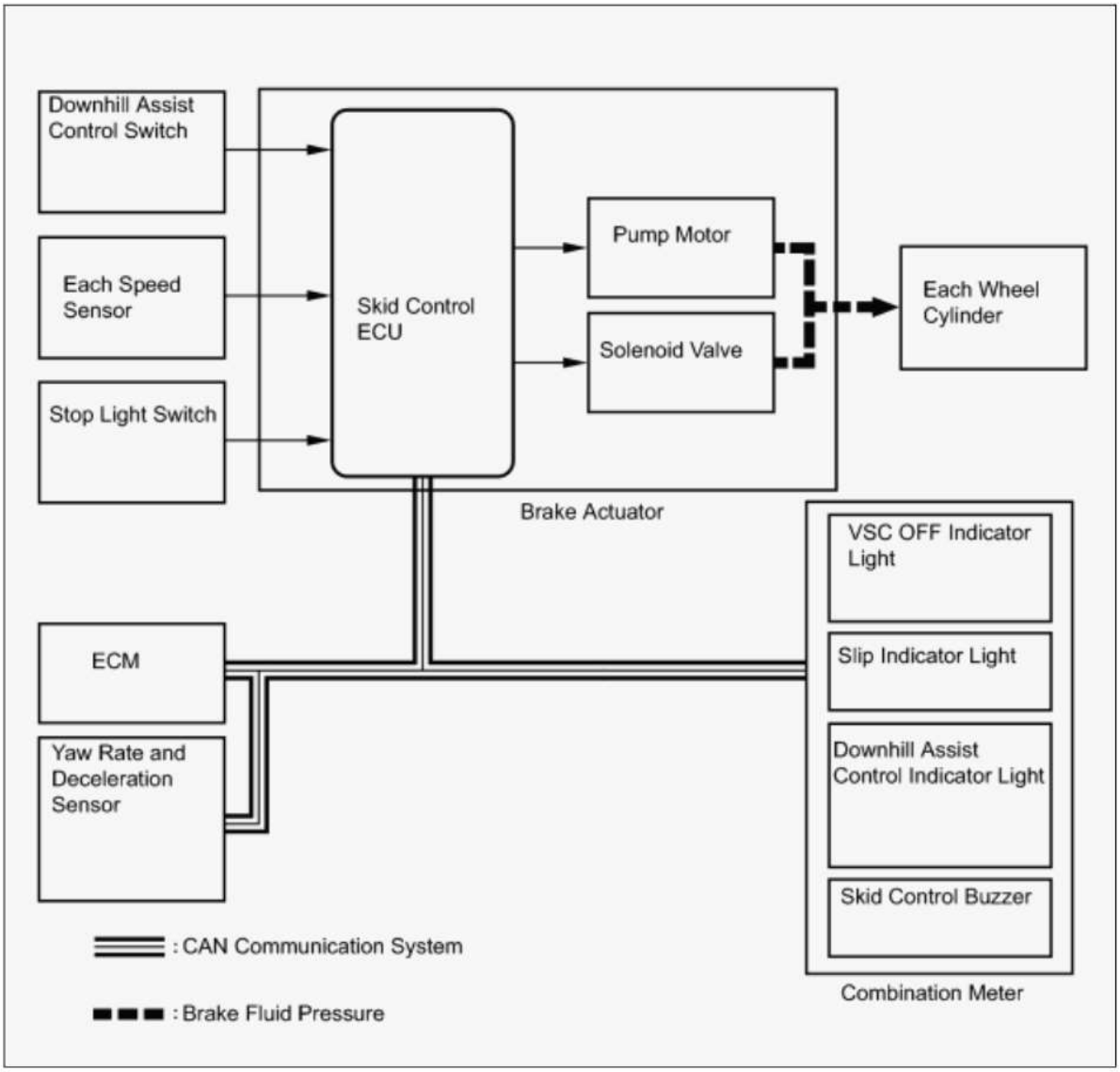
When the downhill assist control switch is pressed with the shift lever in L or R and the accelerator and brake pedals not depressed, downhill assist control is activated. When activated, 4-wheel hydraulic pressure control occurs in order to maintain a constant low vehicle speed without causing the wheels to become locked. Thus, the vehicle can descend a steep hill in a stable manner.

HINT:

- Depressing the accelerator and brake pedal cancels control of the downhill assist control.

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- Downhill assist control begins operating when driving down on a slope at a speed of 25 km/h (16 mph) or less with the engine brake applied.



(1) Operation description:

The slip indicator light blinks and the downhill assist control indicator light comes on when the system is in operation.

The slip indicator light comes on and downhill assist control indicator light blinks to indicate a malfunction in downhill assist control.

(g) Hill-start assist control:

When the vehicle starts off on a steep hill, hill-start assist control performs 4-wheel hydraulic pressure control to prevent the vehicle from rolling backwards.

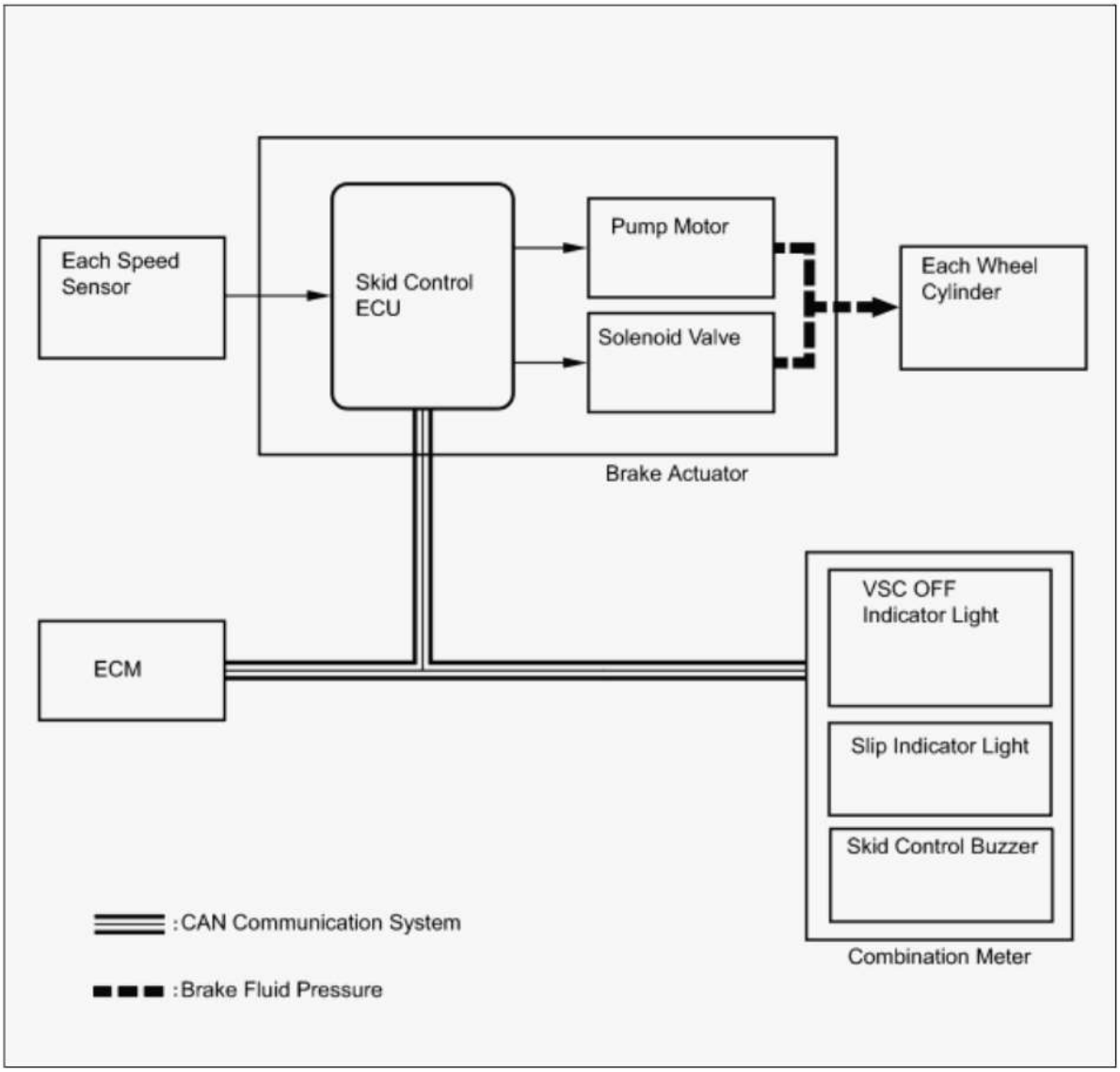
Within 2 seconds after the control starts, fluid pressure is gradually released and control is completed.

HINT:

- Depressing the brake pedal cancels the hill-start assist control.
- Hill-start assist control does not operate when the shift lever is in P, or when the vehicle is running and the

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parking brake lever is pulled or the accelerator pedal is depressed.



(1) Operation description:

When the system is operating, the following occurs: 1) the slip indicator light blinks; and 2) when hill-start assist control operation starts, the skid control buzzer sounds once; when hill-start assist control operation ends, the skid control buzzer sounds twice.

The slip indicator light comes on when the hill-start assist control is malfunctioning.

(h) AUTO LSD (Auto Limited Slip Differential) for 2WD:

The AUTO LSD achieves the equivalent functions of an LSD (Limited Slip Differential) through the use of a traction control system. When the driver momentarily presses the VSC OFF switch, this system achieves the LSD effect by regulating the hydraulic pressure that acts on the drive wheels and controlling the engine output in accordance with the amount of pedal effort applied on the accelerator. The AUTO LSD operates with the VSC OFF switch on and the accelerator pedal depressed.

AUTO LSD restrains brake pressure and reduces differential movement, thus transmitting the drive torque to the other drive wheel to ensure stability under the following conditions:

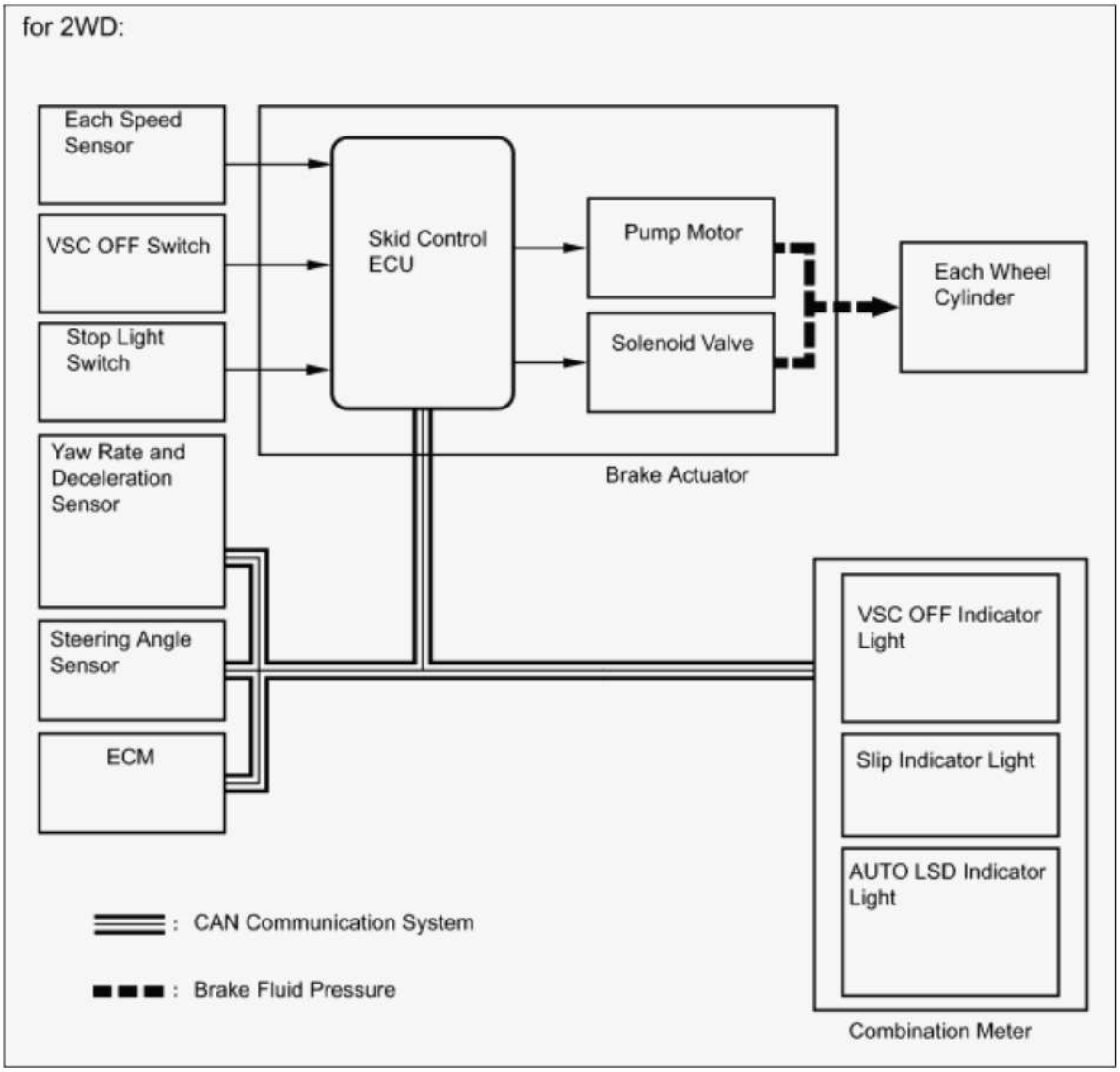
- Wheels run off the road.

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- Drive wheels spin in place when starting on a slope with one wheel on snow/ice.

HINT:

Depressing the brake pedal cancels control of the AUTO LSD system.



(1) Operation description:

The skid control ECU determines that the vehicle is in a state in which the AUTO LSD can operate by using various sensors and switches to detect the operating conditions of the VSC OFF switch, shift position, accelerator pedal, and brake pedal. When the vehicle is in a state in which the AUTO LSD can operate, the skid control ECU performs hydraulic pressure control of the wheel cylinder at the wheel with the faster wheel speed so that the wheel speeds of the right and left drive wheels will become equal.

The slip indicator light blinks and the AUTO LSD indicator light comes on when the system is operating. The slip indicator light come on when the AUTO LSD system malfunctions.

2. COOPERATIVE CONTROL FUNCTION

(a) Description

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(1) Braking when Surface Resistance Differs Between Left and Right Wheels

If the driver suddenly applies the brakes on a road surface with a considerable difference in friction coefficient between the right and left wheels, the difference in the brake force between the right and left wheels will cause the vehicle posture to become unstable and create a yaw movement. In this state, the skid control ECU controls the VSC to stabilize the vehicle posture. At the same time, it performs cooperative control with the EPS to provide steering torque assist, which facilitates the steering maneuvers of the driver to stabilize the vehicle posture.

(2) Accelerating when Surface Resistance Differs Between Left and Right Wheels

If the driver suddenly starts off or accelerates on a road surface with a considerable difference in friction coefficient between the right and left wheels, the slippage of a drive wheel will cause the vehicle posture to become unstable and negatively affect its acceleration performance. In this state, the skid control ECU causes the TRAC to control the hydraulic brake of the slipping drive wheel, and requests the ECM to perform engine output control. At the same time, it performs cooperative control with the EPS to provide steering torque assist, which facilitates the steering maneuvers of the driver to stabilize the vehicle posture.

(3) Front Wheel Skid Tendency

When the skid control ECU determines that there is a front wheel skid tendency, it controls the VSC to dampen the front wheel skid. At the same time, it performs cooperative control with the EPS to provide steering torque assist, which facilitates the steering maneuvers of the driver to stabilize the vehicle posture. To prevent excessive steering maneuvers, it provides a steering torque assist. This assist increases the resistance to counter the driver steering effort, if the driver turns the steering wheel excessively.

(4) Rear Wheel Skid Tendency

When the skid control ECU determines that there is a rear wheel skid tendency, it controls the VSC to dampen the rear wheel skid. At the same time, it performs cooperative control with the EPS to provide steering torque assist, which facilitates the driver steering maneuvers in the direction to correct the rear wheel skid.

(5) Acceleration During Cornering

A sudden acceleration of the vehicle during cornering may cause a drive wheel to freewheel, which could cause the front wheels or rear wheels to skid. If the skid control ECU determines that there is freewheeling of a drive wheel, a front wheel skid tendency, or a rear wheel skid tendency, it performs cooperative control with the 4WD system to optimally control the drive torque distribution to the front and rear wheels. Furthermore, it controls the TRAC and the VSC as needed to ensure driving stability and acceleration performance.

(b) Operation

The operation of the solenoid valves under the cooperative control is the same as the TRAC or VSC operation.

3. ABS WITH EBD, BA, TRAC AND VSC OPERATION

(a) The skid control ECU calculates vehicle stability tendency based on the signals from the 4 wheel speed sensors, the yaw rate and deceleration sensor and the steering angle sensor. In addition, it evaluates the results of the calculations to determine whether any control actions (control of the engine output torque by electronic throttle control and of the brake fluid pressure by the brake actuator) should be implemented.

(b) The slip indicator light blinks and the skid control buzzer sounds to inform the driver that the VSC system is operating. The slip indicator light also blinks when traction control is operating, and the operation being performed is displayed.

4. FAIL-SAFE FUNCTION

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(a) When a failure occurs in the ABS with BA system, the ABS warning light and slip indicator light come on and the operations of the system are prohibited. When a failure occurs in the TRAC and VSC systems, the slip indicator light comes on and the operations of the system are prohibited. In addition to this, when a failure which disables the EBD operation occurs, the BRAKE warning light and ABS warning light come on and the EBD operation is prohibited.

(b) If control is prohibited due to a malfunction during operation, control is disabled gradually to avoid sudden vehicle instability.

5. INITIAL CHECK

(a) When the vehicle speed first reaches approximately 6 km/h (4 mph) or more after the ignition switch is turned to ON, each solenoid valve and the motor of the brake actuator are sequentially activated to perform electrical checks. During the initial check, the operating sound of the solenoid valve and motor can be heard from the engine compartment, but this does not indicate a malfunction.

6. SERVICE MODE

(a) VSC operation can be disabled by operating the Techstream.

HINT:

Refer to the Techstream operator manual for further details.

7. FUNCTION OF COMPONENTS

COMPONENT	FUNCTION
Speed Sensor (Semiconductor Type)	Detects the wheel speed and sends the signal to skid control ECU.
Skid Control ECU (Housed in brake actuator)	• Processes the signals from each sensor to control the ABS, EBD, BA, TRAC, and VSC. • Sends and receives control signals to and from the ECM, yaw rate and deceleration sensor, steering angle sensor, etc. via CAN communication system.
Brake actuator	• Consists of the master cylinder cut solenoid valve, holding solenoid valve, pressure reduction solenoid valve, pump motor, and reservoir, and adjusts the brake fluid pressure applied to each wheel cylinder. • Houses the skid control ECU.
Solenoid Relay	• Supplies power to each solenoid. • Housed in the skid control ECU.
Motor Relay (VSC MTR Relay)	• Supplies power to the pump motor. • Housed in the skid control ECU.
Fail-safe Relay (VSC FAIL Relay)	• Cuts off power to the motor when the pump motor circuit malfunctions. • Housed in the skid control ECU.

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COMPONENT		FUNCTION
Steering Angle Sensor		• Detects the steering extent and direction and sends signals to the skid control ECU via CAN communication system. • Has a magnetic resistance element which detects the rotation of the magnet housed in the detection gear in order to detect the changes in magnetic resistance and the steering amount and direction.
Yaw Rate and Deceleration Sensor		• Yaw rate sensor detects the vehicle angular velocity (yaw rate) in the vertical direction based on the extent and direction of the deflection of the piezoelectric ceramics. • Deceleration sensor measures the capacity of the condenser that changes the distance between the electrodes depending on G force, which occurs when the vehicle is accelerated, and converts the measured value into electrical signals. • Sends signals to the skid control ECU via CAN communication system.
Master Cylinder Pressure Sensor		• Detects the brake fluid pressure in the master cylinder. • Housed in the brake actuator.
ECM		Controls the engine output when TRAC and VSC are operating with the skid control ECU via CAN communication system.
Downhill Assist Control Switch*1		Allows the driver to turn downhill assist control ON and OFF.
VSC OFF Switch		for 2WD: Pressing this switch turns on AUTO LSD and pressing and holding this switch turns off TRAC and VSC. for 4WD: Pressing this switch turns off TRAC and pressing and holding this switch turns off TRAC and VSC.
Combination Meter	ABS Warning Light	• Illuminates to inform the driver that a malfunction in the ABS or EBD has occurred. • Blinks to indicate DTCs that relate to the ABS.
	VSC OFF Indicator Light	Illuminates to inform the driver when VSC OFF mode is entered using the VSC OFF switch.
	BRAKE Warning Light	• Illuminates to inform the driver that the parking brake is ON when the system is normal, and when the brake fluid has decreased. • Illuminates to inform the driver that a malfunction in the EBD has occurred.
	Slip Indicator Light	• Blinks to inform the driver that TRAC, VSC, downhill assist control and hill-start assist control are operating. • Illuminates to inform the driver that a malfunction has occurred in the ABS, BA, TRAC or VSC system. • Blinks to indicate DTCs that relate to the VSC.

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COMPONENT		FUNCTION
	AUTO LSD Indicator Light*2	Illuminates to inform the driver when AUTO LSD operation is possible.
	TRAC OFF Indicator Light*3	Illuminates to inform the driver when the vehicle is in TRAC OFF mode.
	Downhill Assist Control Indicator Light*1	Illuminates to inform the driver when downhill assist control operation is possible.
	Skid Control Buzzer	• Intermittently sounds to inform the driver that the VSC is operating. • Housed in the combination meter.

HINT:

***1: w/ Downhill Assist Control**

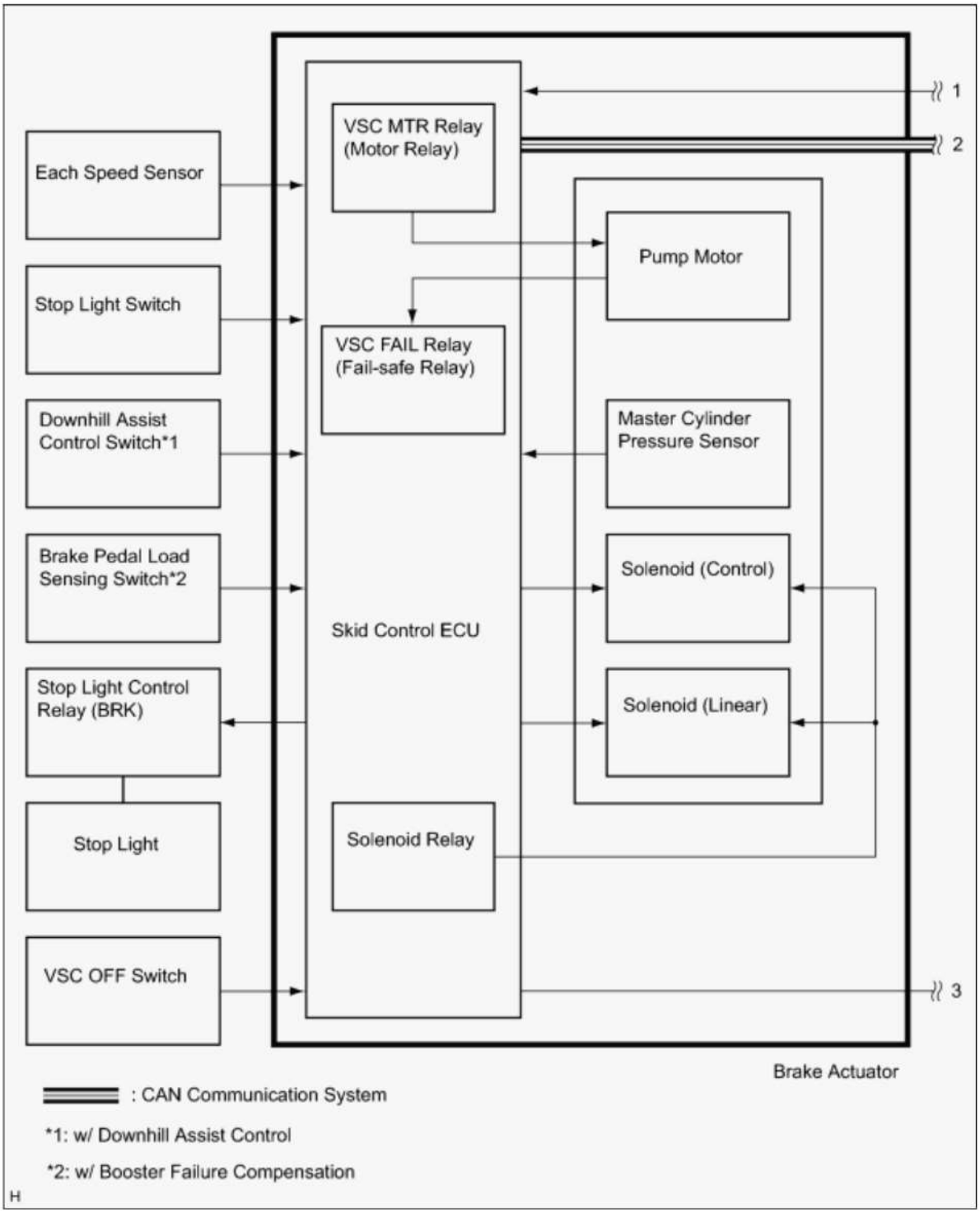
***2: for 2WD**

***3: for 4WD**

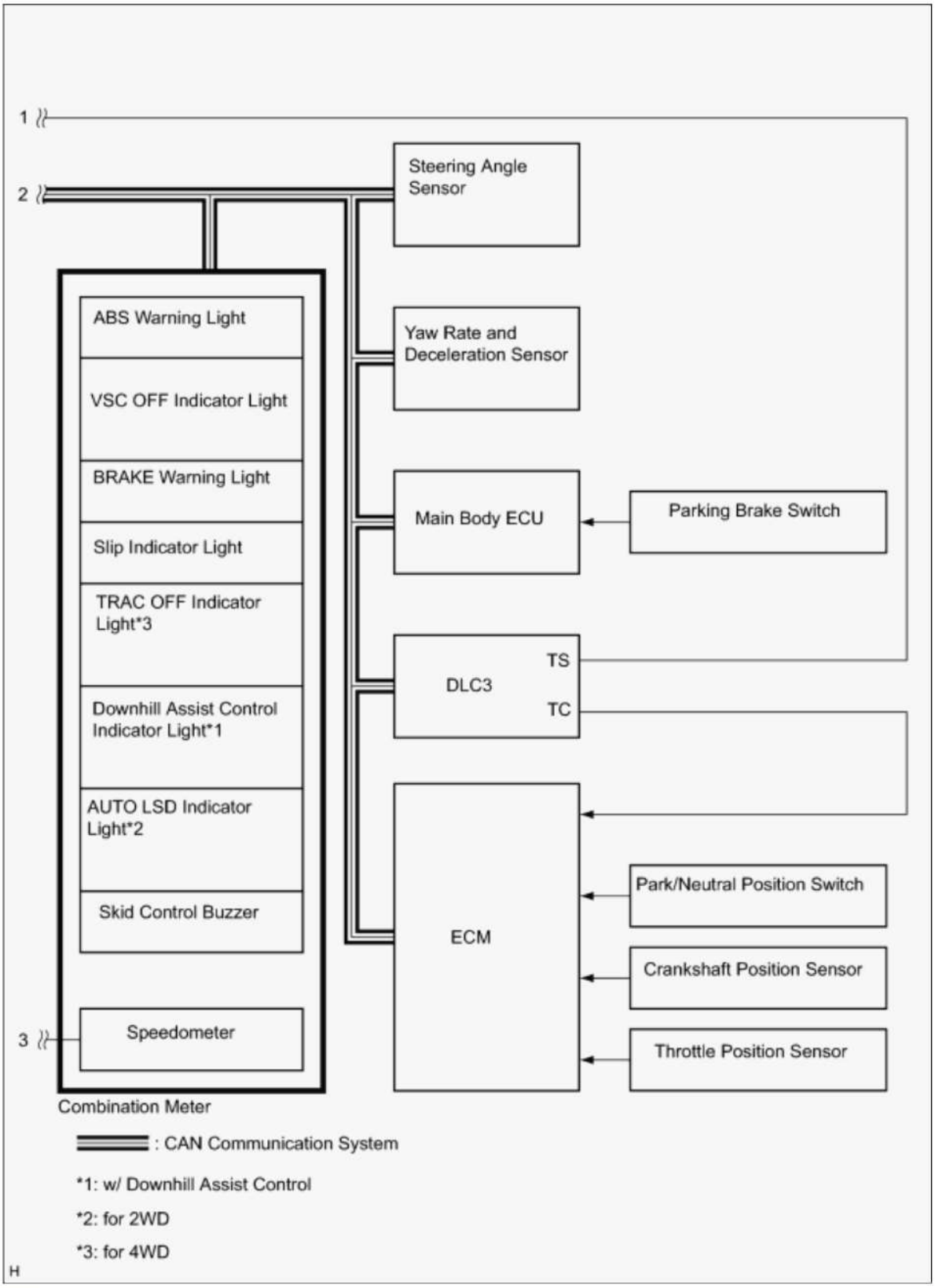
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Last Modified: 9-7-2011	6.4 U	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000OND01NX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: SYSTEM DIAGRAM (2011 RAV4)		

SYSTEM DIAGRAM



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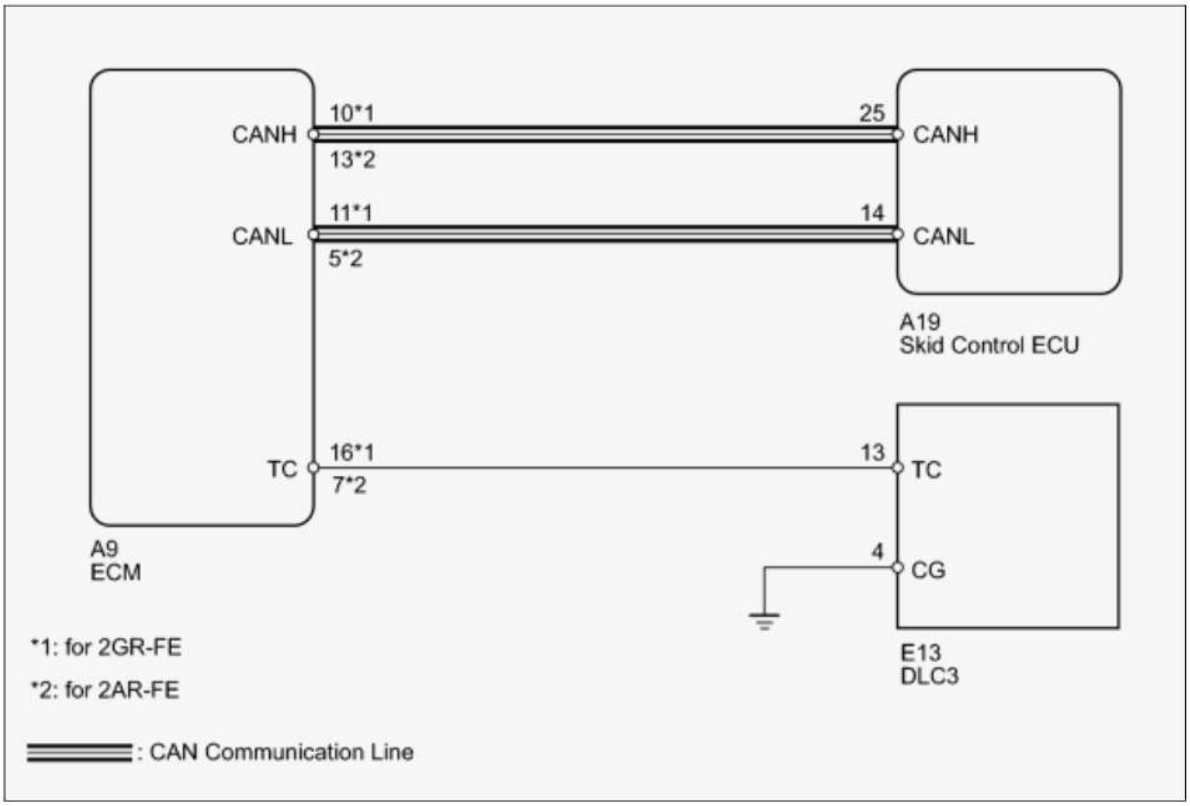
Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000OSL02CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TC and CG Terminal Circuit (2011 RAV4)		

TC and CG Terminal Circuit

DESCRIPTION

Connecting terminals 13 (TC) and 4 (CG) of the DLC3 causes the skid control ECU to output 2-digit DTCs by flashing the ABS warning light/slip indicator light.

WIRING DIAGRAM



INSPECTION PROCEDURE

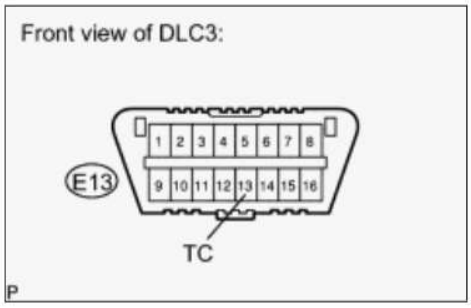
NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK DLC3 (TC VOLTAGE)**

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(a) Turn the ignition switch to ON.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
E13-13 (TC) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **CHECK HARNESS AND CONNECTOR (DLC3 - ECM)**

OK ▼

2.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

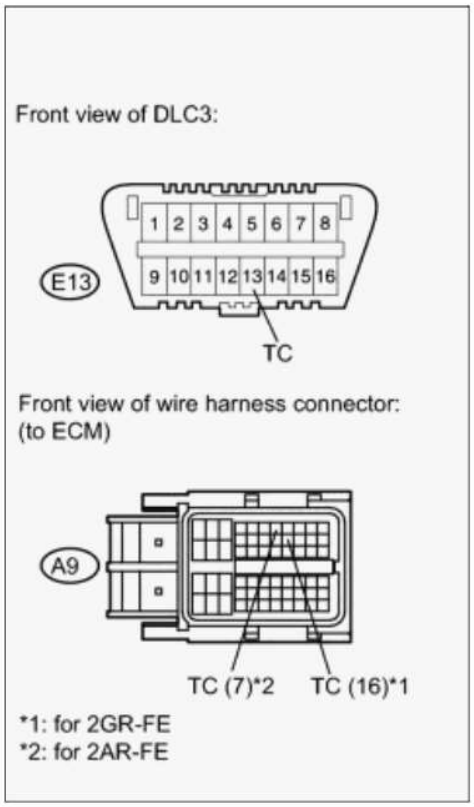
B ▶ **REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

A ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

3.	**CHECK HARNESS AND CONNECTOR (DLC3 - ECM)**

(a) Turn the ignition switch off.

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(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for 2GR-FE:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E13-13 (TC) - A9-16 (TC)	Always	Below 1 Ω
A9-16 (TC) - Body ground	Always	10 kΩ or higher

for 2AR-FE:

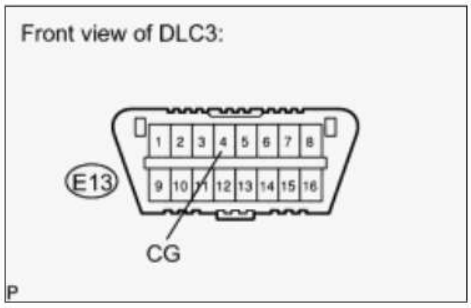
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E13-13 (TC) - A9-7 (TC)	Always	Below 1 Ω
A9-7 (TC) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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4.	CHECK HARNESS AND CONNECTOR (DLC3 - BODY GROUND)



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E13-4 (CG) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

A ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

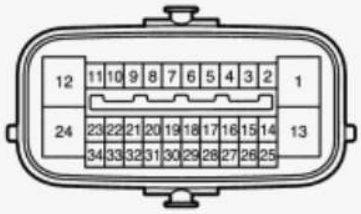
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Last Modified: 9-7-2011	6.4 U	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000ONH01QX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TERMINALS OF ECU (2011 RAV4)		

TERMINALS OF ECU

1. SKID CONTROL ECU

Component without harness connected:
(Skid Control ECU)



TERMINAL NO. (SYMBOL)	TERMINAL DESCRIPTION
1 (GND1)	Skid control ECU ground
2 (STP)	Stop light switch input
4 (RL-)	Rear LH wheel speed signal input
5 (RL+)	Rear LH wheel speed sensor power supply
6 (FR-)	Front RH wheel speed signal input
7 (FR+)	Front RH wheel speed sensor power supply
11 (SP1)	Speed signal output for speedometer
12 (+BS)	Solenoid valve power supply
13 (GND2)	Motor ground
14 (CANL)	CAN communication line L
16 (RR-)	Rear RH wheel speed signal input
17 (RR+)	Rear RH wheel speed signal power supply
18 (FL-)	Front LH wheel speed signal input
19 (FL+)	Front LH wheel speed sensor power supply
22 (STP2)	Stop light control relay input
24 (BM)	Motor power supply
25 (CANH)	CAN communication line H
27 (FSW+)*1	Brake pedal load sensing switch input

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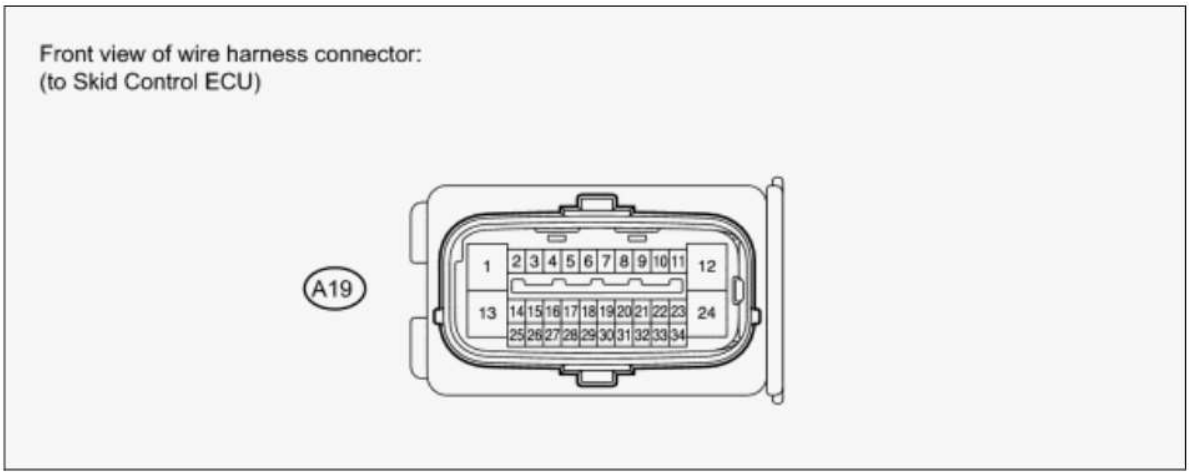
TERMINAL NO. (SYMBOL)	TERMINAL DESCRIPTION
29 (HDCS)*2	Downhill assist control switch input
30 (CSW)	VSC OFF switch input
31 (STPO)	Stop light control relay output
33 (TS)	Sensor diagnosis check input
34 (IG1)	ECU power supply

HINT:

***1: w/ Booster Failure Compensation**

***2: w/ Downhill Assist Control**

2. CHECK SKID CONTROL ECU



(a) Disconnect the A19 ECU connector.

(b) Measure the voltage and resistance of the wire harness side connector.

HINT:

The voltage cannot be measured with the connector connected to the skid control ECU as the connector is water resistant.

Skid Control ECU:

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A19-1 (GND1) - Body ground	W-B - Body ground	Skid control ECU ground	Always	Below 1 Ω
A19-2 (STP) - Body ground	L - Body ground	Stop light switch input	Stop light switch off Brake pedal released	Below 1.5 V
			Stop light switch on Brake pedal depressed	8 to 14 V

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TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A19-12 (+BS) - Body ground	W - Body ground	Solenoid valve power supply	Always	11 to 14 V
A19-13 (GND2) - Body ground	W-B - Body ground	Motor ground	Always	Below 1 Ω
A19-22 (STP2) - Body ground	L - Body ground	Stop light control relay input	Stop light switch off Brake pedal released	Below 1.5 V
			Stop light switch on Brake pedal depressed	8 to 16 V
A19-24 (BM) - Body ground	B - Body ground	Motor power supply	Always	11 to 14 V
A19-27 (FSW+)*1 - Body ground	P - Body ground	Brake pedal load sensing switch input	Brake pedal load sensing switch on Brake pedal not depressed beyond the specified point	192 to 234 Ω
			Brake pedal load sensing switch off Brake pedal depressed beyond the specified point	0.9 to 1.1 kΩ
A19-29 (HDCS)*2 - Body ground	Y - Body ground	Downhill assist control switch input	Downhill assist control switch on	Below 1 Ω
			Downhill assist control switch off	10 kΩ or higher
A19-30 (CSW) - Body ground	L - Body ground	VSC OFF switch input	VSC OFF switch on	Below 1 Ω
			VSC OFF switch off	10 kΩ or higher
A19-31 (STPO) - Body ground	W - Body ground	Stop light control relay output	Ignition switch ON	11 to 14 V
A19-34 (IG1) - Body ground	L - Body ground	ECU power supply	Ignition switch ON	11 to 14 V

HINT:

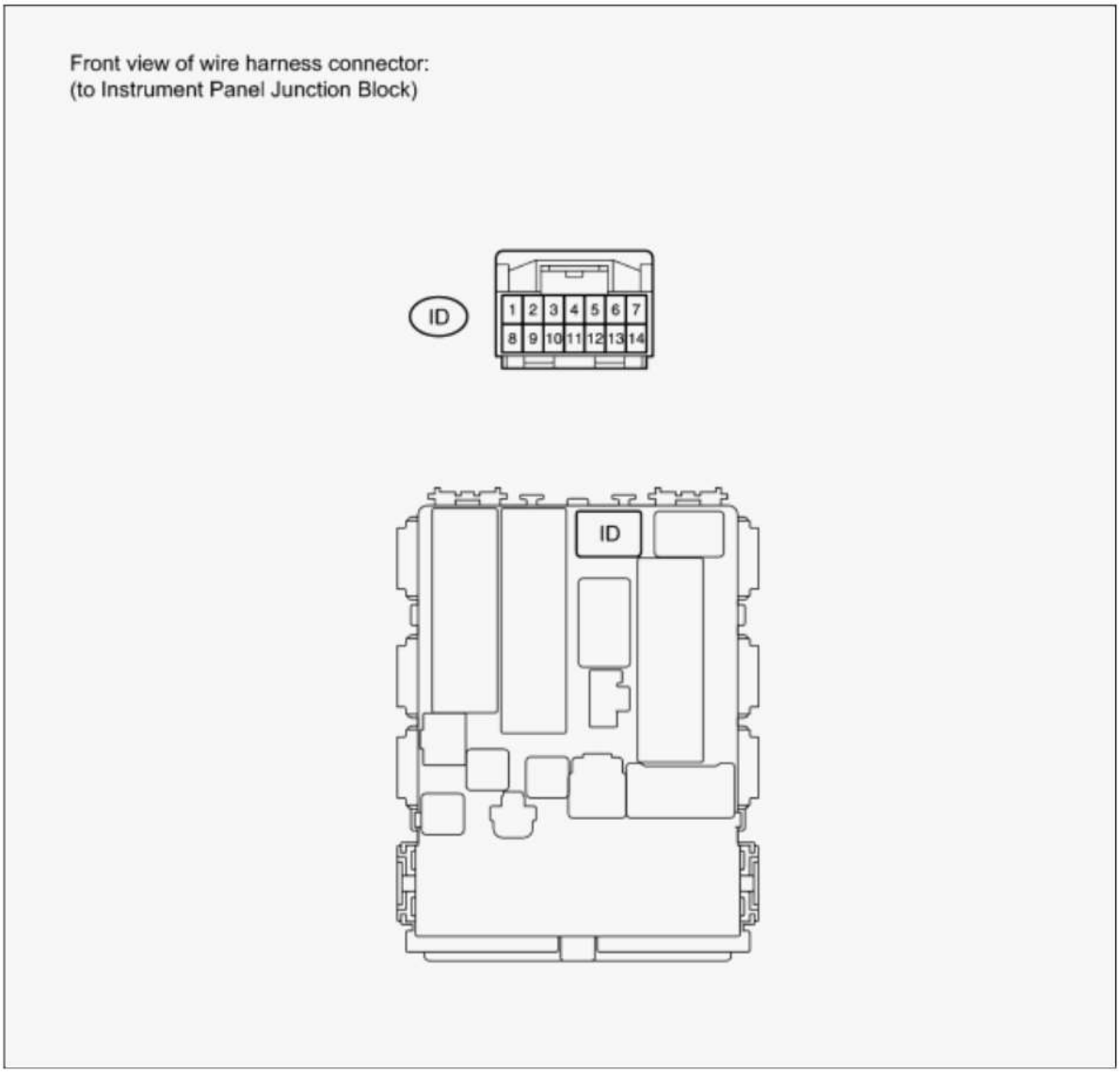
***1: w/ Booster Failure Compensation**

***2: w/ Downhill Assist Control**

If the result is not as specified, there may be a malfunction on the wire harness side.

3. CHECK INSTRUMENT PANEL JUNCTION BLOCK (MAIN BODY ECU)

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(a) Disconnect the ID junction block connector.

(b) Measure the resistance of the wire harness side connector.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
ID-4 (PKB) - Body ground	B - Body ground	Parking brake switch input	Parking brake switch on	Below 1 Ω
			Parking brake switch off	10 kΩ or higher

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the ID junction block connector.

(d) Measure the voltage of the wire harness side connector.

TERMINAL NO.	WIRING	TERMINAL	CONDITION	SPECIFIED

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(SYMBOL)	COLOR	DESCRIPTION		CONDITION
ID-4 (PKB) - Body ground	B - Body ground	Parking brake switch input	Parking brake switch on	Below 1 V
			Parking brake switch off	11 to 14 V

If the result is not as specified, the junction block (main body ECU) may be a malfunction.

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Last Modified: 9-7-2011	6.4 D	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000022CZ00CX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TEST MODE PROCEDURE (2011 RAV4)		

TEST MODE PROCEDURE

NOTICE:

VSC operation is prohibited while in test mode.

HINT:

- By switching the skid control ECU from normal mode to test mode, abnormality detection sensitivity is enhanced and troubleshooting can be conducted efficiently.
- Perform a sensor check in test mode after the speed sensor or sensor rotor has been repaired or replaced.
- If the ignition switch is turned from ON to ACC or off during test mode, DTCs related to the signal check function will be cleared.
- During test mode, the skid control ECU stores all DTCs related to the signal check function, and the DTCs are cleared if normality is confirmed. Any remaining DTCs are those indicating abnormalities that were found.

1. CHECK SENSOR SIGNAL BY TEST MODE (When Using Techstream)

(a) Procedures for test mode:

(1) Turn the ignition switch off.

(2) Check that the steering wheel is in the centered position.

(3) Check that the shift lever is in P and apply the parking brake.

(4) Connect the Techstream to the DLC3.

(5) Turn the ignition switch to ON.

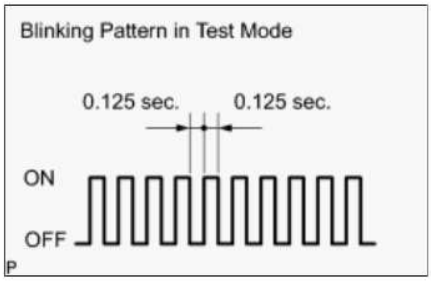
(6) Turn the Techstream on.

(7) Set the Techstream to test mode (select "Signal Check").

HINT:

Refer to the Techstream operator manual for further details.

(8) Check that the ABS warning light and slip indicator light blink as shown in the illustration.



HINT:

If the ABS warning light and slip indicator light do not blink, check the TS and CG terminal circuit, and the ABS and slip indicator light circuits.

SECTION TITLE	SEE PROCEDURE
ABS Warning Light does not Come ON	INFO
Slip Indicator Light does not Come ON	INFO

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SECTION TITLE	SEE PROCEDURE
TS and CG Terminal Circuit	INFO

(9) Start the engine.

(b) w/ Downhill Assist Control:

Check the lost booster pressure judgment and perform the master cylinder pressure sensor zero point calibration.

NOTICE:

Perform the check in the lost booster pressure state (negative pressure in the booster is depressurized).

(1) Turn the ignition switch to ON.

(2) Check that the BRAKE warning light comes on when depressing the brake pedal with a force of 59 N (6 kgf, 13.2 lbf) or more for 1 second or more (lost booster pressure judgment).

(3) Start the engine while depressing the brake pedal with a force of 59 N (6 kgf, 13.2 lbf) or more.

(4) Check that the BRAKE warning light goes off when quickly releasing the brake pedal (normal booster pressure judgment).

(5) Leave the vehicle for 1 second or more (master cylinder pressure sensor zero point calibration).

NOTICE:

- If you slowly depress the brake pedal or depress it again, master cylinder pressure sensor zero point calibration is not performed normally.
- If the lost booster pressure judgment check is not completed normally, the master cylinder pressure sensor check is not judged.
- If a recheck is performed after the engine has started, end the test mode, enter test mode again, and release the vacuum in the booster by pumping the brake pedal prior to the recheck.

(c) Check the deceleration sensor.

(1) Keep the vehicle stationary on a level surface for 1 second or more.

HINT:

The deceleration sensor check can be performed together with the following master cylinder pressure sensor check.

(d) Check the master cylinder pressure sensor.

(1) Leave the vehicle in a stationary condition and release the brake pedal for 1 second or more, and quickly depress the brake pedal with a force of 98 N (10 kgf, 22 lbf) or more for 1 second.

Check that the ABS warning light remains illuminated for 3 seconds.

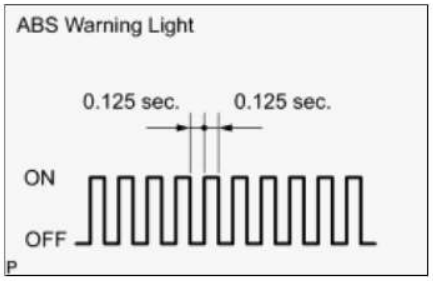
HINT:

- Ensure that the ABS warning light comes on.
- While the ABS warning light remains illuminated, continue depressing the brake pedal with a force of 98 N (10 kgf, 22 lbf) or more.
- The ABS warning light comes on for 3 seconds every time the brake pedal operation above is performed.

(e) Check the speed sensor.

(1) Check that the ABS warning light is blinking as shown in the illustration.

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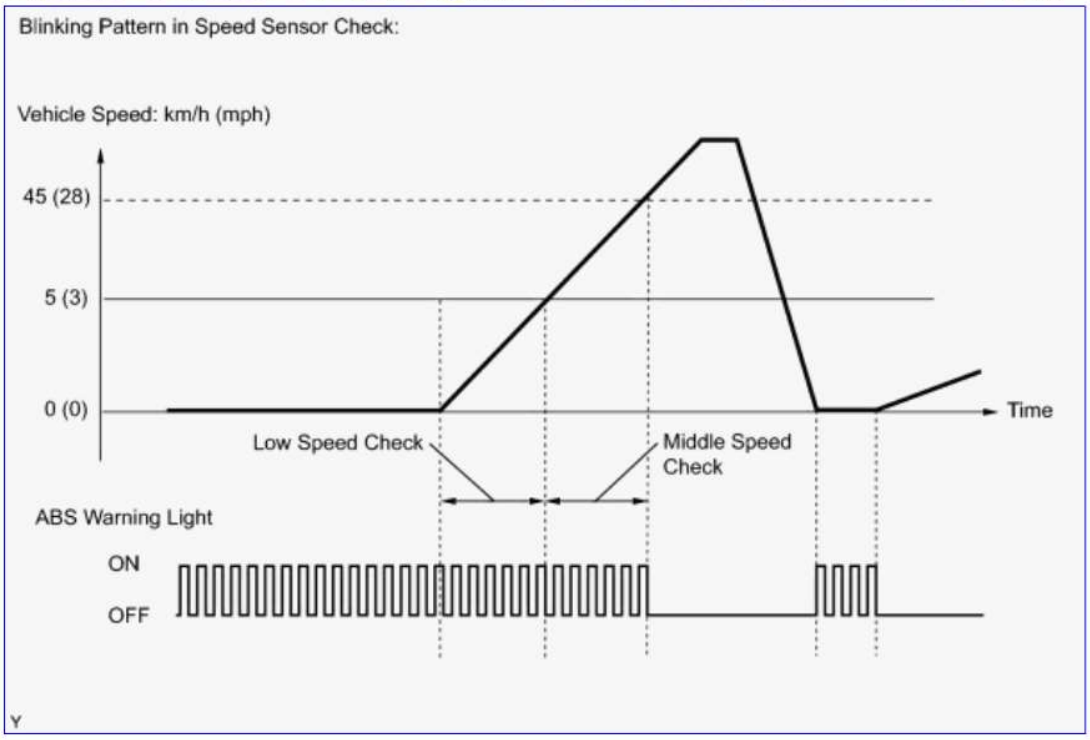


(2) Check the speed sensor signal.

1. Drive the vehicle straight forward at a speed of 45 km/h (28 mph) or more for several seconds.
2. Check that the ABS warning light goes off.

NOTICE:

- The speed sensor check may not be completed if the sensor check is started with the steering wheel turned or one or more wheels spinning.
- If the speed sensor check is commenced while the steering wheel is turned, the ABS warning light may not turn off after the middle speed sensor check is finished.
- The ABS warning light comes on immediately when an abnormality is detected.
- When the speed sensor signal is normal, the ABS warning light goes off while driving at 45 km/h (28 mph) or more, and blinks in the test mode pattern while the vehicle is stationary.
- Do not drive the vehicle at a speed of 80 km/h (50 mph) or more after the ABS warning light turns off, because test mode DTCs are stored again when the vehicle speed exceeds 80 km/h (50 mph).



HINT:

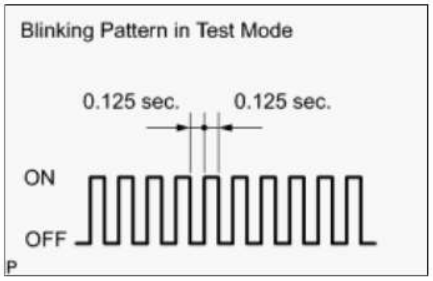
When there is a speed sensor malfunction, or when the deceleration sensor and master cylinder pressure sensor check is incomplete, the illumination condition differs from that shown above.

3. Stop the vehicle.

(f) Check the yaw rate sensor.

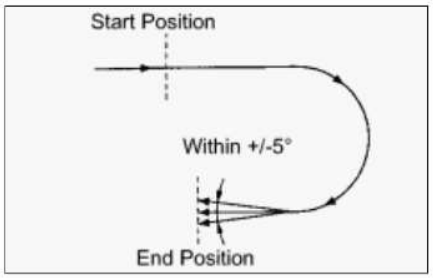
(1) Move the shift lever to P and pull the parking brake lever.

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(2) Check that the slip indicator light is blinking as shown in the illustration.

(3) Keep the vehicle stationary on a level surface for 1 second or more.



(4) Move the shift lever to D and drive the vehicle at a speed of 5 km/h (3 mph) or more, and turn the steering wheel either to the left or right 90° or more for 1 second or more to turn the vehicle through 180°.

NOTICE:

It is possible to change the vehicle speed, stop the vehicle and drive in reverse while turning. However, do not turn the ignition switch off or move the shift lever to P.

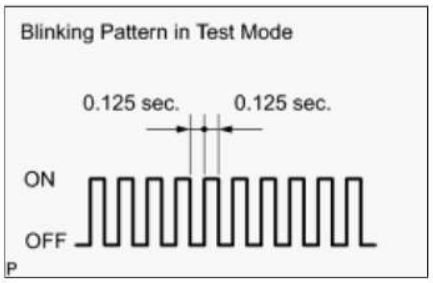
(5) Stop the vehicle, move the shift lever to P, and then apply the parking brake.

(6) Check that the skid control buzzer sounds for 3 seconds.

HINT:

- If the skid control buzzer sounds, the signal check has been completed normally.
- If the skid control buzzer does not sound, check the skid control buzzer circuit INFO .
- If the skid control buzzer still does not sound, there is a malfunction in the yaw rate sensor, so check for DTCs.
- Drive the vehicle in a 180° semi circle. At the end of the turn, the direction of the vehicle should be within 180 +/-5° of its start position.
- Complete the vehicle turn within 20 seconds.
- Do not spin the wheels.

(g) Check the VSC OFF switch.



(1) Check that the slip indicator light is blinking as shown in the illustration.

(2) for 2WD: Check that the AUTO LSD indicator light turns on when the VSC OFF switch is pressed briefly.

(3) for 4WD: Check that the TRAC OFF indicator light turns off when the VSC OFF switch is pressed briefly.

(4) Briefly press the VSC OFF switch again.

(h) Check the completion of sensor check.

(1) When the sensor check is successfully completed, the ABS warning light blinks in the test mode pattern when the vehicle is stopped, and goes off when the vehicle is driven.

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NOTICE:

If the sensor check is not completed, the ABS warning light blinks even while the vehicle is driving and the ABS does not operate.

(i) Read the DTCs of signal check function.

(1) Read the DTC(s) by following the instructions on the Techstream screen.

NOTICE:

- If only the DTCs are output, repair the malfunction area and clear the DTCs.
- If the DTCs or test mode codes (DTC of signal check function) are output, repair the malfunction area, clear the DTCs and perform the test mode procedures again.

HINT:

See the list of the DTCs (refer to "DTC OF TEST MODE FUNCTION (SIGNAL CHECK)" below).

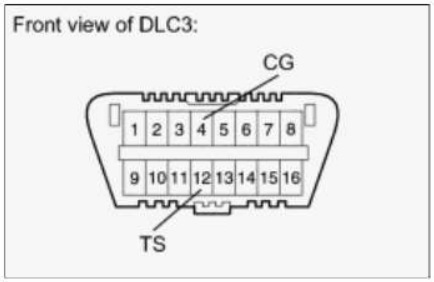
2. CHECK SENSOR SIGNAL BY TEST MODE (When not Using Techstream)

(a) Procedures for test mode:

(1) Turn the ignition switch off.

(2) Check that the steering wheel is in the centered position.

(3) Check that the shift lever is in P and apply the parking brake.

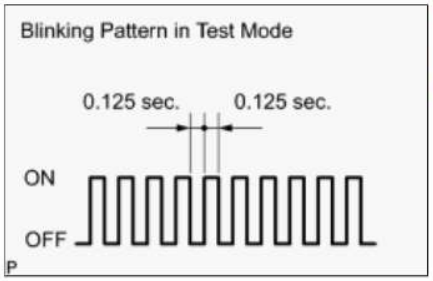


(4) Using SST, connect terminals 12 (TS) and 4 (CG) of the DLC3.

SST: 09843-18040

(5) Turn the ignition switch to ON.

(6) Check that the ABS warning light and slip indicator light blink as shown in the illustration.



HINT:

If the ABS warning light and slip indicator light do not blink, check the TS and CG terminal circuit, and the ABS and slip indicator light circuits.

SECTION TITLE	SEE PROCEDURE
ABS Warning Light does not Come ON	INFO
Slip Indicator Light does not Come ON	INFO
TS and CG Terminal Circuit	INFO

(7) Start the engine.

(b) w/ Downhill Assist Control:

Check the lost booster pressure judgment and perform the master cylinder pressure sensor zero point calibration.

NOTICE:

Perform the check in the lost booster pressure state (negative pressure in the booster is depressurized).

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(1) Turn the ignition switch to ON.

(2) Check that the BRAKE warning light comes on when depressing the brake pedal with a force of 59 N (6 kgf, 13.2 lbf) or more for 1 second or more (lost booster pressure judgment).

(3) Start the engine while depressing the brake pedal with a force of 59 N (6 kgf, 13.2 lbf) or more.

(4) Check that the BRAKE warning light goes off when quickly releasing the brake pedal (normal booster pressure judgment).

(5) Leave the vehicle for 1 second or more (master cylinder pressure sensor zero point calibration).

NOTICE:

- If you slowly depress the brake pedal or depress it again, master cylinder pressure sensor zero point calibration is not performed normally.
- If the lost booster pressure judgment check is not completed normally, the master cylinder pressure sensor check is not judged.
- If a recheck is performed after the engine has started, end the test mode, enter test mode again, and release the vacuum in the booster by pumping the brake pedal prior to the recheck.

(c) Check the deceleration sensor.

(1) Keep the vehicle stationary on a level surface for 1 second or more.

HINT:

The deceleration sensor check can be performed together with the following master cylinder pressure sensor check.

(d) Check the master cylinder pressure sensor.

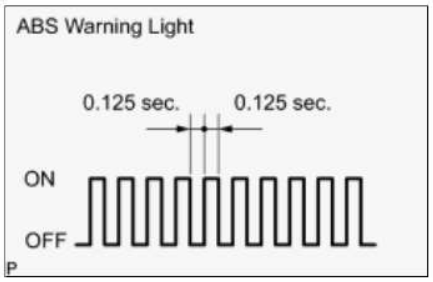
(1) Leave the vehicle in a stationary condition and release the brake pedal for 1 second or more, and quickly depress the brake pedal with a force of 98 N (10 kgf, 22 lbf) or more for 1 second.

Check that the ABS warning light remains illuminated for 3 seconds.

HINT:

- Ensure that the ABS warning light comes on.
- While the ABS warning light remains illuminated, continue depressing the brake pedal with a force of 98 N (10 kgf, 22 lbf) or more.
- The ABS warning light comes on for 3 seconds every time the brake pedal operation above is performed.

(e) Check the speed sensor.



(1) Check that the ABS warning light is blinking as shown in the illustration.

(2) Check the speed sensor signal.

1. Drive the vehicle straight forward at a speed of 45 km/h (28 mph) or more for several seconds.
2. Check that the ABS warning light goes off.

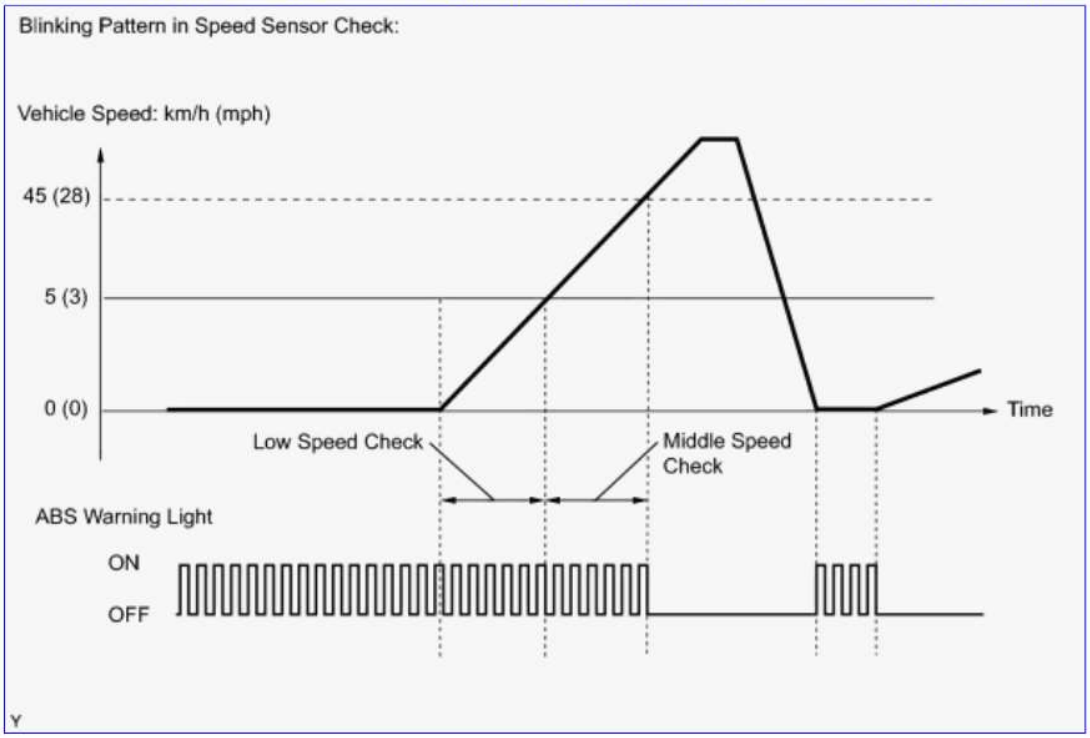
NOTICE:

- The speed sensor check may not be completed if the sensor check is started with the steering wheel turned or one or more wheels spinning.
- If the speed sensor check is commenced while the steering wheel is turned, the ABS warning light

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may not turn off after the middle speed sensor check is finished.

- The ABS warning light comes on immediately when an abnormality is detected.
- When the speed sensor signal is normal, the ABS warning light goes off while driving at 45 km/h (28 mph) or more, and blinks in the test mode pattern while the vehicle is stationary.
- Do not drive the vehicle at a speed of 80 km/h (50 mph) or more after the ABS warning light turns off, because test mode DTCs are stored again when the vehicle speed exceeds 80 km/h (50 mph).



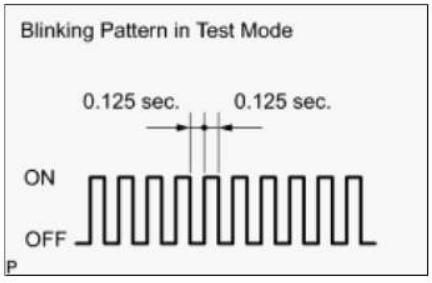
HINT:

When there is a speed sensor malfunction, or when the deceleration sensor and master cylinder pressure sensor check is incomplete, the illumination condition differs from that shown above.

3. Stop the vehicle.

(f) Check the yaw rate sensor.

(1) Move the shift lever to P and pull the parking brake lever.



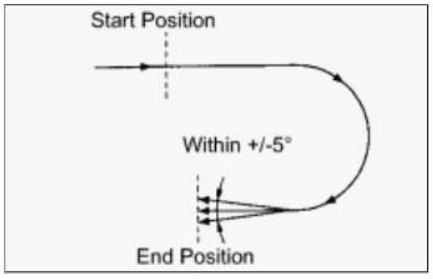
(2) Check that the slip indicator light is blinking as shown in the illustration.

(3) Keep the vehicle stationary on a level surface for 1 second or more.

(4) Move the shift lever to D and drive the vehicle at a speed of 5 km/h (3 mph) or more, and turn the steering wheel either to the left or right 90° or more for 1 second or more to turn the vehicle through 180°.

NOTICE:

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It is possible to change the vehicle speed, stop the vehicle and drive in reverse while turning. However, do not turn the ignition switch off or move the shift lever to P.

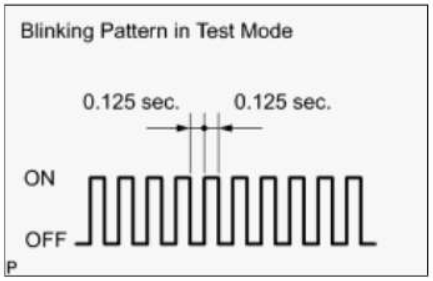
(5) Stop the vehicle, move the shift lever to P, and then apply the parking brake.

(6) Check that the skid control buzzer sounds for 3 seconds.

HINT:

- If the skid control buzzer sounds, the signal check has been completed normally.
- If the skid control buzzer does not sound, check the skid control buzzer circuit INFO .
- If the skid control buzzer still does not sound, there is a malfunction in the yaw rate sensor, so check for DTCs.
- Drive the vehicle in a 180° semi circle. At the end of the turn, the direction of the vehicle should be within 180 +/-5° of its start position.
- Complete the vehicle turn within 20 seconds.
- Do not spin the wheels.

(g) Check the VSC OFF switch.



(1) Check that the slip indicator light is blinking as shown in the illustration.

(2) for 2WD: Check that the AUTO LSD indicator light turns on when the VSC OFF switch is pressed briefly.

(3) for 4WD: Check that the TRAC OFF indicator light turns off when the VSC OFF switch is pressed briefly.

(4) Briefly press the VSC OFF switch again.

(h) Check the completion of sensor check.

(1) When the sensor check is successfully completed, the ABS warning light blinks in the test mode pattern when the vehicle is stopped, and goes off when the vehicle is driven.

NOTICE:

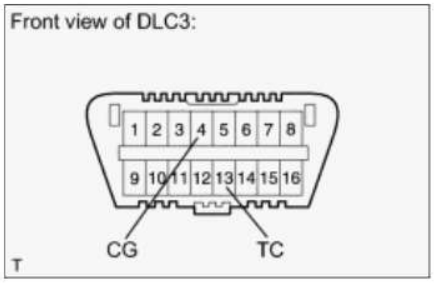
If the sensor check is not completed, the ABS warning light blinks even while the vehicle is driving and the ABS does not operate.

(i) Read the DTCs of the signal check function.

(1) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

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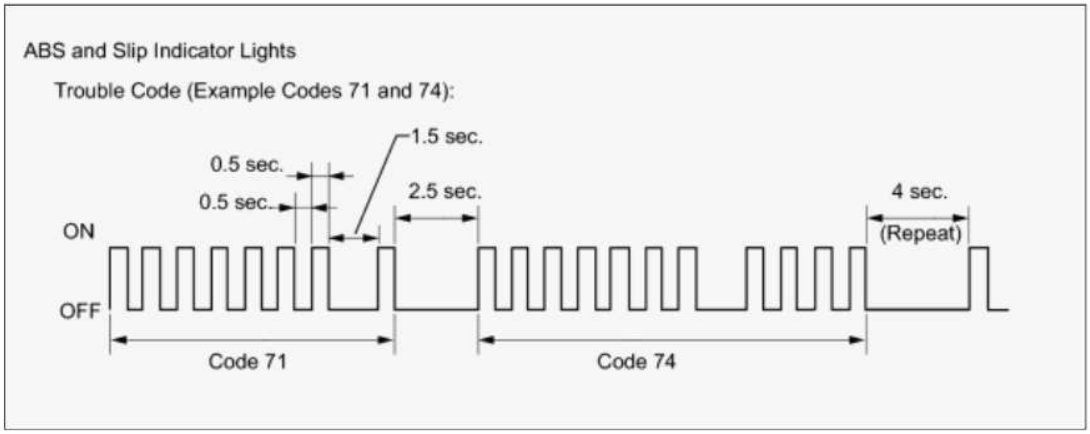


(2) Turn the ignition switch to ON.

(3) Count the number of blinks of the ABS and slip indicator lights.

HINT:

As an example, the blinking patters of DTCs 71 and 74 are shown below.



NOTICE:

- If only DTCs are output, repair the malfunctioning area and clear the DTCs.
- If the DTCs or test mode codes (DTC of signal check function) are output, repair the malfunctioning area, clear the DTCs and perform the test mode procedures again.

HINT:

- If more than 1 malfunction is detected at the same time, the lowest numbered code will be displayed first.
- See the list of DTCs (refer to "DTC OF TEST MODE FUNCTION (SIGNAL CHECK)" below).
- If all sensors are normal, a normal system code is output (the light comes on for 0.25 seconds at intervals of 0.25 seconds).

(4) After the check, disconnect SST from terminals 13 (TC) and 4 (CG) of the DLC3.

(5) Turn the ignition switch off.

3. DTC OF TEST MODE FUNCTION (SIGNAL CHECK)

DTC of ABS Sensor Check Function:

DTC CODE	DETECTION ITEM	TROUBLE AREA
C1271/71	Low output signal of front speed sensor RH	• Front speed sensor RH • Speed sensor circuit • Sensor installation

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DTC CODE	DETECTION ITEM	TROUBLE AREA
C1272/72	Low output signal of front speed sensor LH	• Front speed sensor LH • Speed sensor circuit • Sensor installation
C1273/73	Low output signal of rear speed sensor RH	• Rear speed sensor RH (for 4WD) • Rear axle hub and bearing assembly (skid control sensor) RH (for 2WD) • Speed sensor circuit • Sensor installation
C1274/74	Low output signal of rear speed sensor LH	• Rear speed sensor LH (4WD) • Rear axle hub and bearing assembly (skid control sensor) LH (2WD) • Speed sensor circuit • Sensor installation
C1275/75	Abnormal change in output signal of front speed sensor RH	• Sensor installation • Speed sensor rotor • Foreign matter on sensor tip or sensor rotor
C1276/76	Abnormal change in output signal of front speed sensor LH	• Sensor installation • Speed sensor rotor • Foreign matter on sensor tip or sensor rotor
C1277/77	Abnormal change in output signal of rear speed sensor RH	• Sensor installation • Speed sensor rotor • Foreign matter on sensor tip or sensor rotor
C1278/78	Abnormal change in output signal of rear speed sensor LH	• Sensor installation • Speed sensor rotor • Foreign matter on sensor tip or sensor rotor
C1279/79	Deceleration sensor output voltage malfunction	• Yaw rate sensor • Sensor installation
C1281/81	Master cylinder pressure sensor output malfunction	Master cylinder pressure sensor
	Booster failure detection (w/ Booster Failure Compensation)	Brake pedal load sensing switch

DTC of VSC Sensor Check Function:

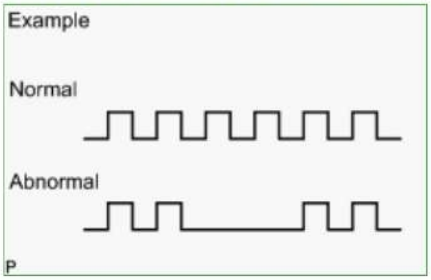
DTC CODE	DETECTION ITEM	TROUBLE AREA
C0371/71	Yaw rate sensor	Yaw rate sensor
C1379/74*	Downhill assist control switch	Downhill assist control switch

HINT:

- *: w/ Downhill Assist Control

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- The DTCs in this table are only stored in test mode.
- The storing of DTCs from C1271/71 to C1274/74 is completed before the vehicle speed reaches 5 km/h (3 mph).
- The storing of DTCs from C1275/75 to C1278/78 is completed before the vehicle speed reaches 45 km/h (28 mph).
- C1271/71 to C1274/74: The speed output from only one wheel is extremely low despite other wheel speed outputs reaching 5 km/h (3 mph).
- C1275/75 to C1278/78: The abnormal speed sensor output frequency is as shown in the illustration.



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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003QXW00DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TRAC OFF Indicator Light does not Come ON (2011 RAV4)		

TRAC OFF Indicator Light does not Come ON

DESCRIPTION

The skid control ECU is connected to the combination meter via the CAN communication system.

WIRING DIAGRAM

Refer to TRAC OFF indicator light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A

▼

2.	**INSPECT COMBINATION METER ASSEMBLY**

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(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000003QXV00DX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TRAC OFF Indicator Light Remains ON (2011 RAV4)		

TRAC OFF Indicator Light Remains ON

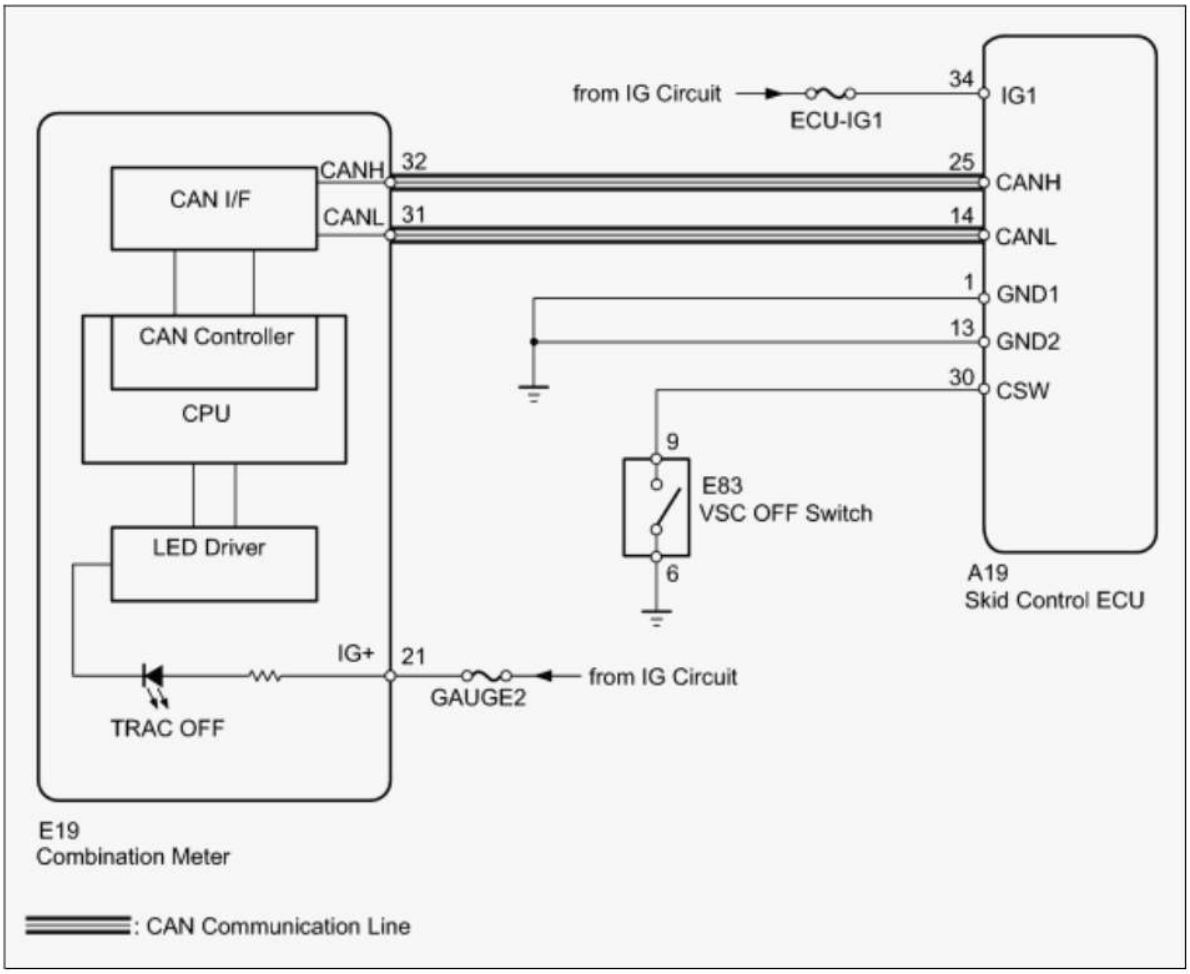
DESCRIPTION

The TRAC OFF indicator light is located in the combination meter for 4WD vehicles.

The skid control ECU is connected to the combination meter via the CAN communication system.

Pressing the VSC OFF switch turns off traction control and pressing and holding this switch turns off traction and VSC controls. If TRAC control turns off, the TRAC OFF indicator light comes on.

WIRING DIAGRAM



INSPECTION PROCEDURE

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NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A

▼

2.	**INSPECT SKID CONTROL ECU CONNECTOR**

(a) Check if the skid control ECU connector is securely connected.

OK:

The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU SECURELY

OK

▼

3.	**CHECK BATTERY**

(a) Check the battery voltage.

Standard Voltage:

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11 to 14 V

Result:

RESULT		PROCEED TO
OK		A
NG	for 2AR-FE	B
	for 2GR-FE	C

B ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

C ▶ **CHECK OR REPLACE CHARGING SYSTEM OR BATTERY**

A ▼

4.	**READ VALUE USING TECHSTREAM (TRAC/VSC OFF MODE)**

(a) Check the Data List for proper functioning of the VSC OFF switch.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
TRAC/VSC Off Mode	VSC OFF switch / Normal, TRC OFF, unknown or VSC OFF	Normal: Normal mode TRC OFF: TRAC off mode VSC OFF: VSC off mode	-

OK:

Display changes according to switch operation.

NG ▶ **INSPECT TRACTION CONTROL SWITCH (VSC OFF SWITCH)**

OK ▼

5.	**INSPECT COMBINATION METER ASSEMBLY**

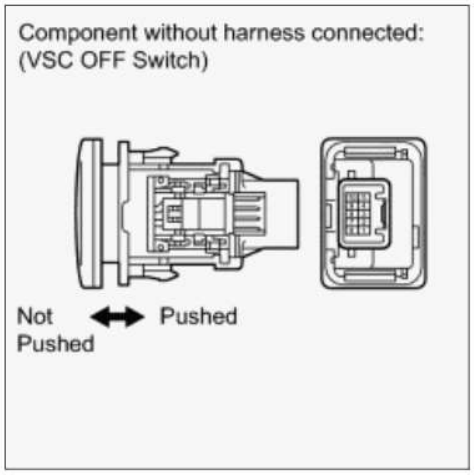
(a) Inspect the combination meter INFO .

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NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

6.	**INSPECT TRACTION CONTROL SWITCH (VSC OFF SWITCH)**



(a) Remove the VSC OFF switch INFO .

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
6 - 9	Switch is not pushed	10 kΩ or higher
	Switch is pushed	Below 1 Ω

NG ▶ **REPLACE TRACTION CONTROL SWITCH (VSC OFF SWITCH)**

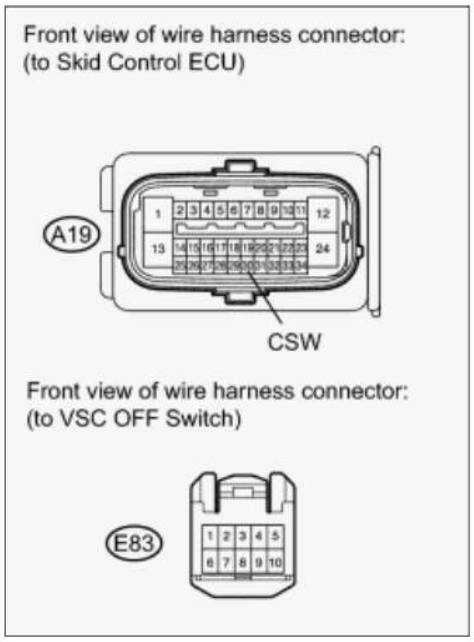
OK ▼

7.	**CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - VSC OFF SWITCH)**

(a) Disconnect the skid control ECU connector.

(b) Measure the resistance according to the value(s) in the table

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below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A19-30 (CSW) - E83-9	Always	Below 1 Ω
A19-30 (CSW) - Body ground	Always	10 kΩ or higher
E83-6 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM00000104K022X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: TS and CG Terminal Circuit (2011 RAV4)		

TS and CG Terminal Circuit

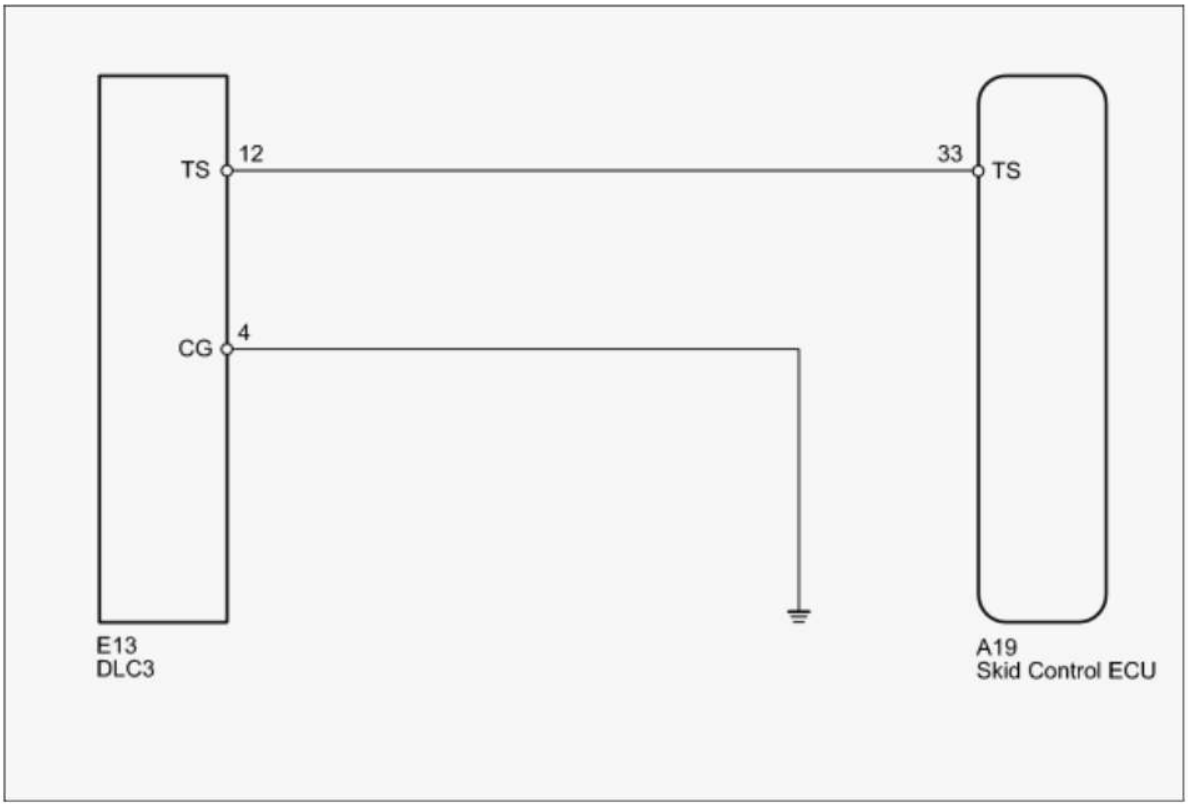
DESCRIPTION

If the vehicle is stationary during sensor check mode, speed sensor malfunctions cannot be detected. The vehicle must be driven for speed sensor malfunctions to be detected.

HINT:

Change to sensor check mode by connecting terminals 12 (TS) and 4 (CG) of the DLC3, and turning the ignition switch from off to ON.

WIRING DIAGRAM



INSPECTION PROCEDURE

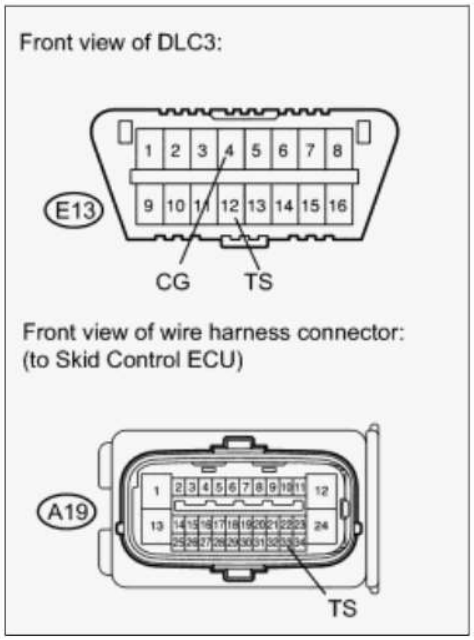
NOTICE:

When replacing the brake actuator assembly, perform zero point calibration INFO .

PROCEDURE

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1.	CHECK HARNESS AND CONNECTOR (DLC3 - SKID CONTROL ECU/BODY GROUND)



(a) Disconnect the skid control ECU connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E13-4 (CG) - Body ground	Always	Below 1 Ω
E13-12 (TS) - A19-33 (TS)	Always	Below 1 Ω
A19-33 (TS) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 C	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000YUO08PX
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: U0073,U0100,U0123,U0124,U0126: Control Module Communication Bus OFF (2011 RAV4)		

DTC	**U0073**	**Control Module Communication Bus OFF**

DTC	**U0100**	**Lost Communication with ECM / PCM**

DTC	**U0123**	**Lost Communication with Yaw Rate Sensor Module**

DTC	**U0124**	**Lost Communication with Lateral Acceleration Sensor Module**

DTC	**U0126**	**Lost Communication with Steering Angle Sensor Module**

DESCRIPTION

The skid control ECU receives signals from the ECM, steering angle sensor, and yaw rate and deceleration sensor via the CAN communication system.

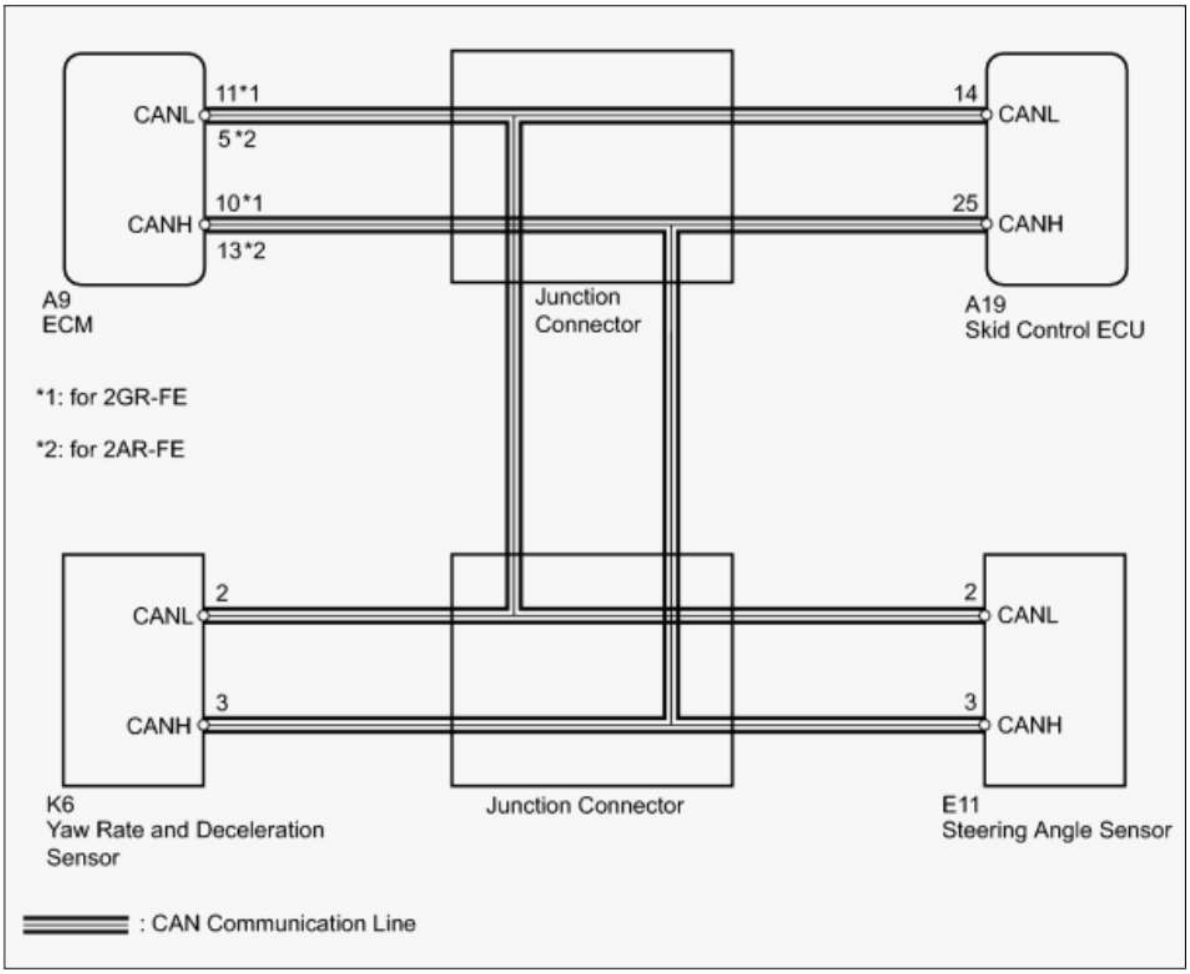
DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
U0073	Any of the following is detected: 1. When the IG1 terminal voltage is between 10 and 17.4 V, after the output of data from the skid control ECU is completed, the signals cannot be sent for 5 seconds or more. 2. The condition that bus OFF state occurs once or more within 0.1 seconds occurs 10 times in succession. (Sent signals cannot be received.) 3. When the IG1 terminal voltage is between 10 and 17.4 V, a delay in receiving data from the yaw rate and deceleration sensor and steering angle sensor continues for 1 second or more. 4. When the IG1 terminal voltage is between 10 and 17.4 V, the following occurs 10 times in succession. ○ The condition that a delay in receiving data from the yaw rate and deceleration sensor and steering angle	CAN communication system

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DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
	sensor occurs more than once within 5 seconds.	
U0100	The IG1 terminal voltage is between 10 and 17.4 V and the vehicle speed is 15 km/h (9 mph) or more, data cannot be received from the ECM for 2 seconds or more.	CAN communication system (Skid control ECU to ECM)
U0123	Either of the following is detected: 1. When the IG1 terminal voltage is between 10 and 17.4 V, data from the yaw rate sensor cannot be received for 1 second or more. 2. When the IG1 terminal voltage is between 10 and 17.4 V, the following occurs 10 times in succession. ○ The condition that data from the yaw rate sensor cannot be received occurs once or more within 5 seconds.	CAN communication system (Skid control ECU to yaw rate and deceleration sensor)
U0124	Either of the following is detected: 1. When the IG1 terminal voltage is between 10 and 17.4 V, data from the deceleration sensor cannot be received for 1 second or more. 2. When the IG1 terminal voltage is between 10 and 17.4 V, the following occurs 10 times in succession. ○ The condition that data from the deceleration sensor cannot be received occurs once or more within 5 seconds.	CAN communication system (Skid control ECU to yaw rate and deceleration sensor)
U0126	Either of the following is detected: 1. When the IG1 terminal voltage is between 10 and 17.4 V, data from the steering angle sensor cannot be received for 1 second or more. 2. When the IG1 terminal voltage is between 10 and 17.4 V, the following occurs 10 times in succession. ○ The condition that data from the steering angle sensor cannot be received occurs once or more within 5 seconds.	CAN communication system (Skid control ECU to steering angle sensor)

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (MOMENTARY INTERRUPTION)**

(a) Using the Techstream, check for any momentary interruption in the wire harness and connector corresponding to the DTC INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
EFI Communication Open	EFI communication open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-
Yaw Rate Open	Yaw rate sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Steering Open	Steering angle sensor open detection / Error or Normal	Error: Momentary interruption Normal: Normal	-

Result:

RESULT	PROCEED TO
There is a constant open circuit.	A
There are no momentary interruptions.	B
There are momentary interruptions.	C

HINT:

Perform the above inspection before removing the sensor and connector.

B ▶ **RECONFIRM DTC**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A ▼

2.	**CHECK IF EACH SENSOR AND ECM CONNECTOR IS SECURELY CONNECTED**

(a) Turn the ignition switch off.

(b) Check if each sensor or ECM connector is securely connected.

OK:
Each connector is securely connected.

NG ▶ **CONNECT CONNECTOR TO EACH SENSOR OR ECM CORRECTLY**

OK ▼

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3.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Record the output DTCs (for ABS, VSC system and/or CAN communication system) INFO for ABS and VSC system, or INFO for CAN communication system).

HINT:

If CAN communication system DTCs and the relevant sensor DTCs are output simultaneously, troubleshoot the relevant sensor DTCs (for ABS and/or VSC system) after the CAN communication system returns to normal.

Result:

RESULT		PROCEED TO
DTC is not output.		A
DTC is output.	ABS and/or VSC system DTC	B
	CAN communication system DTC	C

B ▶ **REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

C ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS (SYMPTOM SIMULATION)**

4.	**REPAIR OR REPLACE HARNESS OR CONNECTOR**

(a) Turn the ignition switch off.

(b) Repair or replace the harness or connector.

(c) Check for any momentary interruption between the skid control ECU and each sensor or ECM INFO .

(d) Check that there are no momentary interruptions.

NEXT ▼

5.	**RECONFIRM DTC**

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(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Start the engine.

(d) Drive the vehicle at a speed of 15 km/h (9 mph) or more and turn the steering wheel to the right and left.

(e) Check that no CAN communication system DTC is output INFO .

(f) If ABS and/or VSC system DTCs are output, record them.

Result:

RESULT		PROCEED TO
DTC is not output.		A
DTC is output.	ABS and/or VSC system DTC	B
	CAN communication system DTC	C

HINT:

The CAN communication system must be normal when performing troubleshooting for each sensor DTC (for ABS and/or VSC system).

B ▶ REPAIR CIRCUIT INDICATED BY OUTPUT DTC

C ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▶ END

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K2B013X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: VSC OFF Indicator Light does not Come ON (2011 RAV4)		

VSC OFF Indicator Light does not Come ON

DESCRIPTION

Refer to the description of "VSC OFF Indicator Light Remains ON" INFO .

WIRING DIAGRAM

Refer to the VSC OFF indicator light circuit INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assembly, perform the zero point calibration INFO .

PROCEDURE

1.	**INSPECT CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ REPAIR CAN COMMUNICATION SYSTEM

A

▼

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (VSC OFF INDICATOR LIGHT)**

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(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test mode on the Techstream INFO .

ABS/VSC/TRAC:

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
VSC OFF Indicator Light	VSC OFF indicator light	Indicator light ON / OFF	Observe the combination meter.

OK:
The VSC OFF indicator light turns on or off.

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

NG ▼

3.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 J	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001K29014X
Title: BRAKE CONTROL: VEHICLE STABILITY CONTROL SYSTEM: VSC OFF Indicator Light Remains ON (2011 RAV4)		

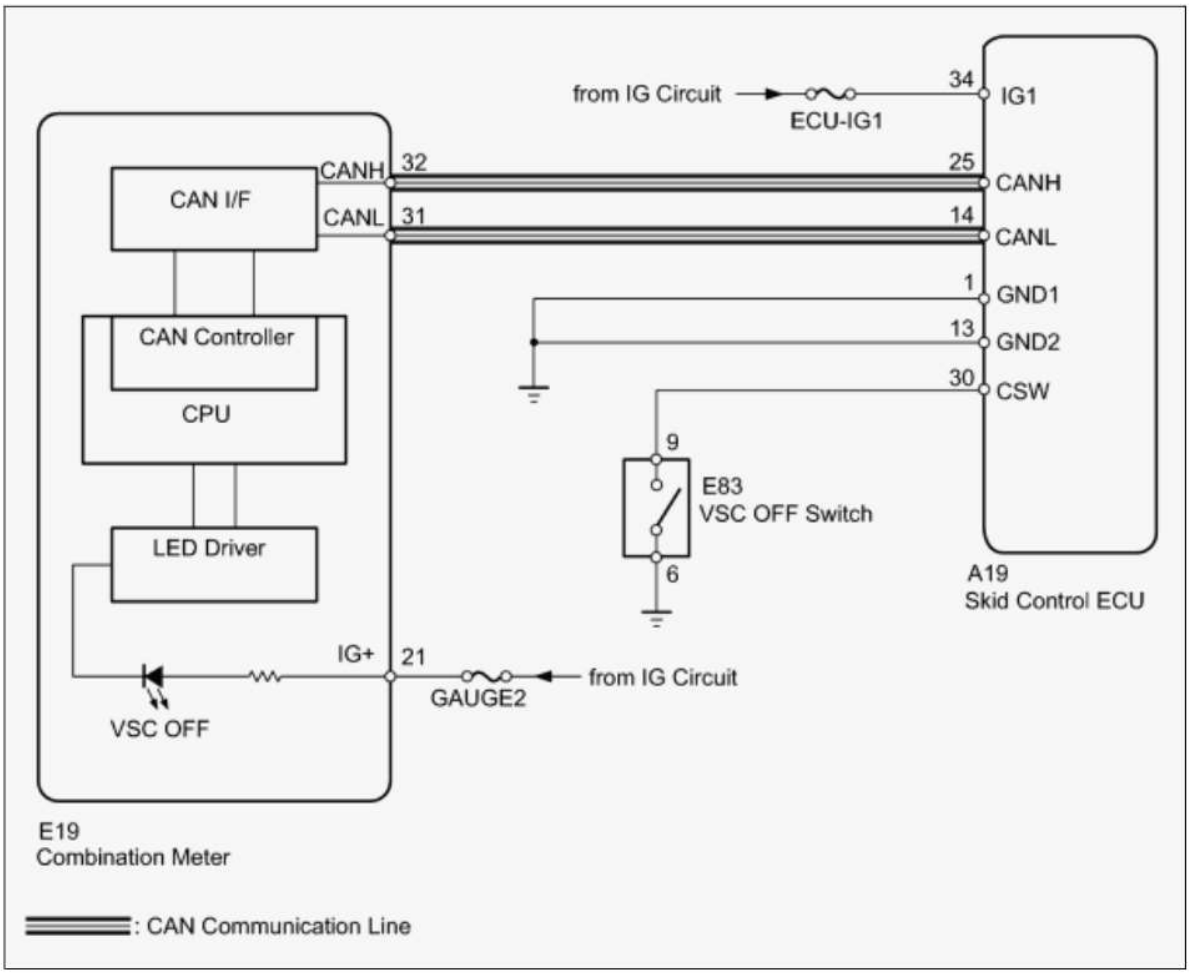
VSC OFF Indicator Light Remains ON

DESCRIPTION

The skid control ECU is connected to the combination meter via the CAN communication system.

The VSC OFF indicator light illuminates to inform the driver when VSC OFF mode is entered using the VSC OFF switch.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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When replacing the brake actuator assembly, perform the zero point calibration INFO .

PROCEDURE

1.	**PREPARE FOR INSPECTION**

(a) Check that both of the following conditions are satisfied.

- The vehicle is not in VSC OFF mode.
- The vehicle is not in inspection mode.

HINT:

Confirm if the vehicle is in inspection mode or not by using the Techstream Data List.

NEXT

2.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

NG ▶ **REPAIR CAN COMMUNICATION SYSTEM**

OK

3.	**INSPECT SKID CONTROL ECU CONNECTOR**

(a) Check if the skid control ECU connector is securely connected.

OK:

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The connector is securely connected.

NG ▶ **CONNECT CONNECTOR CORRECTLY**

OK ▼

4.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Inspect the combination meter INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

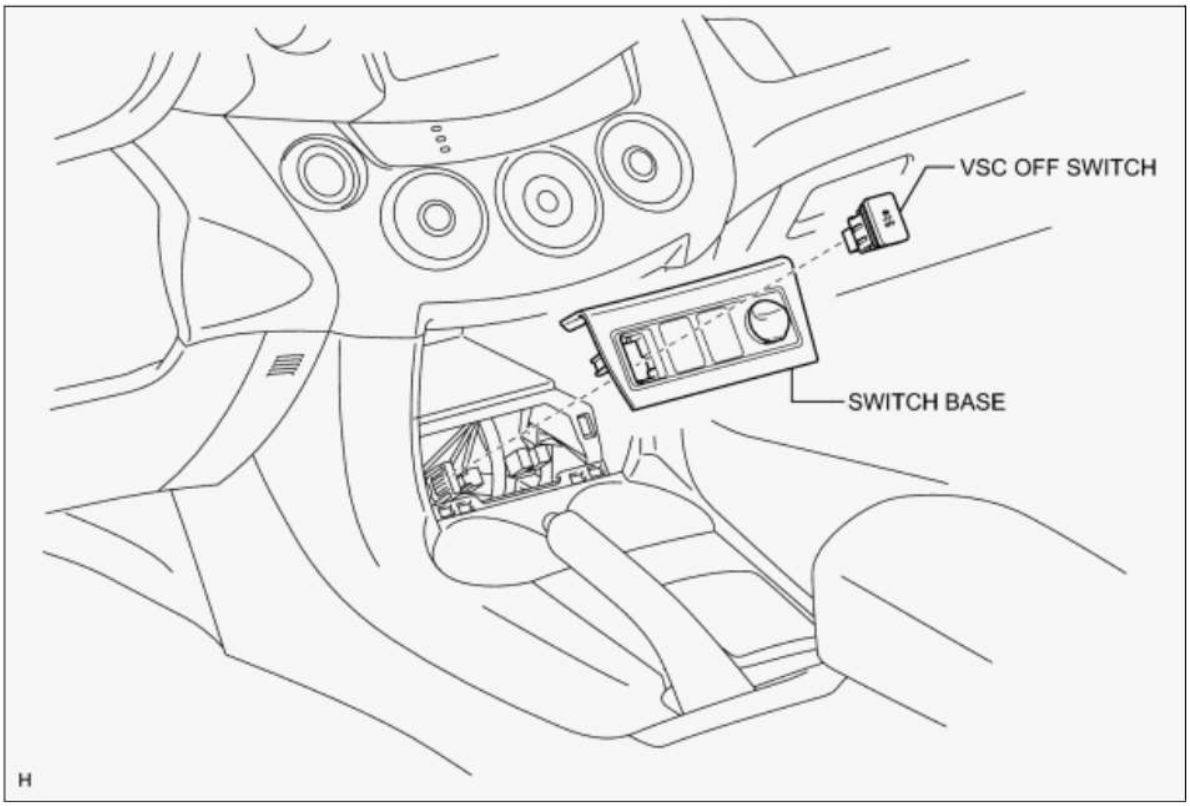
OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000210000EX
Title: BRAKE CONTROL: VSC OFF SWITCH: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



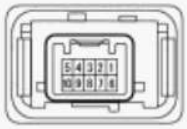
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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000020ZZ00JX
Title: BRAKE CONTROL: VSC OFF SWITCH: INSPECTION (2011 RAV4)		

INSPECTION

1. CHECK VSC OFF SWITCH

Component without harness connected:
(VSC OFF Switch)



H

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
6 - 9	Not pushed	10 kΩ or higher
	Pushed in	Below 1 Ω

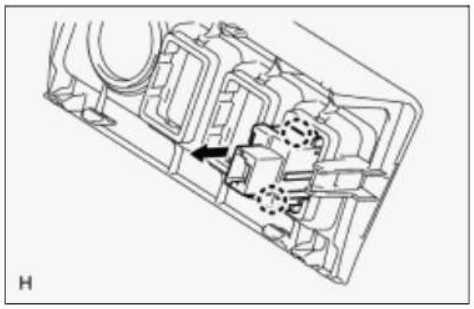
If the result is not as specified, replace the VSC OFF switch.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM0000020ZY00IX
Title: BRAKE CONTROL: VSC OFF SWITCH: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL VSC OFF SWITCH



(a) Attach the 2 claws to install the VSC OFF switch to the switch base.

(b) Connect the VSC OFF switch connector.

2. INSTALL SWITCH BASE

(a) Install the switch base INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000000210100IX
Title: BRAKE CONTROL: VSC OFF SWITCH: REMOVAL (2011 RAV4)		

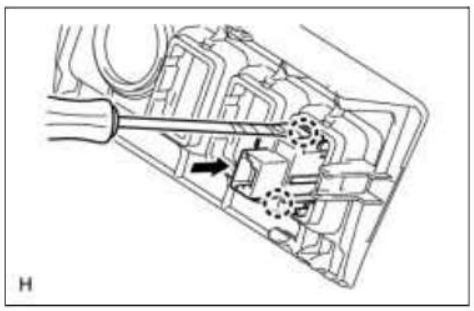
REMOVAL

1. REMOVE SWITCH BASE

(a) Remove the switch base INFO .

2. REMOVE VSC OFF SWITCH

(a) Disconnect the VSC OFF switch connector.



(b) Using a screwdriver, detach the 2 claws and remove the VSC OFF switch from the switch base.

HINT:

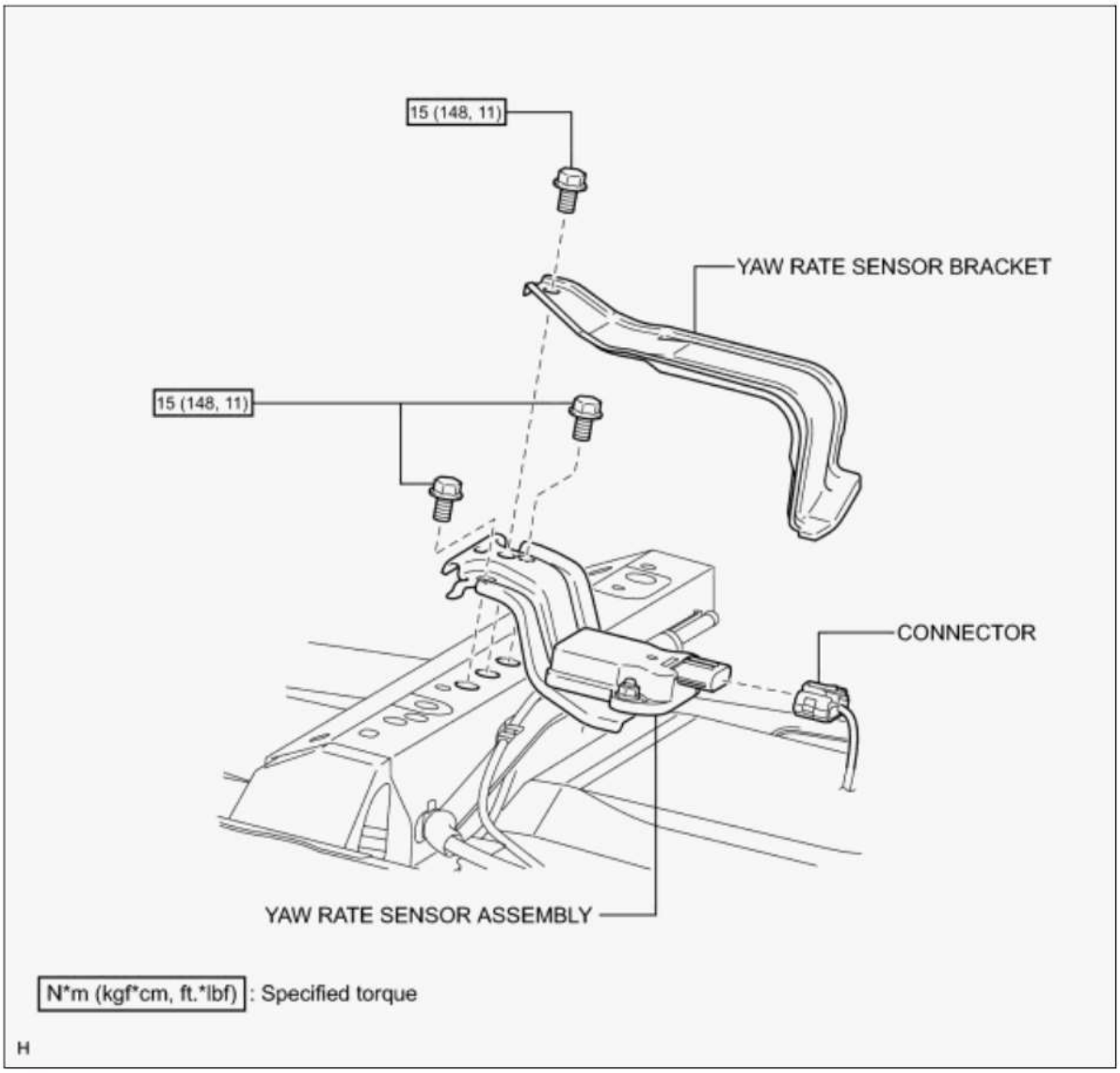
Tape the screwdriver tip before use.

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Last Modified: 9-7-2011	6.4 K	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVP008X
Title: BRAKE CONTROL: YAW RATE AND DECELERATION SENSOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001YBE00CX
Title: BRAKE CONTROL: YAW RATE AND DECELERATION SENSOR: INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT YAW RATE SENSOR

(a) Inspect the yaw rate sensor.

Under any of the following conditions, replace the sensor with a new one.

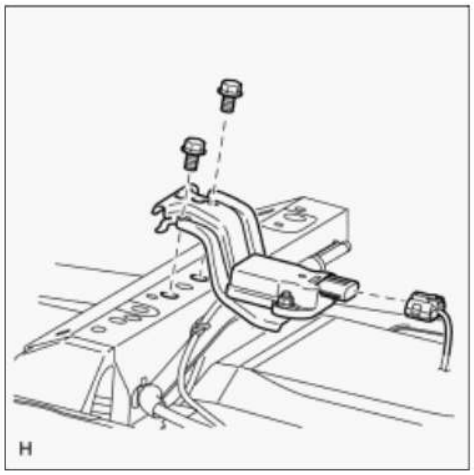
- The surface of the sensor is cracked, dented, or chipped.
- The connector or wire harness is scratched, cracked, or damaged.
- The sensor has been dropped.

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVO00JX
Title: BRAKE CONTROL: YAW RATE AND DECELERATION SENSOR: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL YAW RATE SENSOR ASSEMBLY



(a) Install the yaw rate sensor with the 2 bolts.

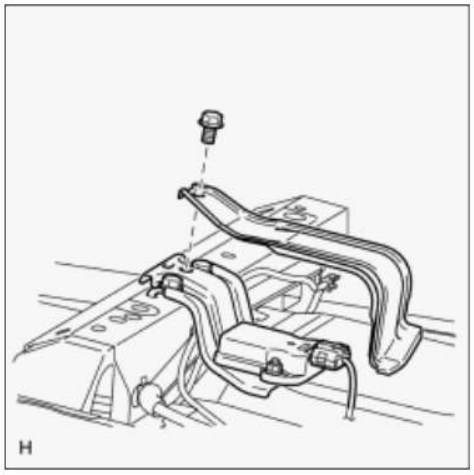
Torque: 15 N·m (148 kgf·cm, 11ft·lbf)

NOTICE:

- Do not damage the yaw rate sensor.
- Make sure that the yaw rate sensor is installed securely.

(b) Connect the yaw rate sensor connector.

2. INSTALL YAW RATE SENSOR BRACKET



(a) Install the bracket with the bolt.

Torque: 15 N·m (148 kgf·cm, 11ft·lbf)

3. INSTALL FRONT SEAT ASSEMBLY LH

(a) for Manual Seat:

Install the front seat INFO .

(b) for Power Seat:

Install the front seat INFO .

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4. INSTALL FRONT DOOR SCUFF PLATE LH INFO

5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

6. PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSOR

(a) Perform the yaw rate and deceleration sensor zero point calibration INFO .

7. INSPECT YAW RATE SENSOR SIGNAL

(a) Inspect the yaw rate sensor signal INFO .

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Last Modified: 9-7-2011	6.4 A	**From:** 201008
Model Year: 2011	**Model:** RAV4	**Doc ID:** RM000001XVQ00DX
Title: BRAKE CONTROL: YAW RATE AND DECELERATION SENSOR: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE FRONT DOOR SCUFF PLATE LH INFO

3. REMOVE FRONT SEAT ASSEMBLY LH

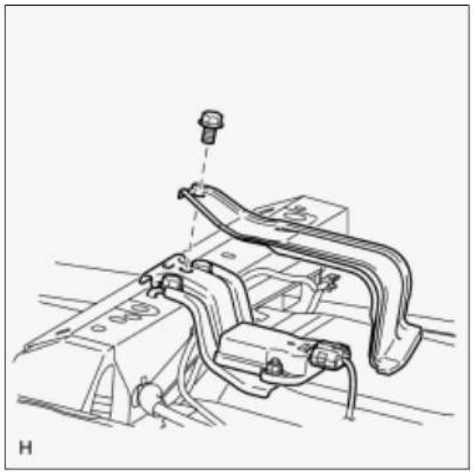
(a) for Manual Seat:

Remove the front seat LH INFO .

(b) for Power Seat:

Remove the front seat LH INFO .

4. REMOVE YAW RATE SENSOR BRACKET

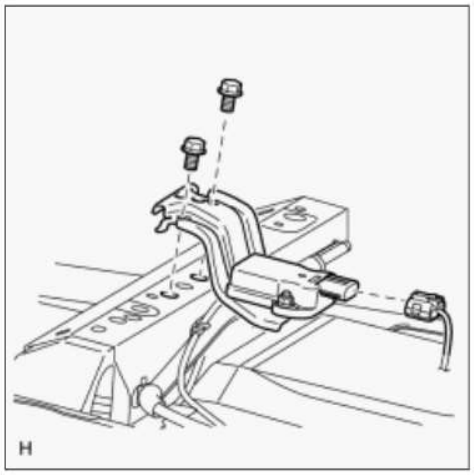


(a) Remove the bolt and yaw rate sensor bracket.

5. REMOVE YAW RATE SENSOR ASSEMBLY

(a) Disconnect the yaw rate sensor connector.

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(b) Remove the 2 bolts and yaw rate sensor.

NOTICE:

Do not remove the sensor from the bracket.

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