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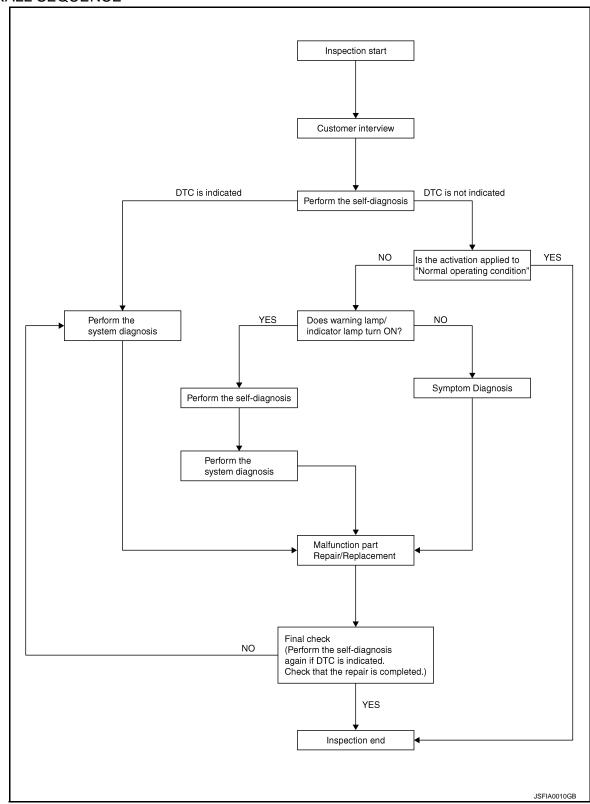
< BASIC INSPECTION > [ABS]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

[ABS] < BASIC INSPECTION > 1. COLLECT THE INFORMATION FROM THE CUSTOMER Α Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-8, "Diagnostic Work Sheet". В >> GO TO 2. 2.PERFORM THE SELF-DIAGNOSIS Perform self-diagnosis with CONSULT. Is there any DTC displayed? YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 3. D NO >> GO TO 4. 3.PERFORM THE SYSTEM DIAGNOSIS Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT. Refer to BRC-57, "DTC Index". **BRC** >> GO TO 7. f 4.CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-63, "Description". Is the symptom a normal operation? YES >> GO TO 8. Н NO >> GO TO 5. 5.CHECK THE WARNING LAMP FOR ILLUMINATION Check that the warning lamp illuminate. ABS warning lamp: Refer to <u>BRC-52</u>, "<u>Description</u>". • Brake warning lamp: Refer to BRC-53, "Description". Is ON/OFF timing normal? YES >> GO TO 6. NO >> GO TO 2. K $oldsymbol{6}.$ PERFORM THE DIAGNOSIS BY SYMPTOM Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT. >> GO TO 7. 7 . REPAIR OR REPLACE THE MALFUNCTIONING PARTS Repair or replace the specified malfunctioning parts. >> GO TO 8. N 8.MEMORY CLEAR Perform self-diagnosis memory clear for "ABS" with CONSULT. >> GO TO 9. 9. FINAL CHECK Perform the again, and check that the malfunction is repaired completely. Is no other DTC present and the repair completed? YES >> INSPECTION END NO >> GO TO 3.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ABS]

Diagnostic Work Sheet

INFOID:0000000008282217

Customer name MR/MS	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Date	
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate		☐ Firm pedal operation Large stroke pedal operation
	□ ABS does not work (Wheels lock when braking) □ Lack of sense of acceleration			
Engine conditions	□ When starting □ After starting			
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐ Bumps / potholes	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes		
Driving conditions	□ Full-acceleration □ High speed cornering □ Vehicle speed: Greater than 10 km/h (6 MPH) □ Vehicle speed: 10 km/h (6 MPH) or less □ Vehicle is stopped			
Applying brake conditions	□ Suddenly □ Gradually			
Other conditions	☐ Operation of electrical equipment☐ Shift change☐ Other descriptions			

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[ABS]

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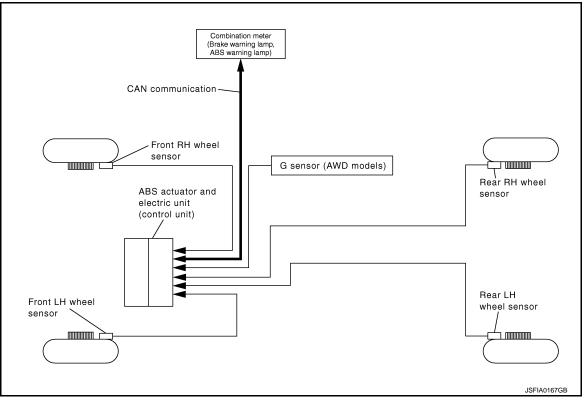
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SYSTEM DESCRIPTION

ABS

System Diagram



System Description

INFOID:0000000008282219

Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls
braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.

Electrical system diagnosis by CONSULT is available.

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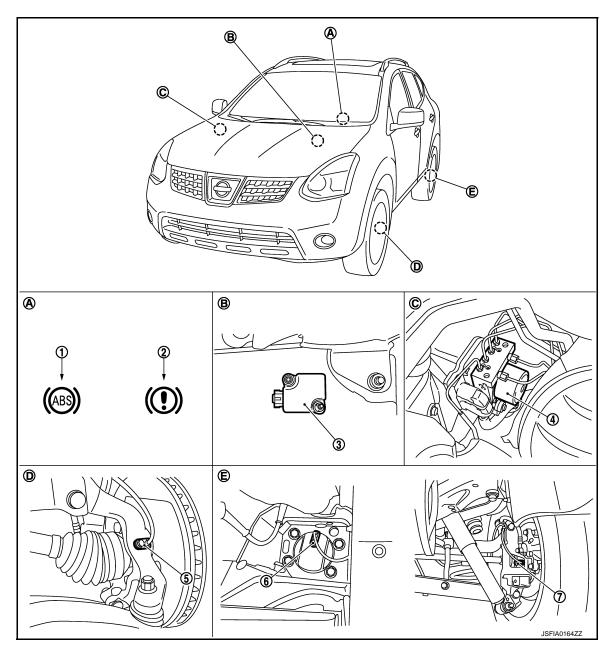
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Component Parts Location

INFOID:0000000008282220



- 1. ABS warning lamp
- 4. ABS actuator and electric unit (control unit)
- 7. Rear wheel sensor (AWD models)
- A. Combination meter
- D. Steering knuckle

- 2. Brake warning lamp
- 5. Front wheel sensor
- B. Center console
- E. Rear axle

- 3. G sensor (AWD models)
- 6. Rear wheel sensor (2WD models)
- C. Engine room (right side)

ABS

< SYSTEM DESCRIPTION >

[ABS]

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Component Description

INFOID:0000000008282221

Compo	Reference	
ABS actuator and electric unit (control unit)	Pump	BRC-29, "Description"
	Motor	BRC-29, Description
	Actuator relay (Main relay)	BRC-42, "Description"
	Solenoid valve	BRC-38, "Description"
Wheel sensor	BRC-18, "Description"	
G sensor (AWD models)	BRC-31, "Description"	
ABS warning lamp	BRC-52, "Description"	
Brake warning lamp		BRC-53, "Description"

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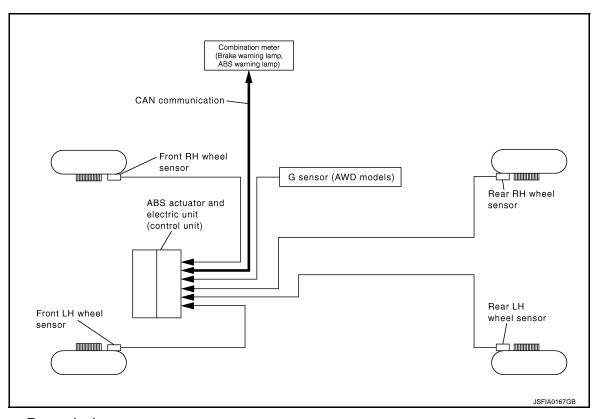
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[ABS]

EBD

System Diagram

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System Description

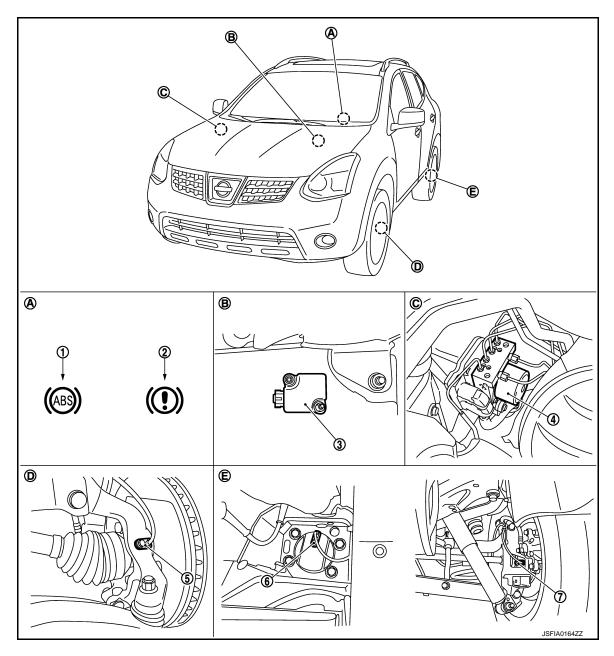
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- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then is electronically controls the rear braking force (brake fluid pressure) to reducing and reduces rear wheel slippage. Accordingly it improves vehicle stability.
- Electrical system diagnosis by CONSULT is available.

[ABS]

Component Parts Location

INFOID:0000000008282224



- 1. ABS warning lamp
- 4. ABS actuator and electric unit (control unit)
- 7. Rear wheel sensor (AWD models)
- A. Combination meter
- D. Steering knuckle

- 2. Brake warning lamp
- Front wheel sensor
- B. Center console
 - E. Rear axle

- 3. G sensor (AWD models)
- 6. Rear wheel sensor (2WD models)
- C. Engine room (right side)

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Component Description

INFOID:0000000008282225

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-29, "Description"
	Motor	BRC-29, Description
	Actuator relay (Main relay)	BRC-42, "Description"
	Solenoid valve	BRC-38, "Description"
Wheel sensor	BRC-18, "Description"	
G sensor (AWD models)	BRC-31, "Description"	
ABS warning lamp		BRC-52, "Description"
Brake warning lamp		BRC-53, "Description"

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT Function

FUNCTION

CONSULT can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	
Self diagnostic result	Self-diagnostic results can be read and erased quickly.	
Data monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	
Active test	Diagnostic test mode is which CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	
ECU identification	ABS actuator and electric unit (control unit) part number can be read.	

SELF DIAGNOSTIC RESULT

< SYSTEM DESCRIPTION >

Operation Procedure

Before performing the self-diagnosis for "ABS" with CONSULT, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

• When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

• Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

Display Item List

Refer to BRC-57, "DTC Index".

DATA MONITOR

Display Item List

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

x: Applicable ▼: Optional item

	SELECT MC	NITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
FR LH SENSOR [km/h (MPH)]	×	×	
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed
RR LH SENSOR [km/h (MPH)]	×	×	Wileel Speed
RR RH SENSOR [km/h (MPH)]	×	×	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status

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DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIP	PTION >		[ABS]
-	SELECT M	ONITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)
DECEL G-SEN1 (On/Off) (AWD models)	×	×	Vehicle on level surface or on slope
DECEL G-SEN2 (On/Off) (AWD models)	×	×	verlicle of level surface of off slope
FR RH IN SOL (On/Off)	•	×	
FR RH OUT SOL (On/Off)	•	×	
FR LH IN SOL (On/Off)	•	×	
FR LH OUT SOL (On/Off)	•	×	Operation status of each calculated value
RR RH IN SOL (On/Off)	•	×	Operation status of each solenoid valve
RR RH OUT SOL (On/Off)	•	×	
RR LH IN SOL (On/Off)	•	×	
RR LH OUT SOL (On/Off)	•	×	
MOTOR RELAY (On/Off)	•	×	Motor and motor relay operation
ACTUATOR RLY (On/Off)	•	×	Actuator relay operation
ABS WARN LAMP (On/Off)	•	×	ABS warning lamp
EBD SIGNAL (On/Off)	•	•	EBD operation
ABS SIGNAL (On/Off)	•	•	ABS operation
EBD FAIL SIG (On/Off)	•	•	EBD fail-safe signal

ACTIVE TEST

ABS FAIL SIG

CAUTION:

(On/Off)

- Never perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be performed with the ABS warning lamp and brake warning lamp are on.
- ABS warning lamp and brake warning lamp are on during active test.

 When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)

ABS fail-safe signal

- "TEST IS STOPPED" in "ABS" with CONSULT is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT is displayed, to perform test again.

Test Item

ABS SOLENOID VALVE

 Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in solenoid valve operation chart.

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< SYSTEM DESCRIPTION >

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Test item	Diaplay item	Display		
restitem	Display item	Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH SUL	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*

^{*:} On for 1 to 2 seconds after the select, and then Off.

ABS MOTOR

• Select "On" and "Off" of "ACTIVE TEST" in "ABS" with CONSULT on screen. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Display	
	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY (Note)	On	On

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number can be read.

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[ABS]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

Description INFOID:0000000008282227

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:00000000008282228

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	Harness or connector Wheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

>> Proceed to diagnosis procedure. Refer to BRC-18, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282229

CAUTION:

Never check between wheel sensor harness connector terminals.

1.CHECK WHEEL SENSOR

- Turn the ignition switch OFF.
- Check wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 3.

>> GO TO 2. NO

2.REPLACE WHEEL SENSOR (1)

- Replace wheel sensor.
- Front: Refer to <u>BRC-66</u>, "FRONT WHEEL SENSOR: Exploded View". Rear: Refer to <u>BRC-67</u>, "REAR WHEEL SENSOR: Exploded View".
- 2. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.

C1101, C1102, C1103, C1104 WHEEL SENSOR

[ABS] < DTC/CIRCUIT DIAGNOSIS > Perform self-diagnosis for "ABS" with CONSULT. Α Is DTC "C1101", "C1102", "C1103" or "C1104" detected? YES >> GO TO 3. NO >> INSPECTION END В 3.check connector Turn the ignition switch OFF. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Check wheel sensor harness connector for disconnection or looseness. Is the inspection result normal? YES >> GO TO 5. D NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 4. 4.PERFORM SELF-DIAGNOSIS (1) Е Erase self-diagnosis result for "ABS" with CONSULT. 2. Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. **BRC** Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1101", "C1102", "C1103" or "C1104" detected? YES >> GO TO 5. NO >> INSPECTION END CHECK TERMINAL Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> GO TO 7. NO >> Repair or replace error-detected parts and GO TO 6. **6.**PERFORM SELF-DIAGNOSIS (2) K 1. Connect ABS actuator and electric unit (control unit) harness connector. 2. Connect wheel sensor harness connector. Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 7. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1101", "C1102", "C1103" or "C1104" detected? N YES >> GO TO 7. NO >> INSPECTION END 7.CHECK WHEEL SENSOR HARNESS Turn the ignition switch OFF. 2. Disconnect ABS actuator and electric unit (control unit) harness connector. Disconnect wheel sensor harness connector. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	21	E39 (Front RH wheel)	3	
E36	23	E22 (Front LH wheel)	1	Existed
	11	B41 (Rear RH wheel)	7	LAISIEU
	26	B44 (Rear LH wheel)	5	

Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	12	E39 (Front RH wheel)	4	
E36	27	E22 (Front LH wheel)	2	Existed
L30	15	B41 (Rear RH wheel)	8	LXISIGU
	30	B44 (Rear LH wheel)	6	

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts and GO TO 8.

8.PERFORM SELF-DIAGNOSIS (3)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 9.

NO >> INSPECTION END

9. REPLACE WHEEL SENSOR

- Replace wheel sensor.
- Front: Refer to BRC-66, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to <u>BRC-67</u>, "<u>REAR WHEEL SENSOR</u>: <u>Exploded View</u>".
- Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- 7. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

INFOID:0000000008282230

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C1105, C1106, C1107, C1108 WHEEL SENSOR

Description

ABS unit continually monitors wheel speed sensors to detect abnormal signals.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Signal from rear RH wheel sensor does not match other 3 wheel speed signals.	Sensor not installed currently Sensor rotor or encoder dam-
C1106	RR LH SENSOR-2	Signal from rear LH wheel sensor does not match other 3 wheel speed signals.	aged Sensor rotor loose on axle Electrical interference
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signals.	Wheel not turning - e.g. vehi- cle driven on 2WD dynamom-
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signals.	Sensor damaged ABS unit damaged

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-21, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:
Never check between wheel sensor harness connector terminals.

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-46, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- Turn the ignition switch OFF.
- Check tire air pressure, wear and size. Refer to <u>WT-50, "Tire Air Pressure"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.

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< DTC/CIRCUIT DIAGNOSIS >

[ABS]

Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4. NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>

YES >> GO TO 5.

NO >> INSPECTION END

CHECK WHEEL SENSOR

- 1. Turn the ignition switch OFF.
- Check wheel sensor for damage.
- 3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

- Front: Refer to BRC-66, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to <u>BRC-67</u>, "<u>REAR WHEEL SENSOR</u>: <u>Exploded View</u>".

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 6.

O.REPLACE WHEEL SENSOR (1)

- Replace wheel sensor.
- Front: Refer to <u>BRC-66</u>, "FRONT WHEEL SENSOR: Exploded View". Rear: Refer to <u>BRC-67</u>, "REAR WHEEL SENSOR: Exploded View".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7. NO >> GO TO 19.

/ .PERFORM SELF-DIAGNOSIS (2)

(P)With CONSULT.

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 19.

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

8. CHECK CONNECTOR

1. Turn the ignition switch OFF.

- Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9.

9.CHECK DATA MONITOR (2)

- Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more. 2.
- 3. Start the engine.
- 4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.

NO >> GO TO 11.

10. PERFORM SELF-DIAGNOSIS (3)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 11.

NO >> INSPECTION END

11. CHECK TERMINAL

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace error-detected parts and GO TO 12.

12. CHECK DATA MONITOR (3)

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13.

NO >> GO TO 14. **BRC**

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< DTC/CIRCUIT DIAGNOSIS >

[ABS]

13. PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 14.

NO >> INSPECTION END

14. CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector Terminal			Continuity	
	12, 21		Not existed	
E36	27, 23	Ground		
	15, 11	Giodila		
	30, 26			

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts and GO TO 15.

15. CHECK DATA MONITOR (4)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.

NO >> GO TO 17.

16. PERFORM SELF-DIAGNOSIS (5)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17. REPLACE WHEEL SENSOR

- 1. Replace wheel sensor.
- Front: Refer to BRC-66, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to <u>BRC-67</u>, "<u>REAR WHEEL SENSOR</u>: <u>Exploded View</u>".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.

C1105, C1106, C1107, C1108 WHEEL SENSOR [ABS] < DTC/CIRCUIT DIAGNOSIS > Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. Α NOTE: Set the "DATA MONITOR" recording speed to "10 msec". Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. В Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively? C YES >> GO TO 18. NO >> GO TO 19. 18. PERFORM SELF-DIAGNOSIS (6) D Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 2. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. Е Is DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> GO TO 19. NO >> INSPECTION END BRC 19. REPLACE SENSOR ROTOR Replace sensor rotor. Front: Refer to BRC-68, "FRONT SENSOR ROTOR: Exploded View". Rear: Refer to BRC-68, "REAR SENSOR ROTOR: Exploded View". 2. Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more. Н Start the engine. 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 7. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1105", "C1106", "C1107" or "C1108" detected? >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View". YES NO >> INSPECTION END K L

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DIAGNOSIS > [ABS]

C1109 POWER AND GROUND SYSTEM

Description INFOID:000000008282233

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply is lower than normal and vehicle speed is greater than 6km/h (4 MPH). Power supply is greater than normal limits.	Harness or connector ABS actuator and electric unit (control unit) Fuse Vehicle electrical power system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1109" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-26, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282235

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage
Connector	Terminal		Condition	Vollage
E36	16	Ground	Ignition switch: OFF	Approx. 0 V

Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ABS actuator and electric unit (control unit)		Condition	Voltage
Connector	Terminal	_	Condition	Voltage
E36	16	Ground	Ignition switch: ON	Battery voltage

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS > [ABS]

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- 2. Check 10A fusible link (59).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

ABS actuator and ele	ectric unit (control unit)	IPDM E/R		continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	16	E15	59	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-18, "Wiring Diagram - IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

1. Turn the ignition switch OFF.

2. Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Terminal		
E36	3	Ground	Existed
L30	4	Glound	LXISIEU

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> Repair or replace error-detected parts (check ABS earth bolt for tightness and corrosion).

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C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Description INFOID:000000008282236

ABS unit is continuously monitoring ECU hardware and software for correct operation.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	Possible internal failure of control unit components.	Internal failure of control unit components. ABS solenoid valve or motor power supply/ ground abnormality.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1110" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-28, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282238

1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

CAUTION:

Replace ABS actuator and electric unit (control unit) when self-diagnostic result shows items other than those applicable.

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:0000000008282239

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The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282240

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit
Omi	T GIVII WOTOK	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)

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DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2 , DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-29, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282241

1. CHECK CONNECTOR

Turn the ignition switch OFF.

- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -"</u>.

$3. \mathsf{CHECK}$ ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	
E36	3	Ground	Existed
L30	4	Glound	LXISIEG

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-69</u>, "Exploded View".

NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

[ABS]

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C1113 G SENSOR

Description INFOID:0000000008282242

G sensor detects G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic INFOID:0000000008282243

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G SENSOR	G sensor is malfunctioning, or signal line of G sensor is open or shorted.	Harness or connector ABS actuator and electric unit (control unit) G sensor Electrical interference Vehicle driven on AWD rolling road

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1113" detected?

>> Proceed to diagnosis procedure. Refer to BRC-31, "Diagnosis Procedure". YES

>> INSPECTION END NO

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Disconnect G sensor harness connector.
- Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK G SENSOR POWER SUPPLY

Check voltage between G sensor harness connector and ground.

G se	ensor		Condition	Voltage
Connector	Terminal		Condition	voltage
B32	1	Ground	Ignition switch: OFF	Approx. 0 V

Turn the ignition switch ON.

CAUTION:

Never start the engine.

Check voltage between G sensor harness connector and ground.

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G se	ensor		Condition	Voltage
Connector	Terminal		Condition	voitage
B32	1	Ground	Ignition switch: ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

${f 3.}$ CHECK G SENSOR POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- 2. Check 10A fusible link (59).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between G sensor harness connector and IPDM E/R.

G se	ensor	IPDM E/R		continuity
Connector	Terminal	Connector	Terminal	Continuity
B32	1	E15	59	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-18, "Wiring Diagram - IGNITION</u> POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

4. CHECK G SENSOR HARNESS

Check continuity between G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and ele	ectric unit (control unit)	G sensor		continuity
Connector	Terminal	Connector	Terminal	Continuity
	13		2	
E36	29	B32 -	3	Existed
€30	14		4	Existed
	28		5	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. REPLACE G SENSOR

- Replace G sensor. Refer to <u>BRC-71</u>, "Exploded View".
- Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF.
- 4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1113" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> INSPECTION END

C1115 WHEEL SENSOR

Description INFOID:0000000008282245

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282246

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	Miss-match between the 4 wheel speed sensor signals.	Harness or connector not a possible cause. Other possible causes tire radius (due to wrong size or pressure) interference.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-33, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

For wheel sensor, never check between terminals.

 ${f 1}$.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to BRC-46, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- Turn the ignition switch OFF.
- Check tire air pressure, wear and size. Refer to WT-50, "Tire Air Pressure".

Is the inspection result normal?

YFS >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more. 2.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

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< DTC/CIRCUIT DIAGNOSIS >

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4. NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK WHEEL SENSOR

- Turn the ignition switch OFF.
- Check wheel sensor for damage.
- Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

- Front: Refer to <u>BRC-66</u>, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-67, "REAR WHEEL SENSOR: Exploded View".

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 6.

6. REPLACE WHEEL SENSOR (1)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-66</u>, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-67, "REAR WHEEL SENSOR: Exploded View".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7. NO >> GO TO 19.

7.PERFORM SELF-DIAGNOSIS (2)

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

8.check connector

- 1. Turn the ignition switch OFF.
- 2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check wheel sensor harness connector for disconnection or looseness.

C1115 WHEEL SENSOR

< D	TC/CIRCUIT DIAGNOSIS > [ABS	1
ls th	ne inspection result normal?	
YE		Α
NO		
9.0	CHECK DATA MONITOR (2)	D
1.	Erase self-diagnosis result for "ABS" with CONSULT.	<u> </u> В
	Turn the ignition switch OFF, and wait 10 seconds or more.	
3. 4.		(" C
5.	Set the "DATA MONITOR" recording speed to "10 msec". Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	D
whe	parding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting the sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively? SS >> GO TO 10.	
NO		
	PERFORM SELF-DIAGNOSIS (3)	BRC
1.	Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	_
	Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT.	G
	TC "C1115" detected?	
YE NO		Н
	.CHECK TERMINAL	_ ı
 1. 2. 3. 	Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.	
ls th	ne inspection result normal?	
YE		Κ
NC		
12	CHECK DATA MONITOR (3)	
1.	Connect ABS actuator and electric unit (control unit) harness connector.	<u> </u>
2.	Connect wheel sensor harness connector.	
3.	Erase self-diagnosis result for "ABS" with CONSULT.	M
4. 5.	Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine.	171
6.	Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR and "RR RH SENSOR" with CONSULT. NOTE:	?"
	Set the "DATA MONITOR" recording speed to "10 msec".	
7.	Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	0
	parding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting the sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference to the control of the control	g
	e within 5%, respectively?	
YE) >> GO TO 14.	Р
13	PERFORM SELF-DIAGNOSIS (4)	
1. 2.	Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle.	

3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

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< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 14.

NO >> INSPECTION END

14. CHECK WHEEL SENSOR HARNESS

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Disconnect wheel sensor harness connector.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	21	E39 (Front RH wheel)	3	
E36	23	E22 (Front LH wheel)	1	Existed
€30	11	B41 (Rear RH wheel)	7	Existed
	26	B44 (Rear LH wheel)	5	

Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
Connector	Terminal	Connector	Terminal	- Continuity	
	12	E39 (Front RH wheel)	4		
E36	27	E22 (Front LH wheel)	2	Existed	
L30	15	B41 (Rear RH wheel)	8	LAISIEU	
	30	B44 (Rear LH wheel)	6		

5. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	
	12, 21		Not existed
E36	27, 23	Ground	
E30	15, 11	Giouria	Not existed
	30, 26		

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts and GO TO 15.

15. CHECK DATA MONITOR (4)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.

NO >> GO TO 17.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS > [ABS]	
16.PERFORM SELF-DIAGNOSIS (5)	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	1
3. Perform self-diagnosis for "ABS" with CONSULT.	
Is DTC "C1115" detected?	
YES >> GO TO 17. NO >> INSPECTION END	
17. REPLACE WHEEL SENSOR	(
Replace wheel sensor. Front: Poter to BBC 66 "EDONE WHEEL SENSOR: Explanded View".	ı
 Front: Refer to <u>BRC-66, "FRONT WHEEL SENSOR: Exploded View"</u>. Rear: Refer to <u>BRC-67, "REAR WHEEL SENSOR: Exploded View"</u>. 	[
2. Erase self-diagnosis result for "ABS" with CONSULT.	
 Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. 	
 Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE: 	В
Set the "DATA MONITOR" recording speed to "10 msec".	D
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?	(
YES >> GO TO 18.	
NO >> GO TO 19.	ı
18. PERFORM SELF-DIAGNOSIS (6)	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	
3. Perform self-diagnosis for "ABS" with CONSULT.	
Is DTC "C1115" detected?	,
YES >> GO TO 19.	
NO >> INSPECTION END	
19. REPLACE SENSOR ROTOR	
1. Replace sensor rotor.Front: Refer to <u>BRC-68, "FRONT SENSOR ROTOR: Exploded View"</u>.	
- Rear: Refer to <u>BRC-68, "REAR SENSOR ROTOR: Exploded View"</u> .	
 Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. 	
4. Start the engine.	1
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.6. Stop the vehicle.	
7. Perform self-diagnosis for "ABS" with CONSULT.	
Is DTC "C1115" detected?	1
YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".	
NO >> INSPECTION END	(
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Revision: 2012 June BRC-37 2013 ROGUE

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:000000008282248

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1120", "C1122", "C1124" or "C1126" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-38, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282250

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK SOLENOID VALVE POWER SUPPLY

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY</u> POWER SUPPLY -".

C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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3.check solenoid valve ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal	_	Continuity	
E36	3	Ground	Existed	
E30	4	Giodila	LAISIEU	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> Repair or replace error-detected parts.

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:000000008282251

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1121", "C1123", "C1125" or "C1127" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-40, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282253

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK SOLENOID VALVE POWER SUPPLY

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	<u></u>	Voltage
Connector	Terminal		voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".</u>

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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3.check solenoid valve ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		ectric unit (control unit)		
Connector	Terminal	_	Continuity	
E36	3	Ground	Existed	
E30	4	Glound	LXISIEU	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-69</u>, "Exploded View".

NO >> Repair or replace error-detected parts.

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C1140 ACTUATOR RELAY SYSTEM

Description INFOID:000000008282254

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground.	Harness or connector ABS actuator and electric unit
01140	ACTORIONNET	During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1140" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-42, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282256

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ACTUATOR RELAY POWER SUPPLY

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage
Connector Terminal			voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -"</u>.

3. CHECK ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal	_	Continuity	
E36	3	Ground	Existed	
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Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-69</u>, "Exploded View".

NO >> Repair or replace error-detected parts.

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U1000 CAN COMM CIRCUIT

Description INFOID:0000000008282257

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic INFOID:0000000008282258

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication line ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-44, "Diagnosis Procedure".

>> INSPECTION END NO

Diagnosis Procedure

INFOID:0000000008282259

${\bf 1}$.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

YES >> Proceed to LAN-16, "Trouble Diagnosis Flow Chart".

>> INSPECTION END NO

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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U1010 CONTROL UNIT (CAN)

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Items	Diagnostic item is detected when	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit) error

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1010" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-45, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

${f 1}$.abs actuator and electric unit (control unit)

Check that there is no malfunction in ABS actuator and electric unit (control unit) harness connector or disconnection.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS > [ABS]

POWER SUPPLY AND GROUND CIRCUIT

Description INFOID:000000008282263

Supplies power to ABS actuator and electric unit (control unit).

Diagnosis Procedure

INFOID:0000000008282264

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage
Connector	Terminal		voltage
E36	16	Ground	Approx. 0 V

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage
Connector	Terminal		voltage
E36	16	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

2.check abs actuator and electric unit (control unit) ignition power supply circuit

- Turn the ignition switch OFF.
- 2. Check 10A fuse (59).
- 3. Disconnect IPDM E/R harness connector.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	16	E15	59	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-18, "Wiring Diagram - IGNITION</u> POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

3.check abs actuator and electric unit (control unit) battery power supply

- Turn the ignition switch OFF.
- 2. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal	_	voltage
E36	1	Ground	Battery voltage
LJO	2	Ground	Ballery Vollage

3. Turn the ignition switch ON. CAUTION:

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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Never start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal	_	voltage
E36	1	Ground	Battory voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -"</u>.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND

1. Turn the ignition switch OFF.

2. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E36	3	Ground	Existed
E30	4	Ground	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

BRAKE FLUID LEVEL SWITCH

Description

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

Component Function Check

INFOID:0000000008282266

1. CHECK BRAKE FLUID LEVEL SWITCH OPERATION

Operate the brake fluid level switch. Then check that the brake warning lamp in the combination meter turns on/off correctly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-48, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000008282267

1. CHECK BRAKE FLUID LEVEL

Check brake fluid level. Refer to BR-11, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refill brake fluid. Refer to <u>BR-11</u>, "Refilling".

2. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector and combination meter harness connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect harness connectors and then perform component function check. Refer to <u>BRC-48</u>, "Component Function Check".

Is the inspection result normal?

YES >> Poor connection of harness connector terminal. Replace or repair harness connector.

NO >> GO TO 3.

3. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- Check continuity between brake fluid level switch connector terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1-2	When brake fluid is full in the reservoir tank.	Not existed	
1-2	When brake fluid is empty in the reservoir tank.	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Brake fluid level switch is malfunction. Replace reservoir tank.

4. CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

- Disconnect combination meter harness connector.
- Check continuity between brake fluid level switch harness connector and combination meter harness connector.

BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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Combina	tion meter	Brake fluid	level switch	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M34	27	E37	1	Existed

Check continuity between combination meter harness connector and ground.

Combination meter		_	Continuity
Connector	Terminal		Continuity
M34	27	Ground	Not existed

Check continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch			Continuity
Connector	Terminal	_	Continuity
E37	2	Ground	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

Turn the ignition switch OFF.

- Disconnect brake fluid level switch harness connector.
- Check continuity between brake fluid level switch connector terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	When brake fluid is full in the reservoir tank.	Not existed	
1 – 2	When brake fluid is empty in the reservoir tank.	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to BR-28. "Disassembly and Assembly". **BRC**

INFOID:0000000008282268

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PARKING BRAKE SWITCH

Description INFOID:000000008282269

The parking brake switch converts the status of the parking brake pedal to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

Component Function Check

INFOID:0000000008282270

1. CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake pedal. Then check that the brake warning lamp in the combination meter turns on/off correctly.

Condition	Brake warning lamp illumination status
When the parking brake switch is operation	ON
When the parking brake switch is not operation.	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-50, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000008282271

1. CHECK PARKING BRAKE SWITCH

- Turn the ignition switch OFF.
- 2. Disconnect parking brake switch harness connector.
- 3. Check continuity between parking brake switch connector terminal and ground.

Parking brake switch		Condition	Continuity	
Terminal		Condition		
1	Ground	When the parking brake switch is operated.	Existed	
		When the parking brake switch is not operated.	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace parking brake switch.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace combination meter.

Component Inspection

INFOID:0000000008282272

1. CHECK PARKING BRAKE SWITCH

- 1. Turn the ignition switch OFF.
- Disconnect parking brake switch harness connector.
- Check continuity between parking brake switch connector terminal and ground.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

Parking brake switch		Condition	Continuity	
Terminal	_	Condition		
1	Ground	When the parking brake switch is operated.	Existed	
ı		When the parking brake switch is not operated.	Not existed	

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Is the inspection result normal?

YES >> INSPECTION END

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NO >> Replace parking brake switch. Refer to PB-6, "Exploded View".

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ABS WARNING LAMP

Description INFOID:0000000008282273

 \times : ON -: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000008282274

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-52, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000008282275

1. CHECK SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-69</u>, "Exploded View".

NO >> Repair or replace combination meter.

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

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BRAKE WARNING LAMP

Description INFOID:0000000008282276

×: ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ignition switch ON	× (Note 2)
1 second later after turning ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- · 2: After starting engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000008282277

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to BRC-53, "Diagnosis Procedure".

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check parking brake switch. Refer to BRC-50, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check parking brake switch. Refer to BRC-50, "Diagnosis Procedure".

2.check self-diagnosis

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

>> GO TO 3. YES

NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-69, "Exploded View".

NO >> Repair or replace combination meter. **BRC**

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INFOID:0000000008282278

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		Vehicle stopped	0 [km/h (MPH)]	
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
	Wheel speed	Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
STOP LAMP SW	Construction in the construction	When brake pedal is depressed	On	
STOP LAIVIP SVV	Stop lamp switch signal status	When brake pedal is not depressed	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
DECEL G-SEN1	Decel G detected by G sensor	Changes according to an indication	On	
(Note 2)	Decei G delected by G serisor	shown by the G sensor	Off	
DECEL G-SEN2	Decel G detected by G sensor	Changes according to an indication	On	
(Note 2)	Decei G delected by G serisor	shown by the G sensor	Off	
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
FR LH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
FR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
RR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
	Motor and motor relay operation	When the motor relay and motor are operating	On	
OTOR RELAY		When the motor relay and motor are not operating	Off	
CTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On	
lote 3)	Actuator relay operation	When the actuator relay is not operating	Off	
DC MADNI AMD	ABS warning lamp	When ABS warning lamp is ON	On	
BS WARN LAMP	(Note 4)	When ABS warning lamp is OFF	Off	
D CICNAL	EPD energtion	EBD is active	On	
BD SIGNAL	EBD operation	EBD is inactive	Off	
DC CICNA!	ABC aparation	ABS is active	On	
BS SIGNAL	ABS operation	ABS is inactive	Off	
EDD EATL SIG	EDD feil oofe einsel	In EBD fail-safe	On	
BD FAIL SIG	EBD fail-safe signal	EBD is normal	Off	
ABS FAIL SIG	ARS fail cafe signal	In ABS fail-safe	On	
IDS FAIL SIG	ABS fail-safe signal	ABS is normal	Off	

NOTE:

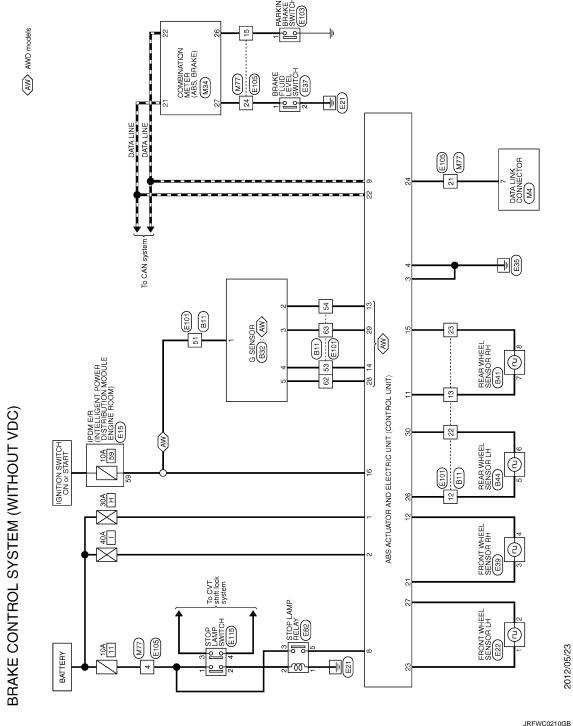
- 1: Confirm tire pressure is normal.
- 2: Only AWD models.
- 3: Every 20 seconds momentary switch to Off.

- 4: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-52, "Description".

Wiring Diagram -BRAKE CONTROL SYSTEM-

INFOID:0000000008282280

For connector terminal arrangements, harness layouts, and alphabets in a (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information".



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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

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Fail-Safe INFOID:0000000008282281

ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp will turn ON. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp will turn ON. Simultaneously, the ABS become one of the following conditions of the fail-safe function.

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

 For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without ABS, EBD system.

DTC Index INFOID:0000000008282282

	Reference	Items (CONSULT screen terms)	DTC
BRC		RR RH SENSOR-1	C1101
	DDC 40 "DTC Logic"	RR LH SENSOR-1	C1102
G	BRC-18, "DTC Logic"	FR RH SENSOR-1	C1103
		FR LH SENSOR-1	C1104
		RR RH SENSOR-2	C1105
Н	DDC 24 "DTC Logic"	RR LH SENSOR-2	C1106
	BRC-21, "DTC Logic"	FR RH SENSOR-2	C1107
1		FR LH SENSOR-2	C1108
	BRC-26, "DTC Logic"	BATTERY VOLTAGE [ABNORMAL]	C1109
	BRC-28, "DTC Logic"	CONTROLLER FAILURE	C1110
J	BRC-29, "DTC Logic"	PUMP MOTOR	C1111
	BRC-31, "DTC Logic"	G SENSOR	C1113
	BRC-33, "DTC Logic"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
— K	BRC-38, "DTC Logic"	FR LH IN ABS SOL	C1120
	BRC-40, "DTC Logic"	FR LH OUT ABS SOL	C1121
L	BRC-38, "DTC Logic"	FR RH IN ABS SOL	C1122
	BRC-40, "DTC Logic"	FR RH OUT ABS SOL	C1123
	BRC-38, "DTC Logic"	RR LH IN ABS SOL	C1124
	BRC-40, "DTC Logic"	RR LH OUT ABS SOL	C1125
	BRC-38, "DTC Logic"	RR RH IN ABS SOL	C1126
N	BRC-40, "DTC Logic"	RR RH OUT ABS SOL	C1127
	BRC-42, "DTC Logic"	ACTUATOR RLY	C1140
	BRC-44, "DTC Logic"	CAN COMM CIRCUIT	U1000
0	BRC-45, "DTC Logic"	CONTROL UNIT (CAN)	U1010

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[ABS]

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000008282283

1. CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-48</u>, "<u>General Specifications</u>". Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles.

- Front
- 2WD models: Refer to FAX-7, "Inspection".
- AWD models: Refer to FAX-33, "Inspection".
- Rear
- 2WD models: Refer to RAX-4, "Inspection".
- AWD models: Refer to RAX-11, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

- · Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- · Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> • Replace wheel sensor or sensor rotor.

• Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated?

YES >> Perform self-diagnosis for "ABS" with CONSULT.

NO >> Normal

UNEXPECTED PEDAL REACTION [ABS] < SYMPTOM DIAGNOSIS > **UNEXPECTED PEDAL REACTION** Α Diagnosis Procedure INFOID:0000000008282284 1. CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-8, "Inspection and Adjustment". Is the stroke too large? YES >> • Bleed air from brake tube and hose. Refer to BR-12, "Bleeding Brake System". Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. - Brake pedal: Refer to BR-8, "Inspection and Adjustment". D - Master cylinder: Refer to BR-13, "Inspection". - Brake booster: Refer to BR-14, "Inspection". NO >> GO TO 2. Е 2. CHECK FUNCTION Disconnect ABS actuator and electric unit (control unit) harness connector to deactivate ABS. Check if braking BRC force is normal in this condition. Connect harness connector after inspection. Is the inspection result normal? YES >> Normal NO >> Check brake system. Н K

Revision: 2012 June BRC-59 2013 ROGUE

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THE BRAKING DISTANCE IS LONG

[ABS] < SYMPTOM DIAGNOSIS >

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000008282285

CAUTION:

The stopping distance on slippery road surfaces might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Turn the ignition switch OFF and disconnect ABS actuator and electric unit (control unit) harness connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect harness connector. Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

[ABS] < SYMPTOM DIAGNOSIS > ABS FUNCTION DOES NOT OPERATE Diagnosis Procedure INFOID:0000000008282286

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?

YES >> Normal

>> Perform self-diagnosis for "ABS" with CONSULT. NO

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[ABS]

INFOID:0000000008282287

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

- · When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

1.SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do the operation noises occur?

YES >> GO TO 3.

NO >> Perform self-diagnosis for "ABS" with CONSULT.

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> Normal

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS > [ABS]

NORMAL OPERATING CONDITION

Description

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS is activated.	This is a normal condi-	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	tion due to the ABS activation.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.	

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< PRECAUTION > [ABS]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

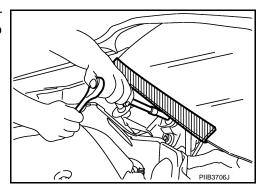
- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the
 ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with
 a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing
 serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

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When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precaution for Brake System

WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

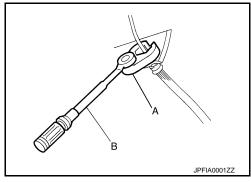
- Brake fluid use refer to MA-15, "FOR NORTH AMERICA: Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.

PRECAUTIONS

< PRECAUTION > [ABS]

• Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).

- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



INFOID:0000000008282292

Precaution for Brake Control

- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.

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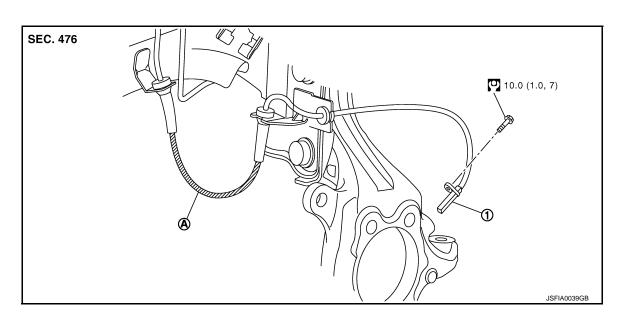
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REMOVAL AND INSTALLATION

WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR: Exploded View



- 1. Front LH wheel sensor
- A. Yellow line (slant line)

Refer to GI-4, "Components" for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR: Removal and Installation

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REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.
- When you see the harness of the wheel sensor from the front side of the vehicle ensure that the yellow lines (A) are not twisted.

INSTALLATION

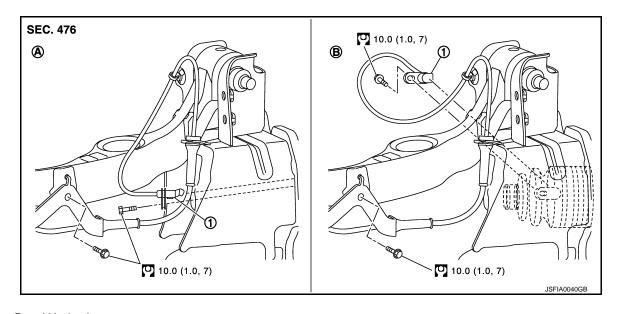
Pay attention to the following when installing wheel sensor. Tighten installation bolts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR: Exploded View

INFOID:0000000008282295



1. Rear LH wheel sensor

A. 2WD models

B. AWD models

Refer to GI-4, "Components" for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

REAR WHEEL SENSOR: Removal and Installation

REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Pay attention to the following when installing wheel sensor. Tighten installation bolts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

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SENSOR ROTOR

< REMOVAL AND INSTALLATION >

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR: Exploded View

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[ABS]

Refer to FAX-9, "Exploded View" (2WD models), FAX-35, "Exploded View" (AWD models).

FRONT SENSOR ROTOR: Removal and Installation

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REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub and bearing assembly. Refer to FAX-9, "Removal and Installation" (2WD models), FAX-35, "Removal and Installation" (AWD models).

INSTALLATION

Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub and bearing assembly. Refer to FAX-9, "Removal and Installation" (2WD models), FAX-35, "Removal and Installation" (AWD models).

REAR SENSOR ROTOR

REAR SENSOR ROTOR: Exploded View

INFOID:0000000008282299

Refer to RAX-5, "Exploded View" (2WD models), RAX-13, "Exploded View" (AWD models).

REAR SENSOR ROTOR: Removal and Installation

INFOID:0000000008282300

2WD MODELS

Removal

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub and bearing assembly. Refer to RAX-5, "Removal and Installation".

Installation

Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub and bearing assembly. Refer to RAX-5, "Removal and Installation".

AWD MODELS

For removal and installation of sensor rotor, refer to RAX-17, "Disassembly and Assembly".

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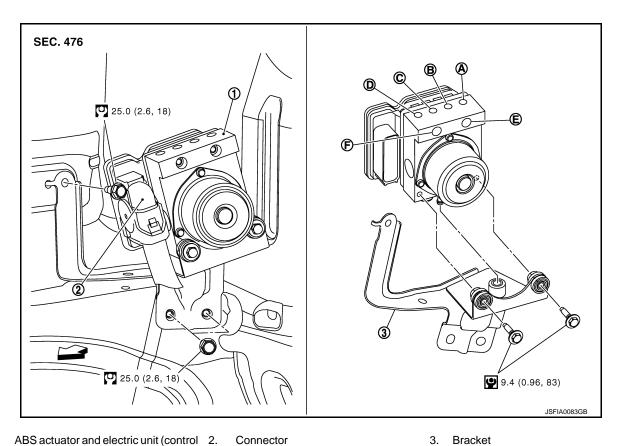
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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View



ABS actuator and electric unit (control unit)

To front LH brake caliper

To front RH brake caliper

- B. To rear RH brake caliper
- E. From master cylinder primary side
- C. To Rear LH brake caliper
- F. From master cylinder secondary side

⟨¬: Vehicle front

A.

Refer to GI-4, "Components" for symbol in the figure.

Removal and Installation

REMOVAL

CAUTION:

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-12, "Bleeding Brake System"</u>.
- 1. Remove cowl top. Refer to EXT-20, "Exploded View".
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- 4. Remove tire (front LH side).
- Remove fender protector (rear): (front LH side). Refer to <u>EXT-22, "Exploded View"</u>.
- 6. Remove ABS actuator and electric unit (control unit) bracket mounting nut.
- 7. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

[ABS]

Note the following, and install in the reverse order of removal.

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-12, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.

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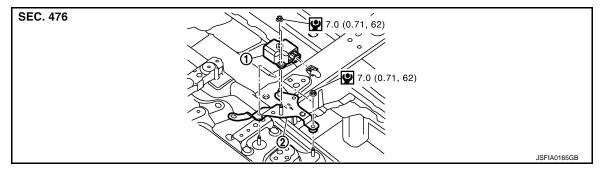
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G SENSOR

Exploded View



1. G sensor 2. Bracket

Refer to GI-4. "Components" for symbol in the figure.

Removal and Installation

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REMOVAL

CAUTION:

Never drop or strike G sensor, or never use power tool etc., because G sensor is sensitive to the impact.

- Remove center console assembly. Refer to <u>IP-22, "Exploded View"</u>.
- 2. Disconnect G sensor harness connector.
- Remove mounting nuts. Remove G sensor.

INSTALLATION

Note the following, and install in the reverse order of removal.

• Never drop or strike G sensor, or never use power tool etc., because G sensor is sensitive to the impact.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VDC/TCS/ABS]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

< BASIC INSPECTION > [VDC/TCS/ABS]

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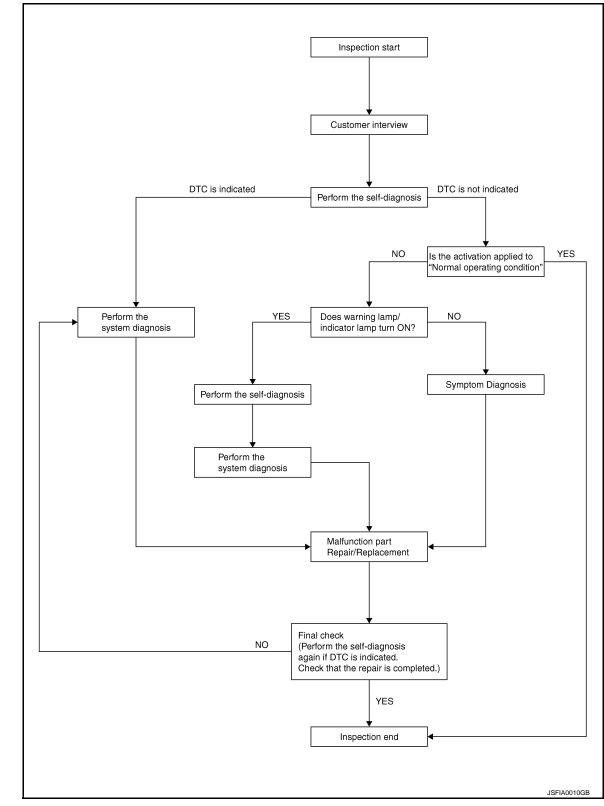
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OVERALL SEQUENCE



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-75, "Diagnostic Work Sheet".

>> GO TO 2.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VDC/TCS/ABS]

2.perform the self-diagnosis

Perform self-diagnosis with CONSULT.

Is there any DTC displayed?

YES >> Record or print self-diagnosis results and freeze frame data (FFD) GO TO 3.

NO >> GO TO 4.

3. PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT. Refer to BRC-166, "DTC <a href="Index".

>> GO TO 7.

4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-174.</u> "<u>Description</u>".

Is the symptom a normal operation?

YES >> GO TO 8.

NO >> GO TO 5.

5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to <u>BRC-155</u>, "<u>Description</u>".
- Brake warning lamp: Refer to <u>BRC-156</u>, "<u>Description</u>".
- VDC warning lamp: Refer to BRC-158, "Description".
- VDC OFF indicator lamp: Refer to BRC-159, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6.

NO >> GO TO 2.

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT.

>> GO TO 7.

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8.

8.MEMORY CLEAR

Perform self-diagnosis memory clear for "ABS" with CONSULT.

>> GO TO 9.

9. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely.

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

Diagnostic Work Sh

INFOID:0000000008282306

Customer name MR/MS	Model & Year		VIN		
Engine #	Trans.		Mileage		
Incident Date	Manuf. Date	Manuf. Date		In Service Date	
Symptoms	□ Noise and vibration (from engine compartment) □ Noise and vibration (from axle)	☐ Warning / Indicator activate		☐ Firm pedal operation Large stroke pedal operation	
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)		☐ Lack of sense of acceleration	
Engine conditions	☐ When starting ☐ After starting				
Road conditions	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes				
Driving conditions	□ Full-acceleration □ High speed cornering □ Vehicle speed: Greater than 10 km/h (6 MPH) □ Vehicle speed: 10 km/h (6 MPH) or less □ Vehicle is stopped				
Applying brake conditions	☐ Suddenly ☐ Gradually				
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions				

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INSPECTION AND ADJUSTMENT

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description

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In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

x: Required -: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering wheel	×
Replacing steering wheel	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	_
Tire rotation	_
Adjusting wheel alignment	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION CAUTION:

To adjust neutral position of steering angle sensor, make sure to use CONSULT. (Adjustment cannot be done without CONSULT)

 ${f 1}$. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR

- 1. Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in order with CONSULT.
- 2. Select "START".

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, select "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn the ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3.CHECK DATA MONITOR

- 1. Run vehicle with front wheels in straight-ahead position, then stop.
- 2. Select "ABS", "DATA MONITOR" and "STR ANGLE SIG" in order with CONSULT, and check steering angle sensor signal.

STR ANGLE SIG : 0±2.5°

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >	[VDC/TCS/ABS]	
Is the steering angle within the specified range?		
YES >> GO TO 4. NO >> Perform the neutral position adjustment for the steering angle sensor again, G	O TO 1.	Α
4. ERASE THE SELF-DIAGNOSIS MEMORY		R
Erase the self-diagnosis memories for "ABS" and "ENGINE" with CONSULT. • "ABS": Refer to BRC-94, "CONSULT Function".		Ь
"ENGINE": Refer to <u>EC-106. "CONSULT Function"</u> .		
Are the memories erased?		
YES >> INSPECTION END NO >> Check the items indicated by the self-diagnosis.		D

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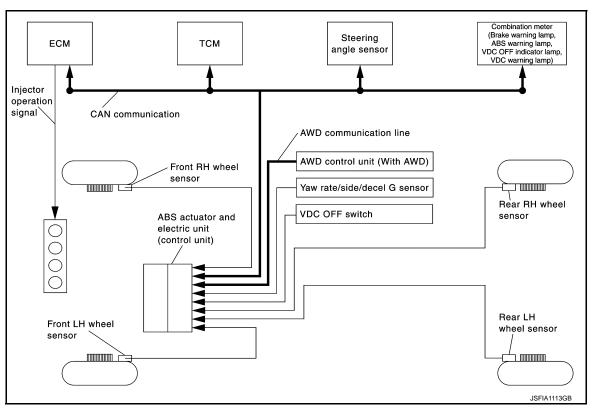
Revision: 2012 June BRC-77 2013 ROGUE

SYSTEM DESCRIPTION

VDC

System Diagram

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System Description

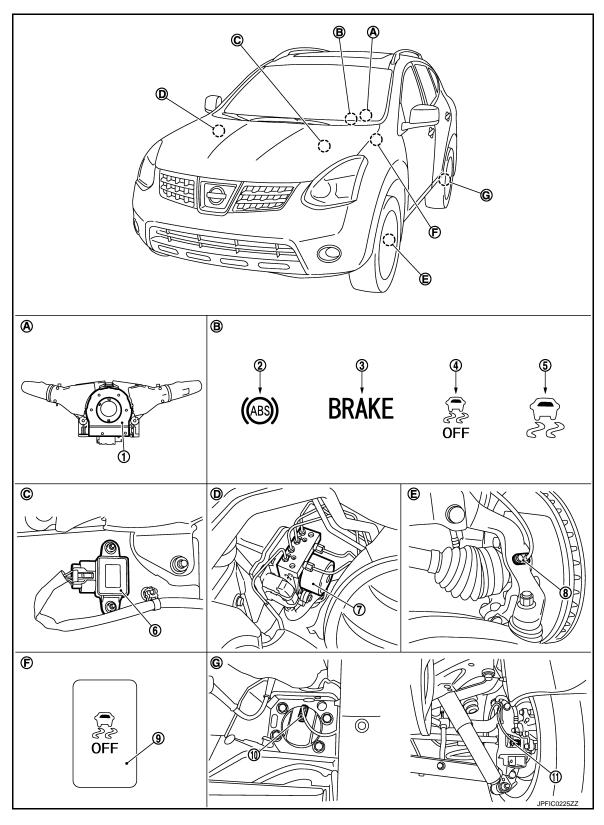
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- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensor. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.
- During VDC operation, it informs driver of system operation by flashing VDC warning lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000008282311

FOR USA



- Steering angle sensor 1.
- VDC OFF indicator lamp
- 7. ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- ABS warning lamp 2.
- 5. VDC warning lamp
- 8. Front wheel sensor
- 3. Brake warning lamp
- Yaw rate/side/decel G sensor
- VDC OFF switch

6.

BRC-79 Revision: 2012 June **2013 ROGUE**

11. Rear wheel sensor (AWD models)

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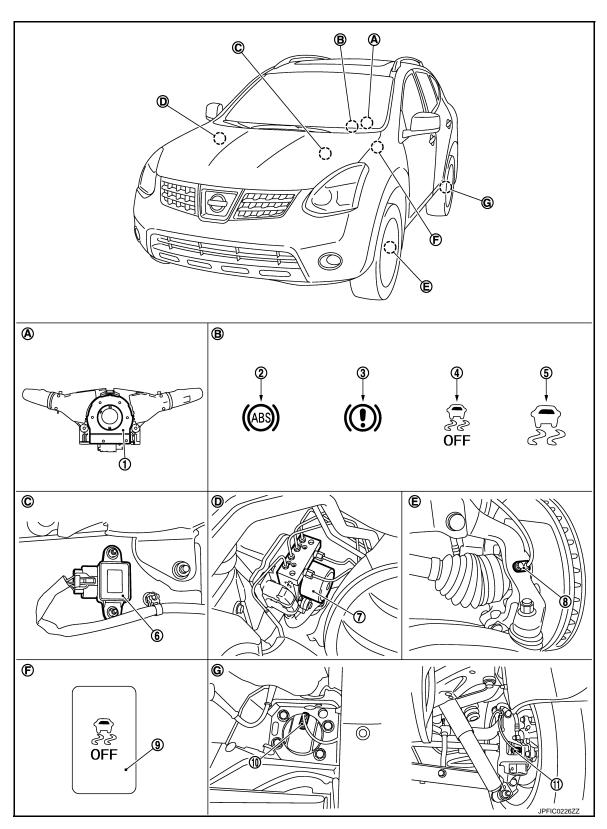
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- A. Back of spiral cable assembly
- D. Engine room (right side)
- G. Rear axle

- B. Combination meter
- E. Steering knuckle
- C. Center console
- F. Instrument driver lower panel

EXCEPT FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor

VDC

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

- ABS actuator and electric unit (control unit)
- 8. Front wheel sensor
- 9. VDC OFF switch

- 10. Rear wheel sensor (2WD models)
- 11. Rear wheel sensor (AWD models)
- A. Back of spiral cable assembly
- B. Combination meter

E.

C. Center console

- D. Engine room (right side)
- Steering knuckle F. Instrument driver lower panel

G. Rear axle

Component Description

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Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-110, "Description"
	Motor	BIXC-110, Description
	Actuator relay (Main relay)	BRC-132, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-127, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-139, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-141, "Description"
Wheel sensor		BRC-99, "Description"
Yaw rate/side/decel G sensor		BRC-112, "Description"
Steering angle sensor		BRC-134, "Description"
VDC OFF switch		BRC-153, "Description"
ABS warning lamp		BRC-155, "Description"
Brake warning lamp		BRC-156, "Description"
VDC OFF indicator lamp		BRC-159, "Description"
VDC warning lamp		BRC-158, "Description"

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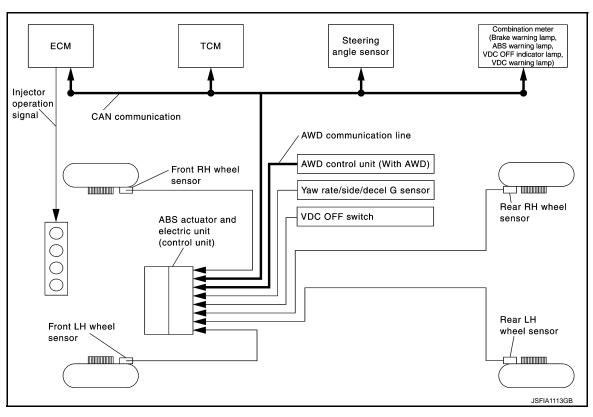
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TCS

System Diagram

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System Description

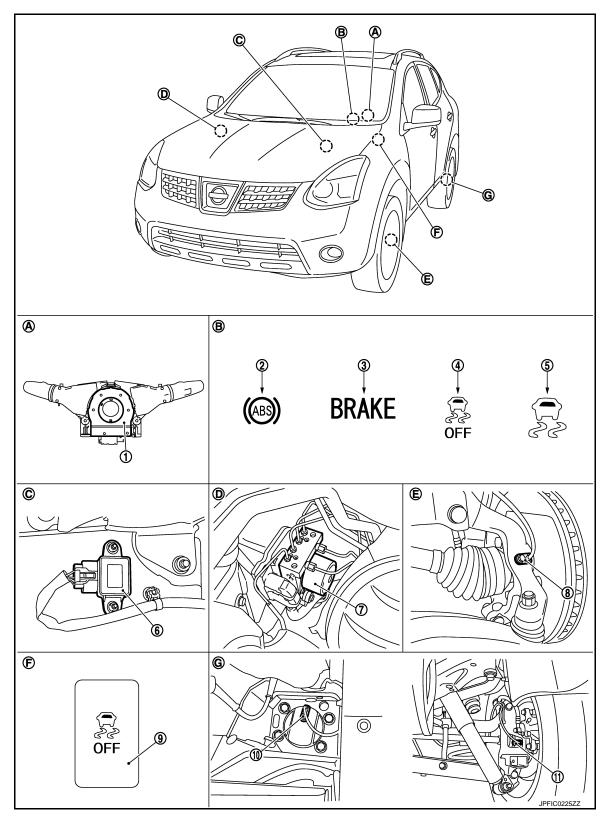
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- Traction Control System is a function that electronically controls engine torque, brake fluid pressure and CVT shift position to ensure the optimum slippage ratio at drive wheels by computing wheel speed signals from 4 wheel sensors. When ABS actuator and electric unit (control unit) detects a spin at drive wheels (rear wheels), it compares wheel speed signals from all 4 wheels. At this time, LH and RH rear brake fluid pressure are controlled, while fuel being cut to engine and throttle valve being closed to reduce engine torque by the control unit. Further more, throttle position is continuously controlled to ensure the optimum engine torque at all times.
- During TCS operation, it informs driver of system operation by flashing VDC warning lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000008282315

FOR USA



1. Steering angle sensor

Revision: 2012 June

- 4. VDC OFF indicator lamp
- 7. ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. VDC warning lamp
- 8. Front wheel sensor
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor
- 9. VDC OFF switch

11. Rear wheel sensor (AWD models)

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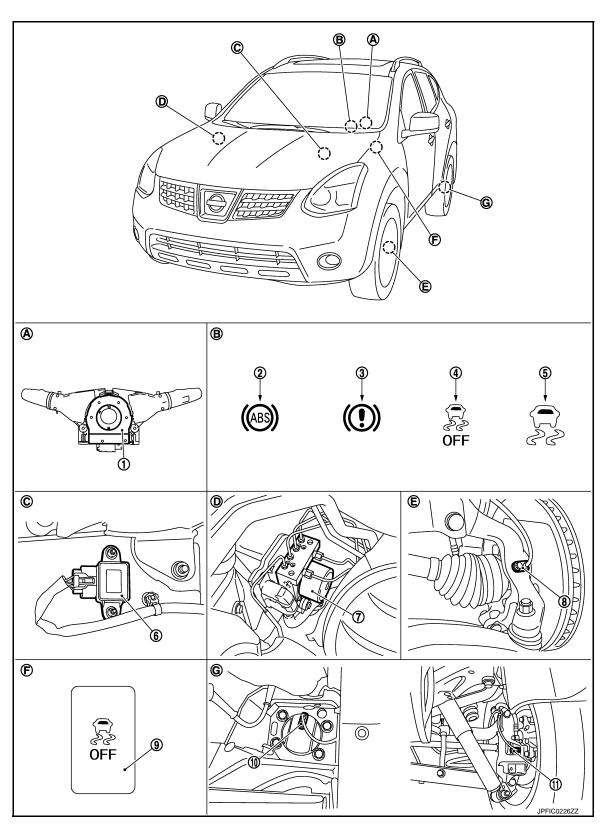
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- A. Back of spiral cable assembly
- D. Engine room (right side)
- G. Rear axle

- B. Combination meter
- E. Steering knuckle
- C. Center console
- F. Instrument driver lower panel

EXCEPT FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor

TCS

< SYSTEM	DESCRIPT	LIUNI ~

[VDC/TCS/ABS]

- ABS actuator and electric unit (control unit)
- Front wheel sensor
- 9. VDC OFF switch

- 10. Rear wheel sensor (2WD models)
- 11. Rear wheel sensor (AWD models)
- A. Back of spiral cable assemblyD. Engine room (right side)
- B. Combination meter
- C. Center console

D. Linging room (iii

E. Steering knuckle F. Instrument driver lower panel

G. Rear axle

Component Description

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Component parts		Reference
	Pump	PDC 440 "Description"
ADO	Motor	BRC-110, "Description"
	Actuator relay (Main relay)	BRC-132, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-127, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-139, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-141, "Description"
Wheel sensor		BRC-99, "Description"
Yaw rate/side/decel G sensor		BRC-112, "Description"
Steering angle sensor		BRC-134, "Description"
VDC OFF switch		BRC-153, "Description"
ABS warning lamp		BRC-155, "Description"
Brake warning lamp		BRC-156, "Description"
VDC OFF indicator lamp		BRC-159, "Description"
VDC warning lamp		BRC-158, "Description"

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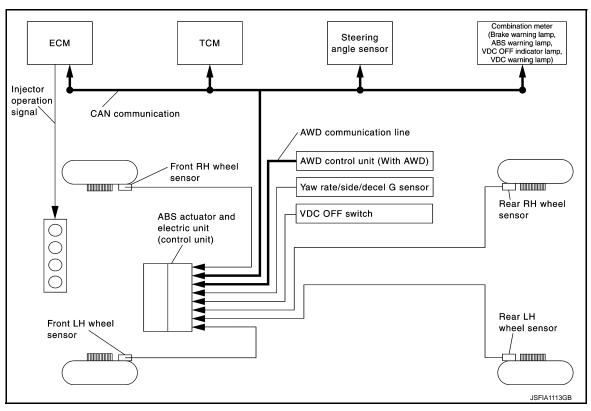
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ABS

System Diagram

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System Description

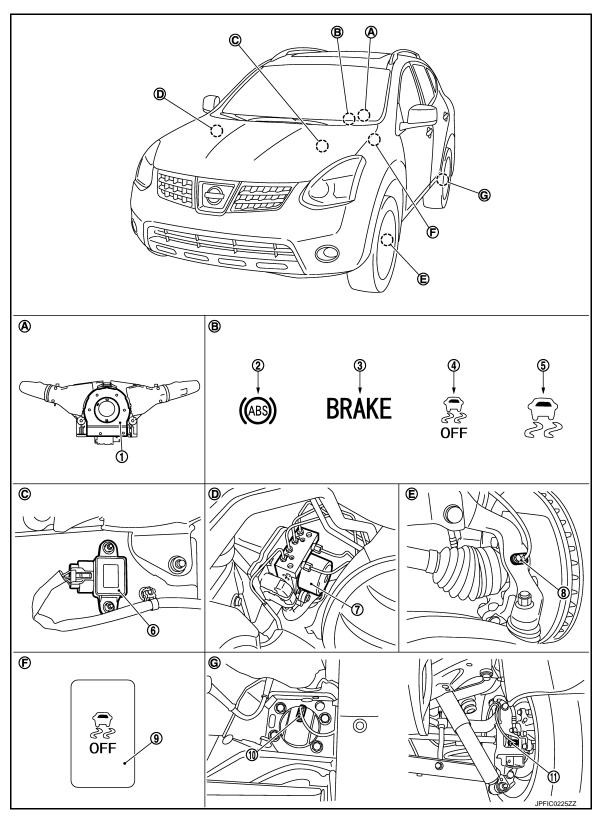
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- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls
 braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000008282319

FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 7. ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. VDC warning lamp
- 8. Front wheel sensor
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor
- 9. VDC OFF switch

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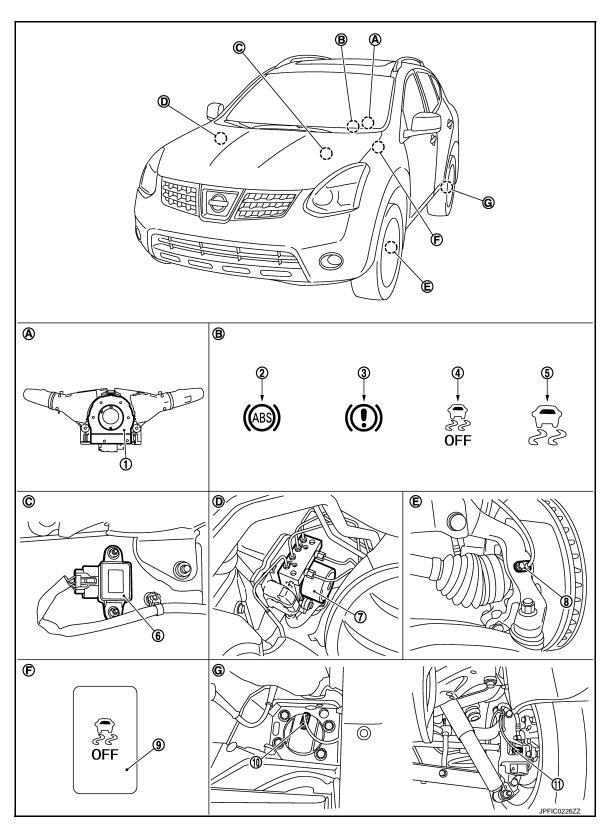
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11. Rear wheel sensor (AWD models)

- A. Back of spiral cable assembly
- D. Engine room (right side)
- G. Rear axle

- B. Combination meter
- E. Steering knuckle
- C. Center console
- F. Instrument driver lower panel

EXCEPT FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor

ABS

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[VDC/TCS/ABS]

- 7. ABS actuator and electric unit (control unit)
- Front wheel sensor
- 9. VDC OFF switch

- 10. Rear wheel sensor (2WD models)
- 11. Rear wheel sensor (AWD models)
- A. Back of spiral cable assembly
- B. Combination meter
- C. Center console

- D. Engine room (right side)
- E. Steering knuckle
- F. Instrument driver lower panel

G. Rear axle

Component Description

INFOID:0000000008282320

Component parts		Reference
	Pump	PDC 110 "Description"
	Motor	BRC-110, "Description"
APC actuator and algoritic unit (control unit)	Actuator relay (Main relay)	BRC-132, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-127, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-139, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-141, "Description"
Wheel sensor		BRC-99, "Description"
Yaw rate/side/decel G sensor		BRC-112, "Description"
Steering angle sensor		BRC-134, "Description"
VDC OFF switch		BRC-153, "Description"
ABS warning lamp		BRC-155, "Description"
Brake warning lamp		BRC-156, "Description"
VDC OFF indicator lamp		BRC-159, "Description"
VDC warning lamp		BRC-158, "Description"

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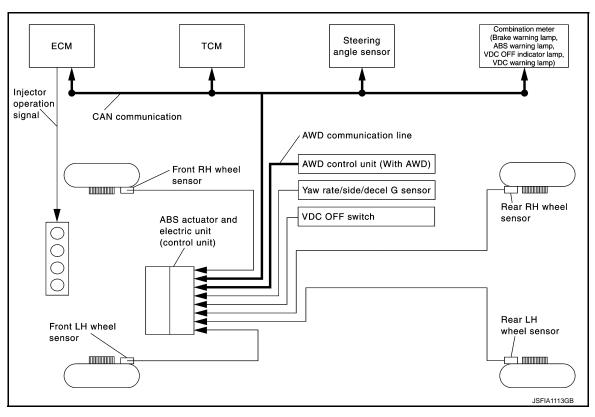
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[VDC/TCS/ABS]

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System Diagram

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System Description

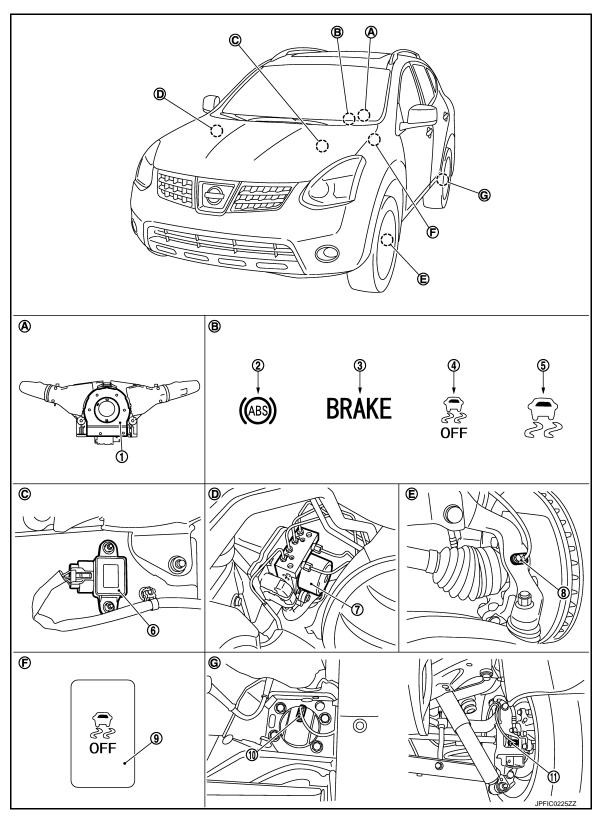
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- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then is electronically controls the rear braking force (brake fluid pressure) to reducing and reduces rear wheel slippage. Accordingly it improves vehicle stability.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000008282323

FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 7. ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. VDC warning lamp
- 8. Front wheel sensor
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor
- 9. VDC OFF switch

11. Rear wheel sensor (AWD models)

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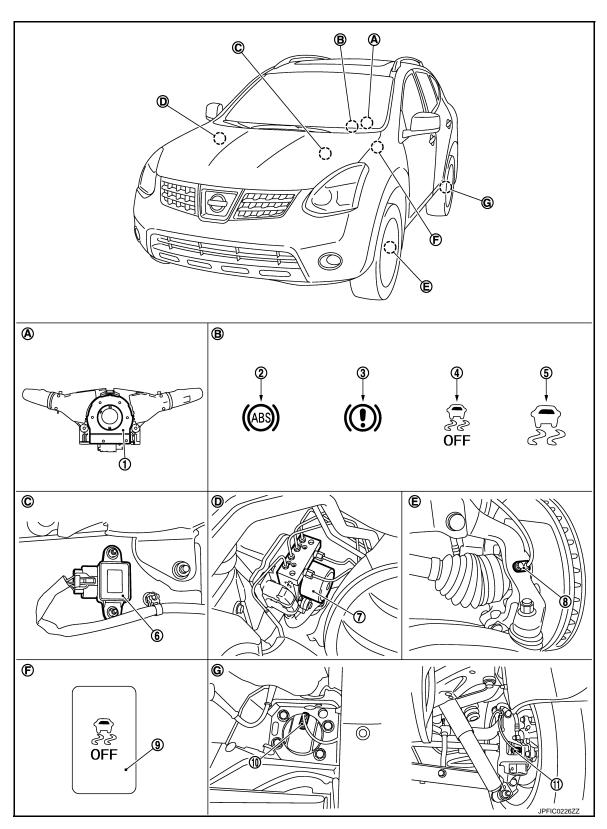
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- A. Back of spiral cable assembly
- D. Engine room (right side)
- G. Rear axle

- B. Combination meter
- E. Steering knuckle
- C. Center console
- F. Instrument driver lower panel

EXCEPT FOR USA



- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Yaw rate/side/decel G sensor

EBD

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[VDC/TCS/ABS]

- ABS actuator and electric unit (control unit)
- 8. Front wheel sensor
- VDC OFF switch

- 10. Rear wheel sensor (2WD models)
- 11. Rear wheel sensor (AWD models)
- Back of spiral cable assembly Engine room (right side)
- B. Combination meter
- C. Center console

- D.
- E. Steering knuckle
- F. Instrument driver lower panel

Rear axle G.

Component Description

INFOID:0000000008282324

Component parts		Reference
	Pump	DDC 440 "Deceription"
	Motor	BRC-110, "Description"
APS actuator and algebra unit (control unit)	Actuator relay (Main relay)	BRC-132, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-127, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-139, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-141, "Description"
Wheel sensor		BRC-99, "Description"
Yaw rate/side/decel G sensor		BRC-112, "Description"
Steering angle sensor		BRC-134, "Description"
VDC OFF switch		BRC-153, "Description"
ABS warning lamp		BRC-155, "Description"
Brake warning lamp		BRC-156, "Description"
VDC OFF indicator lamp		BRC-159, "Description"
VDC warning lamp		BRC-158, "Description"

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< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT Function

FUNCTION

CONSULT can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT.
Self diagnostic result	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.
Active test	Diagnostic test mode is which CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU identification	ABS actuator and electric unit (control unit) part number can be read.

WORK SUPPORT

Item	Description
ST ANGLE SENSOR ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.

SELF DIAGNOSTIC RESULT

Operation Procedure

Before performing the self-diagnosis for "ABS" with CONSULT, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC warning lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay "ON" position.

Display Item List

Refer to BRC-166, "DTC Index".

DATA MONITOR MODE

Display Item List

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MONITOR ITEM		×: Applicable ▼: Optional iter	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
FR LH SENSOR [km/h (MPH)]	×	×		
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed	
RR LH SENSOR [km/h (MPH)]	×	×	wileer speed	
RR RH SENSOR [km/h (MPH)]	×	×		
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status	
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)	
GEAR	×	×	Gear position determined by TCM	
OFF SW (On/Off)	×	×	VDC OFF switch	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate/side/decel G sensor	
DECEL G-SEN (G)	×	×	Decel G detected by yaw rate/side/decel G sensor	
ACCEL POS SIG %)	×	•	Throttle actuator opening/closing is displayed (Linked with accelerator pedal)	
SIDE G-SENSOR (m/s ²)	×	•	Transverse G detected by yaw rate/side/decel G sensor	
STR ANGLE SIG (°)	×	•	Steering angle detected by steering angle sensor	
ENGINE RPM [tr/min (rpm)]	×	•	Engine speed	
FLUID LEV SW (On/Off)	×	•	Brake fluid level switch signal status	
FR RH IN SOL (On/Off)	•	×		
FR RH OUT SOL (On/Off)	•	×		
FR LH IN SOL (On/Off)	•	×		
FR LH OUT SOL On/Off)	▼	×	Operation status of each solenoid valve	
RR RH IN SOL On/Off)	•	×		
RR RH OUT SOL On/Off)	•	×		
RR LH IN SOL On/Off)	•	×		
RR LH OUT SOL On/Off)	▼	×		
MOTOR RELAY (On/Off)	•	×	Motor and motor relay operation	
ACTUATOR RLY (On/Off)	▼	×	Actuator relay operation	

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MONITOR ITEM		
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
ABS WARN LAMP (On/Off)	•	×	ABS warning lamp
OFF LAMP (On/Off)	•	×	VDC OFF indicator lamp
SLIP/VDC LAMP (On/Off)	•	×	VDC warning lamp
N POSI SIG (On/Off)	•	•	N range status
P POSI SIG (On/Off)	•	•	P range status
R POSI SIG (On/Off)	•	•	R range status
CRAKING SIG (On/Off)	•	▼	CAN mask request for cranking
CV1 (On/Off)	•	•	Cut valve 1 monitor
CV2 (On/Off)	•	▼	Cut valve 2 monitor
SV1 (On/Off)	•	▼	Suction valve 1 monitor
SV2 (On/Off)	•	•	Suction valve 2 monitor
STOP LAMP SW2 (On/Off)	•	▼	ASCD brake switch signal status
EBD SIGNAL (On/Off)	•	▼	EBD operation
ABS SIGNAL (On/Off)	•	▼	ABS operation
TCS SIGNAL (On/Off)	•	▼	TCS operation
VDC SIGNAL (On/Off)	•	▼	VDC operation
EBD FAIL SIG (On/Off)	•	▼	EBD fail-safe status
ABS FAIL SIG (On/Off)	•	▼	ABS fail-safe status
TCS FAIL SIG (On/Off)	•	▼	TCS fail-safe status
VDC FAIL SIG (On/Off)	•	•	VDC fail-safe status
4WD MODE MON (On/Off)	•	▼	AWD mode monitor

ACTIVE TEST MODE

CAUTION:

- Never perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be performed with the ABS warning lamp, VDC warning lamp and brake warning lamp are on.
- ABS warning lamp, VDC warning lamp and brake warning lamp are on during active test.
- Erase memory of ICC system after implementing active test.

NOTE:

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)
- "TEST IS STOPPED" in "ABS" with CONSULT is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT is displayed, to perform test again.

Test Item

ABS SOLENOID VALVE

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in solenoid valve operation chart.

Test item	Display item –	Display		
		Up	Keep	Down
	FR RH IN SOL	Off	On	On
ED DILLCOL	FR RH OUT SOL	Off	Off	On*
FR RH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off
	FR LH IN SOL	Off	On	On
ED III COI	FR LH OUT SOL	Off	Off	On*
FR LH SOL	CV2	Off	Off	Off
	SV2	Off	Off	Off
	RR RH IN SOL	Off	On	On
RR RH SOL	RR RH OUT SOL	Off	Off	On*
KK KH SUL	CV2	Off	Off	Off
	SV2	Off	Off	Off
PD 111 001	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
RR LH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off

^{*:} On for 1 to 2 seconds after the select, and then Off.

ABS SOLENOID VALVE (ACT)

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in solenoid valve operation chart.

Test item	Diaplay itam	Display		
rest item	Display item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off
(ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLENOID	FR LH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off

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< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Test item	Dioplay item	Display		
iest item	Display item	Up	ACT UP	ACT KEEP
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	SV1	Off	On*	Off

^{*:} On for 1 to 2 seconds after the select, and then Off.

ABS MOTOR

• Select "On" and "Off" of "ACTIVE TEST" in "ABS" with CONSULT on screen. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Display	
rest item	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY	On	On

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number can be read.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

Description INFOID:0000000008282326

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282327

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	Harness or connector Wheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

>> Proceed to diagnosis procedure. Refer to BRC-99, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

CAUTION: Never check between wheel sensor harness connector terminals.

1.CHECK WHEEL SENSOR

- Turn the ignition switch OFF.
- Check wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.REPLACE WHEEL SENSOR (1)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-177</u>, "FRONT WHEEL SENSOR: Exploded View". Rear: Refer to <u>BRC-178</u>, "REAR WHEEL SENSOR: Exploded View".
- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF, and wait 10 seconds or more.

- Stop the vehicle.

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Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.

BRC-99 Revision: 2012 June **2013 ROGUE**

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

7. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 4.

4. PERFORM SELF-DIAGNOSIS (1)

- Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- 4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 5.

NO >> INSPECTION END

CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts and GO TO 6.

O.PERFORM SELF-DIAGNOSIS (2)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- 8. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 7.

NO >> INSPECTION END

7. CHECK WHEEL SENSOR HARNESS

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Disconnect wheel sensor harness connector.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

C1101, C1102, C1103, C1104 WHEEL SENSOR

ABS actuator and elec		r supply circuit		
	ctric unit (control unit)	Wheel ser	nsor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	21	E39 (Front RH wheel)	3	
E36	23	E22 (Front LH wheel)	1	Existed
230	11	B41 (Rear RH wheel)	7	Existed
	26	B44 (Rear LH wheel)	5	
Measurement connect	tor and terminal for signa	l circuit		
ABS actuator and elec	ctric unit (control unit)	Wheel ser	nsor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	12	E39 (Front RH wheel)	4	
E36	27	E22 (Front LH wheel)	2	Existed
E30	15	B41 (Rear RH wheel)	8	EXISIEU
	30	B44 (Rear LH wheel)	6	
Turn the ignition Start the engine.		ait 10 seconds or more.		
Turn the ignition Start the engine. Drive the vehicle Stop the vehicle. Perform self-diag DTC "C1101", "C1" ES >> GO TO 9	switch OFF, and was at approx. 30 km/h gnosis for "ABS" wit 102", "C1103" or "C	". ait 10 seconds or more. n (19 MPH) or more for a h CONSULT.	approx. 1 minute.	
Turn the ignition Start the engine. Drive the vehicle Stop the vehicle. Perform self-diag OTC "C1101", "C1" ES >> GO TO SO O >> INSPECT	switch OFF, and was at approx. 30 km/h gnosis for "ABS" wit 102", "C1103" or "C o o o o o o o o o o o o o o o o o o	". ait 10 seconds or more. n (19 MPH) or more for a h CONSULT.	approx. 1 minute.	
Turn the ignition Start the engine. Drive the vehicle Stop the vehicle. Perform self-diagon (CTC "C1101", "C1") S >> GO TO GO >> INSPECTOR (CTC) REPLACE WHEE Replace wheel self-diagnostic Refer to Bell Rear: Refer to Bell Erase self-diagnostic Reference (CTC) Reference	e at approx. 30 km/r gnosis for "ABS" wit 102", "C1103" or "C D. TION END EL SENSOR sensor. BRC-177, "FRONT N RC-178, "REAR WI	". ait 10 seconds or more. (19 MPH) or more for a th CONSULT. 1104" detected? WHEEL SENSOR : Explore with CONSULT.	oded View".	
Turn the ignition Start the engine. Drive the vehicle Stop the vehicle. Perform self-diag DTC "C1101", "C1" ES >> GO TO SO >> INSPECTOR REPLACE WHEE Replace wheel so Front: Refer to BO Rear: Refer to BO Rear: Refer to BO Erase self-diagnor Turn the ignition Start the engine. Drive the vehicle Stop the vehicle.	switch OFF, and was at approx. 30 km/r gnosis for "ABS" with 102", "C1103" or "C grant of the control of the co	". ait 10 seconds or more. a (19 MPH) or more for a th CONSULT. 1104" detected? WHEEL SENSOR: Explore with CONSULT. ait 10 seconds or more. a (19 MPH) or more for a	oded View". ded View".	
Turn the ignition Start the engine. Drive the vehicle. Stop the vehicle. Perform self-diagon of the vehicle. Perform self-diagon of the vehicle of the vehicle. Perform self-diagon of the vehicle. Perform self-diagon of the vehicle. Perform self-diagon of the vehicle.	e at approx. 30 km/r gnosis for "ABS" with 102", "C1103" or "C or "C100" or	". ait 10 seconds or more. ait 10 seconds or more. a (19 MPH) or more for a th CONSULT. 1104" detected? WHEEL SENSOR: Explor with CONSULT. ait 10 seconds or more. a (19 MPH) or more for a	oded View". ded View".	

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to <u>BRC-76. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>.

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR

Description INFOID:000000008282330

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Signal from rear RH wheel sensor does not match other 3 wheel speed signal.	Sensor not installed currently Sensor rotor or encoder dam-
C1106	RR LH SENSOR-2	Signal from rear LH wheel sensor does not match other 3 wheel speed signal.	aged Sensor rotor loose on axle Electrical interference
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signal.	Wheel not turning - e.g. vehi- cle driven on 2WD dynamom-
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.	eter Sensor damaged ABS unit damaged

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-102, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

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CAUTION

Never check between wheel sensor harness connector terminals.

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-149</u>, "<u>Diagnosis Procedure</u>".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- Turn the ignition switch OFF.
- Check tire air pressure, wear and size. Refer to <u>WT-50, "Tire Air Pressure"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.

C1105, C1106, C1107, C1108 WHEEL SENSOR
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]
 Start the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:
Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?
YES >> GO TO 4. NO >> GO TO 5.
4.PERFORM SELF-DIAGNOSIS (1)
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle.
3. Perform self-diagnosis for "ABS" with CONSULT.
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> GO TO 5.
YES >> GO TO 5. NO >> INSPECTION END
5.CHECK WHEEL SENSOR
 Turn the ignition switch OFF. Check wheel sensor for damage. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the
wheel sensor mounting hole. CAUTION: Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified
torque.
 Front: Refer to <u>BRC-177</u>, "FRONT WHEEL SENSOR: Exploded View".
Rear: Refer to BRC-178, "REAR WHEEL SENSOR : Exploded View".
Is the inspection result normal? YES >> GO TO 8. NO >> GO TO 6.
6.REPLACE WHEEL SENSOR (1)
 Replace wheel sensor. Front: Refer to <u>BRC-177</u>, "FRONT WHEEL SENSOR: Exploded View". Rear: Refer to <u>BRC-178</u>, "REAR WHEEL SENSOR: Exploded View". Erase self-diagnosis result for "ABS" with CONSULT.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
 Start the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.
NOTE: Set the "DATA MONITOR" recording speed to "10 msec". 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?
YES >> GO TO 7.
NO >> GO TO 19.

7. PERFORM SELF-DIAGNOSIS (2)

- With CONSULT.Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 19.

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< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

8. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- 3. Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9.

9.check data monitor (2)

- Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- 4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.

NO >> GO TO 11.

10. PERFORM SELF-DIAGNOSIS (3)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 11.

NO >> INSPECTION END

11. CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace error-detected parts and GO TO 12.

12. CHECK DATA MONITOR (3)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13. NO >> GO TO 14. [VDC/TCS/ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

13. PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 14.

NO >> INSPECTION END

14. CHECK WHEEL SENSOR HARNESS

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector. 2.
- Disconnect wheel sensor harness connector. 3.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		Continuity
	12, 21		Not existed
E36	27, 23	Ground	
	15, 11		
	30, 26		

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts and GO TO 15.

15. CHECK DATA MONITOR (4)

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.

NO >> GO TO 17.

16. PERFORM SELF-DIAGNOSIS (5)

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17. REPLACE WHEEL SENSOR

- Replace wheel sensor.
- Front: Refer to BRC-177, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-178, "REAR WHEEL SENSOR: Exploded View".
- Erase self-diagnosis result for "ABS" with CONSULT. 2.
- 3.
- Start the engine.

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Turn the ignition switch OFF, and wait 10 seconds or more.

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C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

5. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18. NO >> GO TO 19.

18. PERFORM SELF-DIAGNOSIS (6)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19. REPLACE SENSOR ROTOR

- 1. Replace sensor rotor.
- Front: Refer to BRC-179, "FRONT SENSOR ROTOR: Exploded View".
- Rear: Refer to BRC-179, "REAR SENSOR ROTOR: Exploded View".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000008282333

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1109 POWER AND GROUND SYSTEM

Description INFOID:0000000008282334

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply is lower than normal. Power supply is greater than normal limits.	Harness or connector ABS unit Fuse Vehicle electrical power system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

Turn the ignition switch OFF to ON.

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1109" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-107, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage
Connector	Terminal	1 —	Condition	vollage
E36	16	Ground	Ignition switch: OFF	Approx. 0 V

Turn the ignition switch ON.

CAUTION:

Never start the engine.

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage
Connector	Terminal	1 –	Condition	voltage
E36	16	Ground	Ignition switch: ON	Battery voltage

Is the inspection result normal?

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> GO TO 4. NO >> GO TO 3.

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check 10A fusible link (59).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

ABS actuator and electric unit (control unit)		IPDM E/R		continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E36	16	E15	59	Existed	

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-18, "Wiring Diagram - IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	
E36	3	Ground	Existed
L30	4	Ground	LAISIGU

Is the inspection result normal?

NO

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.

>> Repair or replace error-detected parts (check ABS earth bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282337

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Description

ABS unit is continuously monitoring ECU hardware and software for correct operation.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	Possible internal failure of control unit components.	Internal failure of control unit components. ABS solenoid valve or motor power supply / ground abnormal.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1110" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-109, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

CAUTION:

Replace ABS actuator and electric unit (control unit) when self-diagnostic result shows items other than those applicable.

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

Special Repair Requirement

 ${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000008282342

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric ur	
	POWE WOTOK	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-110, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282344

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			voltage
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".</u>

3.check abs actuator and electric unit (control unit) ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
E36	3	Ground	Existed
L30	4	Giodila	LAISIEU

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282345

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

Description INFOID:000000008282346

Yaw rate/side/decel G sensor detects yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1113	G SENSOR		Harness or connector	
C1145	YAW RATE SENSOR		ABS actuator and electric unit (control unit)	
C1146	SIDE G-SEN CIRCUIT	Yaw rate/side/decel G sensor is malfunctioning, or signal line of yaw rate/side/decel G sensor is open or shorted.	Yaw rate/side/decel G sensor Electrical interference Vehicle driven on AWD rolling road	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1113", "C1145" or "C1146" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-112</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282348

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK YAW RATE/SIDE/DECEL G SENSOR HARNESS

Check continuity between yaw rate/side/decel G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit) Connector Terminal		Yaw rate/side/decel G sensor		Continuity
		Connector	Terminal	Continuity
	13	B38	4	
E36	14		5	Existed
E30	28		2	Existed
	29		6	

Is the inspection result normal?

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK YAW RATE/SIDE/DECEL G SENSOR HARNESS CONNECTOR

Check continuity between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor		Continuity
Connector	Connector Terminal	
	2 – 4	
	2 – 5	
B38	2 – 6	Not existed
D30	4 – 5	Not existed
	4 – 6	
	5 – 6	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK YAW RATE/SIDE/DECEL G SENSOR 1

- 1. Connect yaw rate/side/decel G sensor harness connector.
- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

 Move yaw rate/side/decel G sensor as shown in the figure to check the output of before and after moving the sensor with the "ABS", "DATA MONITOR" and "DECEL G-SEN" in order with CONSULT.

Condition	DATA MONITOR	
Horizontal	Approx. 0 G	
Vertical	Approx. +1 G	

Is the inspection result normal?

YES >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-182</u>, "Exploded View".

NO >> GO TO 5.

5. CHECK YAW RATE/SIDE/DECEL G SENSOR 2

- Turn the ignition switch OFF.
- 2. Connect following terminals between yaw rate/side/decel G sensor and harness connector.

Yaw rate/side/decel G sensor	Harness connector	
	Connector	Terminal
2	B38	2
4		4
5		5
6		6

- 3. Turn the ignition switch ON.
- 4. Check voltage between yaw rate/side/decel G sensor harness connector.

CAUTION:

Never short out the terminals while measuring voltages.

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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Yaw rate/side/decel G sensor		Voltago	
connector	Terminal	Voltage	
B38	5 – 2	2.5 – 4.5 V	
D30	6 – 2	0.5 – 2.5 V	

Is the inspection result normal?

YES >> Replace ABS actuator end electric unit (control unit) Refer to BRC-180, "Exploded View".

NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-182, "Exploded View"</u>.

Special Repair Requirement

INFOID:0000000008282349

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1115 WHEEL SENSOR

Description INFOID:0000000008282350

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282351

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	Miss-match between the 4 wheel speed sensor signals.	Harness or connector not a possible cause. Other possible causes tire radius (due to wrong size or pressure) interference.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-115, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

For wheel sensor, never check between terminals.

 ${f 1}$.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to BRC-149, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- Turn the ignition switch OFF.
- Check tire air pressure, wear and size. Refer to WT-50, "Tire Air Pressure".

Is the inspection result normal?

YFS >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more. 2.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

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< DTC/CIRCUIT DIAGNOSIS >

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4. NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK WHEEL SENSOR

- 1. Turn the ignition switch OFF.
- 2. Check wheel sensor for damage.
- Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

- Front: Refer to BRC-177, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-178, "REAR WHEEL SENSOR: Exploded View".

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 6.

6. REPLACE WHEEL SENSOR (1)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-177</u>, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-178, "REAR WHEEL SENSOR: Exploded View".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7. NO >> GO TO 19.

7.PERFORM SELF-DIAGNOSIS (2)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

8.check connector

- Turn the ignition switch OFF.
- 2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check wheel sensor harness connector for disconnection or looseness.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[VDC/TCS/ABS]
Is the inspection result normal?	
YES >> GO TO 11.	A
NO >> Repair or replace error-detected parts, securely lock the harness connector	, and GO TO 9.
9.check data monitor (2)	В
Erase self-diagnosis result for "ABS" with CONSULT.	D
2. Turn the ignition switch OFF, and wait 10 seconds or more.	
 Start the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOF and "RR RH SENSOR" with CONSULT. NOTE: 	R", "RR LH SENSOR"
Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensors are considered to "10 msec".	
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by wheel sensor and the maximum/minimum wheel speed detected by the normal wheel ence within 5%, respectively?	
YES >> GO TO 10.	
NO >> GO TO 11.	BR
10.perform self-diagnosis (3)	BN
Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	
2. Stop the vehicle.	G
3. Perform self-diagnosis for "ABS" with CONSULT.	
Is DTC "C1115" detected?	
YES >> GO TO 11.	Н
NO >> INSPECTION END	
11.check terminal	
1. Turn the ignition switch OFF.	a ah a ah ADO a atu atau
 Disconnect ABS actuator and electric unit (control unit) harness connector and the and electric unit (control unit) pin terminals for damage or loose connection with har Disconnect wheel sensor harness connector and check each wheel sensor pin ter loose connection with harness connector. 	ness connector.
Is the inspection result normal?	
YES >> GO TO 14.	K
NO >> Repair or replace error-detected parts and GO TO 12.	
12.check data monitor (3)	1
Connect ABS actuator and electric unit (control unit) harness connector.	
2. Connect wheel sensor harness connector.	
 Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more. 	N
5. Start the engine.	
 Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOF and "RR RH SENSOR" with CONSULT. NOTE: 	R", "RR LH SENSOR" N
Set the "DATA MONITOR" recording speed to "10 msec".	
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel	
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by wheel speed detected by the parmal wheel	by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel ence within 5%, respectively?	SCHSUIS, IS THE CHIEF-
YES >> GO TO 13.	Р
NO >> GO TO 14.	
13. PERFORM SELF-DIAGNOSIS (4)	
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	
2. Stop the vehicle.	
3. Perform self-diagnosis for "ABS" with CONSULT.	

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Is DTC "C1115" detected?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 14.

NO >> INSPECTION END

14. CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement connector and terminal for power supply circuit

ABS actuator and ele	ectric unit (control unit)	Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	21	E39 (Front RH wheel)	3	
E36	23	E22 (Front LH wheel)	1	Existed
E30	11	B41 (Rear RH wheel)	7	Existed
	26	B44 (Rear LH wheel)	5	

Measurement connector and terminal for signal circuit

ABS actuator and ele	ectric unit (control unit)	Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	12	E39 (Front RH wheel)	4	
E36	27	E22 (Front LH wheel)	2	Existed
E30 -	15	B41 (Rear RH wheel)	8	LAISIEU
	30	B44 (Rear LH wheel)	6	

5. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and el	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
	12, 21		Not existed
E36	27, 23	Ground	
E30	15, 11	Giouria	Not existed
	30, 26		

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts and GO TO 15.

15. CHECK DATA MONITOR (4)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.

NO >> GO TO 17.

C1115 WHEEL SENSOR

[VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > 16. PERFORM SELF-DIAGNOSIS (5) Α 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. В Is DTC "C1115" detected? YES >> GO TO 17. NO >> INSPECTION END 17. REPLACE WHEEL SENSOR Replace wheel sensor. Front: Refer to BRC-177, "FRONT WHEEL SENSOR: Exploded View". D Rear: Refer to BRC-178, "REAR WHEEL SENSOR: Exploded View". Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more. Е Start the engine. 5. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. **BRC** NOTE: Set the "DATA MONITOR" recording speed to "10 msec". Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively? YES >> GO TO 18. Н NO >> GO TO 19. 18. PERFORM SELF-DIAGNOSIS (6) Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 2. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1115" detected? YES >> GO TO 19. NO >> INSPECTION END 19. REPLACE SENSOR ROTOR K Replace sensor rotor. Front: Refer to BRC-179, "FRONT SENSOR ROTOR: Exploded View". Rear: Refer to BRC-179, "REAR SENSOR ROTOR: Exploded View". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 5. Stop the vehicle. 7. Perform self-diagnosis for "ABS" with CONSULT. N Is DTC "C1115" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View". >> INSPECTION END NO Special Repair Requirement INFOID:0000000008282353 ${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-

>> END

76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

C1116 STOP LAMP SWITCH

Description INFOID:000000008282354

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When a stop lamp switch signal is not input where the brake pedal is depressed.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1116" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-120</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282356

NOTE

DTC "C1116" may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction.

1.INTERVIEW FROM THE CUSTOMER

Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

YES >> GO TO 2. NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.

CAUTION:

Never start the vehicle.

- 4. Depress the brake pedal several times.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

C1116 STOP LAMP SWITCH

[VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > Does stop lamp turn ON? >> GO TO 5. Α YES NO >> Check stop lamp system. GO TO 4. Xenon type: Refer to <u>EXL-62</u>, "Wiring <u>Diagram - STOP LAMP -"</u>. Halogen type: Refer to <u>EXL-182</u>, "Wiring Diagram - STOP LAMP -". В **4.**CHECK DATA MONITOR (1) Erase self-diagnosis result for "ABS" with CONSULT. 2. Turn the ignition switch OFF, and wait 10 seconds or more. 3. Start the engine. **CAUTION:** Never start the vehicle. D 4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value". Е Is the inspection result normal? >> INSPECTION END YES NO >> GO TO 5. **BRC** 5.CHECK STOP LAMP SWITCH CLEARANCE Turn the ignition switch OFF. Check stop lamp switch clearance. Refer to <u>BR-8</u>, "Inspection and Adjustment". Is the inspection result normal? YES >> GO TO 7. >> Adjust stop lamp switch clearance. Refer to <u>BR-8</u>, "Inspection and Adjustment". GO TO 6. NO **O.**CHECK DATA MONITOR (2) Erase self-diagnosis result for "ABS" with CONSULT. 2. Turn the ignition switch OFF, and wait 10 seconds or more. 3. Start the engine. **CAUTION:** Never start the vehicle. 4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value". Is the inspection result normal? >> INSPECTION END YES NO >> GO TO 7. .CHECK STOP LAMP SWITCH Check stop lamp switch. Refer to BRC-124, "Component Inspection (Stop Lamp Switch)". Is the inspection result normal? YES >> GO TO 9. NO >> Replace stop lamp switch. Refer to <u>BR-19</u>, "Exploded View". GO TO 8. Ν 8.CHECK DATA MONITOR (3) 1. Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. **CAUTION:** Never start the vehicle. 4. Select "ABS". "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value". Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 9. 9. CHECK STOP LAMP RELAY

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C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Check stop lamp relay. Refer to BRC-124, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace stop lamp relay. GO TO 10.

10. CHECK DATA MONITOR (4)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.

CAUTION:

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 11.

11. CHECK CONNECTOR AND TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 5. Disconnect stop lamp switch harness connector.
- 6. Check stop lamp switch harness connector for disconnection or looseness.
- 7. Check stop lamp switch pin terminals for damage or loose connection with harness connector.
- 8. Disconnect stop lamp relay harness connector.
- 9. Check stop lamp relay harness connector for disconnection or looseness.
- 10. Check stop lamp relay pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace error-detected parts. GO TO 12.

12. CHECK DATA MONITOR (5)

- Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect stop lamp switch harness connector.
- 3. Connect stop lamp relay harness connector.
- 4. Erase self-diagnosis result for "ABS" with CONSULT.
- 5. Turn the ignition switch OFF, and wait 10 seconds or more.
- 6. Start the engine.

CAUTION:

Never start the vehicle.

7. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 13.

13.CHECK STOP LAMP SWITCH CIRCUIT (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electric unit (control unit)			Condition	Valtage	
Connector	Terminal	_	Condition	Voltage	
E36	Q	Ground	Brake pedal depressed	Battery voltage	
L30	0	Giodila	Brake pedal not depressed	Approx. 0 V	

Turn the ignition switch ON.

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage	
Connector	Terminal	_	Condition	voltage	
E36	26 9 Cround	Ground	Brake pedal depressed	Battery voltage	
£30	8	Ground	Brake pedal not depressed	Approx. 0 V	

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180</u>, "Exploded View".

NO >> Repair or replace error-detected parts. GO TO 14.

14. CHECK STOP LAMP SWITCH CIRCUIT (2)

Disconnect stop lamp switch harness connector.

Check voltage between stop lamp switch harness connector and ground.

Stop lamp switch		_	Voltage
Connector	Terminal		voltage
E115	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 15.

>> Repair or replace error-detected parts. GO TO 15. NO

15. CHECK STOP LAMP SWITCH CIRCUIT (3)

Turn the ignition switch OFF.

Disconnect stop lamp relay harness connector.

3. Check continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp relay harness connector.

ABS actuator and ele	ectric unit (control unit)	Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	8	E82	5	Existed

Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E36	8	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 16.

NO >> Repair or replace error-detected parts. GO TO 16.

16. CHECK STOP LAMP SWITCH CIRCUIT (4)

Check continuity and short circuit between stop lamp relay harness connector terminal (3) and 10 A fuse (11). Is the inspection result normal?

YES >> GO TO 17.

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NO >> Repair or replace error-detected parts. GO TO 17.

17.CHECK STOP LAMP SWITCH CIRCUIT (5)

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C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Check continuity between stop lamp switch harness connector and stop lamp relay harness connector.

Stop lan	np switch	Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E115	2	E82	2	Existed

Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

Stop lamp switch			Continuity
Connector	Terminal		Continuity
E115	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace error-detected parts. GO TO 18.

18. CHECK DATA MONITOR (6)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect stop lamp switch harness connector.
- 3. Connect stop lamp relay harness connector.
- 4. Erase self-diagnosis result for "ABS" with CONSULT.
- 5. Turn the ignition switch OFF, and wait 10 seconds or more.
- 6. Start the engine.

CAUTION:

Never start the vehicle.

7. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.

Component Inspection (Stop Lamp Switch)

INFOID:0000000008282357

1. CHECK STOP LAMP SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check continuity between stop lamp switch connector terminals.

Stop lamp switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Existed
1 – Z	Push stop lamp switch (When brake pedal is released.)	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to BR-19, "Exploded View".

Component Inspection (Stop Lamp Relay)

INFOID:0000000008282358

1. CHECK STOP LAMP RELAY

- 1. Turn the ignition switch OFF.
- Disconnect stop lamp relay harness connector.
- Apply 12 V to stop lamp relay connector terminal (2 and 1). CAUTION:

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- · Never make the terminals short.
- Connect the fuse between the terminals when applying the voltage.
- 4. Check continuity between stop lamp relay connector terminals.

Stop lamp relay	Condition	Continuity	
Terminal	Condition		
3 – 5	Apply 12 V to stop lamp relay connector terminal (2 and 1)	Existed	
	Do not apply 12 V to stop lamp relay connector terminal (2 and 1)	Not existed	

5. Check resistance between stop lamp relay connector terminals.

Stop lamp relay	Resistance	
Terminal	Resistance	
1 – 2	Approx. 50 Ω	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp relay.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

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C1118 AWD SYSTEM

Description INFOID:000000008282360

It transmits the value calculated by AWD control unit to ABS actuator and electric unit (control unit) with AWD communication line (line for AWD system only). ABS actuator and electric unit (control unit) controls AWD solenoid valve according to the received command value.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1118	4WD SYSTEM	An error is detected on AWD control unit side. (AWD control unit fail-safe mode)	Harness or connector AWD communication line AWD control unit ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1118" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-126, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282362

1. CHECK AWD CONTROL UNIT

Perform self-diagnosis for "ALL MODE AWD/4WD" with CONSULT.

Is any error system detected?

YES >> Check the error system. Refer to <u>DLN-39</u>, "<u>DTC Index</u>".

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

Special Repair Requirement

INFOID:0000000008282363

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:0000000008282364

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282365

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.		
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit	
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)	
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1120", "C1122", "C1124" or "C1126" detected?

YFS >> Proceed to diagnosis procedure. Refer to BRC-127, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

>> Perform trouble diagnosis for battery power supply. Refer to PG-6, "Wiring Diagram - BATTERY NO POWER SUPPLY -".

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INFOID:0000000008282366

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C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			trol unit) — Continuity	
Connector	Terminal	_	Continuity	
E36	3	Ground	Existed	
E30	4	Giodila	LAISIEU	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".
- NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282367

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:0000000008282368

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000008282369

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.		
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1121", C"C1123", C"C1125" or "C1127" detected?

YFS >> Proceed to diagnosis procedure. Refer to BRC-129, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282370

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

>> Perform trouble diagnosis for battery power supply. Refer to PG-6, "Wiring Diagram - BATTERY NO POWER SUPPLY -".

BRC-129 Revision: 2012 June **2013 ROGUE**

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			trol unit) — Continuity	
Connector	Terminal	_	Continuity	
E36	3	Ground	Existed	
E30	4	Giodila	LAISIEU	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282371

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1130 ENGINE SIGNAL				
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]				
C1130	ENGINE SIGNAL	-		А
Descrip	otion		INFOID:000000008282372	
line.	·	ontrol unit) and ECM exchange the engine sign	nal via CAN communication	В
DTC Lo	ogic		INFOID:000000008282373	С
DTC DE	TECTION LOGIC			
DTC	Display item	Malfunction detected condition	Possible cause	D
C1130	ENGINE SIGNAL 1	ECM signals are invalid or ECM self diagnosis indicates a fault that prevents correct TCS operation.	Harness or connector ABS actuator and electric unit (control unit) ECM CAN communication line	Е
	ONFIRMATION PROCE	DURE		BRC
		DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF	G
_	>> GO TO 2. REPRODUCTION PROCI	EDURE		Н
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. <u>Is DTC "C1130" detected?</u> 				I
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-131, "Diagnosis Procedure".</u> NO >> INSPECTION END				J
Diagnosis Procedure				
1.CHECK ENGINE SYSTEM				
 Perform self-diagnosis for "ENGINE" with CONSULT. Repair or replace items indicated, then Perform self-diagnosis for "ENGINE" with CONSULT. 				

2. Perform self-diagnosis for "ABS" with CONSULT.

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

Р >> END

BRC-131 Revision: 2012 June **2013 ROGUE**

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INFOID:0000000008282375

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C1140 ACTUATOR RELAY SYSTEM

Description INFOID.000000008282376

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground.	Harness or connector ABS actuator and electric unit
01140	ACTORIONNET	During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1140" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-132, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282378

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

	ABS actuator and electric unit (control unit)			Voltage	
•	Connector	Terminal		voltage	
•	E36	2	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".</u>

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	
E36	3	Ground	Existed
	4	Ground	Existed

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180</u>, "Exploded View".

NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282379

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

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C1143, C1144 STEERING ANGLE SENSOR

Description INFOID:000000008282380

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	Harness or connector Steering angle sensor
C1144	ST ANG SEN SIGNAL	Neutral position of steering angle sensor is not finished.	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1143" or "C1144" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-134, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282382

1. CHECK VEHICLE STATE

Check vehicle for any suspension/steering misalignment or damage.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Correct any damage found.

2. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect steering angle sensor harness connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Check voltage between steering angle sensor harness connector and ground.

Steering a	ngle sensor	_	Voltage
Connector	Terminal		voltage
M30	1	Ground	Approx. 0 V

Turn the ignition switch ON.

CAUTION:

Never start the engine.

C1143, C1144 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Check voltage between steering angle sensor harness connector and ground.

Steering a	ngle sensor		Voltage
Connector	Terminal	_	voltage
M30	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

 $oldsymbol{4}.$ CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- Check 10 A fuse (1).
- Check continuity and short circuit between steering angle sensor harness connector terminal (1) and 10 A fuse (1).

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to PG-18, "Wiring Diagram - IGNITION POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

${f 5}.$ CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

Check continuity between steering angle sensor harness connector and ground.

Steering a	ngle sensor		Continuity
Connector	Terminal		
M30	1	Ground	Exist

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK CAN COMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to LAN-40, "Diagnosis Procedure".

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View". YES

NO >> Repair or replace error-detected parts.

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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INFOID:0000000008282383

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C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:000000008282384

Brake fluid level switch contacts close when brake fluid level is low. This is detected by the combination meter which sends the status of fluid level to the VDC unit via the CAN bus.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1155	BR FLUID LEVEL LOW	Ignition switch ON and brake fluid signal low or not available for 10 seconds.	 Brake fluid level low Brake fluid level switch failure Wiring to brake fluid level switch short circuit CAN bus failure Combination meter failure

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1155" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-136, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282386

1. CHECK BRAKE FLUID LEVEL

- 1. Turn the ignition switch OFF.
- 2. Check the brake fluid level. Refer to BR-11, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refill the brake fluid. Refer to BR-11, "Refilling".

2.PERFORM SELF-DIAGNOSIS (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

4. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1155" detected?

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-138, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

C1155 BRAKE FLUID LEVEL SWITCH [VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > NO >> Replace reservoir tank. Refer to BR-27, "Exploded View". GO TO 4. Α 4.PERFORM SELF-DIAGNOSIS (2) Erase self-diagnosis result for "ABS" with CONSULT. 2. Turn the ignition switch OFF, and wait 10 seconds or more. В 3. Turn the ignition switch ON. **CAUTION:** Never start the engine. 4. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1155" detected? YES >> INSPECTION END NO >> GO TO 5. **5.**CHECK CONNECTOR AND TERMINAL Turn the ignition switch OFF. Е 2. Disconnect brake fluid level switch harness connector. 3. Check brake fluid level switch harness connector for disconnection or looseness. 4. Check brake fluid level switch pin terminals for damage or loose connection with harness connector. **BRC** Disconnect combination meter harness connector. Check combination meter harness connector for disconnection or looseness. Check combination meter pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> GO TO 7. NO >> Repair or replace error-detected parts. GO TO 6. 6.PERFORM SELF-DIAGNOSIS (3) Н Connect brake fluid level switch harness connector. Connect combination meter harness connector. Erase self-diagnosis result for "ABS" with CONSULT. 4. Turn the ignition switch OFF, and wait 10 seconds or more. Turn the ignition switch ON. **CAUTION:** Never start the engine. 6. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1155" detected? YES >> INSPECTION END NO >> GO TO 7. 7.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT 1. Turn the ignition switch OFF. 2. Disconnect brake fluid level switch harness connector. 3. Disconnect ABS actuator and electric unit (control unit) harness connector. M 4. Disconnect combination meter harness connector. 5. Check the continuity between brake fluid level switch harness connector and combination meter harness connector. N

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E37	1	M34	27	Existed

Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch		_	Continuity
Connector	Terminal	_	Continuity
E37	1	Ground	No existed

Is the inspection result normal?

YES >> GO TO 8.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Repair or replace error-detected parts.

8.CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch			Continuity
Connector	Terminal		Continuity
E37	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9. CHECK COMBINATION METER

Check combination meter. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace combination meter. Refer to MWI-70, "Exploded View".

Component Inspection

INFOID:0000000008282387

1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch connector terminals.

Brake fluid	level switch	Condition Continuity		
Connector	Terminal	Conducti	Continuity	
F37	E37 1 – 2	When brake fluid is full in the reservoir tank.	Not existed	
	1-2	When brake fluid is empty in the reservoir tank.	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to <u>BR-27</u>, "Exploded View".

Special Repair Requirement

INFOID:0000000008282388

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1164, C1165 CV SYSTEM

Description INFOID:0000000008282389

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

DTC Logic INFOID:0000000008282390

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1165	CV2	VDC switch-over solenoid valve (CV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

Turn the ignition switch OFF to ON.

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1164" or "C1165" detected?

>> Proceed to diagnosis procedure. Refer to BRC-139, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK VDC SWITCH VALVE POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E36	2	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery power supply. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

3.check abs actuator and electric unit (control unit) ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

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INFOID:0000000008282391

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ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E36	3	Ground	Existed
L30	4	Ground	LAISIEU

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.

NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282392

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1166, C1167 SV SYSTEM

Description INFOID:0000000008282393

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic INFOID:0000000008282394

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1166	SV1	VDC switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit	
C1167	SV2	VDC switch-over solenoid valve (SV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

Turn the ignition switch OFF to ON.

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1166" or "C1167" detected?

>> Proceed to diagnosis procedure. Refer to BRC-141, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK VDC SWITCH VALVE POWER SUPPLY

Check voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		
E36	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

Revision: 2012 June

NO >> Perform trouble diagnosis for battery power supply. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

3.check abs actuator and electric unit (control unit) ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

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INFOID:0000000008282395

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E36	3	Ground	Existed
L30	4	Ground	LAISIEU

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.

NO >> Repair or replace error-detected parts. (Check ABS each bolt for tightness and corrosion).

Special Repair Requirement

INFOID:0000000008282396

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1176 STOP LAMP SW2

Description

INFOID:0000000008282397

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON.

DTC Logic INFOID:0000000008282398

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1176	STOP LAMP SW2	When a ASCD brake switch signal is not input where the brake pedal is depressed.	Harness or connector ASCD brake switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1176" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-143, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

NOTE:

DTC "C1176" may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction.

1.INTERVIEW FROM THE CUSTOMER

Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

>> GO TO 2. YES

NO >> GO TO 3.

2.perform self-diagnosis

- Erase self-diagnosis result for "ABS" with CONSULT.
- Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.

CAUTION:

Never start the vehicle.

- 4. Depress the brake pedal several times.
- 5. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1176" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.check ascd brake switch clearance

- Turn the ignition switch OFF.

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Check ASCD brake switch clearance. Refer to BR-8, "Inspection and Adjustment".

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust ASCD brake switch clearance. Refer to BR-8, "Inspection and Adjustment". GO TO 4.

4.CHECK DATA MONITOR (2)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.

CAUTION:

Never start the vehicle.

 Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-161</u>, "<u>Ref-erence Value</u>".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK ASCD BRAKE SWITCH

Check ASCD brake switch. Refer to BRC-146, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace ASCD brake switch. Refer to BR-19, "Exploded View". GO TO 6.

6.CHECK DATA MONITOR (3)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.

CAUTION:

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7.CHECK CONNECTOR AND TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Disconnect ASCD brake switch harness connector.
- Check ASCD brake switch harness connector for disconnection or looseness.
- 7. Check ASCD brake switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts. GO TO 8.

8.CHECK DATA MONITOR (4)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect ASCD brake switch harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.

CAUTION:

Never start the vehicle.

C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order with CONSULT. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-161, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 9.

9. CHECK ASCD BRAKE SWITCH CIRCUIT (1)

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage
Connector	Terminal	— Condition		
E36 6		Ground	Brake pedal depressed	Approx. 0 V
L30	0	Giodila	Brake pedal not depressed	Αρρίολ. Ο ν

Turn the ignition switch ON.

Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Condition	Voltage
Connector	Terminal	_	Condition	voltage
E36	6	Ground	Brake pedal depressed	Approx. 0 V
€30	6 Groun	Ground	Brake pedal not depressed	Battery voltage

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace error-detected parts. GO TO 10.

10.CHECK ASCD BRAKE SWITCH CIRCUIT (2)

- Turn the ignition switch OFF.
- Disconnect ASCD brake switch harness connector.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and ASCD brake switch harness connector.

ABS actuator and electric unit (control unit)		ASCD brake switch		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	6	E112	2	Existed

Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Connector Terminal		Continuity
E36	6	Ground	Not existed

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace error-detected parts. GO TO 11.

11. CHECK DATA MONITOR (5)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- Connect ASCD brake switch harness connector.
- Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.

CAUTION:

Never start the vehicle.

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C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order with CONSULT. Check
that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-161</u>, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

Component Inspection

INFOID:0000000008282400

1. CHECK ASCD BRAKE SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect ASCD brake switch connector.
- 3. Check continuity between ASCD brake switch connector terminals.

ASCD brake switch	Condition	Continuity	
Terminal	Condition		
1 – 2	Brake pedal is fully released.	Existed	
	Brake pedal is slightly depressed.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch. Refer to BR-19, "Exploded View".

Special Repair Requirement

INFOID:0000000008282401

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to <u>BRC-76</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

U1000 CAN COMM CIRCUIT

Description INFOID:0000000008282402

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-147, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1000" detected?

YES >> Proceed to LAN-16, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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INFOID:0000000008282404

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INFOID:0000000008282405

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[VDC/TCS/ABS]

U1010 CONTROL UNIT (CAN)

Description INFOID:000000008282406

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Items	Diagnostic item is detected when	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit) error

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "U1010" detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-148, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000008282408

${f 1.}$ abs actuator and electric unit (control unit)

Check that there is no malfunction in ABS actuator and electric unit (control unit) harness connector or disconnection.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace the harnesses and connectors.

Special Repair Requirement

INFOID:0000000008282409

${f 1}$.abs actuator and electric unit (control unit)

Check that there is no malfunction in ABS actuator and electric unit (control unit) harness connector or disconnection.

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace error-detected parts.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:0000000008282411

POWER SUPPLY AND GROUND CIRCUIT

Description INFOID:0000000008282410

Supplies power to ABS actuator and electric unit (control unit).

Diagnosis Procedure

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		voltage
E36	16	Ground	Approx. 0 V

Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E36	16	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.check abs actuator and electric unit (control unit) ignition power supply circuit

- Turn the ignition switch OFF.
- 2. Check 10A fuse (59).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

ABS actuator and ele	ectric unit (control unit)	IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	16	E15	59	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to PG-18, "Wiring Diagram - IGNITION POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

3.check abs actuator and electric unit (control unit) battery power supply

- Turn the ignition switch OFF.
- Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal		_	voltage
E36	1	Ground	Battery voltage
	2	Sibulia	Battery Voltage

Turn the ignition switch ON.

CAUTION:

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Never start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			voltage
E36	1	Ground	Battery voltage
E30	2	Giodila	Ballery Vollage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".</u>

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND

- Turn the ignition switch OFF.
- 2. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E36	3	Ground	Existed
E30	4	Giouna	LAISIEU

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:0000000008282412

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

PARKING BRAKE SWITCH

Description

INFOID:0000000008282413

The parking brake switch converts the status of the parking brake pedal to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

Component Function Check

INFOID:0000000008282414

1. CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake pedal. Then check that the brake warning lamp in the combination meter turns on/off correctly.

Condition	Brake warning lamp illumination status
When the parking brake switch is operation	ON
When the parking brake switch is not operation.	OFF

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Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-151, "Diagnosis Procedure".

INFOID:0000000008282415

Diagnosis Procedure

1. CHECK PARKING BRAKE SWITCH

- Turn the ignition switch OFF.
- 2. Disconnect parking brake switch harness connector.
- 3. Check continuity between parking brake switch connector terminal and ground.

Parking brake switch		Condition	Continuity	
Terminal	_	Condition	Continuity	
1 Ground		When the parking brake switch is operated.	Existed	
	Crodila	When the parking brake switch is not operated.	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace parking brake switch.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> INSPECTION END

>> Repair or replace combination meter.

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Component Inspection

1. CHECK PARKING BRAKE SWITCH

- Turn the ignition switch OFF.
- Disconnect parking brake switch harness connector.
- Check continuity between parking brake switch connector terminal and ground.

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INFOID:0000000008282416

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Parking brake switch		Condition	Continuity
Terminal	_	Condition	Continuity
1	Ground	When the parking brake switch is operated.	Existed
ı	Ground	When the parking brake switch is not operated.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to PB-6. "Exploded View".

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:0000000008282418

INFOID:0000000008282419

VDC OFF SWITCH

Description INFOID:0000000008282417

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

>> Proceed to diagnosis procedure. Refer to BRC-153, "Diagnosis Procedure". NO

Diagnosis Procedure

1. CHECK VDC OFF SWITCH

Turn the ignition switch OFF.

- Disconnect VDC OFF switch harness connector.
- Check continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Continuity	
Terminal	Conducti		
1 – 2	When VDC OFF switch is hold pressed.	Existed	
1 – 2	When releasing VDC OFF switch.	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

>> VDC OFF switch is malfunctioning. Replace VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 2. Check continuity between VDC OFF switch harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E36	5	M5	1	Existed

Check continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
E36	5	Ground	Not existed

Check continuity between VDC OFF switch harness connector and ground.

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VDC OF	F switch		Continuity
Connector	Terminal	_	Continuity
M5	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> If the open or short in harness, repair or replace harness.

3. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace combination meter.

Component Inspection

INFOID:0000000008282420

1. CHECK VDC OFF SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect VDC OFF switch harness connector.
- Check continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Condition	
Terminal	Condition		
1 – 2	When VDC OFF switch is hold pressed.	Existed	
1-2	When releasing VDC OFF switch.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.

Special Repair Requirement

INFOID:0000000008282421

1.adjustment of steering angle sensor neutral position

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS WARNING LAMP

Description

INFOID:0000000008282422

 \times : ON -: OFF

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Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000008282423

CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-155, "Diagnosis Procedure".

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Diagnosis Procedure

1. CHECK SELF-DIAGNOSIS

INFOID:0000000008282424

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27. tion".

Is the inspection result normal?

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YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace combination meter.

Special Repair Requirement

INFOID:0000000008282425

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

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BRAKE WARNING LAMP

Description INFOID:000000008282426

×: ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ignition switch ON	× (Note 2)
1 second later after turning ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- 2: After starting engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000008282427

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to BRC-156, "Diagnosis Procedure".

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check parking brake switch. Refer to BRC-151, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000008282428

1. CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check parking brake switch. Refer to <u>BRC-151</u>, "<u>Diagnosis Procedure</u>".

2.check self-diagnosis

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u>.

NO >> Repair or replace combination meter.

Special Repair Requirement

INFOID:0000000008282429

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Revision: 2012 June BRC-156 2013 ROGUE

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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[VDC/TCS/ABS]

VDC WARNING LAMP

Description INFOID:000000008282430

×: ON ,^\; Blink -: OFF

Condition	VDC warning lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
VDC/TCS is activated.	<u> </u>
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000008282431

1. CHECK VDC WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-158, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000008282432

1. CHECK SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-27</u>, "CONSULT Function".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-180, "Exploded View".

NO >> Repair or replace combination meter.

Special Repair Requirement

INFOID:0000000008282433

${f 1}$.adjustment of steering angle sensor neutral position

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

>> END

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

VDC	OFF	INDI	$C\Delta TC$	\mathcal{R}	LAMP
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Description INFOID:0000000008282434

×: ON -: OFF

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Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
VDC OFF switch turned ON. (VDC function is OFF.)	×

Component Function Check

INFOID:0000000008282435

${\sf 1.}$ VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

>> GO TO 2. YES

NO >> Proceed to diagnosis procedure. Refer to BRC-159, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check VDC OFF switch, Refer to BRC-153, "Diagnosis Procedure",

Diagnosis Procedure

INFOID:0000000008282436

CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check VDC OFF switch. Refer to BRC-153. "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-27, "CONSULT Function".

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-180. "Exploded View".

>> Repair or replace combination meter.

Special Repair Requirement

INFOID:0000000008282437

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-76. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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[VDC/TCS/ABS]

>> END

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

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ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		Vehicle stopped	0 [km/h (MPH)]	
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR Wheel speed	Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
STOP LAMP SW	Ston lamp quitch signal status	When brake pedal is depressed	On	
STOP LAWP SW	Stop lamp switch signal status	When brake pedal is not depressed	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	First gear (1GR) Second gear (2GR) Third gear (3GR) Forth gear (4GR) Fifth gear (5GR) Sixth gear (6GR)	1 2 3 4 5	
OFF SW	VDC OFF quitab ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On	
OFF SVV	VDC OFF switch ON/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	Vehicle stopped	Approx. 0 d/s	
IAW NATE SEN	sensor	Vehicle turning	-100 to 100 d/s	
	2 10 11 11 11 11 11 11	Vehicle stopped	-0.11 - +0.11 G	
DECEL G-SEN	Decel G detected by yaw rate/side/decel G sensor	During acceleration	Negative value	
	301001	During deceleration	Positive value	

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< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
ACCEL POS SIG	Throttle actuator opening/closing is displayed	Accelerator pedal not depressed (ignition switch is ON)	0 %
ACCEL FOO SIG	(linked with accelerator pedal)	Depress accelerator pedal (ignition switch is ON)	0 - 100 %
		Vehicle stopped	Approx. 0 m/s ²
SIDE G-SENSOR	Side G detected by yaw rate/side/decel G sensor	Vehicle turning right	Negative value
		Vehicle turning left	Positive value
STR ANGLE SIG	Steering angle detected by steering angle	During straight	Approx. 0°
STR ANGLE SIG	sensor	Steering wheel turned	–720 to 720°
		With engine stopped	0 [tr/min (rpm)]
ENGINE SPEED	With engine running	Engine running	Almost in accordance with tachometer display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	On
1 2010 22 4 044	Brake hald level switch digital status	When brake fluid level switch OFF	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
FR RH IN SOL	R RH IN SOL Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	H OUT SOL Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
FR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
FR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
FR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
RR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
RR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
R LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
OTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	On
JIOR RELAT	Motor and motor relay operation	When the motor relay and motor are not operating	Off
CTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On
ote 2)	Notice Foldy operation	When the actuator relay is not operating	Off
BS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	On
O WAINN LAWIP	(Note 3)	When ABS warning lamp is OFF	Off
FF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On
I LAWIT	(Note 3)	When VDC OFF indicator lamp is OFF	Off
	VDC warning lamp	When VDC warning lamp is ON	On
LIP/VDC LAMP	(Note 3)	When VDC warning lamp is OFF	Off
	5DD	EBD is active	On
BD SIGNAL	EBD operation	EBD is inactive	Off
		ABS is active	On
BS SIGNAL	S SIGNAL ABS operation	ABS is inactive	Off
		TCS is active	On
S SIGNAL	TCS operation	TCS is inactive	Off
		VDC is active	On
DC SIGNAL	VDC operation	VDC is inactive	Off
		In EBD fail-safe	On
BD FAIL SIG	EBD fail-safe signal	EBD is normal	Off On Off On Off
		In ABS fail-safe	On
BS FAIL SIG	ABS fail-safe signal	ABS is normal	Off
		In TCS fail-safe	On
CS FAIL SIG	TCS fail-safe signal	TCS is normal	Off
		In VDC fail-safe	On
DC FAIL SIG	VDC fail-safe signal	VDC is normal	Off
		Crank is active	On
RANKING SIG	Crank operation	Crank is inactive	Off
		For N range	On
POSI SIG	N position signal	Except for N range	Off
		For P range	On
POSI SIG	P position signal	Except for P range	Off
POSI SIG	R position signal	For R range	On Off
		Except for R range	Off
ND MODE MON	And a condition	AUTO is active	AUTO
Λ(1) N (() 1) L N (() N (Axle condition	LOCK is active	LOCK

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< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
CV1 Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off		
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
CV2 Operation status of each solenoid val	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
SV1 Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off		
SV2	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	
STOP LAMP SW2	Stop Jamp switch signal status	When brake pedal is depressed	On	
STOP LAIMP SW2	Stop lamp switch signal status	When brake pedal is not depressed	Off	

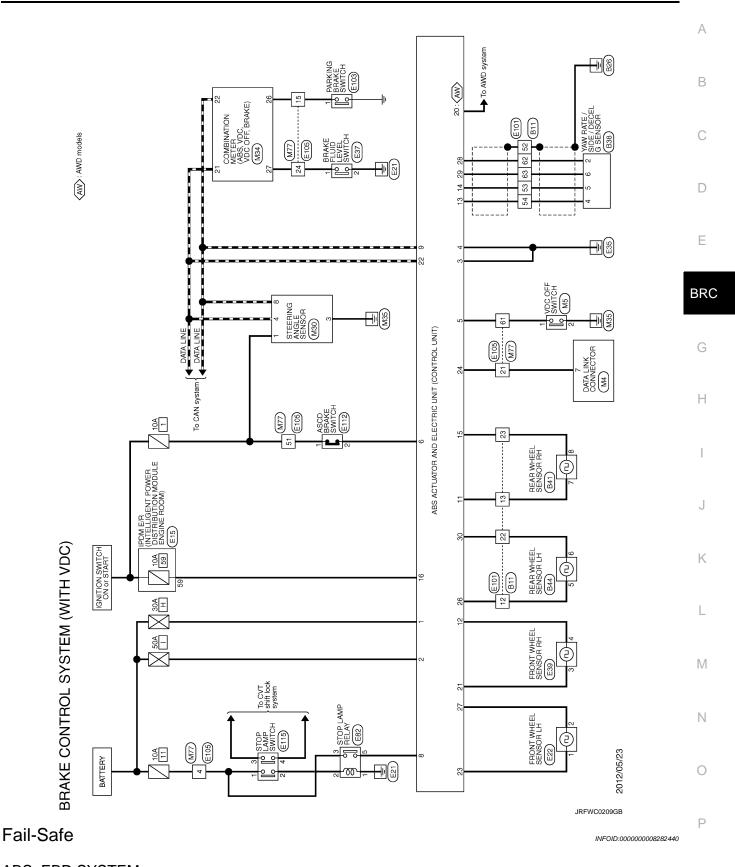
NOTE:

- 1: Confirm tire pressure is normal.
- 2: Every 20 seconds momentary switch to Off.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-155, "Description".
- VDC warning lamp: Refer to BRC-158, "Description".
- VDC OFF indicator lamp: Refer to BRC-159, "Description".

Wiring Diagram -BRAKE CONTROL SYSTEM-

INFOID:0000000008282439

For connector terminal arrangements, harness layouts, and alphabets in a \bigcirc (option abbreviation; if not described in wiring diagram), refer to GI-12. "Connector Information".



ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp and VDC warning lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp and VDC warning lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC/TCS

In case of malfunction in the VDC/TCS/ABS system, VDC warning lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for "ABS" with CONSULT.

DTC Index

DTC	Items (CONSULT screen terms)	Reference	
C1101	RR RH SENSOR-1		
C1102	RR LH SENSOR-1	DDC 00 IIDTC La miall	
C1103	FR RH SENSOR-1	BRC-99, "DTC Logic"	
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2	DDC 400 DTC :-	
C1107	FR RH SENSOR-2	BRC-102, "DTC Logic"	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-107, "DTC Logic"	
C1110	CONTROLLER FAILURE	BRC-109, "DTC Logic"	
C1111	PUMP MOTOR	BRC-110, "DTC Logic"	
C1113	G SENSOR	BRC-112, "DTC Logic"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-115, "DTC Logic"	
C1116	STOP LAMP SW	BRC-120, "DTC Logic"	
C1118	4WD SYSTEM	BRC-126, "DTC Logic"	
C1120	FR LH IN ABS SOL	BRC-127, "DTC Logic"	
C1121	FR LH OUT ABS SOL	BRC-129, "DTC Logic"	
C1122	FR RH IN ABS SOL	BRC-127, "DTC Logic"	
C1123	FR RH OUT ABS SOL	BRC-129, "DTC Logic"	
C1124	RR LH IN ABS SOL	BRC-127, "DTC Logic"	
C1125	RR LH OUT ABS SOL	BRC-129, "DTC Logic"	
C1126	RR RH IN ABS SOL	BRC-127, "DTC Logic"	
C1127	RR RH OUT ABS SOL	BRC-129, "DTC Logic"	
C1130	ENGINE SIGNAL 1	BRC-131, "DTC Logic"	
C1140	ACTUATOR RLY	BRC-132, "DTC Logic"	
C1143	ST ANG SEN CIRCUIT	BRC-134, "DTC Logic"	
C1144	ST ANG SEN SIGNAL	BRG-134, DTG Logic	
C1145	YAW RATE SENSOR	PDC 412 "DTC Logic"	
C1146	SIDE G-SEN CIRCUIT	BRC-112, "DTC Logic"	
C1155	BR FLUID LEVEL LOW	BRC-136, "DTC Logic"	
C1164	CV1	RPC-130 "DTC Logic"	
C1165	CV2	BRC-139, "DTC Logic"	

< ECU DIAGNOSIS INFORMATION > [VDC/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference
C1166	SV1	BRC-141, "DTC Logic"
C1167	SV2	BIXO-141, DTC LOGIC
C1176	STOP LAMP SW2	BRC-143, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-147, "DTC Logic"
U1010	CONTROL UNIT(CAN)	BRC-148, "DTC Logic"

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000008282442

1. CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-48</u>, "<u>General Specifications</u>". Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles.

- Front
- 2WD models: Refer to FAX-7, "Inspection".
- AWD models: Refer to FAX-33, "Inspection".
- Rear
- 2WD models: Refer to RAX-4, "Inspection".
- AWD models: Refer to RAX-11, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

- · Wheel sensor installation for damage.
- · Sensor rotor installation for damage.
- · Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> • Replace wheel sensor or sensor rotor.

• Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated?

YES >> Perform self-diagnosis for "ABS" with CONSULT.

NO >> Normal

UNEXPECTED PEDAL REACTION

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > **UNEXPECTED PEDAL REACTION** Α Diagnosis Procedure INFOID:0000000008282443 1. CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-8, "Inspection and Adjustment". Is the stroke too large? YES >> • Bleed air from brake tube and hose. Refer to BR-12, "Bleeding Brake System". · Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. - Brake pedal: Refer to BR-8, "Inspection and Adjustment". D - Master cylinder: Refer to BR-13, "Inspection". - Brake booster: Refer to BR-14, "Inspection". NO >> GO TO 2. Е

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) harness connector to deactivate ABS. Check if braking force is normal in this condition. Connect harness connector after inspection.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system. BRC

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000008282444

CAUTION:

The stopping distance on slippery road surfaces might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Turn the ignition switch OFF and disconnect ABS actuator and electric unit (control unit) harness connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect harness connector. Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:000000008282445

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis for "ABS" with CONSULT.

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000008282446

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

1.SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do the operation noises occur?

YES >> GO TO 3.

NO >> Perform self-diagnosis for "ABS" with CONSULT.

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> Normal

VEHICLE JERKS DURING		
< SYMPTOM DIAGNOSIS > [VDC/TCS/ABS	<u>S]</u>	
VEHICLE JERKS DURING		
Diagnosis Procedure	2447	
1.SYMPTOM CHECK		
Check if the vehicle jerks during VDC/TCS/ABS control.		
Is the inspection result normal?		
YES >> Normal. NO >> GO TO 2.		
2.CHECK SELF-DIAGNOSIS RESULTS		
Perform self-diagnosis for "ABS" with CONSULT.		
Are self-diagnosis results indicated?		
YES >> Check corresponding items, make repairs, and perform self-diagnosis for "ABS" with CONSULT NO >> GO TO 3.	Ī.	
3. CHECK CONNECTOR		
 Turn the ignition switch OFF and disconnect ABS actuator and electric unit (control unit) harness connect and check terminal for deformation, disconnection, looseness, etc. Securely connect harness connectors and perform self-diagnosis for "ABS" with CONSULT. Are self-diagnosis results indicated? YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. 	tor	
NO >> GO TO 4. 4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS		
Perform self-diagnosis for "ENGINE" and "TRANSMISSION" with CONSULT.		
Are self-diagnosis results indicated?		
YES >> Check the corresponding items. • "ENGINE": Refer to <u>EC-106, "CONSULT Function"</u> . • "TRANSMISSION": Refer to <u>TM-46, "CONSULT Function (TRANSMISSION)"</u> .		
NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-180, "Exploded View"</u> .		

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

NORMAL OPERATING CONDITION

Description INFOID:0000000008282448

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).
The ABS warning lamp and VDC warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal con-
VDC may not operate normally or the ABS warning lamp and VDC warning lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	dition is restored, there is no malfunction. At
A malfunction may occur in the yaw rate/side G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC warning lamp illuminated).	that time, erase the self- diagnosis memory.
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)

< PRECAUTION > [VDC/TCS/ABS]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

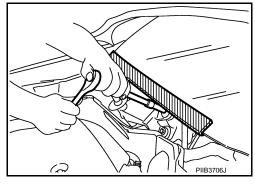
WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the
 ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with
 a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing
 serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precaution for Brake System

WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

- Brake fluid use refer to MA-15, "FOR NORTH AMERICA: Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.

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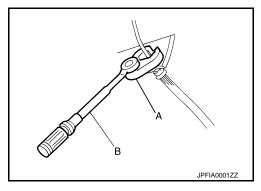
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< PRECAUTION > [VDC/TCS/ABS]

 Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.

- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).
- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



Precaution for Brake Control

INFOID:0000000008282452

- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- VDC system may not operate normally or a VDC warning lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension-related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

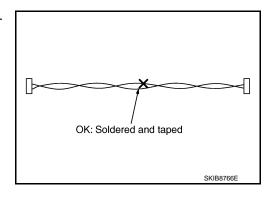
Precautions for Harness Repair

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COMMUNICATION LINE

Solder the repaired area and wrap tape around the soldered area.
 NOTE:

A fray of twisted lines must be within 110 mm (4.33 in).

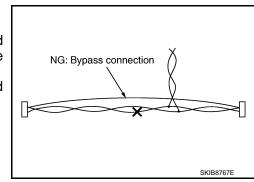


• Bypass connection is never allowed at the repaired area.

NOTE

Bypass connection may cause communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.

• Replace the applicable harness as an assembly if error is detected on the shield lines of communication line.



[VDC/TCS/ABS]

REMOVAL AND INSTALLATION

WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR: Exploded View



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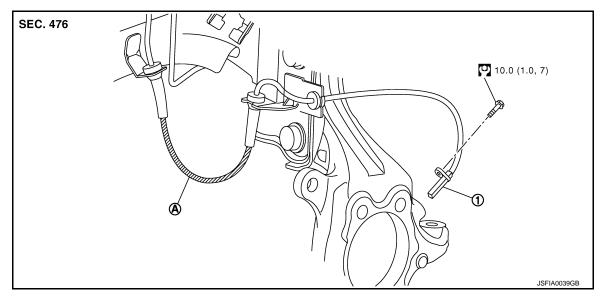
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1. Front LH wheel sensor

A. Yellow line (slant line)

Refer to GI-4, "Components" for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR: Removal and Installation

REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- sensor harness.
- Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before remov-
- low lines (A) are not twisted.

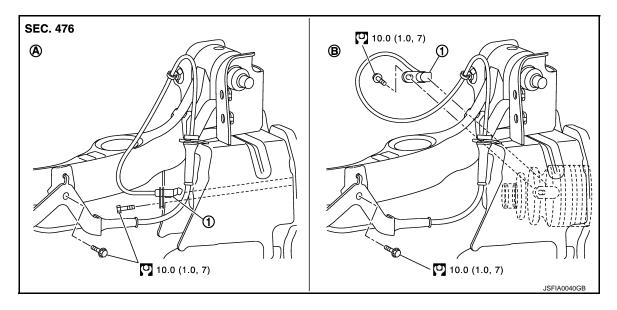
- wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- in the figure. When installed, harness must not be twisted.

REAR WHEEL SENSOR

 Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling ing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function. When you see the harness of the wheel sensor from the front side of the vehicle ensure that the yel-Ν INSTALLATION Pay attention to the following when installing wheel sensor. Tighten installation bolts to the specified torques. When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above Р

REAR WHEEL SENSOR: Exploded View

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1. Rear LH wheel sensor

A. 2WD models

B. AWD models

Refer to GI-4, "Components" for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

REAR WHEEL SENSOR: Removal and Installation

INFOID:0000000008282457

REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Take care to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Pay attention to the following when installing wheel sensor. Tighten installation bolts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

SENSOR ROTOR				
< REMOVAL AND INSTALLATION > [VDC	/TCS/ABS]			
SENSOR ROTOR FRONT SENSOR ROTOR		Α		
FRONT SENSOR ROTOR : Exploded View	IFOID:0000000008282458	В		
Refer to FAX-9, "Exploded View" (2WD models), FAX-35, "Exploded View" (AWD models).				
FRONT SENSOR ROTOR : Removal and Installation	IFOID:0000000008282459	С		
REMOVAL Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub and bearin Refer to FAX-9, "Removal and Installation" (2WD models), FAX-35, "Removal and Installation" (AN INSTALLATION		D		
Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub and bearing Refer to FAX-9, "Removal and Installation" (2WD models), FAX-35, "Removal and Installation" (AVREAR SENSOR ROTOR		Е		
REAR SENSOR ROTOR : Exploded View	IFOID:0000000008282460	BRO		
Refer to RAX-5, "Exploded View" (2WD models), RAX-16, "Exploded View" (AWD models).				
REAR SENSOR ROTOR : Removal and Installation	IFOID:0000000008282461	G		
2WD MODELS		Н		
Removal Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub and bearin Refer to RAX-5, "Removal and Installation".	ig assembly.			
Installation Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub and bearing Refer to RAX-5, "Removal and Installation".	ng assembly.	J		
AWD MODELS For removal and installation of sensor rotor, refer to RAX-17, "Disassembly and Assembly".		K		
		L		
		M		
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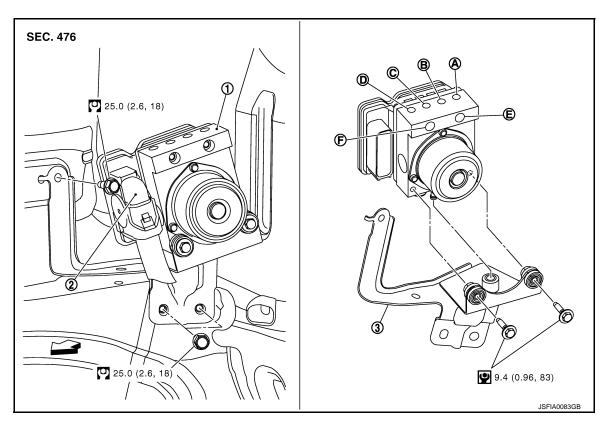
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[VDC/TCS/ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View



- ABS actuator and electric unit (control 2. unit)
 - 2. Connector

3. Bracket

- A. To front LH brake caliper
- B. To rear RH brake caliper
- E. From master cylinder primary side
- C. To Rear LH brake caliper

F. From master cylinder secondary side

<□: Vehicle front

Refer to GI-4, "Components" for symbol in the figure.

Removal and Installation

To front RH brake caliper

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REMOVAL

CAUTION:

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-12, "Bleeding Brake System".
- 1. Remove cowl top. Refer to EXT-20, "Exploded View".
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- 4. Remove tire (front LH side).
- 5. Remove fender protector (rear): (front LH side). Refer to EXT-22, "Exploded View".
- Remove ABS actuator and electric unit (control unit) bracket mounting nut.
- 7. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

Note the following, and install in the reverse order of removal.

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-12, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.
- When replacing ABS actuator and electric unit (control unit), make sure adjust neutral position of steering angle sensor. Refer to <u>BRC-76</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: <u>Description</u>".

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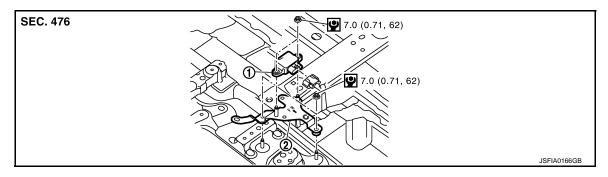
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[VDC/TCS/ABS]

YAW RATE/SIDE/DECEL G SENSOR

Exploded View



- 1. yaw rate/side/decel G sensor
- 2. Bracket

Refer to GI-4, "Components" for symbol in the figure.

Removal and Installation

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REMOVAL

CAUTION:

Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/decel G sensor is sensitive to the impact.

- Remove center console assembly. Refer to <u>IP-22, "Exploded View"</u>.
- 2. Disconnect yaw rate/side/decel G sensor harness connector.
- Remove mounting bolts. Remove yaw rate/side/decel G sensor.

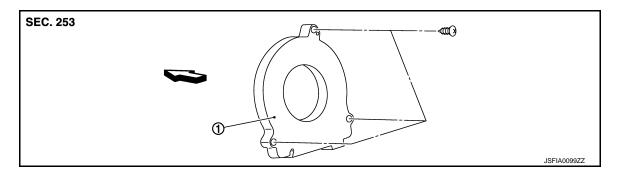
INSTALLATION

Note the following, and install in the reverse order of removal.

 Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/decel G sensor is sensitive to the impact.

STEERING ANGLE SENSOR

Exploded View



1. Steering angle sensor

<□: Vehicle front

Removal and Installation

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REMOVAL

- 1. Remove spiral cable assembly. Refer to SR-14, "Exploded View".
- 2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

• After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-76, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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