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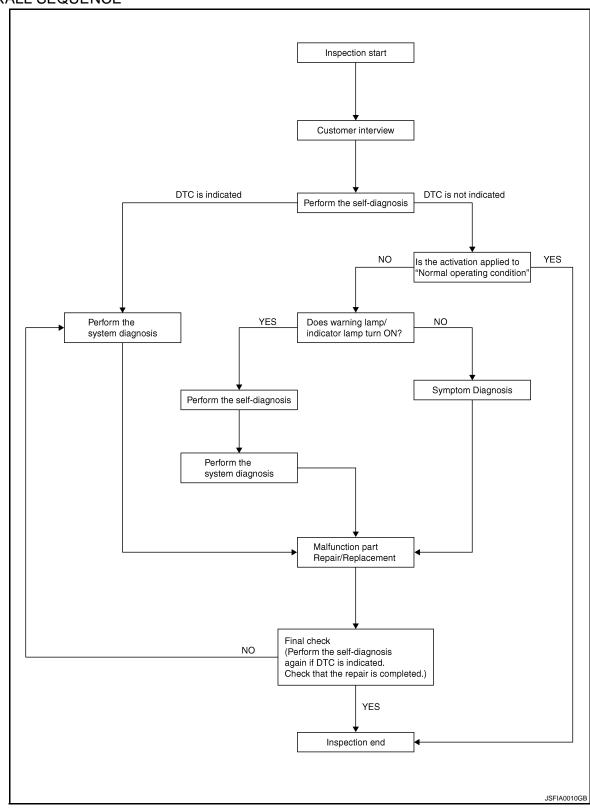
< BASIC INSPECTION > [ABS]

## **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 Check the DTC display with the self-diagnosis function. Refer to BRC-15, "CONSULT-III Function". Is there any DTC displayed? YES >> GO TO 3. D NO >> GO TO 4. 3.PERFORM THE SYSTEM DIAGNOSIS Perform the diagnosis applicable to the displayed DTC. Refer to BRC-55, "DTC Index". >> GO TO 7. BRC 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-61. "Description". Is the symptom a normal operation? >> INSPECTION END YES NO >> GO TO 5. Н  ${f 5.}$ CHECK THE WARNING LAMP FOR ILLUMINATION Check that the warning lamp illuminate. • ABS warning lamp: Refer to BRC-47, "Description". Brake warning lamp: Refer to <u>BRC-48</u>, "<u>Description</u>". 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 symptom. >> GO TO 7.  $7.\mathtt{REPAIR}$  OR REPLACE THE MALFUNCTIONING PARTS Repair or replace the specified malfunctioning parts. M >> GO TO 8. 8. FINAL CHECK Ν Perform the again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to BRC-15, "CONSULT-III Function". Is no other DTC present and the repair completed? YES >> INSPECTION END NO >> GO TO 3. Р

### **DIAGNOSIS AND REPAIR WORKFLOW**

< BASIC INSPECTION >

[ABS]

## **Diagnostic Work Sheet**

INFOID:0000000004231758

Customer name MR/MS	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Date	е
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	□Other)		
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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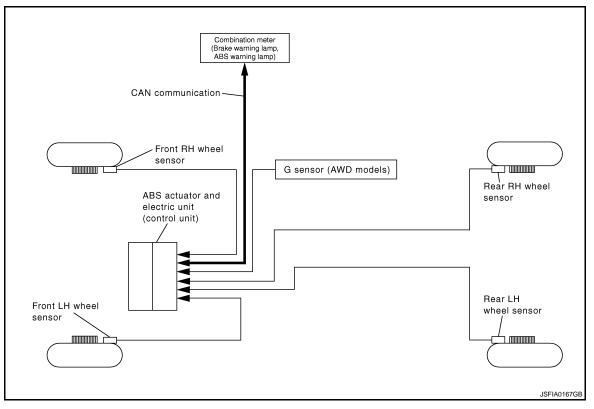
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## **FUNCTION DIAGNOSIS**

**ABS** 

System Diagram



### System Description

INFOID:0000000004231760

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-III is available.

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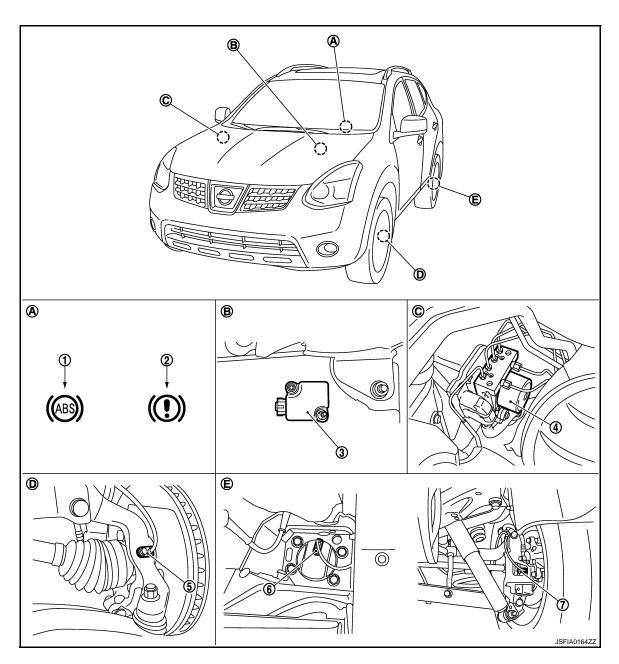
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## **Component Parts Location**

INFOID:0000000004231761



- 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**

### < FUNCTION DIAGNOSIS >

### [ABS]

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## **Component Description**

INFOID:0000000004231762

Component parts		Reference
	Pump	BRC-27, "Description"
ABS actuator and electric unit (control unit)	Motor	BIXO-27, Description
Abo actuator and electric unit (control unit)	Actuator relay (Main relay)	BRC-39, "Description"
	Solenoid valve	BRC-35, "Description"
Wheel sensor		BRC-18, "Description"
G sensor (AWD models)		BRC-29, "Description"
ABS warning lamp		BRC-47, "Description"
Brake warning lamp		BRC-48, "Description"

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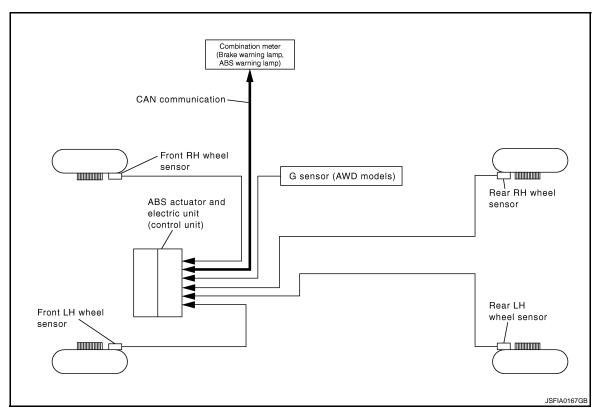
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[ABS]

**EBD** 

### System Diagram

INFOID:0000000004231763



## System Description

INFOID:0000000004231764

- 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-III is available.

### [ABS]

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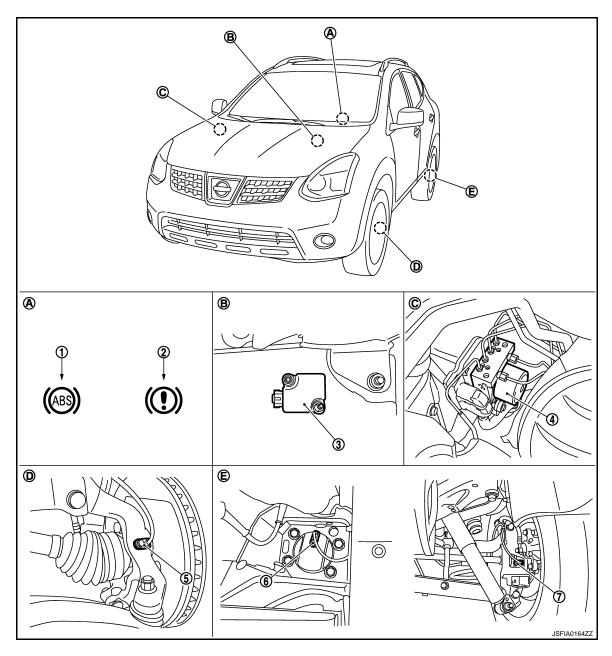
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## **Component Parts Location**

INFOID:0000000004231765



- 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:0000000004231766

Component parts		Reference
	Pump	BRC-27, "Description"
ADC activator and algebric unit (control unit)	Motor	BRC-27, Description
ABS actuator and electric unit (control unit)	Actuator relay (Main relay)	BRC-39, "Description"
	Solenoid valve	BRC-35, "Description"
Wheel sensor		BRC-18, "Description"
G sensor (AWD models)		BRC-29, "Description"
ABS warning lamp		BRC-47, "Description"
Brake warning lamp		BRC-48, "Description"

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

### < FUNCTION DIAGNOSIS > DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

### **CONSULT-III Function**

INFOID:0000000004231767

[ABS]

#### **FUNCTION**

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

Diagnostic test mode	Function
Self-diagnostic results	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-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU part number	ABS actuator and electric unit (control unit) part number can be read.

#### **SELF-DIAG RESULTS MODE**

#### Operation Procedure

Before performing the self-diagnosis, 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, 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-55, "DTC Index".

#### DATA MONITOR MODE

Display Item List

	SELECT MO	NITOR ITEM		
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
FR LH SENSOR [km/h (MPH)]	×	×		
FR RH SENSOR [km/h (MPH)]	×	×	Wheel greed	
RR LH SENSOR [km/h (MPH)]	×	×	Wheel 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)	

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x: Applicable ▼: Optional item

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

< FUNCTION DIAGNOSIS > [ABS]

-	SELECT MC	NITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
DECEL G-SEN1 (On/Off) (AWD models)	×	×	Vehicle on level surface or on slope
DECEL G-SEN2 (On/Off) (AWD models)	×	×	verifice of fever 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 solenoid valve
RR RH IN SOL (On/Off)	▼	×	Operation status of each solehold 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
ABS FAIL SIG (On/Off)	▼	▼	ABS fail-safe signal

#### **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 and brake warning lamp are on.
- ABS warning lamp and brake warning lamp are on during active test.

#### NOTE:

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

#### Test Item

#### ABS SOLENOID VALVE

• For ABS solenoid valve, touch "Up", "Keep", and "Down". 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)]

### < FUNCTION DIAGNOSIS >

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Test item	Diaplay item	Display		
	Display item	Display item Up		Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR KH SOL	FR RH OUT SOL	Off Off	On*	
ED 111 001	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL		On*	
RR RH SOL	RR RH IN SOL	Off	On	On
KK KH SUL	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### **ABS MOTOR**

• Touch "On" and "Off" 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	
ABS MOTOR	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 PART NUMBER

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

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[ABS]

### COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID.000000004231768

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
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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-18">BRC-18</a>, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231770

#### **CAUTION:**

#### Never check between wheel sensor terminals.

### 1. CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- · Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 2. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

### C1101, C1102, C1103, C1104 WHEEL SENSOR-1

#### < COMPONENT DIAGNOSIS >

[ABS]

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5. Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Repair or replace connector.

## 3.CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

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

Measurement terminal for power supply circuit

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

Measurement terminal for ground circuit

	Continuity			
Connector	Terminal	Continuity		
	12, 21	E36	3, 4	Not existed
Eac	27, 23			
E36	15, 11			
	30, 26			

5. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

### 4. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel sensor		_	Voltage	
Connector	Terminal	_	vollage	
E39 (Front RH)	3			
E22 (Front LH)	1	Ground	Approx. 8 V or more	
B41 (Rear RH)	7	Giouna	Approx. 8 v or more	
B44 (Rear LH)	5			

Is the inspection result normal?

### C1101, C1102, C1103, C1104 WHEEL SENSOR-1

#### < COMPONENT DIAGNOSIS >

[ABS]

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

### Component Inspection

INFOID:0000000004231771

### 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-18">BRC-18</a>, "Diagnosis Procedure".

#### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

#### < COMPONENT DIAGNOSIS >

[ABS]

### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000004231772

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

DTC Logic

#### DTC DETECTION LOGIC

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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 dyno
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signals.	Sensor damaged     ABS unit damaged

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### DTC CONFIRMATION PROCEDURE

### 1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

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### Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

#### INFOID:0000000004231774

### Diagnosis Procedure

#### **CAUTION:**

Never check between wheel sensor terminals.

### 1. CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- · Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

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#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

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## 2. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- 5. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

Revision: 2008 August

### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

#### < COMPONENT DIAGNOSIS >

[ABS]

NO >> Poor connection of connector terminal. Repair or replace connector.

## 3. CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

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

Measurement terminal for power supply circuit

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

Measurement terminal for ground circuit

	Continuity			
Connector	Connector Terminal Connector Terminal			
	12, 21		3, 4	Not existed
E36	27, 23	E36		
E30	15, 11			
	30, 26			

5. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

### 4. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	sensor		Voltage	
Connector	Terminal	_		
E39 (Front RH)	3			
E22 (Front LH)	1	Ground	Approx. 8 V or more	
B41 (Rear RH)	7	Giodila		
B44 (Rear LH)	5			

#### Is the inspection result normal?

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

#### < COMPONENT DIAGNOSIS >

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### Component Inspection

INFOID:0000000004231775

## 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-32">BRC-32</a>, "Diagnosis Procedure".

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#### **C1109 POWER AND GROUND SYSTEM**

< COMPONENT DIAGNOSIS >

[ABS]

### C1109 POWER AND GROUND SYSTEM

Description INFOID:000000004231776

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

DTC Logic INFOID:000000004231777

#### 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-24, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231778

### 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Repair or replace connector.

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

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit)
  harness connector terminal and ground.

ABS actuator and electric unit (control unit)			Condition	Voltage	
Connector	Terminal	_	Condition	vollage	
E36	16	Ground	Ignition switch: ON	Battery voltage	
E30	10		Ignition switch: OFF	Approx. 0 V	

- Check 10A fusible link (59).
- 5. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

#### **C1109 POWER AND GROUND SYSTEM**

#### < COMPONENT DIAGNOSIS >

	[ABS]

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

6. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

## 3.abs power supply check (under load conditions)

- 1. Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 16 and 4. With ignition switch ON check bulb illuminates correctly.
- 2. Check ABS motor supply under loaded condition (connector E36 terminals 1 and 3).

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

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

1. Turn ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

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

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

#### Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. it any malfunction is found, repair malfunctioning parts.

NO >> Repair or replace malfunctioning components (check ABS earth bolt for tightness and corrosion).

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### C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< COMPONENT DIAGNOSIS >

[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 abnormality.

#### DTC CONFIRMATION PROCEDURE

## 1. CHECK SELF-DIAGNOSIS RESULTS

- Check both ABS solenoid valve and motor supply and ground circuits using a suitable electrical load.
- Check wheel speed sensor inputs.
- 3. Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

#### Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231781

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).

#### C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

### C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:0000000004231782

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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:0000000004231783 D

#### 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	
C1111		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

### CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results **PUMP MOTOR** 

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-27, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:00000000004231784

### 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO

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

### 2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

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

Reconnect ABS actuator and electric unit (control unit) connector.

**BRC-27** Revision: 2008 August 2009 Rogue

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#### C1111 ABS MOTOR, MOTOR RELAY SYSTEM

### < COMPONENT DIAGNOSIS > Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

## ${f 3.}$ abs power supply check (under load conditions)

Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 1 and 2. With ignition switch ON check bulb illuminates correctly.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

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

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components. (Check ABS each bolt for tightness and corrosion).

### Component Inspection

INFOID:0000000004231785

[ABS]

### 1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Display	
restitem	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
ABS MOTOR	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.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-27</u>, "<u>Diagnosis Procedure</u>".

[ABS]

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### C1113 G SENSOR

Description INFOID:0000000004231786

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:0000000004231787

#### 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results **G SENSOR** 

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-29">BRC-29</a>, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

## 1. CHECK CONNECTOR

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Disconnect G sensor connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

## 2. CHECK G SENSOR HARNESS

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

ABS actuator and electric unit (control unit)		G sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	13		2	
E36	29	B32	3	Existed
E30	14		4	Existed
	28		5	

**BRC-29** Revision: 2008 August 2009 Rogue

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INFOID:0000000004231788

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#### < COMPONENT DIAGNOSIS >

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

## 3.check g sensor power supply circuit

- Turn ignition switch ON.
- 2. Check voltage between G sensor harness connector terminal and ground.

G sensor			Condition	Voltage
Connector	Terminal		Condition	vollage
B32	1	Ground	Ignition switch: ON	Battery voltage
DSZ	'	Giodila	Ignition switch: OFF	Approx. 0 V

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

### 4.CHECK G SENSOR

- 1. Remove G sensor from the vehicle. Refer to <a href="BRC-70">BRC-70</a>, "Exploded View".
- Connect the following terminals between G sensor and connector.

G sensor	Harness connector	
Terminal	Connector Terminal	
1	B32	1
2		2
3		3
4		4
5		5

- 3. Turn ignition switch ON.
- 4. Check voltage between G sensor terminals.

Condition	G sensor		
Condition	Terminals 4 – 5	Terminals 3 – 5	
Horizontal	1.50 – 1.95 V	1.50 – 1.95 V	
Longitudinally 20°	3.51 – 4.14 V	3.51 – 4.14 V	
Longitudinally 40°	1.50 – 1.95 V	3.51 – 4.14 V	

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Replace G sensor.

### Component Inspection

### 1. CHECK DATA MONITOR

Select "DECEL G-SEN1" and "DECEL G-SEN2", in "DATA MONITOR" and check G sensor signal.

Monitor item	Condition	DATA MONITOR
	Changes according to an	On
DECEL G-SEN1	indication shown by the decel G sensor	Off
	Changes according to an indication shown by the decel G sensor	On
DECEL G-SEN2		Off

#### Is the inspection result normal?

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INFOID:0000000004231789

### C1113 G SENSOR

[ABS] < COMPONENT DIAGNOSIS > YES >> INSPECTION END

>> Go to diagnosis procedure. Refer to <a href="BRC-29">BRC-29</a>, "Diagnosis Procedure". NO Α В С D Е BRC G Н J Κ L

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### C1115 WHEEL SENSOR

Description INFOID:000000004231790

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
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

#### CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS SENSOR [ABNORMAL SIGNAL]

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-32">BRC-32</a>, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:00000000004231792

#### **CAUTION:**

#### Never check between wheel sensor terminals.

1.CHECK TIRES

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 2.

NO >> Adjust air pressure, or replace tire.

### 2.CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- Check that there is no deformation, misalignment, float, and backlash on the wheel sensor and wheel sensor mounting surface.
- Check that the wheel sensor in installed with no misalignment and backlash.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 3.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

### 3.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- 5. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 4.

NO >> Poor connection of connector terminal. Repair or replace connector.

#### C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

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## 4. CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

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

Measurement terminal for power supply circuit

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

Measurement terminal for ground circuit

	ABS actuator and electric unit (control unit)				
Connector	Connector Terminal Connector Terminal				
	12, 21	E36	3, 4	Not existed	
E36	27, 23				
E30	15, 11				
	30, 26				

5. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

### 5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel sensor			Voltage	
Connector	Connector Terminal			
E39 (Front RH)	3		Approx. 8 V or more	
E22 (Front LH)	1	Ground		
B41 (Rear RH)	7	- Glodila Applo	Approx. 6 v or more	
B44 (Rear LH)	5			

#### Is the inspection result normal?

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

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### **C1115 WHEEL SENSOR**

#### < COMPONENT DIAGNOSIS >

[ABS]

### Component Inspection

INFOID:0000000004231793

## 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer display (±10% or less)	
RR LH SENSOR		
RR RH SENSOR		

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-32">BRC-32</a>, "Diagnosis Procedure".

#### C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[ABS]

### C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:0000000004231794

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:0000000004231795

#### 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

### CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
RR LH IN ABS SOL
RR RH IN ABS SOL

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-35, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

### CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

### 2.check connector

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

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INFOID:0000000004231796

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[ABS]

## 3.check actuator relay power supply circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check voltage between ABS actuator and electric unit (control unit) harness connector terminal 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 4.

NO >> Repair or replace malfunctioning components.

### 4. CHECK ACTUATOR RELAY GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

### Component Inspection

INFOID:0000000004231797

### 1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Test item	Display item	Display		
rest item	Display item	Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
TR EITSOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
KK KH 30L	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
INI LIT SOL	RR LH OUT SOL	Off	Off	On*

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-35, "Diagnosis Procedure".

### C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[ABS]

### C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:0000000004231798

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:0000000004231799

#### 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

### CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-37, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

### 2.check connector

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

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INFOID:0000000004231800

### C1121, C1123, C1125, C1127 OUT ABS SOL

#### < COMPONENT DIAGNOSIS >

[ABS]

# ${f 3.}$ check actuator relay power supply circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check voltage between ABS actuator and electric unit (control unit) harness connector terminal 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 4.

NO >> Repair or replace malfunctioning components.

### 4. CHECK ACTUATOR RELAY GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

### Component Inspection

INFOID:0000000004231801

### 1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Test item	Display item —	Display		
rest item		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH 30L	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
TR LITSOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
KK KIT SOL	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
- IN LIT SOL	RR LH OUT SOL	Off	Off	On*

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-37, "Diagnosis Procedure".

#### C1140 ACTUATOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

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### C1140 ACTUATOR RELAY SYSTEM

Description INFOID:0000000004231802

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

DTC Logic INFOID:0000000004231803

#### 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	ACTUATOR RET	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

### CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results **ACTUATOR RLY** 

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to <a href="BRC-39">BRC-39</a>, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231804

### 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YFS >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

### 2.CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

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

Reconnect ABS actuator and electric unit (control unit) connector.

### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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### C1140 ACTUATOR RELAY SYSTEM

#### < COMPONENT DIAGNOSIS >

[ABS]

# 3.abs power supply check (under load conditions)

Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 1 and 3. With ignition switch ON check bulb illuminates correctly.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

# ${f 4.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components. (Check ABS each bolt for tightness and corrosion).

### Component Inspection

INFOID:0000000004231805

### 1. CHECK ACTIVE TEST

- 1. On "ACTIVE TEST", select "ABS MOTOR".
- Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below

Test item	Display item	Display	
rest item		On	Off
ABS MOTOR	MOTOR RELAY	On	Off
ABS WOTOR	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.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-27</u>, "<u>Diagnosis Procedure</u>".

#### **U1000 CAN COMM CIRCUIT**

< COMPONENT DIAGNOSIS >

[ABS]

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### U1000 CAN COMM CIRCUIT

Description INFOID:0000000004231806

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:0000000004231807

#### 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	_
CAN COMM CIRCUIT	

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-41, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231808

### 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector. 2.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or 3. replace terminal.
- Reconnect connector and perform self-diagnosis.

Self-diagnosis results	
CAN COMM CIRCUIT	

#### Is above displayed on the self-diagnosis display?

YES >> Go to LAN-24, "CAN System Specification Chart".

NO >> INSPECTION END

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[ABS]

### U1010 CONTROL UNIT (CAN)

Description INFOID:000000004231809

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. RECHECK DTC

- 1. Turn the ignition switch OFF to ON.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### Is DTC "U1010" detected?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-42">BRC-42</a>, "Diagnosis Procedure".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000004231811

# 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).

NO >> Repair or replace the harnesses and connectors.

#### **BRAKE FLUID LEVEL SWITCH**

< COMPONENT DIAGNOSIS >

[ABS]

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### BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000004231812

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:0000000004231813

### 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 >> Go to diagnosis procedure. Refer to <a href="BRC-43">BRC-43</a>, "Diagnosis Procedure".

### Diagnosis Procedure

INFOID:0000000004231814

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.

- 2. Disconnect brake fluid level switch connector and combination meter connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform component function check. Refer to <u>BRC-43</u>, "Component Function Check".

#### Is the inspection result normal?

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

NO >> GO TO 2.

### 2.CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn 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	Condition	Continuity
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 >> GO TO 3.

NO

>> Brake fluid level switch is malfunction. Replace reservoir tank.

### 3.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

- . Disconnect combination meter connector.
- Check continuity between brake fluid level switch harness connector terminals and combination meter harness connector terminal and/or ground.

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

Combina	tion meter		Continuity
Connector	Terminal		Continuity
M34	27	Ground	Not existed

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### **BRAKE FLUID LEVEL SWITCH**

#### < COMPONENT DIAGNOSIS >

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning components.

### Component Inspection

INFOID:0000000004231815

[ABS]

# 1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn 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	Condition	Continuity	
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.

#### PARKING BRAKE SWITCH

#### < COMPONENT DIAGNOSIS >

[ABS]

Α

### PARKING BRAKE SWITCH

Description INFOID:0000000004231816

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:0000000004231817

### 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 >> Go to diagnosis procedure. Refer to <a href="BRC-45">BRC-45</a>, "Diagnosis Procedure".

### Diagnosis Procedure

# 1. CHECK PARKING BRAKE SWITCH

1. Turn ignition switch OFF.

- Disconnect parking brake switch connector.
- 3. Check continuity between parking brake switch connector terminal and ground.

Parking brake switch		Condition	Continuity
Connector	Terminal	Condition	Continuity
E103	1 – Ground	When the parking brake switch is operated.	Existed
	i – Giouna	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-32, "Diagnosis Description".

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace combination meter.

### Component Inspection

### INFOID:0000000004231819

# 1. CHECK PARKING BRAKE SWITCH

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

### **PARKING BRAKE SWITCH**

### < COMPONENT DIAGNOSIS >

[ABS]

Parking brake switch		Condition	Continuity
Connector	Terminal	Condition	Continuity
E103 1 – Ground	1 Ground	When the parking brake switch is operated.	Existed
	i – Giouna	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".

#### **ABS WARNING LAMP**

< COMPONENT DIAGNOSIS > [ABS]

**ABS WARNING LAMP** 

Description INFOID:000000004231820

×: 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:0000000004231821

### 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 >> Go to diagnosis procedure. Refer to <a href="BRC-47">BRC-47</a>, "Diagnosis Procedure".

INFOID:0000000004231822

### Diagnosis Procedure

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

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Check if the indication and operation of combination meter are normal. Refer to MWI-32, "Diagnosis Description".

Is the inspection result normal?

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YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

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### **BRAKE WARNING LAMP**

Description INFOID:000000004231823

×: 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:0000000004231824

### 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 >> Go to diagnosis procedure. Refer to <a href="BRC-48">BRC-48</a>, "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 <a href="BRC-45">BRC-45</a>, "Diagnosis Procedure".

### Diagnosis Procedure

INFOID:0000000004231825

## 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 <a href="BRC-45">BRC-45</a>, "Diagnosis Procedure".

### 2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### 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 <a href="MWI-32">MWI-32</a>, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

### ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS] < ECU DIAGNOSIS >

# **ECU DIAGNOSIS**

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value INFOID:0000000004231826

#### 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.

		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)	ВІ
		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	OR Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	-  -
		Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR	SENSOR Wheel speed	Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)	
STOD LAMP SW	OP LAMP SW Stop lamp switch signal status	When brake pedal is depressed	On	
STOP LAWP SW		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 decel G sensor	Changes according to an indication shown by the decel G sensor	On	ı
(Note 2)	Decei G detected by decei G serisor		Off	
DECEL G-SEN2	Decel G detected by decel G sensor	Changes according to an indication	On	
(Note 2)	Decer of detected by decer of serisor	shown by the decel G sensor	Off	
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On	
FR 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	١
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On	(
FR RH OUT SOL Operation status of each so	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	F
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On	
FR LH IN SOL	R 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	

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# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	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
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On
		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" with CONSULT-III)	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" with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
MOTOR RELAY	MOTOR RELAY Motor and motor relay operation	When the motor relay and motor are operating	On
WOTOR RELAT		When the motor relay and motor are not operating	Off
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On
(Note 3)	Actuator relay operation	When the actuator relay is not operating	Off
ABS WARN LAMP	ABS warning lamp (Note 4)	When ABS warning lamp is ON	On
		When ABS warning lamp is OFF	Off
EBD SIGNAL	EBD operation	EBD is active	On
		EBD is inactive	Off
ABS SIGNAL	ABS operation	ABS is active	On
		ABS is inactive	Off
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	On
		EBD is normal	Off
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	On
		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-47, "Description".

< ECU DIAGNOSIS > [ABS]

INFOID:0000000004231827

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Wiring Diagram -BRAKE CONTROL SYSTEM-

В AWD models COMBINATION METER (ABS, BRAKE) 15 C D DATA LINE Е M77 E105 21 M77 M77 DATA LINK
CONNECTOR
(M4) BRC G To CAN system Н ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IIPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) - [5] - [8] E101 G SENSOR

(B32): (AW) 63 J 53 62 IGNITION SWITCH ON or START BRAKE CONTROL SYSTEM (WITHOUT VDC) K REAR WHEEL SENSOR LH (B44) L FRONT WHEEL SENSOR RH (E39) (4) M To CVT shift lock system Ν FRONT WHEEL SENSOR LH (E22) STOP LAMP SWITCH (E115) M77 E105 5 ₹ 0 2008/07/15 Р JCFWM0259GE

Connector No.   E15   Connector No.   Connec	Color Of Wire GR B B B B B C V V V V V V V V V V V V V V		Connector No.   B44
NS: IRFW-CS	Connector Name FROZMGY  Connector Type RKOZMGY  H.S.  Terminal Color Signal Name [Specification]  1 W  2 P	Connector Name   Conn	

JCFWM0260GE

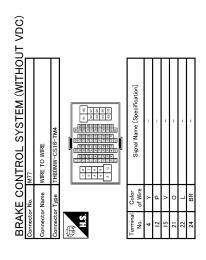
# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [ABS]

	П				Α
swпсн	Signal Name [Specification]	ETER	Signal Name [Specification] CAN-H CAN-L PARKING BRAKE SW BRAKE FLUID LEVEL SE		В
E 103 PARKING BRAKE SWITCH POI IB-A		No.   Mi34			С
Connector No. Connector Name Connector Type	Terminal Color No. of Wire 1	Connector No. Connector Type H.S.	Terminal Color No.   21   L   22   P   25   P   25   C   27   BR   27   27   BR   27   27   27   27   27   27   27   2		D
	ation]		ation]		Е
TO WRE	Signal Name [Specification]	M4 DATA LINK CONNECTOR BD16FW 10111213141516	Signal Name [Specification]		BRC
E1011  WIRE  TH801	Color Color Color    S		Oolor O Mire		G
Connector No. Connector Type  Connector Type  H.S.	Terminal No. 12 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Connector No. Connector Type	Terminal No. 7		Н
±	eoffication]		eoification]		I
FRONT WHEEL SENSOR RH RKOZMGY	Signal Name [Specification]	STOP LAMP SWITCH MOMPW-LC  3 4 12	Signal Name [Specification]		J
No. Name Type	Color of Wire	Connector No. E115 Connector Name STOR Connector Type MO4F	Color of Wire		K
HOUT VDC) Connector Connector ALS.	1 reminal No. No. 3 3 3 4 4 4	Comme	Terminal No. No. 2 2 2 2 4 4 3 3 4 4 4 4 4 4 4 4 4 4 4 4		L
STEM (WIT	Signal Name (Specification)		Signal Mane [Specification]		M
NNTROL SYSTEM E87 BRAKE FLUID LEVEL SWITCH VVQZFGY	Signal Nan	E105 WHRE TO WIRE TH80PW-CS10-TM4	Signal Nan		N
BRAKE CONTROL SYSTEM (WITHOUT Connector No. 637 Connector No. 637 Connector No. 637 Connector Type SWAKE FLUD LEVEL SWITCH Connector Type (VIQTEGY CON	Terminal Color of Wire 1 B B B B B B B B B B B B B B B B B B	Connector No. Connector Name Connector Type H.S.	No.   Octor   No.   Octor   No.   Octor   No.   Octor   Octo		0
				JCFWM0261GE	Р

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[ABS]



JCFWM0262GE

INFOID:0000000004231828

# Fail-Safe

### 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.

### ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS] < ECU DIAGNOSIS >

• 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:0000000004231829

DTC	Items (CONSULT screen terms)	Reference	D
C1101	RR RH SENSOR-1		D
C1102	RR LH SENSOR-1	DDC 40 "DTC Logic"	
C1103	FR RH SENSOR-1	BRC-18, "DTC Logic"	Е
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		DDC
C1106	RR LH SENSOR-2	PPC 24 "DTC Logic"	BRC
C1107	FR RH SENSOR-2	BRC-21, "DTC Logic"	
C1108	FR LH SENSOR-2		G
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-24, "DTC Logic"	
C1110	CONTROLLER FAILURE	BRC-26, "DTC Logic"	
C1111	PUMP MOTOR	BRC-27, "DTC Logic"	Н
C1113	G SENSOR	BRC-29, "DTC Logic"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-32, "DTC Logic"	1
C1120	FR LH IN ABS SOL	BRC-35, "DTC Logic"	
C1121	FR LH OUT ABS SOL	BRC-37, "DTC Logic"	
C1122	FR RH IN ABS SOL	BRC-35, "DTC Logic"	J
C1123	FR RH OUT ABS SOL	BRC-37, "DTC Logic"	
C1124	RR LH IN ABS SOL	BRC-35, "DTC Logic"	K
C1125	RR LH OUT ABS SOL	BRC-37, "DTC Logic"	11
C1126	RR RH IN ABS SOL	BRC-35, "DTC Logic"	
C1127	RR RH OUT ABS SOL	BRC-37, "DTC Logic"	L
C1140	ACTUATOR RLY	BRC-39, "DTC Logic"	
U1000	CAN COMM CIRCUIT	BRC-41, "DTC Logic"	M
U1010	CONTROL UNIT (CAN)	BRC-42, "DTC Logic"	IVI

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### **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY**

< SYMPTOM DIAGNOSIS >

[ABS]

### SYMPTOM DIAGNOSIS

### **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY**

### Diagnosis Procedure

INFOID:0000000004231830

### 1. CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-47</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-8, "Inspection".
- AWD models: Refer to FAX-32, "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 malfunctioning components.

### 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.

NO >> Normal

**UNEXPECTED PEDAL REACTION** [ABS] < SYMPTOM DIAGNOSIS > **UNEXPECTED PEDAL REACTION** Α Diagnosis Procedure INFOID:0000000004231831 1. CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-9, "Inspection and Adjustment". Is the stroke too large? YES >> • Bleed air from brake tube and hose. Refer to BR-13, "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-9, "Inspection and Adjustment". D - Master cylinder: Refer to BR-14, "Inspection". - Brake booster: Refer to BR-15, "Inspection". NO >> GO TO 2. Е 2. CHECK FUNCTION Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is BRC normal in this condition. Connect connector after inspection. Is the inspection result normal? YES >> Normal NO >> Check brake system. Н K L M

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#### THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[ABS]

### THE BRAKING DISTANCE IS LONG

### Diagnosis Procedure

INFOID:0000000004231832

#### **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 ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

### **ABS FUNCTION DOES NOT OPERATE**

< SYMPTOM DIAGNOSIS > [ABS]
ABS FUNCTION DOES NOT OPERATE

# Diagnosis Procedure

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.

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### PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[ABS]

### PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

### Diagnosis Procedure

INFOID:0000000004231834

#### **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.

### 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 INFOID:000000004231835

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS is activated.	This is a normal condition due to the ABS activation.	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.		
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 FOR USA AND CANADA

FOR USA AND CANADA: 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 AIRBAG" and "SEAT BELT" of this Service Manual.

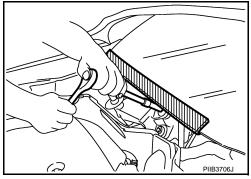
#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the "SRS AIRBAG".
- 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.

FOR USA AND CANADA: Precaution for Procedure without Cowl Top Cover

INFOID:0000000004554003

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



FOR USA AND CANADA: Precaution for Brake System

INFOID:0000000004231838

#### **WARNING:**

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

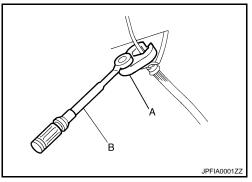
- Only use "DOT 3" brake fluid. Refer to MA-17, "FOR NORTH AMERICA: Fluids and Lubricants".
- · Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



### FOR USA AND CANADA: Precaution for Brake Control

INFOID:0000000004231839

- 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.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

#### FOR MEXICO

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

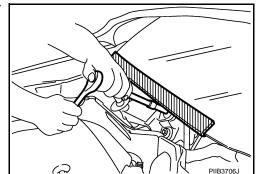
The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the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

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the "SRS AIRBAG".
- Do not 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.

# FOR MEXICO: 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.



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### **PRECAUTIONS**

< PRECAUTION > [ABS]

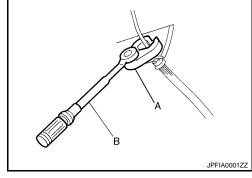
### FOR MEXICO: Precaution for Brake System

INFOID:0000000004231842

#### **WARNING:**

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

- Only use "DOT 3" brake fluid. Refer to MA-18, "FOR MEXICO: 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.
- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



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#### FOR MEXICO: Precaution for Brake Control

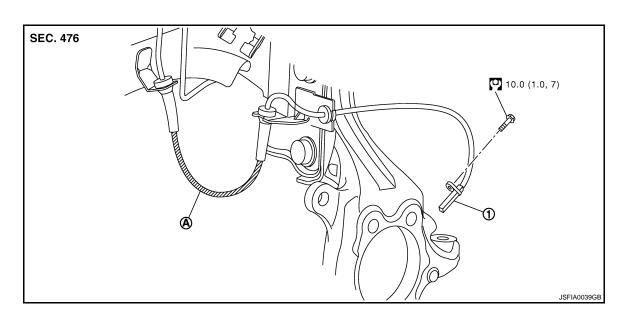
- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what 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.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

< ON-VEHICLE REPAIR > [ABS]

# ON-VEHICLE REPAIR

WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR: Exploded View



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:**

- 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

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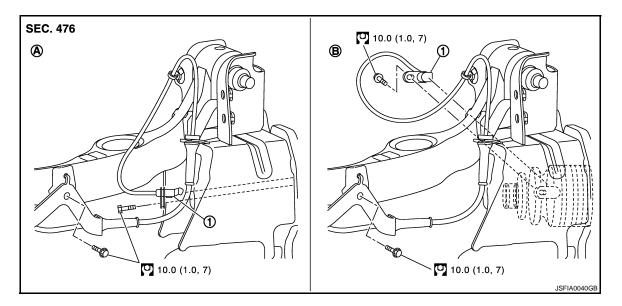
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< ON-VEHICLE REPAIR > [ABS]

### **REAR WHEEL SENSOR: Exploded View**

INFOID:0000000004231846



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:0000000004231847

#### **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 < ON-VEHICLE REPAIR > [ABS	<b>3</b> 1
SENSOR ROTOR FRONT SENSOR ROTOR	A
FRONT SENSOR ROTOR : Exploded View	848 B
Refer to FAX-10, "Exploded View" (2WD models), FAX-34, "Exploded View" (AWD models).  FRONT SENSOR ROTOR: Removal and Installation	849 C
REMOVAL Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-10, "Removal and Installation" (2WD models), FAX-34, "Removal and Installation" (AWD models).	to <sub>D</sub>
INSTALLATION Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub bearing assembly. Refeto FAX-10, "Removal and Installation" (2WD models), FAX-34, "Removal and Installation" (AWD models). REAR SENSOR ROTOR	er <sub>E</sub>
REAR SENSOR ROTOR : Exploded View	BRC
Refer to RAX-5, "Exploded View" (2WD models), RAX-13, "Exploded View" (AWD models).  REAR SENSOR ROTOR: Removal and Installation	G 851
2WD MODELS	Н
Removal Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer <u>RAX-5. "Removal and Installation"</u> .	t <b>o</b>
Installation Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub bearing assembly. Refeto RAX-5, "Removal and Installation".	er J
AWD MODELS For removal and installation of sensor rotor, refer to <u>RAX-16, "Disassembly and Assembly"</u> .	K
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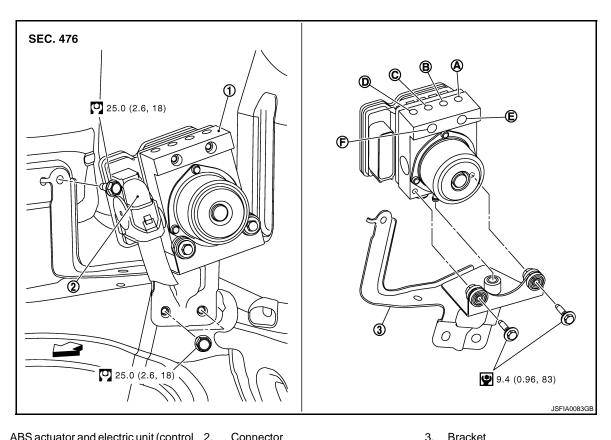
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[ABS]

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

**Exploded View** INFOID:0000000004231852



- 1. ABS actuator and electric unit (control 2. unit)

3. Bracket

A. To front LH brake caliper

To front RH brake caliper

- B. To rear RH brake caliper
  - 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

INFOID:0000000004231853

### **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-13, "Bleeding Brake System"</u>.
- Remove cowl top. Refer to EXT-20, "Exploded View". 1.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- 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.
- Remove ABS actuator and electric unit (control unit) from vehicle. 7.

#### INSTALLATION

### ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ON-VEHICLE REPAIR > [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 <u>BR-13, "Bleeding Brake System"</u>.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.

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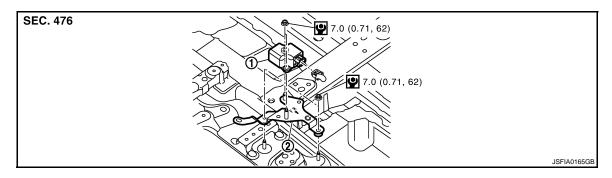
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< ON-VEHICLE REPAIR > [ABS]

### **G SENSOR**

Exploded View



1. G sensor

2. Bracket

<□: Vehicle front

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

#### Removal and Installation

INFOID:0000000004231855

#### **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-20, "Exploded View"</u>.
- 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.

### **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 <a href="https://example.com/BRC-75">BRC-75</a>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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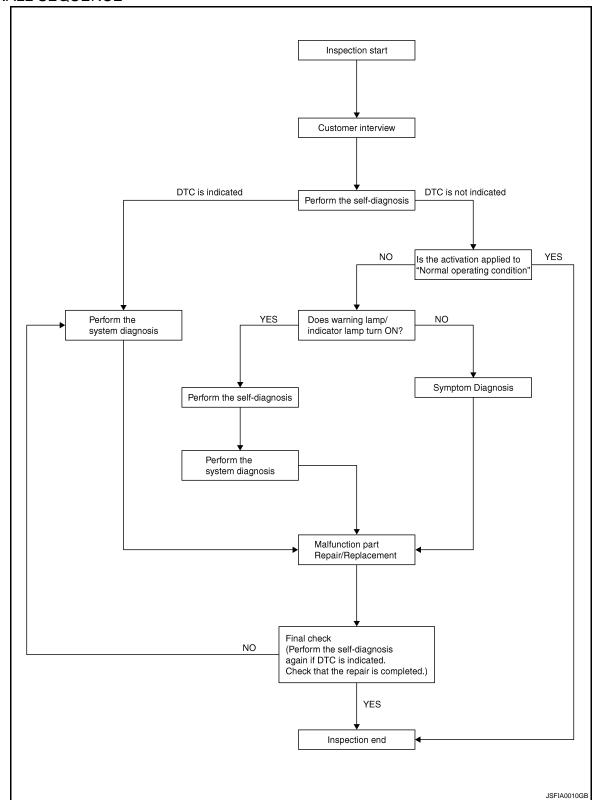
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### **OVERALL SEQUENCE**



### **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 <a href="BRC-74">BRC-74</a>, "Diagnostic Work Sheet".

## **DIAGNOSIS AND REPAIR WORKFLOW**

< BASIC INSPECTION > [VDC/TCS/ABS	3]
2.PERFORM THE SELF-DIAGNOSIS	
Check the DTC display with the self-diagnosis function. Refer to BRC-93, "CONSULT-III Function".	
Is there any DTC displayed?	
YES >> GO TO 3. NO >> GO TO 4.	
3.PERFORM THE SYSTEM DIAGNOSIS	
Perform the diagnosis applicable to the displayed DTC. Refer to BRC-156, "DTC 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 <a href="BRC-16">BRC-16</a> <a href="BRC-16">BRC-16</a> <a href="BRC-16">"Description"</a> .	<u>4,</u>
Is the symptom a normal operation?	_
YES >> INSPECTION END 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-144, "Description"</u> .	
Brake warning lamp: Refer to <u>BRC-145, "Description"</u> .	
<ul> <li>VDC OFF indicator lamp: Refer to <u>BRC-146, "Description"</u>.</li> <li>SLIP indicator lamp: Refer to <u>BRC-147, "Description"</u>.</li> </ul>	
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 symptom.	
00.70.7	
>> GO TO 7.	
REPAIR OR REPLACE THE MALFUNCTIONING PARTS	
Repair or replace the specified malfunctioning parts.	
>> GO TO 8.	
8. FINAL CHECK	
Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, eras	
the self-diagnosis memory. Refer to <u>BRC-93</u> , "CONSULT-III Function".	36
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 Sheet**

INFOID:0000000004231857

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
	☐ 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☐ Bumps / potholes	□Other)		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h ☐ Vehicle speed: 10 km/h (6 MPH) or le ☐ Vehicle is stopped			
Applying brake conditions	□ Suddenly □ Gradually			
Other conditions	☐ Operation of electrical equipment☐ Shift change☐ Other descriptions			

SFIA3265E

[VDC/TCS/ABS] < BASIC INSPECTION >

# INSPECTION AND ADJUSTMENT

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description

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

×: 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 INFOID:00000000004231859

# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

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

- On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.
- Touch "START".

#### **CAUTION:**

Never touch steering wheel while adjusting steering angle sensor.

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

#### NOTE:

After approximately 60 seconds, it ends automatically.

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

#### **CAUTION:**

Be sure to perform above operation.

>> GO TO 3.

# 3. CHECK DATA MONITOR

- Run vehicle with front wheels in straight-ahead position, then stop.
- Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°.

Is the steering angle within the specified range?

YES >> GO TO 4.

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### **INSPECTION AND ADJUSTMENT**

< BASIC INSPECTION > [VDC/TCS/ABS]

NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1.

## 4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to BRC-93, "CONSULT-III Function".
- ECM
- For CALIFORNIA: Refer to EC-105, "CONSULT-III Function".
- For USA (FEDERAL) and CANADA: Refer to EC-576, "CONSULT-III Function".
- For MEXICO: Refer to EC-1003, "CONSULT-III Function".

## Are the memories erased?

YES >> INSPECTION END

NO >> Check the items indicated by the self-diagnosis.

#### [VDC/TCS/ABS]

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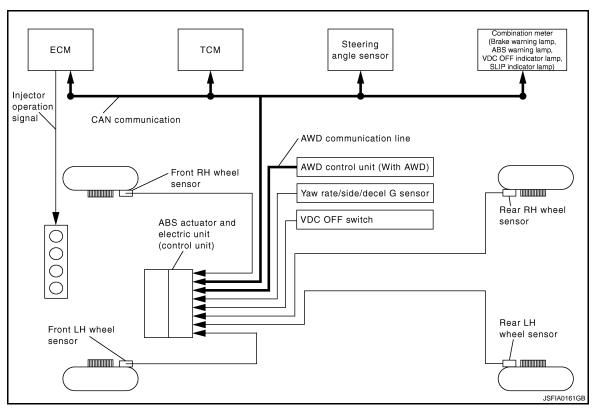
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# **FUNCTION DIAGNOSIS**

**VDC** 

System Diagram



## 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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

## **Component Parts Location**

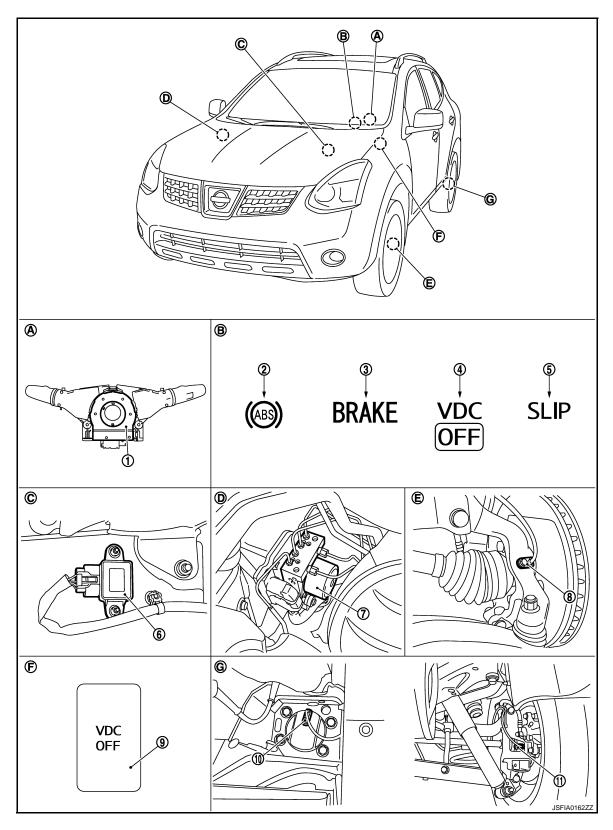
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Revision: 2008 August BRC-77 2009 Rogue

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- Steering angle sensor
- 4. VDC OFF indicator lamp
- ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. SLIP indicator 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)

- 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

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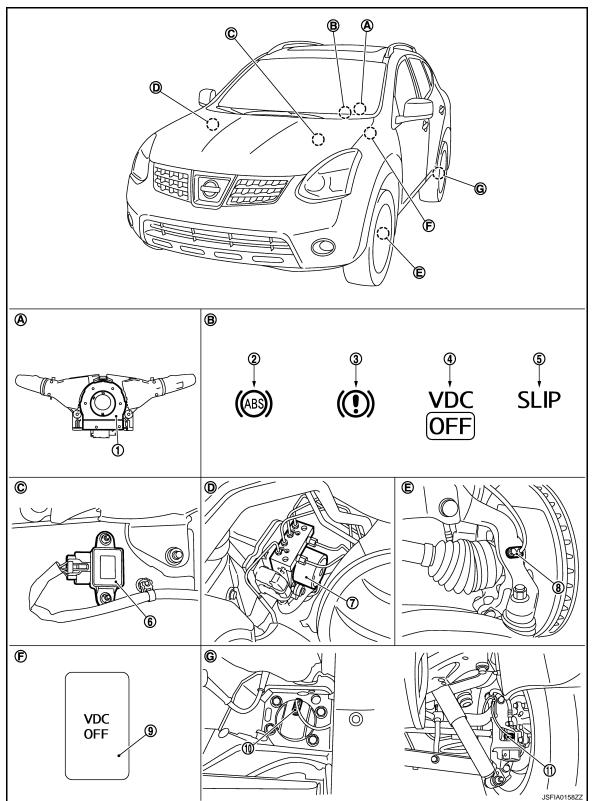
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**EXCEPT FOR USA** 



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

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
- C. Center console

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

G. Rear axle

## **Component Description**

INFOID:0000000004231863

Compo	Reference	
	Pump	PDC 107 "Description"
	Motor	BRC-107, "Description"
APC actuator and algebric unit (control unit)	Actuator relay (Main relay)	BRC-125, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-118, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-132, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-134, "Description"
Wheel sensor	BRC-98, "Description"	
Yaw rate/side/decel G sensor		BRC-109, "Description"
Steering angle sensor		BRC-127, "Description"
VDC OFF switch		BRC-142, "Description"
ABS warning lamp		BRC-144, "Description"
Brake warning lamp		BRC-145, "Description"
VDC OFF indicator lamp		BRC-146, "Description"
SLIP indicator lamp		BRC-147, "Description"

[VDC/TCS/ABS]

TCS

## System Diagram

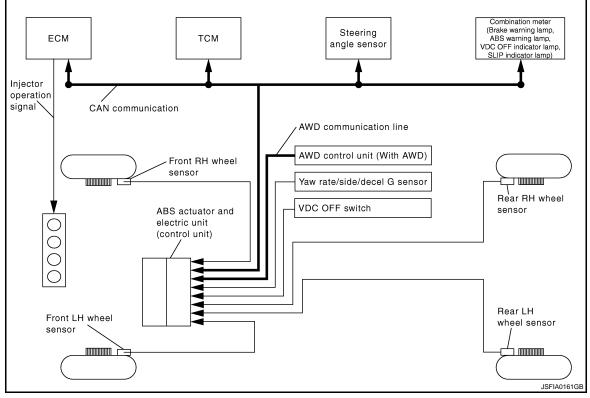
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## System Description

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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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

## Component Parts Location

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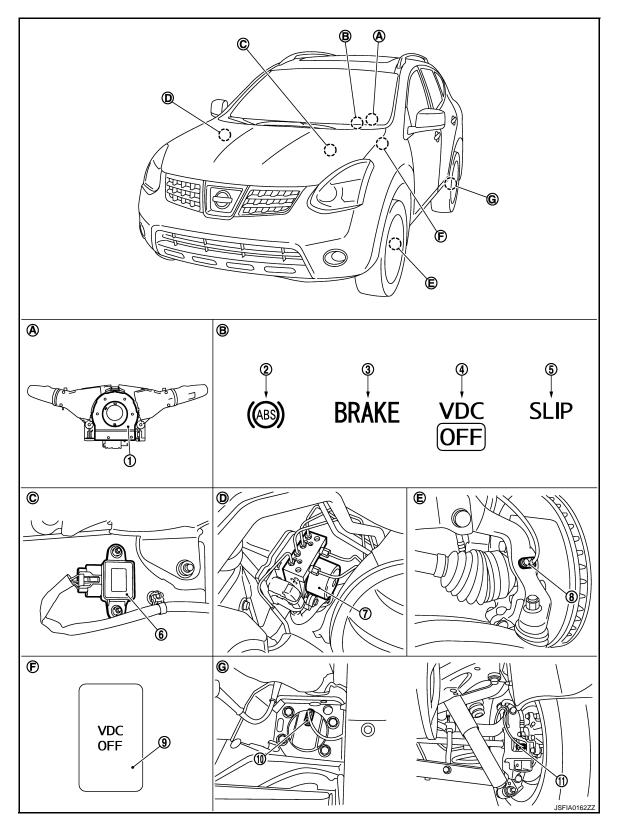
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- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. SLIP indicator lamp
- 8. Front wheel sensor
- 11. Rear wheel sensor (AWD models)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

- 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

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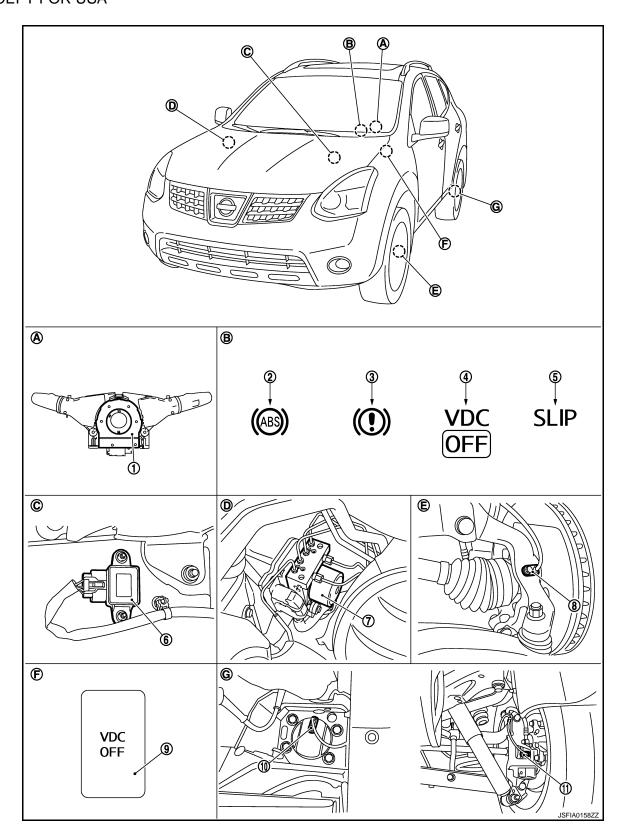
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## **EXCEPT FOR USA**



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

Revision: 2008 August BRC-83

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
- C. Center console

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

G. Rear axle

## **Component Description**

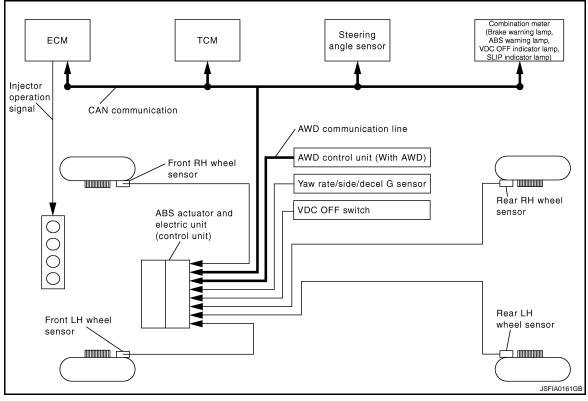
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Compo	Reference	
	Pump	PDC 107 "Description"
	Motor	BRC-107, "Description"
APC actuator and algebric unit (control unit)	Actuator relay (Main relay)	BRC-125, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-118, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-132, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-134, "Description"
Wheel sensor	BRC-98, "Description"	
Yaw rate/side/decel G sensor		BRC-109, "Description"
Steering angle sensor		BRC-127, "Description"
VDC OFF switch		BRC-142, "Description"
ABS warning lamp		BRC-144, "Description"
Brake warning lamp		BRC-145, "Description"
VDC OFF indicator lamp		BRC-146, "Description"
SLIP indicator lamp		BRC-147, "Description"

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## **ABS**

## System Diagram



## **System Description**

- 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-III is available.

## **Component Parts Location**

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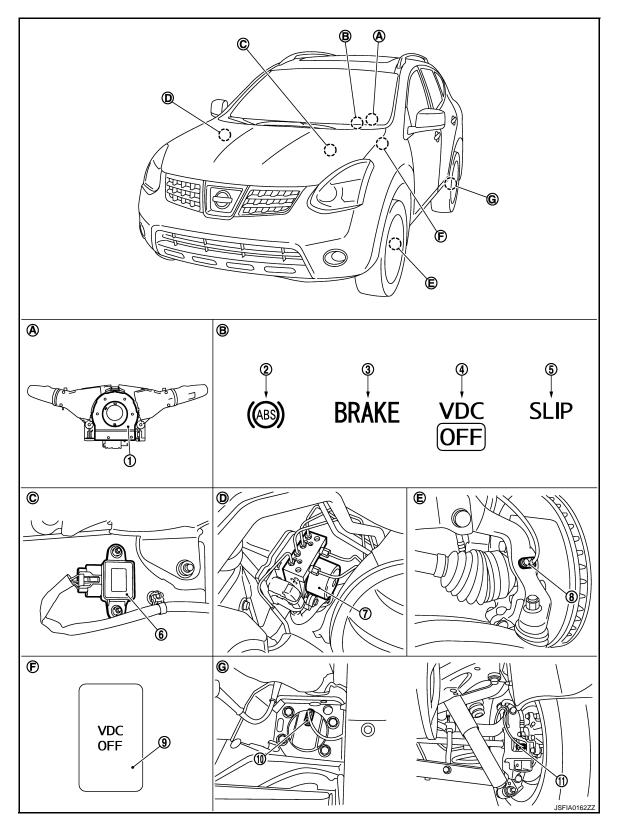
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- Steering angle sensor
- 4. VDC OFF indicator lamp
- ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. SLIP indicator lamp
- 8. Front wheel sensor
- 3. Brake warning lamp
- 6. Yaw rate/side/decel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

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

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

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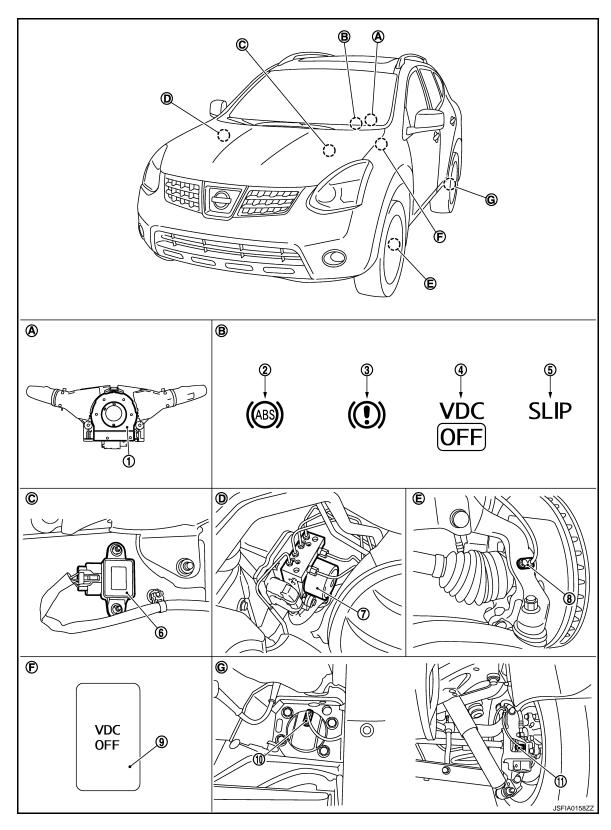
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Yaw rate/side/decel G sensor

## **EXCEPT FOR USA**



- Steering angle sensor 1.
- VDC OFF indicator lamp
- 2. ABS warning lamp
- SLIP indicator lamp 5.
- 3. Brake warning lamp
- 6.

**BRC-87** Revision: 2008 August

- 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
- C. Center console

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

G. Rear axle

## **Component Description**

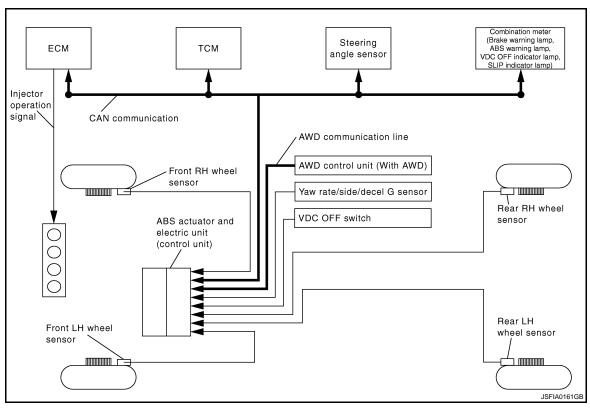
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Compo	Reference	
	Pump	PDC 107 "Description"
	Motor	BRC-107, "Description"
APC actuator and algebric unit (control unit)	Actuator relay (Main relay)	BRC-125, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-118, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-132, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-134, "Description"
Wheel sensor	BRC-98, "Description"	
Yaw rate/side/decel G sensor		BRC-109, "Description"
Steering angle sensor		BRC-127, "Description"
VDC OFF switch		BRC-142, "Description"
ABS warning lamp		BRC-144, "Description"
Brake warning lamp		BRC-145, "Description"
VDC OFF indicator lamp		BRC-146, "Description"
SLIP indicator lamp		BRC-147, "Description"

INFOID:0000000004231872

**EBD** 

## System Diagram



System Description

- 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-III is available.

## Component Parts Location

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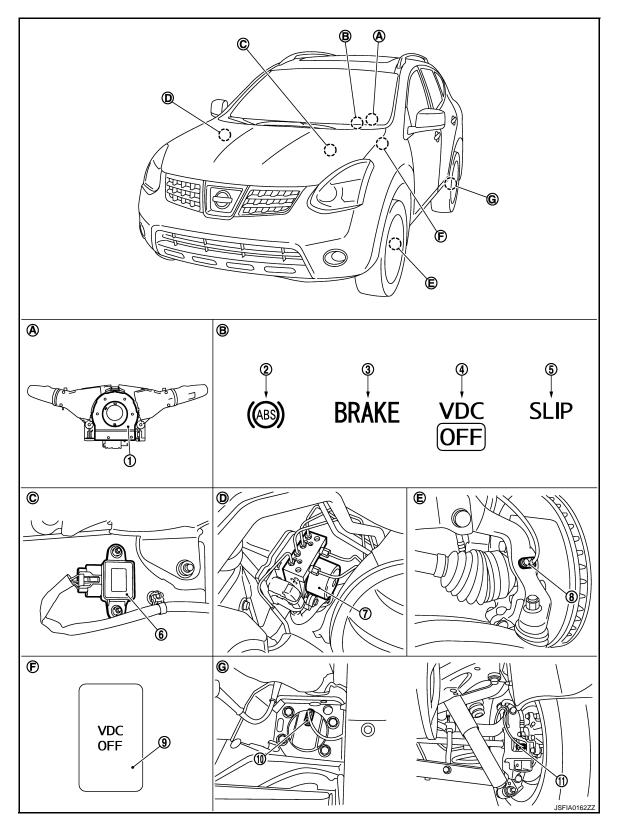
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- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- ABS actuator and electric unit (control unit)
- 10. Rear wheel sensor (2WD models)
- 2. ABS warning lamp
- 5. SLIP indicator lamp
- 8. Front wheel sensor
- 11. Rear wheel sensor (AWD models)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

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

**EXCEPT FOR USA** 

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- B. Combination meter
- E. Steering knuckle

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**(D)** 

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- C. Center console
- F. Instrument driver lower panel

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1. Steering angle sensor

Revision: 2008 August

4. VDC OFF indicator lamp

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2. ABS warning lamp

5. SLIP indicator lamp

3. Brake warning lamp

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6. Yaw rate/side/decel G sensor

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- 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
- C. Center console

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

G. Rear axle

## **Component Description**

INFOID:0000000004231875

Compo	nent parts	Reference
	Pump	DDC 407 "Decoration"
	Motor	BRC-107, "Description"
ADC patriotor and algebric unit (control unit)	Actuator relay (Main relay)	BRC-125, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-118, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-132, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-134, "Description"
Wheel sensor	BRC-98, "Description"	
Yaw rate/side/decel G sensor	BRC-109, "Description"	
Steering angle sensor	BRC-127, "Description"	
VDC OFF switch		BRC-142, "Description"
ABS warning lamp	arning lamp	
Brake warning lamp	BRC-145, "Description"	
VDC OFF indicator lamp	BRC-146, "Description"	
SLIP indicator lamp		BRC-147, "Description"

### < FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

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

**CONSULT-III Function** 

INFOID:0000000004231876

#### **FUNCTION**

CONSULT-III 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-III.
Self diagnostic results	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-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU part number	ABS actuator and electric unit (control unit) part number can be read.

#### WORK SUPPORT

ltem	Description	
ST ANG SEN ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.	

#### SELF DIAGNOSTIC RESULT

Operation Procedure

Before performing the self-diagnosis, 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, 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 OFF indicator lamp, SLIP indicator 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 OFF indicator lamp, SLIP indicator 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-156, "DTC Index".

DATA MONITOR MODE

Display Item List

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< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

-	OFI FOT MA	ONITOD ITEM	×: Applicable ▼: Optional item
Monitor item (Unit)  SELECT MONITOR  ECU INPUT  MANUAL  SELECT MONITOR		UNITOR ITEM	Remarks
Monitor Rom (Only)	SIGNALS	MAIN SIGNALS	remane
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 <sup>2</sup> )	×	•	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 calcustid 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

#### < FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

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	SELECT MO	ONITOR ITEM		
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	Α
ABS WARN LAMP (On/Off)	▼	×	ABS warning lamp	В
OFF LAMP (On/Off)	▼	×	VDC OFF indicator lamp	
SLIP LAMP (On/Off)	▼	×	SLIP indicator lamp	С
N POSI SIG (On/Off)	▼	•	N range status	D
P POSI SIG (On/Off)	▼	•	P range status	-
R POSI SIG (On/Off)	▼	•	R range status	Е
CRAKING SIG (On/Off)	•	•	CAN mask request for cranking	BRO
CV1 (On/Off)	▼	▼	Cut valve 1 monitor	
CV2 (On/Off)	▼	•	Cut valve 2 monitor	G
SV1 (On/Off)	▼	•	Suction valve 1 monitor	Н
SV2 (On/Off)	▼	•	Suction valve 2 monitor	-
STOP LAMP SW2 (On/Off)	•	•	ASCD brake switch signal status	I
EBD SIGNAL (On/Off)	•	•	EBD operation	J
ABS SIGNAL (On/Off)	▼	•	ABS operation	-
TCS SIGNAL (On/Off)	▼	•	TCS operation	K
VDC SIGNAL (On/Off)	•	•	VDC operation	L
EBD FAIL SIG (On/Off)	•	•	EBD fail-safe status	_
ABS FAIL SIG (On/Off)	•	•	ABS fail-safe status	M
TCS FAIL SIG (On/Off)	▼	•	TCS fail-safe status	N
VDC FAIL SIG (On/Off)	•	•	VDC fail-safe status	- IV
4WD MODE MON (On/Off)	•	•	AWD mode monitor	0

## 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 OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.
- Erase memory of ICC system after implementing active test.

### < FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

#### NOTE:

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

Test Item

#### ABS SOLENOID VALVE

• For ABS solenoid valve, touch "Up", "Keep" and "Down". Then use screen monitor to check that solenoid valve operates as shown in the table below.

Took itom	Diamlassitana	Display			
Test item	Display item —	Up	Keep	Down	
	FR RH IN SOL	Off	On	On	
FR RH SOL	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 I II COI	FR LH OUT SOL	Off	Off	On*	
FR LH SOL	CV2	Off	Off	Off	
	SV2	Off	Off	Off	
RR RH SOL	RR RH IN SOL	Off	On	On	
	RR RH OUT SOL	Off	Off	On*	
	CV2	Off	Off	Off	
	SV2	Off	Off	Off	
	RR LH IN SOL	Off	On	On	
RR LH SOL	RR LH OUT SOL	Off	Off	On*	
	CV1	Off	Off	Off	
	SV1	Off	Off	Off	

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### ABS SOLENOID VALVE (ACT)

• For ABS solenoid valve (ACT), touch "Up", "ACT UP" and "ACT KEEP". Then use screen monitor to check that solenoid valve operates as shown in the table below.

Test item	Display item		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 (ACT)	RR RH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	

## < FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]
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Test item	Dioplay itom	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

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### **ABS MOTOR**

• Touch "On" and "Off" 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
ABS MOTOR	ACTUATOR RLY	On	On

#### **ECU PART NUMBER**

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

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[VDC/TCS/ABS]

## COMPONENT DIAGNOSIS

## C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID.000000004231877

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
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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-98, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231879

#### **CAUTION:**

#### Never check between wheel sensor terminals.

## 1. CHECK SENSOR AND SENSOR ROTOR

- · Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- · Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 2. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

### C1101, C1102, C1103, C1104 WHEEL SENSOR-1

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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5. Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Repair or replace connector.

## 3.CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

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

Measurement terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F00	21	E39 (Front RH)	3	
	23	E22 (Front LH)	1	Existed
E36	11	B41 (Rear RH)	7	Existed
	26	B44 (Rear LH)	5	

Measurement terminal for ground circuit

	Continuity			
Connector	Terminal	Connector	Terminal	Continuity
	12, 21	12, 21	Not existed	
Eac	27, 23	2.4		
E36	15, 11	E36 3, 4		
	30, 26			

5. Reconnect ABS actuator and electric unit (control unit) connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel sensor		_	Voltage
Connector	Terminal	_	voltage
E39 (Front RH)	3		
E22 (Front LH)	1	Ground	Approx. 8 V or more
B41 (Rear RH)	7	Giouna	Approx. 8 v or more
B44 (Rear LH)	5		

Is the inspection result normal?

## C1101, C1102, C1103, C1104 WHEEL SENSOR-1

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

## **Component Inspection**

INFOID:0000000004231880

## 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-98">BRC-98</a>, "Diagnosis Procedure".

### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description INFOID:0000000004231881

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:0000000004231882

#### 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 dyno
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.	Sensor damaged     ABS unit damaged

## DTC CONFIRMATION PROCEDURE

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-101, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

**CAUTION:** 

Never check between wheel sensor terminals.

## CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- · Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 2. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector. 2.
- Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?

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### C1105, C1106, C1107, C1108 WHEEL SENSOR-2

### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Repair or replace connector.

## 3.CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

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

Measurement terminal for power supply circuit

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

Measurement terminal for ground circuit

	ABS actuator and electric unit (control unit)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
	12, 21	E36		Not existed
E36	27, 23		3, 4	
E30	15, 11			
	30, 26			

5. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

## 4. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	sensor	— Voltage	
Connector	Terminal	_	vollage
E39 (Front RH)	3	Ground Approx. 8 V	
E22 (Front LH)	1		Approx 8 V or more
B41 (Rear RH)	7		Approx. 6 v or more
B44 (Rear LH)	5		

#### Is the inspection result normal?

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

## C1105, C1106, C1107, C1108 WHEEL SENSOR-2

### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## Component Inspection

INFOID:0000000004231884

## 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-101">BRC-101</a>, "Diagnosis Procedure".

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### **C1109 POWER AND GROUND SYSTEM**

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1109 POWER AND GROUND SYSTEM

Description INFOID:000000004231885

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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-104, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231887

## 1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Repair or replace connector.

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

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and e	ABS actuator and electric unit (control unit)		Condition	Voltago
Connector	Terminal	_	Condition	Voltage
E36	16	Ground	Ignition switch: ON	Battery voltage
€30	10	Giouria	Ignition switch: OFF	Approx. 0 V

- Check 10A fusible link (59).
- Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

#### C1109 POWER AND GROUND SYSTEM

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

6. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

## 3.abs power supply check (under load conditions)

- 1. Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 16 and 4. With ignition switch ON check bulb illuminates correctly.
- 2. Check ABS motor supply under loaded condition (connector E36 terminals 1 and 3).

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

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

1. Turn ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

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

ABS actuator and election	ric unit (control unit)	— Continuity	
Connector	Terminal		Continuity
E36	3, 4	Ground	Existed

#### Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. it any malfunction is found, repair malfunctioning parts.

NO >> Repair or replace malfunctioning components. (Check ABS earth bolt for tightness and corrosion.)

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## C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Description INFOID:000000004231888

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. CHECK SELF-DIAGNOSIS RESULTS

- Check both ABS solenoid valve and motor supply and ground circuits using a suitable electrical load.
- Check wheel speed sensor inputs.
- 3. Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-106</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231890

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).

### C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:0000000004231891

**PUMP** 

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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 un
		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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	•
PUMP MOTOR	-

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-107">BRC-107</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231893

## 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

## 2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

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

Reconnect ABS actuator and electric unit (control unit) connector.

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### C1111 ABS MOTOR, MOTOR RELAY SYSTEM

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

# ${f 3.}$ abs power supply check (under load condition)

Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 2 and 3. With ignition switch ON check bulb illuminates correctly.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

## ${f 4.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components. (Check ABS each bolt for tightness and corrosion.)

## Component Inspection

INFOID:0000000004231894

## 1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-107, "Diagnosis Procedure".

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

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

Description INFOID:0000000004231895

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     ABS actuator and electric unit (control unit)
C1145	YAW RATE SENSOR		
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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
G SENSOR
YAW RATE SENSOR
SIDE G-SEN CIRCUIT

#### Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

## Diagnosis Procedure

# 1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect yaw rate/side/decel G sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

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

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Disconnect yaw rate/side/decel G sensor connector.
- 4. Check continuity between yaw rate/side/decel G sensor harness connector terminals and ABS actuator and electric unit (control unit) harness connector terminals.

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2009 Rogue

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

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

# $3. {\tt CHECK\ YAW\ RATE/SIDE/DECEL\ G\ SENSOR\ HARNESS\ CONNECTOR}$

Check continuity between G sensor harness connector terminal and ground.

Yaw rate/side	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 malfunctioning components.

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

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

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

# JSFIA0098ZZ

#### Is the inspection result normal?

YES >> Replace yaw rate/side/decel G sensor.

NO >> GO TO 5.

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

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

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

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

[VDC/TCS/ABS] < COMPONENT DIAGNOSIS >

Turn ignition switch ON.

Check voltage between yaw rate/side/decel G sensor harness connector terminals.

Never short out the terminals while measuring voltages.

Yaw rate/side/decel G sensor Voltage **Terminal** connector 5 - 22.5 - 4.5 V**B38** 6 - 20.5 - 2.5 V

Is the inspection result normal?

>> Replace ABS actuator end electric unit (control unit). Perform self-diagnosis again.

>> Replace yaw rate/side/decel G sensor. Perform self-diagnosis again. NO

## Component Inspection

## 1. CHECK DATA MONITOR

Select "YAW RATE SENSOR", "SIDE G-SENSOR" and "DECEL G-SEN", in "DATA MONITOR" and check yaw rate/side/decel G sensor signal.

#### YAW RATE SENSOR

Vehicle condition	DATA MONITOR		
Vehicle stopped	Approx. 0 d/s		
Vehicle turning	-100 to 100 d/s		
SIDE G SENSOR			
Vehicle condition	DATA MONITOR		
Vehicle stopped	Approx. 0 m/s <sup>2</sup>		
Vehicle turning right	Negative value		
Vehicle turning left	Positive value		
DECEL G SENSOR			
Vehicle condition	DATA MONITOR		
Vehicle stopped	−0.11 to +0.11 G		
During acceleration	Negative value		
During deceleration	Positive value		

## Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-109">BRC-109</a>, "Diagnosis Procedure". **BRC** 

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## C1115 WHEEL SENSOR

Description INFOID:000000004231899

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
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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS SENSOR [ABNORMAL SIGNAL]

#### Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231901

#### **CAUTION:**

#### Never check between wheel sensor terminals.

1. CHECK TIRES

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 2.

NO >> Adjust air pressure, or replace tire.

## 2.CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- Check that there is no deformation, misalignment, float, and backlash on the wheel sensor and wheel sensor mounting surface.
- Check that the wheel sensor in installed with no misalignment and backlash.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 3.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 3.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- 5. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 4.

NO >> Poor connection of connector terminal. Repair or replace connector.

## C1115 WHEEL SENSOR

## < COMPONENT DIAGNOSIS >

#### [VDC/TCS/ABS]

# 4. CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

moderation to the signal of our					
ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	12	E39 (Front RH)	4		
E36	27	E22 (Front LH)	2	Existed	
E30	15	B41 (Rear RH)	8	EXISTEC	
	30	B44 (Rear LH)	6		

Measurement terminal for power supply circuit

ABS actuator and electric unit (control unit)  Connector Terminal		Wheel sensor		Continuity
		Connector	Terminal	Continuity
	21	E39 (Front RH)	3	
E36	23	E22 (Front LH)	1	Existed
L30 -	11	B41 (Rear RH)	7	Existed
	26	B44 (Rear LH)	5	

Measurement terminal for ground circuit

	Continuity			
Connector	Connector Terminal Connector Terminal			
	12, 21	E36		Not existed
E36	27, 23		2.4	
E30	15, 11		3, 4	
	30, 26			

5. Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

## 5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch ON.
- 2. Check voltage between wheel sensor harness connector power supply terminal and ground.

Wheel	sensor		Voltage	
Connector	Terminal			
E39 (Front RH)	3			
E22 (Front LH)	1	Ground	Approx. 8 V or more	
B41 (Rear RH)	7	Giodila	Approx. 6 v or more	
B44 (Rear LH)	5			

## Is the inspection result normal?

YES >> Replace applicable wheel sensor.

NO >> Replace ABS actuator and electric unit (control unit).

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## **C1115 WHEEL SENSOR**

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## Component Inspection

INFOID:0000000004231902

# 1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-112">BRC-112</a>, "Diagnosis Procedure".

## **C1116 STOP LAMP SWITCH**

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1116 STOP LAMP SWITCH

Description INFOID:0000000004231903

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

DTC Logic INFOID:0000000004231904

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector     Stop lamp switch     ABS actuator and electric unit (control unit)

#### DTC CONFIRMATION PROCEDURE

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results STOP LAMP SW

#### Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to <a href="BRC-115">BRC-115</a>, "Diagnosis Procedure".

>> INSPECTION END NO

## Diagnosis Procedure

1. CHECK STOP LAMP ILLUMINATE

Check stop lamps illuminate when brake pedal is pressed.

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Check stop lamp circuit.

# 2.CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect stop lamp switch connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors securely.
- Start engine.
- 7. Repeat pumping brake pedal carefully several times, and perform self-diagnosis.

#### Is any item indicated in the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

## 3.CHECK STOP LAMP SWITCH CIRCUIT

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

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#### < COMPONENT DIAGNOSIS >

	or and electric ntrol unit)	_	Condition	Voltage
Connector	Terminal			
E36	8	Ground	Brake pedal is depressed	Battery voltage
L30	eso o Ground		Brake pedal is released	Approx. 0 V

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning components.

## Component Inspection

INFOID:0000000004231906

# 1. CHECK STOP LAMP SWITCH

- Turn ignition switch OFF.
- 2. Disconnect stop lamp switch 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 – 2	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 <u>BR-18</u>, "Exploded View".

## C1118 AWD SYSTEM

#### < COMPONENT DIAGNOSIS >

#### [VDC/TCS/ABS]

## C1118 AWD SYSTEM

Description INFOID:000000004231907

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)	<ul> <li>Harness or connector</li> <li>AWD communication line</li> <li>AWD control unit</li> <li>ABS actuator and electric unit (control unit)</li> </ul>

#### DTC CONFIRMATION PROCEDURE

## 1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
4WD SYSTEM

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-117</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

## Diagnosis Procedure

1. CHECK AWD CONTROL UNIT

Perform AWD control unit self-diagnosis.

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).

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[VDC/TCS/ABS]

## C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:000000004231910

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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
FR LH IN ABS SOL	
FR RH IN ABS SOL	
RR LH IN ABS SOL	
RR RH IN ABS SOL	

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-118">BRC-118</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231912

## 1.CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- · Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 2.check connector

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

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## C1120, C1122, C1124, C1126 IN ABS SOL

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

# ${f 3.}$ check solenoid, vdc switch-over valve and actuator relay power supply circuit

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

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

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

## f 4.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

## Component Inspection

## 1. CHECK ACTIVE TEST

1. Select each test menu item on "ACTIVE TEST".

2. On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Toot itom	Test item Display item Display			
rest item	Display item —	Up	Keep	Down
	FR RH IN SOL	Off	On	On
FR RH SOL	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
FR LH SOL	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 30L	CV2	Off	Off	Off
	SV2	Off	Off	Off
	RR LH IN SOL	Off	On	On
DD I H COI	RR LH OUT SOL	Off	Off	On*
RR LH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

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## C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-118">BRC-118</a>, "Diagnosis Procedure".

## C1121, C1123, C1125, C1127 OUT ABS SOL

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:0000000004231914

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:0000000004231915

#### 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

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-121, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

## CHECK SENSOR AND SENSOR ROTOR

- Check that there is no damage or adherence of foreign matter on the sensor rotor surface.
- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

#### Are the sensor and sensor rotor normal?

YES >> GO TO 2.

NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

## 2.check connector

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YFS >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

**BRC-121** Revision: 2008 August 2009 Rogue

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## C1121, C1123, C1125, C1127 OUT ABS SOL

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

# ${f 3.}$ check solenoid, vdc switch-over valve and actuator relay power supply circuit

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check voltage between ABS actuator and electric unit (control unit) harness connector terminal 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 4.

NO >> Repair or replace malfunctioning components.

## f 4.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

## Component Inspection

INFOID:0000000004231917

## 1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Test item	Display item —		Display	
rest item		Up	Keep	Down
	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
FR KH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off
	FR LH IN SOL	Off	On	On
FR LH SOL	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 30L	CV2	Off	Off	Off
	SV2	Off	Off	Off
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
KK LH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

## C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS > [VDC/TCS/ABS]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-121">BRC-121</a>, "Diagnosis Procedure".

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## **C1130 ENGINE SIGNAL**

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1130 ENGINE SIGNAL

Description INFOID:000000004231918

ABS actuator and electric unit (control unit) and ECM exchange the engine signal via CAN communication line.

DTC Logic

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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

#### DTC CONFIRMATION PROCEDURE

## 1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-124, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231920

# 1. CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

## Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

#### C1140 ACTUATOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1140 ACTUATOR RELAY SYSTEM

Description INFOID:0000000004231921

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

DTC Logic INFOID:0000000004231922

#### 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	ACTUATOR NET	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

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results **ACTUATOR RLY** 

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to <a href="BRC-125">BRC-125</a>, "Diagnosis Procedure".

NO >> INSPECTION END

# Diagnosis Procedure

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YFS >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

# 2.check solenoid, vdc switch-over valve and actuator relay power supply circuit

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

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

Reconnect ABS actuator and electric unit (control unit) connector.

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

**BRC-125** Revision: 2008 August 2009 Rogue

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#### C1140 ACTUATOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

# ${f 3.}$ abs power supply check (under load condition)

Use 12 V lamp (normal rating 10 to 20 W) connected between E36 terminals 1 and 3. With ignition switch ON check bulb illuminates correctly.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Check both power supply and ground circuit.

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

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components. (Check ABS each bolt for tightness and corrosion.)

## Component Inspection

INFOID:0000000004231924

## 1. CHECK ACTIVE TEST

- 1. On "ACTIVE TEST", select "ABS MOTOR".
- 2. Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-107, "Diagnosis Procedure".

## C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1143, C1144 STEERING ANGLE SENSOR

Description INFOID:0000000004231925

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 INFOID:0000000004231926

#### 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

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT
ST ANG SEN SIGNAL

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to <a href="BRC-127">BRC-127</a>, "Diagnosis Procedure". YES

NO >> INSPECTION END

## Diagnosis Procedure

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 ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Disconnect steering angle sensor connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors and then perform the self-diagnosis.

Is any item indicated on the self-diagnosis display?

YFS >> GO TO 3.

NO >> Poor connection of connector terminal. Replace or repair connector.

# 3.check steering angle sensor harness

- Turn ignition switch OFF.
- Disconnect steering angle sensor connector. 2.
- Check continuity between steering angle sensor harness connector terminal and ground. 3.

Steering a	ngle sensor	_	Continuity
Connector	Terminal	_	Continuity
M30	3	Ground	Existed

**BRC-127** Revision: 2008 August 2009 Rogue

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## C1143, C1144 STEERING ANGLE SENSOR

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Turn ignition switch ON.

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

Steering angle sensor			Voltage
Connector	Connector Terminal		voltage
M30	1	Ground	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

## 4. CHECK DATA MONITOR

- 1. Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
- Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)	
Driving straight	±2.5 °	
Turn 90 ° to right	Approx. +90 °	
Turn 90 ° to left	Approx. –90 °	

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust neutral position of steering angle sensor.

# 5. CHECK FOR BACKLASH

- 1. Check for backlash [turn wheel to left then straight then right then straight (approx. 90°)].
- 2. Check straight position is always similar value.

#### Is there noticeable backlash?

YES >> Check sensor is correctly fitted to combination switch.

NO >> Check sensor output is correct from lock to lock.

## Component Inspection

INFOID:0000000004231928

## 1. CHECK DATA MONITOR

Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)	
Driving straight	±2.5 °	
Turn 90 ° to right	Approx. +90 °	
Turn 90 ° to left	Approx. –90 °	

## Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-127</u>, "<u>Diagnosis Procedure</u>".

## Special Repair Requirement

INFOID:0000000004231929

# 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the "ST ANG SEN ADJUSTMENT" in "WORK SUPPORT", when replacing the steering angle sensor.

>> END

## C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000004231930

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 INFOID:0000000004231931

#### 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.	<ul> <li>Brake fluid level low</li> <li>Brake fluid level switch failure</li> <li>Wiring to brake fluid level switch short circuit</li> <li>CAN bus failure</li> <li>Combination meter failure</li> </ul>

#### DTC CONFIRMATION PROCEDURE

## CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

## Diagnosis Procedure

1.CHECK BRAKE FLUID LEVEL

Check the brake fluid level.

Is the inspection result normal? YES >> GO TO 2.

NO >> Investigate and fix.

2.CHECK BRAKE WARNING LAMP 1 Check that the brake warning lamp illuminates after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check wiring to brake fluid level sensor and brake fluid level sensor.

## 3.CHECK BRAKE WARNING LAMP 2

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

Is the inspection result normal?

YFS >> GO TO 4.

NO >> Check parking brake switch.

## 4. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect brake fluid level switch connector and combination meter connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or
- Reconnect connectors and then perform the self-diagnosis.

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**BRC-129** Revision: 2008 August 2009 Rogue

#### C1155 BRAKE FLUID LEVEL SWITCH

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 5.

NO >> Poor connection of connector terminal. Replace or repair connector.

# 5. CHECK BRAKE FLUID LEVEL SWITCH

- Turn ignition switch OFF.
- Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch connector terminals.

Brake fluid	level switch	Condition	Continuity	
Connector	Terminal	Condition	Continuity	
E37	1-2	When brake fluid is full in the reservoir tank.	Not existed	
L37   1-2		When brake fluid is empty in the reservoir tank.	Existed	

#### Is the inspection result normal?

YES >> GO TO 6.

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

## 6.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

- 1. Disconnect combination meter connector.
- Check continuity between brake fluid level switch harness connector terminals and combination meter harness connector terminal and/or ground.

ConnectorTerminalConnectorTerminalM3427E371Existed	Combination meter		Brake fluid level switch		Continuity
M34 27 E37 1 Existed	Connector	Terminal	Connector	Terminal	Continuity
	M34	27	E37	1	Existed

Combination meter			Continuity
Connector	Terminal		Continuity
M34	27	Ground	Not existed

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

## Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

## Component Inspection

INFOID:0000000004231933

# 1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn 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	
E37	1 – 2	When brake fluid is full in the reservoir tank.	Not existed	
E37	1-2	When brake fluid is empty in the reservoir tank.	Existed	

C1155 BRAKE FLUID LEVEL SWITCH		
< COMPONENT DIAGNOSIS >	[VDC/TCS/ABS]	
Is the inspection result normal?		
YES >> INSPECTION END NO >> Go to diagnosis procedure. Refer to <u>BRC-129, "Diagnosis Procedure"</u> .		Α
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## C1164, C1165 CV SYSTEM

Description INFOID:000000004231934

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

DTC Logic

#### 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
CV1	
CV2	

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-132">BRC-132</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231936

## 1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

# 2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and actuator relay ground circuit

## C1164, C1165 CV SYSTEM

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:0000000004231937

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

## Component Inspection

# 1. CHECK ACTIVE TEST

Select each test menu item on "ACTIVE TEST".

2. On the display, touch "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Test item	Display item	Display		
iest 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 ABS SOLENOID (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	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
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

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-132">BRC-132</a>, "Diagnosis Procedure".

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## C1166, C1167 SV SYSTEM

Description INFOID:000000004231938

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic

#### 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. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
SV1
SV2

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-134">BRC-134</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231940

## 1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

# 2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and actuator relay ground circuit

## C1166, C1167 SV SYSTEM

#### < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:0000000004231941

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

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

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace malfunctioning components.

## Component Inspection

# 1. CHECK ACTIVE TEST

Select each test menu item on "ACTIVE TEST".

2. On the display, touch "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Test item	Display item	Display		
iest 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 ABS SOLENOID (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	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
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

<sup>\*:</sup> On for 1 to 2 seconds after the touch, and then Off.

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <a href="BRC-134">BRC-134</a>, "Diagnosis Procedure".

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## C1176 STOP LAMP SW2

Description INFOID:000000004231942

When the brake pedal is depressed, ASCD brake switch is turned OFF and stop lamp switch is turned ON.

DTC Logic

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1176	STOP LAMP SW2	When ASCD brake switch circuit is open.	Harness or connector     ASCD brake switch     ABS actuator and electric unit (control unit)

#### DTC CONFIRMATION PROCEDURE

## 1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
STOP LAMP SW2	

## Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-136</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231944

## 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis.

#### Is any item indicated on the self-diagnosis display?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair connector.

## CHECK ASCD BRAKE SWITCH

- 1. Turn ignition switch OFF.
- Disconnect ASCD brake switch connector.
- Check continuity between ASCD brake switch connector terminals.

ASCD brake switch	Condition	Continuity	
Terminal	Condition		
1 – 2	Brake pedal is fully released.	Existed	
1-2	Brake pedal is slightly depressed.	Not existed	

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace ASCD brake switch.

# 3.check ascd brake switch power supply circuit

- Turn ignition switch OFF.
- 2. Disconnect ASCD brake switch connector.
- Turn ignition switch ON.

## C1176 STOP LAMP SW2

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

4. Check voltage between ASCD brake switch harness connector and ground.

ASCD brake switch			Voltage
Connector	Terminal		voltage
E112	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

## 4. CHECK ASCD BRAKE SWITCH INPUT SIGNAL CIRCUIT

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

ASCD bra	ake switch		3S actuator and electric unit (control unit)	
Connector	Terminal	Connector Terminal		
E112	2	E36	6	Existed

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning components.

## Component Inspection

## 1. CHECK ASCD BRAKE SWITCH

- Turn 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	
1 – 2	Brake pedal is slightly depressed.	Not existed	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch. Refer to <u>BR-18</u>, "Exploded View".

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[VDC/TCS/ABS]

## U1000 CAN COMM CIRCUIT

Description INFOID:000000004231946

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.	CAN communication line     ABS actuator and electric unit (control unit)

## DTC CONFIRMATION PROCEDURE

## 1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnos	is results
CAN COMM	CIRCUIT

#### Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-138</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004231948

## 1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connector and perform self-diagnosis.

Self-diagnosis results	
CAN COMM CIRCUIT	

#### Is above displayed on the self-diagnosis display?

YES >> Go to LAN-24, "CAN System Specification Chart".

NO >> INSPECTION END

## **U1010 CONTROL UNIT (CAN)**

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

## U1010 CONTROL UNIT (CAN)

Description INFOID:000000004231949

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. RECHECK DTC

- 1. Turn the ignition switch OFF to ON.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### Is DTC "U1010" detected?

YES >> Proceed to diagnosis procedure. Refer to <a href="BRC-139">BRC-139</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

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-171, "Exploded View".

NO >> Repair or replace the harnesses and connectors.

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## PARKING BRAKE SWITCH

Description INFOID:000000004231952

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:0000000004231953

## 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 >> Go to diagnosis procedure. Refer to <a href="BRC-140">BRC-140</a>, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004231954

## 1. CHECK PARKING BRAKE SWITCH

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

Parking brake switch			Condition	Continuity
Connector	Terminal		Condition	Continuity
E103	1	When the parking brake switch is operated.		Existed
L103		Ground	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-32, "Diagnosis Description".

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Check ABS actuator and electric unit (control unit). Refer to <u>BRC-93</u>, "CONSULT-III Function".

## Component Inspection

INFOID:0000000004231955

# 1. CHECK PARKING BRAKE SWITCH

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

## **PARKING BRAKE SWITCH**

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Parking brake switch			Condition	Continuity
Connector	Terminal	_	Condition	Continuity
E103 1		Ground	When the parking brake switch is operated.	Existed
L103	'	Giodila	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 <a href="PB-6">PB-6</a>, "Exploded View".

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## VDC OFF SWITCH

Description INFOID:000000004231956

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

## Component Function Check

INFOID:0000000004231957

## 1. 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

NO >> Go to diagnosis procedure. Refer to <a href="BRC-142">BRC-142</a>, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004231958

# 1. CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Continuity	
Terminal			
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.

NO >> VDC OFF switch is malfunctioning. Replace VDC OFF switch.

## 2. CHECK VDC OFF SWITCH HARNESS

- 1. Disconnect ABS actuator and electric unit (control unit) connector.
- Check continuity between VDC OFF switch connector terminals and ABS actuator and electric unit (control unit) connector terminal and/or ground.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector Terminal		
E36	5	M5	1	Existed

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	— Continuity	Continuity
E36	5	Ground	Not existed

VDC OFF switch			Continuity
Connector	Terminal	_	Continuity
M5	2	Ground	Existed

#### Is the inspection result normal?

## **VDC OFF SWITCH**

## < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:0000000004231959

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-32, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

## Component Inspection

# 1. CHECK VDC OFF SWITCH

1. Turn ignition switch OFF.

2. Disconnect VDC OFF switch connector.

3. Check continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Condition	
Terminal	Containon	Condition	
1 – 2	When VDC OFF switch is hold pressed.	Existed	
	When releasing VDC OFF switch.	Not existed	

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.

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[VDC/TCS/ABS]

## **ABS WARNING LAMP**

Description INFOID:000000004231960

×: 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:0000000004231961

## 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 >> Go to diagnosis procedure. Refer to <a href="BRC-144">BRC-144</a>. "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004231962

## 1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### 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-32, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

#### BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

### BRAKE WARNING LAMP

Description INFOID:0000000004231963

×: 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:0000000004231964

# 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.

>> Go to diagnosis procedure. Refer to <a href="BRC-145">BRC-145</a>, "Diagnosis Procedure". NO

# 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 <u>BRC-140</u>, "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 <a href="BRC-140">BRC-140</a>, "Diagnosis Procedure".

# 2.check self-diagnosis

Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### 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-32, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

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

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INFOID:0000000004231965

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[VDC/TCS/ABS]

### VDC OFF INDICATOR LAMP

Description INFOID:000000004231966

×: ON -: OFF

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.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

# Component Function Check

INFOID:0000000004231967

### 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?

YES >> GO TO 2.

NO >> Go to diagnosis procedure. Refer to <a href="BRC-146">BRC-146</a>, "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-142, "Diagnosis Procedure".

# Diagnosis Procedure

INFOID:0000000004231968

# 1. 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-142, "Diagnosis Procedure".

# 2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### 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 <a href="MWI-32">MWI-32</a>, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

### **SLIP INDICATOR LAMP**

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

### SLIP INDICATOR LAMP

Description INFOID:000000004231969

×: ON –: OFF

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Condition	SLIP indicator lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

# Component Function Check

INFOID:0000000004231970

# 1. CHECK SLIP INDICATOR 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 >> Go to diagnosis procedure. Refer to <a href="BRC-147">BRC-147</a>, "Diagnosis Procedure".

# Diagnosis Procedure

INFOID:0000000004231971

## 1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

#### 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 <a href="MWI-32">MWI-32</a>, "Diagnosis Description".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

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< ECU DIAGNOSIS > [VDC/TCS/ABS]

# **ECU DIAGNOSIS**

# 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.

		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		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
CTOD LAMB CW/	Chan lamp quitch signal status	When brake pedal is depressed	On
STOP LAMP 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	1st gear 2nd gear 3rd gear 4th gear 5th gear 6th gear	1 2 3 4 5 6
OEE SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On
OFF SW VDC OFF switch ON/OFF		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off
VAM DATE CEN	Vow rate detected by your rate concer	Vehicle stopped	Approx. 0 d/s
YAW RATE SEN	Yaw rate detected by yaw rate sensor	Vehicle turning	-100 to 100 d/s
		Vehicle stopped	−0.11 − +0.11 G
DECEL G-SEN	Decel G detected by decel G sensor	During acceleration	Negative value
		During deceleration	Positive value
ACCEL POS SIG	Throttle actuator opening/closing is displayed	Accelerator pedal not depressed (ignition switch is ON)	0 %
AUGEL PUS SIG	(linked with accelerator pedal)	Depress accelerator pedal (ignition switch is ON)	0 - 100 %

< ECU DIAGNOSIS > [VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
		Vehicle stopped	Approx. 0 m/s <sup>2</sup>
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value
		Vehicle turning left	
OTD ANOLE 010	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
ELLID LEV SW	Proke fluid level eviteb signal status	When brake fluid level switch ON	On
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	Off
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On
FR 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" with CONSULT-III)	On
FR 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" with CONSULT-III)	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" with CONSULT-III)	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" with CONSULT-III)	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" with CONSULT-III)	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" with CONSULT-III)	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
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On
RR 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

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< ECU DIAGNOSIS > [VDC/TCS/ABS]

Monitor item		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	On	
MOTOR NEED (	motor and motor rolay operation	When the motor relay and motor are not operating	Off	
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On	
ACTUATOR REI	Actuator relay operation	When the actuator relay is not operating	Off	
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	On	
ADO WARIA EARINI	(Note 2)	When ABS warning lamp is OFF	Off	
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On	
OIT LAWI	(Note 2)	When VDC OFF indicator lamp is OFF	Off	
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is ON	On	
OLII LAWII	(Note 2)	When SLIP indicator lamp is OFF	Off	
EBD SIGNAL	EBD operation	EBD is active	On	
LDD SIGNAL	LDD operation	EBD is inactive	Off	
ABS SIGNAL	ABS operation	ABS is active	On	
ADS SIGNAL	ABS operation	ABS is inactive	Off	
TCS SIGNAL	TCS aparation	TCS is active	On	
103 SIGNAL	TCS operation	TCS is inactive	Off	
VDC SIGNAL	VDC eneration	VDC is active	On	
VDC SIGNAL	VDC operation	VDC is inactive	Off	
EDD FAIL CIC	CDD fail acts aireal	In EBD fail-safe	On	
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	Off	
ABS FAIL SIG	ARC fail acts signal	In ABS fail-safe	On	
ADS FAIL SIG	ABS fail-safe signal	ABS is normal	Off	
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	On	
103 I AIL SIG	100 faii-sale signal	TCS is normal	Off	
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	On	
VDC FAIL SIG	VDC fall-sale signal	VDC is normal	Off	
CRANKING SIG	Crank operation	Crank is active	On	
CRAINING SIG	Ciank operation	Crank is inactive	Off	
N POSI SIG	N position signal	For N range	On	
N POSI SIG	N position signal	Except for N range	Off	
P POSI SIG	D position signal	For P range	On	
P POSI SIG	P position signal	Except for P range	Off	
D DOOL GIO	D assisting signal	For R range	On	
R POSI SIG	R position signal	Except for R range	Off	
	Axle condition	AUTO is active	AUTO	
4WD MODE MON		LOCK is active	LOCK	
		2WD is active	2WD	
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	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	

[VDC/TCS/ABS] < ECU DIAGNOSIS >

		Data monitor	Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation	- A
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On	В
CV2	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	С
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	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	D
		Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III)	On	Е
SV2	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	BR
STOP LAMP SW2	Stop lamp switch signal status	When brake pedal is depressed	On	- 1
STOP LAWIF SWZ	Stop lamp switch signal status	When brake pedal is not depressed	Off	G

#### NOTE:

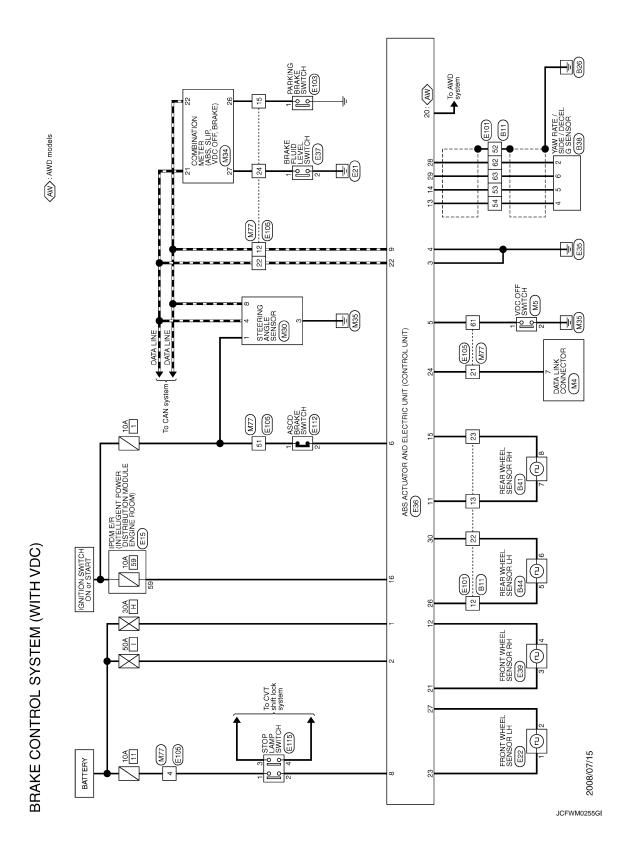
- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-144, "Description".
- Brake warning lamp: Refer to BRC-145, "Description".
- VDC OFF indicator lamp: Refer to BRC-146, "Description".
- SLIP indicator lamp: Refer to BRC-147, "Description".

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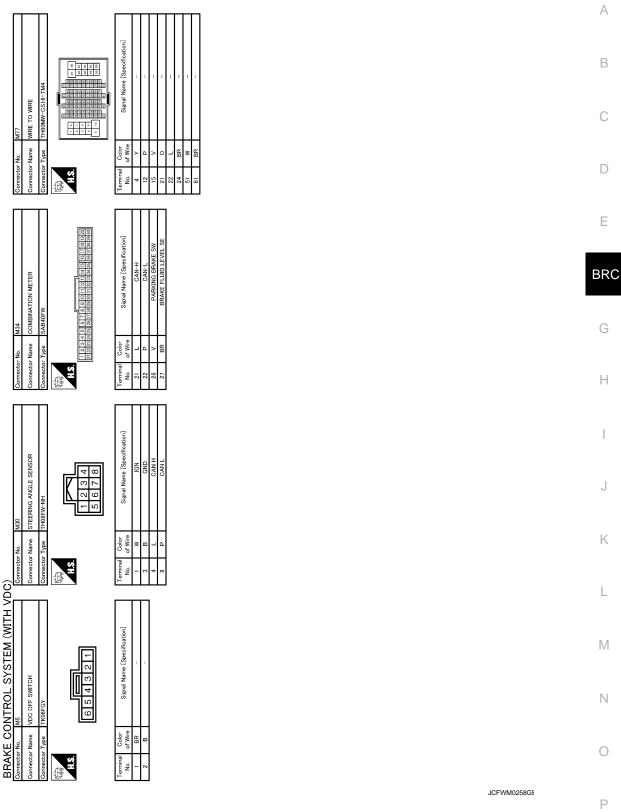
< ECU DIAGNOSIS > [VDC/TCS/ABS]

	[lu			А
SENSOR LH	Signal Name [Specification]	RR SENSOR SIG IGN HR SENSOR SIG IGN HR SENSOR VB CARL SENSOR VB DIAG K RL SENSOR VB FL SENSOR VB FL SENSOR VB G GND G SW2 RL SENSOR SIG G GND G SW2 RL SENSOR SIG		В
me REAR WHEEL SENSOR LH RROZEGY	Golor of Wine B R R	0 × × 6 8 8 × 6 × 6 × 8 × 8 × 8 × 6 × 6 ×		С
Connector No. Connector Name Connector Type H.S.	Terminal C of 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		D
	refreation]	ECTRIC UNIT		Е
B41 REAR WHEEL SENSOR RH RKGZFGY	Signal Name [Specification]	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) RHZBFB-NUA-DH  RHZBFB-NUA-DH  Signal Name [Specification]  Signal Name [Specification]  MOTOR  ACTR  GND A  STOP LAMS SW  STOP LAMS SW  CAN L  RR SENSOR VB  FR SENSOR VB  G OHE CK		BRC
or No. or Type	SB SB	Name Type Odlor Of Wire BR BB B		G
Connect Connect Connect H.S.	Terminal No. 7 7 8 8	Connector Connector Connector Connector Connector Terminal No. 1 2 2 3 3 4 4 5 6 6 6 6 11 11 12		Н
ECEL G SENSOR	Signal Name [Specification] GND VCC/PC/PE/NETS SER/ALL- SER/ALL-	HEEL SENSOR LH		I
888  VAW RATE / SIDE / DECEL G SENSOR  SCZ06FB  (123456	Signal Name Di NOV SER SER SER	FROMT WHEL SENSOR LH RROZMGY Signal Name [Speci		J
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SYSTEM (WITH VD	Signal Name [Specification]	(INTELLIGENT POWER TITON MODULE ENGINE ROOM)  SS		M
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BRAKE CONTROL Connector No. B11 Connector No. B11 Connector Type THEOMW-CS1	Terminal   Color	Connector Name Connector Name Connector Type Connector Type Connector Type Connector Type Connector Type Connector Type Connector No. Or Wire S9  BR		0
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BRAKE CONTROL SYSTEM (WITH VD	00)		
Connector No. E37	Connector No. E39	Connector No. E101	Connector No. E103
Connector Name BRAKE FLUID LEVEL SWITCH	Connector Name FRONT WHEEL SENSOR RH	Connector Name WIRE TO WIRE	Connector Name PARKING BRAKE SWITCH
Connector Type YV02FGY	Connector Type RK02MGY	Connector Type TH80FW-CS16-TM4	Connector Type P01FB-A
#SH	都 HS.	H.S.	H.S.
<b>₽</b>	(34)	# 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Terminal Color Signal Name [Specification]	Terminal Color Signal Name [Specification]	Terminal   Color   Signal Name [Specification]   No.   of Wire   Signal Name [Specification]	Terminal Color Signal Name [Specification]
+	9 0	7	
- g 7	±	22 G	
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		52 SHIELD –	
		+	
		54 B	
		<u> </u>	
		63 R -	
Connector No. E105	Connector No. E112	Connector No. E115	Connector No. M4
Connector Name WIRE TO WIRE	Connector Name ASCD BRAKE SWITCH	Connector Name STOP LAMP SWITCH	Connector Name DATA LINK CONNECTOR
Connector Type TH80FW-CS16-TM4	Connector Type M02FBR-LC	Connector Type M04FW-LC	Connector Type BD16FW
	E	唇	•
	H.S.	18.	10 11 12 13 14 15
	<b>=</b>	1 2	12345678
Terminal Color Signal Name [Specification]	Terminal Color No. of Wire Signal Name [Specification]	Terminal   Color   Signal Name [Specification]   No.   of Wire	Terminal   Color   Signal Name [Specification]   No.   of Wire
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54 FG =			
BR			

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< ECU DIAGNOSIS > [VDC/TCS/ABS]



# Fail-Safe

#### ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

< ECU DIAGNOSIS > [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 OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

If the Fail-Safe function is activated, then perform self-diagnosis for VDC/TCS/ABS control system.

DTC Index

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	BRC-98, "DTC Logic"
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	DDC 404 UDTC Lawiell
C1107	FR RH SENSOR-2	BRC-101, "DTC Logic"
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-104, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-106, "DTC Logic"
C1111	PUMP MOTOR	BRC-107, "DTC Logic"
C1113	G SENSOR	BRC-109, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-112, "DTC Logic"
C1116	STOP LAMP SW	BRC-115, "DTC Logic"
C1118	4WD SYSTEM	BRC-117, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-118, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-121, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-118, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-121, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-118, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-121, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-118, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-121, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-124, "DTC Logic"
C1140	ACTUATOR RLY	BRC-125, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	PDC 127 "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-127, "DTC Logic"
C1145	YAW RATE SENSOR	PDC 400 "DTC   acia"
C1146	SIDE G-SEN CIRCUIT	BRC-109, "DTC Logic"
C1155	BR FLUID LEVEL LOW	BRC-129, "DTC Logic"
C1164	CV1	DDC 422 "DTC   acia"
C1165	CV2	BRC-132, "DTC Logic"

< ECU DIAGNOSIS > [VDC/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference	
C1166	SV1	BBC-134 "DTC Logic"	
C1167	SV2	BRC-134, "DTC Logic"	
C1176	STOP LAMP SW2	BRC-136, "DTC Logic"	
U1000	CAN COMM CIRCUIT	BRC-138, "DTC Logic"	
U1010	CONTROL UNIT(CAN)	BRC-139, "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:0000000004231976

### 1. CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-47, "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-8, "Inspection".
- AWD models: Refer to FAX-32, "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 malfunctioning components.

# 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.

NO >> Normal

**UNEXPECTED PEDAL REACTION** [VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > **UNEXPECTED PEDAL REACTION** Α Diagnosis Procedure INFOID:0000000004231977 1. CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-9, "Inspection and Adjustment". Is the stroke too large? YES >> • Bleed air from brake tube and hose. Refer to BR-13, "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-9, "Inspection and Adjustment". D - Master cylinder: Refer to BR-14, "Inspection". - Brake booster: Refer to BR-15, "Inspection". NO >> GO TO 2. Е 2. CHECK FUNCTION Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is BRC normal in this condition. Connect connector after inspection. Is the inspection result normal? YES >> Normal NO >> Check brake system. Н

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Revision: 2008 August BRC-159 2009 Rogue

### THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

# THE BRAKING DISTANCE IS LONG

# Diagnosis Procedure

INFOID:0000000004231978

#### **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 ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect 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

#### **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.

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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:0000000004231980

#### **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.

# 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 VDC/TCS/ABS CONTROL

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > VEHICLE JERKS DURING VDC/TCS/ABS CONTROL Α Diagnosis Procedure INFOID:0000000004231981 1.SYMPTOM CHECK В 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 D Perform self-diagnostic of ABS actuator and electric unit (control unit). Are self-diagnosis results indicated? YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3. 3. CHECK CONNECTOR **BRC**  Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc. Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis. Are self-diagnosis results indicated? YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. Н NO >> GO TO 4. 4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS Perform ECM self-diagnosis and TCM self-diagnosis. Are self-diagnosis results indicated? YES >> Check the corresponding items. ECM - For CALIFORNIA: Refer to EC-92, "Diagnosis Description". - For USA (FEDERAL) and CANADA: Refer to EC-563, "Diagnosis Description". - For MEXICO: Refer to EC-990, "Diagnosis Description". K TCM: Refer to TM-42, "Diagnosis Description". NO >> Replace ABS actuator and electric unit (control unit). L M N Р

[VDC/TCS/ABS]

# NORMAL OPERATING CONDITION

Description INFOID:0000000004231982

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.	TOO OF A DO GOLLAGION.	
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 places the highest priority on the optimum traction (stability).	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.		
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator 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, VDC OFF indicator lamp, and SLIP indicator 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 OFF indicator 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.)	

[VDC/TCS/ABS] < PRECAUTION >

# **PRECAUTION**

# **PRECAUTIONS** FOR USA AND CANADA

FOR USA AND CANADA: Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" INFOID:0000000004554007

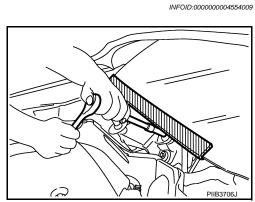
The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air 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 AIRBAG" and "SEAT BELT" of this Service Manual.

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the "SRS AIRBAG".
- 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.

FOR USA AND CANADA: 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.



FOR USA AND CANADA: Precaution for Brake System

**WARNING:** 

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

- Only use "DOT 3" brake fluid. Refer to MA-17, "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.
- Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).

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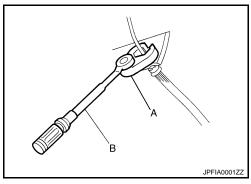
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#### **PRECAUTIONS**

< PRECAUTION > [VDC/TCS/ABS]

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- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



### FOR USA AND CANADA: Precaution for Brake Control

INFOID:0000000004231986

- 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.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator 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.

### FOR MEXICO

# FOR MEXICO: 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 AIRBAG" and "SEAT BELT" of this Service Manual.

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the "SRS AIRBAG".
- Do not 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.

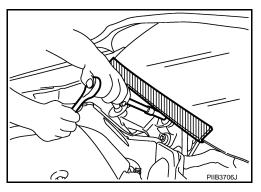
#### **PRECAUTIONS**

< PRECAUTION > [VDC/TCS/ABS]

# FOR MEXICO: 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.



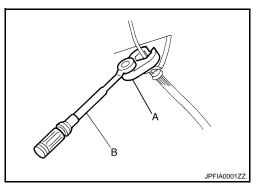
FOR MEXICO: Precaution for Brake System

INFOID:0000000004231989

#### **WARNING:**

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

- Only use "DOT 3" brake fluid. Refer to MA-18, "FOR MEXICO: 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.
- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



# FOR MEXICO: 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.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator 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.

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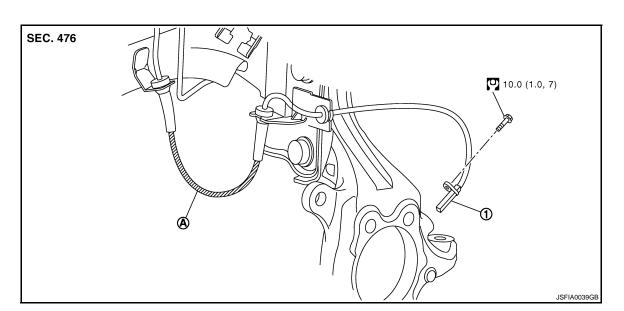
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# ON-VEHICLE REPAIR

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

#### 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

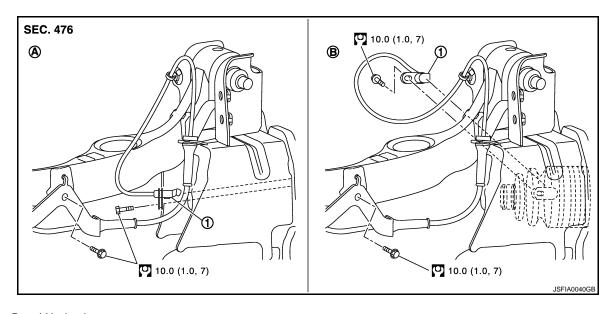
Pay attention to the following when installing wheel sensor. Tighten installation bolts to the specified torques.

- 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:0000000004231993



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

< ON-VEHICLE REPAIR > [VDC/TCS/ABS]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR: Exploded View

INFOID:0000000004231995

Refer to FAX-10, "Exploded View" (2WD models), FAX-34, "Exploded View" (AWD models).

FRONT SENSOR ROTOR: Removal and Installation

INFOID:0000000004231996

#### **REMOVAL**

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to <u>FAX-10</u>, "Removal and Installation" (2WD models), <u>FAX-34</u>, "Removal and Installation" (AWD models).

#### INSTALLATION

Sensor rotor cannot be disassembled. Installation the sensor rotor together with hub bearing assembly. Refer to <u>FAX-34</u>, "Removal and Installation" (2WD models), <u>FAX-34</u>, "Removal and Installation" (AWD models).

REAR SENSOR ROTOR

REAR SENSOR ROTOR: Exploded View

INFOID:0000000004231997

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

REAR SENSOR ROTOR: Removal and Installation

INFOID:0000000004231998

#### **2WD MODELS**

Removal

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

Installation

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

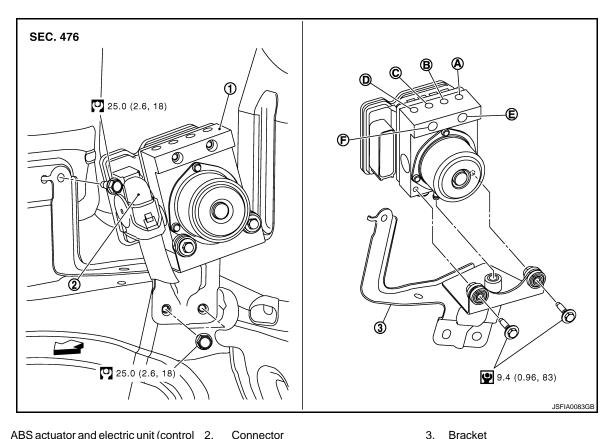
#### AWD MODELS

For removal and installation of sensor rotor, refer to RAX-16, "Disassembly and Assembly".

[VDC/TCS/ABS] < ON-VEHICLE REPAIR >

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

**Exploded View** INFOID:0000000004231999



- ABS actuator and electric unit (control 2. 1. unit)
- To Rear LH brake caliper

To front RH brake caliper

To front LH brake caliper

- To rear RH brake caliper From master cylinder primary side
- 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.

В.

- 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-13, "Bleeding Brake System".
- Remove cowl top. Refer to EXT-20, "Exploded View". 1.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- Remove tire (front LH side).
- Remove fender protector (rear): (front LH side). Refer to <u>EXT-22, "Exploded View"</u>.
- Remove ABS actuator and electric unit (control unit) bracket mounting nut. 6.
- Remove ABS actuator and electric unit (control unit) from vehicle. 7.

#### INSTALLATION

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< ON-VEHICLE REPAIR > [VDC/TCS/ABS]

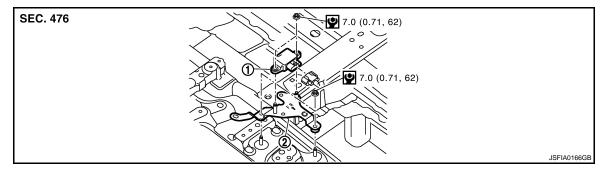
Note the following, and install in the reverse order of removal.

- 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-13, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.

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# **G** SENSOR

**Exploded View** INFOID:0000000004232001



1. yaw rate/side/decel G sensor

**Bracket** 

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

### Removal and Installation

# **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 IP-20, "Exploded View".
- Disconnect yaw rate/side/decel G sensor harness connector. 2.
- 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.

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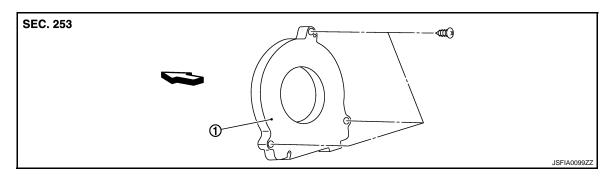
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[VDC/TCS/ABS]

# 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 <u>SR-8</u>, "<u>Exploded View</u>" (for USA and Canada), <u>SR-27</u>, "<u>Exploded View</u>" (for Mexico).
- 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 <a href="BRC-75">BRC-75</a>. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".