# SECTION BRAKE CONTROL SYSTEM

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BASIC INSPECTION	
DIAGNOSIS AND REPAIR WORKFLOW	А
Work Flow	В
1.COLLECT INFORMATION FROM THE CUSTOMER	
Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-8</u> , " <u>Diagnostic Work Sheet</u> ".	С
>> GO TO 2. 2.PERFORM SELF DIAGNOSTIC RESULT	D
Perform self diagnostic result. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u> .	F
Are any DTCs displayed?	E
YES >> Refer to <u>BRC-45, "DTC No. Index"</u> . NO >> GO TO 3.	
3. CHECK SYMPTOM OPERATING CONDITION	BR(
Check that the symptom is a normal operating condition. Refer to <u>BRC-60, "Description"</u> .	0
<u>Is the symptom a normal operating condition?</u> YES >> Inspection End. NO >> GO TO 4.	G
4. CHECK WARNING LAMPS OPERATION	Η
Check warning lamps operation. <ul> <li>ABS warning lamp: Refer to <u>BRC-42, "Description"</u>.</li> <li>brake warning lamp: Refer to <u>BRC-43, "Description"</u>.</li> </ul>	I
Is ON/OFF timing normal?	
<ul> <li>YES &gt;&gt; GO TO 5.</li> <li>NO &gt;&gt; Perform warning lamp diagnosis. Refer to <u>BRC-42, "Component Function Check"</u> (ABS warning lamp) or <u>BRC-43, "Component Function Check"</u> (brake warning lamp).</li> </ul>	J
5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM	Κ
Perform diagnosis applicable to the symptom. Refer to <u>BRC-54, "Symptom Table"</u> .	
>> GO TO 6.	L
6.FINAL CHECK	
Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to <u>BRC-15. "CONSULT Function (ABS)"</u> .	M
>> Inspection End.	Ν
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# DIAGNOSIS AND REPAIR WORKFLOW

# < BASIC INSPECTION >

# **Diagnostic Work Sheet**

Applying brake conditions

Other conditions

□ Suddenly □ Gradually

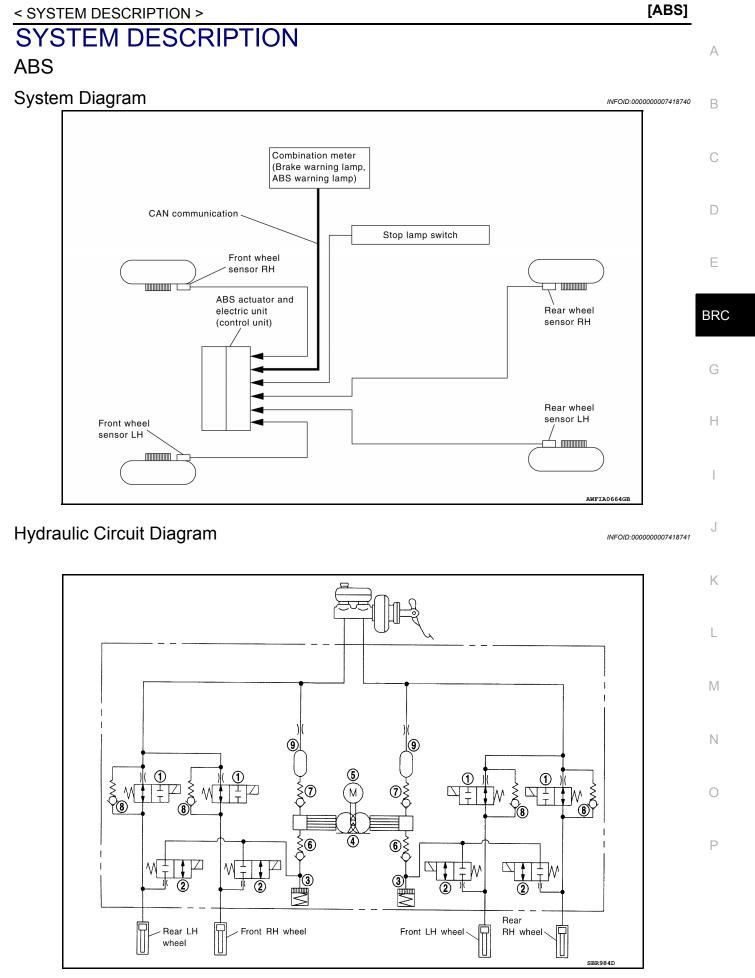
Operation of electrical equipment
 Shift change
 Other descriptions

INFOID:000000007418739

[ABS]

Customer name MR/MS	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Dat	e
Symptoms	<ul> <li>□ Noise and vibration (from engine compartment)</li> <li>□ Noise and vibration (from axle)</li> </ul>	Warning / Indicator activate		<ul> <li>Firm pedal operation</li> <li>Large stroke pedal</li> <li>operation</li> </ul>
	ABS does not work (Wheels lock when braking)	ABS does not work (wheels slip when braking)		Lack of sense of acceleration
Engine conditions	When starting After starting			
Road conditions	□ Low friction road (□Snow □Grav □ Bumps / potholes	rel □Other )		
Driving conditions	Full-acceleration     High speed cornering     Vehicle speed: Greater than 10 km     Vehicle speed: 10 km/h (6 MPH) or     Vehicle is stopped			

LFIA0176E



ABS

2012 Altima GCC

1. Inlet solenoid valve

System Description

- 4. Pump
- 7. Outlet valve

- 2. Outlet solenoid valve
- 5. Motor
- 8. Bypass check valve
- 3. Reservoir
- 6. Inlet valve
- 9. Damper

[ABS]

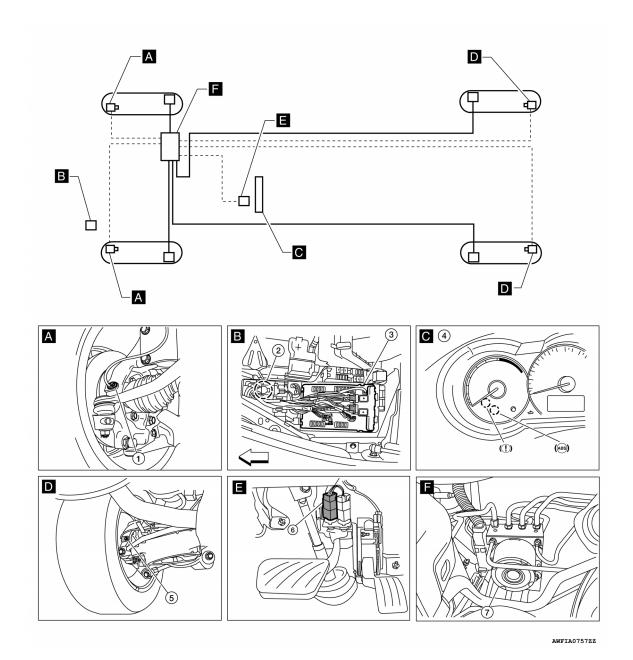
- INFOID:000000007418742
- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.

ABS

• Electrical system diagnosis by CONSULT is available.

# **Component Parts Location**

INFOID:000000007418743



1. Front wheel sensor LH E19 Front wheel sensor RH E41 2. Stop lamp relay-1 E57

3. IPDM E/R

- 4. Combination meter M24
- 5. Rear wheel sensor LH C2 Rear wheel sensor RH C3

ABS

7. ABS actuator and electric unit (control unit) E26

# **Component Description**

sor LH C2 6. sor RH C3 [ABS]

Stop lamp switch E38

INFOID:000000007418744

Component parts		Reference	С
	Pump	BRC-27, "Description"	-
ABS actuator and electric unit (control unit)	Motor		D
	Actuator relay (Main relay)	BRC-29, "Description"	
	Solenoid valve	BRC-34, "Description"	_
Wheel sensor		BRC-18, "Description"	E
Stop lamp switch		BRC-39, "Description"	
ABS warning lamp		BRC-42, "Description"	DDC
Brake warning lamp		BRC-43, "Description"	- BRC

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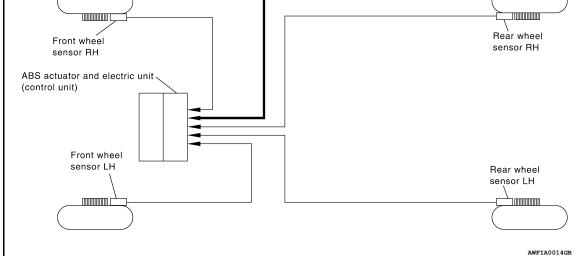
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# EBD

INFOID:000000007418745

System Diagram



# System Description

INFOID:000000007418746

Electric Brake force Distribution functions as follows:

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

# **Component Parts Location**

INFOID:000000007418747

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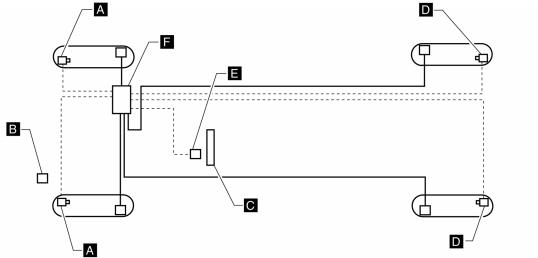
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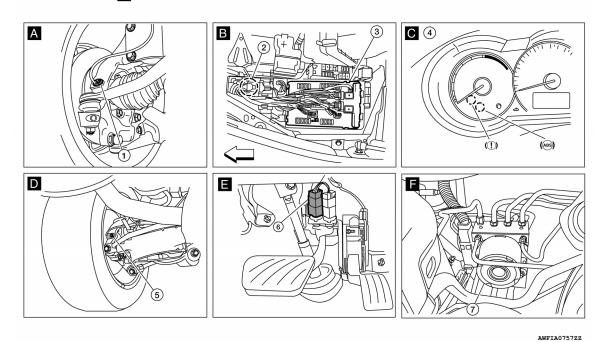
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EBD



- 1. Front wheel sensor LH E19 Front wheel sensor RH E41
- 4. Combination meter M24
- 7. ABS actuator and electric unit (control unit) E26

# **Component Description**

- 2. Stop lamp relay-1 E57
- 5. Rear wheel sensor LH C2 Rear wheel sensor RH C3
- 3. IPDM E/R
- 6. Stop lamp switch E38

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INFOID:000000007418748

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Component parts		Reference
	Pump	BRC-27, "Description"
ABS actuator and electric unit (control unit)	Motor	bite-27, Description
	Actuator relay (Main relay)	BRC-29, "Description"
	Solenoid valve	BRC-34, "Description"

## 2012 Altima GCC

[ABS]
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Component parts	Reference
Wheel sensor	BRC-18, "Description"
Stop lamp switch	BRC-39, "Description"
ABS warning lamp	BRC-42, "Description"
Brake warning lamp	BRC-43, "Description"

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

< SYSTEM DESCRIPTION >

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

# CONSULT Function (ABS)

INFOID:000000007418749

[ABS]

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# FUNCTION

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

Diagnostic test mode	Function	
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT.	
Self-diagnostic 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 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.	-
Function test	Performed by CONSULT instead of a technician to determine whether each system is "OK" or "NG".	•
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	•

## SELF DIAGNOSTIC RESULT

**Operation Procedure** 

- 1. Turn ignition switch OFF.
- 2. Connect CONSULT to data link connector.
- 3. Turn ignition switch ON.
- 4. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 5. After stopping vehicle, with the engine running, touch "ABS", "SELF-DIAG RESULTS" in order on the CONSULT screen.
- 6. The self-diagnostic results are displayed.
  - Check ABS warning lamp. If "NO FAILURE" is displayed. Refer to <u>BRC-42, "Component Function</u> <u>Check"</u>.
- 7. Perform the appropriate inspection from display item list, and repair or replace the malfunctioning component. Refer to "Display Item List".
- 8. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute. CAUTION:

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 driven at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

#### **Erase Memory**

- 1. Turn ignition switch OFF.
- Start engine and touch "ABS", "SELF-DIAG RESULTS", "ERASE MEMORY" in order on the CONSULT screen to erase the diagnostic memory. If "ABS" is not indicated, go to <u>GI-50. "Description"</u>. CAUTION:

# If the diagnostic memory is not erased, re-perform the operation from step 4.

- 3. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
- 4. 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.

#### NOTE:

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 <u>BRC-45, "DTC No. Index"</u>.

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

#### < SYSTEM DESCRIPTION >

[ABS]

# DATA MONITOR

Display Item List

#### 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.

Item	Data n		ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor sig- nal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor sig- nal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) is displayed.
FR RH IN SOL (ON/OFF)	_	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	_	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	—	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	_	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	_	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	_	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	_	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	_	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.

×: Applicable

-: Not applicable

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.

#### ACTIVE TEST

#### **CAUTION:**

- Do not 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.

**Operation Procedure** 

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

#### < SYSTEM DESCRIPTION >

[ABS]

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#### NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is A 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, touch "BACK" to restart the process.

#### Solenoid Valve

#### NOTE:

- The example shown is for front right wheel. The procedure for the other wheels is the same as given below.
- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item.
  For ABS solenoid valve, touch "UP", "KEEP", and "DOWN" on the display screen. For ABS solenoid valve (ACT), touch "UP", "ACT KEEP" and confirm that solenoid valves (IN, OUT) operate as shown in the table below.

Operation	AB	S solenoid va	alve	ABS	solenoid valve	e (ACT)	E
(Note)	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP	
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	BRC
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	DRC

\*: ON for 1 to 2 seconds after the touch, and then OFF

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.

#### ABS Motor

Touch "ON" and "OFF" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

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

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

## < DTC/CIRCUIT DIAGNOSIS >

# DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

# Description

INFOID:000000007418750

[ABS]

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:000000007418751

# 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 when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

# DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

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

2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

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

NO >> Inspection End.

**Diagnosis** Procedure

INFOID:000000007418752

Regarding Wiring Diagram information, refer to <u>BRC-47, "Wiring Diagram - ABS"</u>.

# CAUTION:

#### Do not check between wheel sensor terminals.

**1**.CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
- 2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.
  - NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

 Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. NOTE:

	DIAGNOSIS >				[ABS
If the red SE retest.	ENSOR indicator illu	iminates but does	not flash, reverse	the polarity of the	e tester leads an
	tive wheel sensor to	ester detect a signa	?		
YES >> GO T					
	ace wheel sensor. F	Refer to <u>BRC-64, "</u> ₽	Removal and Insta	llation".	
<b>3.</b> CHECK TIRE					
•	re, wear and size.				
•	wear and size withi	<u>n standard?</u>			
YES >> GO T NO >> • Ad	IO 4 just air pressure, or	replace tire			
-	rform the self-diagn		e that the result sl	hows "NO DTC IS	DETECTED".
<b>1.</b> CHECK WHE	EL BEARINGS				
Check wheel bea	iring axial end play.	Refer to <u>F</u> AX-6, "Ins	spection" (front) or	RAX-6, "On-vehic	le Service" (rear)
s the inspection	•		、 ,		
YES >> GO T					
	air or replace as ne		FAX-8, "Remova	I and Installation"	(front) or <u>RAX-7</u>
	noval and Installatio	. ,			
Check continuity	between wheel sen	sor connector term	inals and ground.		
Wheel sensor	connector terminal	Grou	Ind	Cont	linuity
	1				lineity
	2		—		lo
the inspection	result normal?				
	TO 6				
YES >> GO T NO >> Repa	air the circuit.				
YES >> GO T NO >> Repa					
YES >> GO NO >> Repa CHECK WIRII	air the circuit. NG HARNESS FOR between ABS actua		t (control unit) cor	nector and the ma	Ilfunctioning whee
YES >> GO NO >> Repa	air the circuit. NG HARNESS FOR between ABS actua		t (control unit) cor	nector and the ma	Ilfunctioning whe
YES >> GO NO >> Repa <b>6.</b> CHECK WIRII	air the circuit. NG HARNESS FOR between ABS actua r.	ator and electric unit			
YES >> GO NO >> Repa	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele	ator and electric unit	Wheel	sensor	Ilfunctioning whe
YES >> GO NO >> Repa CHECK WIRII Check continuity sensor connector	air the circuit. NG HARNESS FOR between ABS actua r.	ator and electric unit ctric unit (control unit) Terminal		sensor Terminal	
YES >> GO NO >> Repa CHECK WIRII heck continuity ensor connector Wheel sensor	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele	ator and electric unit ctric unit (control unit) Terminal 16	Wheel	sensor Terminal 1	
YES >> GO NO >> Repa CHECK WIRII heck continuity ensor connector Wheel sensor	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele	ator and electric unit ctric unit (control unit) Terminal 16 5	Wheel Connector	sensor Terminal 1 2	
YES >> GO NO >> Repa CHECK WIRII heck continuity ensor connector Wheel sensor	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele	ator and electric unit ctric unit (control unit) Terminal 16 5 9	Wheel Connector	sensor Terminal 1 2 1	Continuity
YES >> GO NO >> Repa CHECK WIRII check continuity ensor connector Wheel sensor	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele	ator and electric unit ctric unit (control unit) Terminal 16 5 9 10	Wheel Connector E19	sensor Terminal 1 2 1 1 2	
YES >> GO NO >> Repa CHECK WIRII Check continuity ensor connector Wheel sensor Front LH	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele Connector	ator and electric unit ectric unit (control unit) Terminal 16 5 9 10 6	Wheel Connector E19	sensor Terminal 1 2 1 2 1 2 1	Continuity
YES >> GO NO >> Repa CHECK WIRII Check continuity ensor connector	air the circuit. NG HARNESS FOR between ABS actua r. ABS actuator and ele Connector	ator and electric unit ctric unit (control unit) Terminal 16 5 9 10	Wheel Connector E19 E41	sensor Terminal 1 2 1 1 2	Continuity

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> P tion".

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NO >> Repair the circuit.

Component	Inspection
-----------	------------

**1.**CHECK DATA MONITOR

2

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

#### < DTC/CIRCUIT DIAGNOSIS >

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", 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 <u>BRC-18. "Diagnosis Procedure"</u>.

[ABS]

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

#### < DTC/CIRCUIT DIAGNOSIS >

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

# Description

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:000000007418755

INFOID:000000007418754

# DTC DETECTION LOGIC

DTC	Display	Condition	Possible Cause	D
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-cir- cuited, or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.		Е
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-cir- cuited, or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>	BRO
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-cir- cuited, or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	<ul> <li>ABS actuator and electric unit (control unit)</li> </ul>	G
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-cir- cuited, or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.		Н

#### DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

(B)With CONSULT.

- Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
   Perform self diagnostic result.
- Is DTC C1105, C1106, C1107 or C1108 detected?
- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-21, "Diagnosis Procedure"</u>. NO >> Inspection End.

# Diagnosis Procedure

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

#### CAUTION:

#### Do not check between wheel sensor terminals.

- **1.**CONNECTOR INSPECTION
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.

2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

# **2.**CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.

- 2. Turn on the ABS active wheel sensor tester power switch.
- NOTE:

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INFOID:000000007418756

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

#### < DTC/CIRCUIT DIAGNOSIS >

[ABS]

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-64, "Removal and Installation"</u>.

**3.**CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4

NO >> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

## **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6</u>, "Inspection" (front) or <u>RAX-6</u>, "On-vehicle Service" (rear). Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, <u>"Removal and Installation"</u> (rear).

**5.**CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1		No
2		

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

**6.**CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

	ABS actuator and electric unit (control unit) Wheel sensor		Continuity		
Wheel sensor	Connector	Terminal	Connector	Terminal	
		16	E19	1	
Front LH	5	E19 -	2		
Front RH	E26	9	E41	1	
		10		2	Yes
Rear LH		6	C2	1	
		17	02	2	
Rear RH	8	C3 -	1		
		19	05	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> tion".

NO >> Repair the circuit.

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

# < DTC/CIRCUIT DIAGNOSIS >

# Component Inspection

[ABS]

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INFOID:000000007418757

# 1.CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", 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 norm	al?	
YES >> Inspection End.		
NO >> Go to diagnosis	procedure. Refer to <u>BRC-21, "Diagnosis Procedure"</u> .	
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# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

# < DTC/CIRCUIT DIAGNOSIS >

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

# Description

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

# DTC Logic

INFOID:000000007418759

INFOID:000000007418758

[ABS]

# 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 voltage is lower than normal.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> </ul>

# DTC CONFIRMATION PROCEDURE

# **1.**CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC C1109 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-24, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

# Diagnosis Procedure

INFOID:000000007418760

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u>.

#### Is DTC 1109 detected?

YES >> GO TO 2

NO >> Poor connection of connector terminals. 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.
- 4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

	and electric unit ol unit)	Ground	Condition	Voltage (Approx)
Connector	Terminal			(Αρριολ)
E26	10		Ignition switch ON	Battery voltage
E26 18	10	—	Ignition switch OFF	0V

5. Turn ignition switch OFF.

6. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminals 1, 4 and ground.

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

# < DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		Ground Continuity		А
Connector	Terminal	Glound	Continuity	
E26	1		Yes	B
	4	—	105	D

Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunc- C tioning parts.

NO >> Repair or replace malfunctioning components.

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# DTC C1110 CONTROL FAILURE

# < DTC/CIRCUIT DIAGNOSIS >

# DTC C1110 CONTROL FAILURE

# DTC Logic

INFOID:000000007418761

[ABS]

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

# DTC CONFIRMATION PROCEDURE

# 1. CHECK SELF DIAGNOSTIC RESULT

#### (B) With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC C1110 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-26, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

# **Diagnosis** Procedure

INFOID:000000007418762

# **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 that applicable.

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67. "Removal and Installa-</u> tion".

# DTC C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

# DTC C1111 PUMP MOTOR

# Description

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

MOTOR

PUMP

С 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	E
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.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit</li> </ul>	BF
Unn		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)	G
TC CC	NFIRMATION PROCE	DURE		
.CHEC	K SELF DIAGNOSTIC R	RESULT		ŀ
	ONSULT.			
	the ignition switch OFF to orm self diagnostic result.			
	1111 detected?			
	>> Proceed to diagnosis>> Inspection End.	procedure. Refer to <u>BRC-27, "Diagnosis Proced</u>	<u>ure"</u> .	J
iagno	sis Procedure		INFOID:00000007418765	
iagno	sis Procedure		INFOID:000000007418765	ŀ
U		ation, refer to <u>BRC-47, "Wiring Diagram - ABS"</u> .	INFOID:000000007418765	k
U		ation, refer to <u>BRC-47, "Wiring Diagram - ABS"</u> .	INFOID:000000007418765	k
legardir		ation, refer to <u>BRC-47, "Wiring Diagram - ABS"</u> .	INFOID:00000007418765	K
egardir .CONI	ig Wiring Diagram informa		INFOID:00000007418765	ŀ L
CONN	NECTOR INSPECTION Ignition switch OFF. Igniction solution and Igniction solution and Ignict ABS actuator and Ignict for deformation and the solution and the so	ation, refer to <u>BRC-47, "Wiring Diagram - ABS"</u> . electric unit (control unit) connector. ion, disconnection, looseness, and so on. If any		L
egardir .CONN . Turn . Disc . Cheo or re	NECTOR INSPECTION Ignition switch OFF. onnect ABS actuator and ck terminals for deformati place terminals.	electric unit (control unit) connector.	malfunction is found, repair	L
CONI CONI Turn Disc Chec or re Reco	NECTOR INSPECTION Ignition switch OFF. onnect ABS actuator and ck terminals for deformati place terminals.	electric unit (control unit) connector. on, disconnection, looseness, and so on. If any	malfunction is found, repair	L
CONN . Turn . Disc . Cheo or re . Reco <u>. DTC C</u> YES	NECTOR INSPECTION Ignition switch OFF. Ignition switch OFF. Ignition solution and onnect ABS actuator and tk terminals for deformati place terminals. Ignition and per Solution and per Solution and per Solution and per Solution and per	electric unit (control unit) connector. on, disconnection, looseness, and so on. If any form self-diagnosis. Refer to <u>BRC-15, "CONSUL</u>	malfunction is found, repair	L
CONN . Turn . Disc . Chec or re . Reco <u>s DTC C</u> YES NO	Ig Wiring Diagram information NECTOR INSPECTION ignition switch OFF. onnect ABS actuator and ck terminals for deformation place terminals. onnect connector and per connect connector and per connector and	electric unit (control unit) connector. ion, disconnection, looseness, and so on. If any form self-diagnosis. Refer to <u>BRC-15, "CONSUL</u> onnector terminals. Repair or replace connector.	malfunction is found, repair	L
CONN CONN Turn Disc Chec or re Reco SDTC C YES NO CHE	Ig Wiring Diagram information NECTOR INSPECTION ignition switch OFF. onnect ABS actuator and ck terminals for deformation place terminals. onnect connector and per 21111 detected? >> GO TO 2 >> Poor connection of co CK ABS MOTOR AND M	electric unit (control unit) connector. on, disconnection, looseness, and so on. If any form self-diagnosis. Refer to <u>BRC-15, "CONSUL</u>	malfunction is found, repair	
egardir CONI Turn Disc Or re Chec or re DIC C YES NO CHE Turn Disc	Ig Wiring Diagram information NECTOR INSPECTION ignition switch OFF. onnect ABS actuator and ck terminals for deformation place terminals. onnect connector and per called the state of the state interval of the state of the sta	electric unit (control unit) connector. ion, disconnection, looseness, and so on. If any form self-diagnosis. Refer to <u>BRC-15, "CONSUL</u> onnector terminals. Repair or replace connector.	malfunction is found, repair . <u>T Function (ABS)"</u> .	ן און 1

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# DTC C1111 PUMP MOTOR

# < DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Glound	(Approx)	
E26	2	_	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminals 1, 4 and ground.

ABS actuator and electric unit (control unit)		Cround	Continuity
Connector	Terminal	Ground	Continuity
E26	1		Yes
	4	—	105

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace malfunctioning components.

# **Component Inspection**

INFOID:000000007418766

# **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

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

#### Is the inspection result normal?

YES >> Inspection End.

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

# DTC C1114 MAIN RELAY

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1114 MAIN RELAY

# Description

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

# DTC Logic

INFOID:000000007418768

INFOID:000000007418767

# DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1114	MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for th relay is shorted to the ground.		Е
01114		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for relay is open.	e (control unit)	BRC
DTC CC	NFIRMATION PROCE	DURE		BRO
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT		
	CONSULT.			G
	<ul> <li>the ignition switch OFF to orm self diagnostic result.</li> </ul>	ON.		
	C1114 detected?			Н
		procedure. Refer to <u>BRC-29, "Diagnosis Pro</u>	cedure".	
NO	>> Inspection End.			
Diagno	sis Procedure		INFOID:000000007418769	
				J
Regardir	ng Wiring Diagram informa	tion, refer to <u>BRC-47, "Wiring Diagram - AB</u>	<u>S"</u> .	
4				К
1.CON	NECTOR INSPECTION			
	ignition switch OFF.	electric unit (control unit) connector.		I
3. Che	ck terminals for deformation	on, disconnection, looseness, and so on. If	any malfunction is found, repair	L
	place terminals.	orm self-diagnosis. Refer to <u>BRC-15, "CON</u>	SULT Function (ABS)"	
	spection result normal?			Μ
	>> Inspection End.			
	>> GO TO 2			Ν
		JATOR RELAY POWER SUPPLY CIRCUIT		
2. Disc		electric unit (control unit) connector. ctuator and electric unit (control unit) conne	ctor E26 terminal 3 and ground.	0
	-		-	
ABS actu	ator and electric unit (control un	t) Ground	Voltage	Ρ

ABS actuator and electric unit (control unit)		Ground	Voltage	Ρ
Connector	Terminal	Ground	(Approx)	
E26	3		Battery voltage	

#### Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

[ABS]

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# DTC C1114 MAIN RELAY

#### < DTC/CIRCUIT DIAGNOSIS >

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal	Ground	Continuity
E26	1		Yes
E20	4	—	165

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> tion".

NO >> Repair or replace malfunctioning components.

#### **Component Inspection**

INFOID:000000007418770

# **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

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

#### Is the inspection result normal?

YES >> Inspection End.

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

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

# Description

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

# **DTC Logic**

INFOID:000000007418772

INFOID:000000007418771

# DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	<ul> <li>Harness or connector</li> <li>Wheel sensor</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
DTC CC	NFIRMATION PROCEI	DURE	
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT	1
1. Start 2. Perfe <u>Is DTC C</u> YES	orm self diagnostic result. <u>21115 detected?</u> >> Proceed to diagnosis p	at approx. 30 km/h (19 MPH) or more for appro procedure. Refer to <u>BRC-31, "Diagnosis Proce</u>	
	>> Inspection End.		
Diagno	sis Procedure		INFOID:000000007418773
CAUTIO Do not c	N: heck between wheel ser	tion, refer to <u>BRC-47, "Wiring Diagram - ABS"</u> . <b>nsor terminals.</b>	
1.CON	NECTOR INSPECTION		
code 2. Che	<b>)</b> .	electric unit (control unit) connector and whe	eel sensor of malfunctioning
YES	>> GO TO 2		
-	>> Repair or replace as n	•	
	CK WHEEL SENSOR OUT		·····
	on the ABS active wheel	nsor tester (J-45741) to wheel sensor using ap sensor tester power switch.	propriate adapter.
batte 3. Spin	ery in the ABS active whee the wheel of the vehicle for tester. The red SENSC	should illuminate. If the POWER indicator doe el sensor tester before proceeding. by hand and observe the red SENSOR indica R indicator should flash on and off to indicate a	tor on the ABS active wheel
If the retes		Iluminates but does not flash, reverse the pol	larity of the tester leads and
	ABS active wheel sensor	tester detect a signal?	
	>> GO TO 3 > Replace wheel sensor	. Refer to BRC-64, "Removal and Installation".	
•	CK TIRE		

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# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

Check air pressure, wear and size. Are air pressure, wear and size within standard?

YES >> GO TO 4

NO >> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6</u>, "Inspection" (front) or <u>RAX-6</u>, "On-vehicle Service" (rear). <u>Is the inspection result normal?</u>

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5.check wiring harness for short circuit

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity	
1		No	
2			

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

**6.**CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		16	E19	1	Yes
		5	- E19	2	
Front RH		9	E41	1	
	E26	10		2	
Rear LH	LZU	6	C2	1	
	17	17	02	2	
Rear RH		8	C3	1	
		19	00	2	

#### Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-67</u>, "<u>Removal and Installa-</u> tion".

NO >> Repair the circuit.

# Component Inspection

INFOID:000000007418774

# **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)

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### [ABS] < DTC/CIRCUIT DIAGNOSIS > FR LH SENSOR А FR RH SENSOR Nearly matches the speedometer display (±10% or less) **RR LH SENSOR RR RH SENSOR** В Is the inspection result normal? >> Inspection End. YES NO >> Go to diagnosis procedure. Refer to BRC-31. "Diagnosis Procedure". С

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# < DTC/CIRCUIT DIAGNOSIS >

# C1120, C1122, C1124, C1126 IN ABS SOL

# Description

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:000000007418776

INFOID:000000007418775

# 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 DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-34, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

# **Diagnosis** Procedure

INFOID:000000007418777

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-15</u>, "CONSULT Function (ABS)".

## Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2

2. CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. 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) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clound	(Approx)	
E26	3		Battery voltage	

Is the inspection result normal?

# C1120, C1122, C1124, C1126 IN ABS SOL

#### < DTC/CIRCUIT DIAGNOSIS >

#### YES >> GO TO 3

NO

NO

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

BS actuator and electric unit (control unit)		Ground	Continuity	C
Connector	Terminal	Glound	Continuity	0
E26	1		Yes	-
E26	4	—	Tes	D

#### Is the inspection result normal?

YES	>> • Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installa-
	tion".
	Deferm the self diagnosis, and make sure that the result shows "NO DTC IS DETECTED"

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

## Component Inspection

**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.

#### NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Neta)	ABS solenoid valve			
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

\*: ON for 1 to 2 seconds after the touch, and then OFF.

#### 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-34, "Diagnosis Procedure"</u>.

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# C1121, C1123, C1125, C1127 OUT ABS SOL

# < DTC/CIRCUIT DIAGNOSIS >

# C1121, C1123, C1125, C1127 OUT ABS SOL

# Description

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:000000007418780

INFOID:000000007418779

# 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.	ABS actuator and electric unit
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

# DTC CONFIRMATION PROCEDURE

# 1.CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-36, "DTC Logic"</u>.
- NO >> Inspection End.

# **Diagnosis** Procedure

INFOID:000000007418781

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-15</u>, "CONSULT Function (ABS)".

## Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2

2. CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. 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) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage
Connector	Terminal	Ground	(Approx)
E26	3	_	Battery voltage

Is the inspection result normal?

# C1121, C1123, C1125, C1127 OUT ABS SOL

#### < DTC/CIRCUIT DIAGNOSIS >

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INFOID:000000007418782

#### YES >> GO TO 3

NO

NO

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

BS actuator and electric unit (control unit)		Cround	Continuity	
Connector	Terminal	Ground	Continuity	
E26	1		Yes	_
E20	4	—	fes	Γ

#### Is the inspection result normal?

YES	>> • Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installa-
	tion".
	Device we the cold discussion and we have that the result shows "NO DTO 10 DETECTED"

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Component Inspection

**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.

#### NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Nate)		ABS solenoid valve		
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

\*: ON for 1 to 2 seconds after the touch, and then OFF.

#### 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-36, "Diagnosis Procedure"</u>.

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# U1000 CAN COMM CIRCUIT

# Description

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

# DTC Logic

INFOID:000000007418784

INFOID:000000007418785

INFOID:000000007418783

### DTC DETECTION LOGIC

DTC	Display	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 system malfunction

## DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC U1000 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-38</u>, "Diagnosis Procedure".
- NO >> Inspection End.

## Diagnosis Procedure

**1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self diagnostic result. Refer to <u>BRC-15</u>, "CONSULT Function (ABS)".

#### Is DTC U1000 detected?

- YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
- NO >> Inspection End.

# **STOP LAMP SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

# STOP LAMP SWITCH

### Description

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit) either directly (with M/T) or through the stop lamp relay (with CVT).

# **Component Function Check**

# 1.CHECK DATA MONITOR

On "DATA MONITOR", select "STOP LAMP SW" and check the stop lamp switch signal.

Conditio	วท	STOP LAM (DATA MON	-
Brake pedal depressed.		On	
Brake pedal released.		Off	
Is the inspection result norma	al?		
YES >> Inspection End.			
-	procedure. Refer to <u>BRC-3</u>	<u>39, "Diagnosis Procedure"</u> .	
Diagnosis Procedure			INFOID:000000007418788
Regarding Wiring Diagram ir	formation, refer to BRC-4	7. "Wiring Diagram - ABS".	
	<u></u>	<u>,</u>	
1.CHECK STOP LAMP SW			
Perform the stop lamp switc Switch)".	h component inspection.	Refer to <u>BRC-41, "Compone</u>	ent Inspection (Stop Lamp
Is the inspection result norma	al?		
YES (with CVT)>>GO TO 2			
YES (with M/T)>>GO TO 7			
NO >> Replace stop lar	•		
2.CHECK STOP LAMP REI			
Perform the stop lamp relay Relay)".	-1 component inspection.	Refer to <u>BRC-41, "Compone</u>	ent Inspection (Stop Lamp
Is the inspection result norma	al?		
YES >> GO TO 3	<u>ur.</u>		
NO >> Replace stop lar	np relay-1.		
3.CHECK STOP LAMP SW	ITCH SIGNAL CIRCUIT		
1. Connect stop lamp switc	ch and stop lamp relay-1 co	onnectors.	
	or and electric unit (control		
<ol><li>Check voltage between ground.</li></ol>	ABS actuator and electr	ric unit (control unit) conne	ctor E26 terminal 20 and
ground.			
ABS actuator and electric unit			
(control unit)	Ground	Condition	Voltage (Approx.)
Connector Terminal	1		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

(control unit)		Ground	Condition	Voltage (Approx.)	Ρ
Connector	Terminal	inal		(Appiox.)	
E26 20		Brake pedal depressed	Battery voltage		
L20	20		Brake pedal released	0V	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> tion".

[ABS]

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< DTC/CIRCUIT DIAGNOSIS >

## NO >> GO TO 4

#### 4.CHECK STOP LAMP RELAY-1 COIL CIRCUIT

1. Disconnect stop lamp relay-1 connector.

2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lamp relay-1		Ground	Condition	Voltage	
Connector	Terminal	Ground	Condition	(Approx.)	
E57	1		Brake pedal depressed	Battery voltage	
L37	I	—	Brake pedal released	0V	

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

#### **5.**CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

Stop lam	p relay-1	Ground	Voltage (Approx.)	
Connector	Terminal	Clouin		
E57	5		Battery voltage	

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair circuit between fuse block J/B and stop lamp relay.

#### **6.**CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

Stop lam	p relay-1	Ground	Continuity	
Connector	Terminal	Cround	Continuity	
E57	2		Yes	

Is the inspection result normal?

YES >> Repair circuit between stop lamp relay and ABS actuator and electric unit (control unit).

NO >> Repair stop lamp relay ground circuit.

7. CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector.
- 2. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)	
Connector	Terminal			(Approx.)	
E26	20		Brake pedal depressed	Battery voltage	
E20	20		Brake pedal released	0V	

Is the inspection result normal?

NO >> GO TO 8

#### 8.CHECK STOP LAMP SWITCH INPUT CIRCUIT

1. Disconnect stop lamp switch connector.

2. Check voltage between stop lamp switch connector E38 terminal 1 and ground.

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> tion".

# **STOP LAMP SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

[ABS]

Stop lamp switch			Ground			Itage
Connector	Terminal					prox.)
E38	1				Battery voltage	
	uit between s	top lamp switch a use block J/B and			ctric unit (cor	ntrol unit).
Component Inspec	ction (Stop	Lamp Switch	ר)			INFOID:000000007418789
CHECK STOP LAM	P SWITCH					
<ol> <li>Turn ignition switch</li> <li>Disconnect stop lar</li> <li>Check continuity be</li> </ol>	np switch co		nals.			
Stop lamp switch terr	minals	C	ondition		Со	ontinuity
1 0	I	Brake pedal depresse	ed.			Yes
1 – 2	I	Brake pedal released	•			No
s the inspection result YES >> Inspection NO >> Replace sto	End.	ch.				
Component Inspec			)			
			)			INFOID:000000007418790
<b>1.</b> CHECK STOP LAM	P RELAY					
1. Turn ignition switch	OFF.					
<ol> <li>Disconnect stop lar</li> <li>Apply battery voltage</li> </ol>			1 and around to	(3		
terminal 2.			-			
<ol> <li>Check continuity be</li> </ol>	etween stop I	amp relay termin	als 3 and 5.	<u>م</u>	5	
Stop lamp relay terminals	C	ondition	Continuity			3
	-	e applied to terminal	Continuity			5
3 – 5	1 and ground		Yes	2		2 1
	Voltage and g	round removed	No			SCIA1245E
s the inspection result	normal?					SCIAI245E
YES >> Inspection						
NO >> Replace sto	op lamp relay	Ι.				

# ABS WARNING LAMP

#### < DTC/CIRCUIT DIAGNOSIS >

# ABS WARNING LAMP

# Description

INFOID:000000007418791

×: ON –: OFF

[ABS]

Condition	ABS warning lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

# **Component Function Check**

INFOID:000000007418792

# 1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON. <u>Is the inspection result normal?</u>

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-42, "Diagnosis Procedure"</u>.

## Diagnosis Procedure

INFOID:000000007418793

# **1.**CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-15. "CONSULT Function</u> (<u>ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4</u>, <u>"Work Flow"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-67, "Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-139</u>, "Removal and Installation".

# **BRAKE WARNING LAMP**

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< DTC/CIRCUIT DIAGNOSIS > **BRAKE WARNING LAMP**  [ABS]

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Description	INFOID:00000007418794
	×: ON –: OFF
Condition	Brake warning lamp (Note 1)
Ignition switch OFF	_
Ignition switch ON	× (Note 2)
EBD function is malfunctioning.	x
<ul> <li>NOTE:</li> <li>1: Brake warning lamp will turn on in case of parking brake op (when brake fluid is insufficient).</li> <li>2: After starting engine, brake warning lamp is turned off.</li> <li>Component Function Check</li> </ul>	peration (when switch is ON) or of brake fluid level switch operation
<b>1.</b> BRAKE WARNING LAMP OPERATION CHECK 1	
	vitch is turned ON, and turns OFF after the engine is
<b>2.</b> BRAKE WARNING LAMP OPERATION CHECK 2	
Check that the brake warning lamp in the combination ing brake lever (M/T models) or the parking brake ped Is the inspection result normal? YES >> Inspection End NO >> Check parking brake switch. Refer to <u>BR-</u>	
Diagnosis Procedure	INFOID:000000007418796
1.CHECK PARKING BRAKE SWITCH	
Check that the brake warning lamp in the combination ing brake lever (M/T models) or the parking brake ped Is the inspection result normal? YES >> GO TO 2	
NO >> Check parking brake switch. Refer to <u>BR-</u> 2.CHECK SELF-DIAGNOSIS	13, "Inspection and Adjustment".
<u>(ABS)"</u> .	self-diagnosis. Refer to <u>BRC-15. "CONSULT Function</u>
Is the inspection result normal?	
YES >> GO TO 3 NO >> Check items displayed by self-diagnosis. <b>3.</b> CHECK COMBINATION METER	
Check if the indication and operation of combination n	neter are normal. Refer to MWI-4. "Work Flow"
Is the inspection result normal? YES >> Replace ABS actuator and electric unit (	control unit). Refer to <u>BRC-67, "Removal and Installa-</u>
NO >> Repair or replace combination meter. Refe	er to MWI-139, "Removal and Installation".

< ECU DIAGNOSIS INFORMATION >

# ECU DIAGNOSIS INFORMATION ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

**Reference Value** 

INFOID:000000007418797

#### 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		
FR LH SENSOR		0 [km/h]	Vehicle stopped		
FR RH SENSOR RR LH SENSOR RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10 % or less)	Vehicle running (Note 1)		
STOP LAMP SW	Brake pedal operation	When brake pedal is de- pressed	ON		
STOP LAWF 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		
SLCT LVR POSI	CVT shift position	P position R position N position D position	P R N D		
PARK BRAKE SW	Parking brake switch	Parking brake switch is active	ON		
FARR BRARE SW	Parking brake switch	Parking brake switch is inactive	OFF		
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	ON		
RR LH OUT SOL RR RH IN SOL RR RH OUT SOL		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	OFF		
		When the motor relay and motor are operating	ON		
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operat- ing	OFF		
ACTUATOR RLY		When the actuator relay is operating	ON		
(Note 2)	Actuator relay operation	When the actuator relay is not operating	OFF		
	ABS warning lamp	When ABS warning lamp is ON	ON		
ABS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	OFF		
		ABS is active	ON		
ABS SIGNAL	ABS operation	ABS is inactive	OFF		

**Revision: February 2013** 

Display content

#### < ECU DIAGNOSIS INFORMATION >

Monitor item

Reference value in

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Data monitor

		Condition	normal operation
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
ADS FAIL SIG		ABS is normal	OFF
an operation for chec	of ON/OFF condition occurs every 20 seconds after ignitio king.		
	g for warning lamp and indicator lamp.Refer to <u>BRC-15. "(</u>	CONSULT Function (ABS)".	
ail-Safe			INFOID:000000007418798
witches to the fail-	al malfunctions with ABS, the ABS warning la safe mode. unction with ABS, the result of a fail-safe mod	•	•
switch ON" and " CAUTION:	is sound may be heard. That is a normal cond The first starting" are being performed.		
OTC No. Index			INFOID:000000007418799
CAUTION: f the Fail-Safe fur	ction is activated, then perform self-diagno	sis for VDC/TCS/ABS	control system.
Display item	Malfunction detecting con	dition	Check item
Display item RR RH SENSOR-1 [C1101] <sup>*1</sup>	Malfunction detecting con Circuit of rear RH wheel sensor is open. Or when th side the standard.		
RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when th	e sensor power voltage is o	ide BRC-18, "Diagno-
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the side the standard. Circuit of rear LH wheel sensor is open. Or when the sensor is open.	e sensor power voltage is o sensor power voltage is outs	ide BRC-18, "Diagno- sis Procedure"
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the side the standard. Circuit of rear LH wheel sensor is open. Or when the standard. Circuit of front RH wheel sensor is open. Or when the standard.	he sensor power voltage is o sensor power voltage is outs he sensor power voltage is o	but- BRC-18, "Diagno- sis Procedure" (Note 1)
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1 [C1103] <sup>*1</sup> FR LH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the side the standard.         Circuit of rear LH wheel sensor is open. Or when the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.	he sensor power voltage is o sensor power voltage is outs he sensor power voltage is o he sensor power voltage is o -circuited. Or when the distar	but- bide but- but- but- but- but- but- but-
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1 [C1103] <sup>*1</sup> FR LH SENSOR-1 [C1104] <sup>*1</sup> RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the side the standard.         Circuit of rear LH wheel sensor is open. Or when the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         When the circuit in the rear RH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large	he sensor power voltage is o sensor power voltage is outs he sensor power voltage is o he sensor power voltage is o -circuited. Or when the distar ge and the sensor pulse can -circuited. Or when the distar	but- but- but- but- but- but- but- but-
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1 [C1103] <sup>*1</sup> FR LH SENSOR-1 [C1104] <sup>*1</sup> RR RH SENSOR-2 [C1105] <sup>*1</sup> RR LH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the side the standard.         Circuit of rear LH wheel sensor is open. Or when the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         When the circuit in the rear RH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the rear LH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large between the wheel sensor and sensor rotor is too large	he sensor power voltage is o sensor power voltage is outs he sensor power voltage is o he sensor power voltage is o circuited. Or when the distar ge and the sensor pulse can circuited. Or when the distar ge and the sensor pulse can port-circuited. Or when the distar	but-     BRC-18, "Diagno- sis Procedure" (Note 1)       but-     (Note 1)       but-     BRC-21, "Diagno- sis Procedure" (Note 1)
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1 [C1103] <sup>*1</sup> FR LH SENSOR-1 [C1104] <sup>*1</sup> RR RH SENSOR-2 [C1105] <sup>*1</sup> RR LH SENSOR-2 [C1106] <sup>*1</sup> FR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the side the standard.         Circuit of rear LH wheel sensor is open. Or when the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         When the circuit in the rear RH wheel sensor is short-between the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the rear LH wheel sensor is short-between the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the rear LH wheel sensor is short-between the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the rear LH wheel sensor is short-between the wheel sensor and sensor rotor is too large be recognized by the control unit.	he sensor power voltage is o sensor power voltage is outs he sensor power voltage is o re sensor power voltage is o -circuited. Or when the distar ge and the sensor pulse can -circuited. Or when the distar ge and the sensor pulse can ort-circuited. Or when the distar too large and the sensor pulse can -circuited. Or when the distar	but- but-
RR RH SENSOR-1 [C1101] <sup>*1</sup> RR LH SENSOR-1 [C1102] <sup>*1</sup> FR RH SENSOR-1 [C1103] <sup>*1</sup> FR LH SENSOR-1 [C1104] <sup>*1</sup> RR RH SENSOR-2 [C1105] <sup>*1</sup> FR RH SENSOR-2 [C1106] <sup>*1</sup> FR RH SENSOR-2 [C1107] <sup>*1</sup> FR LH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the side the standard.         Circuit of rear LH wheel sensor is open. Or when the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front RH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         Circuit of front LH wheel sensor is open. Or when the side the standard.         When the circuit in the rear RH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the rear LH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the front RH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large be recognized by the control unit.         When the circuit in the front RH wheel sensor is shortbetween the wheel sensor and sensor rotor is conlarge be recognized by the control unit.         When the circuit in the front RH wheel sensor is shortbetween the wheel sensor and sensor rotor is conlarge between the wheel sensor and sensor rotor is conlarged by the control unit.         When the circuit in the front LH wheel sensor is shortbetween the wheel sensor and sensor rotor is conlarged by the control unit.         When the circuit in the front LH wheel sensor is shortbetween the wheel sensor and sensor rotor is too large between the wheel sensor and sensor rotor is too large between the wheel sensor and sensor rotor is shortbetween the wheel sensor and sensor rotor is shortbetween the wheel sensor and	he sensor power voltage is outs sensor power voltage is outs he sensor power voltage is outs he sensor power voltage is o -circuited. Or when the distar ge and the sensor pulse can -circuited. Or when the distar ge and the sensor pulse can ort-circuited. Or when the distar too large and the sensor pulse can -circuited. Or when the distar ge and the sensor pulse can	but-     BRC-18, "Diagno- sis Procedure" (Note 1)       but-     (Note 1)       but-     BRC-21, "Diagno- sis Procedure" (Note 1)       but-     BRC-21, "Diagno- sis Procedure" (Note 1)

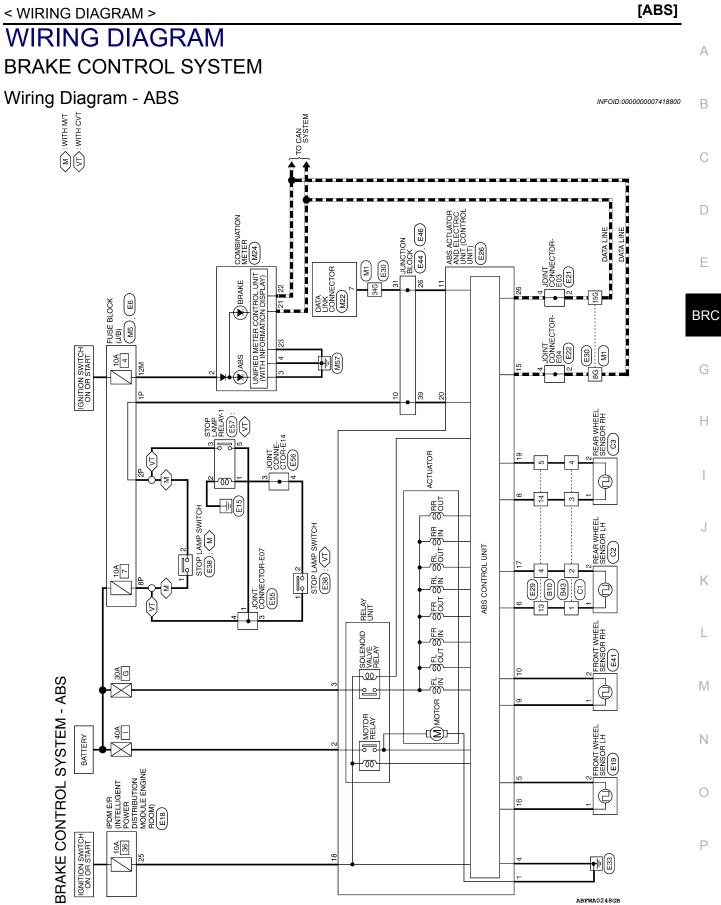
#### < ECU DIAGNOSIS INFORMATION >

Display item	Malfunction detecting condition	Check item
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.	BRC-27, "Diagno-
[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.	sis Procedure"
MAIN RELAY	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.	BRC-29, "Diagno-
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	sis Procedure"
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-31. "Diagno- sis Procedure" (Note 1)
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-36, "Diagno- sis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-36, "Diagno- sis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-36, "Diagno- sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-36, "Diagno- sis Procedure"
CAN COMM CIRCUIT [U1000] <sup>*3</sup>	When there is a malfunction in the CAN communication circuit.	BRC-38, "Diagno- sis Procedure"

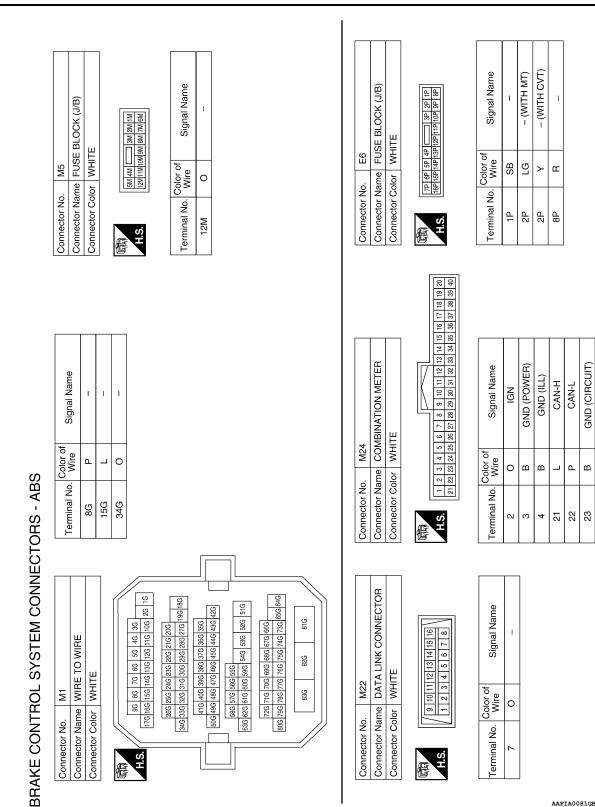
\*1: Be sure to confirm the ABS warning lamp illuminates when the ignition switch is turned ON after repairing the shorted sensor circuit, but the lamp turns off when driving the vehicle over 30 km/h (19 MPH) for approximately 1 minute in accordance with SELF-DIAGNOSIS PROCEDURE.

\*2: When "CONTROLLER FAILURE" is displayed, check to see if the ABS warning lamp is burned out, and check the circuit between the ABS warning lamp and ABS actuator and electric unit (control unit) for open or short. Then, check the ABS actuator and electric unit (control unit) and circuit.

\*3: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit first. Refer to <u>LAN-6, "System Description"</u>.



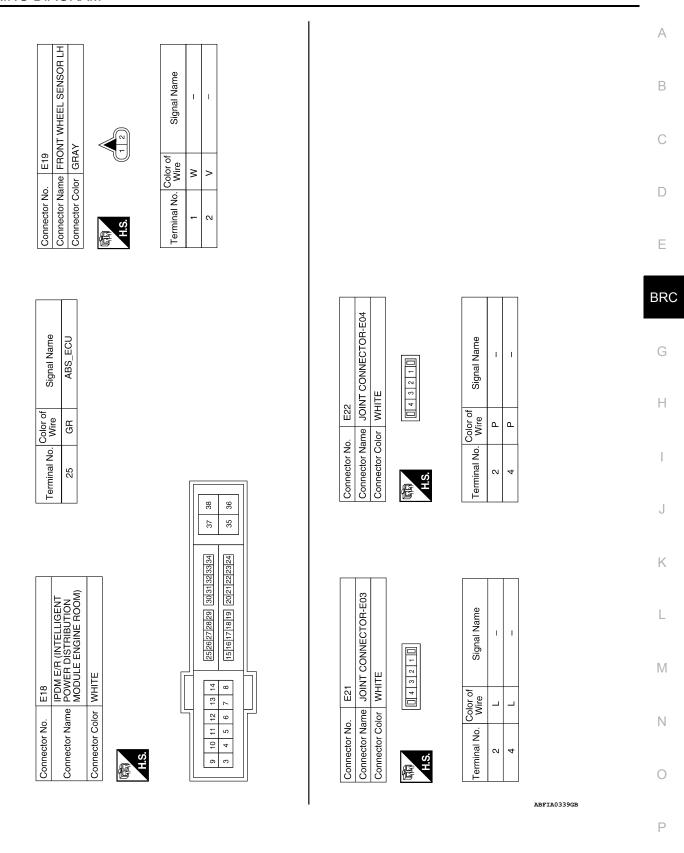
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AAFIA0081GB



[ABS]



BRAKE CONTROL S	YSTEM
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Signal Name L Т Т

Color of Wire ٩ \_ 0

Terminal No.

Connector Name WIRE TO WIRE

E30

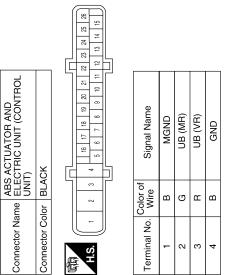
Connector No.

Connector Color WHITE

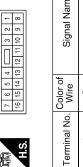
8G 15G 34G

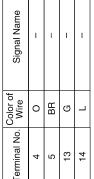
r	_								
Signal Name	IGN	DS RR	BLS	I	I	I	I	I	CAN-H
Color of Wire	GR	BR	SB	I	I	I	I	I	_
Terminal No. Wire	18	19	20	21	22	23	24	25	26

Signal Name	DS FL	DP RL	I	DP RR	DP FR	DS FR	DIAG-K	I	I	I	CAN-L	DP FL	DS RL	
Color of Wire	>	σ	I	_	в	ГG	GR	I	-	I	٩	×	0	
Terminal No.	5	9	2	80	6	10	÷	12	13	14	15	16	17	



r No. E29	Connector Name WIRE TO WIRE	r Color WHITE	7 6 5 4 - 3 2 1
Connector No.	Connector Name M	Connector Color WHITE	<b>际</b> 和





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82G

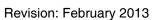
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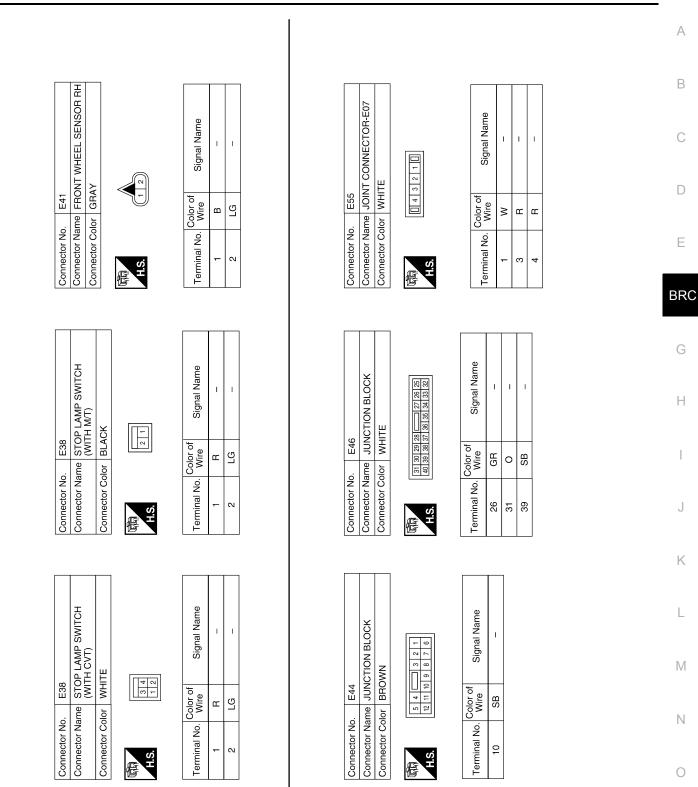
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Connector No.

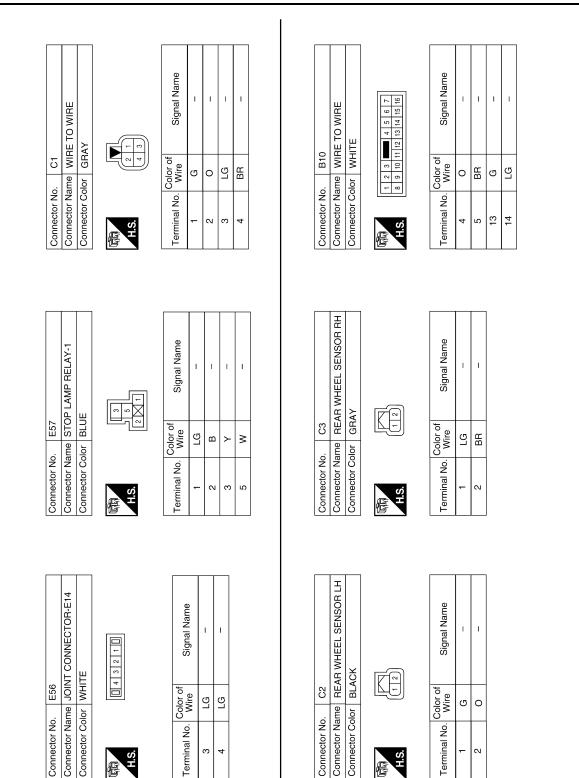




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BRAKE	CONTROL	SYSTEM



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BRAKE CONTROL SYSTEM	BRAKE	CONTROL	SYSTEM
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BRAKE CONTROL SYSTEM WIRING DIAGRAM >	[ABS]	
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# SYMPTOM DIAGNOSIS ABS

# Symptom Table

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If ABS warning lamp turns ON, perform self-diagnosis.

Symptom	Check item	Reference	
	Brake force distribution		
Excessive ABS function operation fre- quency	Looseness of front and rear axle	<u>BRC-55, "Diagno-</u> sis Procedure"	
	Wheel sensor and rotor system		
Unexpected pedal reaction	Brake pedal stroke	BRC-56, "Diagno-	
	Make sure the braking force is sufficient when the ABS is not operating.	sis Procedure"	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-57, "Diagno- sis Procedure"	
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-58, "Diagno- sis Procedure"	
Pedal vibration or ABS operation sound	Brake pedal	BRC-59, "Diagno-	
occurs (Note 2)	ABS actuator and electric unit (control unit)	sis Procedure"	

#### NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: 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]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
< SYMPTOM DIAGNOSIS > [ABS]	<u> </u>
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
Diagnosis Procedure	)2
1.CHECK START	
Check front and rear brake force distribution using a brake tester.	-
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. Refer to front: <u>FAX-6, "Inspection"</u> , Rear <u>RAX-6, "On-vehicle Service"</u> .	
Is the inspection result normal?	
YES >> GO TO 3	
NO >> Repair or replace malfunctioning components.	
3. CHECK WHEEL SENSOR AND SENSOR ROTOR	_
<ul> <li>Check the following.</li> <li>Wheel sensor installation for damage.</li> <li>Sensor rotor installation for damage.</li> <li>Wheel sensor connector connection.</li> <li>Wheel sensor harness inspection.</li> </ul>	
Is the inspection result normal?	
<ul> <li>YES &gt;&gt; GO TO 4</li> <li>NO &gt;&gt; • Replace wheel sensor or sensor rotor. Refer to <u>BRC-64, "Removal and Installation"</u> or <u>BRC-66</u> <u>"Removal and Installation"</u>.</li> <li>• Repair harness.</li> </ul>	-
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 inspection result normal?	-
YES >> Inspection End.	
NO >> Perform self-diagnosis. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u> .	

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# UNEXPECTED PEDAL REACTION

**Diagnosis** Procedure

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[ABS]

# 1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-13, "Inspection and Adjustment".

Is the stroke too big?

YES >> • Bleed air from brake tube and hose. Refer to <u>BR-16, "Bleeding Brake System"</u>.

 Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: <u>BR-13</u>, "<u>Inspection and Adjustment</u>", brake booster: <u>BR-9, "Inspection"</u> and master cylinder: <u>BR-10, "On Board Inspection"</u>.

NO >> GO TO 2

2. CHECK ABS FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is normal in this condition.Connect connector after inspection.

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Check brake system.

# THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

#### CAUTION:

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

**1.**CHECK ABS 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 >> Inspection End.

NO >> Check brake system.

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# 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 >> Inspection End.

NO >> Perform self-diagnosis. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u>.

[ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS< SYMPTOM DIAGNOSIS >[ABS]PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS	
Diagnosis Procedure	А
<ul> <li>CAUTION:</li> <li>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.</li> <li>When shifting gears</li> <li>When driving on slippery road</li> <li>During cornering at high speed</li> <li>When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]</li> <li>When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]</li> </ul>	B C D
Check that there are pedal vibrations when the engine is started. <u>Do vibrations occur?</u> YES >> GO TO 2	E
NO >> Inspect the brake pedal. 2.SYMPTOM CHECK 2	BRC
Check that there are ABS operation noises when the engine is started. <u>Do the operation noises occur?</u> YES >> GO TO 3	G
NO >> Perform self diagnostic result. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u> . <b>3.</b> SYMPTOM CHECK 3	Н
<ul> <li>Check symptoms when electrical component (headlamps, etc.) switches are operated.</li> <li><u>Do symptoms occur?</u></li> <li>YES &gt;&gt; Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.</li> </ul>	I
NO >> Inspection End.	J
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# NORMAL OPERATING CONDITION

#### < SYMPTOM DIAGNOSIS >

# NORMAL OPERATING CONDITION

# Description

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Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS is activated.	This is a normal condi- tion due to ABS activa- tion.	
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.	

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 SR and SB section 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 SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this G Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

#### WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

#### Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

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## NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If
   a DTC is detected, perform trouble diagnosis according to self-diagnosis results.
- This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure N below before starting the repair operation.

## OPERATION PROCEDURE

1. Connect both battery cables. **NOTE:** 

Supply power using jumper cables if battery is discharged.

- Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.

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# PRECAUTIONS

#### < PRECAUTION >

- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT.

## Precaution for Brake System

- Recommended fluid is brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

#### WARNING:

# Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

#### Precaution for Brake Control

- Just after starting vehicle after ignition switch ON, 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 simple 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.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated 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.

Commercial service tool

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# PREPARATION

# < PREPARATION > PREPARATION

# PREPARATION

# Special Service Tool

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description	С
 (J-45741) ABS active wheel sensor tester	J-45741.60X	Checking operation of ABS active wheel sen- sor	D
	Norm where		E
Commercial Convice Teel			BR

# **Commercial Service Tool**

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Tool name		Description	
<ol> <li>Flare nut crowfoot</li> <li>Torque wrench</li> </ol>		Removing and installing brake piping a: 10mm (0.39 in)/12mm (0.47 in)	
	S-NT360		

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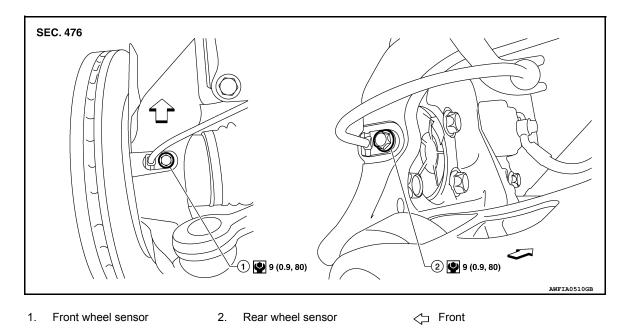
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# < REMOVAL AND INSTALLATION >

# REMOVAL AND INSTALLATION WHEEL SENSORS

# Removal and Installation

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#### CAUTION:

- Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Before installation, check if foreign objects such as iron fragments are adhered to the pick-up part of
  the sensor or to the inside of the hole in the wheel hub for the wheel sensor, or if a foreign object is
  caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the
  wheel sensor.

#### FRONT WHEEL SENSOR

#### Removal

- 1. Remove front wheel and tire. Refer to WT-68. "Adjustment".
- 2. Partially remove front wheel fender protector. Refer to <u>EXT-22</u>, "Removal and Installation" (Coupe), <u>EXT-46</u>, "Removal and Installation" (Sedan).
- 3. Remove wheel sensor bolt and wheel sensor.
- 4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

#### Installation

Installation is in the reverse order of removal.

#### REAR WHEEL SENSOR

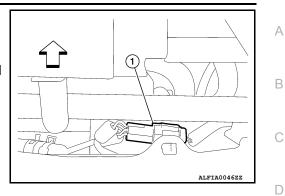
#### Removal

1. Remove rear wheel and tire. Refer to WT-68. "Adjustment".

# WHEEL SENSORS

#### < REMOVAL AND INSTALLATION >

- 2. Disconnect wheel sensor harness connector (1).
  - < : Front
- 3. Remove harness wire clips from rear suspension member.
- 4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



Installation Installation is in the reverse order of removal.

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[ABS]

< REMOVAL AND INSTALLATION >

# SENSOR ROTOR

## Removal and Installation

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

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#### < REMOVAL AND INSTALLATION >

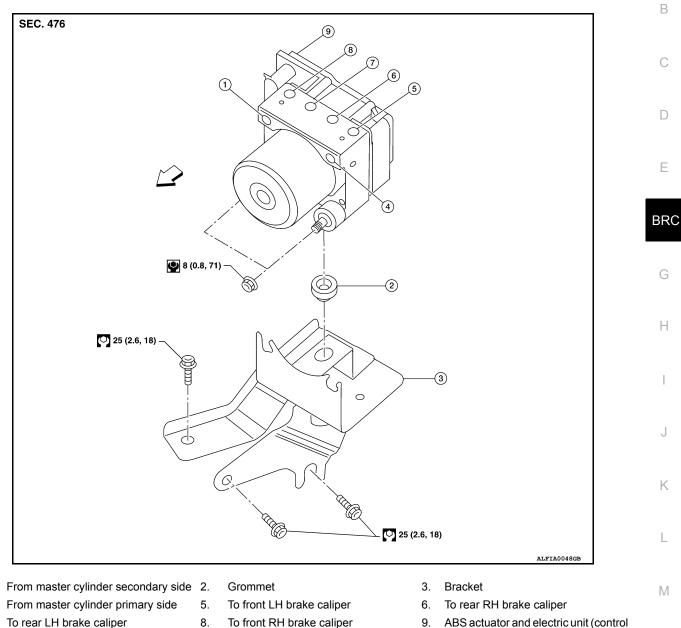
# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

# Exploded View

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[ABS]

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7. To rear LH brake caliper

∠ Front

1.

4.

#### Removal and Installation

#### **CAUTION:**

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (flare nut torque wrench).

unit)

- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install ABS actuator and electric unit (control unit) by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-16, "Bleeding Brake System"</u>.
- After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.

#### **BRC-67**

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< REMOVAL AND INSTALLATION >

#### REMOVAL

#### NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

- 1. Remove cowl top. Refer to <u>EXT-21, "Removal and Installation"</u> (Coupe), <u>EXT-45, "Removal and Installa-</u> <u>tion"</u> (Sedan).
- 2. Disconnect washer hose.
- 3. Disconnect the battery negative terminal.
- 4. Remove strut tower bar, if equipped. Refer to <u>FSU-14</u>, "Exploded View".
- 5. Disconnect ABS actuator and electric unit (control unit) connector.
- 6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit) using a suitable tool.
- 7. Remove ABS actuator and electric unit (control unit) nuts.
- 8. Remove ABS actuator and electric unit (control unit).
- 9. Remove bracket as necessary.

#### INSTALLATION

Installation is in the reverse order of removal.

Torque brake lines to proper specifications. Refer to BR-18, "Hydraulic Circuit".

DIAGNOSIS AND REPAIR WORKFLOW
< BASIC INSPECTION > [TCS/ABS]
BASIC INSPECTION
DIAGNOSIS AND REPAIR WORKFLOW
Work Flow
1.COLLECT INFORMATION FROM THE CUSTOMER
Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-70, "Diagnostic Work Sheet"</u> .
>> GO TO 2.
2. PERFORM SELF DIAGNOSTIC RESULT
Perform self diagnostic result. Refer to BRC-81, "CONSULT Function (ABS)".
Are any DTCs displayed?
YES >> Refer to <u>BRC-115, "DTC No. Index"</u> . NO >> GO TO 3.
3. CHECK SYMPTOM OPERATING CONDITION
Check that the symptom is a normal operating condition. Refer to <u>BRC-131, "Description"</u> .
Is the symptom a normal operating condition?
YES >> Inspection End. NO >> GO TO 4.
4. CHECK WARNING AND INDICATOR LAMPS OPERATION
Check warning and indicator lamps operation.
<ul> <li>ABS warning lamp: Refer to <u>BRC-109</u>, "<u>Description</u>".</li> </ul>
<ul> <li>brake warning lamp: Refer to <u>BRC-110, "Description"</u>.</li> <li>SLIP indicator lamp: Refer to <u>BRC-113, "Description"</u>.</li> </ul>
Is ON/OFF timing normal?
YES >> GO TO 5.
NO >> Perform warning lamp diagnosis. Refer to <u>BRC-109</u> , "Component Function Check" (ABS warning lamp), <u>BRC-110</u> , "Component Function Check" (brake warning lamp), or <u>BRC-113</u> , "Component
Function Check" (SLIP indicator lamp).
5. PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM
Perform diagnosis applicable to the symptom. Refer to BRC-124, "Symptom Table".
>> GO TO 6.
6.FINAL CHECK
Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to <u>BRC-81</u> , <u>"CONSULT Function (ABS)"</u> .
>> Inspection End.

# DIAGNOSIS AND REPAIR WORKFLOW

## < BASIC INSPECTION >

# Diagnostic Work Sheet

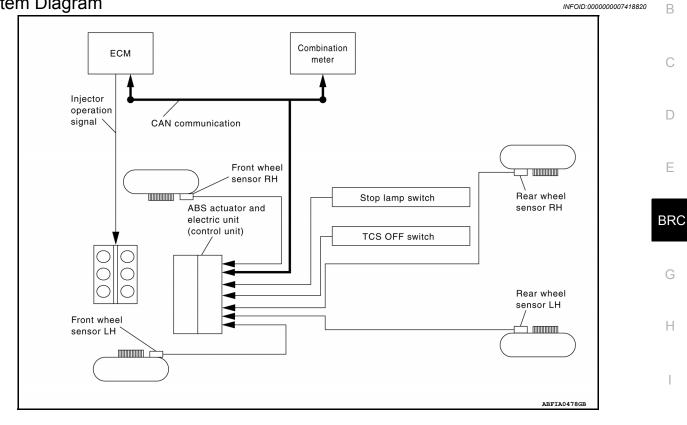
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[TCS/ABS]

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

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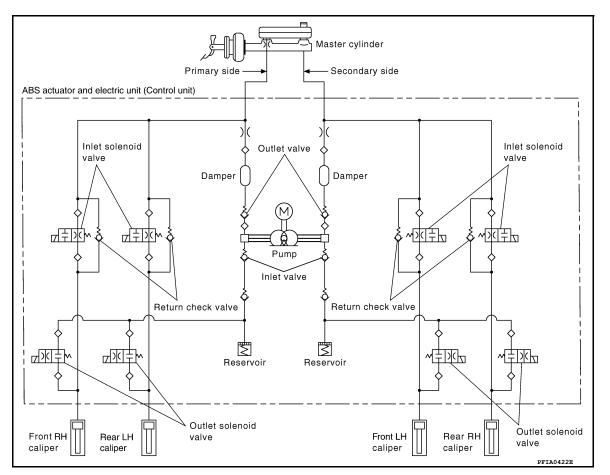
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# Hydraulic Circuit Diagram

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[TCS/ABS]



TCS

# System Description

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- Traction Control System is a function that electronically controls engine torque and brake fluid pressure 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, it compares wheel speed
  signals from all 4 wheels. At this time, LH and RH front 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 is available.

# **Component Parts Location**

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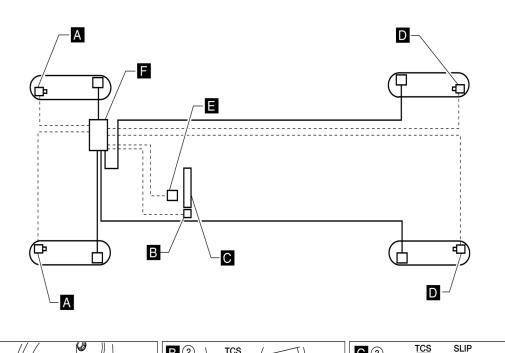
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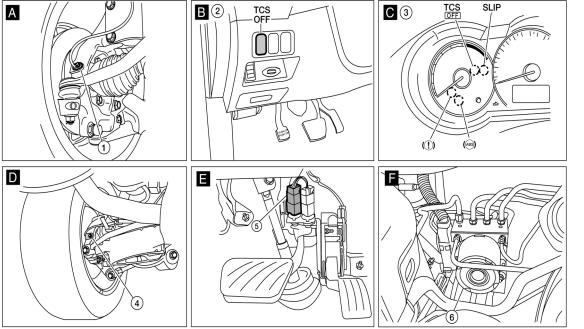
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TCS



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- 1. Front wheel sensor LH E19 Front wheel sensor RH E41
- 4. Rear wheel sensor LH C2 Rear wheel sensor RH C3
- 2. TCS OFF switch M72
- 5. Stop lamp switch E38

- AWFIA0662ZZ
- 3. Combination meter M24
- 6. ABS actuator and electric unit (control unit) E26

# < SYSTEM DESCRIPTION >

# **Component Description**

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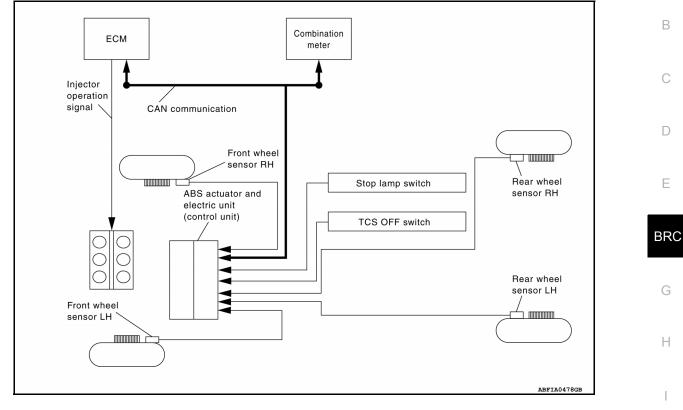
[TCS/ABS]

Compo	Reference	
	Pump	BRC-93, "Description"
ABS actuator and electric unit (control unit)	Motor	BRC-95, Description
	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100, "Description"
Wheel sensor	BRC-84, "Description"	
TCS OFF switch	BRC-111, "Description"	
ABS warning lamp	BRC-109. "Description"	
Brake warning lamp	BRC-110, "Description"	
Slip indicator lamp	BRC-113, "Description"	

TCS

# ABS





ABS

# System Description

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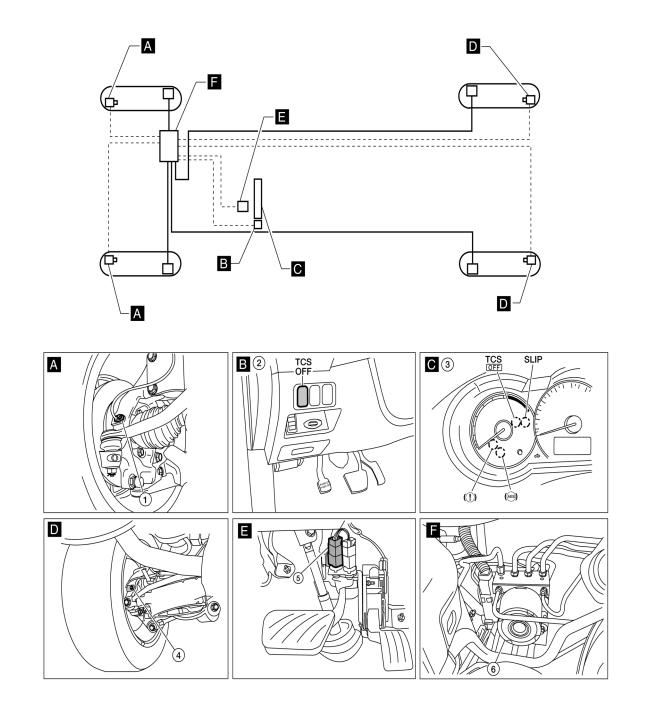
- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles. Κ
- · Electrical system diagnosis by CONSULT is available.

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# **Component Parts Location**

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ABS

#### AWFIA0662ZZ

- 1. Front wheel sensor LH E19 Front wheel sensor RH E41
- 4. Rear wheel sensor LH C2 Rear wheel sensor RH C3
- 2. TCS OFF switch M72
- 5. Stop lamp switch E38
- 3. Combination meter M24
- 6. ABS actuator and electric unit (control unit) E26



# < SYSTEM DESCRIPTION >

# **Component Description**

Compo	Reference	
	Pump	
ADC actuator and electric unit (control unit)	Motor	BRC-93, "Description"
ABS actuator and electric unit (control unit)	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100, "Description"
Wheel sensor	BRC-84, "Description"	
TCS OFF switch	BRC-111, "Description"	
ABS warning lamp	BRC-109, "Description"	
Brake warning lamp	BRC-110. "Description"	
Slip indicator lamp	BRC-113, "Description"	

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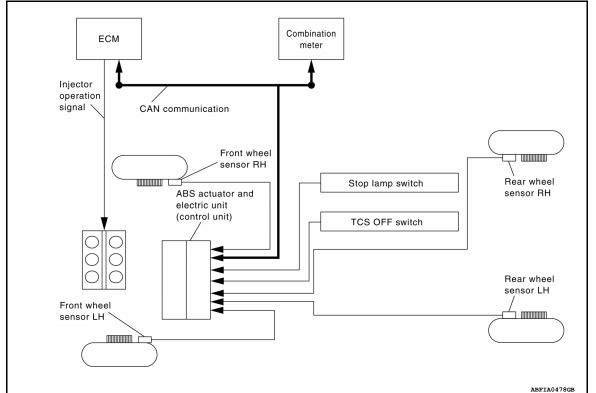
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INFOID:000000007418828

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INFOID:000000007418829



**EBD** 

# System Description

INFOID:000000007418830

Electric Brake force Distribution functions as follows:

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

# **Component Parts Location**

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#### INFOID:000000007418831

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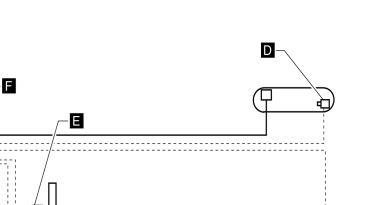
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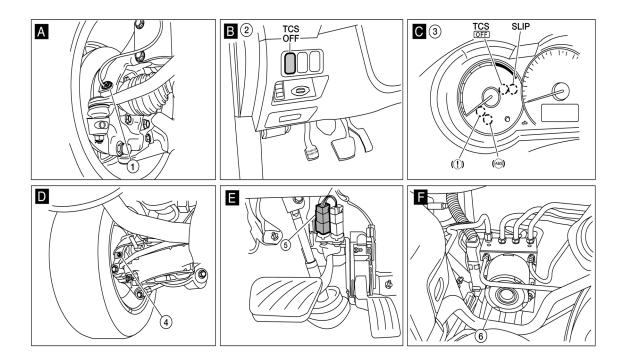
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- 1. Front wheel sensor LH E19 Front wheel sensor RH E41
- 4. Rear wheel sensor LH C2 Rear wheel sensor RH C3
- 2. TCS OFF switch M72
- 5. Stop lamp switch E38

- AWFIA0662ZZ
- 3. Combination meter M24
- 6. ABS actuator and electric unit (control unit) E26



# **Component Description**

INFOID:000000007418832

[TCS/ABS]

Compo	Reference	
	Pump	BRC-93, "Description"
ABS actuator and electric unit (control unit)	Motor	BRC-35, Description
	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100. "Description"
Wheel sensor	BRC-84, "Description"	
TCS OFF switch	BRC-111, "Description"	
ABS warning lamp	BRC-109, "Description"	
Brake warning lamp	BRC-110, "Description"	
Slip indicator lamp	BRC-113, "Description"	

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

< SYSTEM DESCRIPTION >

[TCS/ABS]

< SYSTEM DESCRIPTION > [ICS]	403]
DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTR	
UNIT)]	A
CONSULT Function (ABS)	
SELF DIAGNOSTIC RESULT	В
Operation Procedure	
1. Turn ignition switch ON.	С
<ol> <li>Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.</li> </ol>	
3. After stopping vehicle, with the engine running, touch "ABS", "SELF-DIAG RESULTS" in order of CONSULT screen.	on the D
<ul> <li>4. The self-diagnostic results are displayed.</li> <li>• Check ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lam off. If "NO FAILURE" is displayed, refer to <u>BRC-109, "Description"</u>.</li> </ul>	p turn      ⊨
5. Perform the appropriate inspection from display item list, and repair or replace the malfunctioning content. Refer to "Display Item List".	ompo- BRC
<ol> <li>Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.</li> <li>CAUTION:</li> </ol>	
When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS wa lamp, SLIP indicator lamp and brake warning lamp will not turn off even when the system is mal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approxima minute.	s nor-
Erase Memory	Н
1. Turn ignition switch OFF.	
<ol> <li>Start engine and touch "ABS", "SELF-DIAG RESULTS", "ERASE MEMORY" in order on the CON screen to erase the diagnostic memory. If "ABS" is not indicated, go to <u>GI-50, "Description"</u>. CAUTION:</li> </ol>	SULT
If the diagnostic memory is not erased, re-perform the operation from step 6 above.	J
3. Perform self-diagnosis again, and make sure that diagnostic memory is erased.	
<ol> <li>Drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and sure that the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning turn off.</li> </ol>	
<ul> <li>NOTE:</li> <li>Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or with brake level switch operation (when brake fluid is insufficient).</li> <li>TCS OFF switch should not stay in the "ON" position.</li> </ul>	e fluid $\ ^{ m L}$
Display Item List Refer to <u>BRC-115, "DTC No. Index"</u> .	Μ
DATA MONITOR	5. P
Display Item List	Ν
CAUTION: The display shows the control unit calculation data, so a normal value might be displayed even event the output circuit (harness) is open or short - circuited.	in the $_{ m O}$
Data monitor item selection	

Item	Data	a monitor item sele	ection		D
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks	
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor sig- nal is displayed.	
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.	

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

#### < SYSTEM DESCRIPTION >

[TCS/ABS]

RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor sig- nal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) is displayed.
GEAR	×	×	×	Gear position judged by PNP switch signal is displayed.
SLCT LVR POSI	×	×	×	Shift position judged by PNP switch signal.
OFF SW (ON/OFF)	×	×	×	TCS OFF switch (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	_	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	_	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	_	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	_	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)		×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	_	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	_	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	_	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	_	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	_	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	_	×	×	TCS OFF lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	_	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
	•	•	•	

×: Applicable

-: Not applicable

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.

### ACTIVE TEST

#### **CAUTION:**

- Do not 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, TCS indicator lamp, SLIP indicator lamp and brake warning lamp are on.
- ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

Operation Procedure **NOTE:** 

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

#### < SYSTEM DESCRIPTION >

#### [TCS/ABS]

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

#### Solenoid Valve

#### NOTE:

- The example shown is for front right wheel. The procedure for the other wheels is the same as given below.
- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the TCS function, select the item menu for each test item.
  For ABS solenoid valve, touch "UP", "KEEP", and "DOWN" on the display screen. For ABS solenoid valve
- (ACT), touch "UP", "ACT UP", "ACT KEEP" and confirm that solenoid valves (IN, OUT) operate as shown in the table below.

Operation	ABS solenoid valve		ABS solenoid valve (ACT)		Е		
(Note)	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP	
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	BRC
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	BRU

\*: ON for 1 to 2 seconds after the touch, and then OFF

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.

#### ABS Motor

Touch "ON" and "OFF" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

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

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

### < DTC/CIRCUIT DIAGNOSIS >

# DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

# Description

INFOID:000000007418834

ITCS/ABS1

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:000000007418835

# 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 when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

# DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

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

2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-84, "Diagnosis Procedure"</u>.

NO >> Inspection End.

**Diagnosis** Procedure

INFOID:000000007418836

Regarding Wiring Diagram information, refer to <u>BRC-117, "Wiring Diagram - TCS"</u>.

### CAUTION:

### Do not check between wheel sensor terminals.

**1**.CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
- 2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.
  - NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

 Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. NOTE:

<b>C1101, C1</b> 1	102, C1103, C1104 WHEEL	SENSOR-1
< DTC/CIRCUIT DIAGNOSIS >		[TCS/ABS]
If the red SENSOR indicator illu retest.	uminates but does not flash, reverse	e the polarity of the tester leads and
Does the ABS active wheel sensor to	ester detect a signal?	
YES >> GO TO 3 NO >> Replace wheel sensor. F	Refer to <u>BRC-136, "Removal and Ins</u>	tallation".
<b>3.</b> CHECK TIRE		
Check air pressure, wear and size.		
Are air pressure, wear and size withi	<u>n standard?</u>	
YES >> GO TO 4		
NO >> • Adjust air pressure, or • Perform the self-diagn	replace tire. osis, and make sure that the result s	hows "NO DTC IS DETECTED".
<b>4.</b> CHECK WHEEL BEARINGS		
Check wheel bearing axial end play.	Refer to <u>FAX-6, "Inspection"</u> (front) or	r <u>RAX-6, "On-vehicle Service"</u> (rear).
Is the inspection result normal?		
YES >> GO TO 5 NO >> Repair or replace as no "Removal and Installation		al and Installation" (front) or RAX-7,
5. CHECK WIRING HARNESS FOR	R SHORT CIRCUIT	
Check continuity between wheel sen	sor connector terminals and ground.	
Wheel sensor connector terminal	Ground	Continuity
1		No
2	—	INU

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

6. Check wiring harness for open circuit

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and ele	ctric unit (control unit)	Wheel	sensor	Continuity
Wheel Sensor	Connector	Terminal	Connector	Terminal	
		16	E19	1	
Front LH		5	E19	2	
Front RH		9		1	1
	– E26	10	E41	2	Yes
Rear LH	E20	E26 6	C2	1	
		17	02	2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Instal-</u> P <u>lation</u>".
- NO >> Repair the circuit.

Component Inspection

**1.**CHECK DATA MONITOR

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

### < DTC/CIRCUIT DIAGNOSIS >

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 <u>BRC-84, "Diagnosis Procedure"</u>.

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

### < DTC/CIRCUIT DIAGNOSIS >

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

# Description

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:000000007418839

INFOID:000000007418838

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)     B
C1108	FR LH SENSOR-2	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
DTC CC	ONFIRMATION PROCE	DURE	
<b>1</b> .CHE	CK SELF DIAGNOSTIC R	ESULT	
1. Star 2. Perf	orm self diagnostic result.	at approx. 30 km/h (19 MPH) or more for appro	x. 1 minute.
	C1105, C1106, C1107 or C		ure"
YES NO	>> Inspection End.	procedure. Refer to <u>BRC-87, "Diagnosis Proced</u>	uie.
Diagno	sis Procedure		INFOID:00000007418840
Regardi	ng Wiring Diagram informa	ation, refer to <u>BRC-117, "Wiring Diagram - TCS"</u>	
	N: check between wheel se	no or terminale	
	NECTOR INSPECTION		
		l electric unit (control unit) connector and whe	el sensor of malfunctioning
code 2. Che		on, disconnection, looseness or damage.	
	spection result normal?	sh, disconnection, looseness of damage.	
YES	>> GO TO 2		
	>> Repair or replace as n CK WHEEL SENSOR OU		(
		nsor tester (J-45741) to wheel sensor using app sensor tester power switch.	
NO1		should illuminate. If the POWER indicator does	a not illuminato, ronlago the
batte	ery in the ABS active whee	el sensor tester before proceeding.	
sens	sor tester. The red SENSC	by hand and observe the red SENSOR indicate R indicator should flash on and off to indicate a	
NO If th rete	e red SENSOR indicator	illuminates but does not flash, reverse the pola	arity of the tester leads and

### **BRC-87**

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

< DTC/CIRCUIT DIAGNOSIS >

#### Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-136. "Removal and Installation"</u>.

**3.**CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4

- NO >> Adjust air pressure, or replace tire.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6. "Inspection"</u> (front) or <u>RAX-6. "On-vehicle Service"</u> (rear). <u>Is the inspection result normal?</u>

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, <u>"Removal and Installation</u>" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1		No
2		ino ino

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		16	F10	1	Yes
		5	E19	2	
Front RH	E26	9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17	02	2	
Rear RH	_	8	C3	1	
		19	00	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Instal-</u><u>lation</u>".

NO >> Repair the circuit.

# Component Inspection

### **1.**CHECK DATA MONITOR

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

# **BRC-88**

INFOID:000000007418841

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

### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS]

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Nearly matches the speedometer display ( $\pm 10\%$ or less)
FR RH SENSOR	
RR LH SENSOR	
RR RH SENSOR	
s the inspection result normal?	·

<u>Is the inspection result normal?</u>

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-87, "Diagnosis Procedure"</u>.

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# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

# Description

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

### DTC Logic

INFOID:000000007418843

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### 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 voltage is lower than normal.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> </ul>

### DTC CONFIRMATION PROCEDURE

### **1.**CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC C1109 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-90, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000007418844

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-81, "CONSULT Function (ABS)"</u>.

#### Is DTC 1109 detected?

YES >> GO TO 2

NO >> Poor connection of connector terminals. 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.
- 4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx)	
Connector	Terminal			(Αρριοχ)	
E26	18		Ignition switch ON	Battery voltage	
E20	18	26 18 —	Ignition switch OFF	0V	

5. Turn ignition switch OFF.

[TCS/ABS]

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

#### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS]

6.	Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and	
	ground.	

ABS actuator and el	ectric unit (control unit)	Ground	Continuity	
Connector	Terminal			В
E26	1		Yes	
E20	4	—	Tes	С

Is the inspection result normal?

NO

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

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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# DTC C1110 CONTROL FAILURE

### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1110 CONTROL FAILURE

# **DTC Logic**

[TCS/ABS]

INFOID:000000007418845

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

### DTC CONFIRMATION PROCEDURE

# 1. CHECK SELF DIAGNOSTIC RESULT

#### (B) With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC C1110 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-92, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

### **Diagnosis** Procedure

INFOID:000000007418846

# **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 that applicable.

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> tion".

# DTC C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

# DTC C1111 PUMP MOTOR

# Description

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

MOTOR

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

# DTC Logic

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	Е
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for ac- tuator motor relay is open.		BRC
	PUMP MOTOR	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)	G
DTC CC	NFIRMATION PROCE	DURE		
<b>1.</b> CHEC	CK SELF DIAGNOSTIC R	ESULT		Н
With C	CONSULT.			
	the ignition switch OFF to orm self diagnostic result.	ON.		I
	C1111 detected?			
	>> Proceed to diagnosis   >> Inspection End.	procedure. Refer to <u>BRC-93, "Diagnosis Proced</u>	<u>ure"</u> .	J
Diagno	sis Procedure		INFOID:00000007418849	
				Κ
Regardir	ng Wiring Diagram informa	ation, refer to BRC-117, "Wiring Diagram - TCS"		
5	0 0 0			L
1.com	NECTOR INSPECTION			
1. Turn	ignition switch OFF.			M
3. Che	ck terminals for deformation	electric unit (control unit) connector. on, disconnection, looseness, and so on. If any	malfunction is found, repair	
	place terminals. Innect connector and per	orm self-diagnosis. Refer to <u>BRC-81, "CONSUL</u>	T Function (ABS)".	Ν
	C1111 detected?	<b>.</b>	· · · · ·	
	>> GO TO 2			$\bigcirc$
•		nnector terminals. Repair or replace connector.		0
		OTOR RELAY POWER SUPPLY CIRCUIT		
2. Disc	ck voltage between the A	electric unit (control unit) connector. BS actuator and electric unit (control unit) cor	nnector E26 terminal 2 and	Ρ

INFOID:000000007418847

INFOID:000000007418848

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# DTC C1111 PUMP MOTOR

### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS]

ABS actuator and ele	ectric unit (control unit)	Ground	Voltage	
Connector Terminal		Ground	(Approx)	
E26	2	_	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO

NO

>> • Repair or replace malfunctioning components.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and ele	ectric unit (control unit)	Ground	Continuity
Connector	Terminal		
E26	1		Yes
E20	4	—	162

### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> tion".
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### Component Inspection

INFOID:000000007418850

# **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

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

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-93. "Diagnosis Procedure"</u>.

# DTC C1114 MAIN RELAY

### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1114 MAIN RELAY

# Description

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

# DTC Logic

INFOID:000000007418852

### DTC DETECTION LOGIC

			1	
DTC	Display item	Malfunction detected condition	Possible cause	D
C1114 MAIN RELAY	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	E	
01114		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)	BRC
DTC CC	NFIRMATION PROCE	DURE		BRC
<b>1.</b> CHEC	K SELF DIAGNOSTIC R	ESULT		
( ) With C	ONSULT.			G
	the ignition switch OFF to orm self diagnostic result.	ON.		
	31114 detected?			Η
YES	>> Proceed to diagnosis	procedure. Refer to <u>BRC-95, "Diagnosis Proced</u>	lure".	
NO	>> Inspection End.			
Diagno	sis Procedure		INFOID:000000007418853	
				J
Regardin	g Wiring Diagram informa	ation, refer to <u>BRC-117, "Wiring Diagram - TCS"</u>		0
1.com	NECTOR INSPECTION			K
1. Turn	ignition switch OFF.			
		electric unit (control unit) connector. on, disconnection, looseness, and so on. If any	malfunction is found repair	L
or re	place terminals.	•		
	•	form self-diagnosis. Refer to <u>BRC-15, "CONSUI</u>	<u>_T Function (ABS)"</u> .	M
	pection result normal? >> GO TO 2			
-		nnector terminals. Repair or replace connector.		N
<b>2.</b> CHEC	K SOLENOID AND ACT	JATOR RELAY POWER SUPPLY CIRCUIT		IN
1. Turn	ignition switch OFF.			
2. Disc 3. Chec	onnect ABS actuator and	electric unit (control unit) connector.	E26 terminal 3 and ground	0
J. UIE	r vollage between ADS a		L20 terminal 3 and ground.	

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clouid	(Approx)	
E26	3		Battery voltage	

### Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **BRC-95**

[TCS/ABS]

INFOID:000000007418851

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# DTC C1114 MAIN RELAY

### < DTC/CIRCUIT DIAGNOSIS >

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal	Gibuna	Continuity
E26	1	—	Yes
	4		165

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> tion".
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### Component Inspection

INFOID:000000007418854

### **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

NO

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-93. "Diagnosis Procedure"</u>.

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

# Description

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

# **DTC Logic**

INFOID:000000007418856

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	<ul> <li>Harness or connector</li> <li>Wheel sensor</li> <li>ABS actuator and electric unit (control unit)</li> </ul>	E
DTC CC	NFIRMATION PROCEI	DURE		
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT	E	BRC
1. Start 2. Perfo <u>Is DTC C</u> YES	orm self diagnostic result. <u>21115 detected?</u> >> Proceed to diagnosis p	at approx. 30 km/h (19 MPH) or more for appro procedure. Refer to <u>BRC-97, "Diagnosis Proced</u>		G
	>> Inspection End.			
Diagno	sis Procedure		INFOID:000000007418857	
				I
Regardin	ng Wiring Diagram informa	tion, refer to <u>BRC-117. "Wiring Diagram - TCS"</u>		J
CAUTIO				
	heck between wheel ser	nsor terminals.		К
	NECTOR INSPECTION			
1. Disc code		electric unit (control unit) connector and whe	el sensor of malfunctioning	
		on, disconnection, looseness or damage.		L
	pection result normal?			
	>> GO TO 2			Μ
-	>> Repair or replace as n	•		
Z.CHEC	CK WHEEL SENSOR OUT	FPUT SIGNAL		
	on the ABS active wheel	nsor tester (J-45741) to wheel sensor using app sensor tester power switch.	ropriate adapter.	Ν
The batte	green POWER indicator	should illuminate. If the POWER indicator does		0
	or tester. The red SENSC	by hand and observe the red SENSOR indicate R indicator should flash on and off to indicate a		Р
	e red SENSOR indicator i	lluminates but does not flash, reverse the pola	arity of the tester leads and	
Does the	ABS active wheel sensor	tester detect a signal?		
-	>> GO TO 3			
-		. Refer to <u>BRC-136, "Removal and Installation"</u> .		
<b>3.</b> CHEC	CK TIRE			

INFOID:000000007418855

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# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS > Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4

NO >> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6</u>, "Inspection" (front) or <u>RAX-6</u>, "On-vehicle Service" (rear). <u>Is the inspection result normal?</u>

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, <u>"Removal and Installation</u>" (rear).

5.check wiring harness for short circuit

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1		No
2		INC

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

**6.**CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and ele	ctric unit (control unit)	Wheel	sensor	Continuity
Wheel Selisor	Connector	Terminal	Connector	Terminal	
Front LH		16 5 9	E19	1	Yes
Front LH				2	
Front RH			E41 C2	1	
	E26 10 6 17	10		2	
Rear LH		6		1	
		17	02	2	
Rear RH		8	C3	1	
		19	00	2	

#### Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Instal-</u><u>lation</u>".

NO >> Repair the circuit.

### Component Inspection

INFOID:000000007418858

# **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)

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS] FR LH SENSOR А FR RH SENSOR Nearly matches the speedometer display (±10% or less) **RR LH SENSOR RR RH SENSOR** В Is the inspection result normal? >> Inspection End. YES

>> Go to diagnosis procedure. Refer to BRC-87. "Diagnosis Procedure". NO

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### < DTC/CIRCUIT DIAGNOSIS >

# C1120, C1122, C1124, C1126 IN ABS SOL

### Description

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:000000007418860

INFOID:000000007418859

### 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 DIAGNOSTIC RESULT

#### With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-100, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

# **Diagnosis** Procedure

INFOID:000000007418861

Regarding Wiring Diagram information, refer to <u>BRC-117. "Wiring Diagram - TCS"</u>.

# **1**.CONNECTOR INSPECTION

### 1. Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-81, "CONSULT Function (ABS)"</u>.

### Is the inspection result normal?

YES >> GO TO 2

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

# 2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. 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) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clound	(Approx)	
E26	3	_	Battery voltage	

Is the inspection result normal?

# C1120, C1122, C1124, C1126 IN ABS SOL

### < DTC/CIRCUIT DIAGNOSIS >

### [TCS/ABS]

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#### YES >> GO TO 3 NO >> • Repair

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		ol unit) Ground Continuity		C
Connector	Terminal	Glound	Continuity	0
E26	1		Yes	
	4	—	105	D

#### Is the inspection result normal?

YES	>> • Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139, "Removal and Installa-</u>
	tion".
	• Derform the colf diagnosis, and make sure that the result shows "NO DTC IS DETECTED"

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
   >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### Component Inspection

INFOID:000000007418862

# **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.

#### NOTE:

NO

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Nate)	ABS solenoid valve			
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

\*: ON for 1 to 2 seconds after the touch, and then OFF.

#### 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-100, "Diagnosis Procedure"</u>.

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# C1121, C1123, C1125, C1127 OUT ABS SOL

### < DTC/CIRCUIT DIAGNOSIS >

# C1121, C1123, C1125, C1127 OUT ABS SOL

### Description

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:000000007418864

INFOID:000000007418863

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

### 1.CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-102. "Diagnosis Procedure"</u>.
- NO >> Inspection End.

# **Diagnosis** Procedure

INFOID:000000007418865

Regarding Wiring Diagram information, refer to BRC-117. "Wiring Diagram - TCS".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-15. "CONSULT Function (ABS)"</u>.

### Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2

2. CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. 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) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage
Connector	Terminal	Ground	(Approx)
E26	3	_	Battery voltage

Is the inspection result normal?

# C1121, C1123, C1125, C1127 OUT ABS SOL

### < DTC/CIRCUIT DIAGNOSIS >

### [TCS/ABS]

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#### YES >> GO TO 3 NO >> • Repair

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		(control unit) Ground Continuity		C
Connector	Terminal	Gibuna	Continuity	0
E26	1		Yes	
⊏20	4	—	Tes	D

#### Is the inspection result normal?

YES	>> • Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139, "Removal and Installa-</u>
	tion".
	• Derform the colf diagnosis, and make sure that the result shows "NO DTC IS DETECTED"

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
   >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### Component Inspection

INFOID:000000007418866

# **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.

#### NOTE:

NO

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Nate)	ABS solenoid valve			
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

\*: ON for 1 to 2 seconds after the touch, and then OFF.

#### 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-102, "Diagnosis Procedure"</u>.

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# C1130, C1131, C1132, C1133 ENGINE SIGNAL

### < DTC/CIRCUIT DIAGNOSIS >

# C1130, C1131, C1132, C1133 ENGINE SIGNAL

### Description

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

### DTC Logic

INFOID:000000007418868

INFOID:000000007418867

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1		Harness or connector
C1131	ENGINE SIGNAL 2	Major engine components are malfunctioning.	<ul> <li>ABS actuator and electric unit (control unit)</li> </ul>
C1132	ENGINE SIGNAL 3		• ECM
C1133	ENGINE SIGNAL 4		CAN communication line

### DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

() With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

Is DTC C1130, C1131, C1132, C1133 or C1136 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-104</u>, "<u>Diagnosis Procedure</u>". NO >> Inspection End.

# Diagnosis Procedure

INFOID:000000007418869

# 1.CHECK ENGINE SYSTEM

- Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to <u>EC-99, "CONSULT Function"</u> (QR25DE), <u>EC-422, "CONSULT Function"</u> (VQ35DE).
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-81, "CONSULT Func-</u> tion (ABS)".

### Is the inspection result normal?

- YES >> Inspection end. NO >> • Repair or repl
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### < DTC/CIRCUIT DIAGNOSIS >

# U1000 CAN COMM CIRCUIT

# Description

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

# DTC Logic

INFOID:000000007418871

### 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 system malfunction	В
DTC CC	NFIRMATION PROCE	DURE		
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT		
1. Turn 2. Perf	CONSULT. the ignition switch OFF t orm self diagnostic result. J1000 detected?			
YES		procedure. Refer to <u>BRC-105, "Diagnosis Proce</u>	edure".	
Diagno	sis Procedure		INFOID:00000007418872	
1.com	NECTOR INSPECTION			
<ol> <li>Disc</li> <li>Che</li> </ol>		electric unit (control unit) connector. on, disconnection, looseness, and so on. If any	malfunction is found, repair	
		form self diagnostic result. Refer to <u>BRC-81, "Co</u>	ONSULT Function (ABS)".	
YES	<u>J1000 detected?</u> >> Refer to <u>LAN-15, "Tro</u> >> Inspection End.	uble Diagnosis Flow Chart".		ſ

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### < DTC/CIRCUIT DIAGNOSIS >

# STOP LAMP SWITCH

### Description

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

# Component Function Check

# **1.**CHECK DATA MONITOR

On "DATA MONITOR", select "STOP LAMP SW" and check the stop lamp switch signal.

Condition	STOP LAMP SW (DATA MONITOR)
Brake pedal depressed.	On
Brake pedal released.	Off

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-106, "Diagnosis Procedure"</u>.

### **Diagnosis** Procedure

INFOID:000000007418875

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

# **1**.CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to <u>BRC-107</u>, <u>"Component Inspection (Stop Lamp Switch)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace stop lamp switch.

2.CHECK STOP LAMP RELAY-1

Perform the stop lamp relay-1 component inspection. Refer to <u>BRC-107</u>, "Component Inspection (Stop Lamp <u>Relay)</u>".

Is the inspection result normal?

YES >> GO TO 3

NO >> Replace stop lamp relay-1.

**3.**CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

- 1. Connect stop lamp switch and stop lamp relay-1 connectors.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			(Appiox.)
E26	20		Brake pedal depressed	Battery voltage
Ezo	20	0 —	Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> tion".

NO >> GO TO 4

Revision: February 2013

INFOID:000000007418873

INFOID:000000007418874

# **STOP LAMP SWITCH**

### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS]

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# 4. CHECK STOP LAMP RELAY-1 COIL CIRCUIT

- 1. Disconnect stop lamp relay-1 connector.
- 2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lam	ip relay-1	Cround	Condition	Voltage	-
Connector	Terminal	Ground	Condition	(Approx.)	
E57	1		Brake pedal depressed	Battery voltage	С
E37	I	—	Brake pedal released	0V	-

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

# 5. CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

				DINO
Stop lamp relay-1		Ground	Voltage	
Connector	Terminal		(Approx.)	0
E57	5	_	Battery voltage	G

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair circuit between fuse block J/B and stop lamp relay.

# 6.CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

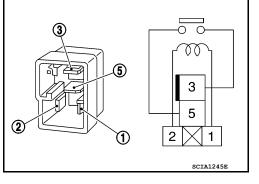
Stop lamp relay-1		Ground	Continuity
Connector	Terminal	Ground Continuity	Continuity
E57	2	_	Yes
NO >> Repair Component Ins 1.CHECK STOP L 1. Turn ignition sw 2. Disconnect stop	circuit between st stop lamp relay g pection (Stop AMP SWITCH vitch OFF. o lamp switch con	Lamp Switch)	electric unit (control unit).
Stop lamp switc	h terminals	Condition	Continuity
4 0		rake pedal depressed.	Yes
1 – 2		rake pedal depressed. rake pedal released.	Yes No

# **STOP LAMP SWITCH**

### < DTC/CIRCUIT DIAGNOSIS >

### [TCS/ABS]

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp relay connector.
- 3. Apply battery voltage to stop lamp relay terminal 1 and ground to terminal 2.
- 4. Check continuity between stop lamp relay terminals 3 and 5.



Stop lamp relay terminals	Condition	Continuity
3 – 5	Battery voltage applied to terminal 1 and ground to terminal 2	Yes
	Voltage and ground removed	No

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Replace stop lamp relay.

### **ABS WARNING LAMP**

### < DTC/CIRCUIT DIAGNOSIS >

### ABS WARNING LAMP

### Description

INFOID:000000007418878

[TCS/ABS]

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Condition	×: ON –: OFF
Condition	ABS warning lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	
ABS function is malfunctioning.	×
EBD function is malfunctioning.	X
Component Function Check	INFOID:000000007418879
CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 2 se	econds after the ignition switch is turned ON
s the inspection result normal?	sconds after the ignition switch is tarried on.
YES >> Inspection End	
NO >> Go to diagnosis procedure. Refer to <u>BRC</u>	<u>-109, "Diagnosis Procedure"</u> .
Diagnosis Procedure	INFOID:000000007418880
.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) <u>ABS)</u> ".	self-diagnosis. Refer to <u>BRC-81, "CONSULT Function</u>
s the inspection result normal?	
YES >> GO TO 2	
NO >> Check items displayed by self-diagnosis.	
CHECK COMBINATION METER	
	meter are normal. Refer to MWI-28, "Diagnosis Descrip-
ion".	
s the inspection result normal? YES >> Replace ABS actuator and electric unit (	control unit) Defer to PDC 120 "Demovel and Installe
tion".	control unit). Refer to <u>BRC-139, "Removal and Installa-</u>
	er to MWI-139, "Removal and Installation".
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	
NO >> Repair or replace combination meter. Ref	

### **BRAKE WARNING LAMP**

#### < DTC/CIRCUIT DIAGNOSIS >

### BRAKE WARNING LAMP

### Description

INFOID:000000007418881

[TCS/ABS]

×: ON –: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
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:000000007418882

### **1.**BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to <u>BRC-110, "Diagnosis Procedure"</u>.

### 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 lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> Inspection End

NO >> Check parking brake switch. Refer to <u>BR-13, "Inspection and Adjustment"</u>.

#### Diagnosis Procedure

INFOID:000000007418883

#### 1. CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> GO TO 2

NO >> Check parking brake switch. Refer to <u>BR-13</u>, "Inspection and Adjustment".

2. CHECK SELF-DIAGNOSIS RESULT

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-81, "CONSULT Function</u> (<u>ABS)"</u>.

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 <u>MWI-28</u>, "Diagnosis Description".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> <u>tion</u>".
- NO >> Repair or replace combination meter. Refer to <u>MWI-139</u>, "Removal and Installation".

### **TCS OFF SWITCH**

### < DTC/CIRCUIT DIAGNOSIS >

### TCS OFF SWITCH

### Description

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

Component Function Check

### 1.CHECK TCS OFF SWITCH OPERATION

Press and release the TCS OFF switch, then press and release the TCS OFF switch again and check that the TCS OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	TCS OFF indicator lamp illumination status			
TCS OFF switch: pressed and re- leased	ON			E
TCS OFF switch: pressed and re- leased	OFF			
Is the inspection result normal?	2			BRC
YES >> Inspection End. NO >> Go to diagnosis pr	ocedure. Refer to <u>BRC-111, "Diagnosis</u>	Procedure".		G
Diagnosis Procedure			INFOID:000000007418886	0
				Н
Regarding Wiring Diagram info	rmation, refer to <u>BRC-117, "Wiring Diac</u>	<u>gram - TCS"</u> .		
1. CHECK TCS OFF SWITCH				I
Derform the TCS OFF switch a	omnonant increation Defer to PDC 11	2 "Component Inc	naction"	

Perform the TCS OFF switch component inspection. Refer to <u>BRC-112, "Component Inspection"</u>. Is the inspection result normal?

YES >> GO TO 2

NO >> Replace TCS OFF switch.

**2.**CHECK TCS OFF SWITCH HARNESS

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

2. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 13 and TCS OFF switch connector M72 terminal 1.

ABS actuator and ele	ctric unit (control unit)	TCS OF	FF switch	Continuity	M
Connector	Terminal	Connector	Terminal		
E26	13	M72	1	Yes	

 Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 13 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity	
Connector	Terminal	Ground	Continuity	
E26	13	—	No	Р

#### Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK TCS OFF SWITCH GROUND

Check continuity between TCS OFF switch connector M72 terminal 2 and ground.

[TCS/ABS]

INFOID:000000007418884

INFOID:000000007418885

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### **TCS OFF SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

[TCS/ABS]

INFOID:000000007418887

TCS OF	TCS OFF switch Ground Continuity		
Connector	Terminal	Ground	Continuity
M72	2	—	Yes

Is the inspection result normal?

YES >> Inspection end.

NO >> Repair or replace malfunctioning components.

### Component Inspection

### 1.CHECK TCS OFF SWITCH

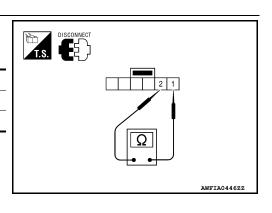
- 1. Disconnect TCS OFF switch connector.
- 2. Check continuity between TCS OFF switch terminals.

TCS OFF switch terminals	Condition	Continuity
1. 2	TCS OFF switch pressed	Yes
1, 2	TCS OFF switch released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace TCS OFF switch.



### SLIP INDICATOR LAMP

### < DTC/CIRCUIT DIAGNOSIS >

### SLIP INDICATOR LAMP

### Description

INFOID:000000007418888

[TCS/ABS]

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Condition	SLIP indicator lamp
Ignition switch OFF	
For 2 seconds after turning ON ignition switch	
2 seconds later after turning ON ignition switch	×
VDC/TCS function is malfunctioning.	
ABS function is malfunctioning.	× ×
BD function is malfunctioning.	
	*
Component Function Check	INFOID:00000000741888
.CHECK SLIP INDICATOR LAMP OPERATION	
heck that the lamp illuminates for approximately 2 se	econds after the ignition switch is turned ON.
the inspection result normal?	č
YES >> Inspection End	
NO >> Go to diagnosis procedure. Refer to <u>BRC</u>	2-113, "Diagnosis Procedure".
Diagnosis Procedure	INFOID:00000000741889
.CHECK SELF DIAGNOSTIC RESULT	
	elf diagnostic result. Refer to <u>BRC-81, "CONSULT Func</u>
<u>on (ABS)"</u> .	elf diagnostic result. Refer to <u>BRC-81, "CONSULT Func</u>
on (ABS)".	elf diagnostic result. Refer to <u>BRC-81, "CONSULT Func</u>
<u>on (ABS)"</u> .	
on (ABS)". <u>s the inspection result normal?</u> YES >> GO TO 2	
on (ABS)". the inspection result normal? YES >> GO TO 2 NO >> Check items displayed by self diagnostic CHECK COMBINATION METER	result. Refer to <u>BRC-115, "DTC No. Index"</u> .
on (ABS)". <u>s the inspection result normal?</u> YES >> GO TO 2 NO >> Check items displayed by self diagnostic CHECK COMBINATION METER Check if the indication and operation of combination n	result. Refer to <u>BRC-115, "DTC No. Index"</u> .
on (ABS)". the inspection result normal? YES >> GO TO 2 NO >> Check items displayed by self diagnostic CHECK COMBINATION METER Check if the indication and operation of combination n the inspection result normal?	result. Refer to <u>BRC-115, "DTC No. Index"</u> . meter are normal. Refer to <u>MWI-4, "Work Flow"</u> .
on (ABS)". the inspection result normal? YES >> GO TO 2 NO >> Check items displayed by self diagnostic CHECK COMBINATION METER Check if the indication and operation of combination mathematication for the inspection result normal? YES >> Replace ABS actuator and electric unit ( tion".	result. Refer to <u>BRC-115, "DTC No. Index"</u> . meter are normal. Refer to <u>MWI-4, "Work Flow"</u> . (control unit). Refer to <u>BRC-139, "Removal and Installa</u>
on (ABS)". the inspection result normal? YES >> GO TO 2 NO >> Check items displayed by self diagnostic CHECK COMBINATION METER Check if the indication and operation of combination no the inspection result normal? YES >> Replace ABS actuator and electric unit (	result. Refer to <u>BRC-115, "DTC No. Index"</u> . meter are normal. Refer to <u>MWI-4, "Work Flow"</u> . (control unit). Refer to <u>BRC-139, "Removal and Installa</u>
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< ECU DIAGNOSIS INFORMATION >

[TCS/ABS]

### ECU DIAGNOSIS INFORMATION ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000007418891

#### 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 mo	nitor
Monitor item	Display content	Condition	Reference value in normal operation
FR LH SENSOR		0 [km/h]	Vehicle stopped
FR RH SENSOR RR LH SENSOR RR RH SENSOR	Wheel speed	Nearly matches the speed meter display ( $\pm$ 10 % or less)	Vehicle running (Note 1)
STOP LAMP SW	Brake pedal operation	When brake pedal is de- pressed	ON
STOP LAWF 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
		TCS OFF switch ON (When TCS OFF indica- tor lamp is ON)	ON
OFF SW TCS OFF switch ON/OFF	TCS OFF switch OFF (When TCS OFF indica- tor lamp is OFF)	OFF	
		With engine stopped	0 rpm
ENGINE RPM	With engine running	Engine running	Almost in accor- dance with tachome- ter display
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL	FR LH OUT SOL FR RH IN SOL	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	ON
RR LH OUT SOL RR RH IN SOL RR RH OUT SOL		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	OFF
		When the motor relay and motor are operating	ON
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operat- ing	OFF
ACTUATOR RLY	Actuator rolay operation	When the actuator relay is operating	ON
(Note 2)	Actuator relay operation	When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
	(Note 3)	When ABS warning lamp is OFF	OFF

#### < ECU DIAGNOSIS INFORMATION >

			nitor	٨
Monitor item	Display content	Condition	Reference value in normal operation	A
OFF LAMP	TCS OFF indicator lamp	When TCS OFF indica- tor lamp is ON	ON	В
	(Note 3)	When TCS OFF indica- tor lamp is OFF	OFF	
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is ON	ON	С
	(Note 3)	When SLIP indicator lamp is OFF	OFF	D

Note 1: Confirm tire pressure is normal.

Note 2: 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.

Note 3: On and off timing for warning lamp and indicator lamp. Refer to BRC-81, "CONSULT Function (ABS)".

#### Fail-Safe

INFOID:000000007418892

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[TCS/ABS]

#### ABS, EBD SYSTEM

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

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

#### TCS

In case of malfunction in the TCS/ABS system, TCS OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without TCS control.

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

#### DTC No. Index

INFOID:000000007418893

Display item	Malfunction detecting condition	Check item	ЪЛ
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is out- side the standard.		IVI
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	BRC-84, "Diagno- sis Procedure"	Ν
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	(Note)	0
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		0

#### < ECU DIAGNOSIS INFORMATION >

#### [TCS/ABS]

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	BRC-87. "Diagno- sis Procedure"
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	(Note)
FR LH SENSOR- 2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-90, "Diagno- sis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-92, "Diagno- sis Procedure"
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.	BRC-93. "Diagno-
[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.	sis Procedure"
MAIN RELAY [C1114]	Actuator solenoid valve relay is ON, even if control unit sends OFF signal. Actuator solenoid valve relay is OFF, even if control unit sends ON signal.	BRC-95. "Diagno- sis Procedure"
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-97, "Diagno- sis Procedure"
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-100, "Diagno- sis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-102, "Diagno- sis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-100, "Diagno- sis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-102, "Diagno- sis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-100, "Diagno- sis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-102, "Diagno- sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-100, "Diagno- sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-102, "Diagno- sis Procedure"
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.	
ENGINE SIGNAL 2 [C1131]	Electric throttle control abnormal.	BRC-104, "Diagno-
ENGINE SIGNAL 3 [C1132]	ECM CAN communication abnormal.	sis Procedure"
ENGINE SIGNAL 4 [C1133]	ECM communication to ABS actuator and electric unit (control unit) abnormal.	
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-105, "Diagno- sis Procedure"

Note: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage.

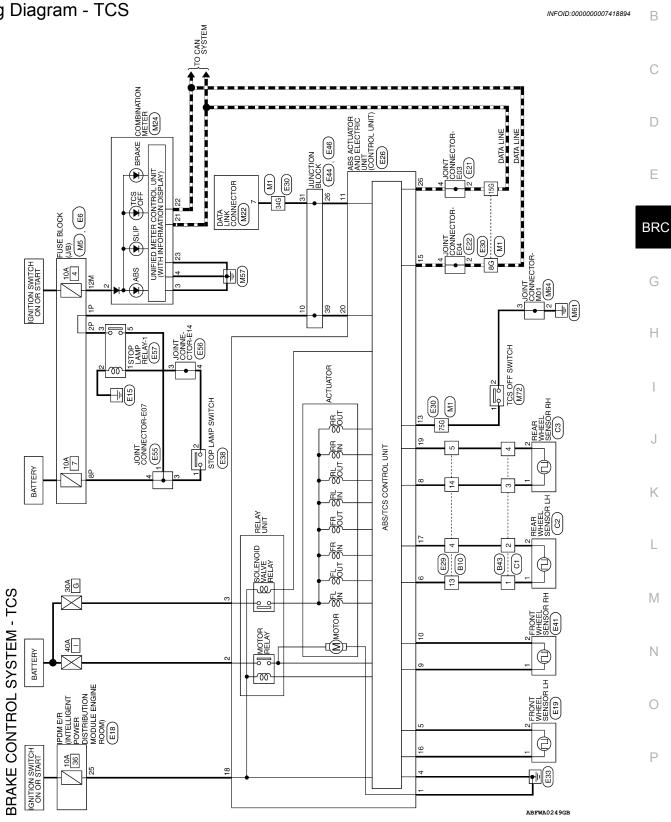
[TCS/ABS]

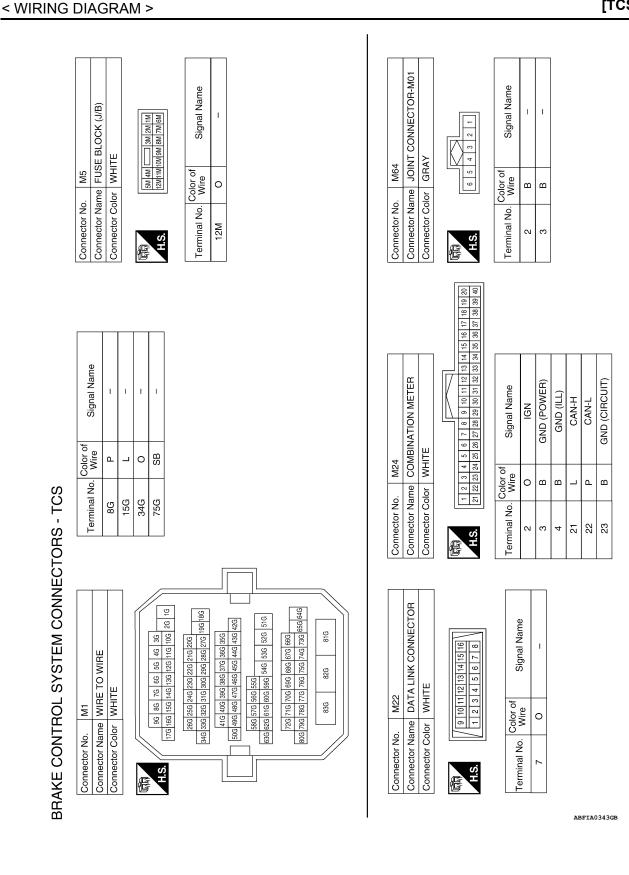
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### < WIRING DIAGRAM > WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram - TCS





### BRAKE CONTROL SYSTEM

Revision: February 2013

### **BRAKE CONTROL SYSTEM**

< WIRING DIAGRAM >

FUSE BLOCK (J/B)

Connector Name

Connector Name TCS OFF SWITCH

M72

Connector No.

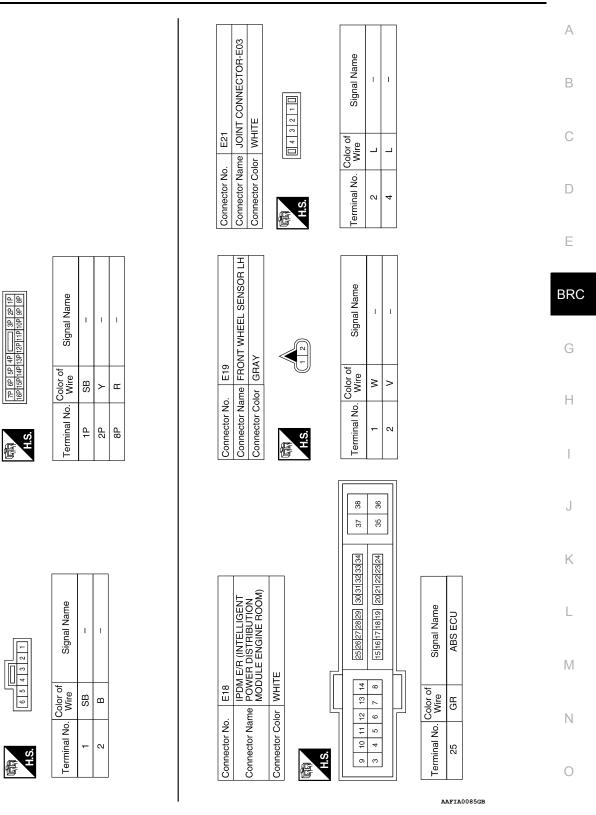
Connector Color GRAY

E6

Connector No.

Connector Color WHITE

[TCS/ABS]



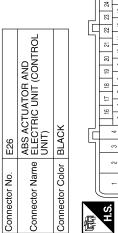
Signal Name	DP FR	DS FR	DIAG-K	I	ASR AUS (TCS)	I	CAN-L	DP FL	DS RL	ZN	DS RR	BLS	I	I	I	

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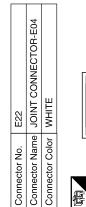
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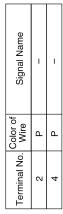
Color of Wire	В	ГG	GR	I	œ	Ι	٩	×	0	GR	BR	SB	-	Η	I	-	Η	Γ
Terminal No.	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
						81 H												



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	Signal Name	MGND	UB (MR)	UB (VR)	GND	DS FL	DP RL	I	DP RR
_	Color of Wire	в	σ	н	В	>	თ	I	_
	Terminal No. Color of Wire	٢	2	3	4	5	9	7	8







	Ë		2 1 9 8
E29	WIRE TO WIF	WHITE	7 6 5 4 3 3 16 15 14 13 12 11 10
Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE	H.S.

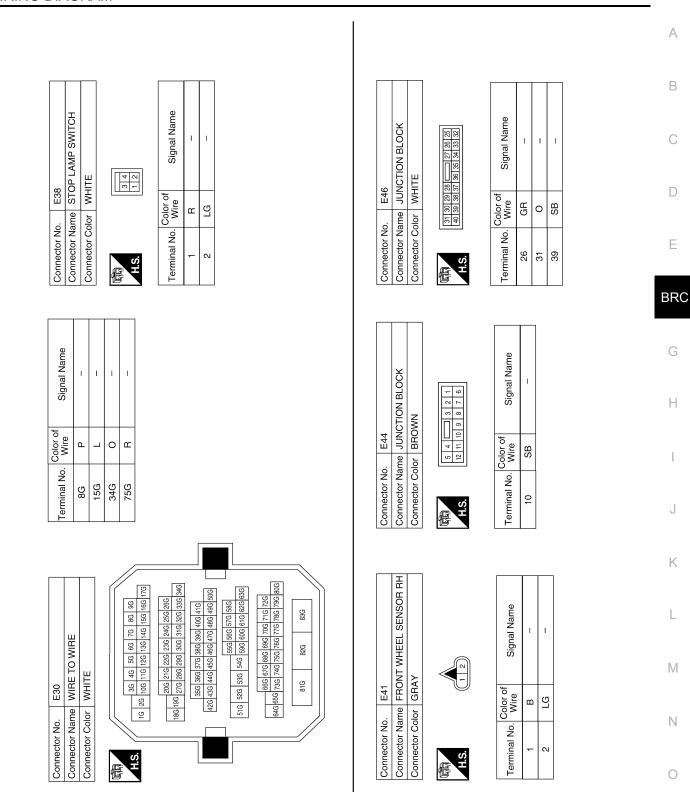
/ 0 3 4 5 14 13 12 11 11
- 11

Signal Name	-	I	-	I
Color of Wire	0	BR	g	L
Terminal No.	4	5	13	14

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### BRAKE CONTROL SYSTEM

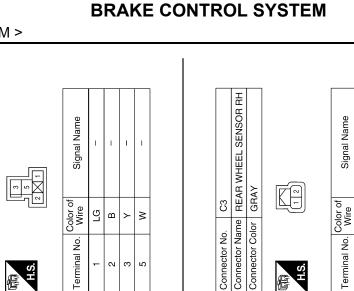
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[TCS/ABS]

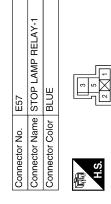
Revision: February 2013

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#### < WIRING DIAGRAM >



Connector Name JOINT CONNECTOR-E14

E56

Connector No.

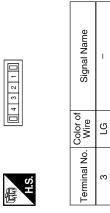
Connector Color WHITE



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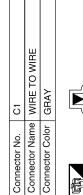
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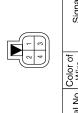


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Connector No.	E55
Connector Name	Connector Name JOINT CONNECTOR-E07
Connector Color WHITE	WHITE
」 で	043210

Signal Name	-	-	I
Color of Wire	M	В	щ
Terminal No.	٢	3	4





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	Signal Name	I	I	I	I
	Color of Wire	ŋ	0	ГG	BR
	Terminal No. Wire	ŀ	2	З	4

Signal Name

Color of Wire

Terminal No.

Signal Name

Color of Wire

Terminal No.

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Connector Color GRAY

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Connector No.

Connector Name REAR WHEEL SENSOR LH

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Connector No.

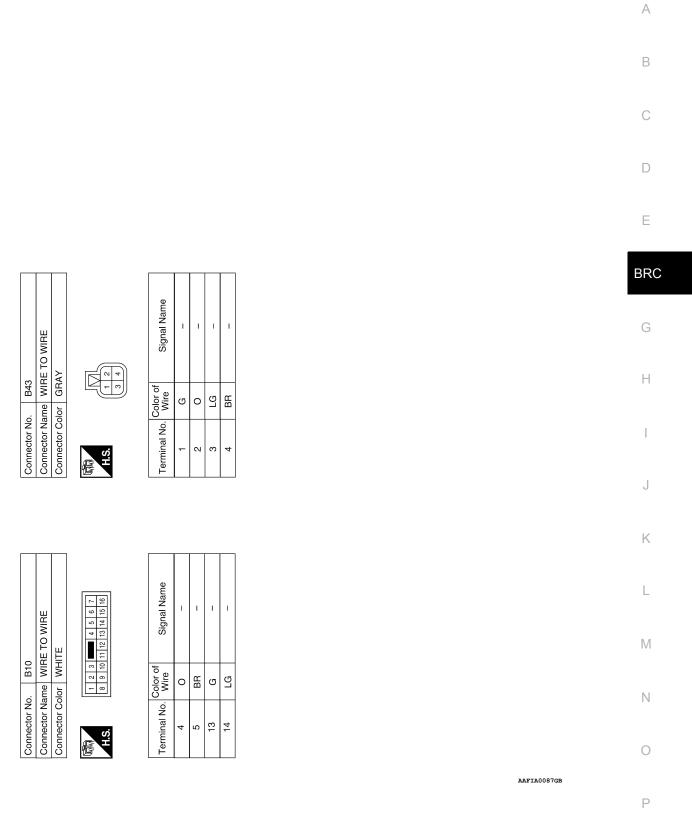
Connector Color BLACK

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### SYMPTOM DIAGNOSIS TCS

### Symptom Table

INFOID:000000007418895

[TCS/ABS]

If ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation fre- quency	Looseness of front and rear axle	BRC-125, "Diag- nosis Procedure"
400.00	Wheel sensor and rotor system	<u>1100101110000010</u>
Uppypaged podal reaction	Brake pedal stroke	BRC-126, "Diag-
Unexpected pedal reaction	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-127, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-128, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-129, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
Vehicle jerks during TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-130, "Diag-
Vehicle jerks during TCS/ABS control	ECM	nosis Procedure"

#### NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: 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]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
< SYMPTOM DIAGNOSIS > [TCS/ABS	;]
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
Diagnosis Procedure	
1.CHECK START	
Check front and rear brake force distribution using a brake tester.	_
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. Refer to front: <u>FAX-6, "Inspection"</u> , Rea <u>RAX-6, "On-vehicle Service"</u> .	r:
Is the inspection result normal?	
YES >> GO TO 3	
NO >> Repair or replace malfunctioning components.	
3. CHECK WHEEL SENSOR AND SENSOR ROTOR	В
<ul> <li>Check the following.</li> <li>Wheel sensor installation for damage.</li> <li>Sensor rotor installation for damage.</li> <li>Wheel sensor connector connection.</li> <li>Wheel sensor harness inspection.</li> </ul>	(
Is the inspection result normal?	
<ul> <li>YES &gt;&gt; GO TO 4</li> <li>NO &gt;&gt; • Replace wheel sensor or sensor rotor. Refer to <u>BRC-136</u>, "<u>Removal and Installation</u>" or <u>BRC 138</u>, "<u>Removal and Installation</u>".</li> <li>• Repair harness.</li> </ul>	2-
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 inspection result normal?	
YES >> System normal.	
NO >> Perform self-diagnosis. Refer to <u>BRC-15, "CONSULT Function (ABS)"</u> .	
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### UNEXPECTED PEDAL REACTION

Diagnosis Procedure

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[TCS/ABS]

### 1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-13, "Inspection and Adjustment".

Is the stroke too big?

- YES >> Bleed air from brake tube and hose. Refer to <u>BR-16. "Bleeding Brake System"</u>.
  - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: <u>BR-13</u>, "<u>Inspection and Adjustment</u>", brake booster: <u>BR-9, "Inspection"</u> and master cylinder: <u>BR-10, "On Board Inspection"</u>.

NO >> GO TO 2.

2.CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is normal in this condition.Connect connector after inspection.

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Check brake system.

### THE BRAKING DISTANCE IS LONG

**Diagnosis** Procedure

#### **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 >> Inspection End.

NO >> Check brake system. INFOID:000000007418898

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### 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 >> Inspection End.

NO >> Perform self-diagnosis. Refer to <u>BRC-81, "CONSULT Function (ABS)"</u>.

INFOID:000000007418899

[TCS/ABS]

2012 Altima GCC

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS         < SYMPTOM DIAGNOSIS >       [TCS/ABS]         PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS	
Diagnosis Procedure	A
<ul> <li>CAUTION:</li> <li>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.</li> <li>When shifting gears</li> <li>When driving on slippery road</li> <li>During cornering at high speed</li> <li>When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]</li> <li>When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]</li> <li>1.SYMPTOM CHECK 1</li> </ul>	E
Check that there are pedal vibrations when the engine is started. Do symptoms occur?	E
YES >> GO TO 2 NO >> Inspect the brake pedal. 2.SYMPTOM CHECK 2	BI
Check that there are ABS operation noises when the engine is started. <u>Do symptoms occur?</u>	(
YES $>>$ GO TO 3 NO $>>$ Perform self diagnostic result. Refer to <u>BRC-81, "CONSULT Function (ABS)"</u> . <b>3.</b> SYMPTOM CHECK 3	ŀ
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 >> Inspection End.	,
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### VEHICLE JERKS DURING TCS/ABS CONTROL

Diagnosis Procedure

[TCS/ABS]

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**1**.SYMPTOM CHECK

Check if the vehicle jerks during TCS/ABS control.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnostic of ABS actuator and electric unit (control unit). Refer to <u>BRC-81</u>, "CONSULT Function (ABS)".

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

• 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. NO >> GO TO 4

**4.**CHECK ECM AND CVT SELF-DIAGNOSIS RESULTS

Perform ECM and CVT self-diagnosis. Refer to <u>EC-422, "CONSULT Function"</u> or <u>TM-123, "CONSULT Func-</u> tion (TRANSMISSION)".

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
  - ECM: Refer to <u>EC-422, "CONSULT Function"</u>.
  - CVT: Refer to <u>TM-123, "CONSULT Function (TRANSMISSION)"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-139</u>, "<u>Removal and Installa-</u> tion".

### NORMAL OPERATING CONDITION

#### < SYMPTOM DIAGNOSIS >

### NORMAL OPERATING CONDITION

### Description

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[TCS/ABS]

Symptom	Result		
Slight vibrations are felt on the brake pedal and the operation noises occur, when 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 condi- tion due to the TCS or ABS activation.		
The brake pedal moves and generates noises, when TCS is activated due to rapid acceleration or sharp turn.			
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.	D	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	E	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	BR	
The ABS warning 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-		
The ABS warning lamp, TCS 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 that time, erase the self- diagnosis memory.	G	
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 TCS function before performing an inspec- tion on a chassis dyna- mometer.)	H	
TCS OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a TCS sys- tem error but results from characteristic change of tire.	J	

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# < PRECAUTION > PRECAUTION PRECAUTIONS

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section 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 SR section.
- 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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

#### WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

#### Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

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#### NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

#### OPERATION PROCEDURE

1. Connect both battery cables. **NOTE:** 

Supply power using jumper cables if battery is discharged.

- 2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.

### PRECAUTIONS

### < PRECAUTION >

- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
- Perform self-diagnosis check of all control units using CONSULT.

### Precaution for Brake System

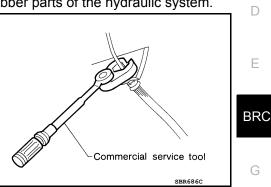
- Recommended fluid is brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- · Use a flare nut wrench when removing flare nuts, and use a flare nut torgue wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- · Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- · Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

#### WARNING:

#### Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

#### Precaution for Brake Control

- Just after starting vehicle after ignition switch ON, 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 simple 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.
- 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.). Μ
- When driving with worn or deteriorated suspension, tires and brake-related parts.



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[TCS/ABS]

### PREPARATION PREPARATION

### Special Service Tool

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[TCS/ABS]

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
 (J-45741) ABS active wheel sensor tester	J-15741.BOX	Checking operation of ABS active wheel sensor

### **Commercial Service Tool**

Tool name		Description
<ol> <li>Flare nut crowfoot</li> <li>Torque wrench</li> </ol>		Removing and installing brake piping a: 10mm (0.39 in)/12mm (0.47 in)
	S-NT360	

### < REMOVAL AND INSTALLATION >

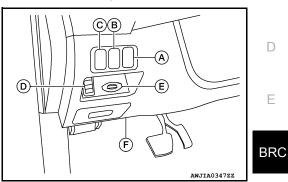
## REMOVAL AND INSTALLATION TCS OFF SWITCH

#### REMOVAL

- 1. Remove instrument lower cover to access the TCS OFF switch. Refer to IP-11. "Exploded View".
- 2. Disconnect the following harness connectors to remove from the instrument lower cover:
  - Headlamp aiming (A)
  - Rear sonar system off switch (B)
  - TCS OFF (C)
  - Trunk release (D)
  - Key slot (E)
  - Diagnostic connector (F)
  - Aspirator tube
- 3. Remove TCS OFF switch from the back of the instrument lower cover

#### INSTALLATION

Installation is in the reverse order of removal.



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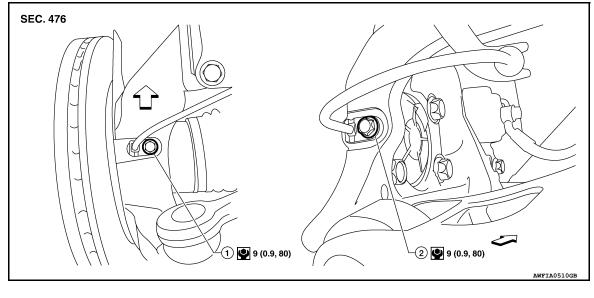
#### < REMOVAL AND INSTALLATION >

### WHEEL SENSORS

### Removal and Installation

INFOID:000000007418910

[TCS/ABS]



1. Front wheel sensor 2. Rear wheel sensor <

#### **CAUTION:**

- Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Before installation, check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole in the wheel hub for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the wheel sensor.

#### FRONT WHEEL SENSOR

#### Removal

- 1. Remove front wheel and tire. Refer to WT-68, "Adjustment".
- 2. Partially remove front wheel fender protector. Refer to <u>EXT-22</u>, "Removal and Installation" (Coupe), <u>EXT-46</u>, "Removal and Installation" (Sedan).
- 3. Remove wheel sensor bolt and wheel sensor.
- 4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

Installation

Installation is in the reverse order of removal.

#### REAR WHEEL SENSOR

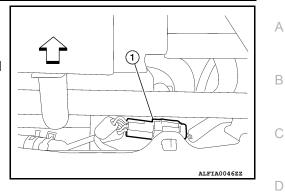
#### Removal

1. Remove rear wheel and tire. Refer to WT-68, "Adjustment".

### WHEEL SENSORS

#### < REMOVAL AND INSTALLATION >

- 2. Disconnect wheel sensor harness connector (1).
  - < : Front
- 3. Remove harness wire clips from rear suspension member.
- 4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



[TCS/ABS]

Installation Installation is in the reverse order of removal.



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< REMOVAL AND INSTALLATION >

### SENSOR ROTOR

### Removal and Installation

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

#### < REMOVAL AND INSTALLATION >

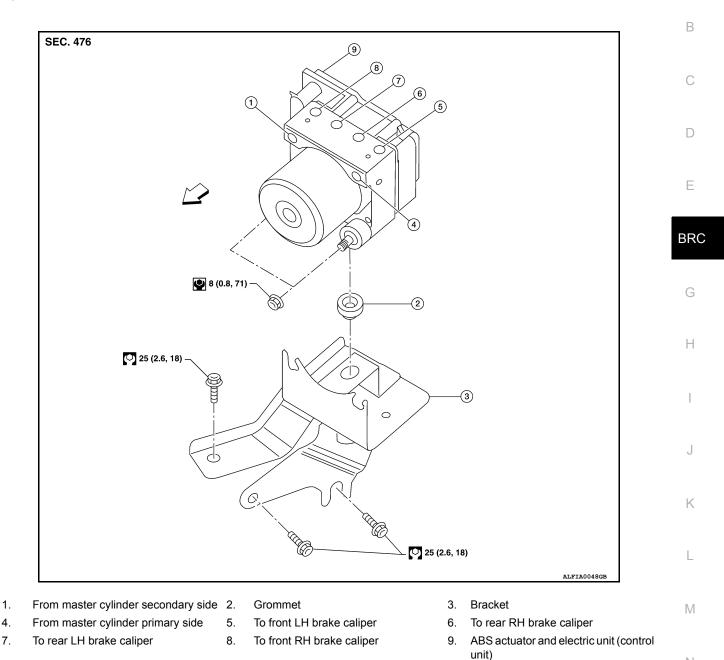
### ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### Exploded View

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[TCS/ABS]



← Front

#### **Removal and Installation**

#### **CAUTION:**

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (flare nut torque wrench).
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install ABS actuator and electric unit (control unit) by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-16, "Bleeding Brake System"</u>.
- After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.

#### **BRC-139**

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< REMOVAL AND INSTALLATION >

#### REMOVAL

#### NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

- 1. Remove cowl top. Refer to <u>EXT-21, "Removal and Installation"</u> (Coupe), <u>EXT-45, "Removal and Installa-</u> <u>tion"</u> (Sedan).
- 2. Disconnect washer hose.
- 3. Disconnect the battery negative terminal.
- 4. Remove strut tower bar, if equipped. Refer to <u>FSU-14</u>, "Exploded View".
- 5. Disconnect ABS actuator and electric unit (control unit) connector.
- 6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit) using a suitable tool.
- 7. Remove ABS actuator and electric unit (control unit) nuts.
- 8. Remove ABS actuator and electric unit (control unit).
- 9. Remove bracket as necessary.

#### INSTALLATION

Installation is in the reverse order of removal.

Torque brake lines to proper specifications. Refer to BR-18, "Hydraulic Circuit".

< BASIC INSPECTION >	
BASIC INSPECTION	
DIAGNOSIS AND REPAIR WORKFLOW	
Work Flow	INFOID:000000007418914
1.COLLECT INFORMATION FROM THE CUSTOMER	
Get detailed information from the customer about the symptom (the condition and t incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-142</u> , "D	he environment when the iagnostic Work Sheet".
>> GO TO 2.	
<b>2.</b> PERFORM SELF DIAGNOSTIC RESULT	
Perform self diagnostic result. Refer to <u>BRC-158</u> , "CONSULT Function (ABS)".	
Are any DTCs displayed?	
YES >> Refer to <u>BRC-220, "DTC No. Index"</u> . NO >> GO TO 3.	
3. CHECK SYMPTOM OPERATING CONDITION	
Check that the symptom is a normal operating condition. Refer to BRC-248, "Description of the symptom is a normal operating condition.	ption".
Is the symptom a normal operating condition?	
YES >> Inspection End. NO >> GO TO 4.	
4. CHECK WARNING AND INDICATOR LAMPS OPERATION	
Check warning and indicator lamps operation.	
<ul> <li>ABS warning lamp: Refer to <u>BRC-209, "Description"</u>.</li> <li>brake warning lamp: Refer to <u>BRC-210, "Description"</u>.</li> </ul>	
<ul> <li>VDC OFF indicator lamp: Refer to <u>BRC-212, "Description"</u>.</li> </ul>	
SLIP indicator lamp: Refer to <u>BRC-214, "Description"</u> .	
<u>Is ON/OFF timing normal?</u> YES >> GO TO 5.	
<ul> <li>NO &gt;&gt; Perform warning lamp diagnosis. Refer to <u>BRC-209, "Component Funct</u> lamp), <u>BRC-210, "Component Function Check"</u> (brake warning lamp) <u>Function Check"</u> (VDC OFF indicator lamp) or <u>BRC-214, "Component</u> indicator lamp).</li> </ul>	), BRC-212, "Component
5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM	
Perform diagnosis applicable to the symptom. Refer to <u>BRC-241, "Symptom Table"</u> .	
>> GO TO 6. 6.FINAL CHECK	
	, abacking areas the self
Perform self diagnostic result again, and check that the malfunction is repaired. After diagnosis memory. Refer to <u>BRC-158</u> , "CONSULT Function (ABS)".	e checking, erase the self
>> Inspection End.	

### DIAGNOSIS AND REPAIR WORKFLOW

#### < BASIC INSPECTION >

### **Diagnostic Work Sheet**

INFOID:000000007418915

[VDC/TCS/ABS]

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

SFIA3265E

< BASIC INSPECTION >	[VDC/TCS/ABS]
INSPECTION AND ADJUSTMENT	
ADDITIONAL SERVICE WHEN REPLAC	CING CONTROL UNIT
ADDITIONAL SERVICE WHEN REPLACI	NG CONTROL UNIT : Description
After replacing the ABS actuator and electric unit (cont steering angle sensor.	trol unit), perform the neutral position adjustment for the
ADDITIONAL SERVICE WHEN REPLACII quirement	NG CONTROL UNIT : Special Repair Re-
1.PERFORM THE NEUTRAL POSITION ADJUSTME	ENT FOR THE STEERING ANGLE SENSOR
Perform the neutral position adjustment for the steering	g angle sensor.
	STEERING ANGLE SENSOR NEUTRAL POSITION :
Special Repair Requirement". ADJUSTMENT OF STEERING ANGLE S	SENSOR NEUTRAL POSITION
ADJUSTMENT OF STEERING ANGLE SE	ENSOR NEUTRAL POSITION : Description
In case of doing work that applies to the list below, ma sor before running vehicle.	ake sure to adjust neutral position of steering angle sen- ×: Required –: Not required
Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	_
Tire rotation	_
Adjusting wheel alignment	×
	ENSOR NEUTRAL POSITION : Special Re-
pair Requirement	INFOID:000000007418919
ADJUSTMENT OF STEERING ANGLE SENSOR CAUTION:	
To adjust neutral position of steering angle sensor (Adjustment cannot be done without CONSULT)	, make sure to use CONSOLT
<b>1</b> .ALIGN THE VEHICLE STATUS	
Stop vehicle with front wheels in straight-ahead positio	on.
>> GO TO 2.	
2. PERFORM THE NEUTRAL POSITION ADJUSTME	ENT FOR THE STEERING ANGLE SENSOR
<ol> <li>On the CONSULT screen, touch "WORK SUPPOF</li> <li>Touch "START".</li> </ol>	RT", then "ST ANG SEN ADJUSTMENT".
Revision: February 2013 BRC	2012 Altima GCC

**INSPECTION AND ADJUSTMENT** 

### **INSPECTION AND ADJUSTMENT**

< BASIC INSPECTION >

#### CAUTION:

#### Do not touch steering wheel while adjusting steering angle sensor.

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

- NOTE: After approximately 60 seconds, the adjustment 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

- 1. Run vehicle with front wheels in straight-ahead position, then stop.
- 2. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within  $0\pm 2.5^{\circ}$ .

Is the steering angle within the specified range?

YES >> GO TO 4.

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-158, "CONSULT Function (ABS)".
- ECM: Refer to EC-99, "CONSULT Function" (QR25DE), EC-422, "CONSULT Function" (VQ35DE).

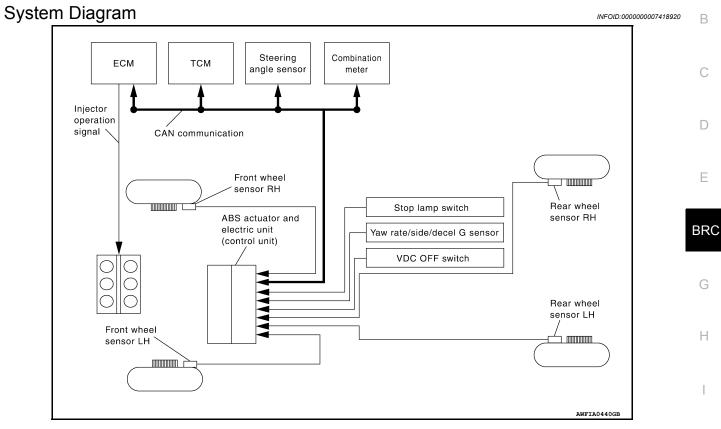
Are the memories erased?

- YES >> Inspection End
- NO >> Check the items indicated by the self-diagnosis.

VDC

# SYSTEM DESCRIPTION > SYSTEM DESCRIPTION

# VDC



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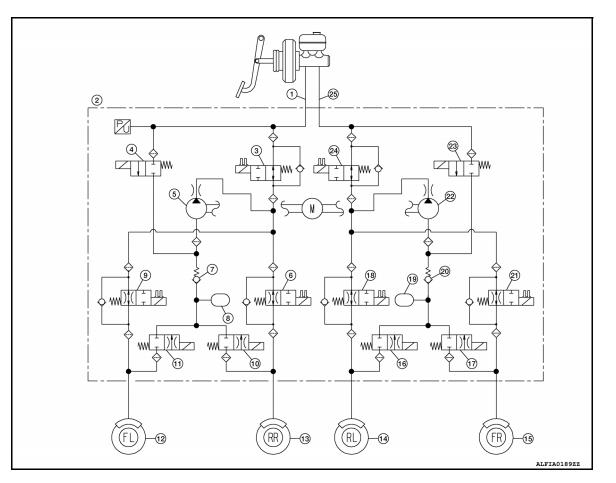
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#### < SYSTEM DESCRIPTION >

### Hydraulic Circuit Diagram

INFOID:000000007418921

[VDC/TCS/ABS]



Primary side 1.

- VDC/TCS/ABS actuator 2.
- 4. Primary side VDC switch-over valve 5. 1 (HSV1)
- 7. Primary side inlet valve
- 10. Rear right outlet solenoid valve
- 13. Rear right caliper
- 16. Rear left outlet solenoid valve
- 19. Secondary side damper
- 22. Secondary side pump
- 25. Secondary side

# System Description

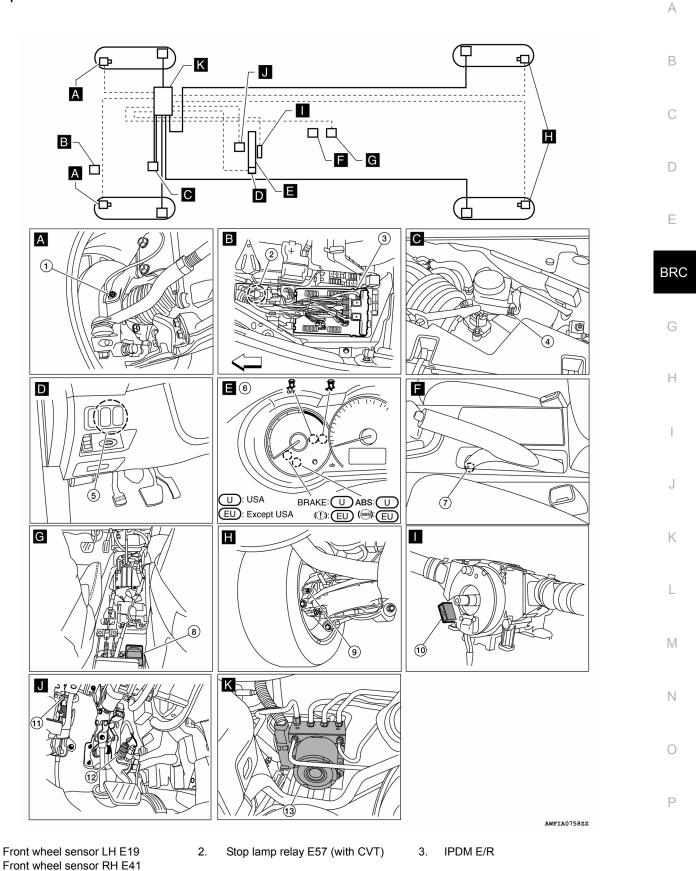
- Primary side pump
- 8. Primary side damper
- 11. Front left outlet solenoid valve
- 14. Rear left caliper
- 17. Front right outlet solenoid valve
- 20. Secondary side inlet valve
- 23. Secondary side VDC switch-over valve 2 (HSV2)

- Primary side VDC switch-over valve 3. 1 (USV1)
- 6. Rear right inlet solenoid valve
- 9. Front left inlet solenoid valve
- 12. Front left caliper
- 15. Front right caliper
- 18. Rear left inlet solenoid valve
- 21. Front right inlet solenoid valve
- 24. Secondary side VDC switch-over valve 2 (USV2)

INFOID:000000007418922

- Vehicle dynamic control system detects driver's steering operation amount from the steering angle sensor. Using input information from the yaw rate/side/decel G sensor and wheel speed sensors, the VDC system judges driving conditions (conditions of understeer and oversteer) and controls engine output and brake application to improve vehicle driving stability.
- During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.
- ٠ Electrical system diagnosis by CONSULT is available.

# INFOID:000000007418923



VDC

- 5. VDC OFF switch M72
- 8. Yaw rate/side/decel G sensor M55
- 9. Rear wheel sensor LH C2 Rear wheel sensor RH C3

Combination meter M24

6.

Revision: February 2013

with M/T)

Brake fluid level switch E24

Parking brake switch M73 (Sedan

1.

4.

7.

**BRC-147** 

#### < SYSTEM DESCRIPTION >

- steering wheel removed)
- 10. Steering angle sensor M53 (view with 11. Parking brake switch E35 (with CVT) 12. Stop lamp switch E38
- 13. ABS actuator and electric unit (control unit) E26

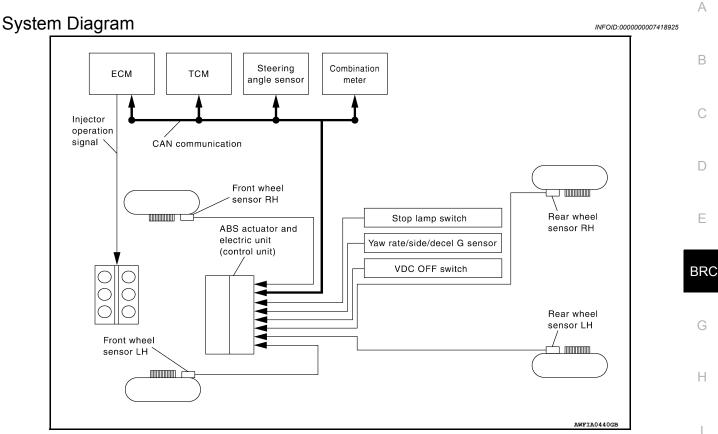
# **Component Description**

INFOID:000000007418924

Compo	onent parts	Reference
	Pump	PPC 171 "Description"
	Motor	BRC-171, "Description"
	Actuator relay (Main relay)	BRC-173, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196. "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch	F switch	
ABS warning lamp		BRC-209, "Description"
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

# < SYSTEM DESCRIPTION >

# TCS



TCS

# System Description

INFOID:000000007418926

- J Traction Control System is a function that electronically controls engine torque and brake fluid pressure 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, it compares wheel speed signals from all 4 wheels. At this time, LH and RH front brake fluid pressure are controlled, while fuel being Κ 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 is available.

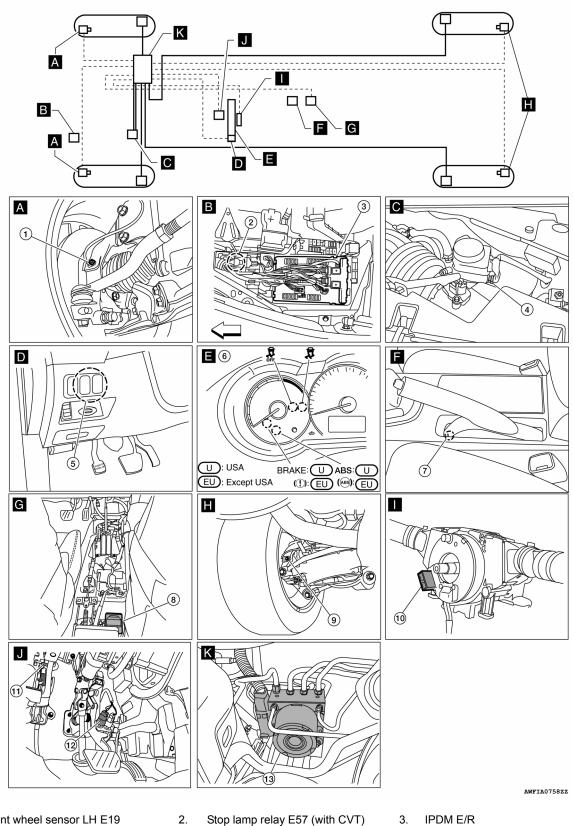
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INFOID:000000007418927



TCS

- 1. Front wheel sensor LH E19 Front wheel sensor RH E41
- 4. Brake fluid level switch E24
- Parking brake switch M73 (Sedan with M/T)
- 5. VDC OFF switch M72
- 8. Yaw rate/side/decel G sensor M55
- .
- 6. Combination meter M24
- 9. Rear wheel sensor LH C2 Rear wheel sensor RH C3

Revision: February 2013

**BRC-150** 

#### < SYSTEM DESCRIPTION >

# 10. Steering angle sensor M53 (view with 11. Parking brake switch E35 (with CVT) 12. Stop lamp switch E38 steering wheel removed)

TCS

13. ABS actuator and electric unit (control unit) E26

# **Component Description**

INFOID:000000007418928

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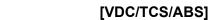
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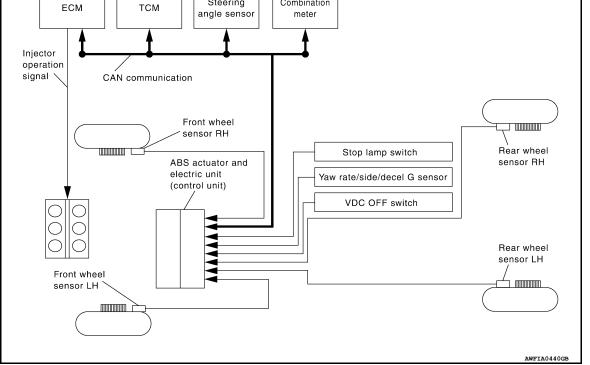
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Compo	nent parts	Reference	С
	Pump	BRC-171, "Description"	
	Motor	BRC-171, Description	
	Actuator relay (Main relay)	BRC-173, "Description"	D
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-182, "Description"	
	Pressure sensor	BRC-189, "Description"	E
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"	
Wheel sensor		BRC-162, "Description"	BRC
Stop lamp switch		BRC-178, "Description"	
Steering angle sensor		BRC-191, "Description"	
Yaw rate/side/G sensor		BRC-193, "Description"	G
Brake fluid level switch		BRC-201, "Description"	
Parking brake switch		BRC-205, "Description"	Н
VDC OFF switch		BRC-207, "Description"	
ABS warning lamp		BRC-209, "Description"	
Brake warning lamp		BRC-210, "Description"	
VDC OFF indicator lamp		BRC-212, "Description"	
Slip indicator lamp		BRC-214, "Description"	J

# ABS



# System Diagram



ABS

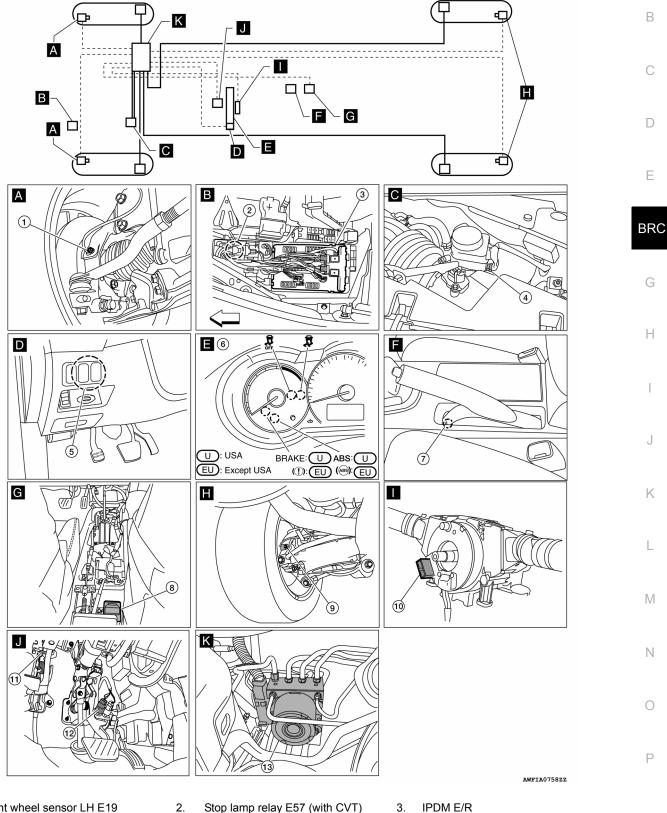
# System Description

INFOID:000000007418930

INFOID:000000007418929

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





ABS

- Front wheel sensor LH E19 1. Front wheel sensor RH E41
- Brake fluid level switch E24 4.
- 7. Parking brake switch M73 (Sedan with M/T)
- 2. Stop lamp relay E57 (with CVT)
- 5. VDC OFF switch M72
- 8. Yaw rate/side/decel G sensor M55
- 9. Rear wheel sensor LH C2 Rear wheel sensor RH C3

Combination meter M24

3.

6.

Revision: February 2013

**BRC-153** 

2012 Altima GCC

#### < SYSTEM DESCRIPTION >

- steering wheel removed)
- 10. Steering angle sensor M53 (view with 11. Parking brake switch E35 (with CVT) 12. Stop lamp switch E38
- 13. ABS actuator and electric unit (control unit) E26

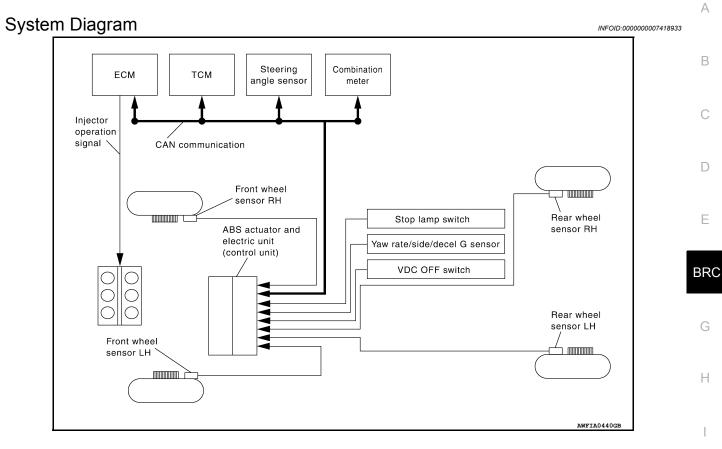
# **Component Description**

INFOID:000000007418932

Compo	onent parts	Reference
	Pump	PPC 171 "Description"
	Motor	BRC-171, "Description"
	Actuator relay (Main relay)	BRC-173, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196. "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch		BRC-207, "Description"
ABS warning lamp	BRC-209, "Description"	
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

#### < SYSTEM DESCRIPTION > EBD

### [VDC/TCS/ABS]



**EBD** 

# System Description

INFOID:000000007418934

Electric Brake force Distribution functions as follows:

- · ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.
- Electrical system diagnosis by CONSULT is available.

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EBD

- Front wheel sensor LH E19 1. Front wheel sensor RH E41
- 4. Brake fluid level switch E24
- 7. Parking brake switch M73 (Sedan with M/T)
- 2. Stop lamp relay E57 (with CVT)
- 5. VDC OFF switch M72
- 8. Yaw rate/side/decel G sensor M55

- IPDM E/R
- Combination meter M24 6.

3.

9. Rear wheel sensor LH C2 Rear wheel sensor RH C3

Revision: February 2013

**BRC-156** 

2012 Altima GCC

#### < SYSTEM DESCRIPTION >

# 10. Steering angle sensor M53 (view with 11. Parking brake switch E35 (with CVT) 12. Stop lamp switch E38 steering wheel removed)

**EBD** 

13. ABS actuator and electric unit (control unit) E26

# **Component Description**

INFOID:000000007418936

Compo	nent parts	Reference	С
	Pump	BRC-171, "Description"	
	Motor	BRC-171, Description	
	Actuator relay (Main relay)	BRC-173, "Description"	U
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-182, "Description"	
	Pressure sensor	BRC-189, "Description"	E
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"	
Wheel sensor		BRC-162, "Description"	BRC
Stop lamp switch		BRC-178, "Description"	
Steering angle sensor		BRC-191, "Description"	
Yaw rate/side/G sensor		BRC-193, "Description"	G
Brake fluid level switch		BRC-201, "Description"	
Parking brake switch		BRC-205, "Description"	Н
VDC OFF switch		BRC-207, "Description"	
ABS warning lamp		BRC-209, "Description"	
Brake warning lamp		BRC-210, "Description"	
VDC OFF indicator lamp		BRC-212, "Description"	
Slip indicator lamp		BRC-214, "Description"	J

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

# CONSULT Function (ABS)

INFOID:000000007418937

#### FUNCTION

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

Diagnostic test mode	Function
Work support	Supports inspections and adjustments. Commands are transmitted to the ABS actuator and electric unit (control unit) for setting the status suitable for required operation, input/output signals are received from the ABS actuator and electric unit (control unit) and received data is displayed.
Data monitor	Displays ABS actuator and electric unit (control unit) input/output data in real time.
Active test	Operation of electrical loads can be checked by sending drive signals to them.
Function test	This mode is used to inform customers when the vehicle requires periodic maintenance.
Self diagnostic result	Displays ABS actuator and electric unit (control unit) self-diagnosis results.
CAN diag support mntr	The result of transmit/receive diagnosis of CAN communication can be read.
ECU identification	ABS actuator and electric unit (control unit) part number can be read.

#### SELF DIAGNOSTIC RESULT 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, 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 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 <u>BRC-220, "DTC No. Index"</u>.

#### DATA MONITOR

Display Item List

Item	Data monitor item selection			
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.

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

#### < SYSTEM DESCRIPTION >

# [VDC/TCS/ABS]

FR RH IN SOL (On/Off)	_	×	×	Front RH IN ABS solenoid (On/Off) status is displayed.
FR RH OUT SOL (On/Off)	_	×	x	Front RH OUT ABS solenoid (On/Off) status is displayed.
FR LH IN SOL (On/Off)	_	×	×	Front LH IN ABS solenoid (On/Off) status is displayed.
FR LH OUT SOL (On/Off)	_	×	×	Front LH OUT ABS solenoid (On/Off) status is displayed.
RR RH IN SOL (On/Off)	_	×	×	Rear RH IN ABS solenoid (On/Off) status is displayed.
RR RH OUT SOL (On/Off)	_	×	×	Rear RH OUT ABS solenoid (On/Off) status is displayed.
RR LH IN SOL (On/Off)	_	×	×	Rear LH IN ABS solenoid (On/Off) status is displayed.
RR LH OUT SOL (On/Off)	_	×	×	Rear LH OUT ABS solenoid (On/Off) status is displayed.
STOP LAMP SW (On/Off)	×	×	×	Stop lamp switch (On/Off) status is displayed.
MOTOR RELAY (On/Off)	_	×	×	ABS motor relay signal (On/Off) status is displayed.
ACTUATOR RLY (On/Off)	_	×	×	ABS actuator relay signal (On/Off) status is displayed.
ABS WARN LAMP (On/Off)	_	×	×	ABS warning lamp (On/Off) status is displayed.
OFF LAMP (On/Off)	_	×	×	VDC OFF lamp (On/Off) status is displayed.
OFF SW (On/Off)	×	×	×	VDC OFF switch (On/Off) status is displayed.
SLIP LAMP (On/Off)	_	×	×	SLIP indicator lamp (On/Off) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) is displayed.
GEAR (1, 2, 3, 4, 5, 6)	×	×	×	Gear position while in manual mode determined by TCM is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
ACCEL POS SIG (%)	×	_	×	Throttle valve open/close status judged by CAN com- munication signal is displayed.
SIDE G-SENSOR (m/s <sup>2</sup> )	×	_	×	Lateral acceleration detected by side G sensor is displayed.
STR ANGLE SIG (°)	×	_	×	Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×	_	×	Brake fluid pressure detected by pressure sensor is displayed.
EBD SIGNAL (On/Off)	_	_	×	EBD operation (On/Off) status is displayed.
ABS SIGNAL (On/Off)	_	_	×	ABS operation (On/Off) status is displayed.
TCS SIGNAL (On/Off)	_	_	×	TCS operation (On/Off) status is displayed.
VDC SIGNAL (On/Off)	_	_	×	VDC operation (On/Off) status is displayed.
EBD FAIL SIG (On/Off)	_	_	×	EBD fail signal (On/Off) status is displayed.

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

#### < SYSTEM DESCRIPTION >

#### [VDC/TCS/ABS]

ABS FAIL SIG (On/Off)	_	_	×	ABS fail signal (On/Off) status is displayed.
TCS FAIL SIG (On/Off)	_	_	×	TCS fail signal (On/Off) status is displayed.
VDC FAIL SIG (On/Off)	_	_	×	VDC fail signal (On/Off) status is displayed.
CRANKING SIG (On/Off)	_	_	×	Cranking condition (On/Off) status is displayed.
FLUID LEV SW (On/Off)	×	_	×	Brake fluid level switch (On/Off) status is displayed.
PARK BRAKE SW (On/Off)	×	_	×	Parking brake switch (On/Off) status is displayed.
USV [FL-RR] (On/Off)	_	_	×	Primary side USV solenoid valve (On/Off) status is displayed.
USV [FR-RL] (On/Off)	_	_	×	Secondary side USV solenoid valve (On/Off) status is displayed.
HSV [FL-RR] (On/Off)	_	_	×	Primary side HSV solenoid valve (On/Off) status is displayed.
HSV [FR-RL] (On/Off)	_	_	×	Secondary side HSV solenoid valve (On/Off) status is displayed.
V/R OUTPUT (On/Off)	_	_	×	Valve relay operation signal (On/Off) status is displayed.
M/R OUTPUT (On/Off)	-	-	×	Motor relay operation signal (On/Off) status is displayed.
ENGINE RPM (rpm)	×	_	×	Engine speed judged by CAN communication signal is displayed.

×: Applicable

-: Not applicable

#### ACTIVE TEST

#### **CAUTION:**

- Do not 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 indicator lamp, SLIP indicator lamp or brake warning lamp on.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator 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, touch BACK.

#### Test Item

#### SOLENOID VALVE

- When performing an active test of the ABS function, select "MAIN SIGNALS" for each test item.
- For ABS solenoid valve, touch "Up", "Keep", and "Down" on the display screen. For ABS solenoid valve (ACT), touch "Up", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

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

#### < SYSTEM DESCRIPTION >

#### [VDC/TCS/ABS]

Operation –		ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	On	On	_	_	_
	FR RH OUT SOL	Off	Off	On*	_	_	_
FR RH SOL	USV [FR-RL]	Off	Off	On*	_	_	_
	HSV [FR-RL]	Off	Off	On*	_	_	_
	FR LH IN SOL	Off	On	On	_	_	_
	FR LH OUT SOL	Off	Off	On*	_	_	_
FR LH SOL	USV [FL-RR]	Off	Off	On*	_	—	_
	HSV [FL-RR]	Off	Off	On*	_	_	_
	RR RH IN SOL	Off	On	On		_	_
	RR RH OUT SOL	Off	Off	On*	—	—	_
RR RH SOL	USV [FL-RR]	Off	Off	On*	—	_	_
	HSV [FL-RR]	Off	Off	On*	—	—	-
	RR LH IN SOL	Off	On	On	—	—	_
RR LH SOL	RR LH OUT SOL	Off	Off	On*	—	—	_
	USV [FR-RL]	Off	Off	On*	_	_	_
	HSV [FR-RL]	Off	Off	On*	_	_	_
	FR RH IN SOL	—	—	_	Off	Off	Off
	FR RH OUT SOL	_	_	_	Off	Off	Off
FR RH ABS SOLENOID (ACT)	USV [FR-RL]	—	_	_	Off	On	On
	HSV [FR-RL]	—	_	_	Off	On*	Off
	FR LH IN SOL	—	—	—	Off	Off	Off
	FR LH OUT SOL	—	—	_	Off	Off	Off
FR LH ABS SOLENOID (ACT)	USV [FL-RR]	—	_	_	Off	Off	Off
	HSV [FL-RR]	—	_	-	Off	Off	Off
	RR RH IN SOL	—	—	_	Off	Off	Off
	RR RH OUT SOL	—	—	_	Off	Off	Off
RR RH ABS SOLENOID (ACT)	USV [FL-RR]	—	—	-	Off	Off	Off
	HSV [FL-RR]	—	—	—	Off	Off	Off
	RR LH IN SOL	_	—	_	Off	Off	Off
	RR LH OUT SOL	_		_	Off	Off	Off
RR LH ABS SOLENOID (ACT)	USV [FR-RL]	—	—	-	Off	On	On
	HSV [FR-RL]	_	_	_	Off	On*	Off

\*: 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 operate as shown in table below.

Operation	On	Off	_
MOTOR RELAY	On	Off	Р
ACTUATOR RLY	On	On	-

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

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

### Description

INFOID:000000007418938

**IVDC/TCS/ABS1** 

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:000000007418939

### 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 when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

#### DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

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

2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-162, "Diagnosis Procedure"</u>.

NO >> Inspection End.

**Diagnosis** Procedure

INFOID:000000007418940

Regarding Wiring Diagram information, refer to <u>BRC-223, "Wiring Diagram - Coupe"</u> or <u>BRC-232, "Wiring Dia-</u> gram - Sedan With VDC".

#### CAUTION:

#### Do not check between wheel sensor terminals.

**1**.CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
- 2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

 $\mathbf{2}$ .CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.

2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

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

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#### NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-253</u>, "Removal and Installation".

# 3.CHECK TIRE

Check air pressure, wear and size.

< DTC/CIRCUIT DIAGNOSIS >

Are air pressure, wear and size within standard?

YES >> GO TO 4 NO >> • Adjust a

>> • Adjust air pressure, or replace tire.

Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6, "Inspection"</u> (front) or <u>RAX-6, "On-vehicle Service"</u> (rear). Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

#### ${f 5}.$ CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

			Н
Wheel sensor connector terminal	Ground	Continuity	
1		No	
2	—	No	

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

#### **6.**CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel keepsor connector.

Wheel concer	ABS actuator and ele	d electric unit (control unit) Wheel sensor		Continuity			
Wheel sensor	Connector	Terminal	Connector	Terminal			
Front LH		16	E19	1			
		5	E19	2			
Front RH		9	<b>F</b> 44	E41	1		
	E26	10	E41	2	Yes		
Rear LH	E20	6	C2	1			
Real LH		17		2			
Rear RH		8	C3	1			
		19	05	2			

#### Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-256. "Removal and Instal-</u> lation".

NO >> Repair the circuit.

#### Component Inspection

**1.**CHECK DATA MONITOR

INFOID:000000007418941

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

#### < DTC/CIRCUIT DIAGNOSIS >

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", 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 <u>BRC-162</u>, "Diagnosis Procedure".

#### Special Repair Requirement

INFOID:000000007418942

[VDC/TCS/ABS]

# **1**.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: Special Repair Requirement".

>> END

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

#### < DTC/CIRCUIT DIAGNOSIS >

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

#### Description

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:000000007418944

INFOID:000000007418943

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#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
	NFIRMATION PROCE		
<b>1.</b> CHEC	CK SELF DIAGNOSTIC R	ESULT	
9	CONSULT.	at approx 30 km/b (10 MDH) or more for corre	
1. Start 2. Perfe	orm self diagnostic result.	at approx. 30 km/h (19 MPH) or more for approx	
<u>Is DTC C</u>	<u>1105, C1106, C1107 or C</u>	1108 detected?	
	>> Proceed to diagnosis >> Inspection End.	procedure. Refer to <u>BRC-165. "Diagnosis Proce</u>	<u>dure"</u> .
	sis Procedure		
Diagno			INFOID:00000007418945
	edan With VDC".	ition, refer to <u>BRC-223, "Wiring Diagram - Coup</u>	e" or <u>BRC-232, "Wiring Dia-</u>
Do not o	heck between wheel sei	nsor terminals.	
1.con	NECTOR INSPECTION		
1. Disc code		l electric unit (control unit) connector and whe	el sensor of malfunctioning
		on, disconnection, looseness or damage.	
	pection result normal?		
	>> GO TO 2 >> Repair or replace as n	acassan/	
	CK WHEEL SENSOR OUT		
1. Con	nect ABS active wheel ser	nsor tester (J-45741) to wheel sensor using app sensor tester power switch.	ropriate adapter.
NOT The batte 3. Spin	E: green POWER indicator ery in the ABS active whee the wheel of the vehicle for tester. The red SENSC	should illuminate. If the POWER indicator does al sensor tester before proceeding. by hand and observe the red SENSOR indicate oR indicator should flash on and off to indicate a	or on the ABS active wheel

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-253, "Removal and Installation"</u>.

3.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4

NO >> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

**4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6</u>, "Inspection" (front) or <u>RAX-6</u>, "On-vehicle Service" (rear). Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8, "Removal and Installation"</u> (front) or <u>RAX-7,</u> <u>"Removal and Installation"</u> (rear).

5.check wiring harness for short circuit

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity	
1		No	
2			

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

**6.**CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
wheel sensor	Connector	Terminal	Connector	Terminal	
Front LH		16	F10	1	
	-	5	E19	2	
Front RH		9	E41	1	
	E26	10	E41 =	2	Yes
Rear LH		6	C2	1	
		17	02	2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Instal-</u> lation".

NO >> Repair the circuit.

Component Inspection

**1.**CHECK DATA MONITOR

INFOID:000000007418946

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

#### < DTC/CIRCUIT DIAGNOSIS >

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", 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 proc	edure. Refer to <u>BRC-175, "Diagnosis</u>	Procedure".
Special Repair Requireme	ent	INFOID:000000007418947
1.ADJUSTMENT OF STEERING	G ANGLE SENSOR NEUTRAL POS	TION
Always perform the neutral positi	on adjustment for the steering angle	sensor, when replacing the ABS actua- OF STEERING ANGLE SENSOR NEU-

>> END

Revision: February 2013

[VDC/TCS/ABS]

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# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

#### Description

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

#### DTC Logic

INFOID:000000007418949

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**IVDC/TCS/ABS1** 

#### 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 voltage is lower than normal.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> </ul>

#### DTC CONFIRMATION PROCEDURE

#### **1.**CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC C1109 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-168</u>, "Diagnosis Procedure".
- NO >> Inspection End.

#### **Diagnosis** Procedure

INFOID:000000007418950

Regarding Wiring Diagram information, refer to <u>BRC-223</u>, "Wiring Diagram - Coupe" or <u>BRC-232</u>, "Wiring Diagram - Sedan With VDC".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-158, "CONSULT Function (ABS)"</u>.

#### Is DTC 1109 detected?

YES >> GO TO 2

NO >> Poor connection of connector terminals. 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.
- 4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

	and electric unit ol unit)	Ground	Condition	Voltage (Approx)	
Connector	Terminal				
E26	10		Ignition switch ON	Battery voltage	
220	18	_	Ignition switch OFF	0V	

5. Turn ignition switch OFF.

# DTC C1109 BATTERY VOLTAGE [ABNORMAL]

#### < DTC/CIRCUIT DIAGNOSIS >

6. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity	
Connector	Terminal	Glound	Continuity	В
E26	1		Yes	
20	4	—	105	С

Is the inspection result normal?

NO

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

- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- >> Repair or replace malfunctioning components.
- Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Special Repair Requirement

# 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Special Repair Requirement"</u>.

>> END

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[VDC/TCS/ABS]

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# C1110, C1153, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

# C1110, C1153, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

# DTC Logic

INFOID:000000007418952

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	
C1153	EMERGENCY BRAKE	When ABS actuator and electric unit (control unit) is mal- functioning. (Pressure increase is too much or too little)	ABS actuator and electric unit (control unit)
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	

#### DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

Turn the ignition switch OFF to ON.

2. Perform self diagnostic result.

Is DTC C1110, C1153 or C1170 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-170, "Diagnosis Procedure"</u>.

NO >> Inspection End.

#### Diagnosis Procedure

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

#### CAUTION:

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

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> <u>tion</u>".

#### Special Repair Requirement

INFOID:000000007418954

INFOID:000000007418953

**1.**ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

# DTC C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

# DTC C1111 PUMP MOTOR

### Description

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

MOTOR

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

### DTC Logic

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric un</li> </ul>
CIIII	FOMF MOTOR	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)
DTC CC	ONFIRMATION PROCI	EDURE	
<b>1.</b> CHE	CK SELF DIAGNOSTIC	RESULT	
	CONSULT.		
2. Perf	the ignition switch OFF form self diagnostic resul		
YES		s procedure. Refer to <u>BRC-171, "Diagnosis Proce</u>	dure".
NO	>> Inspection End.		
	>> Inspection End.		INFOID:00000000741895
	•		INFOID:00000000741895
Diagno Regardii	osis Procedure	nation, refer to <u>BRC-223, "Wiring Diagram - Coupe</u>	
Diagno Regardii gram - S	osis Procedure	nation, refer to <u>BRC-223, "Wiring Diagram - Coupe</u>	
Diagno Regardii gram - S <b>1.</b> CONI 1. Turr	osis Procedure ng Wiring Diagram inform Sedan With VDC". NECTOR INSPECTION		
Diagno Regardii gram - S <b>1.</b> CONI 1. Turr 2. Disc 3. Che	osis Procedure ng Wiring Diagram inform edan With VDC". NECTOR INSPECTION n ignition switch OFF. connect ABS actuator and ck terminals for deforma	nation, refer to <u>BRC-223, "Wiring Diagram - Coupe</u> d electric unit (control unit) connector. tion, disconnection, looseness, and so on. If any	e" or <u>BRC-232, "Wiring Dia</u>
Diagno Regardii gram - S 1. CONI 1. Turr 2. Disc 3. Che or re	Desis Procedure Mag Wiring Diagram inform Sedan With VDC". NECTOR INSPECTION In ignition switch OFF. Sconnect ABS actuator and ck terminals for deformate eplace terminals.	d electric unit (control unit) connector.	e" or <u>BRC-232, "Wiring Dia</u>
Diagno Regardii gram - S 1. CONI 1. Turr 2. Disc 3. Che or re 4. Rec Is DTC (	Desis Procedure Mag Wiring Diagram inform Sedan With VDC". NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and ck terminals for deformation ck terminals for deformation charter connector and per- C1111 detected?	d electric unit (control unit) connector. tion, disconnection, looseness, and so on. If any	e" or <u>BRC-232, "Wiring Dia</u>
Diagno Regardin gram - S 1. CONI 1. Turr 2. Disc 3. Che or re 4. Rec Is DTC ( YES	Desis Procedure Mag Wiring Diagram inform Sedan With VDC". NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and ck terminals for deformation eplace terminals. onnect connector and per- <u>C1111 detected?</u> >> GO TO 2	d electric unit (control unit) connector. tion, disconnection, looseness, and so on. If any erform self-diagnosis. Refer to <u>BRC-158, "CONSU</u>	e" or <u>BRC-232, "Wiring Dia</u>
Diagno Regardir gram - S 1.CON 1. Turr 2. Disc 3. Che or re 4. Rec Is DTC ( YES NO	Ang Wiring Diagram inform Sedan With VDC". NECTOR INSPECTION In ignition switch OFF. Connect ABS actuator and ck terminals for deformate applace terminals. onnect connector and per- <u>C1111 detected?</u> >> GO TO 2 >> Poor connection of c	d electric unit (control unit) connector. tion, disconnection, looseness, and so on. If any	e" or <u>BRC-232, "Wiring Dia</u>

3. Check voltage between the ABS actuator and electric unit (control unit) connector E26 terminal 2 and ground.

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# DTC C1111 PUMP MOTOR

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clouid	(Approx)	
E26	2	_	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO

NO

>> • Repair or replace malfunctioning components.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and ele	ectric unit (control unit)	Ground	Continuity
Connector	Terminal	Gibuna	Continuity
E26	1		Yes
L20	4	—	165

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Installa-</u> tion".
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Component Inspection

INFOID:000000007418958

#### **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

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

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-171, "Diagnosis Procedure"</u>.

#### Special Repair Requirement

INFOID:000000007418959

#### **1.**ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Special Repair Requirement".

>> END

# DTC C1114 MAIN RELAY

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1114 MAIN RELAY

### Description

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

# DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition		Possible cause	D
C1114	MAIN RELAY	During the actuator relay operating with OFF, w actuator relay turns ON, or when the control lin relay is shorted to the ground.		<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit</li> </ul>	E
01114		During the actuator relay operating with ON, will actuator relay turns ON, or when the control lin relay is open.		(control unit)	BR
DTC CC	NFIRMATION PROCE	DURE			
<b>1.</b> CHEC	K SELF DIAGNOSTIC F	ESULT			0
1. Turn	CONSULT. the ignition switch OFF t prm self diagnostic result				G
	1114 detected?				11
	>> Proceed to diagnosis>> Inspection End.	procedure. Refer to <u>BRC-173, "Diagnos</u>	is Proced	<u>dure"</u> .	
	sis Procedure				
Blagho				INFOID:000000007418962	
	ng Wiring Diagram inform edan With VDC".	ation, refer to <u>BRC-223, "Wiring Diagram</u>	<u>ı - Coupe</u>	" or <u>BRC-232, "Wiring Dia-</u>	J
<b>1</b> .com	NECTOR INSPECTION				K
2. Disc 3. Cheo	ck terminals for deformat	electric unit (control unit) connector. on, disconnection, looseness, and so or	n. If any i	malfunction is found, repair	L
	place terminals.	form self-diagnosis. Refer to <u>BRC-158. '</u>	"CONSU	T Function (ABS)"	M
	pection result normal?				
-	>> GO TO 2				N
-		nnector terminals. Repair or replace cor			
		UATOR RELAY POWER SUPPLY CIRC	,011		
2. Disc		electric unit (control unit) connector. actuator and electric unit (control unit) co	onnector	E26 terminal 3 and ground.	F
ABS actu	ator and electric unit (control un	Ground		Voltage	
Conr	nector Terminal	Cround		(Approx)	

# ConnectorTerminalGround(Approx)E263—Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> • Repair or replace malfunctioning components.

[VDC/TCS/ABS]

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# DTC C1114 MAIN RELAY

#### < DTC/CIRCUIT DIAGNOSIS >

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# $\mathbf{3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and ele	ectric unit (control unit)	Ground	Continuity
Connector	Terminal	Giodila	Continuity
E26	1		Yes
220	4	—	165

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Installa-</u> tion".
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Component Inspection

INFOID:000000007418963

#### **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.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

#### NOTE:

NO

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-171, "Diagnosis Procedure"</u>.

#### Special Repair Requirement

INFOID:000000007418964

#### **1.**ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Special Repair Requirement".

>> END

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### Description

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:000000007418966

INFOID:000000007418965

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#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	<ul> <li>Harness or connector</li> <li>Wheel sensor</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
DTC CC	NFIRMATION PROCE	DURE	
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT	F
1. Start 2. Perfe <u>Is DTC (</u>	orm self diagnostic result.	at approx. 30 km/h (19 MPH) or more for appr procedure. Refer to <u>BRC-175, "Diagnosis Proc</u>	
	>> Inspection End.		<u>oddro</u> .
Diagno	sis Procedure		INFOID:00000007418967
	ng Wiring Diagram informa edan With VDC".	ation, refer to <u>BRC-223, "Wiring Diagram - Cou</u>	<u>pe"</u> or <u>BRC-232, "Wiring Dia-</u>
	N: :heck between wheel se NECTOR INSPECTION	nsor terminals.	
2. Che		electric unit (control unit) and malfunctioning w are deformed, disconnected, loose, etc., Rep	
Is the ins	pection result normal?		
	>> GO TO 2 >> Repair or replace as n	ecessary	
•	CK WHEEL SENSOR OU	-	
1. Con 2. Turn	nect ABS active wheel ser on the ABS active wheel	nsor tester (J-45741) to wheel sensor using ap sensor tester power switch.	propriate adapter.
	green POWER indicator	should illuminate. If the POWER indicator doe	es not illuminate, replace the
3. Spin	the wheel of the vehicle or tester. The red SENSC	by hand and observe the red SENSOR indica R indicator should flash on and off to indicate	
	e red SENSOR indicator	illuminates but does not flash, reverse the po	larity of the tester leads and
	ABS active wheel sensor	r tester detect a signal?	
YES	>> GO TO 3		

- YES >> GO TO 3
- NO >> Replace wheel sensor. Refer to <u>BRC-253</u>, "Removal and Installation".

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

# **3.**CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

- YES >> GO TO 4
- NO >> Adjust air pressure, or replace tire.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-6. "Inspection"</u> (front) or <u>RAX-6. "On-vehicle Service"</u> (rear). <u>Is the inspection result normal?</u>

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8, "Removal and Installation"</u> (front) or <u>RAX-7, "Removal and Installation"</u> (rear).

#### 5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1		No
2		

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

 $\mathbf{6}$ .CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and ele	ectric unit (control unit)	Wheel sensor		Continuity
Wheel Sensor	Connector	Terminal	Connector	Terminal	
Front LH		16	E19	1	
		5	E19	2	
Front RH		9	E41	1	
	E26	10		2	Yes
Rear LH	L20	6	C2	1	
		17	02	2	
Rear RH		8	C3	1	
		19	00	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-256. "Removal and Instal-</u> lation".

# NO >> Repair the circuit.

#### Component Inspection

INFOID:000000007418968

#### **1.**CHECK DATA MONITOR

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

Wheel sensor

Vehicle speed (DATA MONITOR)

# DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

	FR LH SENSOR		Δ	
	FR RH SENSOR	Nearly matches the speedometer dis-		А
	RR LH SENSOR	play (±10% or less)		
	RR RH SENSOR			В
Is the ir	spection result normal?			
YES NO	<ul><li>&gt;&gt; Inspection End.</li><li>&gt;&gt; Go to diagnosis proce</li></ul>	dure. Refer to BRC-175. "Diagnosis Procedure".		С
Specia	al Repair Requiremer	nt	INFOID:000000007418969	

# 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Special Repair Requirement"</u>.

>> END

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# C1116 STOP LAMP SW

#### Description

INFOID:000000007418970

IVDC/TCS/ABS1

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit) either directly (with M/T) or through the stop lamp relay (with CVT).

#### DTC Logic

INFOID:000000007418971

#### DTC DETECTION LOGIC

DTC	Display	Condition	Possible Cause
C1116	STOP LAMP SW	When stop lamp switch signal circuit is open.	<ul> <li>Harness or connector</li> <li>Stop lamp switch</li> <li>Stop lamp relay (with CVT)</li> <li>ABS actuator and electric unit (control unit)</li> </ul>

#### DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

(I) With CONSULT.

Turn the ignition switch OFF to ON.

2. Perform self diagnostic result.

Is DTC C1116 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-178</u>, "<u>Diagnosis Procedure (With M/T)</u>" or <u>BRC-179</u>, "<u>Diagnosis Procedure (With CVT)</u>".
- NO >> Inspection End.

Diagnosis Procedure (With M/T)

INFOID:000000007418972

Regarding Wiring Diagram information, refer to <u>BRC-223</u>, "Wiring Diagram - Coupe" or <u>BRC-232</u>, "Wiring Diagram - Sedan With VDC".

#### **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- Reconnect connector and perform self diagnostic result. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)".

Is DTC C1116 detected?

YES >> GO TO 2

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

2. CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to <u>BRC-180</u>, "Component Inspection (Stop Lamp <u>Switch)</u>".

Is the inspection result normal?

YES >> GO TO 3

NO >> Replace stop lamp switch.

**3**.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

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

2. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

# C1116 STOP LAMP SW

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator ar (control		Ground	Condition	Condition Voltage (Approx.	
Connector	Terminal				
E26	20		Brake pedal depre		Battery voltage
			Brake pedal relea	ased	0V
the inspectio					
		ctuator and electric ι	unit (control unit). Refer to	D <u>BRC-25</u>	6, "Removal and Installa
tior NO >> GC					
			u <del></del>		
		ITCH INPUT CIRCU	J11		
		witch connector.			
. Check volta	age between	stop lamp switch cor	nnector E38 terminal 1 and	a grouna.	
Cto	n lamn awitab				
	p lamp switch	minol	Ground		Voltage (Approx.)
Connector		minal			
E38		1			Battery voltage
the inspectio					
			itch and ABS actuator and 3 and stop lamp switch.	a electric u	init (control unit).
	•		s and stop lamp switch.		
lagnosis P	rocedure (	With CVT)			INFOID:00000000741897
lagnoolo i		, ,			
lagnoolo i					
•		formation rafar to P	PC 222 "Wiring Diagram	Coupo"	or PPC 222 "Wiring Dia
egarding Wiri	ng Diagram ir	nformation, refer to <u>B</u>	RC-223, "Wiring Diagram	- Coupe"	or <u>BRC-232, "Wiring Dia</u>
•	ng Diagram ir	nformation, refer to $\underline{B}$	RC-223, "Wiring Diagram	- Coupe"	or <u>BRC-232, "Wiring Dia</u>
egarding Wirin r <u>am - Sedan V</u>	ng Diagram ir <u>Vith VDC"</u> .		RC-223, "Wiring Diagram	- Coupe"	or <u>BRC-232, "Wiring Dia</u>
egarding Wiri	ng Diagram ir <u>Vith VDC"</u> .		RC-223, "Wiring Diagram	<u>- Coupe"</u>	or <u>BRC-232. "Wiring Dia</u>
egarding Wirir ram - Sedan V .CONNECTO	ng Diagram ir <u>Vith VDC"</u> . DR INSPECT on switch OFF	ION		- Coupe"	or <u>BRC-232, "Wiring Dia</u>
egarding Wirin ram - Sedan V .CONNECTO . Turn ignitio . Disconnect	ng Diagram ir <u>Vith VDC"</u> . DR INSPECT n switch OFF t ABS actuato	ION 	ontrol unit) connector.		
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egarding Wirin ram - Sedan V .CONNECTO . Turn ignitio Disconnect . Check term or replace to . Reconnect . Reconnect . Reconnect . DTC C1116 of YES >> GO	ng Diagram in <u>With VDC"</u> . OR INSPECT In switch OFF t ABS actuato ninals for defo terminals. connector ar <u>detected?</u> O TO 2 or connectior	ION 	ontrol unit) connector. ion, looseness, and so on	n. If any m 158, "CO	alfunction is found, repai
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egarding Wirin ram - Sedan W .CONNECTO . Turn ignitio Disconnect . Check term or replace f . Reconnect . Reconnect . Reconnect . Reconnect . CHECK STO . CHECK STO erform the sto witch)". . the inspectio YES >> GO	ng Diagram in <u>With VDC"</u> . OR INSPECT on switch OFF t ABS actuato ninals for defo terminals. connector ar <u>detected?</u> O TO 2 or connection OP LAMP SW op lamp switco n result norm	ION Fr and electric unit (co ormation, disconnect ad perform self diagn of connector termin /ITCH h component inspect al?	ontrol unit) connector. ion, looseness, and so on ostic result. Refer to <u>BRC</u> als. Repair or replace con	n. If any m - <u>158. "CO</u> nector.	alfunction is found, repai
egarding Wirin ram - Sedan W .CONNECTO . Turn ignitio Disconnect . Check term or replace f . Reconnect . Reconnect . Reconnect . DTC C1116 ( YES >> GC NO >> Por .CHECK STO erform the sto witch)". . the inspectio YES >> GC NO >> Re	ng Diagram in <u>With VDC"</u> . OR INSPECT on switch OFF t ABS actuato hinals for defo terminals. connector ar <u>detected?</u> O TO 2 or connection OP LAMP SW op lamp switco <u>n result norm</u> O TO 3 place stop lan	ION or and electric unit (co ormation, disconnect nd perform self diagn of connector termin /ITCH h component inspec al? mp switch.	ontrol unit) connector. ion, looseness, and so on ostic result. Refer to <u>BRC</u> als. Repair or replace con	n. If any m - <u>158. "CO</u> nector.	alfunction is found, repai
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egarding Wirin ram - Sedan W .CONNECTO . Turn ignitio Disconnect . Check term or replace f . Reconnect . Reconnect . Reconnect . CHECK STO .CHECK STO	ng Diagram in <u>With VDC</u> OR INSPECT on switch OFF t ABS actuator inals for defor terminals. connector ar <u>detected?</u> O TO 2 or connection OP LAMP SW op lamp switco n result norm O TO 3 place stop land DP LAMP RE op lamp relay n result norm	ION The rand electric unit (constraints) for and electric unit (constraints) formation, disconnect and perform self diagn a of connector termin /ITCH h component inspect al? mp switch. LAY-1 -1 component inspect	ontrol unit) connector. ion, looseness, and so on ostic result. Refer to <u>BRC</u> als. Repair or replace con tion. Refer to <u>BRC-180, "</u>	n. If any m 158, "CO nector. Compone	alfunction is found, repaints in the second state of the second st
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egarding Wirin ram - Sedan W .CONNECTO . Turn ignitio Disconnect . Disconnect . Check term or replace f . Reconnect . Reconnect . Reconnect . Reconnect . CHECK STO erform the sto witch)". . the inspectio YES >> GO NO >> Re .CHECK STO erform the sto	ng Diagram in <u>With VDC</u> OR INSPECT on switch OFF t ABS actuator innals for defor terminals. connector ar <u>detected?</u> ) TO 2 or connection OP LAMP SW op lamp switce <u>n result norm</u> ) TO 3 place stop land OP LAMP RE op lamp relay <u>n result norm</u> ) TO 4 place stop land ) TO 4 place stop land	ION The rand electric unit (contraction, disconnection) and perform self diagnant and perform self diagnant and connector termina (ITCH h component inspection) al? The switch. LAY-1 -1 component inspection al?	ontrol unit) connector. ion, looseness, and so on ostic result. Refer to <u>BRC</u> als. Repair or replace con tion. Refer to <u>BRC-180, "</u>	n. If any m 158, "CO nector. Compone	alfunction is found, repaints in the second state of the second st

1. Connect stop lamp switch and stop lamp relay-1 connectors.

# C1116 STOP LAMP SW

#### < DTC/CIRCUIT DIAGNOSIS >

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

	S actuator and electric unit (control unit) Ground Condition		Condition	Voltage (Approx.)	
Connector	Terminal			(Approx.)	
E26	20		Brake pedal depressed	Battery voltage	
E20	20	_	Brake pedal released	0V	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".

NO >> GO TO 5

5. CHECK STOP LAMP RELAY-1 COIL CIRCUIT

1. Disconnect stop lamp relay-1 connector.

2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lamp relay-1		Ground	Condition	Voltage	
Connector	Terminal	Ground	Condition	(Approx.)	
E57	1	_	Brake pedal depressed	Battery voltage	
			Brake pedal released	0V	

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

### 6.CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

Stop lam	p relay-1	Ground	Voltage
Connector	Terminal	Clouin	(Approx.)
E57	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 7

NO >> Repair circuit between fuse block J/B and stop lamp relay.

7.CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

Stop lam	p relay-1	Ground	Continuity
Connector	Terminal	Glound	
E57	2		Yes

#### Is the inspection result normal?

YES >> Repair circuit between stop lamp relay and ABS actuator and electric unit (control unit).

NO >> Repair stop lamp relay ground circuit.

#### Component Inspection (Stop Lamp Switch)

### **1.**CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF.

2. Disconnect stop lamp switch connector.

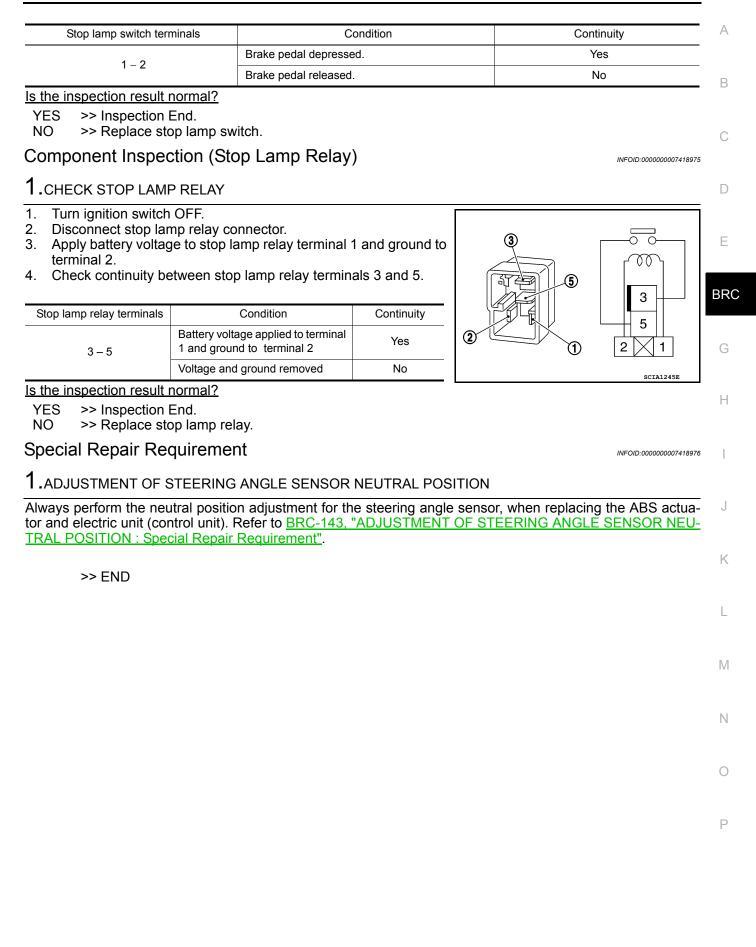
3. Check continuity between stop lamp switch terminals.

2012 Altima GCC

# C1116 STOP LAMP SW

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]



#### < DTC/CIRCUIT DIAGNOSIS >

# C1120, C1122, C1124, C1126 IN ABS SOL

### Description

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:000000007418978

INFOID:000000007418977

### 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 uni	
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 DIAGNOSTIC RESULT

#### With CONSULT.

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-182, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000007418979

Regarding Wiring Diagram information, refer to <u>BRC-223</u>, "Wiring Diagram - Coupe" or <u>BRC-232</u>, "Wiring Diagram - Sedan With VDC".

## **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-158. "CONSULT Function (ABS)"</u>.

#### Is the inspection result normal?

YES >> GO TO 2

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

## 2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. 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) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clouid	(Approx)	
E26	3		Battery voltage	

# C1120, C1122, C1124, C1126 IN ABS SOL

#### < DTC/CIRCUIT DIAGNOSIS >

#### Is the inspection result normal?

YES >> GO TO 3

NO

NO

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# $\mathbf{3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

				C
ABS actuator and ele	ectric unit (control unit)	Ground Continuity	Continuity	0
Connector	Terminal		Continuity	
E26	1		Yes	D
E20	4	—	165	

#### Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Installa-</u> tion".

Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
 Penair or replace malfunctioning components

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Component Inspection

INFOID:000000007418980

[VDC/TCS/ABS]

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## **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.

Operation			ABS solenoid valve	9
	Operation	Up	Keep	Down
	FR RH IN SOL	Off	On	On
	FR RH OUT SOL	Off	Off	On*
FR RH SOL	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
FR LH SOL	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	RR RH IN SOL	Off	On	On
RR RH SOL	RR RH OUT SOL	Off	Off	On*
	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

\*: 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 <u>BRC-182, "Diagnosis Procedure"</u>.

# C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Special Repair Requirement

INFOID:000000007418981

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

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

#### < DTC/CIRCUIT DIAGNOSIS >

# C1121, C1123, C1125, C1127 OUT ABS SOL

## Description

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:000000007418983

INFOID:000000007418982

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
DIC	Display item			D
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	E
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit) B	BRC
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.		
DTC CC	NFIRMATION PROCE	DURE		G
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT		
	CONSULT. the ignition switch OFF to			Н
	orm self diagnostic result.	JON.		
	C1121, C1123, C1125 or C	1127 detected?		Ι
YES		procedure. Refer to <u>BRC-185, "Diagnosis Proce</u>	dure".	
NO	>> Inspection End.			
Diagno	sis Procedure		INFOID:00000007418984	J
· ·				
Deservi		tion refer to DDC 202 WWining Discourse Course		К
	edan With VDC".	ition, refer to <u>BRC-223. "Wiring Diagram - Coup</u>	e" of <u>BRC-232, "Wiring Dia-</u>	
<u>g</u>	<u> </u>			
1				L
	NECTOR INSPECTION			
	ignition switch OFF.			М
		electric unit (control unit) connector. on, disconnection, looseness, and so on. If any		IVI
	place terminals.			
4. Reco	onnect connector and perf	orm self-diagnosis. Refer to <u>BRC-158, "CONSL</u>	JLT Function (ABS)"	Ν
Is the ins	spection result normal?			
	>> Inspection End.			
-	>> GO TO 2			0
Z.CHEC	CK SOLENOID AND ACTU	JATOR RELAY POWER SUPPLY CIRCUIT		
	ignition switch OFF.			Р
		electric unit (control unit) connector. ctuator and electric unit (control unit) connector		٢
J. CHE	on vollage between ADS a		L20 terminar 5 and ground.	

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Clound	(Approx)	
E26	3		Battery voltage	

[VDC/TCS/ABS]

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# C1121, C1123, C1125, C1127 OUT ABS SOL

#### < DTC/CIRCUIT DIAGNOSIS >

#### Is the inspection result normal?

YES >> GO TO 3

NO

NO

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# $\mathbf{3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity	
Connector	Terminal	Glound	Continuity	
E26	1		Yes	
E20	4	—	165	

#### Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

#### Component Inspection

INFOID:000000007418985

[VDC/TCS/ABS]

## **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.

Operation		ABS solenoid valve		
Operation		Up	Keep	Down
	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
FR RH SOL	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
FR LH SOL	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	RR RH IN SOL	Off	On	On
RR RH SOL	RR RH OUT SOL	Off	Off	On*
KK KH SUL	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
RR LH SOL	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

\*: 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 <u>BRC-182, "Diagnosis Procedure"</u>.

# C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:000000007418986

# Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actua-	_
tor and electric unit (control unit). Refer to <u>BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u>	В
TRAL POSITION : Special Repair Requirement".	

>> END

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# C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

#### < DTC/CIRCUIT DIAGNOSIS >

# C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

### Description

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

# DTC Logic

INFOID:000000007418988

INFOID:000000007418987

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1		
C1131	ENGINE SIGNAL 2		<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
C1132	ENGINE SIGNAL 3	Major engine components are malfunctioning.	
C1133	ENGINE SIGNAL 4		ECM     CAN communication line
C1136	ENGINE SIGNAL 6		

## DTC CONFIRMATION PROCEDURE

# 1. CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

Is DTC C1130, C1131, C1132, C1133 or C1136 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-188</u>, "Diagnosis Procedure".

NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000007418989

### **1.**CHECK ENGINE SYSTEM

- Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to <u>EC-99, "CONSULT Function"</u> (QR25DE) or <u>EC-422, "CONSULT Function"</u> (VQ35DE).
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)"

#### Is the inspection result normal?

- YES >> Inspection End. NO >> • Repair or repla
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

[VDC/TCS/ABS]

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1142 PRESS SEN CIRCUIT

## Description

The pressure sensor converts the brake fluid pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit). (The pressure sensor is integrated in the ABS actuator and electric unit (control unit).)

# DTC Logic

# DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pres sure sensor is malfunctioning.	<ul> <li>Harness or connector</li> <li>Stop lamp switch</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
отс сс	NFIRMATION PROCE	EDURE	
1.снес	CK SELF DIAGNOSTIC I	RESULT	
	CONSULT.		
	the ignition switch OFF		
	C1142 detected?		
		procedure. Refer to <u>BRC-189, "Diagnosis Pro</u>	<u>cedure"</u> .
NO	>> Inspection End.		
Jiagno	sis Procedure		INFOID:00000007418992
		nation, refer to <u>BRC-223, "Wiring Diagram - Cou</u>	upe" or <u>BRC-232, "Wiring Dia-</u>
<u>Iram - S</u>	edan With VDC".		
4			
I.CHEC	CK STOP LAMP SWITCH	1 CONNECTOR	
	ignition switch OFF.	d electric unit (control unit) and stop lamp switc	h connectors
		tion, disconnection, looseness, and so on. If a	
	place terminals. onnect connectors secur	elv	
	engine.	ery.	
	eat pumping brake ped NSULT Function (ABS)".	al carefully several times, and perform self-c	liagnosis. Refer to <u>BRC-158.</u>
	spection result normal?		
	>> GO TO 2		
		onnector terminal. Repair or replace connector	ſ.
<b>2.</b> CHEC	CK STOP LAMP SWITCH	4	
	ignition switch OFF.		
2. Disc	onnect stop lamp switch		
} Cho	ck continuity between str	on lamn switch connector terminals	
3. Che	ck continuity between sto	op lamp switch connector terminals.	

Stop lamp switch terminals	Condition	Continuity
1-2	Brake pedal depressed.	Yes
1 – 2	Brake pedal released.	No

Is the inspection result normal?

INFOID:000000007418990

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# DTC C1142 PRESS SEN CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

#### YES >> GO TO 3 NO >> Replace stop lamp switch.

3. CHECK STOP LAMP SWITCH CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector.
- 2. Connect stop lamp switch connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Condition	Voltage	
Connector	Terminal	Condition	voilage	
E26	20	Brake pedal is depressed	Battery voltage	
E26		Brake pedal is released	Approx. 0 V	

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

**4.**CHECK SELF DIAGNOSTIC RESULT

#### () With CONSULT.

1. Turn the ignition switch OFF to ON.

2. Perform self diagnostic result.

#### Is DTC C1142 detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

#### Component Inspection

**1.**CHECK DATA MONITOR

On "DATA MONITOR", select "PRESS SENSOR" and check the brake fluid pressure.

Condition	PRESS SENSOR (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	– 40 to 300 bar

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-189, "Diagnosis Procedure"</u>.

### Special Repair Requirement

INFOID:000000007418994

INFOID:000000007418993

### **1.**ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Special Repair Requirement".

>> END

## C1143, C1144 STEERING ANGLE SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

# C1143, C1144 STEERING ANGLE SENSOR

### Description

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:000000007418996

INFOID:000000007418995

#### DTC DETECTION LOGIC

DTC	Displ	lay item	Malfunction detected condition	Possible cause	C
C1143	ST ANG SEN	I CIRCUIT	Neutral position of steering angle sensor is dislocated, or       • Harness or connector         the steering angle sensor is malfunctioning.       • Steering angle sensor         • APS actuator and electric       • APS actuator and electric		
C1144	ST ANG SEN SIGNAL Neutral position of steering angle sensor is not finished. (control unit)				E
DTC CO	NFIRMATIO	ON PROCED	DURE		
<b>1.</b> CHEC	K SELF DIA	AGNOSTIC RE	ESULT		BF
1. Turn 2. Perfo <u>Is DTC C</u>	orm self diag 1143 or C11	switch OFF to gnostic result. 144 detected? to diagnosis p	ON. procedure. Refer to <u>BRC-191, "Diagnosis Pr</u>	ocedure".	G
	>> Inspectio				
Diagno	sis Proce	dure		INFOID:00000007418997	
			tion, refer to <u>BRC-223, "Wiring Diagram - C</u>	upe" or <u>BRC-232, "Wiring Dia-</u>	
	ig Wiring Dia edan With VI		tion, refer to <u>BRC-223, "Wiring Diagram - C</u>	upe" or <u>BRC-232, "Wiring Dia-</u>	
gram - Se	edan With VI	<u>′ĎC"</u> .	tion, refer to <u>BRC-223, "Wiring Diagram - C</u>	upe" or <u>BRC-232, "Wiring Dia-</u>	ţ
gram - Se 1.conn	edan With VI	<u>'DC"</u> . SPECTION	tion, refer to <u>BRC-223, "Wiring Diagram - C</u>	upe" or <u>BRC-232, "Wiring Dia-</u>	ļ
1.CONN 1. Turn 2. Disco 3. Chec or rej	ECTOR INS ignition swittonnect ABS ck terminals	<u>DC"</u> . SPECTION tch OFF. actuator and e for deformationals.	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a	ny malfunction is found, repair	
1.CONN 1. Turn 2. Disco 3. Cheo or re 4. Reco	ECTOR INS ignition swittonnect ABS ck terminals	<u>DC"</u> . SPECTION tch OFF. actuator and e for deformationals. ector and perfe	electric unit (control unit) connector.	ny malfunction is found, repair	
gram - Se <b>1</b> .CONN 1. Turn 2. Disco 3. Chec or rep 4. Reco Is the ins YES	VECTOR INS ignition swite onnect ABS ck terminals place termin onnect conne pection resu >> Inspectio	<u>DC"</u> . SPECTION tch OFF. actuator and e for deformationals. ector and performationals. ector and performationals.	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a	ny malfunction is found, repair	
1.CONN 1. Turn 2. Disco 3. Chec or re 4. Reco Is the ins YES	VECTOR INS ignition swite onnect ABS ck terminals place termin place termin place termin prection resu >> Inspectio >> GO TO 2	<u>DC"</u> . SPECTION tch OFF. actuator and e for deformation nals. ector and performation ult normal? on End. 2	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a orm self-diagnosis. Refer to <u>BRC-158, "COI</u>	ny malfunction is found, repair	
1.CONN 1. Turn 2. Disco 3. Chec or re 4. Reco Is the ins NO 2.CHEC	VECTOR INS ignition swite onnect ABS ck terminals place termin onnect conne pection resu >> Inspectio >> GO TO 2 CK STEERIN	<u>CC</u> . SPECTION tch OFF. actuator and e for deformation nals. ector and perfect ult normal? on End. SG ANGLE SE	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a orm self-diagnosis. Refer to <u>BRC-158, "COI</u> NSOR HARNESS	ny malfunction is found, repair ISULT Function (ABS)".	
1. CONN 1. Turn 2. Disco 3. Chec or re 4. Reco Is the ins YES NO 2.CHEC 1. Chec 2. Turn	VECTOR INS ignition swite onnect ABS ck terminals place termin place termin place termin prection resu >> Inspectio >> GO TO 2 CK STEERIN ck CAN comi ignition swite	<u>CC</u> . SPECTION tch OFF. actuator and e for deformation nals. ector and performation ult normal? on End. CONTRACTION STATES STATES SPECTION actuation system tch OFF.	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a orm self-diagnosis. Refer to <u>BRC-158, "COI</u> NSOR HARNESS stem. Refer to <u>LAN-15, "Trouble Diagnosis</u>	ny malfunction is found, repair ISULT Function (ABS)".	
1.CONN 1. Turn 2. Disco 3. Chec or rel 4. Reco Is the ins YES NO 2.CHEC 1. Chec 2. Turn 3. Disco	VECTOR INS ignition swite onnect ABS ck terminals place termin onnect conne pection resu >> Inspectio >> GO TO 2 CK STEERIN ck CAN comi ignition swite onnect steer	<u>CC</u> . SPECTION tch OFF. actuator and e for deformation nals. ector and perforult normal? on End. Con E	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a orm self-diagnosis. Refer to <u>BRC-158, "COI</u> NSOR HARNESS stem. Refer to <u>LAN-15, "Trouble Diagnosis</u>	ny malfunction is found, repair ISULT Function (ABS)".	
1. CONN 1. Turn 2. Disco 3. Chec or re 4. Reco Is the ins YES NO 2.CHEC 1. Chec 2. Turn 3. Disco 4. Chec	VECTOR INS ignition swite onnect ABS ck terminals place termin onnect conne pection resu >> Inspectio >> GO TO 2 CK STEERIN ck CAN comi ignition swite onnect steer	<u>SPECTION</u> tch OFF. actuator and e for deformation nals. ector and performation on End. Son End. Son End. Son ANGLE SE munication systech OFF. ring angle sense between stee	electric unit (control unit) connector. on, disconnection, looseness, and so on. If a orm self-diagnosis. Refer to <u>BRC-158, "COI</u> NSOR HARNESS stem. Refer to <u>LAN-15, "Trouble Diagnosis</u> sor connector.	ny malfunction is found, repair ISULT Function (ABS)".	

5. Turn ignition switch ON.

1

M53

6. Check voltage between steering angle sensor connector M53 terminal 4 and ground.

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Yes

[VDC/TCS/ABS]

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# C1143, C1144 STEERING ANGLE SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Steering a	ngle sensor	Ground	Voltage	
Connector	Terminal	Clouid	(Approx.)	
M53	4	_	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO

>> • Repair or replace malfunctioning components.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

# **3.**CHECK DATA MONITOR

1. Turn ignition switch OFF.

2. Connect the steering angle sensor and ABS actuator and electric unit (control unit) connectors.

3. Perform the steering angle sensor component inspection. Refer to <u>BRC-192</u>, "Component Inspection".

#### Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".

NO >> Replace steering angle sensor. Refer to <u>BRC-259</u>, "Removal and Installation".

#### Component Inspection

INFOID:000000007418998

### **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-191, "Diagnosis Procedure"</u>.

### Special Repair Requirement

INFOID:000000007418999

# **1**.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Special Repair Requirement</u>".

>> END

## C1145, C1146 YAW RATE/SIDE G SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

# C1145, C1146 YAW RATE/SIDE G SENSOR

### Description

The yaw rate/side/decel G sensor detects the 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

INFOID:000000007419001

INFOID:000000007419000

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D	
C1145	YAW RATE SENSOR	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	<ul><li>Harness or connector</li><li>ABS actuator and electric unit</li></ul>		
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	<ul><li>(control unit)</li><li>Yaw rate/side G sensor</li></ul>	E	
DTC CO	NFIRMATION PROCEI	DURE		BRC	
<b>1</b> .CHEC	1.CHECK SELF DIAGNOSTIC RESULT				
1. Turn 2. Perfo	CONSULT. the ignition switch OFF to orm self diagnostic result. C1145 or C1146 detected?			G	
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-193, "Diagnosis Procedure"</u> . NO >> Inspection End.					
Diagno	sis Procedure		INFOID:000000007419002		

Regarding Wiring Diagram information, refer to <u>BRC-223, "Wiring Diagram - Coupe"</u> or <u>BRC-232, "Wiring Diagram - Sedan With VDC"</u>.

#### **CAUTION:**

- Sudden turns (such as spin turns, acceleration turns), drifting, etc., when VDC function is off (VDC OFF switch "ON") may cause yaw rate/side/decel G sensor system to indicate a malfunction. However, this is not a malfunction, if normal operation can be resumed after restarting engine. Then erase memory of self-diagnosis.
- If vehicle is on turn-table at entrance to parking garage, or on other moving surface, SLIP indicator lamp may illuminate and CONSULT self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn-table or other moving surface, and start engine. Results will return to normal. And after doing spin turns or acceleration turns with VDC function is being off (VDC OFF switch "ON"), too, the results will return to a normal condition by re-starting vehicle.

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- Reconnect connector and perform self-diagnosis. Refer to <u>BRC-158, "CONSULT Function (ABS)"</u>.
- Is the inspection result normal?
- YES >> Inspection End.

NO >> GO TO 2

2.CHECK YAW RATE/SIDE/DECEL G SENSOR POWER SUPPLY CIRCUIT

1. Check voltage between yaw rate/side/decel G sensor connector M55 terminal 4 and ground.

[VDC/TCS/ABS]

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# C1145, C1146 YAW RATE/SIDE G SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Yaw rate/side/decel G sensor		Ground	Condition	Voltage
Connector	Terminal	Giouna	Condition	(Approx.)
M55	4		Ignition switch ON	Battery voltage
MISS	4	—	Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

>> • Repair or replace malfunctioning components.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

 ${\it 3.}$  Check yaw rate/side/decel G sensor ground supply circuit

Check resistance between yaw rate/side/decel G sensor connector M55 terminal 1 and ground.

Yaw rate/side/decel G sensor		Ground	Continuity	
Connector	Terminal	Ground	Continuity	
M55	1	_	Yes	

Is the inspection result normal?

YES >> GO TO 4

NO

- >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### **4.**CHECK YAW RATE/SIDE/DECEL G SENSOR HARNESS

1. Check continuity between ABS actuator and electric unit (control unit) connector E26 and yaw rate/side/ decel G sensor connector M55.

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
F26	14	MEE	2	Vee
⊏20	E26 M55		3	Yes

2. Check continuity between ABS actuator and electric unit (control unit) connector E26 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity	
Connector	Terminal	Ground	Continuity	
E26	14		No	
	25		INO	

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace malfunctioning components.

## **5.**CHECK DATA MONITOR

1. Connect the Yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit) connectors.

2. Perform the yaw rate/side/decel G sensor component inspection. Refer to <u>BRC-195</u>, "Component <u>Inspection"</u>.

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-158</u>, "<u>CONSULT Function</u> (<u>ABS</u>)".
- NO >> Replace Yaw rate/side/decel G sensor. Refer to <u>BRC-258. "Removal and Installation"</u>.

# C1145, C1146 YAW RATE/SIDE G SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

INFOID:000000007419003

INFOID:000000007419004

[VDC/TCS/ABS]

# **1.**CHECK DATA MONITOR

**Component Inspection** 

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

Vehicle condition	YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	•
Stopped	Approx. 0 d/s	Approx. 0 m/s <sup>2</sup>	С
Turning right	Negative value	Negative value	-
Turning left	Positive value	Positive value	D

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-193. "Diagnosis Procedure"</u>.

## Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Special Repair Requirement"</u>.

>> END

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# C1147, C1148, C1149, C1150 USV/HSV LINE

### < DTC/CIRCUIT DIAGNOSIS >

# C1147, C1148, C1149, C1150 USV/HSV LINE

### Description

USV1, USV2 (CUT VALVE) The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

## HSV1, HSV2 (SUCTION VALVE)

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

# DTC Logic

INFOID:000000007419006

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1147	USV LINE[FL-RR]	VDC switch-over solenoid valve (USV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1148	USV LINE[FR-RL]	VDC switch-over solenoid valve (USV2) 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
C1149	HSV LINE[FL-RR]	VDC switch-over solenoid valve (HSV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)
C1150	HSV LINE[FR-RL]	VDC switch-over solenoid valve (HSV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	

### DTC CONFIRMATION PROCEDURE

1. CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

Turn the ignition switch OFF to ON.

2. Perform self diagnostic result.

Is DTC C1147, C1148, C1149 or C1150 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-196, "Diagnosis Procedure"</u>. NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000007419007

Regarding Wiring Diagram information, refer to <u>BRC-223</u>, "Wiring Diagram - Coupe" or <u>BRC-232</u>, "Wiring Diagram - Sedan With VDC".

# **1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-158. "CONSULT Function (ABS)"</u>.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2

# 2. CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

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

## BRC-196

INFOID:000000007419005

# C1147, C1148, C1149, C1150 USV/HSV LINE

#### < DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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INFOID:000000007419008

### 3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage	
Connector	Terminal	Glouina	(Approx)	D
E26	3	_	Battery voltage	D

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

>> • Repair or replace malfunctioning components.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

**3.** CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)		Crowned		E
Connector	Terminal	Ground	Continuity	
E26	1		Yes	BRC
E20	4	—	165	

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Installa-</u> <u>tion"</u>.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### **Component Inspection**

NO

**1.**CHECK ACTIVE TEST

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

Operation		A	BS solenoid valve (	ACT)
		Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
FR RH ABS SOLENOID (ACT)	USV [FR-RL]	Off	On	On
	HSV [FR-RL]	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
FR LH ABS SOLENOID (ACT)	USV [FL-RR]	Off	Off	Off
	HSV [FL-RR]	Off	Off	Off
	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
RR RH ABS SOLENOID (ACT)	USV [FL-RR]	Off	Off	Off
	HSV [FL-RR]	Off	Off	Off
	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	USV [FR-RL]	Off	On	On
	HSV [FR-RL]	Off	On*	Off

\*: On for 1 to 2 seconds after the touch, and then Off

# C1147, C1148, C1149, C1150 USV/HSV LINE

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-196. "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000007419009

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Special Repair Requirement".

>> END

## < DTC/CIRCUIT DIAGNOSIS >

# C1154 PNP SWITCH

## Description

The transmission range switch signal is transmitted to the ABS actuator and electric unit (control unit) using the CAN communication lines.

## DTC Logic

#### INFOID:000000007419011

INFOID:000000007419010

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1154	PNP POS SIG	Transmission range switch signal or communication line between the ABS actuator and electric unit (control unit) and TCM is open or shorted.	<ul><li>Harness or connector</li><li>Transmission range switch</li></ul>	E
DTC CC	NFIRMATION PROCE	DURE		
<b>1</b> .CHEC	CK SELF DIAGNOSTIC R	ESULT		BF
1. Turn 2. Perf	CONSULT. the ignition switch OFF to orm self diagnostic result.	ON.		G
	C1154 detected?			
	>> Proceed to diagnosis   >> Inspection End.	procedure. Refer to <u>BRC-199, "Diagnosis Proce</u>	<u>aure"</u> .	ŀ
	sis Procedure			1
Diagno			INFOID:000000007419012	
<b>1.</b> CHEC	CK DATA MONITOR			
Select "	SLCT LVR POSI" in "Data	Monitor" and check transmission range switch s	signal.	
	Selector lever position	SLCT LVR POSI (Data monitor)		
	P position	Р		
	R position	R		ŀ
	N position	Ν		
	D position	D		
	pection result normal?			
YES NO	tion".	or and electric unit (control unit). Refer to <u>BRC-3</u> gnosis, and make sure that the result shows "NC		N
<b>2.</b> CHEC	K TRANSMISSION RAN	GE SWITCH		
Perform <u>tion"</u> (QF		inspection. Refer to <u>TM-135, "Description"</u> (VQ	35DE) or <u>TM-296, "Descrip-</u>	I
Is the ins	pection result normal?			(
YES	tion"	or and electric unit (control unit). Refer to <u>BRC-</u>		
NO	>> • Repair or replace ma	gnosis, and make sure that the result shows "NO alfunctioning components. gnosis, and make sure that the result shows "NO		
Specia	l Repair Requiremer	nt	INFOID:000000007419013	
I.ADJU	STMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION		

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## C1154 PNP SWITCH

#### < DTC/CIRCUIT DIAGNOSIS >

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: Special Repair Requirement".

>> END

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1155 BR FLUID LEVEL LOW

## Description

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

## DTC Logic

INFOID:000000007419015

INFOID:000000007419014

## DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	<ul><li>Harness or connector</li><li>Brake fluid level switch</li></ul>
DTC CC	NFIRMATION PROCE	EDURE	
<b>1</b> .CHEC	CK SELF DIAGNOSTIC F	RESULT	
1. Turn 2. Perfe	CONSULT. the ignition switch OFF orm self diagnostic result C1155 detected?		
	>> Proceed to diagnosis>> Inspection End.	procedure. Refer to <u>BRC-201, "Diagnosis Proce</u>	<u>dure"</u> .
	sis Procedure		INFOID:000000007419016
	ng Wiring Diagram inform edan With VDC".	ation, refer to <u>BRC-223, "Wiring Diagram - Coup</u>	e" or <u>BRC-232, "Wiring Dia-</u>
gram o	<u>oddir With VDO</u> .		
CAUTIO		e reservoir tank before starting inspection.	
	NECTOR INSPECTION	reservoir tank before starting inspection.	
<ol> <li>Turn</li> <li>Disc</li> <li>Chee</li> </ol>	ignition switch OFF. onnect brake fluid level s	witch and combination meter connectors. ion, disconnection, looseness, and so on. If any	malfunction is found, repair
4. Reco Is the ins YES		rform self-diagnosis. Refer to <u>BRC-158, "CONSL</u>	JLT Function (ABS)".
-	CK BRAKE FLUID LEVE	SWITCH	
Perform Is the ins		ch component inspection. Refer to <u>BRC-202, "Co</u>	mponent Inspection".
NO	>> Replace brake fluid le	evel switch. Refer to <u>BR-22, "Exploded View"</u> .	
<b>3</b> .CHEC	CK BRAKE FLUID LEVE	_ SWITCH HARNESS	
2. Che	onnect combination mete ck continuity between co or E24 terminal 1.	er connector M24. mbination meter connector M24 terminal 27 and	brake fluid level switch con-

## 27 - 1

- : Continuity should exist.
- 3. Check continuity between combination meter connector M24 terminal 27 and ground.

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# DTC C1155 BR FLUID LEVEL LOW

#### < DTC/CIRCUIT DIAGNOSIS >

#### 27 - Ground

#### : Continuity should not exist.

Is the inspection result normal?

- YES >> GO TO 4 NO >> • Repair of
  - >> Repair or replace malfunctioning components.
    - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

### 4. CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

Check continuity between brake fluid level switch connector E24 Sterminal 2 and ground.

#### 2 - Ground

#### : Continuity should exist.

Is the inspection result normal?

YES >> Brake fluid level switch circuit is OK.

- NO >> Repair or replace malfunctioning components.
  - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

## Component Inspection

## 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	Terminals	Condition	Continuity	
E24	1 – 2	When brake fluid is full in the reservoir tank.	No	
L24	1 – 2	When brake fluid is empty in the reservoir tank.	Yes	

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Replace reservoir tank.

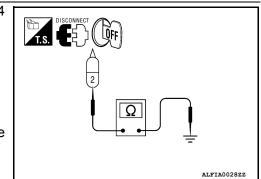
#### Special Repair Requirement

INFOID:000000007419018

# **1**.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Special Repair Requirement</u>".

>> END



INFOID:000000007419017

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC C1156 ST ANG SEN COM CIR

## Description

The steering angle sensor is connected to the ABS actuator and electric unit (control unit) in addition to CAN lines. 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:000000007419020

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1156	ST ANG SEN COM CIR	When steering angle sensor is not transmitting CAN communication signal to the ABS actuator and electric unit (control unit).	<ul> <li>Harness or connector</li> <li>CAN communication line</li> <li>Steering angle sensor</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
DTC CC	NFIRMATION PROCE	EDURE	
<b>1.</b> CHEC	CK SELF DIAGNOSTIC F	RESULT	
	CONSULT.		
2. Perf <u>Is DTC (</u>	the ignition switch OFF orm self diagnostic result C1156 detected?	i.	
	<ul><li>&gt; Proceed to diagnosis</li><li>&gt; Inspection End.</li></ul>	procedure. Refer to <u>BRC-203, "Diagnosis Proce</u>	<u>edure"</u> .
Diagno	sis Procedure		INFOID:000000007419021
<b>1.</b> coni	NECTOR INSPECTION		
<ol> <li>Disc</li> <li>Che</li> </ol>		d electric unit (control unit) connector. tion, disconnection, looseness, and so on. If any	malfunction is found, repair
4. Rec		rform self-diagnosis. Refer to <u>BRC-158, "CONSI</u>	JLT Function (ABS)".
4. Rec <u>Is DTC (</u> YES	21156 detected? >> Refer to <u>LAN-15, "Tre</u>	rform self-diagnosis. Refer to <u>BRC-158, "CONSUpuble Diagnosis Flow Chart"</u> .	JLT Function (ABS)".
4. Rec <u>Is DTC (</u> YES	C1156 detected?	-	<u>JLT Function (ABS)"</u> .
4. Rec <u>Is DTC (</u> YES	21156 detected? >> Refer to <u>LAN-15, "Tre</u>	-	<u>JLT Function (ABS)"</u> .

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# U1000 CAN COMM CIRCUIT

## Description

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

### DTC Logic

INFOID:000000007419023

INFOID:000000007419024

### DTC DETECTION LOGIC

DTC	Display	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 system malfunction

### DTC CONFIRMATION PROCEDURE

**1.**CHECK SELF DIAGNOSTIC RESULT

#### With CONSULT.

- Turn the ignition switch OFF to ON.
- 2. Perform self diagnostic result.

#### Is DTC U1000 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-204, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

## Diagnosis Procedure

**1**.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to <u>BRC-158, "CONSULT Function (ABS)"</u>.

#### Is DTC U1000 detected?

- YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
- NO >> Inspection End.

INFOID:000000007419022

# **PARKING BRAKE SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

# PARKING BRAKE SWITCH

# Description

The parking brake switch converts the status of the parking brake pedal to an electric signal and transmits it to the combination meter. Then, through CAN communication, the signal is carried to the ABS actuator and electric unit (control unit).

## **Component Function Check**

1. CHECK PARKING BRAKE SWITCH OPERATION

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

Condition	Brake warning lamp illumination status	E
When the parking brake is engaged	ON	
When the parking brake is not engaged	OFF	BF
Is the inspection result normal?		יוס
YES >> Inspection End.		
<b>-</b> .	ure. Refer to <u>BRC-205, "Diagnosis Procedure"</u> .	0
Diagnosis Procedure	INFOID:000000007419027	
		ŀ
Regarding Wiring Diagram informat	ion, refer to <u>BRC-223, "Wiring Diagram - Coupe"</u> or <u>BRC-232, "Wiring Dia-</u>	
<u>gram - Sedan With VDC"</u> .		
1. CHECK PARKING BRAKE SWI <sup>-</sup>	TCH CIRCUIT	
1. Disconnect combination meter	connector and parking brake switch connector.	
2. Check continuity between con	nbination meter harness connector M24 terminal 26 and parking brake	
switch harness connector E35	(with CVT) or M73 (with M/T) terminal 1.	
26 - 1	: Continuity should exist.	
3. Check continuity between coml	bination meter harness connector M24 terminal 26 and ground.	
	O antiquity also add as to wint	I
	: Continuity should not exist.	
Is the inspection result normal?		ľ
YES >> GO TO 2 NO >> Repair harness or conr	ector.	
2. CHECK PARKING BRAKE SWI		
	omponent inspection. Refer to <u>BRC-205. "Component Inspection"</u> .	ľ
Is the inspection result normal?		
· · · · · ·	vitch case ground condition.	(
NO >> Replace parking brake		
Component Inspection	INFOID:000000007419028	
1.CHECK PARKING BRAKE SWI		
<ol> <li>Turn ignition switch OFF.</li> <li>Disconnect parking brake switch</li> </ol>	h connector	
	in connector.	

3. Check continuity between parking brake switch terminal 1 and ground.

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# PARKING BRAKE SWITCH

#### < DTC/CIRCUIT DIAGNOSIS >

### [VDC/TCS/ABS]

Parking brake switch terminal	Ground	Condition	Continuity
1	Ground	When the parking brake is engaged.	Yes
1	Ground	When the parking brake is released.	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace parking brake switch.

Special Repair Requirement

INFOID:000000007419029

# 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: Special Repair Requirement".

>> END

# **VDC OFF SWITCH**

# < DTC/CIRCUIT DIAGNOSIS >

# VDC OFF SWITCH

### Description

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

### **Component Function Check**

## CHECK VDC OFF SWITCH OPERATION

Press and release the VDC OFF switch, then press and release the VDC OFF switch again 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: pressed and re- leased	ON	E
VDC OFF switch: pressed and re- leased	OFF	
Is the inspection result normal?		BRC
YES >> Inspection End. NO >> Go to diagnosis pro-	cedure. Refer to <u>BRC-207, "Diagnosi</u>	s Procedure".
Diagnosis Procedure		INFOID:000000007419032

Regarding Wiring Diagram information, refer to BRC-223. "Wiring Diagram - Coupe" or BRC-2	32, "Wiring Dia-
gram - Sedan With VDC".	

# 1.CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to <u>BRC-208, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

**2.**CHECK VDC OFF SWITCH HARNESS

1. Disconnect ABS actuator and electric unit (control unit) connector E26.

2. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 21 and VDC OFF switch connector M72 terminal 1.

 ABS actuator and ele	ectric unit (control unit)	VDC OF	FF switch	Continuity	IVI
 Connector	Terminal	Connector	Terminal		
E26	21	M72	1	Yes	Ν

3. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 21 and ground.

ABS actuator and ele	ectric unit (control unit)	Ground	Continuity	
Connector	Terminal	Ciouna	Continuity	
E26	21	—	No	Ρ

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK VDC OFF SWITCH GROUND

Check continuity between VDC OFF switch connector M72 terminal 2 and ground.

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# **VDC OFF SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

VDC OF	F switch	Ground	Continuity
Connector	Terminal	Ground	Continuity
M72	2	—	Yes

Is the inspection result normal?

YES >> Inspection end.

NO >> Repair or replace malfunctioning components.

## Component Inspection

# 1.CHECK VDC OFF SWITCH

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

VDC OFF switch terminals	Condition	Continuity
1.2	VDC OFF switch pressed	Yes
1, 2	VDC OFF switch released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch.

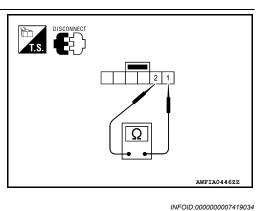
## Special Repair Requirement

# 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Special Repair Requirement"</u>.

**BRC-208** 

>> END



[VDC/TCS/ABS]

INFOID:000000007419033

# **ABS WARNING LAMP**

## < DTC/CIRCUIT DIAGNOSIS >

# ABS WARNING LAMP

# Description

INFOID:000000007419035

А

[VDC/TCS/ABS]

	×: ON –: OFF	В
Condition	ABS warning lamp	
Ignition switch OFF	-	
For 2 seconds after turning ON ignition switch	×	С
2 seconds later after turning ON ignition switch	-	
ABS function is malfunctioning.	x	D
EBD function is malfunctioning.	×	
Component Function Check	INFOID:00000007419036	Е
1. CHECK ABS WARNING LAMP OPERATION		
Check that the lamp illuminates for approximately 2 se Is the inspection result normal? YES >> Inspection End. NO >> Go to diagnosis procedure. Refer to BRC-		BRC G
Diagnosis Procedure	INFOID:00000007419037	0
<b>1.</b> CHECK SELF-DIAGNOSIS		Н
Perform ABS actuator and electric unit (control unit) s (ABS)".	elf-diagnosis. Refer to <u>BRC-158, "CONSULT Function</u>	
Is the inspection result normal?		
YES >> GO TO 2		
NO >> Check items displayed by self-diagnosis.		.1
2. CHECK COMBINATION METER		0
Check if the indication and operation of combination m	eter are normal. Refer to MWI-4, "Work Flow".	
Is the inspection result normal?		Κ
•	ontrol unit). Refer to <u>BRC-256, "Removal and Installa-</u>	
NO >> Repair or replace combination meter. Refe	er to MWI-139, "Removal and Installation".	L
Special Repair Requirement	INFOID:00000007419038	
1. ADJUSTMENT OF STEERING ANGLE SENSOR N	EUTRAL POSITION	M
	steering angle sensor, when replacing the ABS actua-	Ν
>> END		
		0

Ρ

## **BRAKE WARNING LAMP**

#### < DTC/CIRCUIT DIAGNOSIS >

# BRAKE WARNING LAMP

# Description

INFOID:000000007419039

[VDC/TCS/ABS]

×: ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
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:000000007419040

# **1**.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to <u>BRC-210. "Diagnosis Procedure"</u>.

### 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 brakes.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check parking brake switch. Refer to <u>BR-13, "Inspection and Adjustment"</u>.

### Diagnosis Procedure

INFOID:000000007419041

### 1. CHECK PARKING BRAKE SWITCH

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Check parking brake switch. Refer to <u>BR-13, "Inspection and Adjustment"</u>.

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-158, "CONSULT Function</u> (<u>ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

 $\mathbf{3}$ . CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4</u>, <u>"Work Flow"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-139</u>, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

### [VDC/TCS/ABS]

INFOID:000000007419042

# Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actua-	_
tor and electric unit (control unit). Refer to <u>BRC-143. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u>	В
TRAL POSITION : Special Repair Requirement".	

>> END

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# **VDC OFF INDICATOR LAMP**

#### < DTC/CIRCUIT DIAGNOSIS >

# VDC OFF INDICATOR LAMP

# Description

INFOID:000000007419043

**IVDC/TCS/ABS1** 

×: ON –: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
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:000000007419044

### **1.**VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to <u>BRC-212, "Diagnosis Procedure"</u>.

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 <u>BRC-207, "Description"</u>.

## **Diagnosis** Procedure

INFOID:000000007419045

### **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 <u>BRC-207, "Diagnosis Procedure"</u>.

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-158, "CONSULT Function</u> (<u>ABS)"</u>.

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 <u>MWI-4</u>, <u>"Work Flow"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256. "Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-139</u>, "Removal and Installation".

# VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

# [VDC/TCS/ABS]

INFOID:000000007419046

# Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

tor and electric unit (control unit). Refer to <u>BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u>	_
	В
TRAL POSITION : Special Repair Requirement".	

>> END

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### < DTC/CIRCUIT DIAGNOSIS >

# SLIP INDICATOR LAMP

# Description

INFOID:000000007419047

INFOID:000000007419048

INFOID:000000007419049

[VDC/TCS/ABS]

×: ON -: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	_
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

# Component Function Check

## **1.**CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-214</u>, "Diagnosis Procedure".

## Diagnosis Procedure

**1.**CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-158, "CONSULT Function</u> (<u>ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4</u>, <u>"Work Flow"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-139</u>, "Removal and Installation".

# Special Repair Requirement

INFOID:000000007419050

# 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-143</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Special Repair Requirement".

>> END

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000007419051 B

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С

[VDC/TCS/ABS]

#### 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 mo	Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation	
		0 [km/h, mph]	Vehicle stopped	
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display ( $\pm$ 10% or less)	Vehicle running (Note 1)	В
		0 [km/h, mph]	Vehicle stopped	-
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display ( $\pm$ 10% or less)	Vehicle running (Note 1)	(
		0 [km/h, mph]	Vehicle stopped	
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display ( $\pm$ 10% or less)	Vehicle running (Note 1)	.
		0 [km/h, mph]	Vehicle stopped	-
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display ( $\pm$ 10% or less)	Vehicle running (Note 1)	-
FR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On	
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off	-
FR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On	
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off	(
FR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On	-
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off	-

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### < ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data mo	nitor
Monitor item	Display content	Condition	Reference value in normal operation
FR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off
RR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off
RR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off
RR RH IN SOL	OL Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off
RR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actua- tor relay is inactive (in fail-safe mode)	On
		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off
STOP LAMP SW	Brake pedal operation	When brake pedal is de- pressed	ON
STOF LAWIT SV	Brake pedal operation	When brake pedal is not depressed	OFF
		When the motor relay and motor are operating	ON
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operat- ing	OFF

### < ECU DIAGNOSIS INFORMATION >

		Data monitor					
Monitor item	Display content	Condition	Reference value in normal operation				
ACTUATOR RLY	Actuator relay exerction	When the actuator relay is operating	ON				
(Note 2)	Actuator relay operation	When the actuator relay is not operating	OFF				
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON				
ADS WARN LAWP	(Note 3)	When ABS warning lamp is OFF	OFF				
	VDC OFF indicator lamp	When VDC OFF indica- tor lamp is ON	ON				
OFF LAMP	(Note 3)	When VDC OFF indica- tor lamp is OFF	OFF				
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indica- tor lamp is ON)	ON				
		VDC OFF switch OFF (When VDC OFF indica- tor lamp is OFF)	OFF				
	SLIP indicator lamp	When SLIP indicator lamp is ON	ON				
SLIP LAMP	(Note 3)	When SLIP indicator lamp is OFF	OFF				
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V				
GEAR	Manual mode gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear 6th gear	1 2 3 4 5 6				
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	When vehicle stop	Approx. 0 d/s				
		When vehicle turning	-75 to 75 d/s				
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with	Accelerator pedal not de- pressed (ignition switch is ON)	0 %				
	accelerator pedal)	Depress accelerator ped- al (ignition switch is ON)	0 - 100 %				
		Vehicle stopped	Approx. 0 m/s <sup>2</sup>				
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s <sup>2</sup> )				
		Vehicle turning left	Positive value (m/s <sup>2</sup> )				
		Straight-ahead	Approx. 0°				
STR ANGLE SIG	Steering angle detected by steering angle sensor	Steering wheel turned	–720 to 720°				
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar				
I NEGO SENSUR	brake huld pressure delected by pressure sensor	With ignition switch turned ON and brake pedal depressed	-40 to 300 bar				

## < ECU DIAGNOSIS INFORMATION >

		Data mo	nitor
Monitor item	Display content	Condition	Reference value in normal operation
		EBD is active	ON
EBD SIGNAL	EBD operation	EBD is inactive	OFF
		ABS is active	ON
ABS SIGNAL	ABS operation	ABS is inactive	OFF
	TOO seconding	TCS is active	ON
TCS SIGNAL	TCS operation	TCS is inactive	OFF
		VDC is active	ON
VDC SIGNAL	VDC operation	VDC is inactive	OFF
		In EBD fail-safe	ON
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF
		In ABS fail-safe	ON
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF
		In TCS fail-safe	ON
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF
		In VDC fail-safe	ON
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF
		Crank is active	ON
CRANKING SIG	Crank operation	Crank is inactive	OFF
	Drake fluid lovel oviteb	When brake fluid level switch ON	ON
FLUID LEV SW	Brake fluid level switch	When brake fluid level switch OFF	OFF
PARK BRAKE SW	Parking brake switch	Parking brake switch is active	ON
FARR BRARE SW		Parking brake switch is inactive	OFF
USV[FL-RR]	VDC switch-over valve	When actuator (switch- over valve) is active ("AC- TIVE TEST" with CON- SULT) or actuator relay is inactive (when in fail-safe mode)	On
		ConditionEBD is activeEBD is inactiveABS is activeABS is inactiveTCS is activeTCS is inactiveVDC is activeVDC is activeVDC is inactiveIn EBD fail-safeEBD is normalIn ABS fail-safeEBD is normalIn TCS fail-safeTCS is normalIn VDC fail-safeVDC is normalIn VDC fail-safeVDC is normalIn VDC fail-safeVDC is normalCrank is inactiveVDC is normalCrank is inactiveWhen brake fluid level switch ONWhen brake fluid level switch OFFParking brake switch is inactiveParking brake switch is inactiveWhen actuator (switch- over valve) is active ("AC- TIVE TEST" with CON- SULT) or actuator relay is inactive (when in fail-safe	Off
USV[FR-RL]	VDC switch-over valve	over valve) is active ("AC- TIVE TEST" with CON- SULT) or actuator relay is inactive (when in fail-safe	On
		over valve) is not active and actuator relay is ac-	Off

#### < ECU DIAGNOSIS INFORMATION >

, [VDC/TCS/ABS]

		Data mo	nitor	
Monitor item	Display content	Condition	Reference value in normal operation	A
HSV[FL-RR]	VDC switch-over valve	When actuator (switch- over valve) is active ("AC- TIVE TEST" with CON- SULT) or actuator relay is inactive (when in fail-safe mode)	On	B
		When actuator (switch- over valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off	D
HSV[FR-RL]	VDC switch-over valve	When actuator (switch- over valve) is active ("AC- TIVE TEST" with CON- SULT) or actuator relay is inactive (when in fail-safe mode)	On	BRC
		When actuator (switch- over valve) is not active and actuator relay is ac- tive (ignition switch ON)	Off	G
V/R OUTPUT	Solenoid valve relay activated	When the solenoid valve relay is active (When igni- tion switch OFF)	ON	Н
(Note 2)	Solehold valve relay activated	When the solenoid valve relay is not active (in the fail-safe mode)	OFF	
M/R OUTPUT	Actuator motor and motor relay activated	When the actuator motor and motor relay are ac- tive ("ACTIVE TEST" with CONSULT)	ON	J
		When the actuator motor and motor relay are inac- tive	OFF	K
		With engine stopped	0 rpm	
ENGINE RPM	With engine running	Engine running	Almost in accor- dance with tachome- ter display	L

Note 1: Confirm tire pressure is normal.

Note 2: 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.

Note 3: On and off timing for warning lamp and indicator lamp. Refer to <u>BRC-209, "Description"</u> (ABS), <u>BRC-212, "Description"</u> (VDC OFF) or <u>BRC-214, "Description"</u> (SLIP).

## Fail-Safe

INFOID:000000007419052

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#### ABS, EBD SYSTEM

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

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

#### < ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

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

#### VDC / TCS

In case of malfunction in the VDC/TCS/ABS system, SLIP indicator lamp is turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control. **CAUTION:** 

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

DTC No. Index

INFOID:000000007419053

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is out- side the standard.	
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	BRC-162, "Diagno- sis Procedure"
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	(Note 1)
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
RR RH SENSOR-2 [C1105]	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	BRC-165. "Diagno- sis Procedure"
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	(Note 1)
FR LH SENSOR- 2 [C1108]	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-168, "Diagno- sis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-170, "Diagno- sis Procedure"
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.	BRC-171, "Diagno-
[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.	sis Procedure"
MAIN RELAY	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.	BRC-173, "Diagno-
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	sis Procedure"
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-175, "Diagno- sis Procedure" (Note 1)
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-178, "Diagno- sis Procedure (With M/T)" BRC-179, "Diagno- sis Procedure (With CVT)"

#### < ECU DIAGNOSIS INFORMATION >

(VDC/TCS/ABS)

Display item	Malfunction detecting condition	Check item
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-182, "Diagno-
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-185, "Diagno-
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	
ENGINE SIGNAL 1 [C1130]		
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]	Major engine components are malfunctioning.	BRC-188, "Diagno- sis Procedure"
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 6 [C1136]		
PRESS SEN CIRCUIT [C1142]	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	BRC-189, "Diagno- sis Procedure"
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-191, "Diagno-
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	sis Procedure"
YAW RATE SENSOR [C1145]	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	BRC-193, "Diagno-
SIDE G-SEN CIRCUIT [C1146]	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	sis Procedure"
USV LINE [FL-RR] [C1147]	VDC switch-over solenoid valve (USV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.	
USV LINE [FR-RL] [C1148]	VDC switch-over solenoid valve (USV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	BRC-196, "Diagno-
HSV LINE [FL-RR] [C1149]	VDC switch-over solenoid valve (HSV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.	sis Procedure"
HSV LINE [FR-RL] [C1150]	VDC switch-over solenoid valve (HSV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
EMERGENCY BRAKE [C1153]	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little)	BRC-170, "Diagno- sis Procedure"
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-199, "Diagno- sis Procedure"
BR FLUID LEVEL LOW [C1155]	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	BRC-201, "Diagno- sis Procedure"
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-203, "Diagno- sis Procedure"

#### < ECU DIAGNOSIS INFORMATION >

#### [VDC/TCS/ABS]

Display item	Malfunction detecting condition	Check item
VARIANT CODING [C1170]	In a case where VARIANT CODING is different.	BRC-170, "Diagno- sis Procedure"
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-204, "Diagno- sis Procedure" (Note 2)

Note 1: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage. Note 2: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit. Refer to <u>BRC-204</u>, "<u>Diagnosis Procedure</u>".

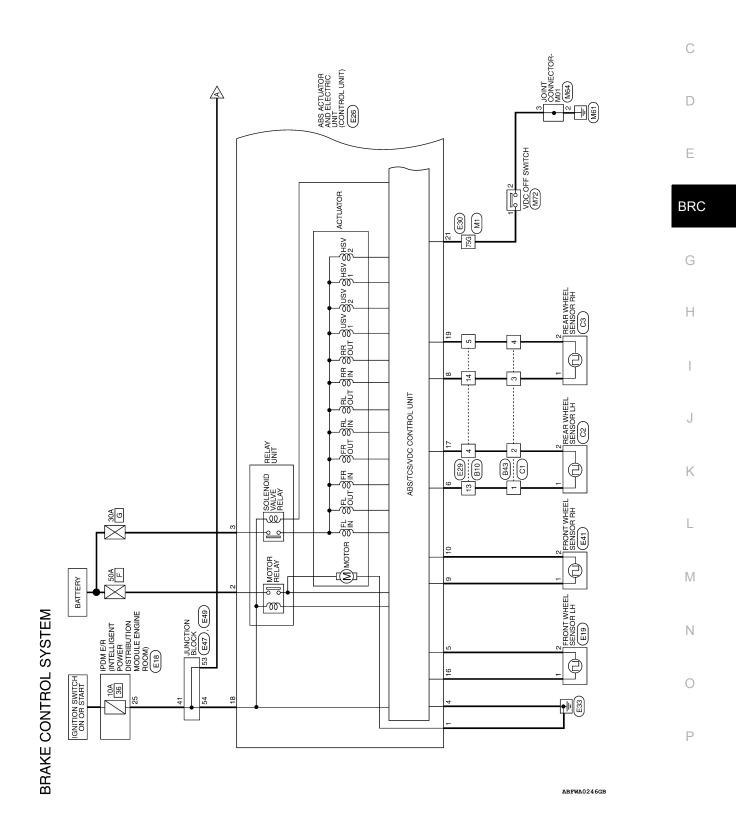
[VDC/TCS/ABS]

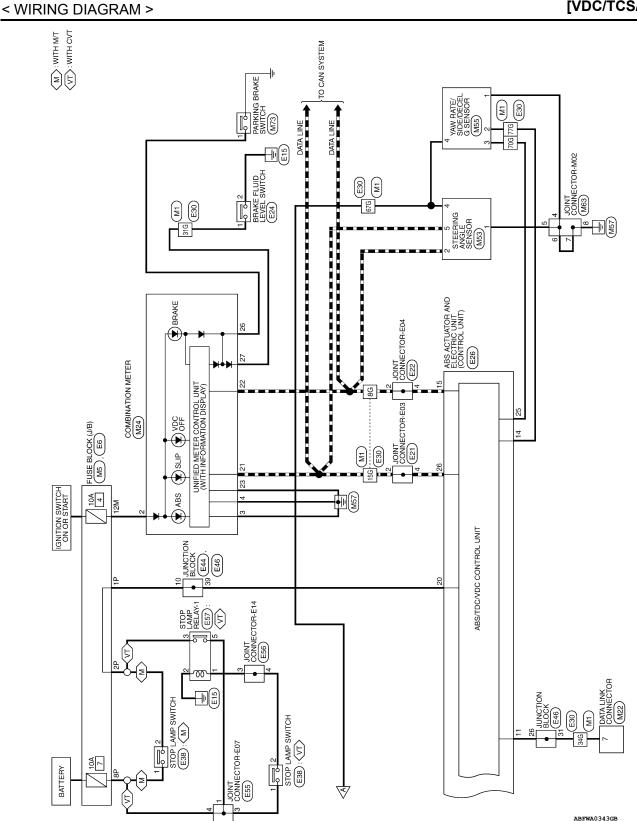
# WIRING DIAGRAM BRAKE CONTROL SYSTEM

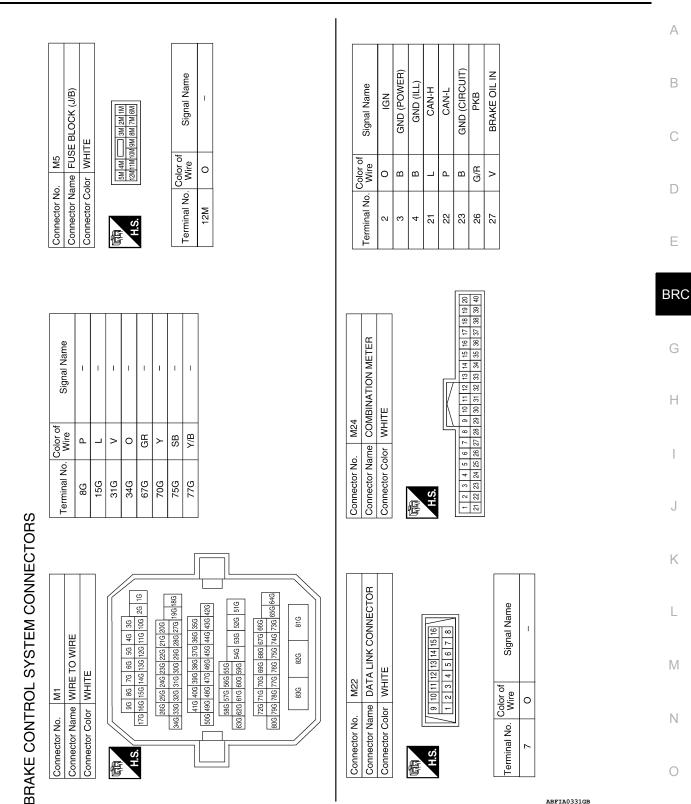
Wiring Diagram - Coupe

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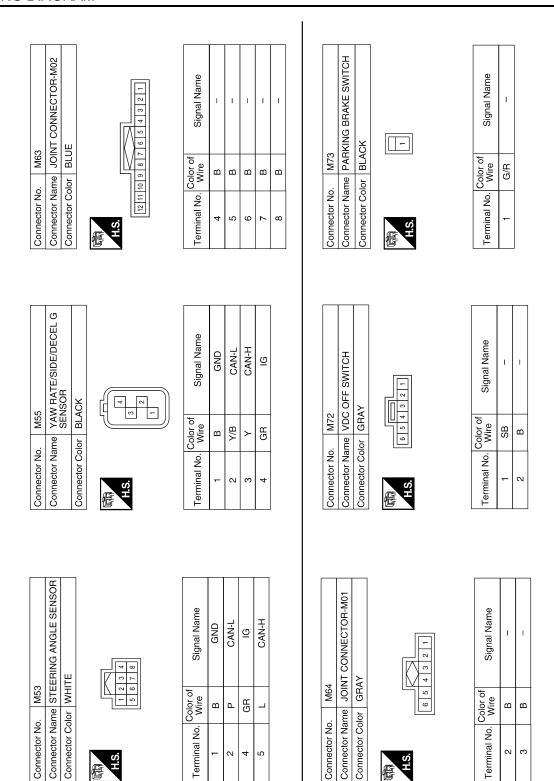




#### < WIRING DIAGRAM >

[VDC/TCS/ABS]

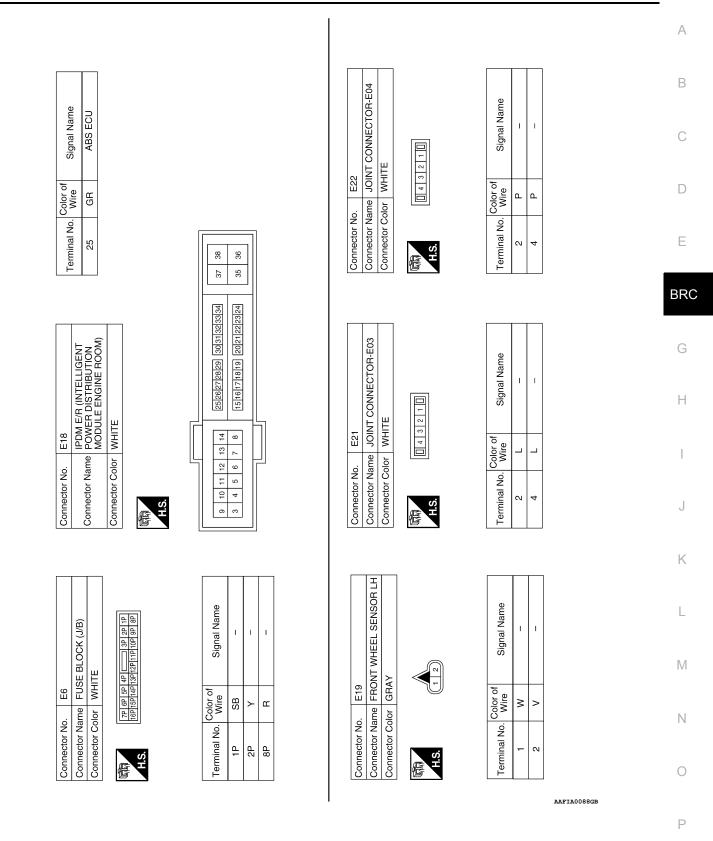
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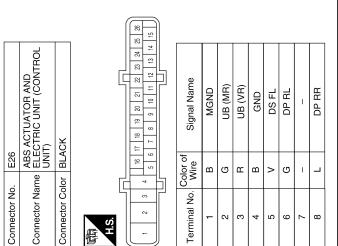
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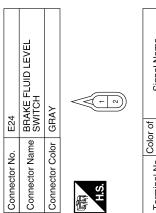
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#### < WIRING DIAGRAM >



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Signal Name	DP FR	DS FR	DIAG-K	I	I	CAN-M2	CAN-L	DP FL	DS RL	NZ	DS RR	BLS	ASR AUS	Ι	Ι	I	CAN-P2	CAN-H
Color of Wire	m	ГG	GR	I	I	0	Р	N	0	GR	BR	SB	н	I	-	I	В	L
Terminal No.	<b>б</b>	10	1	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26







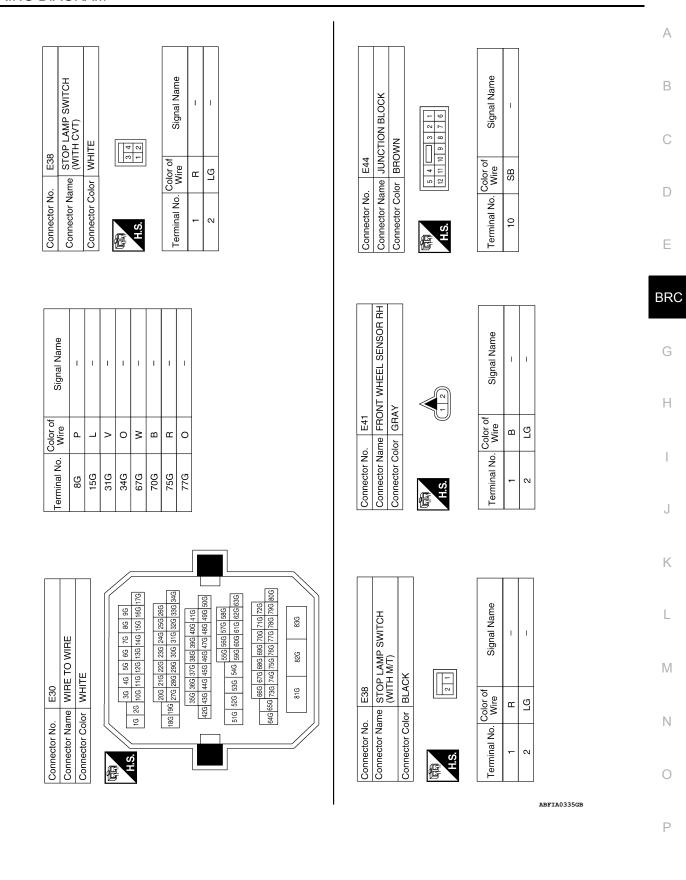
Connector No.	E29
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Connector Color WHITE	WHITE
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Signal Name	-	-	-	-
Color of Wire	0	BR	G	L
Terminal No. Color of Wire	4	5	13	14



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Revision: February 2013

BRAKE	CONTROL	_ SYSTEM	

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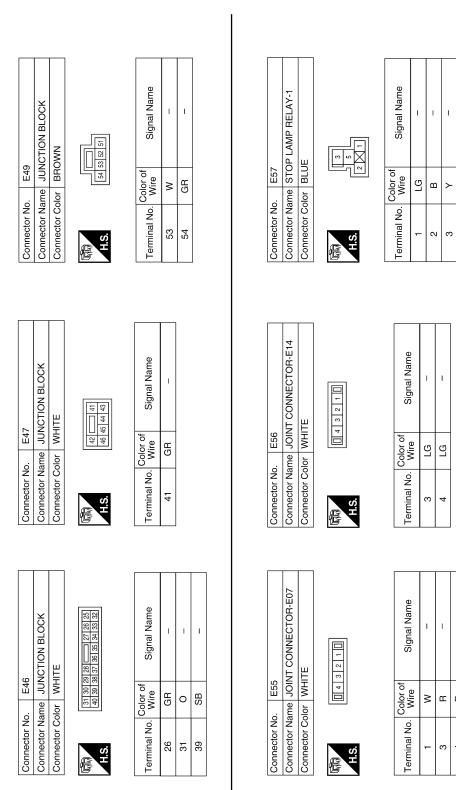
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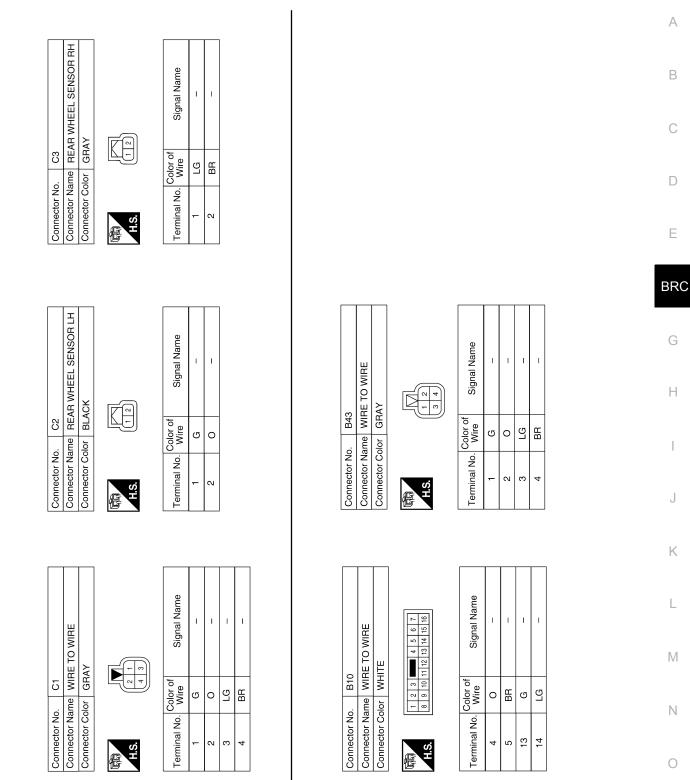
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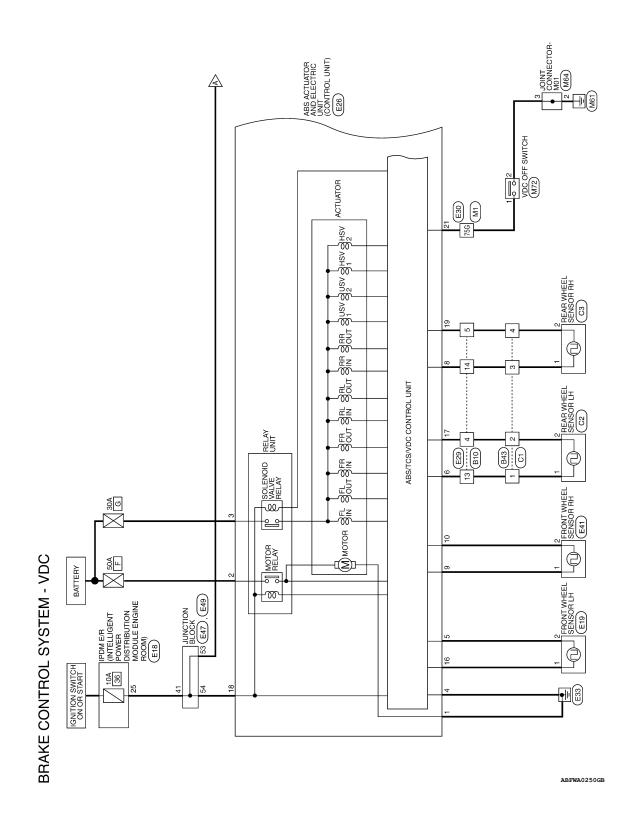
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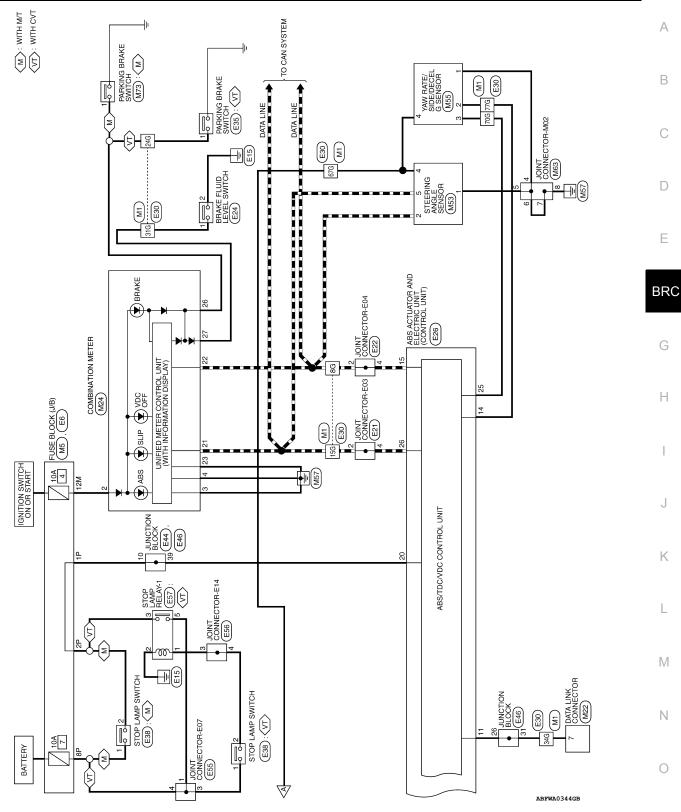
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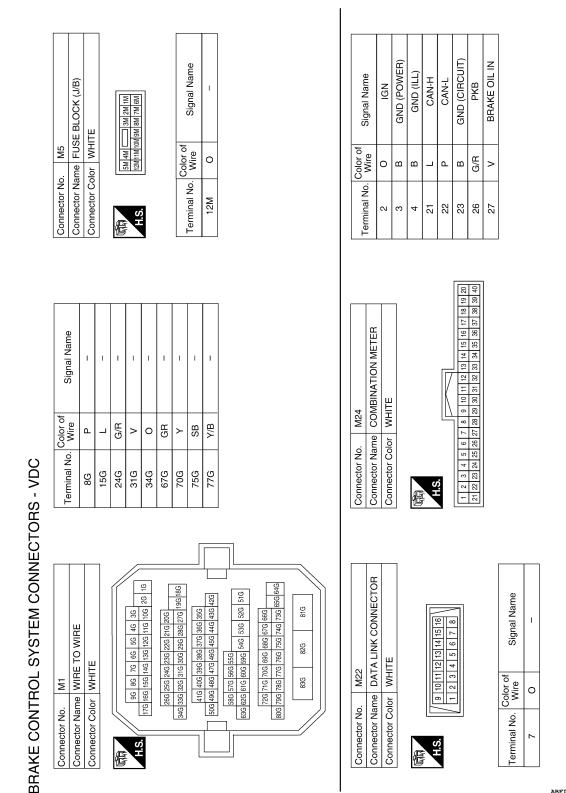


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[VDC/TCS/ABS]



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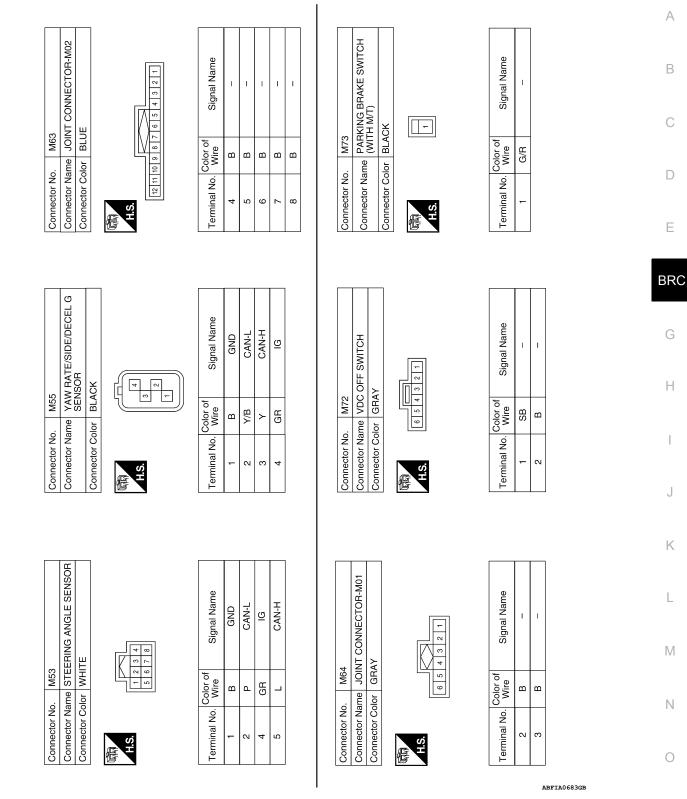
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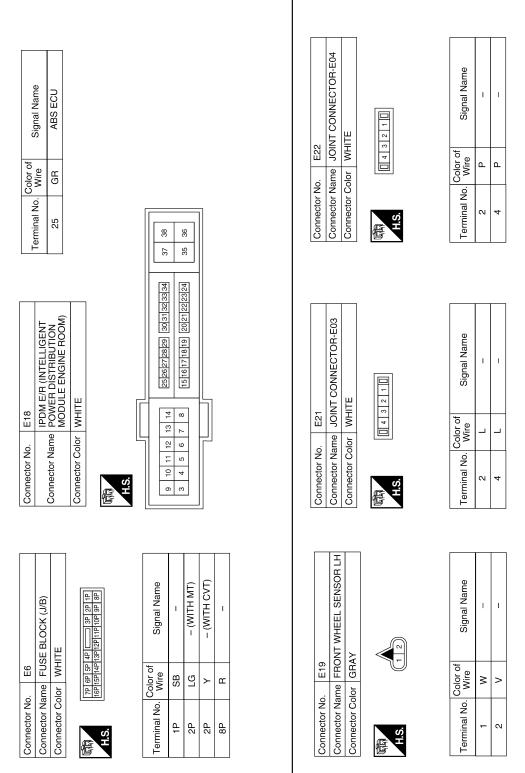
# [VDC/TCS/ABS]



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#### < WIRING DIAGRAM >

[VDC/TCS/ABS]



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#### < WIRING DIAGRAM >

# [VDC/TCS/ABS]

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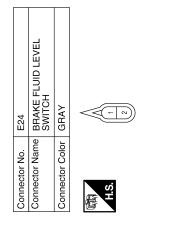
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Signal Name	DP FR	DS FR	DIAG-K	I	I	CAN-M2	CAN-L	DP FL	DS RL	DZ	DS RR	BLS	ASR AUS	I	-	I	CAN-P2	CAN-H
Color of Wire	ш	ЪJ	GR	I	-	0	Р	Ν	0	GR	BR	SB	В	I	I	I	B	
Terminal No.	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

				15 26									
	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	BLACK		7 18 19 20 21 22 23 24 2 7 8 9 10 11 12 13 14	Signal Name	MGND	UB (MR)	UB (VR)	GND	DS FL	DP RL	Н	DP RR
. E26					Color of Wire	ш	σ	æ	в	>	σ	I	-
Connector No.	Connector Name	Connector Color	品. H.S.		Terminal No.	-	2	ю	4	5	9	2	8



Signal Name	I	I	
Color of Wire	^	B/Y	
Terminal No.	-	2	

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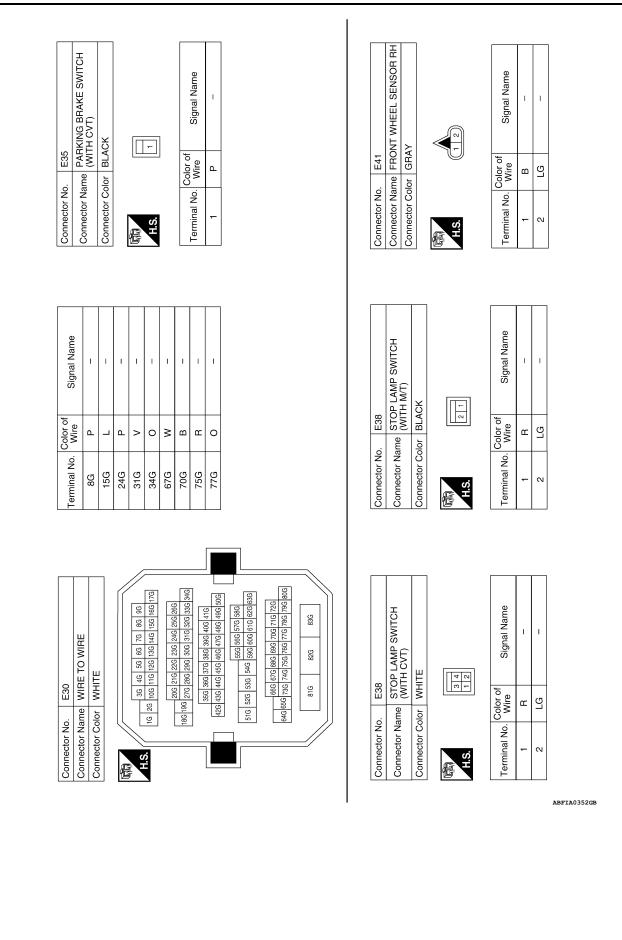
Signal Name	I	-	I	I
Color of Wire	0	BR	G	_
Terminal No.	4	5	13	14

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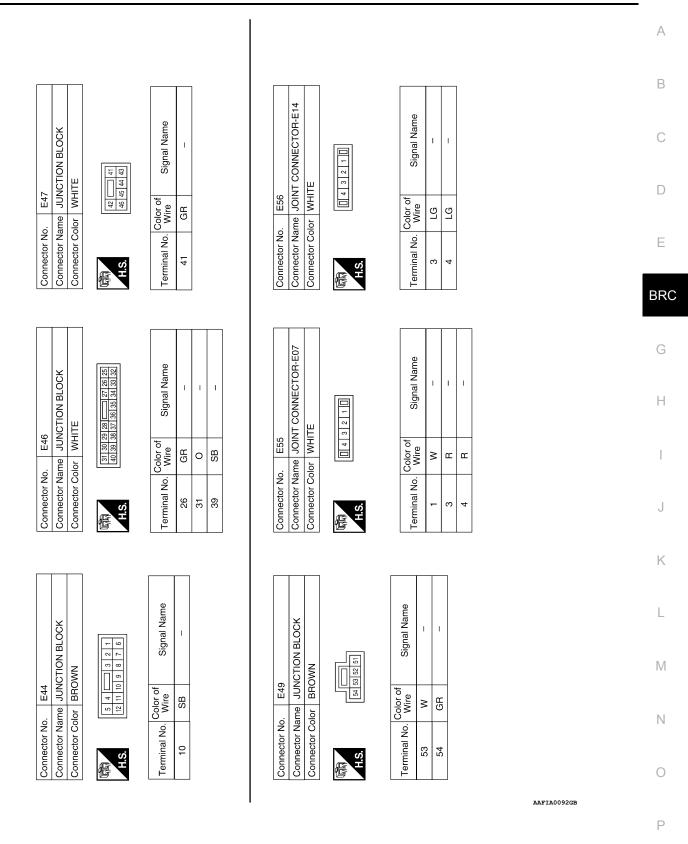
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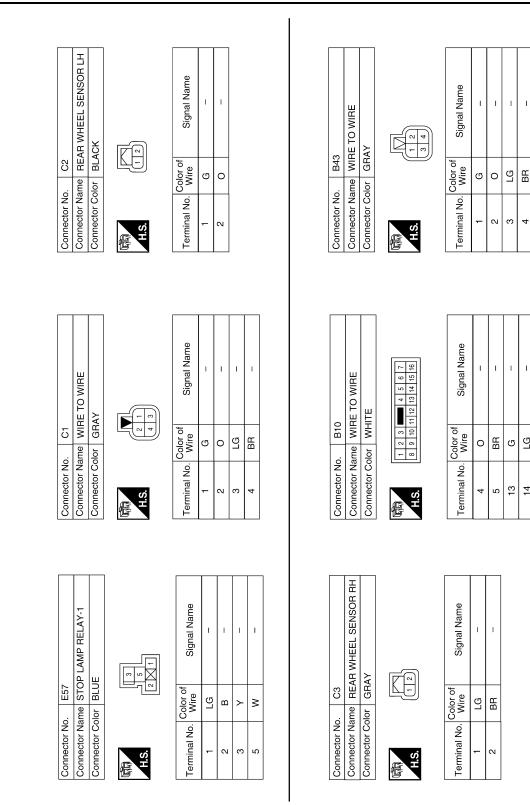
[VDC/TCS/ABS]

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# SYMPTOM DIAGNOSIS VDC/TCS/ABS

# Symptom Table

If ABS warning lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation fre- quency	Looseness of front and rear axle	<u>BRC-242, "Diag-</u> nosis Procedure"
4	Wheel sensor and rotor system	<u></u>
I have a stad had a reaction	Brake pedal stroke	BRC-243, "Diag-
Unexpected pedal reaction	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-244, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-245, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-246, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS con-	ТСМ	<u>BRC-247, "Diag-</u> nosis Procedure"
	ECM	<u></u>

#### NOTE:

• 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

• 2: 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]

[VDC/TCS/ABS]

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INFOID:000000007419056

# **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY**

#### < SYMPTOM DIAGNOSIS >

# EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

## Diagnosis Procedure

INFOID:000000007419057

[VDC/TCS/ABS]

# **1.**CHECK START

Check front and rear brake force distribution using a brake tester.

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. Refer to front: <u>FAX-6</u>, "Inspection", Rear: <u>RAX-6</u>, "On-vehicle Service".

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. Refer to <u>BRC-253</u>, "Removal and Installation" or <u>BRC-255</u>, "Removal and Installation".

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 inspection result normal?

YES >> Inspection End.

NO >> Perform self-diagnosis. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)".

## **UNEXPECTED PEDAL REACTION**

< SYMPTOM DIAGNOSIS >	[VDC/TCS/ABS]
UNEXPECTED PEDAL REACTION	
Diagnosis Procedure	INFOID:00000007419058
1.CHECK BRAKE PEDAL STROKE	
Check brake pedal stroke. Refer to <u>BR-13</u> , "Inspection and Adjustment".	
Is the stroke too big?	
<ul> <li>YES &gt;&gt; • Bleed air from brake tube and hose. Refer to <u>BR-16</u>, "<u>Bleeding Brake Sys</u></li> <li>• Check brake pedal, brake booster, and master cylinder for mount play, loo fluid leakage, etc. Refer to brake pedal: <u>BR-13</u>, "<u>Inspection and Adjustme</u> master cylinder.</li> <li>NO &gt;&gt; GO TO 2</li> </ul>	oseness, brake system
2.CHECK FUNCTION	
Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. C normal in this condition.Connect connector after inspection.	heck if braking force is

Is the inspection result normal?

YES >> Inspection End.

NO >> Check brake system.

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# THE BRAKING DISTANCE IS LONG

**Diagnosis** Procedure

INFOID:000000007419059

[VDC/TCS/ABS]

#### **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 >> Inspection End.

NO >> Check brake system.

# ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >	[VDC/TCS/ABS]	
ABS FUNCTION DOES NOT OPERATE		Δ
Diagnosis Procedure	INFOID:000000007419060	~
CAUTION: ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1.CHECK ABS WARNING LAMP DISPLAY		В
Make sure that the ABS warning lamp turns OFF after ignition switch is turned on or Is the inspection result normal?	when driving.	С
<ul> <li>YES &gt;&gt; Inspection End.</li> <li>NO &gt;&gt; Perform self-diagnosis. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)".</li> </ul>		D

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#### PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

#### < SYMPTOM DIAGNOSIS >

# PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

**Diagnosis** Procedure

INFOID:000000007419061

[VDC/TCS/ABS]

#### 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 symptoms 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 symptoms occur?

YES >> GO TO 3

NO >> Perform self diagnostic result. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)".

**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 >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]	
VEHICLE JERKS DURING VDC/TCS/ABS CONTROL	
Diagnosis Procedure	
1. SYMPTOM CHECK	
Check if the vehicle jerks during VDC/TCS/ABS control.	
<u>Is the inspection result normal?</u> YES >> Inspection End.	
NO >> GO TO 2	
2. CHECK SELF-DIAGNOSIS RESULTS	
Perform self-diagnostic of ABS actuator and electric unit (control unit). Refer to <u>BRC-158</u> , <u>"CONSULT Func-tion (ABS)"</u> .	
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	
Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check	
<ul> <li>terminal for deformation, disconnection, looseness, etc.</li> <li>Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-158</u>, "CONSULT Function (ABS)".</li> </ul>	
Are self-diagnosis results indicated?	
<ul> <li>YES &gt;&gt; If poor contact, damage, open or short circuit of connector terminal is found, repair or replace.</li> <li>NO &gt;&gt; GO TO 4</li> </ul>	
4.CHECK ECM AND CVT SELF-DIAGNOSIS RESULTS	
Perform ECM and CVT self-diagnosis. Refer to <u>EC-99, "CONSULT Function"</u> (QR25DE), <u>EC-422, "CONSULT Function"</u> (VQ35DE) or <u>TM-123, "CONSULT Function (TRANSMISSION)"</u> .	
<u>Are self-diagnosis results indicated?</u> YES >> Check the corresponding items.	
<ul> <li>ECM: Refer to <u>EC-99</u>, "CONSULT Function" (QR25DE) or <u>EC-422</u>, "CONSULT Function" (VQ35DE).</li> </ul>	
<ul> <li>CVT: Refer to <u>TM-123, "CONSULT Function (TRANSMISSION)"</u>.</li> <li>NO &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-256, "Removal and Installa-tion"</u>.</li> </ul>	

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# NORMAL OPERATING CONDITION

#### < SYMPTOM DIAGNOSIS >

# NORMAL OPERATING CONDITION

# Description

INFOID:000000007419063

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	<b>T</b> I.'. '
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 condi- tion due to the VDC, TCS or ABS activation.
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).
The ABS warning lamp and 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
CS may activate momentarily if wheel speed changes when driving over location where friction coefficier ries, when downshifting, or when fully depressing accelerator pedal. e ABS warning lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shakin large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine running. DC may not operate normally or the ABS warning lamp and SLIP indicator lamp may illuminate, when rung on a special road that is extremely slanted (e.g. bank in a circuit course). malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, suc during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illum	road. If the normal con- dition is restored, there is no malfunction. At
A malfunction may occur in the yaw rate/side/decel 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 be- fore performing an in- spection on a chassis dynamometer.)
SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC sys- tem error but results from characteristic change of tire.

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# < PRECAUTION > PRECAUTION PRECAUTIONS

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section 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 SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this G Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

#### WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the J battery, and wait at least 3 minutes before performing any service.

## Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000007419065

#### NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If
   M
   a DTC is detected, perform trouble diagnosis according to self-diagnosis results.
- This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure N below before starting the repair operation.

#### OPERATION PROCEDURE

1. Connect both battery cables. **NOTE:** 

Supply power using jumper cables if battery is discharged.

- Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.

# PRECAUTIONS

#### < PRECAUTION >

#### [VDC/TCS/ABS]

INFOID:000000007419066

- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT.

## Precaution for Brake System

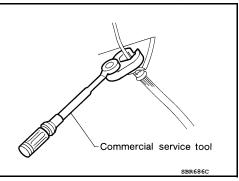
- Recommended fluid is brake fluid "DOT 3".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Do not use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

#### WARNING:

# Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

#### Precaution for Brake Control

- Just after starting vehicle after ignition switch ON, 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 simple 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: Suspensionrelated 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.



INFOID:000000007419067

# PREPARATION

# [VDC/TCS/ABS]

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# PREPARATION PREPARATION

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# Special Service Tool

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description	С
		Checking operation of ABS active wheel sen- sor	D
	Norm where the second		E
· · · · · · · · · · · · · · · · · · ·			BR

# **Commercial Service Tool**

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Tool name		Description	
<ol> <li>Flare nut crowfoot</li> <li>Torque wrench</li> </ol>		Removing and installing brake piping a: 10mm (0.39 in)/12mm (0.47 in)	
			1
	S-NT360		

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# REMOVAL AND INSTALLATION VDC OFF SWITCH

Removal and Installation

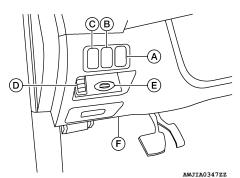
[VDC/TCS/ABS]

#### REMOVAL

- 1. Remove instrument lower cover to access the VDC OFF switch. Refer to IP-11. "Exploded View".
- 2. Disconnect the following harness connectors to remove instrument lower cover:
  - Headlamp aiming (A)
  - Rear sonar system off switch (B)
  - VDC OFF (C)
  - Trunk release (D)
  - Key slot (E)
  - Diagnostic connector (F)
  - Aspirator tube
- 3. Remove VDC OFF switch from the back of the instrument lower cover.

#### INSTALLATION

Installation is in the reverse order of removal.



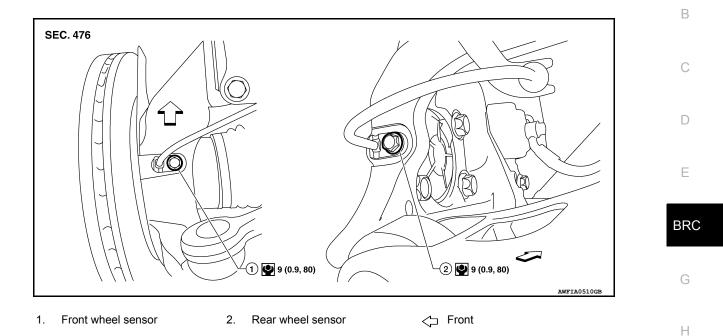
#### < REMOVAL AND INSTALLATION >

# WHEEL SENSORS

# Removal and Installation

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#### **CAUTION:**

- · Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Before installation, check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole in the wheel hub for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the wheel sensor.

#### FRONT WHEEL SENSOR

#### Removal

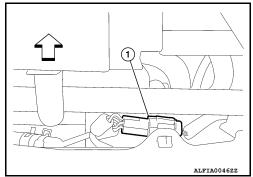
1.	Remove front wheel and tire. Refer to WT-68, "Adjustment".	
2.	Partially remove front wheel fender protector. Refer to <u>EXT-22</u> , "Removal and Installation" (Coupe), <u>EXT-46</u> , "Removal and Installation" (Sedan).	M
3.	Remove wheel sensor bolt and wheel sensor.	
4.	Remove harness wire from mounts and disconnect wheel sensor harness connector.	
	allation allation is in the reverse order of removal.	Ν
RE	REAR WHEEL SENSOR	
Ren	Removal	
1.	Remove rear wheel and tire. Refer to WT-68, "Adjustment".	Ρ

# WHEEL SENSORS

#### < REMOVAL AND INSTALLATION >

- 2. Disconnect wheel sensor harness connector (1).

   ← Front
- 3. Remove harness wire clips from rear suspension member.
- 4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



Installation Installation is in the reverse order of removal.

< REMOVAL AND INSTALLATION >

# SENSOR ROTOR

#### **Removal and Installation**

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to FAX-8, "Removal and Installation" (front), RAX-7, "Removal and Installation" (rear).

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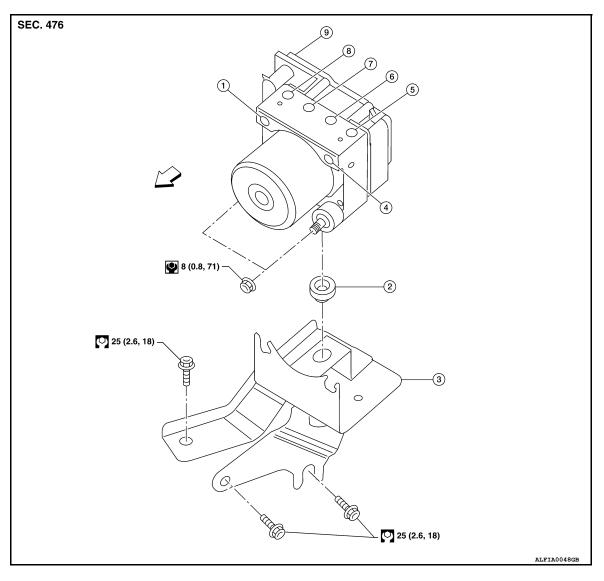
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< REMOVAL AND INSTALLATION >

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

# Exploded View

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- 1. From master cylinder secondary side 2. From master cylinder primary side
- Grommet
- 5. To front LH brake caliper

To front RH brake caliper

3.

6.

9.

Bracket

unit)

To rear RH brake caliper

ABS actuator and electric unit (control

7. To rear LH brake caliper

∠⊐ Front

4.

#### Removal and Installation

#### **CAUTION:**

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.

8.

- To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (flare nut torque wrench).
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install ABS actuator and electric unit (control unit) by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-16, "Bleeding Brake System"</u>.
- After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.

#### **BRC-256**

INFOID:000000007419074

< REMOVAL AND INSTALLATION >

#### REMOVAL А NOTE: When removing components such as hoses tubes/lines, etc., cap or plug openings to prevent fluid from spilling. Remove cowl top. Refer to EXT-21, "Removal and Installation" (Coupe), EXT-45, "Removal and Installa-1. В tion" (Sedan). 2. Disconnect washer hose. Disconnect the battery negative terminal. С Remove tower bar, if equipped. Refer to FSU-14, "Exploded View". 5. Disconnect ABS actuator and electric unit (control unit) connector. D Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit) using a suitable tool. Remove ABS actuator and electric unit (control unit) nuts. Е 8. Remove ABS actuator and electric unit (control unit). Remove bracket as necessary. INSTALLATION BRC Installation is in the reverse order of removal. Torque brake lines to proper specification. Refer to BR-18, "Hydraulic Circuit". CAUTION: In the case that the ABS actuator and electronic unit (control unit) is replaced, after installation, adjust position of steering angle sensor. Refer to BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR **NEUTRAL POSITION : Special Repair Requirement".**

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#### < REMOVAL AND INSTALLATION >

# YAW RATE/SIDE/DECEL G SENSOR

#### Removal and Installation

#### **CAUTION:**

- Do not drop or strike the yaw rate/side/decel G sensor, because it has little endurance to impacts.
- Do not use power tools, because yaw rate/side/decel G sensor is sensitive to impacts.
- For installation, make sure the arrow on top of the yaw rate/side/decel G sensor is pointing to the front of the vehicle.

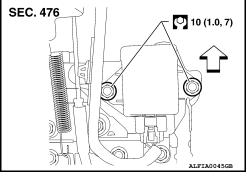
#### REMOVAL

- 1. Remove the center console. Refer to IP-23, "Disassembly and Assembly".
- 2. Disconnect the yaw rate/side/decel G sensor harness connector.
- 3. Remove the yaw rate/side/decel G sensor nuts.
- 4. Remove the yaw rate/side/decel G sensor.

#### INSTALLATION

Installation is in the reverse order of removal.

- For installation, make sure the arrow on top of the yaw rate/side/ decel G sensor is pointing to the front of the vehicle.
- < :: Front of vehicle.



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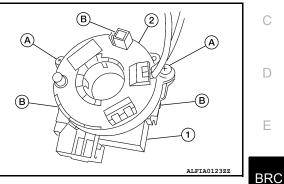
**STEERING ANGLE SENSOR** 

#### < REMOVAL AND INSTALLATION > STEERING ANGLE SENSOR

# Removal and Installation

# REMOVAL

- 1. Remove the spiral cable. Refer to <u>SR-8. "Removal and Installation"</u>.
- 2. Remove the two screws (A) and release the three clips (B) to remove the steering angle sensor (1) from spiral cable (2).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Perform the neutral position adjustment for the steering angle sensor. Refer to <u>BRC-143, "ADJUST-</u> <u>MENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>

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