SECTION BRAKE CONTROL SYSTEM

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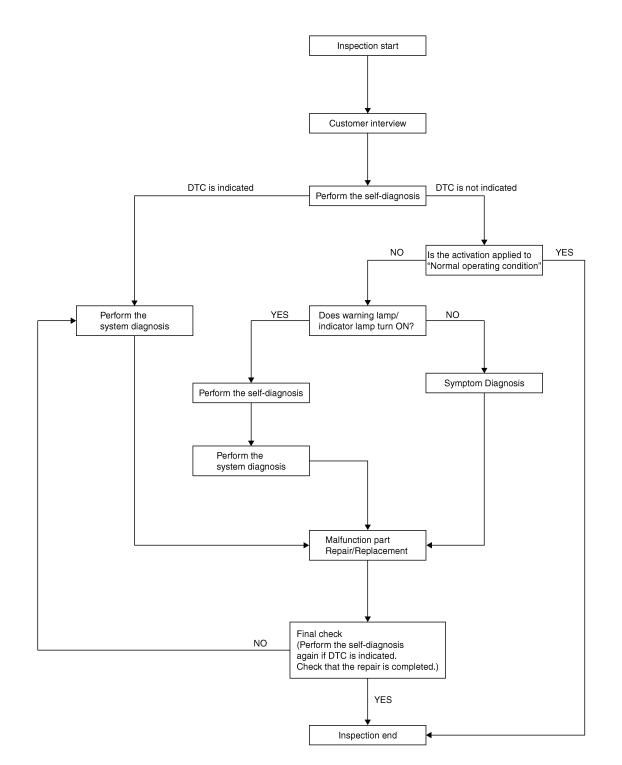
Revision: September 2009

< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



JSFIA0010GB

[ABS]

INFOID:000000005280848

DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ABS]

1.COLLECT THE INFORMATION FROM THE CUSTOMER
Get the detailed information from the customer about the symptom (the condition and the environment whe the incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-8</u> , " <u>Diagnostic Work Sheet</u> ".
>> GO TO 2
2. PERFORM THE SELF-DIAGNOSIS
Check the DTC display with the self-diagnosis function. Refer to <u>BRC-15, "CONSULT-III Function (ABS)"</u> .
Is there any DTC displayed?
YES >> GO TO 3 NO >> GO TO 4
3. PERFORM THE SYSTEM DIAGNOSIS
Perform the diagnosis applicable to the displayed DTC. Refer to <u>BRC-50, "DTC No. Index"</u> .
>> GO TO 7
4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION
Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-5</u> "Description".
<u>Is the symptom a normal operation?</u>
YES >> Inspection End NO >> GO TO 5
5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION
Check that the warning lamps illuminate. ABS warning lamp: Refer to <u>BRC-39, "Description"</u>. Brake warning lamp: Refer to <u>BRC-40, "Description"</u>.
Is ON/OFF timing normal?
YES >> GO TO 6
NO >> GO TO 2 6.PERFORM THE DIAGNOSIS BY SYMPTOM
Perform the diagnosis applicable to the symptom.
>> GO TO 7
7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS
Repair or replace the specified malfunctioning parts.
>> GO TO 8
8.FINAL CHECK
Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, eras the self-diagnosis memory. Refer to <u>BRC-15</u> , "CONSULT-III Function (ABS)".
Is no other DTC present and the repair completed?
YES >> Inspection End
NO >> GO TO 3

~ ~ D

< BASIC INSPECTION >

Diagnostic Work Sheet

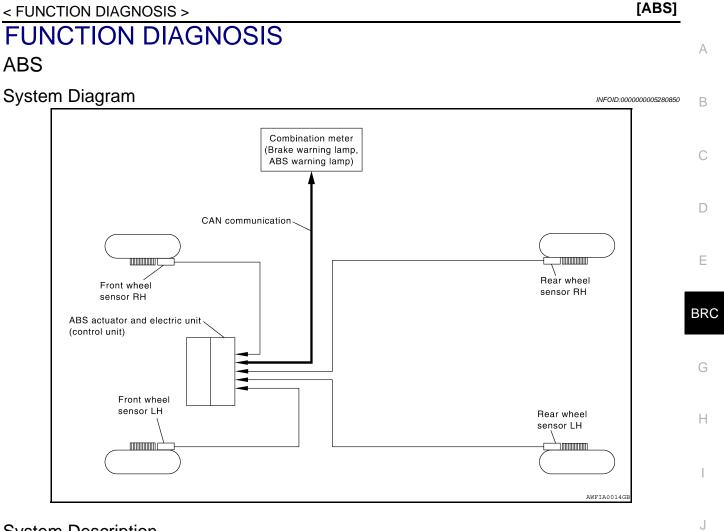
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[ABS]

DIAGNOSIS	AND RE	PAIR WO	RKFLOW

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) 	U Warning / Indicator activate		 Firm pedal operation Large stroke pedal operation 	
	 TCS does not work (Rear wheels slip when accelerating) 	ABS does not work (Wheels lock when braking)		Lack of sense of acceleration	
Engine conditions	When starting After starting	□ When starting □ After starting			
Road conditions	□ Low friction road (□Snow □Grav □ Bumps / potholes	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes			
Driving conditions	□ Full-acceleration □ High speed cornering □ Vehicle speed: Greater than 10 km/h (6 MPH) □ Vehicle speed: 10 km/h (6 MPH) or less □ Vehicle is stopped				
Applying brake conditions	□ Suddenly □ Gradually				
Other conditions	Operation of electrical equipment Shift change Other descriptions				

SFIA3265E



ABS

System Description

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

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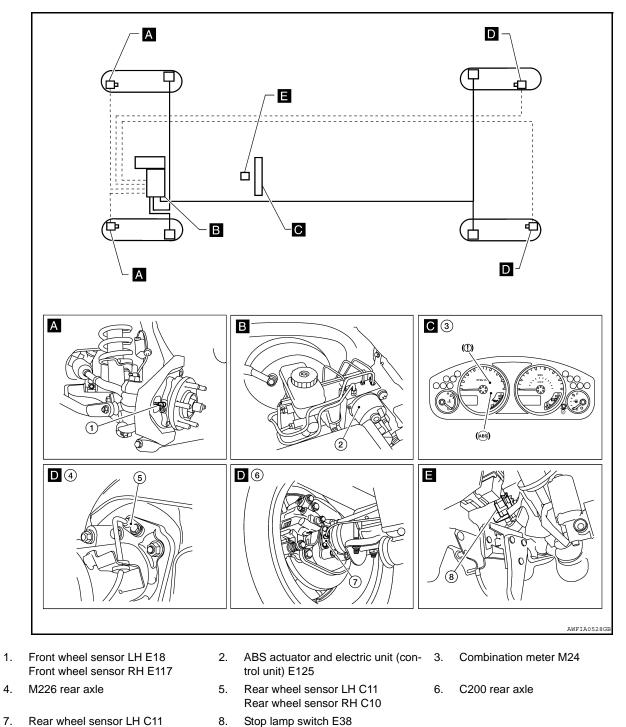
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Component Parts Location

[ABS]



7. Rear wheel sensor LH C11 Rear wheel sensor RH C10

Component Description

INFOID:000000005280853

Component parts		Reference	
ABS actuator and electric unit (control unit)	Pump	BRC-27, "Description"	
	Motor	BRC-27, Description	
	Actuator relay	BRC-36, "Description"	
	Solenoid valve	BRC-32, "Description"	

ABS

< FUNCTION DIAGNOSIS >

Component parts	Reference	
Wheel sensor	BRC-29, "Description"	А
ABS warning lamp	BRC-39, "Description"	
Brake warning lamp	BRC-40, "Description"	В

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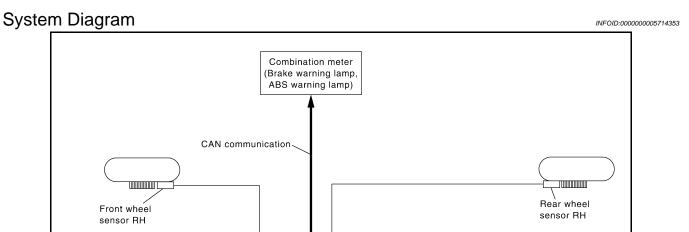
< FUNCTION DIAGNOSIS >

ABS actuator and electric unit-

Front wheel sensor LH

(control unit)

EBD



System Description

INFOID:000000005280855

Rear wheel sensor LH

AWFIA00:

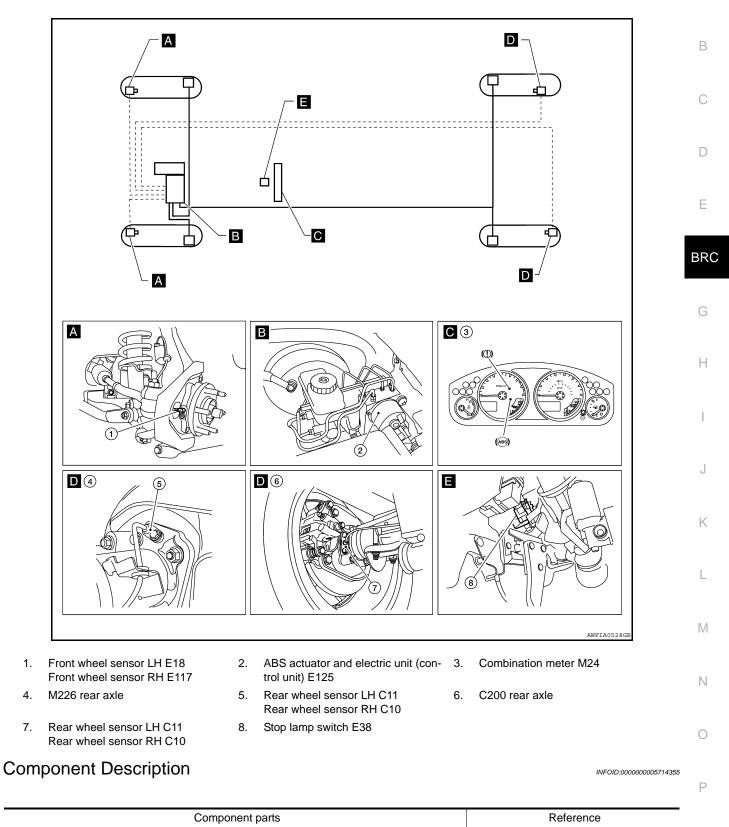
- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly,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

Component Parts Location

INFOID:000000005714354

[ABS]

А



Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-27, "Description"
	Motor	BRC-27, Description
	Actuator relay	BRC-36, "Description"
	Solenoid valve	BRC-32, "Description"

EBD

< FUNCTION DIAGNOSIS >

[ABS]

Component parts	Reference
Wheel sensor	BRC-29, "Description"
ABS warning lamp	BRC-39, "Description"
Brake warning lamp	BRC-40, "Description"

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

< FUNCTION DIAGNOSIS >

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

CONSULT-III Function (ABS)

INFOID:000000005280856

[ABS]

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FUNCTION

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

Diagnostic test mode	Function	
Self Diagnostic Result	Self-diagnostic results can be read and erased quickly.	
Data Monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	D
Active Test	Diagnostic test mode is which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	
Function Test	Other results or histories, etc. that are recorded in ECU are displayed.	
ECU Identification	ABS actuator and electric unit (control unit) part number can be read.	
CAN Diagnostic Support Monitor	The results of transmit/receive diagnosis of CAN communication can be read.	BF

SELF DIAGNOSTIC RESULT MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

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

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

Display Item List Refer to <u>BRC-50, "DTC No. Index"</u>.

DATA MONITOR MODE

Display Item List

ltem	Data	a monitor item sele			
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
FR LH SENSOR (km/h, mph)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.	
FR RH SENSOR (km/h, mph)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.	
RR LH SENSOR (km/h, mph)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.	
RR RH SENSOR (km/h, mph)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.	
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.	
FR RH IN SOL (On/Off)	-	×	×	Front RH IN ABS solenoid (On/Off) status is displayed.	

Revision: September 2009

2010 Xterra GCC

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

< FUNCTION DIAGNOSIS >

[ABS]

ltem	Data	a monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
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.
REAR IN SOL (On/Off)	-	-	×	Rear IN ABS solenoid (On/Off) sta- tus is displayed.
REAR OUT SOL (On/Off)	-	-	×	Rear OUT ABS solenoid (On/Off) status is displayed.
EBD WARN LAMP (On/Off)	-	_	×	Brake warning lamp (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) sta- tus 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.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is dis- played.
EBD SIGNAL (On/Off)	_	_	×	EBD operation (On/Off) status is displayed.
ABS SIGNAL (On/Off)	-	_	×	ABS operation (On/Off) status is displayed.
EBD FAIL SIG (On/Off)	-	_	×	EBD fail signal (On/Off) status is displayed.
ABS FAIL SIG (On/Off)	_	_	×	ABS fail signal (On/Off) status is displayed.
CRANKING SIG (On/Off)	-	_	×	The input state of the key SW START position signal is displayed.
DLOCK SW (On/Off)	-	_	×	Condition of differential lock mode switch (On/Off) is displayed.
DLOCK CHG SW (On/Off)	-	_	×	Condition of differential lock position switch (On/Off) is displayed.

×: Applicable

-: Not applicable

ACTIVE TEST MODE

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

NOTE:

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

Test Item

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

< FUNCTION DIAGNOSIS >

[ABS]

А

SOLENOID VALVE

- 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" and confirm that solenoid valves operate as shown in the table below.

On another			ABS solenoid valve	1	
	Operation	Up	Keep	Down	
	FR RH IN SOL	Off	On	On	
FR RH SOL	FR RH OUT SOL	Off	Off	On*	
	FR LH IN SOL	Off	On	On	
FR LH SOL	FR LH OUT SOL	Off	Off	On*	
	REAR IN SOL	Off	On	On	
REAR SOL	REAR OUT SOL	Off	Off	On*	

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

ABS MOTOR

• Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below. BRC

Operation	On	Off	
MOTOR RELAY	On	Off	G
ACTUATOR RLY	On	On	

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< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:000000005280857

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:000000005280858

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.	Harness or connectorWheel sensor
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-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280859

Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>ABS"</u>.

CAUTION:

Do not check between wheel sensor terminals.

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGI	NOSIS >	·			[ABS]
2. Turn on the ABS ac	tive wheel sensor te	ster power sv	witch.		
NOTE: The green POWER	indicator should illu	iminate. If th	e POWER indicat	or does not ill	uminate, replace the
battery in the ABS a	active wheel sensor t	ester before	proceeding.		·
	ne vehicle by hand a ed SENSOR indicato				ne ABS active wheel
NOTE:					0
	indicator illuminate	es but does r	ot flash, reverse f	he polarity of	the tester leads and
retest. Does the ABS active wh	eel sensor tester de	tect a signal'	2		
YES >> GO TO 3			<u>-</u>		
	wheel sensor. Refe	r to <u>BRC-61,</u>	"Removal and Ins	tallation".	
3. CHECK TIRES					
Check the inflation press	sure, wear and size	of each tire.			
Is the inspection result n	ormal?				
YES >> GO TO 4		<i>(</i>)			
	ressure or replace ti	re(s).			В
4. CHECK WHEEL BEA					
Check wheel bearing a "Rear Axle Bearing" (C2					vice" (front), <u>RAX-7,</u>
Is the inspection result n	,			ar <i>)</i> .	
YES >> GO TO 5	<u>onnar:</u>				
NO >> Repair or re					<u>on"</u> (front), <u>RAX-13,</u>
	nd Installation" (C20	,	X-24, "Removal a	nd Installation	<u>"</u> (M226 rear).
5. CHECK WIRING HAI	RNESS FOR SHOR	T CIRCUIT			
	tuator and electric u				1 Alexandre
2. Check continuity b	or connector of malfu etween wheel sens				T.S.
and ground.					OFF
Continuity ob o	del mot oviet			2 1	
Continuity shou					
Is the inspection result n	<u>iormal?</u>				2
YES >> GO TO 6 NO >> Repair the c	circuit.				
6.CHECK WIRING HAI		CIRCUIT			AWFIA0188ZZ
			unit (control unit)	approxim ap	d the molfunctioning
 Check continuity be wheel sensor conner 				connector an	d the malfunctioning
	ABS actuator electric unit (con		Wheel se	ensor	
Wheel sensor	Connector	Terminal	Connector	Terminal	Continuity
		45		1	
	1				1

Is the inspection result normal? Revision: September 2009

Front LH

Front RH

Rear LH

Rear RH

46 33

34

36

37

42

43

E125

E18

E117

C11

C10

2

2

1

1

2

2

1

Yes

Ρ

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-63</u>, "<u>Removal and Installa-</u> <u>tion</u>".

NO >> Repair the circuit.

Component Inspection

INFOID:000000005280860

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 normal?

YES >> Inspection End

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT 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:000000005280862

INFOID:000000005280861

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected 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.			
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.		 Harness or connector Wheel sensor 	BRC
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.	 ABS actuator and electric unit (control unit) 	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.		H	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	K
RR RH SENSOR-2	N N
RR LH SENSOR-2	
FR RH SENSOR-2	L
FR LH SENSOR-2	
Is above displayed on the self-diagnosis display?	N.A.
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-21</u> NO >> Inspection End	, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000005714356

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Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> CABS".

CAUTION:

Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
 Observe the test of test

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

Is the inspection result normal?

[ABS]

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C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

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:

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 the wheel sensor. Refer to <u>BRC-61. "Removal and Installation"</u>.

3.CHECK TIRES

Check the inflation pressure, wear and size of each tire.

Is the inspection result normal?

- YES >> GO TO 4
- NO >> Adjust tire pressure or replace tire(s).
- **4.**CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5, "On-Vehicle Inspection and Service"</u> (front), <u>RAX-7,</u> "Rear Axle Bearing" (C200 rear) or <u>RAX-19, "Rear Axle Bearing"</u> (M226 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), <u>RAX-13</u>, "<u>Removal and Installation</u>" (C200 rear) or <u>RAX-24</u>, "<u>Removal and Installation</u>" (M226 rear).

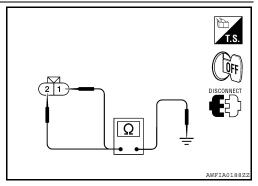
5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

- YES >> GO TO 6
- NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

ABS actuator and А Wheel sensor electric unit (control unit) Wheel sensor Continuity Connector Terminal Connector Terminal В 45 1 E18 Front LH 2 46 33 2 Front RH E117 34 1 E125 Yes 36 1 Rear LH C11 2 37 D 42 2 Rear RH C10 43 1 Ε

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-63, "Removal and Installa-</u> tion".

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.

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?	

is the inspection result normal?

YES >> Inspection End NO >> Go to diagnosis procedure. Refer to <u>BRC-21, "Diagnosis Procedure"</u>.

Revision: September 2009

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INFOID:000000005714357

< COMPONENT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

INFOID:000000005280866

INFOID:000000005280865

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.	 Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280867

Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>ABS"</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 connectors and then perform the self-diagnosis. Refer to <u>BRC-15</u>, "CONSULT-III Function (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

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.

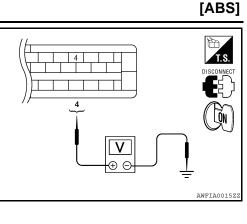
2. Disconnect ABS actuator and electric unit (control unit) connector.

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

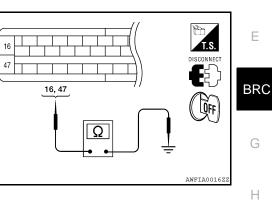
3. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and elec- tric unit (control unit)		_	Condition	Voltage
Connector	Terminal			
F125	4	Ground	Ignition switch: ON	Battery voltage
E125	4	Ground	Ignition switch: OFF	Approx. 0V



- Turn ignition switch OFF. 4.
- Check continuity between ABS actuator and electric unit (control 5. unit) connector E125 terminals 16, 47 and ground.

	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
- NO >> Repair or replace malfunctioning components.

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C1110, C1113, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < COMPONENT DIAGNOSIS > [ABS]

C1110, C1113, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000005280868

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
C1113	G-SENSOR	G-sensor is malfunctioning.	(control unit)
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	•

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

CONTROLLER FAILURE

G-SENSOR

VARIANT CODING

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280869

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

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-63. "Removal and Installa-</u> tion".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

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	E
		During the actuator motor operating with ON, when the	r ussible cause	
C1111	PUMP MOTOR	actuator motor turns OFF, or when the control line for ac- tuator motor relay is open.	Harness or connector APS actuator and electric unit	BRC
onn		During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	ABS actuator and electric unit (control unit)	G
DTC CC	ONFIRMATION PROCE	DURE		
1.снес	CK SELF-DIAGNOSIS RE	SULTS		Н
Check th	ne self-diagnosis results.			
				I
	Self-diagnosis			
	PUMP MOT	-		
	displayed on the self-diag		uro"	J
	>> Inspection End	procedure. Refer to <u>BRC-27, "Diagnosis Proced</u>	uie	
Diagno	sis Procedure		INFOID:000000005280872	К
	ng Wiring Diagram inform	ation, refer to <u>BRC-44, "Wiring Diagram - BRA</u>	AKE CONTROL SYSTEM -	L
<u>ABS"</u> .				
4				M
	NECTOR INSPECTION			
 Disc Che 	ck terminals for deformati	electric unit (control unit) connector. on, disconnect, looseness, and so on. If any ma	alfunction is found, repair or	Ν
		nen perform the self-diagnosis. Refer to <u>BRC-</u>	15. "CONSULT-III Function	0
	em indicated on the self-di	agnosis display?		
-	>> GO TO 2	nnactor terminale. Denoir er replace connector		Ρ
~		nnector terminals. Repair or replace connector. DTOR RELAY POWER SUPPLY CIRCUIT		
		TUR RELAT FOWER SUPPLY CIRCUIT		

[ABS]

INFOID:000000005280870

INFOID:000000005280871

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

- Turn ignition switch OFF. 1.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check voltage between the ABS actuator and electric unit (con-3. trol unit) connector E125 terminal 1 and ground.

				_	i i
ABS actuator and electric unit (control unit)			Voltage		
Connector	Terminal		vollage		[
E125	1	Ground	Battery voltage		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-63, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK ACTIVE TEST

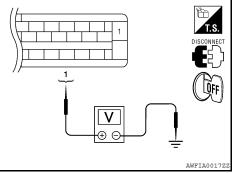
- On "ACTIVE TEST", select "ABS MOTOR". 1.
- Touch On and Off on screen. Make sure motor relay and actuator relay operates as shown in table below. 2.

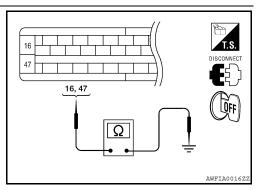
Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

Is the inspection result normal?

YES >> Inspection End

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





INFOID:000000005280873

[ABS]

< COMPONENT DIAGNOSIS >

C1115 WHEEL SENSOR

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:000000005280875

INFOID:000000005280874

DTC DETECTION LOGIC

-				
DTC	Display item	Malfunction detected condition	Possible cause	C
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit) 	E
DTC CC	NFIRMATION PROCE	DURE		
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS		Bł
Check th	e self-diagnosis results.			
				(
	Self-diagnosis			
	ABS SENSOR [ABNOF	-		ŀ
	displayed on the self-diag			Γ
	>> Proceed to diagnosis >> Inspection End	procedure. Refer to <u>BRC-29, "Diagnosis Proce</u>	<u>dure"</u> .	
	·			
Diagno	sis Procedure		INFOID:000000005714358	
Regardir	ng Wiring Diagram inform	ation, refer to <u>BRC-44, "Wiring Diagram - BR</u>	AKE CONTROL SYSTEM -	,
<u>ABS"</u> .				
CAUTIO				
	heck between wheel se	nsor terminals.		
	NECTOR INSPECTION			
		and electric unit (control unit) connector and wh	neel sensor of malfunctioning	
code 2. Che		nation, disconnection, looseness or damage.		Ν
	spection result normal?			
	>> GO TO 2			
	>> Repair or replace as r	ecessary.		ľ
2.снес	CK WHEEL SENSOR OU	TPUT SIGNAL		
1. Con	nect ABS active wheel se	nsor tester (J-45741) to wheel sensor using ap	propriate adapter.	
		sensor tester power switch.		(
NOT		should illuminate. If the DOM/ED indicator do		
		should illuminate. If the POWER indicator doe el sensor tester before proceeding.	es not illuminate, replace the	F
		by hand and observe the red SENSOR indica	ator on the ABS active wheel	
sens	or tester. The red SENSC	DR indicator should flash on and off to indicate		
NOT		illuminates but does not flash, reverse the po	larity of the testor loads and	
retes		marminates but does not hash, reverse the po	nanty of the tester leaus dilu	
Does the	ABS active wheel senso	r tester detect a signal?		

Does the ABS active wheel sensor tester detect a signal?

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< COMPONENT DIAGNOSIS >

NO >> Replace the wheel sensor. Refer to <u>BRC-61, "Removal and Installation"</u>.

3.CHECK TIRES

Check the inflation pressure, wear and size of each tire.

Is the inspection result normal?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5. "On-Vehicle Inspection and Service"</u> (front), <u>RAX-7.</u> <u>"Rear Axle Bearing"</u> (C200 rear) or <u>RAX-19. "Rear Axle Bearing"</u> (M226 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), <u>RAX-13</u>, "<u>Removal and Installation</u>" (C200 rear) or <u>RAX-24</u>, "<u>Removal and Installation</u>" (M226 rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

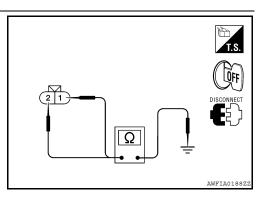
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. 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	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1			
		46	ETO	2	Yes
Front RH Rear LH Rear RH		33	E117	2	
		34		1	
		36	C11	1	
		37		2	
		42	C10	2	
		43		1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-63, "Removal and Installa-</u> tion".

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-30

INFOID:000000005714359

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

[ABS]

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-29, "Diagnosis Procedure"</u>.

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< COMPONENT DIAGNOSIS >

C1120, C1122, C1190 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:000000005280879

INFOID:000000005280878

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 (control unit)
C1190	R-EV	When the control unit detects a malfunction in the rear in- let solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
R-EV

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280880

Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>ABS"</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 connectors and then perform the self-diagnosis. Refer to <u>BRC-15. "CONSULT-III Function</u> (<u>ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

C1120, C1122, C1190 IN ABS SOL

< COMPONENT DIAGNOSIS >

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	– – Volta	Voltage
Connector	Terminal		voltage
E125	32	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and	electric unit (control unit)	- Continuity		
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-63, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

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.

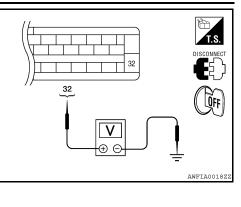
Operation		ABS solenoid valve			-
	Operation	Up	Кеер	Down	-
	FR RH IN SOL	Off	On	On	-
FR RH SOL	FR RH OUT SOL	Off	Off	On*	_
	FR LH IN SOL	Off	On	On	L
FR LH SOL	FR LH OUT SOL	Off	Off	On*	-
REAR SOL	REAR IN SOL	Off	On	On	- N
REAR SOL	REAR OUT SOL	Off	Off	On*	- 10

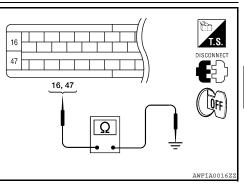
*: ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> Inspection End

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





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< COMPONENT DIAGNOSIS >

C1121, C1123, C1191 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:000000005280883

INFOID:000000005280882

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 (control unit)
C1191	R-AV	When the control unit detects a malfunction in the rear outlet solenoid circuit.	-

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
R-AV

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-34, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005714360

Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>ABS"</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 connectors and then perform the self-diagnosis. Refer to <u>BRC-15</u>, "CONSULT-III Function (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

C1121, C1123, C1191 OUT ABS SOL

< COMPONENT DIAGNOSIS >

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal	_	voltage
E125	32	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

>> Repair or replace malfunctioning components. NO

${f 3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector		Terminal	—	Continuity
E125		16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-63, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK ACTIVE TEST

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

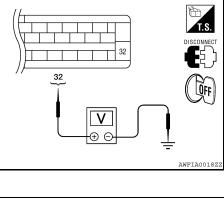
Operation			ABS solenoid valve		
		Up	Keep	Down	– k
FR RH SOL	FR RH IN SOL	Off	On	On	
	FR RH OUT SOL	Off	Off	On*	_
FR LH SOL	FR LH IN SOL	Off	On	On	L
	FR LH OUT SOL	Off	Off	On*	_
REAR SOL	REAR IN SOL	Off	On	On	M
	REAR OUT SOL	Off	Off	On*	IV

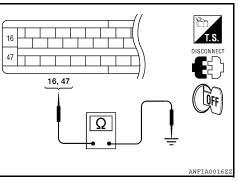
*: ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-34, "Diagnosis Procedure"</u>.





[ABS]

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C1140 ACTUATOR RLY

Description

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

DTC Logic

INFOID:000000005280887

INFOID:000000005280886

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	 Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ACTUATOR RLY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-36, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005714363

Regarding Wiring Diagram information, refer to <u>BRC-44, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>ABS"</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 connectors and then perform the self-diagnosis. Refer to <u>BRC-15</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

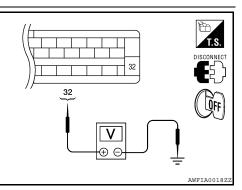
Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	c unit (control unit) Voltage	
Connector	Terminal		voltage
E125	32	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.



C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

${f 3.}$ CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector É125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-63, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK ACTIVE TEST

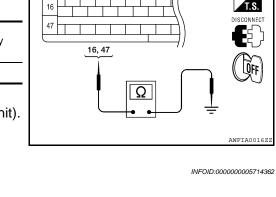
- On "ACTIVE TEST", select "ABS MOTOR". 1.
- BRC 2. Touch On and Off on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

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:000000005280891

INFOID:000000005280892

INFOID:000000005280890

DTC DETECTION LOGIC

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

Diagnosis Procedure

1.CONNECTOR INSPECTION

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

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

- YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".
- NO >> Connector terminal is loose, damaged, open, or shorted.

ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000005280893

[ABS]

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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	INF0/D:0000000528085
1. CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 2 se	econds after the ignition switch is turned ON.
Is the inspection result normal?	
YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC	20 "Diagnasia Drasadura"
	-39. Diagnosis Procedure.
Diagnosis Procedure	INF0ID:000000052808
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) s	elf-diagnosis. Refer to BRC-15, "CONSULT-III Function
<u>(ABS)"</u> .	
Is the inspection result normal?	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis.	
2. CHECK COMBINATION METER	
	meter are normal. Refer to MWI-21, "Diagnosis Descrip
tion".	
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (tion".	(control unit). Refer to <u>BRC-63, "Removal and Installa</u>
NO $>>$ Replace combination meter. Refer to <u>MW</u>	I-86, "Removal and Installation".

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BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

INFOID:000000005280896

×: ON –: OFF

[ABS]

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:000000005280897

1.BRAKE WARNING LAMP OPERATION CHECK

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 >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-40, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005280898

1.CHECK SELF-DIAGNOSIS

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

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-21, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-63, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-86, "Removal and Installation"</u>.

< ECU DIAGNOSIS >

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ECU DIAGNOSIS ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000005280899 В

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
		0 [km/h (MPH)]	Vehicle stopped
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each colonaid value	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	Operation status of each colonaid value	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF

< ECU DIAGNOSIS >

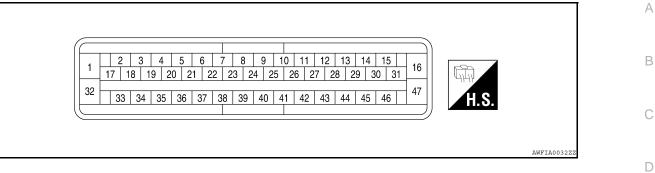
		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
REAR IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
REAR OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	EBD warning lamp	When EBD warning lamp is ON	ON
EBD WARN LAMP	(Note 2)	When EBD warning lamp is OFF	OFF
	Oten lange switch signal status	When brake pedal is depressed	ON
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is released	OFF
	Mater and mater relay an article	When the motor relay and motor are operating	ON
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
ACTUATOR RLT	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 2)	When ABS warning lamp is OFF	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
EBD SIGNAL	EPD energian	EBD is active	ON
EDD SIGNAL	EBD operation	EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
ABS SIGNAL	ABS operation	ABS is inactive	OFF
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON
EBD FAIL SIG		EBD is normal	OFF
ABS FAIL SIG	ABS fail.safe signal	In ABS fail-safe	ON
ADO FAIL OIG	ABS fail-safe signal	ABS is normal	OFF
CRANKING SIG	Crank operation	Crank is active	ON
	Crank operation	Crank is inactive	OFF
DLOCK SW	Differential lock switch ON/OFF	Differential lock switch ON	On
DLUUR SW		Differential lock switch OFF	Off
	Differential look made quiteb sizzal status	When differential lock mode switch is en- gaged	On
DLOCK CHG SW	Differential lock mode switch signal status	When differential lock mode switch is dis- engaged	Off

NOTE:

- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to <u>BRC-39, "Description"</u>.
- Brake warning lamp: Refer to BRC-40, "Description".

< ECU DIAGNOSIS >

TERMINAL LAYOUT





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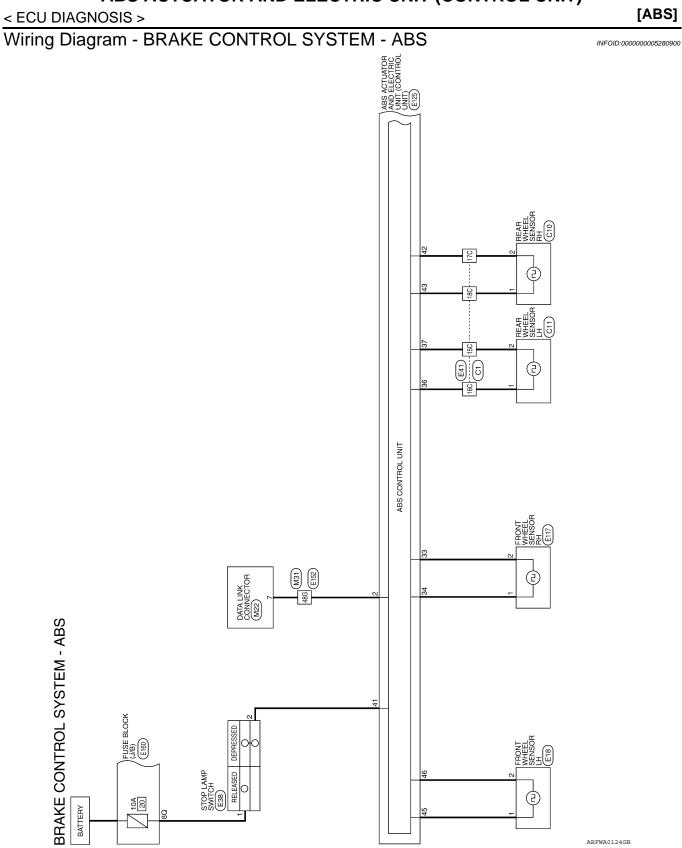
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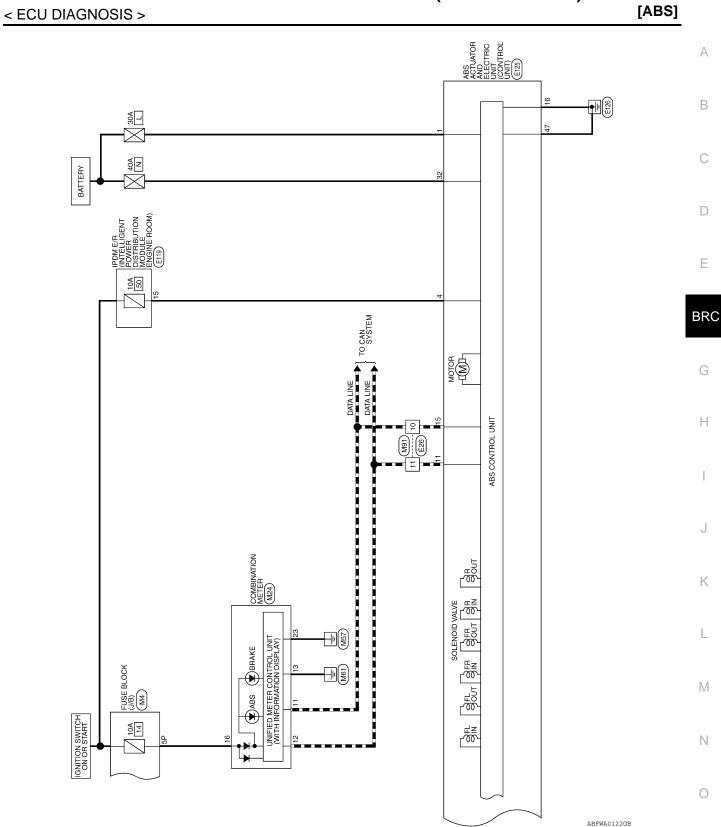
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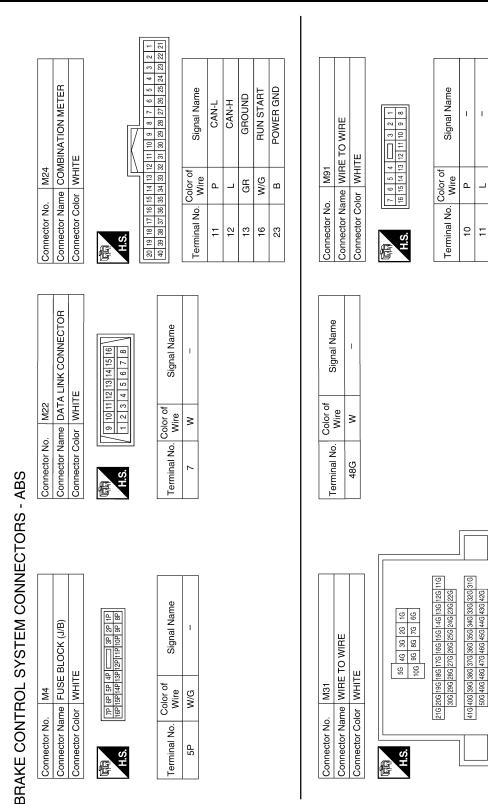
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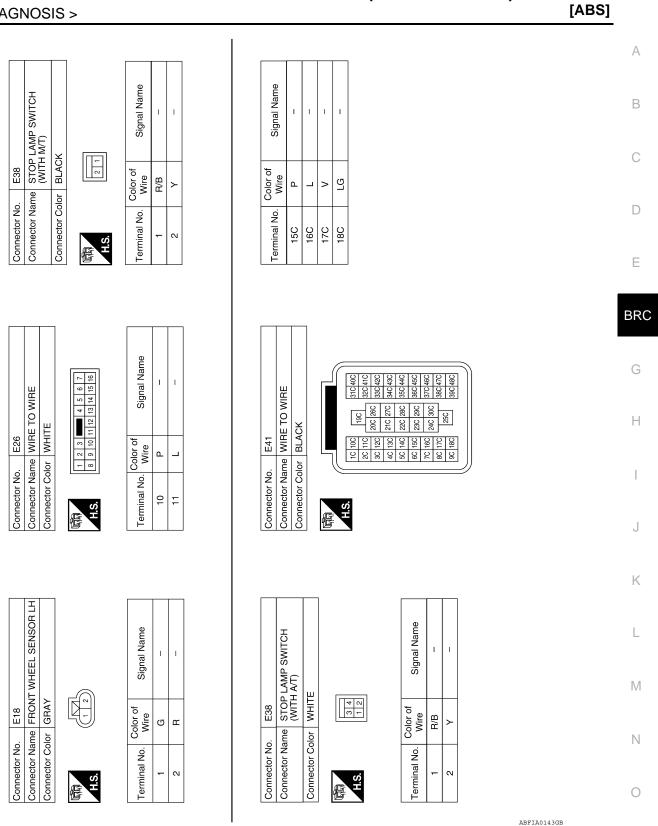
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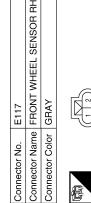
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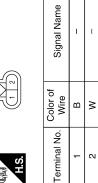
Signal Name	I	I	I	VALVE ECU SUPPLY	FR_RH_SIG	FR_RH_PWR	I	RR_LH_PWR	RR_LH_SIG	I	I	I	STOP_LAMP_SW	RR_RH_SIG	RR_RH_PWR	I	FR_LH_PWR	FR_LH_SIG	MOTOR GND
Color of Wire	I	I	I	≻	3	в	I	_	٩	I	I	I	SB	>	ГG	I	ŋ	щ	В
Terminal No.	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

0. E119	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	vior WHITE	8 7 6 6 6 5 4 3 8 77 16 15 14 13 2 11 10	Color of Signal Name	W/R ABS IGN SUPPLY	
Connector No.	Connector Name	Connector Color WHITE	In the second se	Terminal No.	15	

	Signal Name	I	CAN-H	I	I	I	CAN-L	VALVE ECU GND	I	I	I	I	I	I	I	I	I	I	I	-
	Color of Wire	Ι	_	I	Ι	I	٩	в	I	I	I	Ι	I	Ι	-	Ι	Ι	I	-	1
	Terminal No.	10	1	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

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Connector No.	E125
Connector Name	Connector Name ELECTRIC UNIT (CONTROL UNIT)
Connector Color BLACK	BLACK

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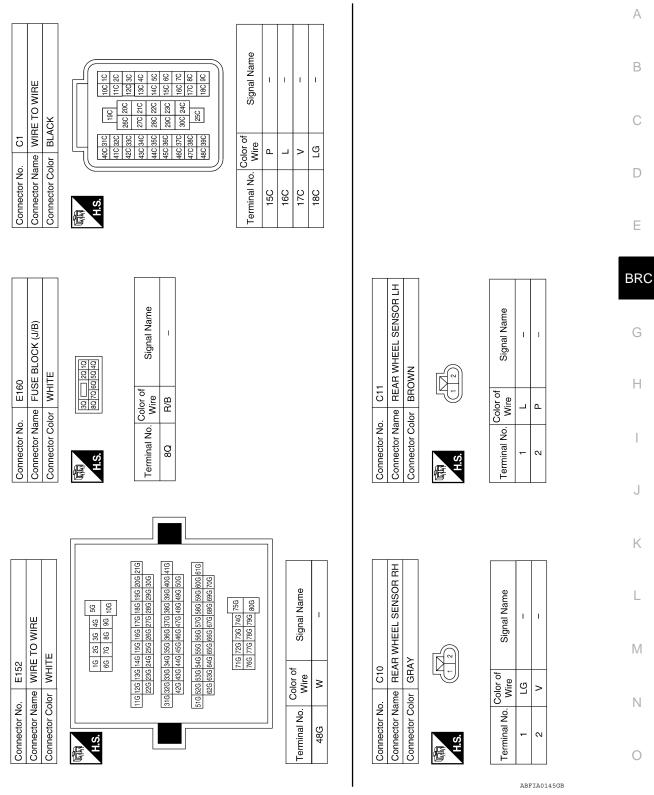
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Signal Name	MOTOR SUPPLY	DIAG_K	I	IGN	I	I	1	I	1
Color of Wire	æ	SB	I	W/R	-	-	I	I	I
Terminal No. Wire	-	2	ę	4	5	9	7	8	6

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Fail-Safe

INFOID:000000005280901

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CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS system.

ABS/EBD SYSTEM

In case of an electrical malfunction with the ABS, the ABS warning lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp and ABS warning lamp will turn on.

< ECU DIAGNOSIS >

The system will revert to one of the following conditions of the Fail-Safe function.

- 1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS system.
- 2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS or EBD system.

DTC No. Index

INFOID:000000005280902

[ABS]

DTC	Items (CONSULT screen terms)	Reference	
C1101	RR RH SENSOR-1		
C1102	RR LH SENSOR-1	BRC-18, "Description"	
C1103	FR RH SENSOR-1		
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2		
C1107	FR RH SENSOR-2	BRC-21, "Description"	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-24, "Description"	
C1110	CONTROLLER FAILURE	BRC-26, "DTC Logic"	
C1111	PUMP MOTOR	BRC-27, "Description"	
C1113	G-SENSOR	BRC-26, "DTC Logic"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-29, "Description"	
C1120	FR LH IN ABS SOL	BRC-32, "Description"	
C1121	FR LH OUT ABS SOL	BRC-34, "Description"	
C1122	FR RH IN ABS SOL	BRC-32, "Description"	
C1123	FR RH OUT ABS SOL	BRC-34, "Description"	
C1140	ACTUATOR RLY	BRC-36, "Description"	
C1170	VARIANT CODING	BRC-26, "DTC Logic"	
C1190	R-EV	BRC-32, "Description"	
C1191	R-AV	BRC-34, "Description"	
U1000	CAN COMM CIRCUIT	BRC-38, "Description"	

SYMPTOM DIAGNOSIS ABS

Symptom Table

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	BRC-52, "Diagno- sis Procedure"
400.109	Wheel sensor and rotor system	
	Brake pedal stroke	BRC-53, "Diagno-
Unexpected pedal reaction	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-54, "Diagno- sis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-55, "Diagno- sis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-56, "Diagno-
occurs (Note 2)	ABS actuator and electric unit (control unit)	sis Procedure"

ABS

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. 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]

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INFOID:000000005280903

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000005280904

[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-5</u>, <u>"On-Vehicle</u> <u>Inspection and Service"</u>, Rear: <u>RAX-7</u>, <u>"Rear Axle Bearing"</u> (C200) or <u>RAX-19</u>, <u>"Rear Axle Bearing"</u> (M226).

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

 $\mathbf{3}$. 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-61, "Removal and Installation"</u> or <u>BRC-62,</u> <u>"Removal and Installation"</u>.
 - Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

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

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS > [ABS]	
UNEXPECTED PEDAL REACTION	٨
Diagnosis Procedure	A
1.CHECK BRAKE PEDAL STROKE	В
Check brake pedal stroke. Refer to BRC-9, "System Description".	
Is the stroke too large?	0
 YES >> • Bleed air from brake tube and hose. Refer to <u>BR-19, "Bleeding Brake System"</u>. • Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-17, "Inspection and Adjustment"</u> (brake pedal), <u>BR-19, "On Board Inspection"</u> (master cylinder), <u>BR-54, "Brake Booster"</u> (brake booster). 	
NO $>>$ GO TO 2	D
2.CHECK FUNCTION	F
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.	L
Is the inspection result normal?	BRC
YES >> Normal NO >> Check brake system.	

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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000005280906

[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 >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]
- **1.**SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3

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

3.SYMPTOM CHECK 3

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

Do symptoms occur?

- YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
- NO >> Normal

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

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[ABS]

INFOID:000000005280909

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS is activated.	This is a normal condi-	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	tion due to ABS activa- tion.	(
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.	[
The ABS warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal	
ABS warning lamp may illuminate when running on a special road that is extremely slanted (e.g. bank in a	road. If the normal con- dition is restored, there is no malfunction. At	_
circuit course).	that time, erase the self- diagnosis memory.	В

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Revision: September 2009

PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT **PRE-TENSIONER**" INFOID:000000005783530

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 iniury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Brake System

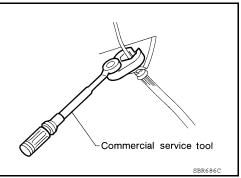
INFOID:000000005280911

CAUTION:

- Refer to MA-10, "Fluids and Lubricants" for recommended brake fluid.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to BR-36, "Brake Burnishing" (front disc brake) or BR-41, "Brake Burnishing" (rear disc brake). WARNING:

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



PRECAUTIONS

Precaution for Brake Control

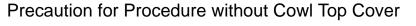
< PRECAUTION >

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine В compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- 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 diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.
- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stop-D ping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error
- Ε If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.

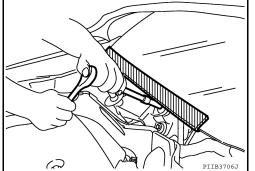
Precaution for CAN System

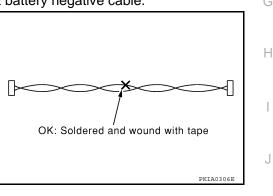
- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape. Make sure that fraying of twisted wire is within 110 mm (4.33 in).

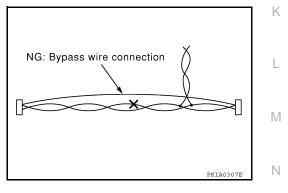
 Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



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







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[ABS]

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< PREPARATION > PREPARATION PREPARATION

Special Service Tool

INFOID:000000005280914

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	Veracione WFIACIOLE	Checking operation of ABS active wheel sensors
ST30031000 (—) Bearing puller	ZZAO700D	Removing sensor rotor

Commercial Service Tool

INFOID:000000005280915

Tool name		Description
 Flare nut crowfoot Torque wrench 		Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
	S-NT360	
Power tool		Removing nuts and bolts
	PIIB1407E	

< REMOVAL AND INSTALLATION > **REMOVAL AND INSTALLATION** WHEEL SENSORS

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🔍 N·m (kg-m, ft-lb) 1. Front wheel sensor Rear wheel sensor (C200) Rear wheel sensor (M226) 2. 3.

17.5 (1.8, 13)

REMOVAL

- 1. When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to BR-37, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Remove wheel sensor bolt(s).
- Pull the sensor straight out, being careful to turn it as little as possible. 3. **CAUTION:**
 - · Be careful not to damage sensor edge and sensor rotor teeth.
 - Do not pull on the sensor harness.
- 4. Disconnect wheel sensor harness electrical connector, then remove harness from mounts.

INSTALLATION

Installation is in the reverse order of removal.

- · Before installing wheel sensors,
- Inspect wheel sensor assembly and replace if damaged.
- Μ - Clean wheel sensor hole and mating surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle.
- Install a new wheel sensor O-ring, then apply a coat of suitable grease to the O-ring and sensor hole. Refer to MA-10, "Fluids and Lubricants". Ν

SENSOR ROTOR

Removal and Installation

INFOID:000000005280917

[ABS]

FRONT

The wheel sensor rotors are built into the wheel hubs and are not removable. If damaged, replace wheel hub and bearing assembly. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>".

REAR (C200)

Removal and Installation

It is necessary to disassemble the rear axle to replace the sensor rotor. Perform the axle shaft assembly removal procedure to replace sensor rotor. Refer to <u>RAX-8</u>, "<u>Removal and Installation</u>".

REAR (M226)

Removal

NOTE:

It is necessary to disassemble the rear axle to replace the sensor rotor.

- 1. Remove the axle shaft assembly. Refer to <u>RAX-20, "Removal and Installation"</u>.
- 2. Pull the sensor rotor off of the axle shaft using Tool and a suitable press.

Tool number : ST30031000 (—)

Installation

1. Install the new sensor rotor on the axle shaft using a suitable length steel tube and a press. Make sure the sensor rotor is fully seated.

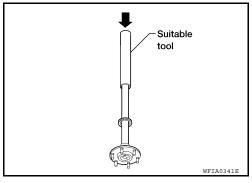
CAUTION:

Do not reuse the old sensor rotor.

2. Install the axle shaft assembly. Refer to <u>RAX-20, "Removal and</u> <u>Installation"</u>.

CAUTION:

Do not reuse the axle oil seal. The axle oil seal must be replaced every time the axle shaft assembly is removed from the axle shaft housing.



ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

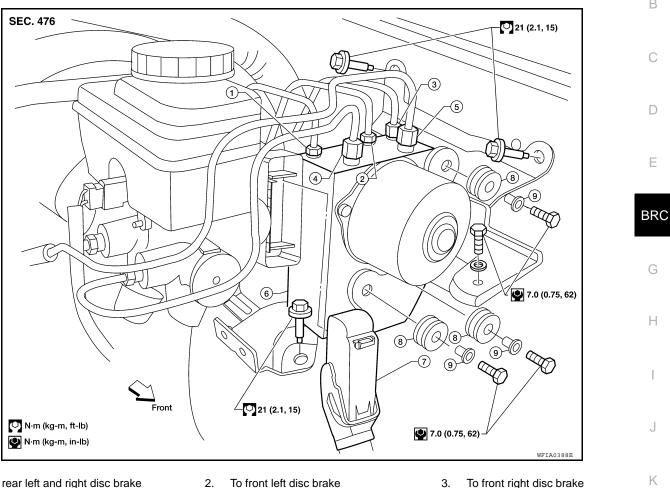
ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

INFOID:000000005280918

[ABS]

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1. To rear left and right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)

18.2 N·m (1.9 kg-m, 13 ft-lb)

- 2. To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- From the master cylinder secondary side 5. From the master cylinder primary side 18.2 N·m (1.9 kg-m, 13 ft-lb)

Grommet

- 6. 9.
- To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb) ABS actuator and electric unit (control unit) Collar

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REMOVAL

4.

- 1. Disconnect the negative battery terminal.
- Remove the air cleaner assembly. Refer to <u>EM-24, "Removal and Installation"</u>.

8.

- Disconnect the actuator harness from the ABS actuator and electric unit (control unit).
- 4. Disconnect the brake tubes.
 - **CAUTION:**

7. Harness connector

- To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
- Be careful not to splash brake fluid on painted areas.
- When removing components, cover connections so that no dirt, dust, or other foreign matter aets in.
- 5. Remove three bracket bolts and remove the ABS actuator and electric unit (control unit) and bracket.
- Remove the ABS actuator and electric unit (control unit) from the bracket.

INSTALLATION

Installation is in the reverse order of removal.

 After installation of the ABS actuator and electric unit (control unit), refill brake system with new brake fluid. Then bleed the air from the system. Refer to <u>BR-19</u>, "Bleeding Brake System".

BRC-63

< REMOVAL AND INSTALLATION >

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.
- The brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.
- Be careful not to splash brake fluid on painted areas; it way cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Do not bend or twist brake hose sharply, or strongly pull it.
- Do not reuse drained brake fluid.
- After installation of the ABS actuator and electric unit (control unit), refill brake system with new brake fluid. Then bleed the air from the system. Refer to <u>BR-19</u>, <u>"Bleeding Brake System"</u>.

< BASIC INSPECTION >

INFOID:000000005280919

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to <u>BRC-69</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION : Description</u>".

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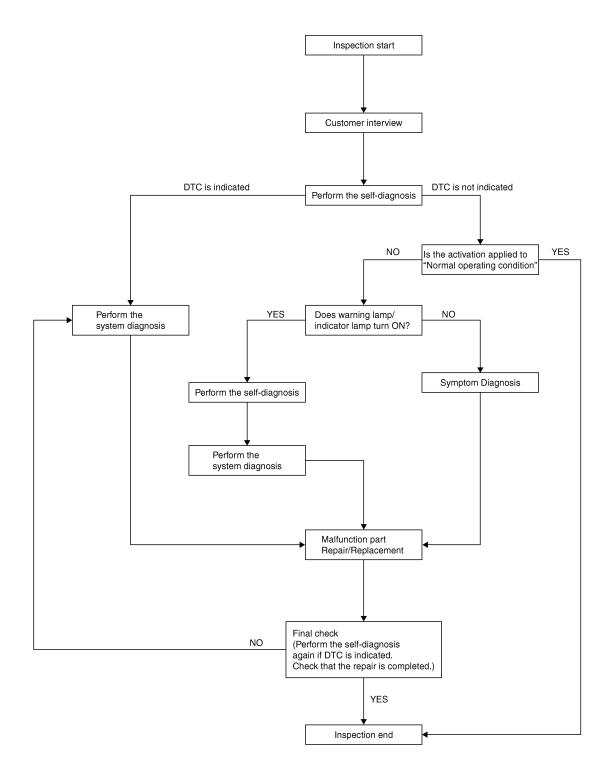
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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



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DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to <u>BRC-68</u>, "<u>Diagnostic Work Sheet</u>".

>> GO TO 2

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VDC/TCS/ABS]
2.PERFORM THE SELF-DIAGNOSIS
Check the DTC display with the self-diagnosis function. Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u> . Is there any DTC displayed?
YES >> GO TO 3 NO >> GO TO 4
3. PERFORM THE SYSTEM DIAGNOSIS
Perform the diagnosis applicable to the displayed DTC. Refer to <u>BRC-150, "DTC No. Index"</u> .
>> GO TO 7
4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION
Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-159</u> , <u>"Description"</u> .
<u>Is the symptom a normal operation?</u> YES >> Inspection End NO >> GO TO 5
5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION
 Check that the warning lamp and indicator lamp illuminate. ABS warning lamp: Refer to <u>BRC-132, "Description"</u>. Brake warning lamp: Refer to <u>BRC-133, "Description"</u>. VDC OFF indicator lamp: Refer to <u>BRC-134, "Description"</u>. SLIP indicator lamp: Refer to <u>BRC-136, "Description"</u>.
Is ON/OFF timing normal?
YES >> GO TO 6 NO >> GO TO 2
6.PERFORM THE DIAGNOSIS BY SYMPTOM
Perform the diagnosis applicable to the symptom.
>> GO TO 7
7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS
Repair or replace the specified malfunctioning parts.
>> GO TO 8
8.FINAL CHECK
Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-85</u> , "CONSULT-III Function (ABS)".
Is no other DTC present and the repair completed?
YES >> Inspection End NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000005280920

[VDC/TCS/ABS]

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

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INSPECTION AN	
< BASIC INSPECTION >	[VDC/TCS/ABS]
NSPECTION AND ADJUSTMENT	
ADDITIONAL SERVICE WHEN REPLAC	ING CONTROL UNIT
ADDITIONAL SERVICE WHEN REPLACIN	
After replacing the ADC estuator and electric unit (cont	
 After replacing the ABS actuator and electric unit (contr Neutral position adjustment for the steering angle ser Calibration of the decel G sensor 	
ADDITIONAL SERVICE WHEN REPLACIN	NG CONTROL UNIT : Special Repair Re-
quirement	INFOID:00000005280922
1.PERFORM THE NEUTRAL POSITION ADJUSTME	
Perform the neutral position adjustment for the steering	angle sensor.
<u>cial Repair Requirement"</u> , GO TO 2 2.PERFORM CALIBRATION OF THE DECEL G SEN	SOR
2.PERFORM CALIBRATION OF THE DECEL G SEN Perform calibration of the decel G sensor. >> Refer to <u>BRC-70, "CALIBRATION OF DEC</u> ADJUSTMENT OF STEERING ANGLE S	EL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION
2.PERFORM CALIBRATION OF THE DECEL G SEN Perform calibration of the decel G sensor. >> Refer to <u>BRC-70, "CALIBRATION OF DEC</u> ADJUSTMENT OF STEERING ANGLE S	EL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION NSOR NEUTRAL POSITION : Description WFOID:0000005280923 teering angle sensor neutral position is required.
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2.PERFORM CALIBRATION OF THE DECEL G SEN Perform calibration of the decel G sensor. >> Refer to <u>BRC-70, "CALIBRATION OF DEC</u> ADJUSTMENT OF STEERING ANGLE SE ADJUSTMENT OF STEERING ANGLE SE Refer to the table below to determine if adjustment of s <u>Situation</u> Removing/Installing ABS actuator and electric unit (control unit)	ELG SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION INFORMATION : Description INFORMATION : DESCRIPTION : DESCRIPTION INFORMATION : DESCRIPTION : DESCRIPTION INFORMATION : DESCRIPTION : DESCRIPTIO
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2.PERFORM CALIBRATION OF THE DECEL G SENS Perform calibration of the decel G sensor. >> Refer to BRC-70, "CALIBRATION OF DEC ADJUSTMENT OF STEERING ANGLE SE ADJUSTMENT OF STEERING ANGLE SE Refer to the table below to determine if adjustment of s Situation 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 Replacing suspension components Replacing suspension components Replacing suspension components	EL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION : Description InFolD-00000005280923 teering angle sensor neutral position is required. x: Required -: Not required Adjustment of steering angle sensor neutral position × × × × × × × × × × × × × × × ×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION **CAUTION:**

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

< BASIC INSPECTION >

>> GO TO 2

2. Perform the neutral position adjustment for the steering angle sensor

- 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.
- Touch "START".
 CAUTION:
 Do not touch steering wheel while adjusting steering angle sensor.
- After approximately 10 seconds, touch "END".
 NOTE: After approximately 60 seconds, it ends automatically.
- 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±2.5°.

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 memory of the ABS actuator and electric unit (control unit) and ECM.

ABS actuator and electric unit (control unit): Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u>.

• ECM: Refer to EC-48, "CONSULT-III Function (ENGINE)".

Are the memories erased?

YES >> Inspection End

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

CALIBRATION OF DECEL G SENSOR

CALIBRATION OF DECEL G SENSOR : Description

INFOID:000000005280925

Refer to the table below to determine if calibration of the decel G sensor is required.

×: Required –: Not required

Situation	Calibration of decel G sensor
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	×

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

CALIBRATION OF DECEL G SENSOR CAUTION:

To calibrate the decel G sensor, make sure to use CONSULT-III

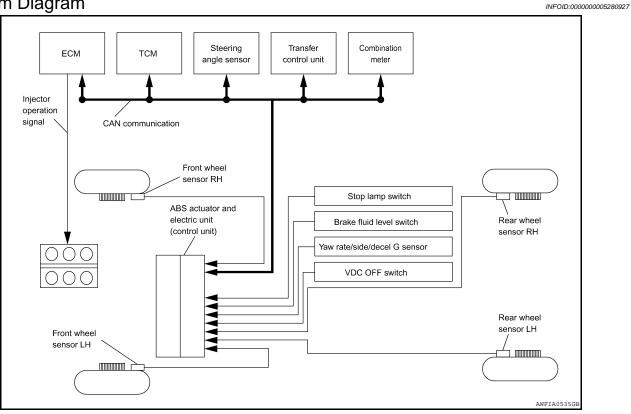
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INSPECTION AND ADJUSTMENT

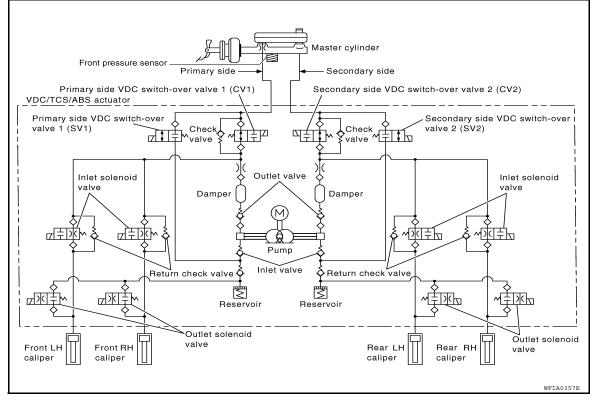
INSPECTION AND ADJUSTMENT
< BASIC INSPECTION > [VDC/TCS/AB
(Calibration cannot be done without CONSULT-III)
1. ALIGN THE VEHICLE STATUS
Stop vehicle with front wheels in straight-ahead position.
>> GO TO 2
2.PERFORM CALIBRATION OF DECEL G SENSOR
 On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order. Touch "START".
3. After approximately 10 seconds, touch "END".
NOTE:
After approximately 60 seconds, it ends automatically. 4. Turn ignition switch OFF, then turn it ON again.
CAUTION:
Be sure to perform above operation.
>> GO TO 3
3. CHECK DATA MONITOR
1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select "DATA MONITOR". Then make sure "DECEL G SEN" is within ±0.08G.
Is the inspection result normal?
YES >> GO TO 4 NO >> Perform calibration of decel G sensor again, GO TO 1
4. ERASE THE SELF-DIAGNOSIS MEMORY
Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM.
 ABS actuator and electric unit (control unit): Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u>.
 ECM: Refer to <u>EC-48, "CONSULT-III Function (ENGINE)"</u>. Are the memories erased?
YES >> Inspection End
NO >> Check the items indicated by the self-diagnosis.

< FUNCTION DIAGNOSIS > FUNCTION DIAGNOSIS VDC

System Diagram



HYDRAULIC CIRCUIT DIAGRAM



< FUNCTION DIAGNOSIS >

System Description

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

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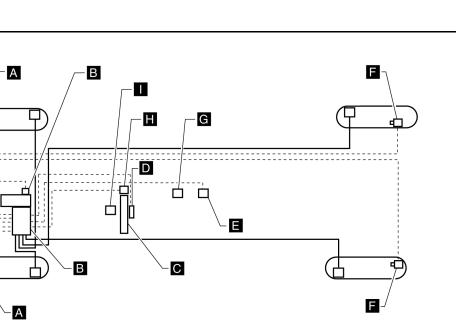
Component Parts Location

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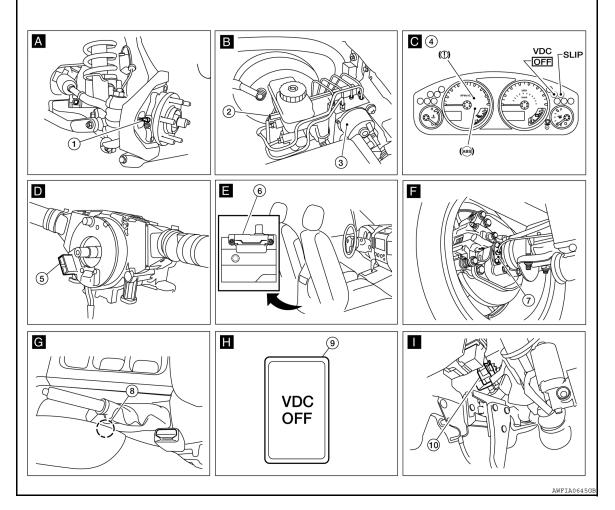
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[VDC/TCS/ABS]



VDC



- 1. Front wheel sensor LH E18 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- Spiral cable (includes steering angle 6. sensor) M47 (steering wheel removed for clarity)
- 3. ABS actuator and electric unit (control unit) E125
 - Yaw rate/side/decel G sensor B73



< FUNCTION DIAGNOSIS >

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10

10. Stop lamp switch E38

Component Description

9. VDC OFF switch M154

[VDC/TCS/ABS]

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Compo	nent parts	Reference	0
	Pump	BRC-98, "Description"	C
	Motor	BRC-96, Description	
ABS actuator and electric unit (control unit)	Actuator relay	BRC-115, "Description"	D
	Solenoid valve	BRC-111, "Description"	
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-126, "Description"	E
Wheel sensor		BRC-103, "Description"	
Yaw rate/side/decel G sensor		BRC-100, "Description"	
Steering angle sensor		BRC-117, "Description"	- BR
VDC OFF switch		BRC-130, "Description"	
Brake fluid level switch		BRC-120, "Description"	G
Parking brake switch		BRC-133, "Description"	
ABS warning lamp		BRC-132, "Description"	_
Brake warning lamp		BRC-133, "Description"	— H
VDC OFF indicator lamp		BRC-134, "Description"	
SLIP indicator lamp		BRC-136, "Description"	

VDC

Parking brake switch B84

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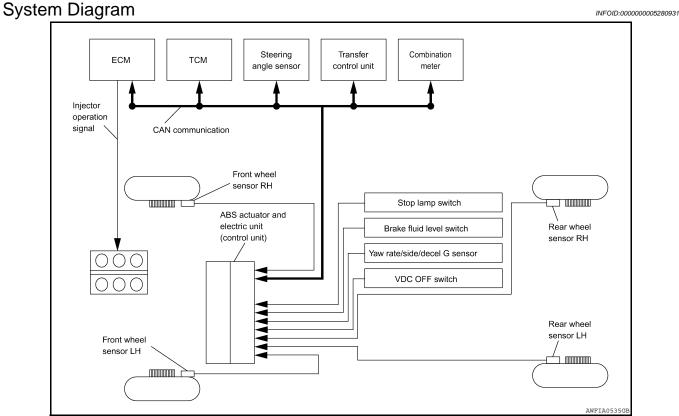
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< FUNCTION DIAGNOSIS >

TCS





TCS

System Description

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

Component Parts Location

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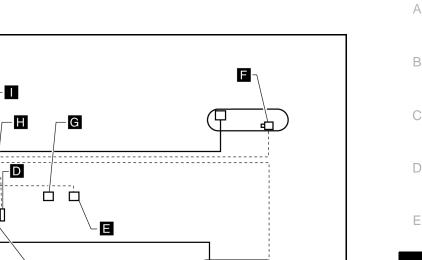
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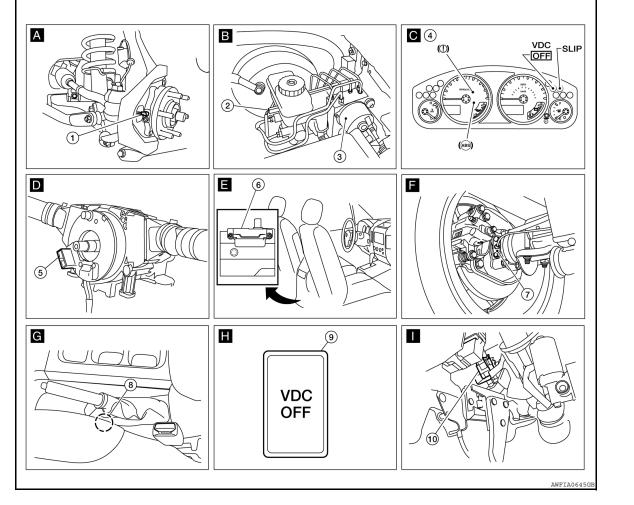
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[VDC/TCS/ABS]



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TCS

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- Front wheel sensor LH E18 1. Front wheel sensor RH E117
- 4. Combination meter M24
- Brake fluid level switch E21 2.
- Spiral cable (includes steering angle 6. 5. sensor) M47 (steering wheel removed for clarity)
- ABS actuator and electric unit (con-3. trol unit) E125
 - Yaw rate/side/decel G sensor B73

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< FUNCTION DIAGNOSIS >

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10

10. Stop lamp switch E38

Component Description

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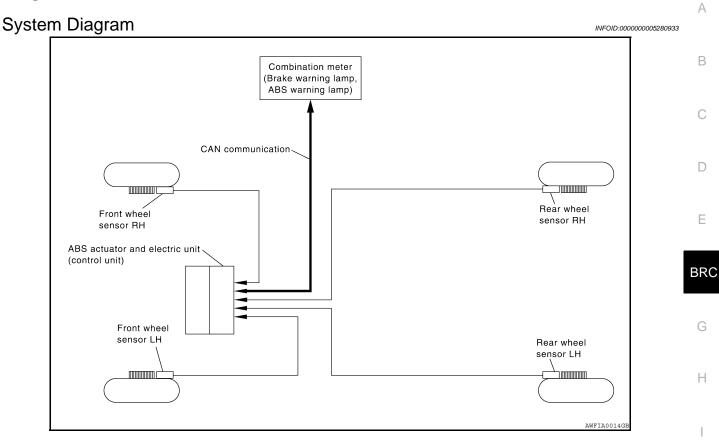
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Сотро	nent parts	Reference
	Pump	PPC 08 "Description"
	Motor	BRC-98, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-115, "Description"
	Solenoid valve	BRC-111, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-126. "Description"
Wheel sensor		BRC-103, "Description"
Yaw rate/side/decel G sensor		BRC-100, "Description"
Steering angle sensor		BRC-117, "Description"
VDC OFF switch		BRC-130, "Description"
Brake fluid level switch		BRC-120, "Description"
Parking brake switch		BRC-133, "Description"
ABS warning lamp		BRC-132, "Description"
Brake warning lamp	BRC-133, "Description"	
VDC OFF indicator lamp	BRC-134, "Description"	
SLIP indicator lamp		BRC-136, "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.
- Electrical system diagnosis by CONSULT-III is available.

[VDC/TCS/ABS]

Component Parts Location

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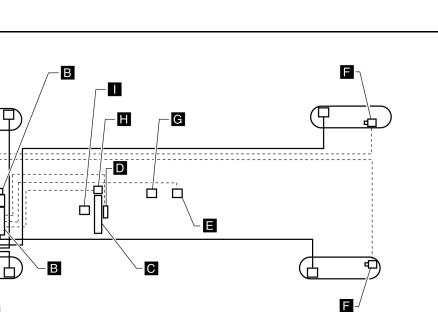
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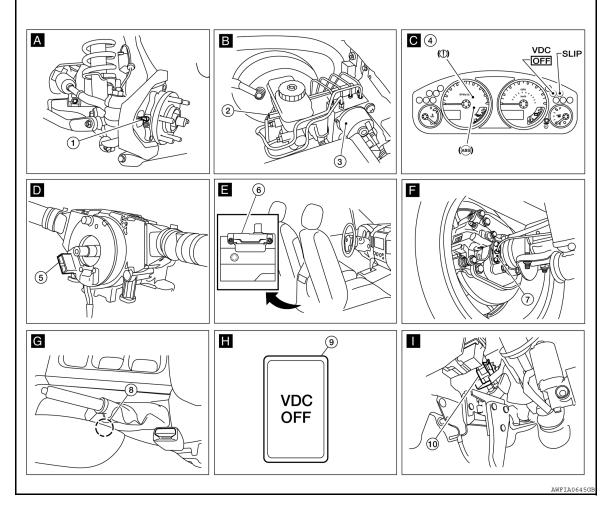
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[VDC/TCS/ABS]



ABS



- 1. Front wheel sensor LH E18 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- Spiral cable (includes steering angle 6. sensor) M47 (steering wheel removed for clarity)
- 3. ABS actuator and electric unit (control unit) E125
 - Yaw rate/side/decel G sensor B73



< FUNCTION DIAGNOSIS >

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10

10. Stop lamp switch E38

Brake warning lamp

SLIP indicator lamp

VDC OFF indicator lamp

Component Description

Defenses

BRC-133, "Description"

BRC-134, "Description"

BRC-136, "Description"

9.

Compo	Component parts	
	Pump	BRC-98, "Description"
	Motor	BICC-30, Description
ABS actuator and electric unit (control unit)	Actuator relay	BRC-115, "Description"
	Solenoid valve	BRC-111, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-126, "Description"
Wheel sensor		BRC-103, "Description"
Yaw rate/side/decel G sensor		BRC-100, "Description"
Steering angle sensor		BRC-117, "Description"
VDC OFF switch		BRC-130, "Description"
Brake fluid level switch	BRC-120, "Description"	
Parking brake switch		BRC-133, "Description"
ABS warning lamp		BRC-132, "Description"

ABS

Parking brake switch B84

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VDC OFF switch M154

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[VDC/TCS/ABS]

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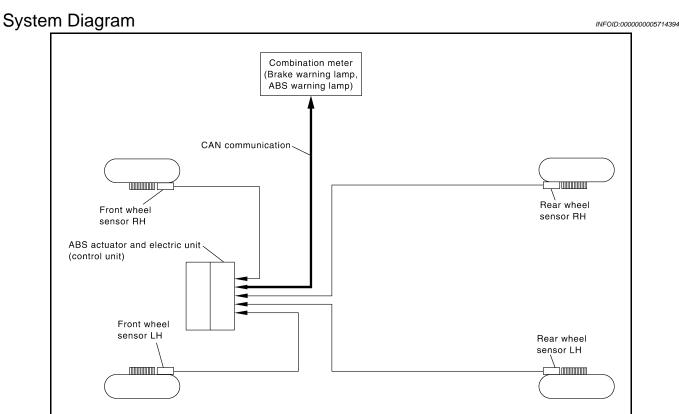
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EBD





EBD

System Description

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AWFIA00:

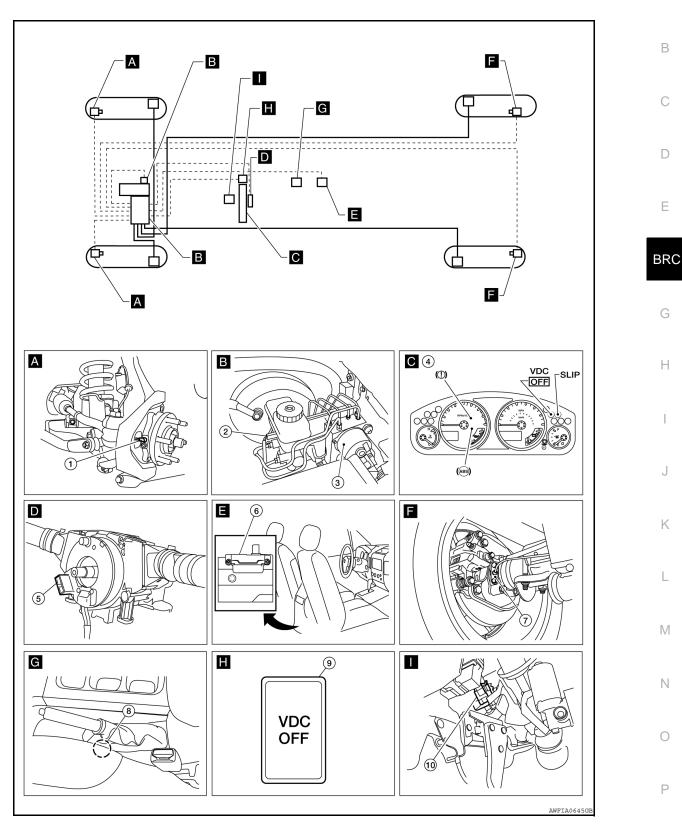
- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly,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

< FUNCTION DIAGNOSIS >

Component Parts Location

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- 1. Front wheel sensor LH E18 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- Spiral cable (includes steering angle 6. sensor) M47 (steering wheel removed for clarity)
- 3. ABS actuator and electric unit (control unit) E125
 - Yaw rate/side/decel G sensor B73



< FUNCTION DIAGNOSIS >

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10

10. Stop lamp switch E38

Component Description

Parking brake switch B84

8.

EBD

VDC OFF switch M154

9.

INFOID:000000005714398

Сотро	nent parts	Reference
	Pump	BBC 08 "Description"
	Motor	<u>BRC-98, "Description"</u>
ABS actuator and electric unit (control unit)	Actuator relay	BRC-115, "Description"
	Solenoid valve	BRC-111, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-126, "Description"
Wheel sensor		BRC-103, "Description"
Yaw rate/side/decel G sensor		BRC-100, "Description"
Steering angle sensor		BRC-117, "Description"
VDC OFF switch		BRC-130, "Description"
Brake fluid level switch		BRC-120, "Description"
Parking brake switch		BRC-133, "Description"
ABS warning lamp		BRC-132, "Description"
Brake warning lamp	BRC-133, "Description"	
VDC OFF indicator lamp	BRC-134, "Description"	
SLIP indicator lamp		BRC-136, "Description"

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

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

CONSULT-III Function (ABS)

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FUNCTION

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

Diagnostic test mode	Function
Work Support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self Diagnostic Result	Self-diagnostic results can be read and erased quickly.
Data Monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.
Active Test	Diagnostic test mode is which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
Function Test	Other results or histories, etc. that are recorded in ECU are displayed.
ECU Identification	ABS actuator and electric unit (control unit) part number can be read.
CAN Diag Support Mntr	The results of transmit/receive diagnosis of CAN communication can be read.

SELF DIAGNOSTIC RESULT MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

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

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

Display Item List Refer to <u>BRC-150, "DTC No. Index"</u>.

DATA MONITOR MODE

Display Item List

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

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

Item				
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor 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.
EBD WARN LAMP (On/Off)	_	_	×	Brake warning lamp (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) sta- tus 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)	_	×	×	OFF Lamp (On/Off) status is dis- played.
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 (control unit) is dis- played.
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position judged by transmis- sion range switch signal is dis- played.
SLCT LVR POSI (P, R, N, D)	×	×	×	Shift position judged by transmis- sion range switch signal.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN com- munication signal is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
R POSI SIG (On/Off)	_	_	×	Shift position judged by transmis- sion range switch signal.
N POSI SIG (On/Off)	-	-	×	Shift position judged by transmis- sion range switch signal.

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

ltem	Data	a monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
P POSI SIG (On/Off)	-	_	×	Shift position judged by transmis- sion range switch signal.
CV1 (On/Off)	-	_	×	Front side switch-over solenoid valve (cut valve) (On/Off) status is displayed.
CV2 (On/Off)	-	_	×	Rear side switch-over solenoid valve (cut-valve) (On/Off) status is displayed.
SV1 (On/Off)	-	_	×	Front side switch-over solenoid valve (suction valve) (On/Off) status is displayed.
SV2 (On/Off)	-	_	×	Rear side switch-over solenoid valve (suction valve) (On/Off) status is displayed.
2WD/4WD (2WD/4WD)	-	_	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
ACCEL POS SIG (%)	×	-	×	Throttle valve open/close status judged by CAN communication signal is displayed.
SIDE G-SENSOR (m/s ²)	×	_	×	Transverse acceleration detected by side G-sensor is displayed.
STR ANGLE SIG (deg)	×	-	×	Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×	_	×	Brake pressure detected by pres- sure 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.
FCS SIGNAL On/Off)	-	_	×	TCS operation (On/Off) status is displayed.
/DC SIGNAL (On/Off)	-	_	×	VDC operation (On/Off) status is displayed.
EBD FAIL SIG On/Off)	-	_	×	EBD fail signal (On/Off) status is displayed.
ABS FAIL SIG (On/Off)	-	-	×	ABS fail signal (On/Off) status is displayed.
CS FAIL SIG On/Off)	-	_	×	TCS fail signal (On/Off) status is displayed.
/DC FAIL SIG /On/Off)	-	_	×	VDC fail signal (On/Off) status is displayed.
CRANKING SIG On/Off)	-	_	×	The input state of the key SW START position signal is displayed.
FLUID LEV SW (On/Off)	×	_	×	Brake fluid level switch (On/Off) sta- tus is displayed.

×: Applicable

-: Not applicable

ACTIVE TEST MODE

CAUTION:

• Do not perform active test while driving vehicle.

• Make sure to completely bleed air from brake system.

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

- The active test cannot be performed with the ABS warning lamp, VDC OFF 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 the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/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 operate as shown in the table below.

Operation -		AE	3S solenoid v	alve	ABS :	ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP	
FR RH SOL	FR RH IN SOL	Off	On	On	—	—	—	
	FR RH OUT SOL	Off	Off	On*		_	_	
FR LH SOL	FR LH IN SOL	Off	On	On	—	—	_	
FR LH SOL	FR LH OUT SOL	Off	Off	On*	—	—	—	
RR RH SOL	RR RH IN SOL	Off	On	On	—	—	—	
	RR RH OUT SOL	Off	Off	On*	—	—	—	
RR LH SOL	RR LH IN SOL	Off	On	On	—	—	—	
KK EH SOL	RR LH OUT SOL	Off	Off	On*	—	—	—	
FR RH ABS SOLENOID (ACT)	FR RH IN SOL	—	—	—	Off	Off	Off	
FR RH ABS SOLENOID (ACT)	FR RH OUT SOL	—	—	—	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	—	—	—	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	FR LH OUT SOL	—	—	—	Off	Off	Off	
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	—	—	—	Off	Off	Off	
KK KI ADS SOLENOID (ACT)	RR RH OUT SOL	—	—	—	Off	Off	Off	
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	—	—	—	Off	Off	Off	
	RR LH OUT SOL		—		Off	Off	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 operates as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

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

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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.	Harness or connectorWheel sensor
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 CC	NFIRMATION PROCE	DURE	
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS	
Check th	e self-diagnosis results.		
	Self-diagnosis		
	RR RH SENS		
	RR LH SENS		
	FR RH SENS		
	displayed on the self-diad		
YES		procedure. Refer to <u>BRC-89. "Diagnosis Proced</u>	<u>ure"</u> .
Diagno	sis Procedure		INFOID:000000005280940
Regardir	ng Wiring Diagram inform	ation, refer to BRC-142, "Wiring Diagram - BRA	KE CONTROL SYSTEM -
Regardir <u>VDC"</u> .	ng Wiring Diagram inform	ation, refer to <u>BRC-142, "Wiring Diagram - BRA</u>	KE CONTROL SYSTEM -
<u>VDC"</u> .		ation, refer to <u>BRC-142, "Wiring Diagram - BR/</u>	KE CONTROL SYSTEM -
<u>VDC"</u> . CAUTIO	N:		KE CONTROL SYSTEM -
VDC". CAUTIO Do not c	<mark>N:</mark> heck between wheel se		KE CONTROL SYSTEM -
VDC". CAUTIO Do not c 1.CONM	N: heck between wheel set NECTOR INSPECTION	nsor terminals.	
<u>VDC"</u> . CAUTIO Do not c 1.CONM	N: heck between wheel set NECTOR INSPECTION onnect the ABS actuator a		
CAUTIO Do not c 1.CONM 1. Disc code 2. Chee	N: heck between wheel set NECTOR INSPECTION onnect the ABS actuator a b. ck the terminals for deform	nsor terminals.	
VDC". CAUTIO Do not c 1.CONN 1. Disc code 2. Chee Is the ins	N: heck between wheel set NECTOR INSPECTION onnect the ABS actuator a ck the terminals for deform apection result normal?	n sor terminals. and electric unit (control unit) connector and whe	
VDC". CAUTIO Do not c 1.CONN 1. Disc code 2. Chee Is the ins YES	N: heck between wheel set NECTOR INSPECTION onnect the ABS actuator a ck the terminals for deform spection result normal? >> GO TO 2	nsor terminals. and electric unit (control unit) connector and whe nation, disconnection, looseness or damage.	
VDC". CAUTIO Do not c 1. CONN 1. Disc code 2. Chee Is the ins YES NO	N: heck between wheel set NECTOR INSPECTION onnect the ABS actuator a ck the terminals for deform apection result normal?	nsor terminals. and electric unit (control unit) connector and whe nation, disconnection, looseness or damage. ecessary.	

BRC-89

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

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:

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 the wheel sensor. Refer to <u>BRC-164, "Removal and Installation"</u>.

3.CHECK TIRES

Check the inflation pressure, wear and size of each tire.

Is the inspection result normal?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5, "On-Vehicle Inspection and Service"</u> (front) or <u>RAX-7, "Rear Axle Bearing"</u> (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-13,</u> <u>"Removal and Installation"</u> (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

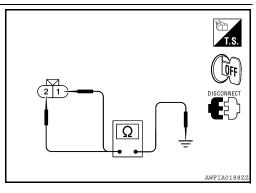
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. 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	
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	
		46		2	
Front RH	– E125	34	E117	1	Yes
		33		2	
Rear LH		36	C11	1	Tes
Rear LH		37		2	
Rear RH		43	- C10	1	
		42		2	

Is the inspection result normal?

Revision: September 2009

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

[VDC/TCS/ABS] < COMPONENT DIAGNOSIS > YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-166, "Removal and Installation". А NO >> Repair the circuit. Component Inspection INFOID:000000005280941 В **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) D FR LH SENSOR FR RH SENSOR Nearly matches the speedometer display (±10% or less) Е **RR LH SENSOR RR RH SENSOR** Is the inspection result normal? BRC >> Inspection End YES >> Go to diagnosis procedure. Refer to <u>BRC-89, "Diagnosis Procedure"</u>. NO Special Repair Requirement INFOID:000000005280942 **1.**ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator Н and electric unit (control unit). Refer to BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 2.CALIBRATION OF DECEL G SENSOR Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-70, "CALIBRATION OF DECEL G SENSOR : Description". Κ >> END L

- Ν
 - 0
- Ρ

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT 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:000000005280944

INFOID:000000005280943

[VDC/TCS/ABS]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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.	
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.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit)
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.	
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.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-92. "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005714364

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

CAUTION:

Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.

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

Is the inspection result normal?

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> GO TO 2 NO >> Repair or replace as necessary.	
CHECK WHEEL SENSOR OUTPUT SIGNAL	
 Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter. 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. B. 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 the wheel sensor. Refer to <u>BRC-164, "Removal and Installation"</u> . CHECK TIRES	
Check the inflation pressure, wear and size of each tire.	
<u>s the inspection result normal?</u> YES >> GO TO 4 NO >> Adjust tire pressure or replace tire(s).	
LCHECK WHEEL BEARINGS	
Check wheel bearing axial end play. Refer to <u>FAX-5, "On-Vehicle Inspection and Service"</u> (front) or <u>RAX-7, Rear Axle Bearing"</u> (rear).	
s 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-13,</u>	
"Removal and Installation" (rear).	
CHECK WIRING HARNESS FOR SHORT CIRCUIT	
 Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No. Check continuity between wheel sensor connector terminals and ground. 	
and ground. Continuity should not exist.	
YES >> GO TO 6 NO >> Repair the circuit. \square	
CHECK WIRING HARNESS FOR OPEN CIRCUIT	
. Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.	

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	
		46		2	
Front RH	E125	34	E117	1	
		33		2	Yes
Rear LH	E120	36	C11	1	165
Rear LH		37		2	
Rear RH		43	C10	1	
		42		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Instal-</u><u>lation"</u>.

NO >> Repair the circuit.

Component Inspection

INFOID:000000005714365

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 normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-92. "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005714366

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

		er to the A	BS actuator and el	ectric unit (control u	unit).		В
DTC LC	IECTION I	_OGIC				INFOID:000000005280949	С
DTC	Disp	ay item	Malfu	unction detected condition	วท	Possible cause	
C1109	BATTERY VO [ABNORMAL			tuator and electric unit (age is lower than norma		 Harness or connector ABS actuator and electric unit (control unit) 	D
DTC CO	NFIRMATI	ON PROC	EDURE				Е
1. CHEC	K SELF-DIA	AGNOSIS F	RESULTS				
Check the	e self-diagno	osis results					BRC
		Self-diagnos	sis results				
	BATT		GE [ABNORMAL]				G
ls above			iagnosis display?				
YES :		to diagnos	•	r to <u>BRC-95, "Diagr</u>	nosis Proced	lure".	Н
Diagnos	sis Proce	uule				INFOID:000000005280950	
1.conn	IECTOR IN	SPECTION					J
	ignition swit		nd electric unit (cor	ntrol unit) connector			
3. Chec	k terminals	for deformation				malfunction is found, repair	K
			then perform the	self-diagnosis. Re	fer to <u>BRC-</u>	85. "CONSULT-III Function	
Is any item indicated on the self-diagnosis display?				L			
	>> GO TO 2				aannaatar		
•				s. Repair or replace		R SUPPLY CIRCUIT AND	M
						IN SOLLEL CINCOLLAND	
1. Turn	ignition swit						Ν
2. Disco tor.	onnect ABS	actuator a	nd electric unit (co	ntrol unit) connec-	T.S.	(LOFF)	1.4
3. Chec				ectric unit (control			
unit)	connector E	125 termin	al 8 and ground.				0
	ator and elec-						
tric unit (Connecto	(control unit) r Terminal	—	Condition	Voltage			Ρ
			Ignition switch: ON	Battery voltage			
E125	8	Ground	Ignition switch: OFF	Approx. 0V		AWFIA0189ZZ	

C1109 POWER AND GROUND SYSTEM

Description

I

INFOID:000000005280948

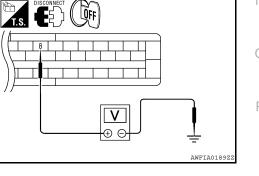
2010 Xterra GCC

4. Turn ignition switch OFF.

[VDC/TCS/ABS]

I

ABS actuator and elec- tric unit (control unit)		_	Condition	Voltage	
Connector	Terminal				
F125	8	8	Ground	Ignition switch: ON	Battery voltage
L120		Ground	Ignition switch: OFF	Approx. 0V	



А

C1109 POWER AND GROUND SYSTEM

Continuity

Yes

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit (control unit)

Connector

E125

5. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

16 47 16,47 16,47 ΓΩ 	
	AWFIA0016ZZ

Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
- NO >> Repair or replace malfunctioning components.

Special Repair Requirement

INFOID:000000005714367

[VDC/TCS/ABS]

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Ground

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL **POSITION : Description".**

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-70, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

Terminal

16, 47

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < COMPONENT DIAGNOSIS > [VDC/TCS/ABS]

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

DTC Logic

INFOID:000000005280952

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	TECTION 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 un
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	(control unit)
DTC CC	NFIRMATION PROCE	DURE	
1. CHEC	CK SELF-DIAGNOSIS RE	ESULTS	
Check th	e self-diagnosis results.		
	Self-diagnosis		
	CONTROLLER		
	VARIANT CC		
	displayed on the self-dia		
YES NO	>> Proceed to diagnosis >> Inspection End	procedure. Refer to <u>BRC-97, "Diagnosis Proced</u>	<u>ure"</u> .
	sis Procedure		
Diagno			INFOID:0000000528095
1.REPL	ACE ABS ACTUATOR A	ND ELECTRIC UNIT (CONTROL UNIT)	
	>> Replace ABS actuato tion".	or and electric unit (control unit). Refer to <u>BRC</u>	166, "Removal and Installa
Specia	I Repair Requireme	nt	INFOID:00000000571436
		ANGLE SENSOR NEUTRAL POSITION	
		adjustment for the steering angle sensor when er to <u>BRC-69, "ADJUSTMENT OF STEERING A</u>	
	N : Description".	end <u>BRC-03. ADJOSTMENT OF STEERING A</u>	NGLL SLNSOK NLOTKA
	>> GO TO 2		
2.CALIE	BRATION OF DECEL G	SENSOR	
Alwavs p	perform calibration of dec	el G sensor when replacing the ABS actuator ar	d electric unit (control unit)
		OF DECEL G SENSOR : Description"	
	>> END		

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

INFOID:000000005280955

[VDC/TCS/ABS]

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

INFOID:000000005280956

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

PUMP MOTOR

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280957

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminals.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-85</u>, "CONSULT-III Function (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between the ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installation"</u>.
- NO >> Repair or replace malfunctioning components.

Component Inspection

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	On	On

Is the inspection result normal?

YES >> Inspection End

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

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

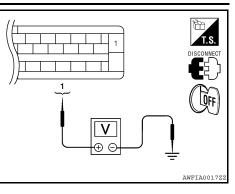
Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, "CALIBRATION OF DECEL G SENSOR : <u>Description</u>".

>> END

BRC-99

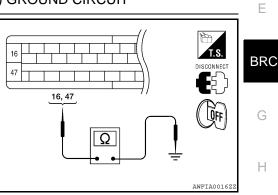


[VDC/TCS/ABS]

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INFOID:000000005280958

INFOID:000000005714369

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

< COMPONENT DIAGNOSIS >

C1113, C1145, C1146 YAW RATE/SIDE/DECEL 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:000000005280961

INFOID:000000005280960

[VDC/TCS/ABS]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G-SENSOR	Longitudinal G-sensor is malfunctioning, or signal line of longitudinal G-sensor is open or shorted.	Harness or connector
C1145	YAW RATE SENSOR	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	ABS actuator and electric unit (control unit)
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	Yaw rate/side/decel G sensor

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-100, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280962

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. when VDC function is OFF may cause the yaw rate/side/decel G sensor system to indicate a malfunction. This is not a malfunction if normal operation can be resumed after restarting the engine.
- If vehicle is on turn table at entrance to parking garage, or on other moving surface, VDC OFF indicator lamp may illuminate and CONSULT-III 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.

1.CONNECTOR INSPECTION

- 1. Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

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

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

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit

(control unit)

Terminal

18

19

22

29

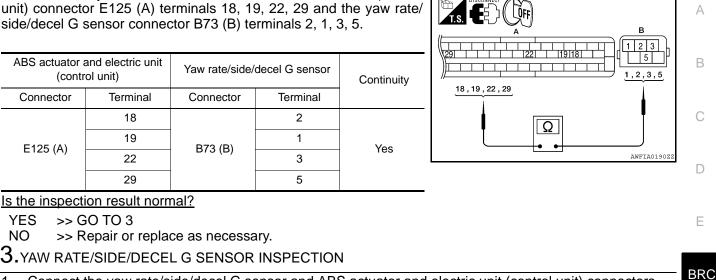
Connector

E125 (A)

YES

NO

Check continuity between the ABS actuator and electric unit (control unit) connector E125 (A) terminals 18, 19, 22, 29 and the yaw rate/ side/decel G sensor connector B73 (B) terminals 2, 1, 3, 5.



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 BRC-101, "Component Inspection".

Is the inspection result normal?

>> GO TO 3

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-166</u>, "Removal and Installation".

Component Inspection

1. CHECK DATA MONITOR

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

Vehicle condition	YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	DECEL G-SEN (DATA MONITOR)
Stopped	-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.11 G to +0.11 G
Turning right	Negative value	Negative value	-
Turning left	Positive value	Positive value	-
Speed up	-	-	Negative value
Speed down	-	-	Positive value

Is the inspection result normal?

YES >> Inspection End

>> Go to diagnosis procedure. Refer to <u>BRC-100, "Diagnosis Procedure"</u>. NO

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-70, "CALIBRATION OF DECEL G SENSOR : Description".

BRC-101

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INFOID:000000005280963

[VDC/TCS/ABS]

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INFOID:000000005714370

>> Replace the yaw rate/side/decel G sensor. Refer to BRC-169, "Removal and Installation". NO

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR < COMPONENT DIAGNOSIS > [VDC/TCS/ABS]

>> END

< COMPONENT DIAGNOSIS >

C1115 WHEEL SENSOR

Description

INFOID:000000005280965

	ogic		INFOID:00000005280966	
				С
DTC	Display item	Malfunction detected condition	Possible cause	D
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit) 	E
DTC CO	ONFIRMATION PROCE	DURE		
1. CHE	CK SELF-DIAGNOSIS RE	SULTS		BR
Check th	ne self-diagnosis results.			
				G
	Self-diagnosis			
	ABS SENSOR [ABNOF	~		Н
	displayed on the self-diag			П
YES NO	>> Proceed to diagnosis >> Inspection End	procedure. Refer to <u>BRC-103, "Diagnosis Pro</u>	<u>cedure"</u> .	
	sis Procedure		INFOID:000000005714371	
Blagin			INFOID.00000003714371	
Regardi <u>VDC"</u> .	ng Wiring Diagram inform	ation, refer to <u>BRC-142, "Wiring Diagram - B</u>	RAKE CONTROL SYSTEM -	J
				K
CAUTIC				K
Do not	check between wheel se	nsor terminals.		K
Do not of 1.CON	check between wheel set NECTOR INSPECTION			K
Do not 1.CON 1. Disc	check between wheel set NECTOR INSPECTION connect the ABS actuator a	nsor terminals. and electric unit (control unit) connector and w	heel sensor of malfunctioning	K
Do not 1.CON 1. Disc cod	check between wheel set NECTOR INSPECTION connect the ABS actuator a		heel sensor of malfunctioning	K L M
Do not 1.CON 1. Disc cod 2. Che	check between wheel set NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal?	and electric unit (control unit) connector and w	heel sensor of malfunctioning	L
Do not (1.CON 1. Disc cod 2. Che Is the intervence YES	check between wheel set NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal? >> GO TO 2	and electric unit (control unit) connector and w nation, disconnection, looseness or damage.	heel sensor of malfunctioning	L
Do not of 1.CON 1. Disc cod 2. Che Is the in YES NO	check between wheel set NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal? >> GO TO 2 >> Repair or replace as n	and electric unit (control unit) connector and w nation, disconnection, looseness or damage. ecessary.	heel sensor of malfunctioning	L
Do not of 1.CON 1. Disc cod 2. Che Is the in YES NO 2.CHE	check between wheel set NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform <u>spection result normal?</u> >> GO TO 2 >> Repair or replace as n CK WHEEL SENSOR OU	and electric unit (control unit) connector and w nation, disconnection, looseness or damage. ecessary. TPUT SIGNAL		L
Do not of 1.CON 1. Disc cod 2. Che Is the in YES NO 2.CHE 1. Con	check between wheel ser NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal? >> GO TO 2 >> Repair or replace as n CK WHEEL SENSOR OU ⁻ nect ABS active wheel ser	and electric unit (control unit) connector and w nation, disconnection, looseness or damage. ecessary.		L
Do not a 1.CON 1. Disc cod 2. Che Is the in YES NO 2.CHE 1. Cor 2. Turr NO 1. Cor 3. Spir sen	check between wheel ser NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal? >> GO TO 2 >> Repair or replace as n CK WHEEL SENSOR OUT nect ABS active wheel ser on the ABS active wheel FE: green POWER indicator ery in the ABS active wheel of the wheel of the vehicle sor tester. The red SENSO	and electric unit (control unit) connector and w nation, disconnection, looseness or damage. ecessary. FPUT SIGNAL nsor tester (J-45741) to wheel sensor using ap	opropriate adapter. es not illuminate, replace the ator on the ABS active wheel	L M N
Do not a 1.CON 1. Disc cod 2. Che Is the in YES NO 2.CHE 1. Cor 2. Turr NO 1. Cor 3. Spir sen NO	check between wheel ser NECTOR INSPECTION connect the ABS actuator a e. ck the terminals for deform spection result normal? >> GO TO 2 >> Repair or replace as n CK WHEEL SENSOR OUT nect ABS active wheel ser on the ABS active wheel ser on the ABS active wheel TE: green POWER indicator ery in the ABS active wheel of the wheel of the vehicle sor tester. The red SENSOR TE: e red SENSOR indicator	and electric unit (control unit) connector and w nation, disconnection, looseness or damage. ecessary. TPUT SIGNAL nsor tester (J-45741) to wheel sensor using ap sensor tester power switch. should illuminate. If the POWER indicator do el sensor tester before proceeding. by hand and observe the red SENSOR indic	opropriate adapter. es not illuminate, replace the ator on the ABS active wheel an output signal.	L M N

>> GO TO 3

YES

А

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

NO >> Replace the wheel sensor. Refer to <u>BRC-164</u>, "Removal and Installation".

3.CHECK TIRES

Check the inflation pressure, wear and size of each tire.

Is the inspection result normal?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5. "On-Vehicle Inspection and Service"</u> (front) or <u>RAX-7.</u> "Rear Axle Bearing" (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-13</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

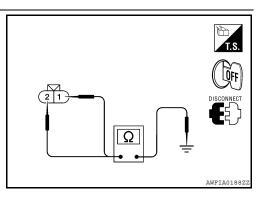
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. 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		45	E18	1	Yes
TIONLET		46		2	
Front RH Rear LH	E125	34	E117	1	
		33		2	
		36		1	
		37		2	
		43	C10	1	
		42	010	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Instal-</u> lation".

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-104

INFOID:000000005714372

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS	>	[100/100/200]
Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
R LH SENSOR	play (±10% or less)	
R RH SENSOR		
the inspection result normal?		
'ES >> Inspection End		
IO >> Go to diagnosis pro	ocedure. Refer to <u>BRC-103, "Diagnosis Pro</u>	<u>ocedure"</u> .
pecial Repair Requirem	ient	INFOID:000000005714373
	NG ANGLE SENSOR NEUTRAL POSITIO	
	n adjustment for the steering angle senso Refer to <u>BRC-69, "ADJUSTMENT OF STEE</u>	
DSITION : Description".	Side to an and the second s	
>> GO TO 2		
CALIBRATION OF DECEL O	SENSOR	
vays perform calibration of de	ecel G sensor when replacing the ABS ac	tuator and electric unit (control unit).
	ON OF DECEL G SENSOR : Description".	
>> END		

C1116 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).

DTC Logic

INFOID:000000005280971

INFOID:000000005280970

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

STOP LAMP SW

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280972

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

1.CONNECTOR INSPECTION

1. Disconnect the ABS actuator and electric unit (control unit) connector and stop lamp switch connector.

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

Is the inspection result normal?

- YES >> GO TO 2
- NO >> Repair or replace as necessary.

2.STOP LAMP SWITCH INSPECTION

- 1. Connect the stop lamp switch connector.
- 2. Check the voltage between the ABS actuator and electric unit (control unit) connector E125 terminal 39 and ground.

Brake pedal depressed

Brake pedal released

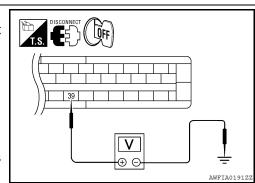
: Battery voltage (approx. 12V)

: Approx. 0V

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166</u>, "<u>Removal and Installation</u>".
- NO >> GO TO 3

3. STOP LAMP SWITCH CIRCUIT INSPECTION



C1116 STOP LAMP SWITCH

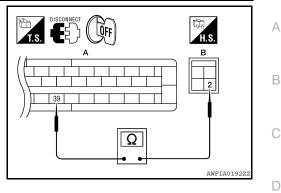
< COMPONENT DIAGNOSIS >

Check the continuity between the ABS actuator and electric unit (control unit) connector E125 (A) terminal 39 and stop lamp switch connector E38 (B) terminal 2.

Continuity should exist.

Is the inspection result normal?

- YES >> Refer to EXL-4, "Work Flow".
- NO >> Repair or replace malfunctioning components.



Special Repair Requirement

INFOID:000000005714374

[VDC/TCS/ABS]

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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< COMPONENT 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:000000005280975

INFOID:000000005280974

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-108</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280976

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

1.CHECK CONNECTOR

- 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 connectors and then perform the self-diagnosis. Refer to <u>BRC-85</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

- YES >> GO TO 2
- NO >> Poor connection of connector terminals. Repair or replace connector.

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

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ABS actuator and electric unit (control unit)		Voltage	
Connector	Terminal		vollage	
E125	32	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

 $\mathbf{3.}$ check solenoid, vdc switch-over valve and actuator relay ground circuit

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installation"</u>.
- NO >> Repair or replace malfunctioning components.

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.

Operation		ABS solenoid valve			
		Up	Keep	Down	
	FR RH IN SOL	Off	On	On	
FR RH SOL	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On	On	_
	FR LH OUT SOL	Off	Off	On*	-
RR RH SOL	RR RH IN SOL	Off	On	On	
	RR RH OUT SOL	Off	Off	On*	
RR LH SOL	RR LH IN SOL	Off	On	On	
	RR LH OUT SOL	Off	Off	On*	

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-108, "Diagnosis Procedure"</u>.

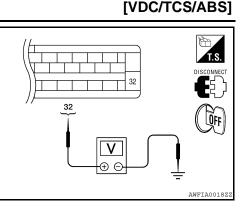
Special Repair Requirement

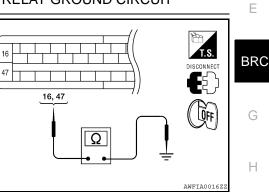
1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

BRC-109

INFOID:000000005714384





INFOID:000000005280977

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< COMPONENT DIAGNOSIS >

>> GO TO 2

 $2. {\sf CALIBRATION} \ {\sf OF} \ {\sf DECEL} \ {\sf G} \ {\sf SENSOR}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT 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:000000005280980

INFOID:000000005280979

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INFOID:000000005714375

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	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 (control unit)	E
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.		BRC
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-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-111, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

Regarding Wiring Diagram information,	refer to	BRC-142,	"Wiring Dia	<u>gram - BRAKE</u>	CONTROL	<u>SYSTEM -</u>	B /
<u>VDC"</u> .			-	-			IVI

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-85</u>, <u>"CONSULT-III Function</u> (<u>ABS)"</u>.

Is any item indicated on the self-diagnosis display?

- YES >> GO TO 2
- NO >> Poor connection of connector terminals. Repair or replace connector.

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

[VDC/TCS/ABS]

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ctric unit (control unit)	c unit (control unit) Voltage		
Connector	Terminal		vollage	
E125	32	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

 ${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installation"</u>.
- NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK ACTIVE TEST

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

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	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-111, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005714377

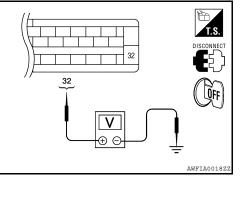
INFOID:000000005714376

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

BRC-112

[VDC/TCS/ABS]



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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

>> GO TO 2	А
2.CALIBRATION OF DECEL G SENSOR	
Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u> , "CALIBRATION OF DECEL G SENSOR : Description".	В
>> END	С
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C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT 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:000000005280985

INFOID:000000005280984

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause			
C1130	ENGINE SIGNAL 1	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.				
C1131	ENGINE SIGNAL 2		 Harness or connector ABS actuator and electric unit 			
C1132	ENGINE SIGNAL 3		unit (control unit) judges that engine fuel cut system is (control	(control unit)		
C1133	ENGINE SIGNAL 4		 ECM CAN communication line 			
C1136	ENGINE SIGNAL 6					

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-114, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005280986

1.CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to <u>EC-48. "CONSULT-III Function (ENGINE)"</u>.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-85. "CONSULT-III Func-</u> tion (ABS)".

Is any item indicated on the self-diagnosis display?

- YES >> Repair or replace the affected part.
- NO >> Inspection End

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

C1140 ACTUATOR RLY

Description

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

DTC Logic

INFOID:000000005280989

INFOID:000000005280988

DTC DETECTION LOGIC

DTC	Displa	ly item	Malfunct	on detected conditic	n	Possible cause	D
C1140	ACTUATOR R	LY AB	S actuator relay or	circuit malfunction.		 Harness or connector ABS actuator and electric unit (control unit) 	E
DTC CC	ONFIRMATIC	ON PROCEDUR	RE				
1. CHEC	CK SELF-DIA	GNOSIS RESUL	TS				BR
Check th	e self-diagnos	sis results.					
		Self-diagnosis result	ts				G
		ACTUATOR RLY					
Is above	displayed on	the self-diagnos	is display?				
YES	>> Proceed to	o diagnosis proc		BRC-115, "Diag	<u>inosis Proce</u>	<u>dure"</u> .	F
	>> Inspection						
Diagno	sis Proced	lure				INFOID:000000005714378	
•	ng Wiring Dia	gram informatior	n, refer to <u>BRC</u>	-142, "Wiring Dia	agram - BR/	AKE CONTROL SYSTEM -	,
<u>VDC"</u> .							
1 OUE							k
2. Disc		actuator and elec					l
	ck terminals for place termina		disconnection, I	ooseness, and s	so on. If any	malfunction is found, repair	-
4. Reco	onnect conne		perform the se	lf-diagnosis. Re	fer to <u>BRC-</u>	85, "CONSULT-III Function	
(ABS)		on the self-diagno	acia diaplav2				N
	>> GO TO 2	n the sen-diagno	<u>USIS UISpiay :</u>				
-		nection of connect	ctor terminals. F	Repair or replace	e connector.		Ν
2.CHEC	CK SOLENOI	D, VDC SWITCH	I-OVER VALVE	AND ACTUATO	OR RELAY P	OWER SUPPLY CIRCUIT	
	ignition switc		tria unit (acatro		11		C
2. Disc tor.	CONNECT ABS 8	actuator and elec	cure unit (contro	or unit) connec-			
		tween ABS actu		ric unit (control			F
unit)	connector E1	125 terminal 32 a	and ground.		//		1
ABS act	tuator and electri	c unit (control unit)		N. K			
Cor	nnector	Terminal		Voltage			

Is the inspection result normal?

32

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2010 Xterra GCC

E125

BRC-115

Battery voltage

Ground

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С

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

- YES >> GO TO 3
- NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		- Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installation"</u>.

NO >> Repair or replace malfunctioning components.

Component Inspection

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	On	On

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-115, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005714380

INFOID:000000005714379

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

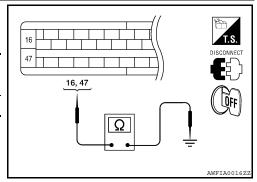
Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END



C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1143, C1144 STEERING ANGLE SENSOR

Description

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

DTC Logic

INFOID:000000005280994

INEOID-000000005280995

INFOID:000000005280993

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DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

ST ANG SEN CIRCUIT ST ANG SEN SIGNAL

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

Regarding Wiring Diagram information, refer to BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -<u>VDC"</u>.

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) and steering angle sensor connectors.
- Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair 3. Μ or replace terminals. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-85, "CONSULT-III Function</u>
- (ABS)". Ν
- Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK STEERING ANGLE SENSOR HARNESS

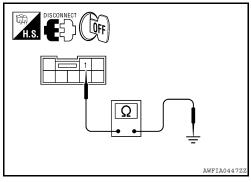
[VDC/TCS/ABS]

C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

Steering angle sensor

- 1. Turn ignition switch OFF.
- 2. Disconnect steering angle sensor connector.
- 3. Check continuity between steering angle sensor connector M47 terminal 1 and ground.



[VDC/TCS/ABS]

Gleening a	ligie serieel	— Continuity	
Connector	Terminal		Continuity
M47	1	Ground	Yes

- 4. Turn ignition switch ON.
- 5. Check voltage between steering angle sensor connector M47 terminal 2 and ground.

H.S. DISCONNECT	
	_
	<u> </u>
	AWFIA0448ZZ

Steering a	ngle sensor	Voltage		
Connector	Terminal		voltage	
M47	2	Ground	Battery voltage	
		•		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3. CHECK DATA MONITOR

1. Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.

Perform the steering angle sensor component inspection. Refer to <u>BRC-118, "Component Inspection"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166. "Removal and Installa-</u> tion".
- NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to <u>BRC-168. "Removal and Installation"</u>.

Component Inspection

INFOID:000000005280996

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	0±2.5 °	
Turn 90 ° to left	Approx. +90 °	
Turn 90 ° to right	Approx. –90 °	

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-117, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005714381

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

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< COMPONENT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

Description

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

DTC Logic

INFOID:000000005280999

INFOID:000000005280998

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.	Harness or connectorBrake fluid level switchBrake fluid level

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005281000

Regarding Wiring Diagram information, refer to <u>BRC-142</u>, "Wiring Diagram - <u>BRAKE CONTROL SYSTEM -</u> <u>VDC</u>".

1.CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) and brake fluid level switch connectors.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

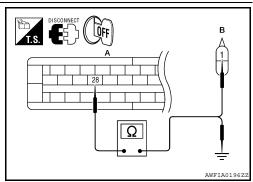
NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

1. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) Terminal 28 and brake fluid level switch connector E21 (B) terminal 1.

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	28	E21 (B)	1	Yes

 Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) Terminal 28 and ground.



C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit (control unit) Continuity Connector Terminal E125 (A) 28 No Ground

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${\it 3.}$ check brake fluid level switch ground

Check continuity between brake fluid level switch connector E21 terminal 2 and ground.

Brake fluid	vel switch		Continuity	
Connector	Terminal		Continuity	
E21	2	Ground	Yes	

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4.CHECK BRAKE FLUID LEVEL SWITCH

Perform the brake fluid level switch component inspection. Refer to BRC-121, "Component Inspection". Is the inspection result normal?

- >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit YES (control unit). Refer to BRC-166, "Removal and Installation".
- NO >> Replace brake fluid level switch.

Component Inspection

1.CHECK BRAKE FLUID LEVEL SWITCH

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

Brake fluid level switch terminals	Condition	Continuity
1 – 2	Brake fluid reservoir is full.	No
1 – 2	Brake fluid reservoir is empty.	Yes

Is the inspection result normal?

YES >> Inspection End

NO >> Replace brake fluid level switch.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL **POSITION : Description".**

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-70, "CALIBRATION OF DECEL G SENSOR : Description".

BRC-121

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[VDC/TCS/ABS]

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INFOID:000000005281001

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< COMPONENT DIAGNOSIS >

>> END

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:000000005281004

INFOID:000000005281003

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).	 Harness or connector CAN communication line Steering angle sensor ABS actuator and electric unit (control unit)
DTC CC	ONFIRMATION PROCE	DURE	
1. CHEC	CK SELF-DIAGNOSIS RE	ESULTS	
Check th	ne self-diagnosis results.		
	Self-diagnosis		
<u> </u>	ST ANG SEN C		
	displayed on the self-dia		o du ro "
YES NO	>> Inspection End	procedure. Refer to <u>BRC-123</u> , "Diagnosis Proce	edure.
Diagno	sis Procedure		INFOID:000000005281005
	CK CONNECTOR		
1. Turn	ignition switch OFF.		
2. Disc	onnect ABS actuator and	electric unit (control unit) connector.	
	ck terminals for deformat place terminals.	ion, disconnection, looseness, and so on. If any	malfunction is found, repair
		form self-diagnosis. Refer to <u>BRC-85, "CONSU</u>	LT-III Function (ABS)".
	Self-diagnosis		
	CAN COMM C		
	ST ANG SEN C		
	displayed on the self-dia		
YES NO	>> Refer to LAN-14, "Tro	uble Diagnosis Flow Chart".	

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< COMPONENT DIAGNOSIS >

C1160 DECEL G SEN SET

Description

INFOID:000000005281006

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:000000005281007

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1160	DECEL G SEN SET	ABS decel G sensor adjustment is incomplete.	 Decel G sensor calibration Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

DECEL G SEN SET

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005281008

1.PERFORM SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-85, "CONSULT-III Function</u> (ABS)".

Self-diagnosis results

DECEL G SEN SET

Do self-diagnosis results indicate anything other than shown above?

- YES >> Perform repair or replacement for the item indicated.
- NO >> Perform calibration of decel G sensor. Refer to <u>BRC-70, "CALIBRATION OF DECEL G SENSOR</u> <u>: Description"</u>. GO TO 2

2. PERFORM SELF-DIAGNOSIS AGAIN

- Turn the ignition switch to OFF and then to ON and erase self-diagnosis results. Refer to <u>BRC-85, "CON-SULT-III Function (ABS)"</u>.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis again. Refer to <u>BRC-85. "CONSULT-III</u> <u>Function (ABS)"</u>.

Are any self-diagnosis results displayed?

- YES >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-169</u>, "Removal and Installation".
- NO >> Inspection End

< COMPONENT DIAGNOSIS >

C1163 ST ANGLE SEN SAFE

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:000000005281010

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position
отс сс	NFIRMATION PROCE	EDURE	
1.снес	CK SELF-DIAGNOSIS RI	ESULTS	
Check th	e self-diagnosis results.		
	Self-diagnosis		
	ST ANGL SE		
	displayed on the self-dia		
	>> Proceed to diagnosis >> Inspection End	procedure. Refer to <u>BRC-125, "Diagnosis Pi</u>	rocedure".
	sis Procedure		
			INFOID:00000005281011
1. ADJU	STMENT OF STEERING	G ANGLE SENSOR NEUTRAL POSITION	
		ral position. Refer to <u>BRC-69, "ADJUSTMEN</u>	T OF STEERING ANGLE SEN-
<u>SOR NE</u>	UTRAL POSITION : Des	<u>cription</u> .	
	>> GO TO 2		
	ATOR LAMP CHECK		
	at VDC OFF indicator la	mp is off.	
	DFF indicator lamp off?		
	>> Inspection End		
NO	>> Perform ABS actuato <u>III Function (ABS)"</u> .	r and electric unit (control unit) self-diagnosis	B. Refer to <u>BRC-85, "CONSULT-</u>

INFOID:000000005281009

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C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description

CV1, CV2 (CUT VALVE) The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

SV1, SV2 (SUCTION VALVE)

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

DTC Logic

INFOID:000000005281013

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1165	CV2	VDC switch-over solenoid valve (CV2) 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
C1166	SV1	VDC switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)
C1167	SV2	VDC switch-over solenoid valve (SV2) 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-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000005714383

Regarding Wiring Diagram information, refer to <u>BRC-142, "Wiring Diagram - BRAKE CONTROL SYSTEM -</u> <u>VDC"</u>.

1.CHECK CONNECTOR

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 connectors and then perform the self-diagnosis. Refer to <u>BRC-85</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

INFOID:000000005281012

C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

YES >> GO TO 2

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

2. Check solenoid, VDC switch-over valve and actuator relay power supply circuit

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E125 32		Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

 ${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166. "Removal and Installation"</u>.

NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK ACTIVE TEST

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

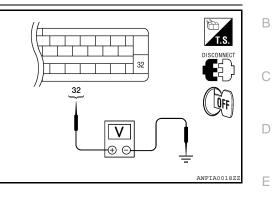
Operation		A	BS solenoid valve (A	ACT)
U	Deration	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLENOID (ACT)	FR RH OUT SOL	Off	Off	Off
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLENOID (ACT)	FR LH OUT SOL	Off	Off	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLENOID (ACT)	RR RH OUT SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off

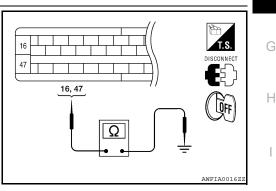
*: ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-126, "Diagnosis Procedure"</u>.





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C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Special Repair Requirement

INFOID:000000005714385

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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:000000005281018

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	Е
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	 CAN communication line ABS actuator and electric unit (control unit) 	BRC
Diagno	sis Procedure		INFOID:000000005281019	
1.снес	CK CONNECTOR			G
 Disc Che or re 	ck the terminals for defo eplace the terminals.	or and electric unit (control unit) connector. ormation, disconnection, looseness, and so on. If t	· ·	Η

4. Reconnect connector and perform self-diagnosis. Refer to BRC-85, "CONSULT-III Function (ABS)".

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

- YES >> Print out the self-diagnostic results, and refer to <u>LAN-14</u>, "Trouble Diagnosis Flow Chart".
- NO >> Connector terminal is loose, damaged, open, or shorted.

Revision: September 2009

INFOID:000000005281017



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VDC OFF SWITCH

< COMPONENT 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

1.CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-130, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005281023

Regarding Wiring Diagram information, refer to <u>BRC-142</u>, "Wiring Diagram - <u>BRAKE CONTROL SYSTEM -</u> <u>VDC</u>".

1.CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to <u>BRC-131, "Component Inspection"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connector.
- Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and VDC OFF switch connector M154 (B) terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	6	M154 (B)	1	Yes

 Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125 (A)	6	Ground	No

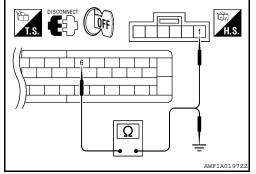
Is the inspection result normal?

YES >> GO TO 3

Revision: September 2009

NO >> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND



INFOID:000000005281021

INFOID:000000005281022

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

Check continuity between VDC OFF switch connector M154 terminal 2 and ground.

VDC OF	FF switch		Continuity
Connector	Terminal		Continuity
M154	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-21, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installa-</u> tion".

NO >> Replace combination meter. Refer to <u>MWI-86, "Removal and Installation"</u>.

Component Inspection

1.CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check continuity between VDC OFF switch 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 neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

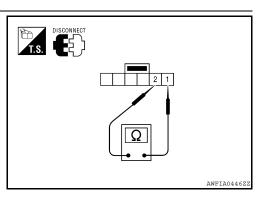
>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END





[VDC/TCS/ABS]

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INFOID:000000005714386

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ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000005281025

[VDC/TCS/ABS]

×: 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.	×

Component Function Check

INFOID:000000005281026

1.CHECK ABS WARNING 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-132, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005281027

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-85. "CONSULT-III 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-21, "Diagnosis Descrip-</u>tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-86, "Removal and Installation"</u>.

Special Repair Requirement

INFOID:000000005714387

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description	
Description	INF0/D:00000005281028
	×: 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 op (when brake fluid is insufficient).	peration (when switch is ON) or of brake fluid level switch operation
• 2: After starting engine, brake warning lamp is turned off.	
Component Function Check	INFOID:00000005281029
1. BRAKE WARNING LAMP OPERATION CHECK	
Check that the lamp illuminates after the ignition sy started.	witch is turned ON, and turns OFF after the engine is
Is the inspection result normal?	
YES >> Inspection End	
NO >> Go to diagnosis procedure. Refer to <u>BRC</u>	-133, "Diagnosis Procedure".
Diagnosis Procedure	INF0ID:000000005281030
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) s (ABS)".	self-diagnosis. Refer to <u>BRC-85, "CONSULT-III Function</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 r tion".	meter are normal. Refer to MWI-21, "Diagnosis Descrip-
Is the inspection result normal?	
· ·	control unit). Refer to BRC-166, "Removal and Installa-
tion".	
NO >> Replace combination meter. Refer to <u>MW</u>	I-86, "Removal and Installation".
Special Repair Requirement	INFOID:00000005714388
1.ADJUSTMENT OF STEERING ANGLE SENSOR	NEUTRAL POSITION
	steering angle sensor when replacing the ABS actuator USTMENT OF STEERING ANGLE SENSOR NEUTRAL
>> GO TO 2	
2.CALIBRATION OF DECEL G SENSOR	
	eplacing the ABS actuator and electric unit (control unit).

Refer to <u>BRC-70, "CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000005281031

[VDC/TCS/ABS]

 $\times: ON -: OFF$

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:000000005281032

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-134, "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-134</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000005281033

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-130</u>, "Diagnosis Procedure".

2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-85, "CONSULT-III 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-21, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-86, "Removal and Installation"</u>.

VDC OFF INDICATOR LAMP

Special Repair Requirement

< COMPONENT DIAGNOSIS >

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-69, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). D Refer to BRC-70, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

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[VDC/TCS/ABS]

INFOID:000000005714389

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SLIP INDICATOR LAMP

< COMPONENT DIAGNOSIS >

SLIP INDICATOR LAMP

Description

INFOID:000000005281034

INFOID:000000005281035

INFOID:000000005281036

[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-136. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-85, "CONSULT-III 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-21</u>, "<u>Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166, "Removal and Installa-</u> tion".

NO >> Replace combination meter. Refer to <u>MWI-86, "Removal and Installation"</u>.

Special Repair Requirement

INFOID:000000005714390

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-69. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u> <u>POSITION : Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-70</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

< ECU DIAGNOSIS >

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000005281037 В

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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
		0 [km/h (MPH)]	Vehicle stopped
R LH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
R RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
JECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
FR RH IN SOL Ope	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	Operation status of each calencid using	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR LH IN SOL Operation st	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
RR RH IN SOL		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR RH OUT SOL		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
KK LH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
RR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
EBD WARN LAMP	EBD warning lamp (Note 3)	When EBD warning lamp is ON	ON
		When EBD warning lamp is OFF	OFF
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	ON
STOI LANI SW		When brake pedal is released	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
	(Note 2)	When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON
	(Note 2)	When VDC OFF indicator lamp is OFF	OFF
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
	(Note 2)	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
		1st gear	1
GEAR	Gear position determined by TCM	2nd gear 3rd gear	2 3
		4th gear	4
		5th gear	5

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

Data m		Data monitor	onitor	
Monitor item	Display content	Condition	Reference value in normal operation	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome- ter display	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	
TAW RATE SEN	sensor	When vehicle turning	-75 to 75 d/s	
R POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = R position	ON	
R PUSI SIG	condition	A/T shift position = other than R position	OFF	
N POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = N position	ON	
11 5031 316	condition	A/T shift position = other than N position	OFF	
	Transmission range switch signal ON/OFF	A/T shift position = P position	ON	
P POSI SIG	condition	A/T shift position = other than P position	OFF	
CV1	VDC switch-over valve	When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail- safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
CV2	VDC switch-over valve	When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail- safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
SV1	VDC switch-over valve	When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail- safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
SV2	VDC switch-over valve	When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail- safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
2WD/4WD	Drive axle	4WD model	4WD	
ACCEL POS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %	
ACCEL FOS SIG	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

	Display content	Data monitor		
Monitor item		Condition	Reference value in normal operation	
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s ²	
		Vehicle turning right	Negative value (m/s ²)	
		Vehicle turning left	Positive value (m/s ²)	
STR ANGLE SIG	Steering angle detected by steering angle	Straight-ahead	Approx. 0±2.5°	
STR ANGLE SIG	sensor	Steering wheel turned	-720 to 720°	
DDESS SENSOD	Brake fluid pressure detected by front pres-	With ignition switch turned ON and brake pedal released	Approx. 0 bar	
PRESS SENSOR	sure sensor	With ignition switch turned ON and brake pedal depressed	-40 to 300 bar	
EBD SIGNAL	EBD operation	EBD is active	ON	
EDD SIGNAL		EBD is inactive	OFF	
ABS SIGNAL	ABS operation	ABS is active	ON	
ABS SIGNAL		ABS is inactive	OFF	
TCS SIGNAL	TCS operation	TCS is active	ON	
103 SIGNAL		TCS is inactive	OFF	
VDC SIGNAL	VDC operation	VDC is active	ON	
VDC SIGNAL		VDC is inactive	OFF	
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON	
LDD I AIL OIO		EBD is normal	OFF	
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON	
ADO I AIL OIO	ABS fail-safe signal	ABS is normal	OFF	
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON	
TOO TAIL DIO		TCS is normal	OFF	
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON	
	VDC fail-safe signal	VDC is normal	OFF	
CRANKING SIG	Crank operation	Crank is active	ON	
		Crank is inactive	OFF	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON	
	שומהב ווטוט וביבו שייונהו שוטומו שמנשש	When brake fluid level switch OFF	OFF	

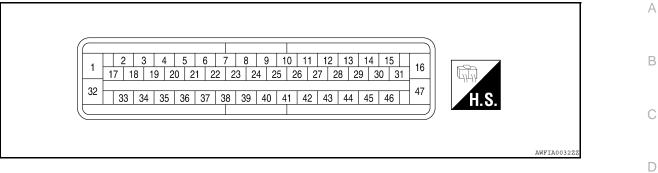
NOTE:

- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to <u>BRC-132, "Description"</u>.
- Brake warning lamp: Refer to BRC-133, "Description".
- VDC OFF indicator lamp: Refer to BRC-134, "Description".
- SLIP indicator lamp: Refer to <u>BRC-136, "Description"</u>.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) OSIS > [VDC/TCS/ABS]

< ECU DIAGNOSIS >

TERMINAL LAYOUT



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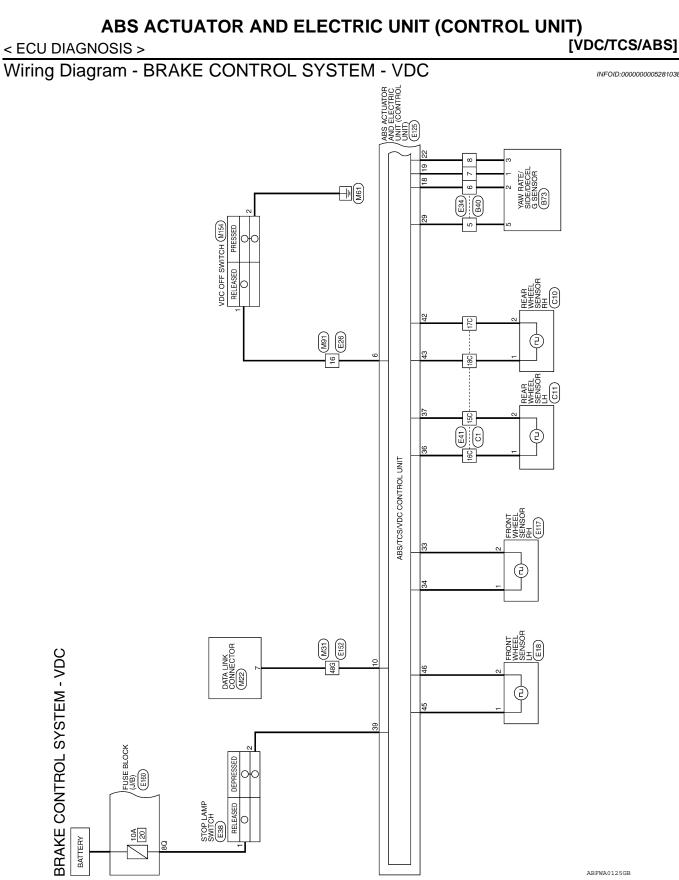
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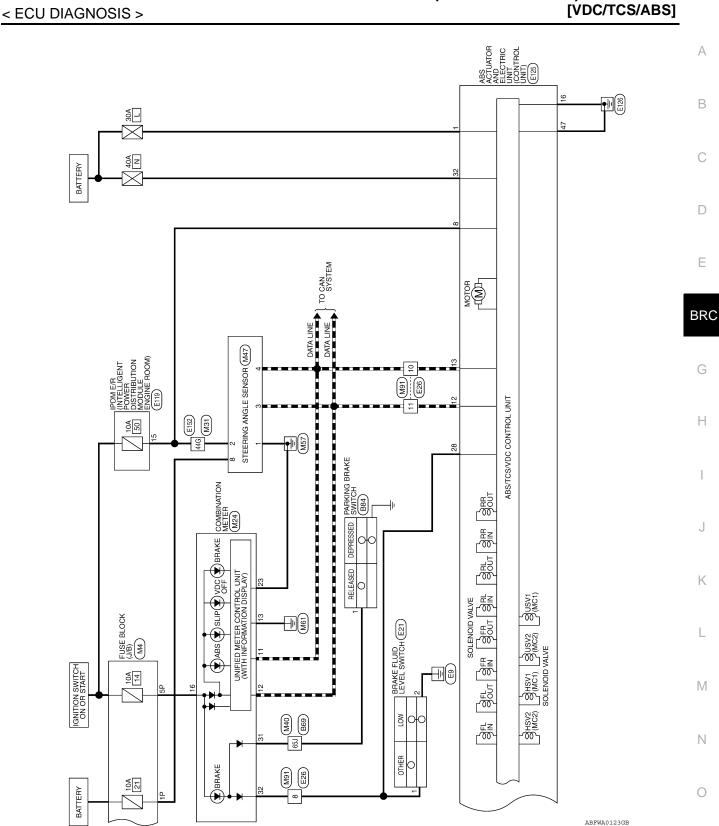
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INFOID:000000005281038



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Revision: September 2009

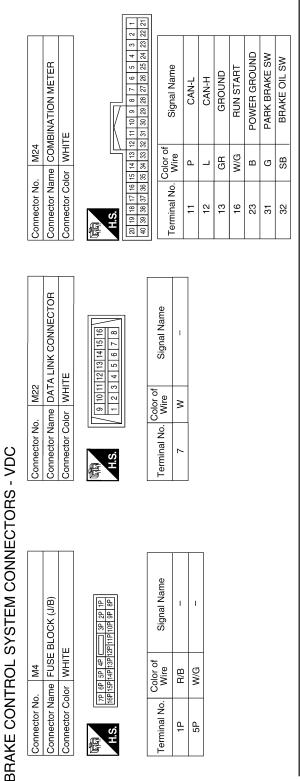
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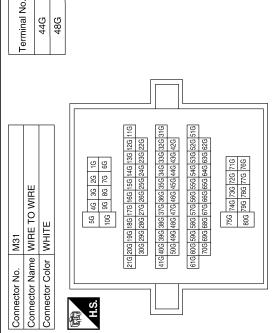
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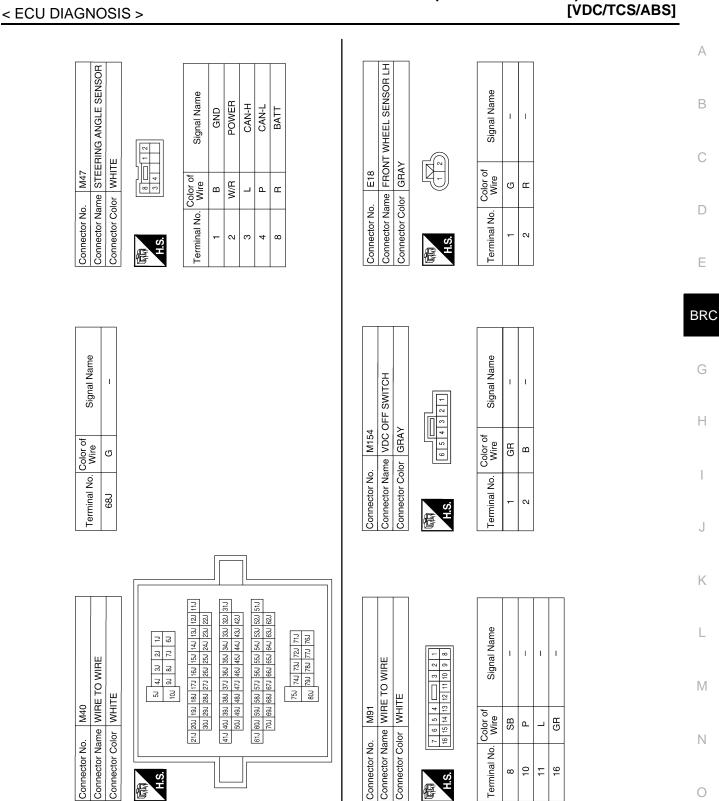
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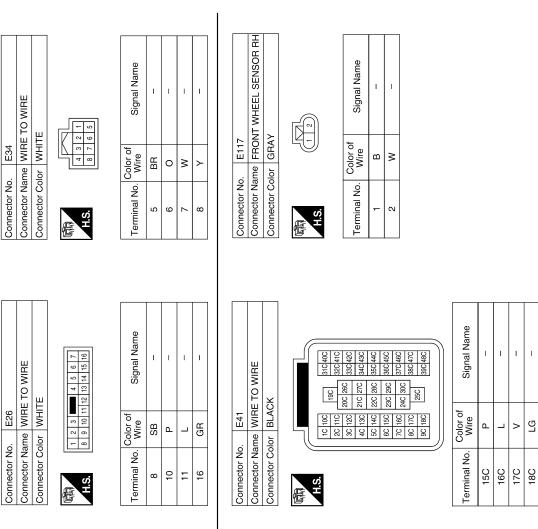
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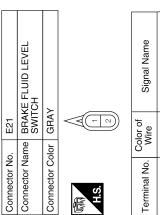
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Revision: September 2009

< ECU DIAGNOSIS >

E34





	Signal Name	I	I	
)	Color of Wire	SB	В	
	Terminal No.	Ţ	2	

Connector No.	E38
Connector Name	Connector Name STOP LAMP SWITCH (WITH A/T)
Connector Color WHITE	WHITE

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Signal Name	1	1	
Color of Wire	R/B	Y	
Terminal No.	Ţ	2	

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[VDC/TCS/ABS]

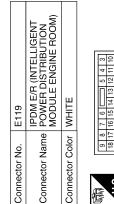
Revision: September 2009

< ECU DIAGNOSIS >

Color of Signal Name	Y CLUS SP	1	1	1	1	1	GR BRAKE LEVEL SW	BR CLUS GND	1	1	۲ KL30 V	W FR-RH SIG	B FR-RH PWR	1	L RR-LH PWR	P RR-LH SIG	1	SB STOP LAMP SW	1	1	V RR-RH SIG	LG RR-RH PWR	I	G FR-LH PWR	R FR-LH SIG	
Terminal No.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	

Connector No.	E125	
Connector Name	Connector Name ELECTRIC UNIT (CONTROL UNIT)	
Connector Color BLACK	BLACK	
団 H.S.		
		$\left(\right)$
1 2 3 4 5 6 17 18 19 20 21	6 7 8 9 10 11 12 13 14 15 1 1 22 23 24 25 26 27 28 29 30 31	16
32 33 34 35 36	7 38 39 40 41 42 43 44 45 46	47
		D,
,		

-	Signal Name	KL30 P	I	I	I	I	VDC OFF SW	I	IGN	I	DIAG K	Ι	CAN-H	CAN-L	Ι	I	GND V	Ι	CAN2-H	CAN2-L	I	I
	Color of Wire	œ	I	I	ı	I	GR	I	W/R	I	SB	I	-	٩	Ι	I	В	I	0	Ν	I	I
	Terminal No.	-	2	в	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21



	Signal Name	ABS IGN SUPPLY
	Color of Wire	W/R
H.S.	Terminal No.	15

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[VDC/TCS/ABS]

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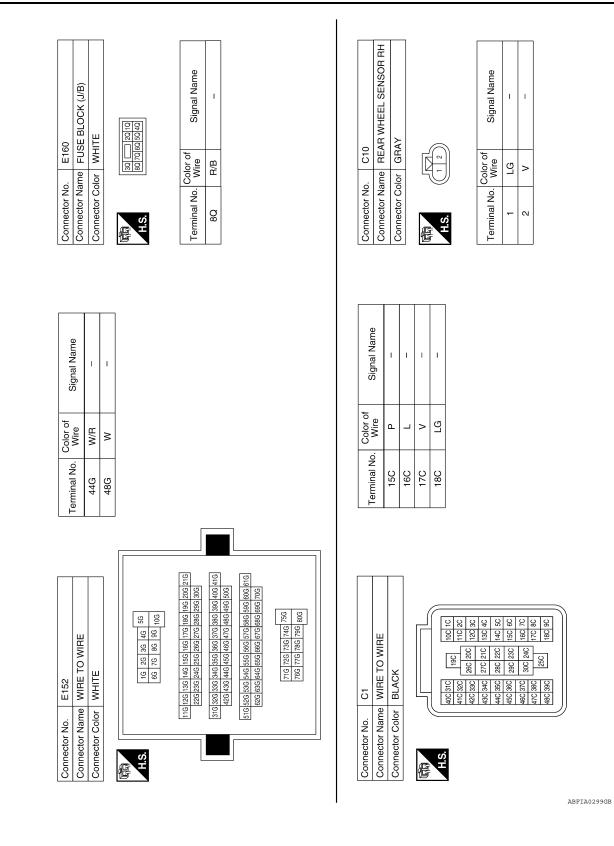
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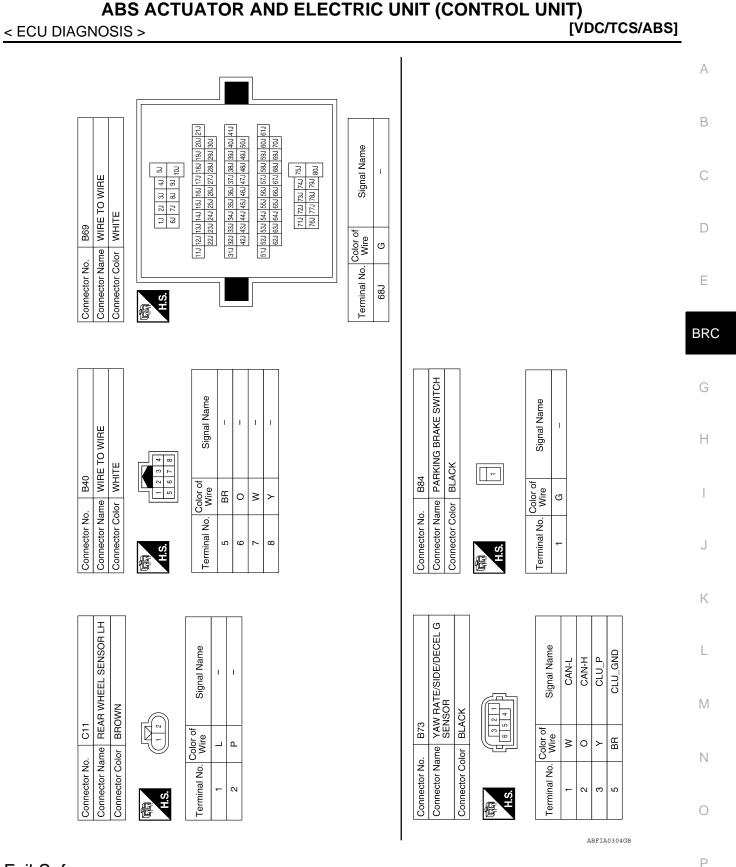
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< ECU DIAGNOSIS >

[VDC/TCS/ABS]





Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS/TCS/VDC system.

ABS/EBD SYSTEM

INFOID:000000005281039

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

In case of an electrical malfunction with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on.

The system will revert to one of the following conditions of the Fail-Safe function.

- 1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS/TCS/VDC system.
- 2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS/TCS/VDC or EBD system.

VDC/TCS SYSTEM

In case of TCS/VDC system malfunction, the VDC OFF indicator lamp and SLIP indicator lamp are turned on and the condition of the vehicle is the same as the condition of vehicles without TCS/VDC system. In case of an electrical malfunction with the TCS/VDC system, the ABS control continues to operate normally without TCS/VDC control.

DTC No. Index

INFOID:000000005281040

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	BRC-89, "Description"
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	BRC-92, "Description"
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-95, "Description"
C1110	CONTROLLER FAILURE	BRC-97, "DTC Logic"
C1111	PUMP MOTOR	BRC-98, "Description"
C1113	G-SENSOR	BRC-100, "Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-103, "Description"
C1116	STOP LAMP SW	BRC-106, "Description"
C1120	FR LH IN ABS SOL	BRC-108, "Description"
C1121	FR LH OUT ABS SOL	BRC-111, "Description"
C1122	FR RH IN ABS SOL	BRC-108, "Description"
C1123	FR RH OUT ABS SOL	BRC-111, "Description"
C1124	RR LH IN ABS SOL	BRC-108, "Description"
C1125	RR LH OUT ABS SOL	BRC-111, "Description"
C1126	RR RH IN ABS SOL	BRC-108, "Description"
C1127	RR RH OUT ABS SOL	BRC-111, "Description"
C1130	ENGINE SIGNAL 1	
C1131	ENGINE SIGNAL 2	
C1132	ENGINE SIGNAL 3	BRC-114, "Description"
C1133	ENGINE SIGNAL 4	
C1136	ENGINE SIGNAL 6	
C1140	ACTUATOR RLY	BRC-115, "Description"
C1143	ST ANG SEN CIRCUIT	
C1144	ST ANG SEN SIGNAL	BRC-117, "Description"

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) OSIS > [VDC/TCS/ABS]

< ECU DIAGNOSIS >

Reference	Items (CONSULT screen terms)	DTC
	YAW RATE SENSOR	C1145
BRC-100, "Description"	SIDE G-SEN CIRCUIT	C1146
BRC-120, "Description"	BR FLUID LEVEL LOW	C1155
BRC-123, "Description"	ST ANG SEN COM CIR	C1156
BRC-124, "Description"	DECEL G SEN SET	C1160
BRC-125, "Description"	ST ANGL SEN SAFE	C1163
	CV1	C1164
PPC 126 "Department	CV2	C1165
BRC-126, "Description"	SV1	C1166
	SV2	C1167
BRC-97, "DTC Logic"	VARIANT CODING	C1170
BRC-129, "Description"	CAN COMM CIRCUIT	U1000

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[VDC/TCS/ABS]

SYMPTOM DIAGNOSIS VDC/TCS/ABS

Symptom Table

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If ABS warning lamp, VDC 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	<u>BRC-153, "Diag-</u> nosis Procedure"
4	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-154, "Diag-
	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-155, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-156, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-157, "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- trol	ТСМ	<u>BRC-158, "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. 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 > [VDC/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-5</u> , " <u>On-Vehicle</u> <u>Inspection and Service</u> ", Rear: <u>RAX-7</u> , " <u>Rear Axle Bearing</u> ".
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 connector connection.
Wheel sensor harness inspection. <u>Is the inspection result normal?</u>
 YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to <u>BRC-164, "Removal and Installation"</u> or <u>BRC-165, "Removal and Installation"</u>. • 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.
<u>Is the ABS warning lamp illuminated?</u> YES >> Perform self-diagnosis. Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u> .
NO $>>$ Normal

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

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[VDC/TCS/ABS]

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-17, "Inspection and Adjustment".

Is the stroke too large?

- YES >> Bleed air from brake tube and hose. Refer to <u>BR-19, "Bleeding Brake System"</u>.
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-17</u>, "<u>Inspection and Adjustment</u>" (brake pedal), <u>BR-11</u>, "<u>On Board</u> <u>Inspection</u>" (master cylinder), <u>BR-9</u>, "<u>Inspection</u>" (brake booster).

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 >> Normal
- 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 >> Normal

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 >> Normal

NO >> Perform self-diagnosis. Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u>.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]
PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS
Diagnosis Procedure
 CAUTION: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal. When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]
1. SYMPTOM CHECK 1
Check that there are pedal vibrations when the engine is started.
Do vibrations occur?
YES >> GO TO 2 NO >> Inspect the brake pedal.
2.SYMPTOM CHECK 2
Check that there are ABS operation noises when the engine is started.
Do the operation noises occur?
YES >> GO TO 3 NO >> Perform self -diagnosis. Refer to <u>BRC-85, "CONSULT-III Function (ABS)"</u> .
3. SYMPTOM CHECK 3
Check symptoms when electrical component (headlamps, etc.) switches are operated.
Do symptoms occur?
YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is
move it farther away. NO >> Normal

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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:000000005281047

[VDC/TCS/ABS]

1.SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

Is the inspection result normal?

YES >> Normal.

NO >> GO TO 2

2.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to <u>BRC-85, "CONSULT-III Func-</u> tion (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 TCM SELF-DIAGNOSIS RESULTS

Perform ECM and TCM self-diagnosis.

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
 - ECM: Refer to EC-48, "CONSULT-III Function (ENGINE)".
 - TCM: Refer to TM-95, "CONSULT-III Function (TRANSMISSION)".
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-166. "Removal and Installa-</u> tion".

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

[VDC/TCS/ABS]

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Symptom	Result	D
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condi	С
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.		D
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.	E
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).	BRO
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal	G
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	road. If the normal con- dition is restored, there is no malfunction. At	Н
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.)	J
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warn- ing lamp turns on.	This is not a VDC sys- tem error but results from characteristic change of tire.	K

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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 for Brake System

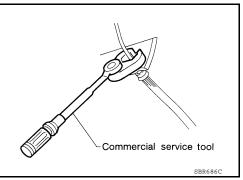
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CAUTION:

- Refer to <u>MA-10, "Fluids and Lubricants"</u> for recommended brake fluid.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to <u>BR-36, "Brake Burnishing"</u> (front disc brake) or <u>BR-41, "Brake Burnishing"</u> (rear disc brake). WARNING:

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



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PRECAUTIONS

Precaution for Brake Control

< PRECAUTION >

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- 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 diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.
- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.
- If the following components are replaced with non-genuine components or modified, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (shock absorbers, struts, springs, bushings, etc.), tires, wheels (exclude specified size), components related to brake system (pads, rotors, calipers, etc.), components related to engine (muffler, ECM, etc.), components related to body reinforcement (roll bar, tower bar, etc.).
- Driving with broken or excessively worn suspension components, tires or brake system components may
 cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not
 operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. This is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. with VDC turned off may cause the yaw rate/side/decel G sensor to indicate a problem. This is not a problem if normal operation can be resumed after restarting the engine.
- If battery is removed or steering angle sensor is disconnected, power to steering angle sensor is lost and the screen goes into steering angle sensor safe mode.
- When screen goes into steering angle sensor safe mode, perform "Adjustment of Steering Angle Sensor Neutral Position" with CONSUT-III and check that VDC OFF indicator turns off. Additionally, perform selfdiagnosis, check that only "Steering Angle Sensor Safe Mode" is shown for self-diagnostic result, and then delete the memory. (If the self-diagnostic result shows an indication other than "Steering Angle Sensor Safe Mode", repair the relevant part and restart self-diagnosis.) The steering angle sensor is released and returns to normal condition by performing the above operation.
- When checking, if only "Steering Angle Sensor Safe Mode" is shown in the self-diagnostic result and VDC OFF indicator is off, delete history of malfunction. This happens when battery power supply is lost and the screen goes into Steering Angle Sensor Safe Mode, and then screen returns to normal mode automatically by driving the vehicle in a straight forward direction [for approximately 30 seconds at 20 km/h (12 MPH) or more] after power is supplied again.

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NOTE:

VDC OFF indicator lamp is on when VDC OFF switch is on.

Precaution for CAN System

- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.

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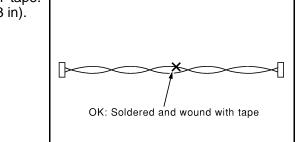
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PRECAUTIONS

< PRECAUTION >

• Area to be repaired must be soldered and wrapped with tape. Make sure that fraying of twisted wire is within 110 mm (4.33 in).



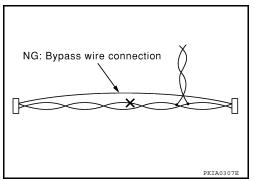


• Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)

Precaution for Procedure without Cowl Top Cover

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

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[VDC/TCS/ABS]

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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
— (J-45741) ABS active wheel sensor tester	HIAOLOLE	Checking operation of ABS active wheel sensors
ST30031000		Removing sensor rotor
(—) Bearing puller		
	ZZAO700D	
Commercial Service To		INFOID:0000000052810
		INFOID:0000000052810
Tool name 1. Flare nut crowfoot		
Commercial Service To Tool name 1. Flare nut crowfoot 2. Torque wrench		Description Removing and installing brake piping
Tool name 1. Flare nut crowfoot		Description Removing and installing brake piping
Tool name 1. Flare nut crowfoot		Description Removing and installing brake piping
Tool name 1. Flare nut crowfoot 2. Torque wrench		Description Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
Tool name 1. Flare nut crowfoot 2. Torque wrench		Description Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)

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[VDC/TCS/ABS]

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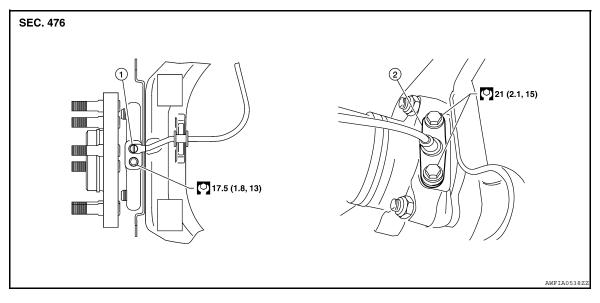
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< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSORS

Removal and Installation

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1. Front wheel sensor

2. Rear wheel sensor (C200)

REMOVAL

- 1. When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to <u>BR-37</u>, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Remove the wheel sensor bolt.
- 3. Pull the wheel sensor straight out, being careful to turn it as little as possible. CAUTION:
 - Be careful not to damage the wheel sensor edge and sensor rotor teeth.
 - Do not pull on the wheel sensor harness.
- 4. Disconnect the wheel sensor harness connector, then remove the wheel sensor harness from the mounts to remove the wheel sensor.

INSTALLATION

Installation is in the reverse order of removal.

- Before installing the wheel sensors do the following:
- Inspect and replace the wheel sensor if damaged.
- Clean the wheel sensor hole and mating surface with brake cleaner and a lint-free cloth. Be careful that dirt and debris do not enter the hub and bearing assembly or the rear axle.
- Replace the wheel sensor O-ring, then apply a coat of suitable grease to the new O-ring and sensor hole for installation.

< REMOVAL AND INSTALLATION >

SENSOR ROTOR

Removal and Installation

FRONT The wheel sensor rotors are built into the wheel hubs and are not removable. If damaged, replace wheel hub and bearing assembly. Refer to FAX-8, "Removal and Installation".

REAR (C200)

Removal and Installation

It is necessary to disassemble the rear axle to replace the sensor rotor. Perform the axle shaft assembly D removal procedure to replace sensor rotor. Refer to RAX-8, "Removal and Installation".

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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

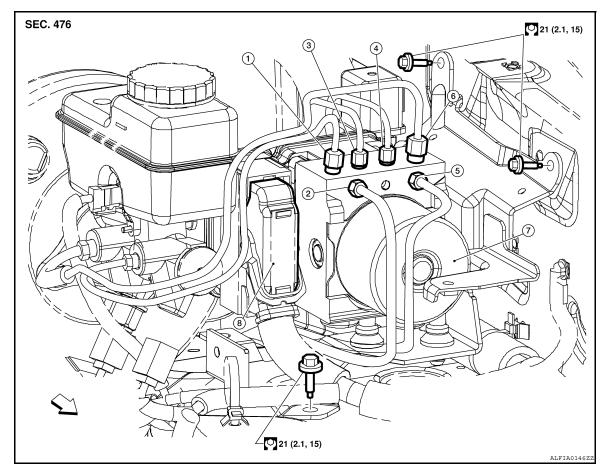
< REMOVAL AND INSTALLATION >

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

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[VDC/TCS/ABS]



- From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- 4. To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 7. ABS actuator and electric unit (control unit)
- To rear right disc brake
 13.0 N⋅m (1.3 kg-m, 10 ft-lb)
- To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
 Harness connector
- 3. To rear left disc brake 13.0 N⋅m (1.3 kg-m, 10 ft-lb)
- From master cylinder primary side 18.2 N⋅m (1.9 kg-m, 13 ft-lb)
- ✓⊐ Front

REMOVAL

- 1. Disconnect the negative battery terminal.
- 2. Remove air cleaner assembly. Refer to EM-24, "Removal and Installation".
- 3. Disconnect the actuator harness from the ABS actuator and electric unit (control unit). CAUTION:
 - To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas.
 - When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.
- 4. Disconnect the brake tubes.
- 5. Remove three bracket bolts and remove the ABS actuator and electric unit (control unit) and bracket.
- 6. Remove the ABS actuator and electric unit (control unit) from the bracket.

INSTALLATION

Installation is in the reverse order of removal.

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

- If the ABS actuator and electric unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to <u>BRC-69</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special <u>Repair Requirement"</u>.
- After installation of the ABS actuator and electric unit (control unit), refill brake system with new brake fluid. Then bleed the air from the system. Refer to <u>BR-19</u>, "<u>Bleeding Brake System</u>".

CAUTION:

- All hoses and piping (tubes) must be free from excessive bending, twisting and pulling.
- Make sure there is no interference with other parts when turning steering both clockwise and counterclockwise.
- The brake piping is an important safety part. If a brake fluid leak is detected, always disassemble the parts. Replace applicable part with a new one, if necessary.
- Be careful not to splash brake fluid on painted areas; it way cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Do not bend or twist brake hose sharply, or strongly pull it.
- Do not reuse drained brake fluid.
- After installation of the ABS actuator and electric unit (control unit), refill brake system with new E brake fluid. Then bleed the air from the system. Refer to <u>BR-19, "Bleeding Brake System"</u>.

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STEERING ANGLE SENSOR

[VDC/TCS/ABS]

Removal and Installation

REMOVAL

- 1. Remove the spiral cable. Refer to <u>SR-6, "Removal and Installation"</u>.
- 2. Remove the screws and remove the steering angle sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

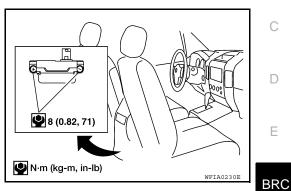
Any time the steering angle sensor is removed and installed or replaced, you must reset the neutral position of the steering angle sensor. Refer to <u>BRC-69</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

G SENSOR

Removal and Installation

REMOVAL

- 1. Remove center console. Refer to <u>IP-16, "Exploded View"</u>.
- Remove yaw rate/side/decel G sensor nuts as shown.
 The location of the sensor is the same for all models. CAUTION:
 - Do not use power tools to remove or install yaw rate/side/ decel G sensor.
 - Do not drop or strike the yaw rate/side/decel G sensor.
- 3. Disconnect harness connector and remove the yaw rate/side/ decel G sensor.



INSTALLATION

Installation is in the reverse order of removal. **NOTE:**

After performing the above work, calibrate the decel G sensor. Refer to <u>BRC-69, "ADDITIONAL SERVICE</u> <u>WHEN REPLACING CONTROL UNIT : Special Repair Requirement"</u>.

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