SECTION BRAKE CONTROL SYSTEM

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APPLICATION NOTICE

BASIC INSPECTION APPLICATION NOTICE

Application Notice

INFOID:000000004064654 В

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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< BASIC INSPECTION >

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000004064655

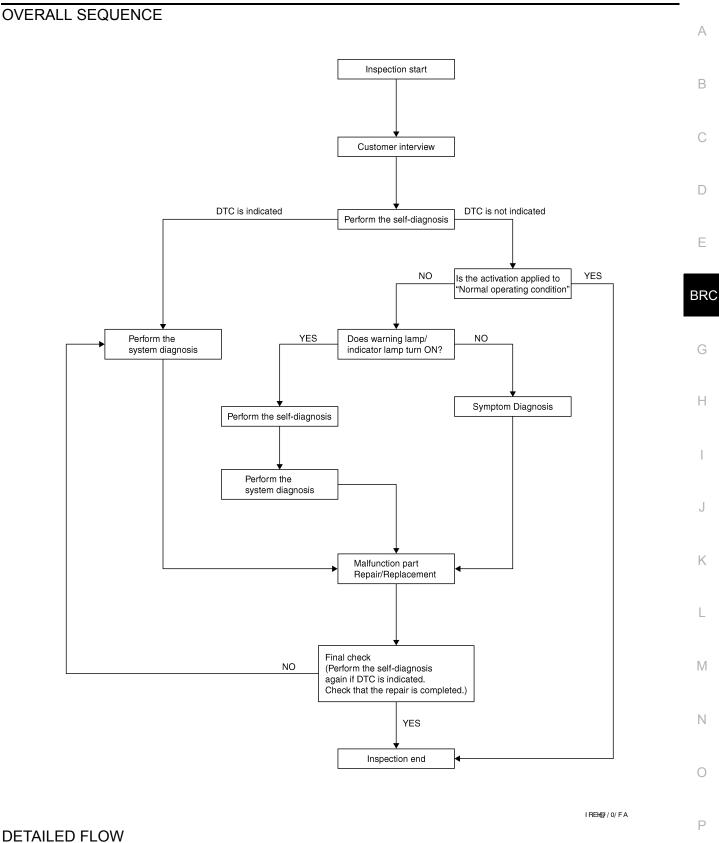
PRECAUTIONS FOR DIAGNOSIS

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-12. "ADJUSTMENT OF STEERING ANGLE</u> <u>SENSOR NEUTRAL POSITION : Description"</u>.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[TYPE 1]



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-11</u>, "Diagnostic Work Sheet".

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[TYPE 1]

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to <u>BRC-23, "CONSULT-III Function (ABS)"</u>. <u>Is there any DTC displayed?</u>

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-89, "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-99,</u> "Description".

Is the symptom a normal operation?

YES >> Inspection End

NO >> GO TO 5

5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-72, "Description".
- · Brake warning lamp: Refer to BRC-73, "Description".
- VDC OFF indicator lamp: Refer to <u>BRC-74, "Description"</u>.

• SLIP indicator lamp: Refer to BRC-75. "Description".

Is ON/OFF timing normal?

YES >> GO TO 6

NO >> GO TO 2

Ó.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

I.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-23</u>, "<u>CONSULT-III Function (ABS)</u>".

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:000000004064656

[TYPE 1]

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

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INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:000000004064657

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:

Neutral position adjustment for the steering angle sensor

Calibration of the decel G sensor

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement", GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement". ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

 \times : Required –: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	_
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	_
Tire rotation	
Adjusting wheel alignment	×
Battery disconnection	x

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

Breis mor Estient	• •
>> GO TO 2	
2. PERFORM THE NEUTRAL POSITION ADJUSTME	ENT FOR THE STEERING ANGLE SENSOR
	ORT" and "ST ANG SEN ADJUSTMENT" in order.
Do not touch steering wheel while adjusting st 3. After approximately 10 seconds, touch "END".	eering angle sensor.
NOTE: After approximately 60 seconds, it ends automatic 4. Turn ignition switch OFF, then turn it ON again. CAUTION:	cally.
Be sure to perform above operation.	
>> GO TO 3	
3. CHECK DATA MONITOR	
 Run vehicle with front wheels in straight-ahead po Select "DATA MONITOR". Then make sure "STR / 	
Is the steering angle within the specified range?	
YES >> GO TO 4 NO >> Perform the neutral position adjustment fo	r the steering angle sensor again, GO TO 1
4. ERASE THE SELF-DIAGNOSIS MEMORY	
Erase the self-diagnosis memory of the ABS actuator a • ABS actuator and electric unit (control unit): Refer to	BRC-23. "CONSULT-III Function (ABS)"
 ECM: Refer to <u>EC-67, "CONSULT-III Function (ENG</u> Are the memories erased? 	<u>INE)"</u> .
YES >> Inspection End	
NO >> Check the items indicated by the self-diag CALIBRATION OF DECEL G SENSOR	nosis.
CALIBRATION OF DECEL G SENSOR : D	Description
Refer to the table below to determine if calibration of the	ne 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)	x
Removing/Installing steering angle sensor	x
Replacing steering angle sensor	X
Removing/Installing steering components	X
Replacing steering components	X
Removing/Installing suspension components	x
Replacing suspension components	x
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 INFOID:000000004064662

< BASIC INSPECTION >

(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

1. On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.

- 2. 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 ± 0.08 G.

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-23, "CONSULT-III Function (ABS)"</u>.

ECM: Refer to <u>EC-67, "CONSULT-III Function (ENGINE)"</u>.

Are the memories erased?

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

APPLICATION NOTICE

< FUNCTION DIAGNOSIS >

FUNCTION DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000004064663

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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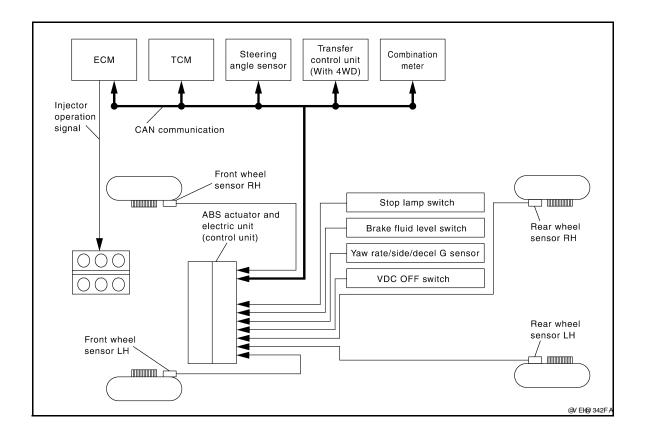
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< FUNCTION DIAGNOSIS >

VDC

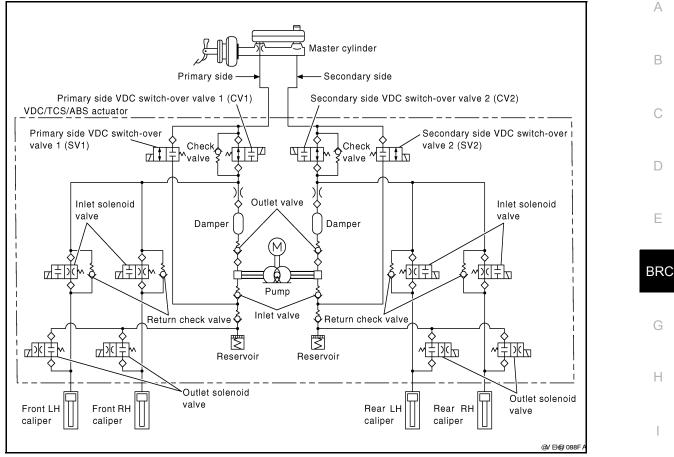
System Diagram

INFOID:000000004064664



< FUNCTION DIAGNOSIS >

HYDRAULIC CIRCUIT DIAGRAM



System Description

INFOID:000000004064665

- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from 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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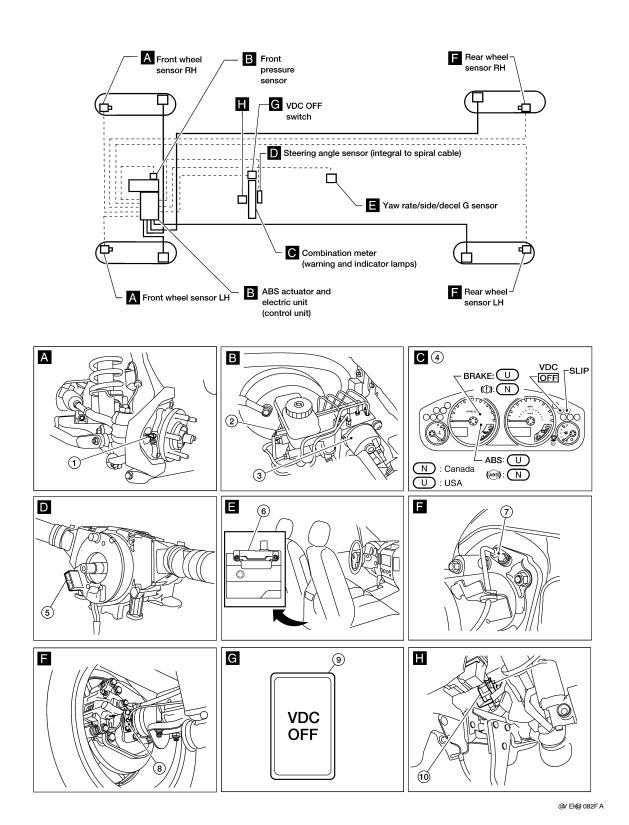
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Component Parts Location

INFOID:000000004064666

[TYPE 1]



- 1. Front wheel sensor LH E18 Front wheel sensor RH E117
- 4. Combination meter M24
- Brake fluid level switch E21

2.

5.

- Steering angle sensor (behind spiral ca- 6. ble) M47 (Steering wheel removed for clarity)
- 3. ABS actuator and electric unit (control unit) E125
 - Yaw rate/side/decel G sensor B73

BRC-18

< FUNCTION DIAGNOSIS >

- 7. Rear wheel sensor (M226 rear 8. axle) LH C11 Rear wheel sensor (M226 rear axle) RH C10
- 10. Stop lamp switch E38 (with M/T) Stop lamp switch E39 (with A/T)

Component Description

Rear wheel sensor (C200 rear axle) LH 9. VDC OFF switch M154 C11 Rear wheel sensor (C200 rear axle) RH C10

VDC

INFOID:000000004064667

Component parts		Reference	—
Pump		DDC 20 "Description"	D
	Motor	BRC-38, "Description"	
ABS actuator and electric unit (control unit)	Actuator relay	BRC-56, "Description"	
	Solenoid valve	BRC-48, "Description"	E
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-66, "Description"	
Wheel sensor		BRC-29, "Description"	BRC
Yaw rate/side/decel G sensor		BRC-40, "Description"	
Steering angle sensor		BRC-58, "Description"	G
Brake fluid level switch		BRC-60, "Description"	
Stop lamp switch		BRC-46, "Description"	
VDC OFF switch		BRC-70, "Description"	H
ABS warning lamp		BRC-72, "Description"	
Brake warning lamp		BRC-73, "Description"	
VDC OFF indicator lamp		BRC-74, "Description"	
SLIP indicator lamp		BRC-75, "Description"	

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[TYPE 1]

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TCS



System Diagram INFOID:000000004064668 Transfer Steering Combination ECM тсм control unit angle sensor meter (With 4WD) Injector operation signal CAN communication Front wheel sensor RH Stop lamp switch ABS actuator and electric unit Rear wheel Brake fluid level switch (control unit) sensor RH Yaw rate/side/decel G sensor VDC OFF switch Rear wheel sensor LH Front wheel sensor LH @V EH@ 34

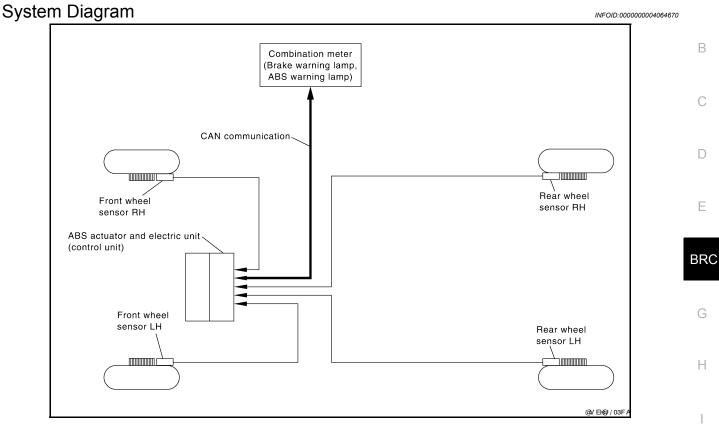
TCS

System Description

INFOID:000000004064669

- 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.

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.

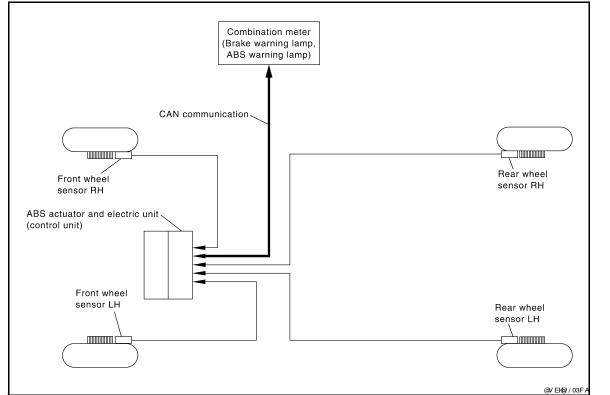
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< FUNCTION DIAGNOSIS >

EBD

INFOID:000000004064672

System Diagram



System Description

INFOID:000000004064673

- 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.

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:000000004064674

[TYPE 1]

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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.
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.

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, 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-89, "DTC No. Index"</u>.

DATA MONITOR MODE

Display Item List

Item	Dat	a monitor item sele		
(Unit)	ECU INPUT MAIN SELECTION SIGNALS SIGNALS FROM MENU	Remarks		
GEAR	×			Gear position judged by PNP switch signal is displayed.
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front 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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ltom	Data	a monitor item sele		
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is dis- played.
N POSI SIG (ON/OFF)	-	_	×	Shift position judged by PNP switch signal.
P POSI SIG (ON/OFF)	-	_	×	Shift position judged by PNP switch signal.
ACCEL POS SIG (%)	×	_	×	Throttle valve open/close status judged by CAN communication signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN com- munication signal is displayed.
STR ANGLE SIG (°)	×	_	×	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
SIDE G-SENSOR (m/s ²)	×	-	×	Transverse acceleration detected by side G-sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	-	×	×	SLIP indicator lamp (ON/OFF) sta- tus 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.
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.
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.
OFF LAMP (ON/OFF)	-	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	-	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)		×	×	ABS actuator relay signal (ON/OFF) status is displayed.

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

< FUNCTION DIAGNOSIS >

[TYPE 1]

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Item	Data	a monitor item sele	ection		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
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.	
/DC FAIL SIG (ON/OFF)	-	_	×	VDC fail signal (ON/OFF) status is displayed.	
TCS FAIL SIG (ON/OFF)	-	_	×	TCS fail signal (ON/OFF) status is displayed.	
ABS FAIL SIG (ON/OFF)	_	_	×	ABS fail signal (ON/OFF) status is displayed.	
EBD FAIL SIG ON/OFF)	-	_	×	EBD fail signal (ON/OFF) status is displayed.	
FLUID LEV SW ON/OFF)	×	_	×	Brake fluid level switch (ON/OFF) status 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 WARN LAMP ON/OFF)	_	_	×	Brake warning lamp (ON/OFF) sta- tus is displayed.	
GLCT LVR POSI P, R, N, D)	×	×	×	Shift position judged by PNP switch signal.	
R POSI SIG ON/OFF)	_	_	×	Shift position judged by PNP switch signal.	
2WD/4WD 2WD/4WD)	-	_	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.	
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.	
CRANKING SIG (ON/OFF)	-	_	×	The input state of the key SW START position signal (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, VDC OFF indicator lamp, SLIP indicator lamp or brake warning lamp on.

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

< FUNCTION DIAGNOSIS >

[TYPE 1]

 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		ABS solenoid valve			ABS solenoid valve (ACT)		
Operation		Up	Keep	Down	Up	ACT UP	ACT KEEF
	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 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 IN SOL	Off	On	On	—	_	—
RR LH SOL	RR LH OUT SOL	Off	Off	On*	_	-	_
	FR RH IN SOL	_	_	—	Off	Off	Off
	FR RH OUT SOL	_	_	—	Off	Off	Off
FR RH ABS SOLENOID (ACT)	CV1	_	_		Off	On	On
	SV1	_	_	—	Off	On*	Off
	FR LH IN SOL	_	_	—	Off	Off	Off
	FR LH OUT SOL	_	_	—	Off	Off	Off
FR LH ABS SOLENOID (ACT)	CV1	_	_		Off	On	On
	SV1	_	_	—	Off	On*	Off
	RR RH IN SOL	_	_	—	Off	Off	Off
	RR RH OUT SOL	_	_		Off	Off	Off
RR RH ABS SOLENOID (ACT)	CV2				Off	On	On
	SV2				Off	On*	Off
	RR LH IN SOL				Off	Off	Off
	RR LH OUT SOL		_	_	Off	Off	Off
RR LH ABS SOLENOID (ACT)	CV2	_		_	Off	On	On
	SV2	_		_	Off	On*	Off
REAR SOL	This item is not used	for this mode	el.	1			1

*: 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

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

< FUNCTION DIAGNOSIS > [TYPE 1] MOTOR RELAY On Off

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COMPONENT DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000004064675

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< 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

INFOID:000000004064677

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
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	E
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)	BRC
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-29, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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.

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

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

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

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INFOID:000000004064678

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C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

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-104, "Removal and Installation"</u>.

3.CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

- 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-8,</u> "<u>Rear Axle Bearing"</u> (C200 rear axle), or <u>RAX-20, "Rear Axle Bearing"</u> (M226 rear axle).

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-14</u>, <u>"Removal and Installation</u>" (C200 rear axle), or <u>RAX-25</u>, "<u>Removal and Installation</u>" (M226 rear axle).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

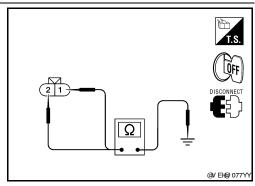
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

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) harness connector and the malfunctioning wheel sensor harness connector.

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

Is the inspection result normal?

NO >> Repair the circuit.

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installation"</u>.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1 < COMPONENT DIAGNOSIS > Component Inspection

[TYPE 1]

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Component Inspection INFOID:000000004064679 А 1. CHECK DATA MONITOR On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-В SOR", and check the vehicle speed. Wheel sensor Vehicle speed (DATA MONITOR) FR LH SENSOR FR RH SENSOR Nearly matches the speedometer display (±10% or less) **RR LH SENSOR** D **RR RH SENSOR** Is the inspection result normal? Е YES >> Inspection End NO >> Go to diagnosis procedure. Refer to <u>BRC-29, "Diagnosis Procedure"</u>. Special Repair Requirement INFOID:000000004064680 BRC 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-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL **POSITION : Description".** Н >> 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-13, "CALIBRATION OF DECEL G SENSOR : Description". >> END Κ L Μ Ν Ο

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:000000004064682

INFOID:000000004064681

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 connectorWheel sensor
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)
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-32, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

BRC-32

INFOID:000000004064683

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 1]

2.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.	
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-104</u> , " <u>Removal and Installation</u> ".	
3. CHECK TIRES	
Check for inflation pressure, wear and size of each tire.	
Are tire pressure and size correct and is tire wear within specifications?	В
YES >> GO TO 4 NO >> Adjust tire pressure or replace tire(s).	
CHECK WHEEL BEARINGS	
Check wheel bearing axial end play. Refer to FAX-5, "On-Vehicle Inspection and Service" (front), RAX-8,	
Rear Axle Bearing" (C200 rear axle), or RAX-20, "Rear Axle Bearing" (M226 rear axle).	
s 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-14</u> , <u>"Removal and Installation</u> " (C200 rear axle), or <u>RAX-25</u> , " <u>Removal and Installation</u> " (M226 rear axle).	
CHECK WIRING HARNESS FOR SHORT CIRCUIT	
. Disconnect ABS actuator and electric unit (control unit) connec-	
tor and wheel sensor connector of malfunction code No. 2. Check continuity between wheel sensor harness connector ter- minals and ground.	
Continuity should not exist.	
s the inspection result normal?	
YES >> GO TO 6	
NO >> Repair the circuit.	
. Check continuity between ABS actuator and electric unit (control unit) harness connector and the mal-	
functioning wheel sensor harness connector.	

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C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 1]

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Instal-</u> lation".

NO >> Repair the circuit.

Component Inspection

INFOID:000000004064684

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-32. "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064685

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-12</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL 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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

C1109 POWER AND GROUND SYSTEM А Description INFOID:000000004064686 Supplies electric power to the ABS actuator and electric unit (control unit). В DTC Logic INFOID:000000004064687 DTC DETECTION LOGIC DTC Display item Malfunction detected condition Possible cause D Harness or connector **BATTERY VOLTAGE** When the ABS actuator and electric unit (control unit) C1109 ABS actuator and electric unit [ABNORMAL] power supply voltage is lower than normal. (control unit) Е DTC CONFIRMATION PROCEDURE 1.CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results. BRC Self-diagnosis results BATTERY VOLTAGE [ABNORMAL] Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to <u>BRC-35, "Diagnosis Procedure"</u>. Н >> Inspection End NO **Diagnosis** Procedure INFOID-000000004064688 INSPECTION PROCEDURE 1.CHECK CONNECTOR 1. Turn ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) connector. 2. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or 3. Κ replace terminal. 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-23, "CONSULT-III Function (ABS)". L Is any item indicated on the self-diagnosis display? YES >> GO TO 2 NO >> Poor connection of connector terminal. Repair or replace connector. 2.check abs actuator and electric unit (control unit) power supply circuit and M GROUND CIRCUIT 1. Turn ignition switch OFF. Ν Disconnect ABS actuator and electric unit (control unit) connector. 2. Turn ignition switch ON or OFF and check voltage between ABS 3. actuator and electric unit (control unit) harness connector terminal and ground. ABS actuator and elec-Ρ tric unit (control unit) Condition Voltage Connector Terminal Ignition switch: ON Battery voltage E125 8 Ground 6 Ignition switch: OFF Approx. 0V

< COMPONENT DIAGNOSIS >

[TYPE 1]

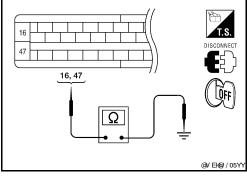
@V EH@ 0781

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal			
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.

Special Repair Requirement

INFOID:000000004064689

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-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL <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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

[TYPE 1]

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < COMPONENT DIAGNOSIS > [TYPE 1]

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

DTC Logic

INFOID:000000004064690

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1. CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results Self-diagnosis results CONTROLLER FAILURE VARIANT CODING Is above displayed on the self-diagnosis display? YES > Proceed to diagnosis procedure. Refer to BRC-37. "Diagnosis Procedure". NO >> Inspection End Diagnosis Procedure Self-Clow PROCEDURE 1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) > Replace ABS actuator and electric unit (control unit). Refer to BRC-106. "Removal and Installition". Special Repair Requirement Accustored and Installition". 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-12. "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-12. "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 electr	DTC	Display item	Malfunction detected condition	Possible cause	
C1170 VARIANT CODING In a case where VARIANT CODING is different. DTC CONFIRMATION PROCEDURE 1. CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results.	C1110	• ABS ac			
CONTROLLER FAILURE VARIANT CODING Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to BRC-37. "Diagnosis Procedure". NO >> Inspection End Diagnosis Procedure INSPECTION PROCEDURE 1.REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) > Replace ABS actuator and electric unit (control unit). Refer to BRC-106. "Removal and Install. tion". Special Repair Requirement APPRICE 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-12. "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-13. "CALIBRATION OF DECEL G SENSOR : Description".	C1170	VARIANT CODING	In a case where VARIANT CODING is different.		
Check the self-diagnosis results. Self-diagnosis results CONTROLLER FAILURE VARIANT CODING Is above displayed on the self-diagnosis display? YES YES >> Proceed to diagnosis procedure. Refer to BRC-37. "Diagnosis Procedure". NO NO >> Inspection End Diagnosis Procedure INSPECTION PROCEDURE 1.REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) ** Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Install. tion". Special Repair Requirement I.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-106, SENSOR NEUTRAL POSITION Always perform calibration of decel G SENSOR Always perform calibration of decel G SENSOR Always perform calibration of decel G SENSOR Neurophace and electric unit (control unit (control unit) Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".	DTC CC	NFIRMATION PROCE	DURE		
Self-diagnosis results CONTROLLER FAILURE VARIANT CODING Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to BRC-37, "Diagnosis Procedure". NO >> Inspection End Diagnosis Procedure ####################################	1. CHEC	CK SELF-DIAGNOSIS RE	SULTS		
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VARIANT CODING Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to BRC-37, "Diagnosis Procedure". NO >> Inspection End Diagnosis Procedure ####################################					
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1.REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106. "Removal and Install: tion". Special Repair Requirement I.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuate and electric unit (control unit). Refer to BRC-12. "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-13. "CALIBRATION OF DECEL G SENSOR : Description".					
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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-13</u> , "CALIBRATION OF DECEL G SENSOR : Description".		>> GO TO 2			
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Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".				d electric unit (control unit	
>> END					
>> END					
		>> END			

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

INFOID:000000004064693

[TYPE 1]

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:000000004064694

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 ac- tuator motor relay is open.	 Harness or connector ABS actuator and electric unit
CIIII		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-38, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064695

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23</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 terminal. Repair or replace connector.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

>> GO TO 3 YES

NO >> Repair or replace malfunctioning components.

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

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

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "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 2. 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-38, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

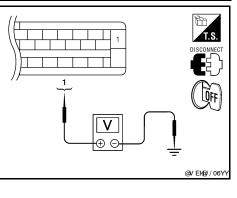
Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL Ο **POSITION : Description".**

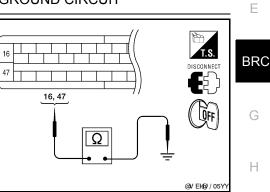
>> GO TO 2

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-13, "CALIBRATION OF DECEL G SENSOR : Description".

BRC-39





INFOID:000000004064696

[TYPE 1]

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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:000000004064699

INFOID:000000004064698

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.

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

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064700

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.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.

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

Continuity

Yes

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit

(control unit)

Connector

E125 (A)

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.

Connector

B73 (B)

Yaw rate/side/decel G sensor

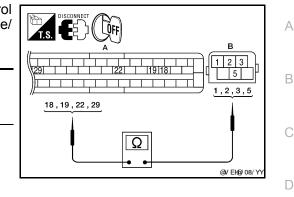
Terminal

2

1

3

5



[TYPE 1]

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

Terminal

18

19

22

29

\mathbf{3}. YAW RATE/SIDE/DECEL G SENSOR INSPECTION

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

2. Use "DATA MONITOR" to check if the yaw rate/side/decel G sensor signals are normal.

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	-0.08 G to +0.08 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 >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Instal-</u> lation".

NO >> Replace the yaw rate/side/decel G sensor. Refer to <u>BRC-109</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	-0.08 G to +0.08 G	N
Turning right	Negative value	Negative value	-	_
Turning left	Positive value	Positive value	-	0
Speed up	-	-	Negative value	- 0
Speed down	-	-	Positive value	_

Is the inspection result normal?

YES >> Inspection End

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

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

< COMPONENT DIAGNOSIS >

[TYPE 1]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12, "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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

< COMPONENT DIAGNOSIS >

C1115 WHEEL SENSOR

Description

INFOID:000000004064703

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:000000004064704

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit)
DTC CC	NFIRMATION PROCE	DURE	
1 .CHEC	CK SELF-DIAGNOSIS RE	SULTS	BI
Check th	e self-diagnosis results.		
	.		(
	Self-diagnosis		
	ABS SENSOR [ABNOF	-	ŀ
	displayed on the self-diag		
	>> Inspection End	procedure. Refer to <u>BRC-43, "Diagnosis Procec</u>	<u>ure</u> .
	sis Procedure		INFOID:000000004064705
CAUTIO Do not c	<mark>N:</mark> :heck between wheel se	nsor terminals.	
INSPEC	TION PROCEDURE		
1.com	NECTOR INSPECTION		ł
		electric unit (control unit) connector and whe	
code.			
		n, disconnection, looseness or damage.	L
	spection result normal?		
-	>> GO TO 2 >> Repair or replace as n	ecessary.	Ν
-	CK WHEEL SENSOR OU	-	
		nsor tester (J-45741) to wheel sensor using app	propriate adapter
		sensor tester power switch.	
NOT		about illuminate. If the DOWED indicator doe	a not illuminata, rankasa tha
		should illuminate. If the POWER indicator doe el sensor tester before proceeding.	
3. Spin	the wheel of the vehicle	by hand and observe the red SENSOR indicated	
sens NOT		OR indicator should flash on and off to indicate a	
-	e red SENSOR indicator	illuminates but does not flash, reverse the pol	arity of the tester leads and
Does the	ABS active wheel senso	r tester detect a signal?	
	>> GO TO 3		
•	•	nsor. Refer to <u>BRC-104, "Removal and Installat</u>	<u>ion</u> .
J. CHEC	CK TIRES		

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С

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

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

Are tire pressure and size correct and is tire wear within specifications?

- 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-8,</u> <u>"Rear Axle Bearing"</u> (C200 rear axle), or <u>RAX-20, "Rear Axle Bearing"</u> (M226 rear axle).

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), <u>RAX-14.</u> <u>"Removal and Installation"</u> (C200 rear axle), or <u>RAX-25. "Removal and Installation"</u> (M226 rear axle).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

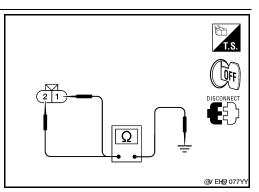
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor harness connector terminals and ground.

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) harness connector and the malfunctioning wheel sensor harness connector.

Wheel sensor	ABS actuato electric unit (co		Wheel sen	sor	Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	
		46	ETO	2	
Front RH	E125	34	E117	1	
		33		2	Yes
Rear LH	- L125	36	C11	1	165
Real LI		37	CH	2	
Rear RH		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-106, "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.

Vehicle speed (DATA MONITOR)

C1115 WHEEL SENSOR

	CTTS WHEEL SENSOR	
< COMPONENT DIAGNOSIS >	[TYPE 1]	l
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	A
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		В
Is the inspection result normal?YES>> Inspection EndNO>> Go to diagnosis proced	lure. Refer to <u>BRC-43, "Diagnosis Procedure"</u> .	С
Special Repair Requiremen	t INFOID:00000004064707	
1. ADJUSTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION	D
	ljustment for the steering angle sensor when replacing the ABS actuator r to <u>BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</u>	E
>> GO TO 2		BRC
2. CALIBRATION OF DECEL G SE	ENSOR	DI
	G sensor when replacing the ABS actuator and electric unit (control unit). <u>OF DECEL G SENSOR : Description</u> .	G
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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-000000004064709

INFOID:000000004064710

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?

>> Proceed to diagnosis procedure. Refer to BRC-46, "Diagnosis Procedure". YES

NO >> Inspection End

Diagnosis Procedure

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

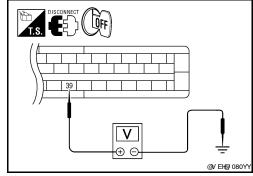
```
Brake pedal depressed
Brake pedal released
```

: Battery voltage

: 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 BRC-106, "Removal and Installation". 3

3.STOP LAMP SWITCH CIRCUIT INSPECTION



C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

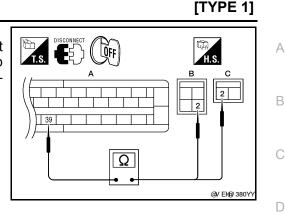
- 1. Disconnect the stop lamp switch connector.
- Check the continuity between the ABS actuator and electric unit (control unit) connector E125 (A) terminal 39 and stop lamp switch connector E39 (B) terminal 2 (with A/T) or E38 (C) terminal 2 (with M/T).

Continuity should exist.

Is the inspection result normal?

- YES >> Refer to <u>BRC-8, "Work Flow"</u>.
- NO >> Repair or replace malfunctioning components.

Special Repair Requirement



INFOID:000000004064711

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-12</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL 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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

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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:000000004064713

INFOID:000000004064714

INFOID:000000004064712

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-48, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23</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 terminal. Repair or replace connector.

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

BRC-48

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 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.

 $\mathbf{3.}$ 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 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-106, "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.

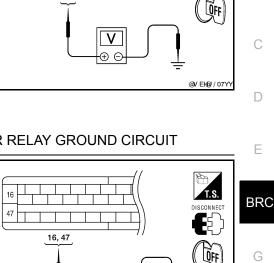
On easting			ABS solenoid valve	•	_
	Operation	Up	Кеер	Down	_
FR RH SOL	FR RH IN SOL	Off	On	On	_
FR RH SUL	FR RH OUT SOL	Off	Off	On*	_
	FR LH IN SOL	Off	On	On	_
FR LH SOL	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On	On	_
KK KH SUL	RR RH OUT SOL	Off	Off	On*	_
	RR LH IN SOL	Off	On	On	_
RR LH SOL	RR LH OUT SOL	Off	Off	On*	
REAR SOL	This item is not used for this mo	del.	1		-

*: 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-48, "Diagnosis Procedure"</u>.

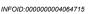
Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION



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C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 1]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12, "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-13</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:000000004064718

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-51. "Diagnosis Procedure"</u>. NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or N replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23. "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 terminal. Repair or replace connector.

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

BRC-51

[TYPE 1]

INFOID:000000004064717

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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 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-106, "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.

	Oncration		ABS solenoid valve	•
	Operation	Up	Кеер	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH 30L	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
RR RH SUL	RR RH OUT SOL	Off	Off	On*
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
REAR SOL	This item is not used for this mod	lel.	1	

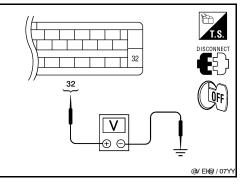
*: ON for 1 to 2 seconds after the touch, and then OFF

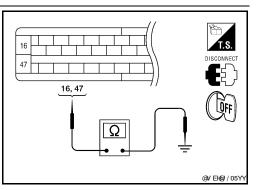
Is the inspection result normal?

- YES >> Inspection End
- NO >> Go to diagnosis procedure. Refer to <u>BRC-51, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION





INFOID:000000004064720

INFOID:000000004064721

BRC-52

[TYPE 1]

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL <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-13</u>, "CALIBRATION OF DECEL G SENSOR : Description".

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[TYPE 1]

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:000000004064723

INFOID:000000004064722

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1		
C1131	ENGINE SIGNAL 2	Based on the signal from ECM, ABS actuator and electric	 Harness or connector ABS actuator and electric unit
C1132	ENGINE SIGNAL 3	unit (control unit) judges that engine fuel cut system is	(control unit)
C1133	ENGINE SIGNAL 4	malfunctioning.	 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-54</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064724

INFOID:000000004064725

1.CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to <u>EC-67, "CONSULT-III Function (ENGINE)"</u>.
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23</u>, "<u>CONSULT-III Func-</u> tion (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

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

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

>> GO TO 2 2.CALIBRATION OF DECEL G SENSOR

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Description".

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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:000000004064727

INFOID:000000004064726

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-56, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064728

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23</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 terminal. 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.
- Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 32 and ground.

ABS actuator and ele	ctric 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.

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

BRC-56

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

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-106, "Removal and Installation".

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.

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-56, "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 BRC-12, "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). L Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".

BRC-57

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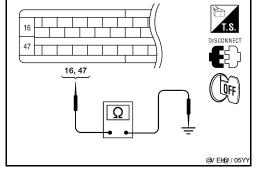
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[TYPE 1]

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< COMPONENT DIAGNOSIS >

C1143, C1144 STEERING ANGLE SENSOR

Description

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

DTC Logic

INFOID:000000004064732

INFOID:000000004064733

INFOID:000000004064731

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.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?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-58, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23</u>, "CONSULT-III Function (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

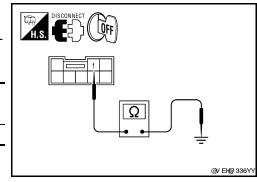
NO >> Poor connection of connector terminal. Repair or replace connector.

2. CHECK STEERING ANGLE SENSOR HARNESS

1. Turn ignition switch OFF.

- 2. Disconnect steering angle sensor connector.
- 3. Check continuity between steering angle sensor harness connector M47 terminal 1 and ground.

Steering a	ngle sensor		Continuity
Connector	Terminal		Continuity
M47	1	Ground	Yes



C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

Turn ignition switch ON. 4.

5. Check voltage between steering angle sensor harness connector M47 terminal 2 and ground.

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

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

Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal. 2.

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?

- >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installa-YES tion".
- NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-108, "Removal and Installation".

Component Inspection

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

>> Go to diagnosis procedure. Refer to BRC-58, "Diagnosis Procedure". NO

Special Repair Requirement

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

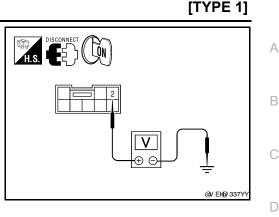
Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL **POSITION : Description".**

>> 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-13, "CALIBRATION OF DECEL G SENSOR : Description".

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INFOID 000000004064734

< 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:000000004064738

INFOID:000000004064737

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-60, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064739

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

Disconnect ABS actuator and electric unit (control unit) connector and brake fluid level switch connector.
 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)

 Check continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) terminal 28 and brake fluid level switch harness 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	

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

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

Is the inspection result normal?

SWITCH

BRC-60

[TYPE 1]

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

Check continuity between brake fluid level switch harness connector

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

@V EH60/15Y

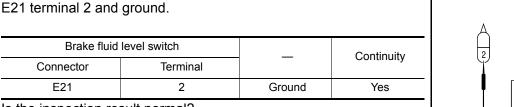
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Is the inspection result normal?

YES >> GO TO 4

E21

NO >> Repair or replace malfunctioning components.

4.CHECK BRAKE FLUID LEVEL SWITCH

Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition		
1-2	When brake fluid is full in the reservoir tank.	No	
1 – 2	When brake fluid is empty in the reservoir tank.	Yes	

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 BRC-106, "Removal and Installation".
- NO >> Replace brake fluid level switch.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

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

Brake fluid level switch	Condition	Continuity	
Terminal	Condition		
1-2	When brake fluid is full in the reservoir tank.	No	
1 - 2	When brake fluid is empty in the reservoir tank.	Yes	
le the inequation regult	normal?		

Is the inspection result normal?

YES >> Inspection End

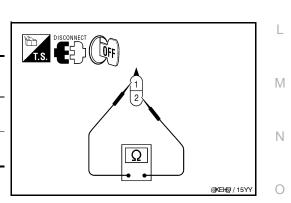
NO >> Replace brake fluid level switch.

Special Repair Requirement

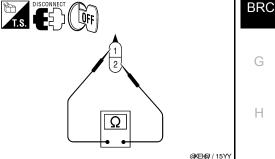
1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL **POSITION : Description".**

BRC-61



INFOID:000000004064741 P



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< COMPONENT DIAGNOSIS >

>> GO TO 2

$2. {\sf CALIBRATION} \text{ of decel g sensor}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> 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:000000004064743

INFOID:000000004064744

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) 	BRC

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN COM CIR
lianlayed on the calf diagnostic diaplay?

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-63, "Diagnosis Procedure"</u>.
- NO >> Inspection End

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 2. Reconnect connector and perform self-diagnosis.

Self-diagnosis results
CAN COMM CIRCUIT
ST ANG SEN COM CIR
Is above displayed on the self-diagnosis display?
YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Inspection End

INFOID:000000004064742

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< COMPONENT DIAGNOSIS >

C1160 DECEL G SEN SET

Description

INFOID:000000004064745

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:000000004064746

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-64, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS

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

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-13, "CALIBRATION OF DECEL G SENSOR</u> : <u>Description"</u>. GO TO 2

2. PERFORM SELF-DIAGNOSIS AGAIN

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

Are any self-diagnosis results displayed?

YES >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-109</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:000000004064749

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position	
DTC CC	NFIRMATION PROCE	DURE		E
1 .CHEC	K SELF-DIAGNOSIS RE	SULTS		
Check th	e self-diagnosis results.			BR
	Self-diagnosis			G
 	ST ANGL SEN			0
-	displayed on the self-diag	· · · · · · · · · · · · · · · · · · ·	el une ll	
	>> Inspection End	procedure. Refer to <u>BRC-65, "Diagnosis Proce</u>	<u>oure</u> .	Н
	sis Procedure			
Diagno			INFOID:000000004064750	
INSPEC	TION PROCEDURE			
1.adju	1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION			1
		al position. Refer to <u>BRC-12, "ADJUSTMENT (</u>	OF STEERING ANGLE SEN-	0
SOR NE	UTRAL POSITION : Desc	ription".		
	>> GO TO 2			K
-	ATOR LAMP CHECK			
	at VDC OFF indicator lam	in is off		L
	DFF indicator lamp off?			
	>> Inspection End			D. /
NO		and electric unit (control unit) self-diagnosis. R	efer to BRC-23, "CONSULT-	N
	III Function (ABS)".			
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INFOID:000000004064748

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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:000000004064752

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	 Harness or connector ABS actuator and electric unit (control unit)
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.	
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.	
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-66, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064753

- 1.CHECK CONNECTOR
- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-23</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 terminal. Repair or replace connector.

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

BRC-66

C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

- Turn ignition switch OFF. 1.
- 2. 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		
E125	16, 47	Ground	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installation".
- NO >> Repair or replace malfunctioning components.

Component Inspection

1. CHECK ACTIVE TEST

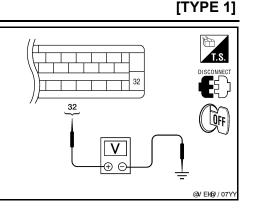
Select each test menu item on "ACTIVE TEST". 1.

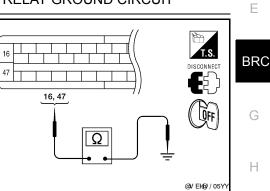
On the display, touch "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in 2. the table below.

Operation		ŀ	ABS solenoid valve (ACT)		
		Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
	FR RH OUT SOL	Off	Off	Off	
FR RH ABS SOLENOID (ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	FR LH IN SOL	Off	Off	Off	
	FR LH OUT SOL	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	
	RR RH OUT SOL	Off	Off	Off	
RR RH ABS SOLENOID (ACT)	CV2	Off	On	On	
	SV2	Off	On*	Off	
	RR LH IN SOL	Off	Off	Off	
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	

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









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C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-66, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064755

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-12, "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-13</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> 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. Can control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000004064758

DTC DETECTION LOGIC

Diagnosis Procedure INFOID:000000004064759 NSPECTION PROCEDURE I.CHECK CONNECTOR I. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.	DTC	Display item	Malfunction detected condition	Possible cause	
NSPECTION PROCEDURE 1. CHECK CONNECTOR 1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal. 2. Reconnect connector and perform 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. Special Repair Requirement 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u> , "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 2. CALIBRATION OF DECEL G SENSOR Ways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u> , "CALIBRATION OF DECEL G SENSOR : Description".	U1000	CAN COMM CIRCUIT	transmitting or receiving CAN communication signal for 2	ABS actuator and electric unit	В
 CHECK CONNECTOR Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal. Reconnect connector and perform self-diagnosis. S"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. Special Repair Requirement <i>weat-account of the steering angle sensor when replacing the ABS actuator</i> and electric unit (control unit). Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Aways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Description". 	Diagno	sis Procedure		INFOID:000000004064759	
 Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal. Reconnect connector and perform self-diagnosis. <u>s "CAN COMM CIRCUIT" displayed in self-diagnosis display items?</u> 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. Special Repair Requirement <i>Nerocommentation</i> ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u>. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Aways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Description". 	INSPEC	TION PROCEDURE			
the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal. 2. Reconnect connector and perform self-diagnosis. <u>s "CAN COMM CIRCUIT" displayed in self-diagnosis display items?</u> 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. Special Repair Requirement INFORMATION OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Aways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13, "CALIBRATION OF DECEL G SENSOR : Description"</u>.</u>	1. CHEC	K CONNECTOR			
s "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. Special Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12</u> , "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 2.CALIBRATION OF DECEL G SENSOR Aways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u> , "CALIBRATION OF DECEL G SENSOR : Description".	the t	erminals for deformation,			
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. Special Repair Requirement Information of the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Aways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". >> GO TO 2 2.CALIBRATION OF DECEL G SENSOR Aways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".		•	0		
NO >> Connector terminal is loose, damaged, open, or shorted. Special Repair Requirement INFOLLOBORDOUGHERTOR 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-12, "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-13, "CALIBRATION OF DECEL G SENSOR : Description".				anosis Flow Chart"	
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-12</u> , "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 <u>BRC-13</u> , "CALIBRATION OF DECEL G SENSOR : Description".				ghosis riow onart.	
Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-12. "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-13, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	Special	Repair Requiremer	nt	INFOID:00000004064760	
 and electric unit (control unit). Refer to <u>BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL</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-13, "CALIBRATION OF DECEL G SENSOR : Description"</u>. 	1.adju	STMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION		
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-13</u> , "CALIBRATION OF DECEL G SENSOR : Description".	and elect	ric unit (control unit). Refe			
Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13, "CALIBRATION OF DECEL G SENSOR : Description"</u> .		>> GO TO 2			
Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".	2.calie	BRATION OF DECEL G S	ENSOR		
>> END				nd electric unit (control unit).	
		>> END			

INFOID:000000004064757

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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

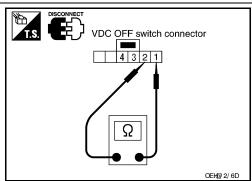
NO >> Go to diagnosis procedure. Refer to <u>BRC-70, "Diagnosis Procedure"</u>.

Diagnosis Procedure

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	Condition	Continuity
Terminal		
1 – 2	When VDC OFF switch is pressed.	Yes
1 – 2	When VDC OFF switch is released.	No



Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

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

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

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

Is the inspection result normal?

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BRC-70

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

NO

>> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND

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

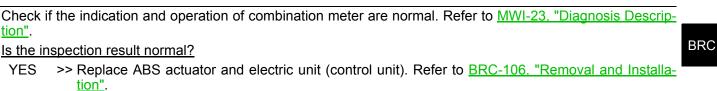
VDC OFF switch			Continuity
Connector	Terminal		Continuity
M154	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4.CHECK COMBINATION METER



NO >> Replace combination meter. Refer to <u>MWI-90</u>, "Removal and Installation".

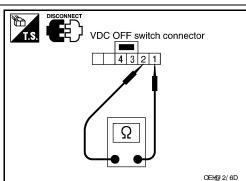
Component Inspection

INSPECTION PROCEDURE

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	Condition	Continuity
Terminal		
1 – 2	When VDC OFF switch is pressed.	Yes
1 – 2	When VDC OFF switch is released.	No



Ω

Is the inspection result normal?

YES >> Inspection End

NO >> Replace VDC OFF switch.

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INFOID:000000004064764

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ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000004064765

×: ON –: OFF

[TYPE 1]

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:000000004064766

1. CHECK ABS WARNING LAMP OPERATION

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

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-72, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000004064767

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23, "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-23</u>, "<u>Diagnosis Descrip-</u> tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-90, "Removal and Installation"</u>.

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

RRAKE WARNING LAMP

[TYPE 1]

Description x: ON -: OFF Condition Brake warning lamp (Note 1) Ignition switch OFF - Ignition switch ON x EBD function is malfunctioning. x 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 switch is only or of brake fluid level switch operation (when switch is insufficient). • 2: After starting engine, brake warning lamp is turned off.	RAKE WARNING LAMP	
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 switch is ON) or of brake fluid level switch 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 Diagnostic Law POPERATION 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 BRC-73. "Diagnosis Procedure". Diagnosis Procedure	escription	INFOID:000000004064768
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 of fluid is inspection fluid is inspection fluid is inspection fluid is inspection Refer to BRC-73, "Diagnosis Proceedure". Diagnosis Procedure		×: ON –: 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 • • I.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 BRC-73. "Diagnosis Procedure". • • • Diagnosis Procedure •	Condition	Brake warning lamp (Note 1)
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. <i>mercin concomment</i> Function Check Component Function Check <i>mercin concomment</i> Function Check 1.BRAKE WARNING LAMP OPERATION CHECK <i>mercin concomment</i> Figure 10 (when 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-73. "Diagnosis Procedure"</u> . Diagnosis Procedure <i>mercin concommenter</i> . 1.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23. "CONSULT-III Function (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-23. "Diagnosis Description"</u> . S >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installation"</u> .	gnition switch OFF	_
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 weoecocococococococococococococococococo	gnition switch ON	× (Note 2)
 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 I: 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 BRC-73. "Diagnosis Procedure". Diagnosis Procedure Mean ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-23. "CONSULT-III Function (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 MWI-23. "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106. "Removal and Installation". 	EBD function is malfunctioning.	×
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-73. "Diagnosis Procedure"</u> . Diagnosis Procedure <i>NETOR</i> 1. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23. "CONSULT-III Function (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-23. "Diagnosis Description"</u> . Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installation"</u> .	1: Brake warning lamp will turn on in case of parking brake ope (when brake fluid is insufficient).	eration (when switch is ON) or of brake fluid level switch operation
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 BRC-73. "Diagnosis Procedure". Diagnosis Procedure I.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-23. "CONSULT-III Function (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 MWI-23. "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installation".	omponent Function Check	INFOID:000000004064769
started. Is the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-73, "Diagnosis Procedure". Diagnosis Procedure I.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-23, "CONSULT-III Function (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 MWI-23, "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installation".	.BRAKE WARNING LAMP OPERATION CHECK	
NO >> Go to diagnosis procedure. Refer to <u>BRC-73. "Diagnosis Procedure"</u> . Diagnosis Procedure INFORCEMENTE 1.CHECK SELF-DIAGNOSIS Information and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23. "CONSULT-III Function (ABS)"</u> . Is the inspection result normal? YES 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-23. "Diagnosis Description"</u> . Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installation"</u> .	arted.	itch is turned ON, and turns OFF after the engine is
1.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-23, "CONSULT-III Function (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 MWI-23, "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installation".	NO >> Go to diagnosis procedure. Refer to <u>BRC-7</u>	73, "Diagnosis Procedure".
Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23</u> , " <u>CONSULT-III Function</u> (<u>ABS</u>)". <u>Is the inspection result normal?</u> 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-23</u> , " <u>Diagnosis Descrip-</u> tion". <u>Is the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u> , " <u>Removal and Installa-</u> tion".	lagnosis Procedure	INFOID:00000004064770
(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-23</u> , "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u> , "Removal and Installation".	.CHECK SELF-DIAGNOSIS	
Is the inspection result normal? YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. 2.CHECK COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installation".		elf-diagnosis. Refer to BRC-23, "CONSULT-III Function
NO >> Check items displayed by self-diagnosis. 2.CHECK COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-106, "Removal and Installa-tion".		
 2.CHECK COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to <u>MWI-23</u>, "<u>Diagnosis Description</u>". <u>Is the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u>, "<u>Removal and Installation</u>". 	YES >> GO TO 2	
Check if the indication and operation of combination meter are normal. Refer to <u>MWI-23</u> , " <u>Diagnosis Descrip-</u> <u>tion</u> ". <u>Is the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u> , " <u>Removal and Installa-</u> <u>tion</u> ".		
tion". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u> , " <u>Removal and Installa-</u> tion".	CHECK COMBINATION METER	
<u>Is the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106, "Removal and Installa-</u> <u>tion"</u> .	•	eter are normal. Refer to <u>MWI-23, "Diagnosis Descrip-</u>
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u> , " <u>Removal and Installa-</u> <u>tion</u> ".		
tion".	·	ontrol unit) Refer to BRC-106 "Removal and Installa-
NO >> Replace combination meter. Refer to <u>MWI-90, "Removal and Installation"</u> .		Sintor antig. Refer to <u>BRO-100, Removal and Installa-</u>
	NO >> Replace combination meter. Refer to <u>MWI-</u>	-90. "Removal and Installation".

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VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000004064771

×: 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:000000004064772

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-74, "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-70. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000004064773

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-70. "Diagnosis Procedure"</u>.

2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-23</u>, "CONSULT-III Function (<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-23, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u>, "<u>Removal and Installa-</u> tion".

NO >> Replace combination meter. Refer to <u>MWI-90, "Removal and Installation"</u>.

BRC-74

SLIP INDICATOR LAMP

SLIP INDICATOR LAMP

Description

[TYPE 1]

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INFOID:000000004064774

	×: 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	INFOID:000000004064775
1. CHECK SLIP INDICATOR LAMP OPERATION	
Check that the lamp illuminates for approximately 2	2 seconds after the ignition switch is turned ON.
Is the inspection result normal?	-
YES >> Inspection End	
NO >> Go to diagnosis procedure. Refer to BF	<u> RC-75, "Diagnosis Procedure"</u> .
Diagnosis Procedure	INFOID:00000004064776
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit (ABS)".	t) self-diagnosis. Refer to <u>BRC-23, "CONSULT-III Function</u>
Is the inspection result normal?	
YES >> GO TO 2	
NO >> Check items displayed by self-diagnosi	IS.
2. CHECK COMBINATION METER	
	on meter are normal. Refer to <u>MWI-23, "Diagnosis Descrip-</u>
Check if the indication and operation of combinatio	on meter are normal. Refer to <u>MWI-23, "Diagnosis Descrip-</u>
Check if the indication and operation of combination tion". Is the inspection result normal?	on meter are normal. Refer to <u>MWI-23, "Diagnosis Descrip-</u> it (control unit). Refer to <u>BRC-106, "Removal and Installa-</u>
Check if the indication and operation of combinatio tion". Is the inspection result normal? YES >> Replace ABS actuator and electric uni	it (control unit). Refer to BRC-106, "Removal and Installa-

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APPLICATION NOTICE

ECU DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000004064777

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

< ECU DIAGNOSIS >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

CONSULT-III MONITOR ITEM

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	D
		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)	E
		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)	BRC
		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)	G
		0 [km/h (MPH)]	Vehicle stopped	Ц
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)	- H
STOP LAMP SW	Stop Jamp quitch signal status	When brake pedal is depressed	ON	I
STOP LAWF SW	Stop lamp switch signal status	When brake pedal is released	OFF	I
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	J
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	K
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	L
		VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	M
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	- N
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	IN
TAW RATE SEN	sensor	When vehicle turning	–75 to 75 d/s	
ACCEL POS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %	0
AUUEL PUD DIG	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	Р
		Vehicle stopped	Approx. 0 m/s ²	-
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s ²)	
		Vehicle turning left	Positive value (m/s ²)	_

[TYPE 1]

INFOID:000000004064778

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< ECU DIAGNOSIS >

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
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°	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome ter display	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON	
FLUID LEV SVV	Brake huid level switch signal status	When brake fluid level switch OFF	OFF	
		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	
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON	
FR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
	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 IN SOL		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 OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR RH IN SOL		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	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	
NN KH OUT SOL		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 sciencid value	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON	
RR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	

BRC-78

< ECU DIAGNOSIS >

[TYPE 1]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
	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	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are op- erating	ON
MOTOR RELAT		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator rolay operation	When the actuator relay is operating	ON
	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
OFF LAMP VDC OFF indicator lamp (Note 2)	When VDC OFF indicator lamp is ON	ON	
	(Note 2)	When VDC OFF indicator lamp is OFF	OFF
	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
SLIP LAMP	(Note 2)	When SLIP indicator lamp is OFF	OFF
		EBD is active	ON
EBD SIGNAL	EBD operation	EBD is inactive	OFF
		ABS is active	ON
ABS SIGNAL ABS operation	ABS is inactive	OFF	
		TCS is active	ON
TCS SIGNAL TCS operation	TCS is inactive	OFF	
		VDC is active	ON
VDC SIGNAL VDC operation		VDC is inactive	OFF
		In EBD fail-safe	ON
EBD FAIL SIG EBD fail-safe signal		EBD is normal	OFF
		In ABS fail-safe	ON
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF
		In TCS fail-safe	ON
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF
		In VDC fail-safe	ON
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF
		Crank is active	ON
CRANKING SIG Crank operation	Crank operation	Crank is inactive	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 (igni- tion switch ON)	OFF	

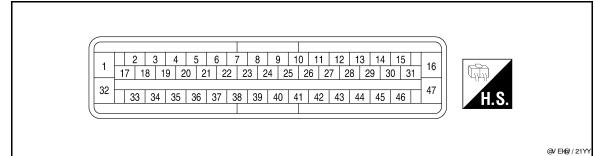
< ECU DIAGNOSIS >

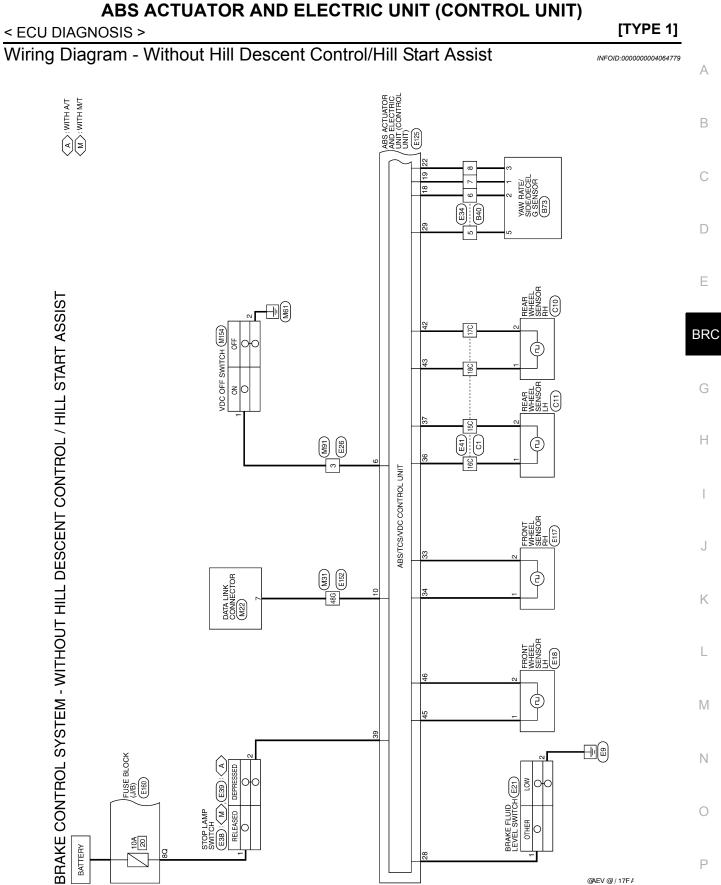
		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
CV2	VDC switch-over valve	When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail- safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
SV1	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	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	
	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G	
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G	
EBD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON	
		When EBD warning lamp is OFF	OFF	
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON	
N F 031 313		A/T shift position = other than N position	OFF	
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON	
P POSI SIG PNP switch signal ON/OFF condition		A/T shift position = other than P position	OFF	
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON	
		A/T shift position = other than R position	OFF	
2WD/4WD	Drive axle	2WD model	2WD	
		4WD model	4WD	

NOTE:

- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-72, "Description".
- Brake warning lamp: Refer to BRC-73, "Description".
- VDC OFF indicator lamp: Refer to BRC-74, "Description".
- SLIP indicator lamp: Refer to BRC-75, "Description".

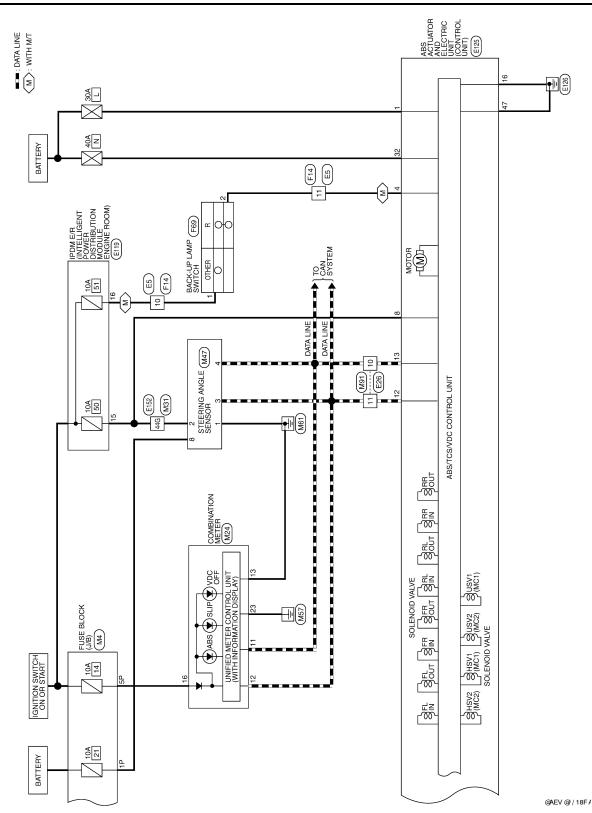
TERMINAL LAYOUT

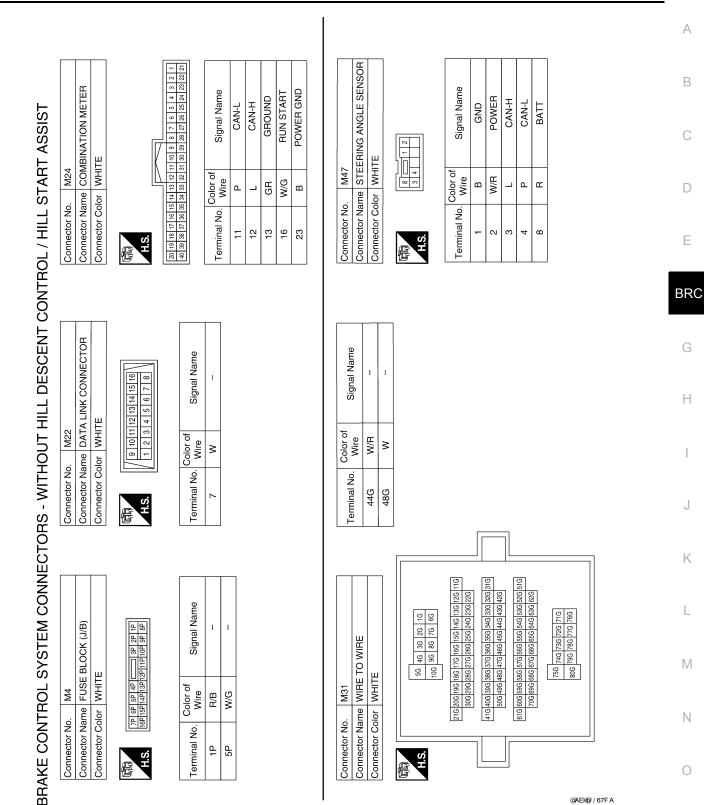




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[TYPE 1]





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[TYPE 1]

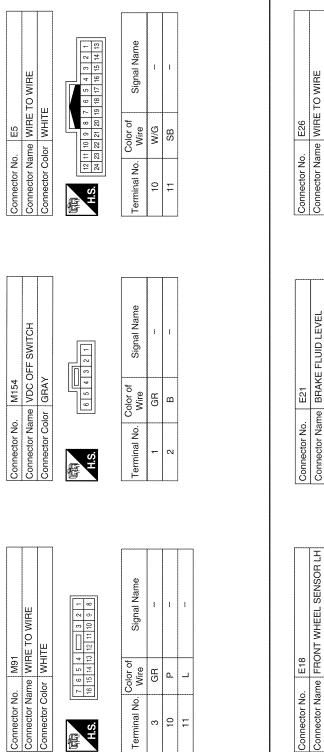
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[TYPE 1]



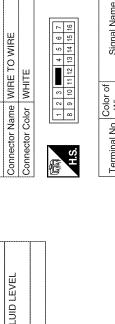
Terminal No.

H.S.

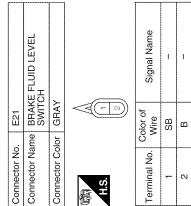
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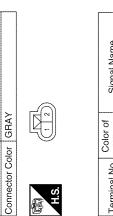
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Signal Name	T		ł
Color of Wire	GR	٩	<u>ب</u>
Terminal No. Wire	ო	10	÷

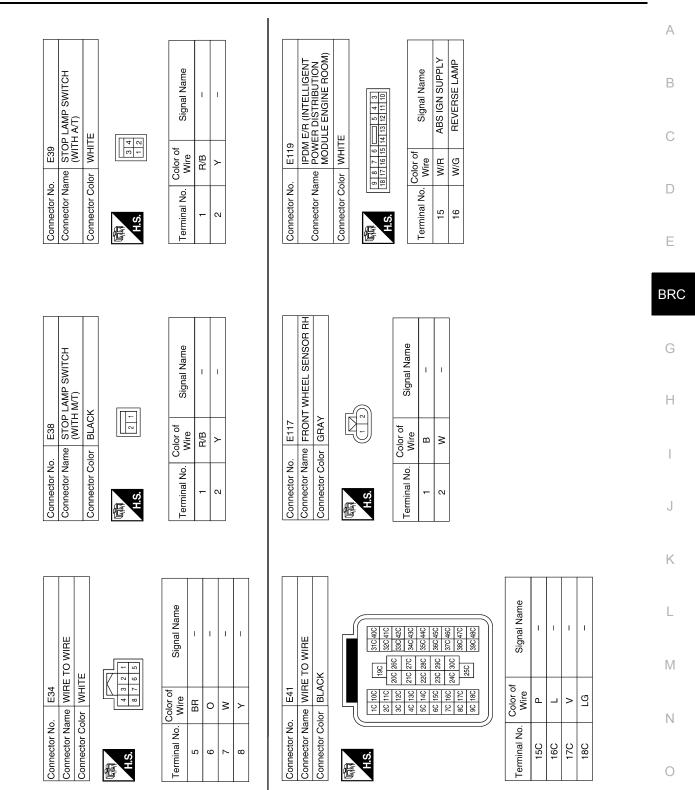




Signal Name ł 1 Color of Wire œ ഗ Terminal No. N **~**~~

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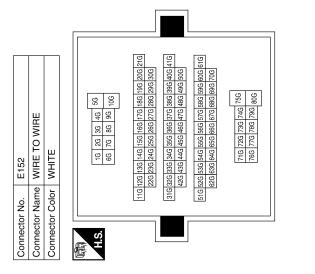


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[TYPE 1]

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[TYPE 1]



Signal Nama		I	I	
Color of	Wire	W/R	M	
Terminal No		946	48G	

Signal Name	I	I	I	I	I	FLUID LEVEL SW	CLUS_GND	I	I	VALVE ECU SUPPLY	FR_RH_SIG	FR_RH_PWR	Ι	RR_LH_PWR	RR_LH_SIG	I	STOP LAMP SW	I	Ι	RR_RH_SIG	RR_RH_PWR	Ι	FR_LH_PWR	FR_LH_SIG	MOTOR GND
Color of Wire	1	I	I	I	I	GR	ВВ	I	I	≻	×	ш	I	_	٩	I	SB	I	I	>	ГG	I	g	В	В
Terminal No.	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

				$\left[\right]$	16	47
					15 131	Ş
E125	Connector Name ELECTRIC UNIT (CONTROL UNIT)	BLACK			2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	02 00 00 10 11 12 12 12
Connector No.	Connector Name	Connector Color BLACK	同同 H.S.		1 2 3 4 5 17 18 19 20 2	32 20 24 25 26

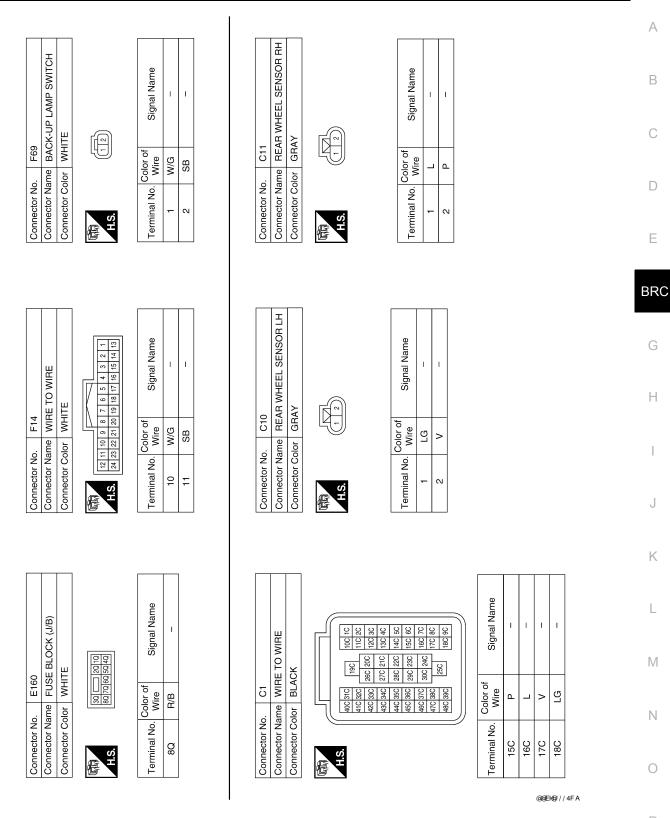
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	14	6		45	
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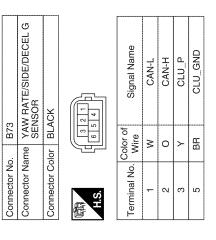
1 15 16 30 31 16 5 46 47		1	1																				
7 8 9 10 11 12 13 14 23 24 25 26 27 28 29 8 39 40 41 42 43 44 45	Signal Name	MOTOR SUPPLY	I	I	REV_SW	I	VDC OFF SW	I	IGN	1	DIAG-K	I	CAN-H	CAN-L	I	I	VALVE ECU GND	I	CAN2-H	CAN2-L	I	Ι	CLUS_SUP
20 21 22 20 21 22	Color of Wire	щ	I	I	>	I	GR	I	W/R	I	SB	I	_	Р	I	I	В	I	0	W	I	Ι	≻
1 2 3 4 1 17 18 19 3 32 33 34 35	Terminal No.	-	2	3	4	5	9	2	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22

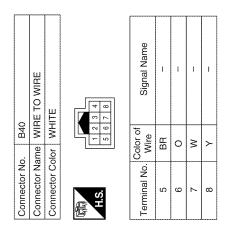
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[TYPE 1]







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Fail-Safe

INFOID:000000004064780

CAUTION:

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

ABS/EBD SYSTEM

BRC-88

< ECU DIAGNOSIS >

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.
- 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

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[TYPE 1]

DTC	Items (CONSULT screen terms)	Reference	В
C1101	RR RH SENSOR-1		
C1102	RR LH SENSOR-1	DDC 20 "Description"	
C1103	FR RH SENSOR-1	BRC-29, "Description"	(
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2	BRC-32, "Description"	
C1107	FR RH SENSOR-2	BRC-32, Description	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-35, "Description"	
C1110	CONTROLLER FAILURE	BRC-37, "DTC Logic"	
C1111	PUMP MOTOR	BRC-38, "Description"	
C1113	G-SENSOR	BRC-40, "Description"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-43, "Description"	
C1116	STOP LAMP SW	BRC-46, "Description"	
C1120	FR LH IN ABS SOL	BRC-48, "Description"	
C1121	FR LH OUT ABS SOL	BRC-51, "Description"	
C1122	FR RH IN ABS SOL	BRC-48, "Description"	
C1123	FR RH OUT ABS SOL	BRC-51, "Description"	
C1124	RR LH IN ABS SOL	BRC-48, "Description"	
C1125	RR LH OUT ABS SOL	BRC-51, "Description"	
C1126	RR RH IN ABS SOL	BRC-48, "Description"	
C1127	RR RH OUT ABS SOL	BRC-51, "Description"	
C1130	ENGINE SIGNAL 1		
C1131	ENGINE SIGNAL 2		
C1132	ENGINE SIGNAL 3	BRC-54, "Description"	
C1133	ENGINE SIGNAL 4		
C1136	ENGINE SIGNAL 6		
C1140	ACTUATOR RLY	BRC-56, "Description"	
C1143	ST ANG SEN CIRCUIT	PDC 59 "Deparinties"	
C1144	ST ANG SEN SIGNAL	BRC-58, "Description"	

< ECU DIAGNOSIS >

[TYPE 1]

DTC	Items (CONSULT screen terms)	Reference
C1145	YAW RATE SENSOR	BRC-40, "Description"
C1146	SIDE G-SEN CIRCUIT	BRC-40, Description
C1155	BR FLUID LEVEL LOW	BRC-60. "Description"
C1156	ST ANG SEN COM CIR	BRC-63. "Description"
C1160	DECEL G SEN SET	BRC-64, "Description"
C1163	ST ANGL SEN SAFE	BRC-65, "Description"
C1164	CV1	
C1165	CV2	BRC-66, "Description"
C1166	SV1	BRC-00, Description
C1167	SV2	
C1170	VARIANT CODING	BRC-37, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-69, "Description"

APPLICATION NOTICE

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS APPLICATION NOTICE

Application Notice

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Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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VDC/TCS/ABS

< SYMPTOM DIAGNOSIS >

VDC/TCS/ABS

INFOID:000000004064783

[TYPE 1]

Symptom Table

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	BRC-93, "Diagno- sis Procedure"
1 2	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-94, "Diagno-
	Make sure the braking force is sufficient when the ABS is not operating.	sis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-95, "Diagno- sis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-96, "Diagno- sis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-97, "Diagno-
occurs (Note 2)	ABS actuator and electric unit (control unit)	sis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS con- trol	ТСМ	BRC-98, "Diagno- sis 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	
<pre>< SYMPTOM DIAGNOSIS > [TYPE 1] EXCESSIVE ABS FUNCTION OPERATION FREQUENCY</pre>	i.
	ŀ
Diagnosis Procedure	
1.CHECK START	E
Check front and rear brake force distribution using a brake tester.	
<u>Is the inspection result normal?</u> YES >> GO TO 2	(
NO >> Check brake system.	
2. CHECK FRONT AND REAR AXLE	Γ
Make sure that there is no excessive play in the front and rear axles. Refer to front: <u>FAX-5, "On-Vehicle</u> <u>Inspection and Service"</u> , Rear: <u>RAX-8, "Rear Axle Bearing"</u> (C200) or <u>RAX-20, "Rear Axle Bearing"</u> (M226).	
Is the inspection result normal?	E
YES >> GO TO 3 NO >> Repair or replace malfunctioning components.	_
3. CHECK WHEEL SENSOR AND SENSOR ROTOR	B
 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?	ŀ
 YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to <u>BRC-104, "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-23, "CONSULT-III Function (ABS)"</u> . NO >> Normal	ŀ
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UNEXPECTED PEDAL REACTION

Diagnosis Procedure

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1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-15, "Inspection and Adjustment".

Is the stroke too large?

- YES >> Bleed air from brake tube and hose. Refer to <u>BR-17, "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-15</u>, "Inspection and Adjustment" (brake pedal), <u>BR-11</u>, "On <u>Board Inspection</u>" (master cylinder), <u>BR-9</u>, "Inspection" (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

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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-23, "CONSULT-III Function (ABS)"</u>.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS < SYMPTOM DIAGNOSIS > [TYPE 1] PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS	
Diagnosis Procedure	A
 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 	B
Check that there are pedal vibrations when the engine is started. Do vibrations occur?	E
YES >> GO TO 2 NO >> Inspect the brake pedal. 2.SYMPTOM CHECK 2	BR
Check that there are ABS operation noises when the engine is started. Do the operation noises occur?	G
YES >> GO TO 3 NO >> Perform self -diagnosis. Refer to <u>BRC-23</u> , <u>"CONSULT-III Function (ABS)"</u> . 3. SYMPTOM CHECK 3	Н
Check symptoms when electrical component (headlamps, etc.) switches are operated. <u>Do symptoms occur?</u> 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	I
NO >> Normal	J
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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:000000004064789

[TYPE 1]

1.SYMPTOM CHECK

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

Is the inspection result normal?

YES >> Normal. NO >> GO TO 2

NO >> GO TO 2

2.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to <u>BRC-23</u>, "CONSULT-III Function (ABS)".

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis.

NO >> GO TO 3

3.CHECK CONNECTOR

• Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc.

• Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis results indicated?

YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

Perform ECM and TCM self-diagnosis.

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
 - ECM: Refer to EC-67, "CONSULT-III Function (ENGINE)".
 - TCM: Refer to <u>TM-102</u>, "CONSULT-III Function (TRANSMISSION)".
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-106</u>, "<u>Removal and Installa-</u> tion".

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000004064790

[TYPE 1]

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		(
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condi- tion due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	_
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	B
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	(
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	
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.)	
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.	

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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.

Precaution for Brake System

CAUTION:

- Refer to MA-11, "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 <u>BR-32, "Brake Burnishing"</u> (front disc brake) or <u>BR-37, "Brake Burnishing"</u> (rear disc brake). WARNING:

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

Precaution for Brake Control

- 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.

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PRECAUTIONS

< PRECAUTION >

[TYPE 1]

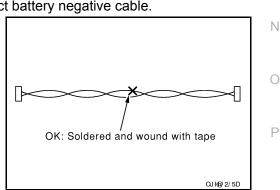
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, 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 self-diagnosis, 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.

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.
- 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).



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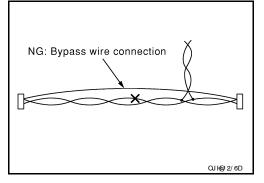
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PRECAUTIONS

< PRECAUTION >

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



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		Checking operation of ABS active wheel sen- sors
ST30031000		Removing sensor rotor
(—) Bearing puller		
	YY@ 6// C	
Commercial Service To	W@6//C	INFOID:00000004064
Commercial Service To		INFOID:0000000406-
Fool name I. Flare nut crowfoot		Description Removing and installing brake piping
Fool name I. Flare nut crowfoot		Description Removing and installing brake piping
Fool name I. Flare nut crowfoot		Description Removing and installing brake piping
Fool name I. Flare nut crowfoot 2. Torque wrench		Description Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
ōool name I. 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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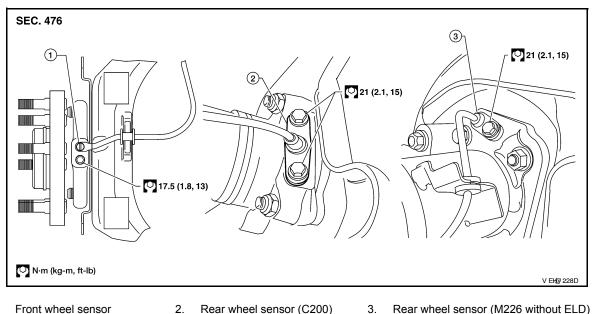
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< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSORS

Removal and Installation

INFOID:000000004064797



Front wheel sensor 1.

REMOVAL

- 1. Remove the wheel sensor bolt(s).
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to BR-33, "Removal and Installation of Brake Caliper and Disc Rotor".
- Pull the wheel sensor straight out, being careful to turn it as little as possible. 2. **CAUTION:**
 - Be careful not to damage the wheel sensor edge and sensor rotor teeth.
 - Do not pull on the wheel sensor harness.
- Disconnect the wheel sensor harness connector, then remove the wheel sensor harness from the mounts 3. 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.

SENSOR ROTOR

< 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 <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-9</u>, "Removal and Installation".

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-21, "Removal and Installation"</u>.
- 2. Pull the sensor rotor off of the axle shaft using Tool and a suitable press.

Tool number : ST30031000 (—)

Installation

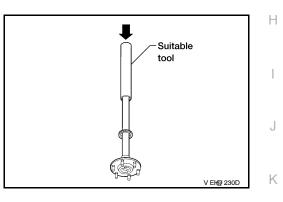
1. Install the new sensor rotor on the axle shaft using a suitable length steel tube and a press. Make sure the sensor rotor is fully seated.

CAUTION:

Do not reuse the old sensor rotor.

 Install the axle shaft assembly. Refer to <u>RAX-21, "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.



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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

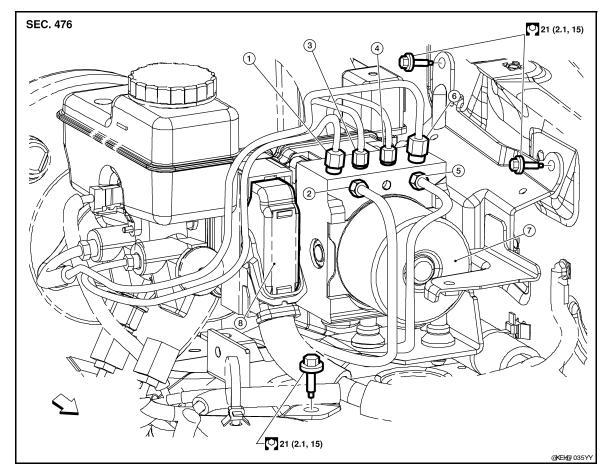
< REMOVAL AND INSTALLATION >

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

INFOID:000000004064799

[TYPE 1]



- From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- 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. Drain the brake fluid. Refer to BR-17, "Drain and Refill".
- 3. Remove air cleaner case. Refer to EM-24, "Exploded View".
- 4. 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.
- 5. Disconnect the brake tubes.
- 6. Remove three bolts and then the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

 If the ABS actuator and electric unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special <u>Repair Requirement</u>".

BRC-106

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< 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.
- When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.
- 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-17, "Bleeding Brake System"</u>.

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BRC-107

STEERING ANGLE SENSOR

Removal and Installation

REMOVAL

- 1. Remove the spiral cable. Refer to SR-6. "Removal and Installation".
- 2. Remove the screws and remove the steering angle sensor from the spiral cable.

INSTALLATION

Installation is in the reverse order of removal.

• Reset the neutral position of the steering angle sensor. Refer to <u>BRC-12, "ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>.

CAUTION:

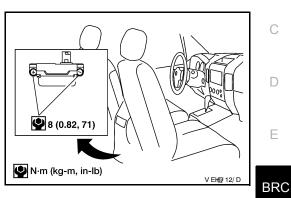
Any time the steering angle sensor is removed and installed or replaced, you must reset the neutral position of the steering angle sensor. Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SEN-SOR NEUTRAL POSITION : Special Repair Requirement".

G SENSOR

Removal and Installation

REMOVAL

- 1. Remove center console. Refer to <u>IP-10, "Exploded View"</u>.
- Remove yaw rate/side/decel G sensor attaching 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 settings of the yaw rate/side/decel G sensor. Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement".

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[TYPE 1]

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BASIC INSPECTION APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

< BASIC INSPECTION >

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to <u>BRC-115</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION : Description</u>".

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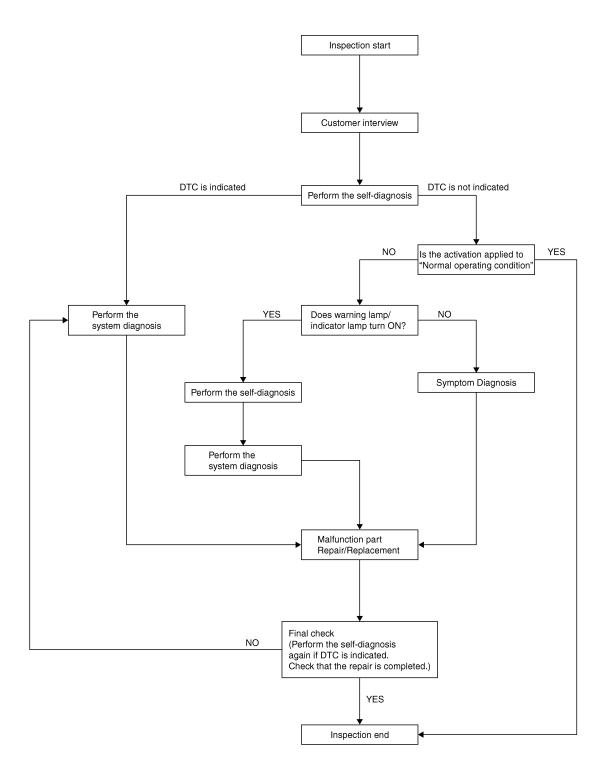
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BRC-111

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-114</u>, <u>"Diagnostic Work Sheet"</u>.

BRC-112

DIAGNOSIS AND REPAIR WORKFLOW

DIAGNOSIS AND REPAIR WORKFLOW	
< BASIC INSPECTION > [TYP	'E 2]
>> GO TO 2	
2.PERFORM THE SELF-DIAGNOSIS	
Check the DTC display with the self-diagnosis function. Refer to BRC-126, "CONSULT-III Function (ABS) ".
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-192, "DTC No. Index"</u> .	
renorm the diagnosis applicable to the displayed DTC. Refer to <u>BRC-192, 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</u> " <u>Description</u> ".	-202,
Is the symptom a normal operation?	
YES >> Inspection End NO >> GO TO 5	
5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION	-
Check that the warning lamp and indicator lamp illuminate.	
ABS warning lamp: Refer to <u>BRC-176, "Description"</u> .	
Brake warning lamp: Refer to <u>BRC-177, "Description"</u> .	
 VDC OFF indicator lamp: Refer to <u>BRC-178, "Description"</u>. SLIP indicator lamp: Refer to <u>BRC-179, "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, et the self diagnosis memory Refer to RPC 126. "CONSULT III Function (ARS)"	erase
the self-diagnosis memory. Refer to <u>BRC-126, "CONSULT-III Function (ABS)"</u> . Is no other DTC present and the repair completed?	
YES >> Inspection End	
NO >> GO TO 3	

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000004064804

[TYPE 2]

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

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INSPECTION AN	
< BASIC INSPECTION >	[TYPE 2]
INSPECTION AND ADJUSTMENT	
ADDITIONAL SERVICE WHEN REPLAC	ING CONTROL UNIT
ADDITIONAL SERVICE WHEN REPLACIN	NG CONTROL UNIT : Description
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 quirement	NG CONTROL UNIT : Special Repair Re-
1.PERFORM THE NEUTRAL POSITION ADJUSTME	INT FOR THE STEERING ANGLE SENSOR
Perform the neutral position adjustment for the steering	g angle sensor.
Special Repair Requirement", GO TO 2	STEERING ANGLE SENSOR NEUTRAL POSITION :
· · · · · · · · · · · · · · · · · · ·	
2. PERFORM CALIBRATION OF THE DECEL G SEN	SOR
Perform calibration of the decel G sensor.	
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S	CEL G SENSOR : Special Repair Requirement".
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116. "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S ADJUSTMENT OF STEERING ANGLE SE	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOID - 00000000000000000000000000000000000
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116. "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S ADJUSTMENT OF STEERING ANGLE SE Refer to the table below to determine if adjustment of s	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD: 000000004064807 eteering angle sensor neutral position is required. x: Required -: Not required
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116. "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S ADJUSTMENT OF STEERING ANGLE SE Refer to the table below to determine if adjustment of s Situation	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD: 000000004064807 eteering angle sensor neutral position is required. x: Required -: Not required
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S 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)	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD: 000000004064807 eteering angle sensor neutral position is required. Xeteering angle sensor neutral position is required. Xeteering angle sensor neutral position Adjustment of steering angle sensor neutral position
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S 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) Replacing ABS actuator and electric unit (control unit)	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOID:00000004064807 eteering angle sensor neutral position is required. X: Required -: Not required Adjustment of steering angle sensor neutral position
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116. "CALIBRATION OF DE</u> ADJUSTMENT OF STEERING ANGLE S 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	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD:00000004064807 Seteering angle sensor neutral position is required. X: Required -: Not required Adjustment of steering angle sensor neutral position
Perform calibration of the decel G sensor. >> Refer to BRC-116, "CALIBRATION OF DE ADJUSTMENT OF STEERING ANGLE S 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	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOID:00000004064807 eteering angle sensor neutral position is required. X: Required –: Not required Adjustment of steering angle sensor neutral position Adjustment of steering angle sensor neutral position X
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> 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	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD:00000004064807 Seteering angle sensor neutral position is required. X: Required –: Not required Adjustment of steering angle sensor neutral position Adjustment of steering angle sensor neutral position X X X X
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116</u> , <u>"CALIBRATION OF DE</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) Replacing ABS actuator and electric unit (control unit) Removing/Installing steering angle sensor Replacing steering angle sensor Removing/Installing steering components Replacing steering components	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD: 00000004084807 eteering angle sensor neutral position is required. X: Required –: Not required Adjustment of steering angle sensor neutral position Adjustment of steering angle sensor neutral position X X X X X
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116. "CALIBRATION OF DE</u> 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	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD:00000004064807 eteering angle sensor neutral position is required. X: Required –: Not required Adjustment of steering angle sensor neutral position Adjustment of steering angle sensor neutral position
Perform calibration of the decel G sensor. >> Refer to <u>BRC-116, "CALIBRATION OF DE</u> 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 Replacing steering angle sensor Replacing steering components Replacing steering components Replacing supension components Replacing suppension components	CEL G SENSOR : Special Repair Requirement". SENSOR NEUTRAL POSITION ENSOR NEUTRAL POSITION : Description INFOLD:00000004064807 eteering angle sensor neutral position is required. X: Required –: Not required Adjustment of steering angle sensor neutral position Adjustment of steering angle sensor neutral position

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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.

INSPECTION AND ADJUSTMENT

< 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.

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 "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-126, "CONSULT-III Function (ABS)"</u>.

ECM: Refer to <u>EC-67, "CONSULT-III Function (ENGINE)"</u>.

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:000000004064809

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	x

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:000000004064810

CALIBRATION OF DECEL G SENSOR CAUTION: To calibrate the decel G sensor, make sure to use CONSULT-III (Calibration cannot be done without CONSULT-III)

BRC-116

INSPECTION AND ADJUSTMENT

INSPECTION AND ADJUSTMENT	
< BASIC INSPECTION >	[TYPE 2]
1 .ALIGN THE VEHICLE STATUS	
Stop vehicle with front wheels in straight-ahead position.	
>> GO TO 2 2.PERFORM CALIBRATION OF DECEL G SENSOR	
1. On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION	l" in order
2. Touch "START".	
 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	В
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. <u>Is the inspection result normal?</u>	
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 BRC-126, "CONSULT-III Function (ABS)"	1-
 ECM: Refer to <u>EC-67, "CONSULT-III Function (ENGINE)"</u>. Are the memories erased? 	
YES >> Inspection End	
NO >> Check the items indicated by the self-diagnosis.	

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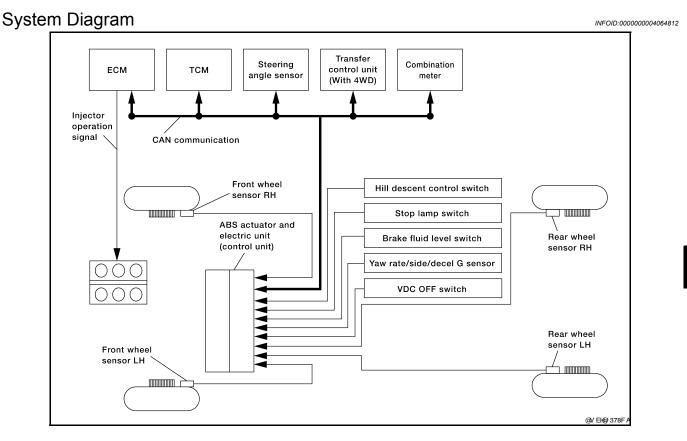
FUNCTION DIAGNOSIS APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

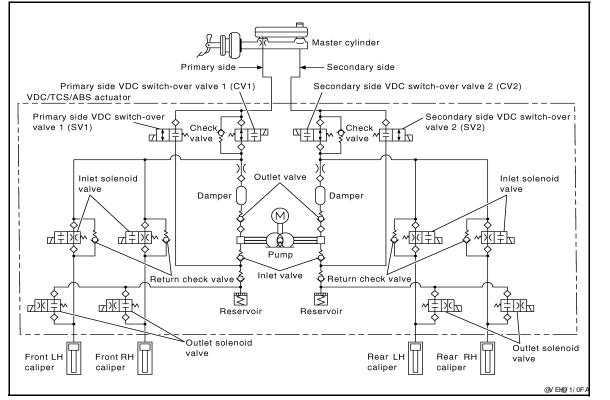
< FUNCTION DIAGNOSIS >

VDC



VDC

HYDRAULIC CIRCUIT DIAGRAM



[TYPE 2]

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System Description

[TYPE 2]

- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from 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.

INFOID:000000004064814



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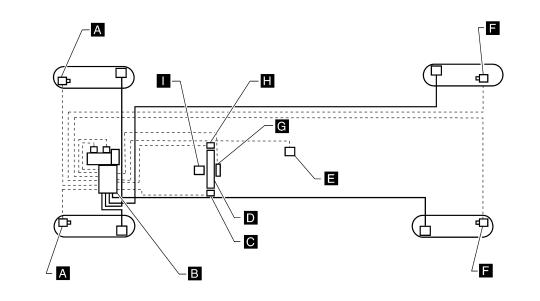
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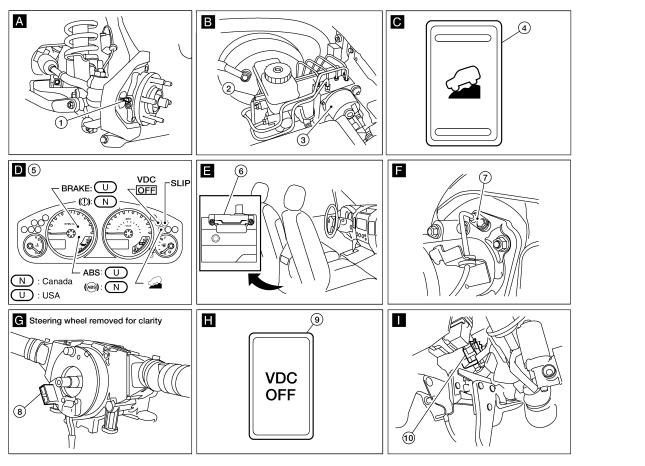
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@VEH@/1/1FA

- 1. Front wheel sensor LH E18 2. Front wheel sensor RH E117
- Brake fluid level switch E21
- 3. ABS actuator and electric unit (control unit) E125

- 4. Hill descent control switch M155 5.
- Combination meter M24
- 6. Yaw rate/side/decel G sensor B73

BRC-121

< FUNCTION DIAGNOSIS >

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

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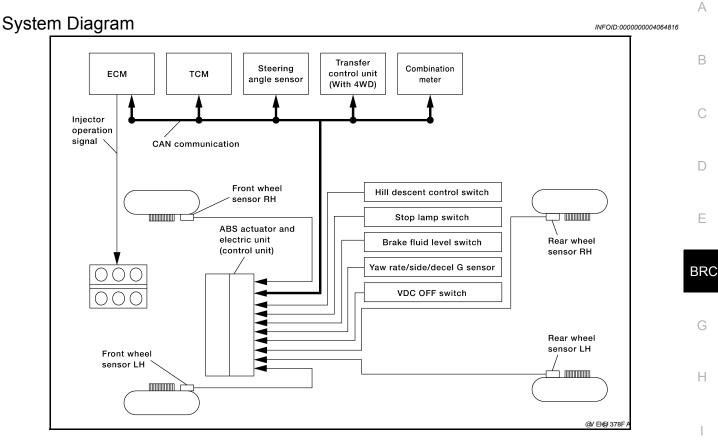
- Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154 ble) M47 (Steering wheel removed for clarity)
- 10. Stop lamp switch E39

Component Description

Component parts		Reference
	Pump Motor	BRC-141, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-159, "Description"
	Solenoid valve	BRC-151, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-169, "Description"
Wheel sensor		BRC-146, "Description"
Yaw rate/side/decel G sensor		BRC-143, "Description"
Brake fluid level switch	BRC-163, "Description"	
Steering angle sensor	BRC-161, "Description"	
Stop lamp switch	BRC-149, "Description"	
VDC OFF switch	BRC-174, "Description"	
ABS warning lamp	BRC-176, "Description"	
Brake warning lamp	BRC-177, "Description"	
VDC OFF indicator lamp		BRC-178, "Description"
SLIP indicator lamp		BRC-179, "Description"

< FUNCTION DIAGNOSIS >

TCS



System Description

 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 pres-Κ sure 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.

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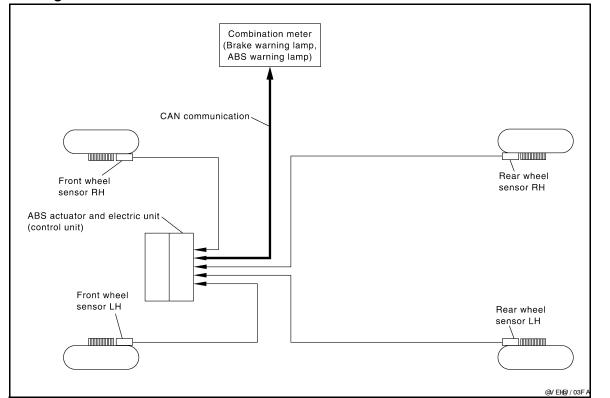
TCS

BRC-123

ABS

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System Diagram

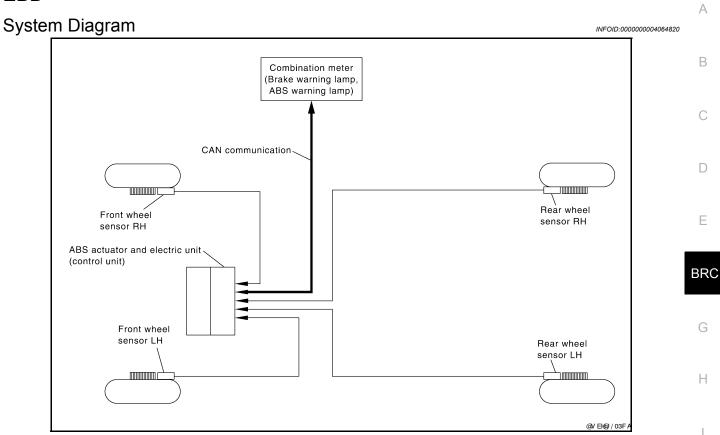


ABS

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.

EBD



EBD

System Description

- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then 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.

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< FUNCTION DIAGNOSIS >

[TYPE 2]

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

CONSULT-III Function (ABS)

INFOID:000000004064822

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.		
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.		

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, 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-192, "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
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position judged by PNP switch signal is displayed.
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.

< FUNCTION DIAGNOSIS >

[TYPE 2]

	Dat	a monitor item sele			
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	A
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.	В
BATTERY VOLT (V)	x	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is dis- played.	С
N POSI SIG (ON/OFF)	-	_	×	Shift position judged by PNP switch signal.	
P POSI SIG (ON/OFF)	-	-	×	Shift position judged by PNP switch signal.	D
ACCEL POS SIG (%)	×	-	×	Throttle valve open/close status judged by CAN communication signal is displayed.	E
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN com- munication signal is displayed.	BRC
STR ANGLE SIG (°)	×	-	×	Steering angle detected by steering angle sensor is displayed.	Dirte
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sen- sor is displayed.	G
SIDE G-SENSOR (m/s ²)	×	_	×	Transverse acceleration detected by side G-sensor is displayed.	Н
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.	11
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.	
ABS WARN LAMP (ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) status is displayed.	1
SLIP LAMP (ON/OFF)	-	×	×	SLIP indicator lamp (ON/OFF) sta- tus is displayed.	0
FR LH IN SOL (ON/OFF)	-	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.	Κ
FR LH OUT SOL (ON/OFF)	-	×	×	Front LH OUT ABS solenoid (ON/ OFF) status is displayed.	I
RR RH IN SOL (ON/OFF)	-	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.	L
RR RH OUT SOL (ON/OFF)	-	×	×	Rear RH OUT ABS solenoid (ON/ OFF) status is displayed.	M
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.	Ν
RR LH IN SOL (ON/OFF)	-	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.	0
RR LH OUT SOL (ON/OFF)	-	×	×	Rear LH OUT ABS solenoid (ON/ OFF) status is displayed.	
OFF LAMP (ON/OFF)	-	×	×	OFF Lamp (ON/OFF) status is dis- played.	Ρ
MOTOR RELAY (ON/OFF)	-	×	×	ABS motor relay signal (ON/OFF) status is displayed.	
ACTUATOR RLY (ON/OFF)	-	×	×	ABS actuator relay signal (ON/OFF) status is displayed.	

< FUNCTION DIAGNOSIS >

[TYPE 2]

ltore	Data monitor item selection			
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
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 dis- played.
SV1 (ON/OFF)	_	_	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) sta- tus is displayed.
SV2 (ON/OFF)	_	_	×	Rear side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	_	_	×	VDC fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	_	_	×	TCS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	_	_	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	_	_	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	_	×	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	_	_	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	_	_	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	_	_	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	_	_	×	VDC operation (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	_	_	×	Brake warning lamp (ON/OFF) sta- tus is displayed.
SLCT LVR POSI (P, R, N, D)	×	×	×	Shift position judged by PNP switch signal.
R POSI SIG (ON/OFF)	_	_	×	Shift position judged by PNP switch signal.
2WD/4WD (2WD/4WD)	_	_	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
CRANKING SIG (ON/OFF)	_	_	×	The input state of the key SW START position signal is displayed.
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.
HDC SW (ON/OFF)	_	_	×	Hill descent control switch (ON/OFF) status is displayed.
HDC SIG (ON/OFF)	_	_	×	Hill descent control operation (ON/ OFF) status is displayed.
HSA SIG (ON/OFF)	_	_	×	Hill start assist operation (ON/OFF) status is displayed.
DLOCK SW (ON/OFF)	-	_	×	Condition of differential lock mode switch (ON/OFF) is displayed.

< FUNCTION DIAGNOSIS >

[TYPE 2]

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ltom	Data	a monitor item sele	ection	
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
DLOCK CHG SW (ON/OFF)	_	-	×	Condition of differential lock position switch (ON/OFF) is displayed.
STP ON RLY (ON/OFF)	_	_	×	Stop lamp relay signal (ON/OFF) status is displayed.
×: Applicable –: Not applicable				
ACTIVE TEST MODE CAUTION: • Do not perform active test v				
 Make sure to completely ble The active test cannot be performed and the performance of the second secon			ng lamp, VDC (OFF indicator lamp, SLIP indi-

- The active test cannot be performed with the ABS v cator 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.

Oneration	AE	3S solenoid v	alve	ABS	ABS solenoid valve (ACT)			
Operation		Up	Keep	Down	Up	ACT UP	ACT KEEP	k
	FR RH IN SOL	Off	On	On	_	_	_	K
FR RH SOL	FR RH OUT SOL	Off	Off	On*	_	—	—	
FR LH SOL	FR LH IN SOL	Off	On	On	—	_	_	L
FR LH SOL	FR LH OUT SOL	Off	Off	On*	_	_	_	
	RR RH IN SOL	Off	On	On	_	—	—	
RR RH SOL	RR RH OUT SOL	Off	Off	On*	—	_	_	M
	RR LH IN SOL	Off	On	On	—	_	_	
RR LH SOL	RR LH OUT SOL	Off	Off	On*	_	_	_	Ν
	FR RH IN SOL	_	—	—	Off	Off	Off	
	FR RH OUT SOL	_	—	—	Off	Off	Off	
FR RH ABS SOLENOID (ACT)	CV1	_	_	_	Off	On	On	0
	SV1		_	—	Off	On*	Off	
FR LH ABS SOLENOID (ACT)	FR LH IN SOL		_	—	Off	Off	Off	Р
	FR LH OUT SOL	_	—	—	Off	Off	Off	
	CV1	_	—	_	Off	On	On	
	SV1		—	—	Off	On*	Off	

< FUNCTION DIAGNOSIS >

[TYPE 2]

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP
	RR RH IN SOL	—	—	—	Off	Off	Off
RR RH ABS SOLENOID (ACT)	RR RH OUT SOL	—	_	_	Off	Off	Off
KK KH ABS SOLENOID (ACT)	CV2	—	_	_	Off	On	On
	SV2	—	_	_	Off	On*	Off
	RR LH IN SOL	—	—	—	Off	Off	Off
	RR LH OUT SOL	—	_	_	Off	Off	Off
RR LH ABS SOLENOID (ACT)	CV2	—	_	_	Off	On	On
	SV2	—	—	—	Off	On*	Off
REAR SOL	This item is not used for this model.						

*: 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

APPLICATION NOTICE

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000004064823

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< 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

INFOID:000000004064825

INFOID:000000004064824

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-132</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064826

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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.

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

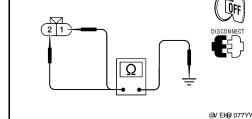
NOTE: The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

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

BRC-132

C1101, C1102, C1103, C1104 WHE		
< COMPONENT DIAGNOSIS >	[TYPE 2]	
NOTE: If the red SENSOR indicator illuminates but does not flash, reverses.	erse the polarity of the tester leads and	А
Does the ABS active wheel sensor tester detect a signal?		
YES >> GO TO 3 NO >> Replace the wheel sensor. Refer to <u>BRC-207, "Removal</u>	and Installation".	В
3.CHECK TIRES		
Check for inflation pressure, wear and size of each tire.		С
Are tire pressure and size correct and is tire wear within specifications	<u>s?</u>	
YES >> GO TO 4 NO >> Adjust tire pressure or replace tire(s).		D
4.CHECK WHEEL BEARINGS		
Check wheel bearing axial end play. Refer to FAX-5, "On-Vehicle Ing "Rear Axle Bearing" (rear).	spection and Service" (front) or RAX-20,	E
Is the inspection result normal?		
YES >> GO TO 5		BRC
NO >> Repair or replace as necessary. Refer to <u>FAX-8</u> , "Removal and Installation" (rear).	oval and Installation" (front) or RAX-25.	
5.check wiring harness for short circuit		G
1. Disconnect ABS actuator and electric unit (control unit) connec-		
tor and wheel sensor connector of malfunction code No. 2. Check continuity between wheel sensor harness connector ter-		Н
 Check continuity between wheel sensor harness connector ter- minals and ground. 		
Continuity should not exist.		
Is the inspection result normal?		
YES >> GO TO 6		

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



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6. Check wiring harness for open circuit

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

Wheel sensor		ABS actuator and electric unit (control unit)		nsor	Continuity				
	Connector	Terminal	Connector	Terminal					
		45	540	1					
Front LH		46	E18	2					
		34	E117	1					
Front RH	– E125	33		L117	L117		2	Yes	
Poor I H	E 125	36		1	res				
Rear LH		37		37	2				
Rear RH	-	43	010	010	010	1			
		42	C10	2					

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Installation".

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

Component Inspection

INFOID:000000004064827

[TYPE 2]

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-132, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064828

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-12</u>, "<u>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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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:000000004064830

INFOID:000000004064829

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.		E
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 connectorWheel 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.		Н

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	К
RR RH SENSOR-2	Γ
RR LH SENSOR-2	
FR RH SENSOR-2	L
FR LH SENSOR-2	
Is above displayed on the self-diagnosis display?	ъл
 YES >> Proceed to diagnosis procedure. Refer to <u>BRC-135, "Diagnosis Procedure"</u>. NO >> Inspection End 	Μ
Diagnosis Procedure	Ν
CAUTION: Do not check between wheel sensor terminals.	
INSPECTION PROCEDURE	0
1.CONNECTOR INSPECTION	
Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.	Ρ
Check the terminals for deformation, disconnection, looseness or damage.	
Is the inspection result normal?	
YES >> GO TO 2	

NO >> Repair or replace as necessary.

BRC-135

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C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

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-207, "Removal and Installation"</u>.

3.CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

- 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-20,</u> <u>"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-25,</u> <u>"Removal and Installation"</u> (rear).

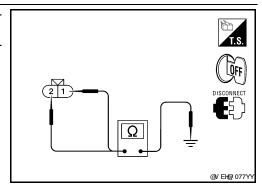
5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 2]

Connector Terminal Connector Terminal Front LH 45 E18 1 Front RH 34 E117 1 Rear LH 33 C11 2 Rear RH 43 C10 1 Rear RH 43 C10 2 Sthe inspection result normal? 43 C10 2 YES > Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Inst lation". NO NO >> Replair the circuit. Promotement Inspection Processesses Component Inspection Processesses Processesses Processesses Check DATA MONITOR Processes Processesses Processesses In "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SESOR", and "RR RH SESOR Processesses TH SENSOR Pranty matches the speedometer dis- play (±10% or less) Processes RR H SENSOR Pranty matches the speedometer dis- play (±10% or less) Processes RR H SENSOR Processes Processes Processes NO >> Go t	Wheel sensor	ABS actuat electric unit (cc		Wheel se	nsor	Continuity
Front LH 46 E18 2 Front RH 33 E117 2 Rear RH 33 C11 2 At 2 C10 1 2 Rear RH 43 C10 2 Sthe inspection result normal? Yes Yes YES > Replace the ABS actuator and electric unit (control unit). Refer to BRC-209. "Removal and Institution". NO >> Repair the circuit. Proceeding and the circuit. Component Inspection Proceeding and the circuit. Do "DATA MONITOR". select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SESOR", and check the vehicle speed. Wheel sensor Vehicle speed (DATA MONITOR) FR H SENSOR Nearly matches the speedometer display (±10% or less) RR H SENSOR play (±10% or less) </th <th></th> <th>Connector</th> <th>Terminal</th> <th>Connector</th> <th>Terminal</th> <th></th>		Connector	Terminal	Connector	Terminal	
intermediate 46 2 intermediate 34 11 intermediate intermediate intermediate intermediate intermediate intermediate intermediate <td></td> <td></td> <td>45</td> <td>540</td> <td>1</td> <td></td>			45	540	1	
Front RH E125 33 E117 2 Yes Rear LH 43 C11 1 2 Yes Rear RH 43 C10 1 2 Yes a the inspection result normal? YES >> Replate the circuit. 2 Yes YES >> Replat the circuit. 2 2 Yes Omponent Inspection wore.common and the circuit. Xere common and the circuit. Omponent Inspection wore.common and the circuit. Xere common and the circuit. Omponent Inspection wheel sensor Vehicle speed (DATA MONITOR) on "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR Play (±10% or less) FR H SENSOR Nearly matches the speedometer display (±10% or less) Play (±10% or less) RR H SENSOR Play (±10% or less) Yes .ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Adducter to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ways perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ways perform calibration of decel G sensor when replacing the ABS actuator and electr	Front LH		46	E18	2	
Rear LH E125 33 2 Yes Rear RH 43 C10 1 43 C10 1 43 C10 2 44 43 C10 2 42 C10 2 44 42 C10 2 42 C10 2 41 42 C10 2 42 C10 2 42 C10 2 41 42 C10 2 42 C10 2 41 43 C10 2 41 43 C10 2 41 42 C10 2 41 42 C10 21 41 42 C10 21 41 $5000000000000000000000000000000000000$		_	34		1	
Rear LH 36 C11 1 Rear RH 43 C10 1 s the inspection result normal? YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-209, "Removal and Inst</u> lation". NO >> Replair the circuit. Component Inspection ####################################	Front RH		33	E117	2	
Rear RH 37 2 43 C10 1 42 C10 2 sthe inspection result normal? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Inst Lation". NO >> Repair the circuit. Component Inspection ####################################		E125	36		1	Yes
Rear RH 42 C10 2 s the inspection result normal? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Instaliation". NO >> Repair the circuit. Component Inspection ####################################	Rear LH		37	C11	2	
42 2 Steinspection result normal? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Instilation". NO >> Repair the circuit. Component Inspection ####################################		-	43		1	
YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Instruction". NO >> Repair the circuit. Component Inspection #************************************	Rear RH		42	C10	2	
Wheel sensor Vehicle speed (DATA MONITOR) FR LH SENSOR Nearly matches the speedometer display (±10% or less) RR LH SENSOR play (±10% or less) RR RH SENSOR play (±10% or less) Atte inspection result normal? YES YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-135, "Diagnosis Procedure". Opecial Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways perform neutral position adjustment for the steering angle sensor when replacing the ABS actual and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL OSITION : Description". >> GO TO 2 >> GO TO 2 >> GO TO 2 >> GO TO 2 >> GO TO 2 >> GO TO 2 <t< th=""><th>COMPONENT INSPECT CHECK DATA MONITOR",</th><th>Ction ITOR select "FR LH SEN</th><th>ISOR", "FR RH</th><th>SENSOR", "RR</th><th>LH SENSOR", a</th><th>INFOID:000000004064</th></t<>	COMPONENT INSPECT CHECK DATA MONITOR",	Ction ITOR select "FR LH SEN	ISOR", "FR RH	SENSOR", "RR	LH SENSOR", a	INFOID:000000004064
FR RH SENSOR Nearly matches the speedometer display (±10% or less) RR LH SENSOR play (±10% or less) Is the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-135. "Diagnosis Procedure". Special Repair Requirement Instrument 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actua and electric unit (control unit). Refer to BRC-12. "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-13. "CALIBRATION OF DECEL G SENSOR : Description".						
RR LH SENSOR play (±10% or less) RR RH SENSOR play (±10% or less) Is the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-135. "Diagnosis Procedure". Special Repair Requirement Information of the steering angle sensor when replacing the ABS actual and electric unit (control unit). Refer to BRC-12. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actual and electric unit (control unit). Refer to BRC-12. "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-13, "CALIBRATION OF DECEL G SENSOR : Description".	Wheel sensor	Vehic	le speed (DATA MC	DNITOR)		
RR RH SENSOR s the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-135. "Diagnosis Procedure". Special Repair Requirement Information of the steering angle sensor when replacing the ABS actua and electric unit (control unit). Refer to BRC-12. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actua and electric unit (control unit). Refer to BRC-12. "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 control unit) are proceeded of the second of the steering the ABS actuator and electric unit (control unit).		Vehic	le speed (DATA MC	DNITOR)		
Is the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-135. "Diagnosis Procedure". Special Repair Requirement Information of the steering angle sensor when replacing the ABS actual and electric unit (control unit). Refer to BRC-12. "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-13. "CALIBRATION OF DECEL G SENSOR : Description".	FR LH SENSOR	Nearly m	atches the speedor	<u>·</u>		
YES >> Inspection End NO >> Go to diagnosis procedure. Refer to <u>BRC-135</u> , "Diagnosis Procedure". Special Repair Requirement Info::::::::::::::::::::::::::::::::::::	FR LH SENSOR FR RH SENSOR	Nearly m	atches the speedor	<u>·</u>		
1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actua and electric unit (control unit). Refer to <u>BRC-12</u> , "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTR <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 un Refer to <u>BRC-13</u> , "CALIBRATION OF DECEL G SENSOR : Description".	FR LH SENSOR FR RH SENSOR RR LH SENSOR	Nearly m	atches the speedor	<u>·</u>		
2.CALIBRATION OF DECEL G SENSOR Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control un Refer to <u>BRC-13, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	FR LH SENSORFR RH SENSORRR LH SENSORRR RH SENSORIs the inspection result in the section	Nearly m play (±10 normal? End nosis procedure. Re	atches the speedor 0% or less)	neter dis-	edure".	
2.CALIBRATION OF DECEL G SENSOR Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control un Refer to <u>BRC-13, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR s the inspection result r YES >> Inspection I NO >> Go to diagr Special Repair Reco	Nearly m. play (±10 normal? End nosis procedure. Re quirement	atches the speedor % or less) fer to <u>BRC-135.</u>	neter dis-	<u>edure"</u> .	INFCID:000000004064
Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control un Refer to <u>BRC-13, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	FR LH SENSOR FR RH SENSOR RR RH SENSOR Is the inspection result of YES >> Inspection of NO >> Go to diagon Special Repair Reconstruction Always perform neutral and electric unit (controposition)	Nearly maplay (±10 normal? End nosis procedure. Re quirement STEERING ANGLE I position adjustmer I unit). Refer to BRC	atches the speedor % or less) fer to <u>BRC-135</u> SENSOR NEU nt for the steering	neter dis- . "Diagnosis Proc TRAL POSITION ng angle sensor	when replacing	the ABS actuat
Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".	FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR s the inspection result in YES >> Inspection I NO >> Go to diagon Special Repair Reconstruction Always perform neutral and electric unit (controposition Solution	Nearly miplay (±10 normal? End nosis procedure. Re quirement STEERING ANGLE I position adjustmer I unit). Refer to BRC	atches the speedor % or less) fer to <u>BRC-135</u> SENSOR NEU nt for the steering	neter dis- . "Diagnosis Proc TRAL POSITION ng angle sensor	when replacing	the ABS actual
>> FND	FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR s the inspection result in YES >> Inspection I NO >> Go to diagon Special Repair Reconstruction Always perform neutral and electric unit (contromination of the second Second Second Seco	Nearly miplay (±10 normal? End nosis procedure. Re quirement STEERING ANGLE I position adjustmer I unit). Refer to BRC 1".	atches the speedor % or less) fer to <u>BRC-135</u> SENSOR NEU nt for the steeri C-12, "ADJUSTN	neter dis- ."Diagnosis Proce TRAL POSITION ng angle sensor <u>MENT OF STEER</u>	when replacing	the ABS actual
	FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR Is the inspection result in YES >> Inspection I NO >> Go to diagon Special Repair Reconstruction Always perform neutral and electric unit (controposition >> GO TO 2 2.CALIBRATION OF D Always perform calibrat	Nearly mi play (±10 normal? End nosis procedure. Re quirement STEERING ANGLE I position adjustmer I unit). Refer to <u>BRC</u> <u>n</u> ".	atches the speedor % or less) fer to <u>BRC-135</u> SENSOR NEU of for the steerin C-12. "ADJUSTN	neter dis- ."Diagnosis Proce TRAL POSITION ng angle sensor MENT OF STEER	when replacing	the ABS actuat

< COMPONENT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

INFOID:000000004064835

INFOID:000000004064836

INFOID:000000004064834

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-138, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-126</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 terminal. Repair or replace connector.

Condition

Ignition switch: ON

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

1. Turn ignition switch OFF.

Terminal

8

ABS actuator and electric unit (control unit)

Connector

E125

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

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	@V EH@ 078Y

4. Turn ignition switch OFF.

Ground

Voltage

Battery voltage

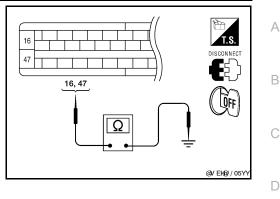
Approx. 0V

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

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

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



[TYPE 2]

INFOID:000000004064837

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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

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-115. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL 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-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

BRC-139

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < COMPONENT DIAGNOSIS > [TYPE 2]

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

DTC Logic

INFOID:000000004064838

DTC DETECTION LOGIC

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

VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-140, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

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

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209</u>, "<u>Removal and Installa-</u> <u>tion</u>".

Special Repair Requirement

INFOID:000000004064840

INFOID:000000004064839

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-115. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

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
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
		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 CO	NFIRMATION PROCE	DURE	
1 .CHEC	CK SELF-DIAGNOSIS RE	SULTS	
Check th	e self-diagnosis results.		
	Colf diagnosis		
	Self-diagnosis		
Is above	displayed on the self-diag		
YES		procedure. Refer to <u>BRC-141, "Diagnosis Proce</u>	<u>dure"</u> .
Diagno	sis Procedure		INFOID:00000004064843
INSPEC	TION PROCEDURE		
1 .CHEC	CK CONNECTOR		
 Disco Check 		electric unit (control unit) connector. n, disconnect, looseness, and so on. If any ma	lfunction is found, repair or
	onnect connectors and th	en perform the self-diagnosis. Refer to <u>BRC-12</u>	26, "CONSULT-III Function
-	em indicated on the self-dia	agnosis display?	
-	>> GO TO 2 >> Poor connection of cou	nnector terminal. Repair or replace connector.	
^		TOR RELAY POWER SUPPLY CIRCUIT	

[TYPE 2]

INFOID:000000004064841

INFOID:000000004064842

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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) harness connector terminal and ground.

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ABS actuator and ele	ABS actuator and electric 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.

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

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

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209, "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-141, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064845

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-115. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

[TYPE 2]

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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

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INFOID:000000004064848

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INFOID:000000004064846

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
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.	(control unit)	E
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	BRC

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
G-SENSOR	
YAW RATE SENSOR	
SIDE G-SEN CIRCUIT	
above displayed on the self-diagnosis display?	
'ES >> Proceed to diagnosis procedure. Refer to BRC-1	43. "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

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.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION	ON
------------------------	----

Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.

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

[TYPE 2]

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

Continuity

Yes

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit

(control unit)

Connector

E125 (A)

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.

Connector

B73 (B)

Yaw rate/side/decel G sensor

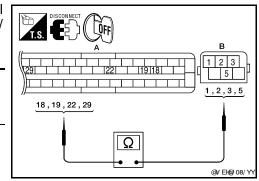
Terminal

2

1

3

5



[TYPE 2]

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

Terminal

18

19

22

29

\mathbf{3}. YAW RATE/SIDE/DECEL G SENSOR INSPECTION

1. Connect the yaw rate/side/decel G sensor connector M108 and ABS actuator and electric unit (control unit) connector E125.

2. Use "DATA MONITOR" to check if the yaw rate/side/decel G sensor signals are normal.

Vehicle condition	YAW RATE SEN	SIDE G-SENSOR	DECEL G-SEN
	(DATA MONITOR)	(DATA MONITOR)	(DATA MONITOR)
Stopped	-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.08 G to +0.08 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 >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-209, "Removal and Instal-</u> lation".

NO >> Replace the yaw rate/side/decel G sensor. Refer to <u>BRC-212, "Removal and Installation"</u>.

Component Inspection

INFOID:000000004064849

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	-0.08 G to +0.08 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

NO >> Go to diagnosis procedure. Refer to <u>BRC-143, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

BRC-144

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

< COMPONENT DIAGNOSIS >

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-115</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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 <u>BRC-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

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[TYPE 2]

C1115 WHEEL SENSOR

Description

INFOID:000000004064851

ITYPE 21

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:000000004064852

INFOID:000000004064853

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-146, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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.

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

NOTE:

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

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. **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-207</u>, "Removal and Installation".

3.CHECK TIRES

C1115 WHEEL SENSO	र	
< COMPONENT DIAGNOSIS >	[TYPE 2]	
Check for inflation pressure, wear and size of each tire.		
Are tire pressure and size correct and is tire wear within specifications	<u>;?</u>	А
YES >> GO TO 4 NO >> Adjust tire pressure or replace tire(s).		
4.CHECK WHEEL BEARINGS	I	В
Check wheel bearing axial end play. Refer to <u>FAX-5</u> , "On-Vehicle Ins "Rear Axle Bearing" (rear).	pection and Service" (front) or RAX-20,	C
Is the inspection result normal?	,	0
YES >> GO TO 5 NO >> Repair or replace as necessary. Refer to <u>FAX-8</u> , "Remo "Removal and Installation" (rear).	oval and Installation" (front) or RAX-25.	D
5. 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 harness connector terminals and ground. 	T.S.	E
Continuity should not exist.		
Is the inspection result normal? YES >> GO TO 6 NO >> Repair the circuit.		G

6. Check wiring harness for open circuit

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

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INFOID:000000004064854

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Wheel sensor		ABS actuator and electric unit (control unit)		Wheel sensor		
	Connector	Terminal	Connector	Terminal		
Front III		45	1			-
Front LH		46	E18	2	Yes	1
Front RH	F 105	34	E117	1		L
		33		2		
Door H	E125	36	C11	1	res	
Rear LH		37			2	
Deer DU		43	010	1		1
Rear RH		42	C10	2		

Is the inspection result normal?

YES >> <u>BRC-209</u>, "<u>Removal and Installation</u>" Replace the ABS actuator and electric unit (control unit). Refer to .

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 SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

FR LH SENSOR

FR RH SENSOR

RR LH SENSOR

Nearly matches the speedometer display ($\pm 10\%$ or less)

RR RH SENSOR

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-146. "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064855

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-12</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL 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-13</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

C1116 STOP LAMP SWITCH

Description

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

DTC Logic

INFOID:000000004064857

INFOID:000000004064856

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	on 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) 	E
отс со	ONFIRMATION PROC	EDURE		
1.сне	CK SELF-DIAGNOSIS R	RESULTS		BF
Check th	ne self-diagnosis results.			
				C
	Self-diagnos	is results		
	STOP LAN			ŀ
	e displayed on the self-di			Г
YES NO	>> Proceed to diagnosis >> Inspection End	s procedure. Refer to <u>BRC-149, "Diag</u>	<u>gnosis Proceaure"</u> .	
	osis Procedure			
			INFCID:00000004064858	
1.CON	NECTOR INSPECTION			
			ector and stop lamp switch connector.	
	ck the terminals for defo spection result normal?	rmation, disconnection, looseness or	damage.	
YES	>> GO TO 2			ŀ
NO	>> Repair or replace as	necessary.		
2.stop	P LAMP SWITCH INSPE	CTION		L
	nect the stop lamp switc			
		the ABS actuator and electric unit 5 terminal 39 and body ground.		Ν
(00)		steminal 39 and body ground.		
E	Brake pedal depressed	: Battery voltage		
E	Brake pedal released	: 0V		Γ
	spection result normal?			
YES	>> Perform self-diagno	osis again. If the same results S actuator and electric unit (control		C
IES	appear, replace AD			
TES	unit). Refer to BRC-2	209, "Removal and Installation".		
NO			@/ EHØ 080YY	F

[TYPE 2]

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C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

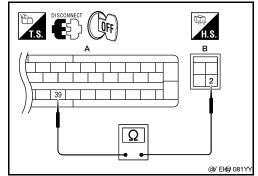
- 1. Disconnect the stop lamp switch connector.
- 2. Check the continuity between the ABS actuator and electric unit (control unit) connector E125 (A) terminal 39 and stop lamp switch connector E39 (B) terminal 2.

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:000000004064859

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-115, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

le sensor when replacing <u>NT OF STEERING ANGL</u> [TYPE 2]

< 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:000000004064861

INFOID:000000004064860

DTC DETECTION LOGIC

D	Possible cause	Malfunction detected condition	Display item	DTC
		When the control unit detects a malfunction in the front LH inlet solenoid circuit.	FR LH IN ABS SOL	C1120
E	ABS actuator and electric unit	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	FR RH IN ABS SOL	C1122
BRC	(control unit)	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	RR LH IN ABS SOL	C1124
		When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	RR RH IN ABS SOL	C1126
0				

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-151, "Diagnosis Procedure"</u> .
NO	>> Inspection End

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn ignition switch OFF.

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

- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-126, "CONSULT-III Function</u> N (<u>ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

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

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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	ectric unit (control unit)	init (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 ele	ectric unit (control unit)	ontrol 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-209, "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		
			Кеер	Down	
FR RH SOL	FR RH IN SOL	Off	On	On	
FR RH 30L	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On	On	
	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*	
REAR SOL	This item is not used for this mod	del.			

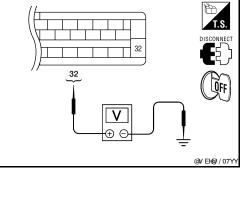
*: ON for 1 to 2 seconds after the touch, and then OFF

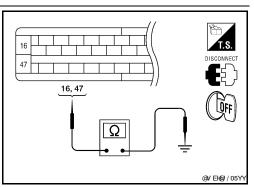
Is the inspection result normal?

- YES >> Inspection End
- NO >> Go to diagnosis procedure. Refer to <u>BRC-151, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION





INFOID:000000004064863

INFOID:000000004064864

[TYPE 2]

BRC-152

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-115</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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 <u>BRC-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

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[TYPE 2]

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:000000004064866

INFOID:00000000406486

INFOID:000000004064865

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-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
KK LH OUT ADS SOL
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-154</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-126</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 terminal. Repair or replace connector.

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

BRC-154

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 electric unit (control unit)			Voltage	
Connector	Connector Terminal		voltage	
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-209, "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.

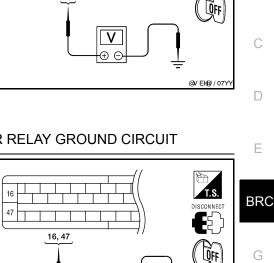
Orerstion			ABS solenoid valve)	
	Operation		Кеер	Down	
FR RH SOL	FR RH IN SOL	Off	On	On	
	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On	On	
	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On	On	
	RR RH OUT SOL	Off	Off	On*	
	RR LH IN SOL	Off	On	On	
RR LH SOL	RR LH OUT SOL	Off	Off	On*	
REAR SOL	This item is not used for this mo	del.	1	1	

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

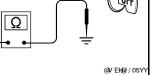
- Is the inspection result normal?
- YES >> Inspection End
- NO >> Go to diagnosis procedure. Refer to <u>BRC-154, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION



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[TYPE 2]

DISCONNECT

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-115, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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:000000004064871

INFOID:000000004064870

DTC DETECTION LOGIC

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

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-157</u>, "<u>Diagnosis Procedure</u>". NO >> Inspection End

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK ENGINE SYSTEM

- Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again.
 Refer to <u>EC-67, "CONSULT-III Function (ENGINE)"</u>.
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-126, "CONSULT-III</u> <u>Function (ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> Inspection End

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-115</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

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INFOID:000000004064872

< COMPONENT DIAGNOSIS >

 $\overline{2.}$ 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-116</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

< 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:000000004064875

INFOID:000000004064874

DTC DETECTION LOGIC

DTC	Display item	Malfund	tion detected condition	Possible cause	D
C1140	ACTUATOR RLY	ABS actuator relay c	or circuit malfunction.	 Harness or connector ABS actuator and electric unit (control unit) 	E
DTC CC	NFIRMATION PROC	EDURE			
1. CHEC	CK SELF-DIAGNOSIS F	RESULTS			BRC
Check th	e self-diagnosis results				BRC
	Self-diagnos				G
	ACTUATO				G
ls above	displayed on the self-d				
	>> Proceed to diagnosi		o BRC-159. "Diagno	osis Procedure".	Н
	>> Inspection End		<u> </u>		
Diagno	sis Procedure			INFOID:00000004064876	
	TION PROCEDURE				
I.CHEC	CK CONNECTOR				J
 Disco Cheo 	ignition switch OFF. onnect ABS actuator ar ck terminal for deformat ace terminal.			n. If any malfunction is found, repair or	К
	onnect connectors and	then perform the se	elf-diagnosis. Refer	to BRC-126, "CONSULT-III Function	L
-	em indicated on the self	-diagnosis display?			
-	>> GO TO 2 >> Poor connection of (connector terminal	Renair or renlace co	nnector	M
•				RELAY POWER SUPPLY CIRCUIT	1 V I
	ignition switch OFF.				
	onnect ABS actuator ar	nd electric unit (conti	ol unit) connec-		Ν
	ck voltage between AB connector E125 termin		tric unit (control		0
			[
	uator and electric unit (contro		Voltage		P
	nnector Termina				1
F	125 32	Ground	Battery voltage		

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

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C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

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

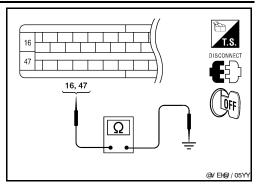
ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209, "Removal and Installation"</u>.

NO >> Repair or replace malfunctioning components.

Component Inspection



INFOID:000000004064877

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-159</u>, "Diagnosis Procedure".

Special Repair Requirement

INFOID:000000004064878

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-115. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

[TYPE 2]

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, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

INFOID:000000004064880

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INFOID:000000004064879

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	 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?

YES	>> Proceed to diagnosis procedure. Refer to <u>BRC-161, "Diagnosis Procedure"</u> .
NO	>> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE	

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-126, "CONSULT-III Function</u> (<u>ABS)</u>"

Is any item indicated on the self-diagnosis display?

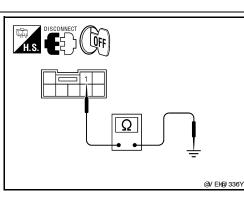
YES >> GO TO 2

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

2.CHECK STEERING ANGLE SENSOR HARNESS

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

Steering angle sensor			Continuity
Connector	Terminal		Continuity
M47	1	Ground	Yes



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C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

4. Turn ignition switch ON.

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

Steering a	ngle sensor	— Voltage		
Connector	Terminal			
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.

2. 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 >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209</u>, "<u>Removal and Installa-</u> tion".
- NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to <u>BRC-</u> 211, "Removal and Installation".

Component Inspection

1.CHECK DATA MONITOR

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

STR ANGLE SIG (DATA MONITOR)
0±2.5 °
Approx. +90 °
Approx. –90 °

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-161, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000004064883

INFOID-000000004064882

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-115, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL 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-116</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

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[TYPE 2]

@V EH@ 337Y

BRC-162

< 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

INEOID:000000004064886

DTC DETECTION LOGIC

DTC	Display item		Malfunctio	n detected condition	Possible cause	
C1155	BR FLUID LEVEL LO	W the AB		or communication line between lectric unit (control unit) and brał n or shorted.		
отс сс	NFIRMATION PF	ROCEDURE				
1. CHEC	CK SELF-DIAGNOS	SIS RESULTS				В
Check th	e self-diagnosis res	sults.				
		agnosis results				(
		ID LEVEL LOW				
	displayed on the se				a a du wa ll	ŀ
	>> Proceed to diag >> Inspection End	nosis procedu		BRC-163, "Diagnosis Pro	<u>ceuure</u> .	
	sis Procedure				INFOID:00000004064887	
Blagilo					INFOID.00000004004087	
INSPEC	TION PROCEDUF	RE				
1.com	NECTOR INSPECT	ION				,
					e fluid level switch connector.	
	ck the terminals for spection result norm		aisconnectioi	n, looseness or damage.		ŀ
	>> GO TO 2	<u>iai :</u>				
	>> Repair or replac	e as necessa	ry.			1
2. снес	CK HARNESS BET	WEEN BRAK	E FLUID LE	VEL SWITCH AND ABS	ACTUATOR AND ELECTRIC	L
	ONTROL UNIT)					
	ck continuity betwee					N
	harness connecto switch harness con					
			,			Ν
	uator and electric unit (control unit)	Brake fluid	evel switch	Continuity		
Connec	. ,	Connector	Terminal			(
E125 ((A) 28	E21 (B)	1	Yes	Ω	
2. Cheo	ck continuity betwee	en ABS actuat	or and electr	ic unit (control		
unit)	harness connector	E125 (A) Terr	minal 28 and	ground.	@/ EH@ 085YY	

unit) harness connector E125 (A) Terminal 28 and ground.

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

Is the inspection result normal?

INFOID:000000004064885

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C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

OFF

@V EH60 / 15Y

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

Brake fluid	level 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

Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity
Terminal	Condition	Continuity
1-2	When brake fluid is full in the reservoir tank.	No
1 – 2	When brake fluid is empty in the reservoir tank.	Yes

Is the inspection result normal?

- >> Perform self-diagnosis again. If the same results YES appear, replace ABS actuator and electric unit (control unit). Refer to BRC-209, "Removal and Installation".
- NO >> Replace brake fluid level switch.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

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

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1-2	When brake fluid is full in the reservoir tank.	No	
1 - 2	When brake fluid is empty in the reservoir tank.	Yes	
le the increation result normal?			

Is the inspection result normal?

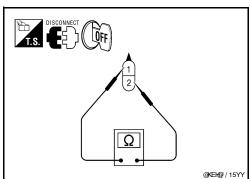
YES >> Inspection End

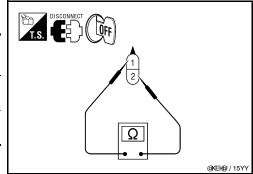
NO >> Replace brake fluid level switch.

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-115, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

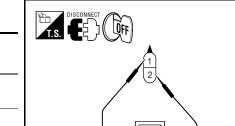




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INFOID:000000004064889



C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >	[TYPE 2]
>> GO TO 2	
2.CALIBRATION OF DECEL G SENSOR	ŀ
Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (c Refer to <u>BRC-116</u> , <u>"CALIBRATION OF DECEL G SENSOR : Description"</u> .	ontrol unit). E
>> END	
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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:000000004064891

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 CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-166</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 2. Reconnect connector and perform self-diagnosis.

Self-diagnosis results	
CAN COMM CIRCUIT	
ST ANG SEN COM CIR	

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14. "Trouble Diagnosis Flow Chart".

NO >> Inspection End

INFOID:000000004064890

ITYPE 21

< COMPONENT DIAGNOSIS >

C1160 DECEL G SEN SET

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:000000004064894

INFOID:000000004064893

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
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) 	E
DTC CC	NFIRMATION PROCE	DURE		
1.снес	CK SELF-DIAGNOSIS RE	SULTS		BRC
Check th	e self-diagnosis results.			
				G
	Self-diagnosis			
	DECEL G SEN	-		Н
<u>Is above</u> YES	displayed on the self-diag	<u>inosis display?</u> procedure. Refer to <u>BRC-167, "Diagnosis Proce</u>	duro"	
NO	>> Inspection End	biocedure. Relet to <u>BRC-107, Diagnosis Floce</u>	<u>cuite</u> .	
Diagno	sis Procedure		INFOID:000000004064895	
2.0.9.10			NW 012.00000000000000000000000000000000000	
	TION PROCEDURE			J
1. PERF	FORM SELF-DIAGNOSIS			
Perform	ABS actuator and electric	unit (control unit) self-diagnosis.		K
				r.
	elf-diagnosis results			
	ECEL G SEN SET			
<u>Do seit-c</u> YES	-	anything other than shown above? acement for the item indicated.		
NO	>> Perform calibration of	decel G sensor. Refer to <u>BRC-116, "CALIBRATI</u>	ON OF DECEL G SENSOR	M
0	: Description". GO TO			
Z .PERF	ORM SELF-DIAGNOSIS	AGAIN		
		and then to ON and erase self-diagnosis resul	ts.	Ν
	orm ABS actuator and ele self-diagnosis results disp	ctric unit (control unit) self-diagnosis again.		
YES		/decel G sensor. Refer to <u>BRC-212, "Removal a</u>	and Installation"	0
NO	>> Inspection End		in the second	
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				ľ

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C1163 ST ANGLE SEN SAFE

Description

INFOID:000000004064896

[TYPE 2]

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:000000004064897

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ST ANGL SEN SAFE

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-168</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:000000004064898

INSPECTION PROCEDURE

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to <u>BRC-115. "ADJUSTMENT OF STEERING ANGLE</u> <u>SENSOR NEUTRAL POSITION : Description"</u>.

>> GO TO 2

2.INDICATOR LAMP CHECK

Check that VDC OFF indicator lamp is off.

Is VDC OFF indicator lamp off?

YES >> Inspection End

NO >> Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-126, "CON-</u> <u>SULT-III Function (ABS)"</u>.

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

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INFOID-000000004064901

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	E
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.		BRC
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)	G
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.		Η

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-169, "Diagnosis Procedure"</u>. NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or place terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-126</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 terminal. Repair or replace connector.

BRC-169

INFOID:000000004064899

C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

$\overline{2.}$ 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 ele	ectric 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 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-209</u>, "<u>Removal and Installation</u>".

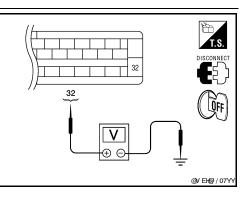
NO >> Repair or replace malfunctioning components.

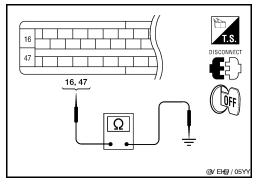
Component Inspection

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)
		Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
FR RH ABS SOLENOID (ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
FR LH ABS SOLENOID (ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
RR RH ABS SOLENOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off





C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

	Operation		BS solenoid valve (A	ACT)
	Operation		ACT UP	ACT KEEP
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off
	CV2	Off	On	On
	SV2	Off	On*	Off
pecial Repair Require	procedure. Refer to <u>BRC-169, "</u> ement	-	edure".	INFCID:00000000406490
ADJUSTMENT OF STEE	RING ANGLE SENSOR NEUTR	RAL POSITION		
and electric unit (control uni	ition adjustment for the steering it). Refer to <u>BRC-115, "ADJUS</u>			
FRAL POSITION : Description	<u>on"</u> .			
>> GO TO 2				
2.CALIBRATION OF DECE	L G SENSOR			
	f decel G sensor when replacing	g the ABS actua	ator and electric	unit (control unit)
Refer to <u>BRC-116, "CALIBR/</u>	ATION OF DECEL G SENSOR	<u>Description</u> .		
>> END				

C1187 DIFFERENTIAL LOCK CONTROL UNIT

< COMPONENT DIAGNOSIS >

C1187 DIFFERENTIAL LOCK CONTROL UNIT

Description

INFOID:000000004471316

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The differential lock control unit is connected to the ABS actuator and electric unit (control unit) via 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:000000004471317

INFOID:000000004471318

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1187	ABS DIFLOCK CONTROL- LER NG	Differential lock controller malfunction.	 Harness or connector CAN communication line Differential lock control unit ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS DIFLOCK CONTROLLER NG

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-172</u>, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 2. Reconnect connector and perform self-diagnosis.

Self-diagnosis results

ABS DIFLOCK CONTROLLER NG

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Inspection 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:000000004064906

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	E
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) 	BRO
Diagno	sis Procedure		INFOID:000000004064907	
INSPEC	TION PROCEDURE			G
1 .CHEC	K CONNECTOR			
the t		onnect the ABS actuator and electric unit (contro , disconnection, looseness, and so on. If there		Η
2. Reco	onnect connector and per	0		
		ed in self-diagnosis display items?		
		nostic results, and refer to <u>LAN-14, "Trouble Dia</u> loose, damaged, open, or shorted.	<u>gnosis Flow Chart"</u> .	J
Specia	Repair Requiremer	nt	INFOID:000000004064908	
1.adju	STMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION		Κ
and elec		djustment for the steering angle sensor when fer to <u>BRC-115. "ADJUSTMENT OF STEERIN</u>		L
•	>> GO TO 2			M
2.Calie	BRATION OF DECEL G S	ENSOR		
		el G sensor when replacing the ABS actuator an I OF DECEL G SENSOR : Description".	nd electric unit (control unit).	Ν
	>> END			0
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INFOID:000000004064905

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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

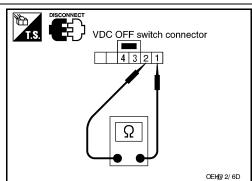
NO >> Go to diagnosis procedure. Refer to <u>BRC-174, "Diagnosis Procedure"</u>.

Diagnosis Procedure

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	Condition	Continuity	
Terminal	Condition		
1 – 2	When VDC OFF switch is pressed.	Yes	
1 – 2	When VDC OFF switch is released.	No	



Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

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

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

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

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

Is the inspection result normal?

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INFOID:000000004064910

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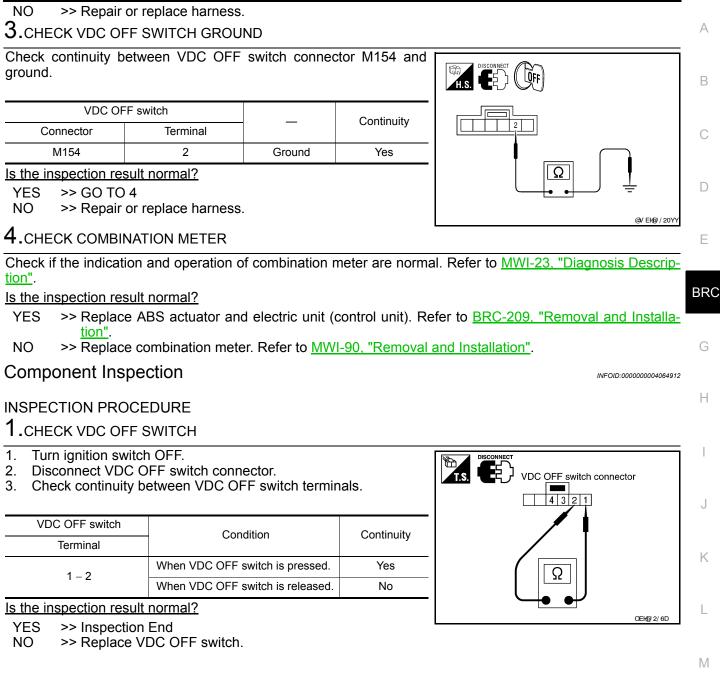
VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

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BRC-175

ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000004064913

×: ON –: OFF

[TYPE 2]

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:000000004064914

1. CHECK ABS WARNING LAMP OPERATION

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

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-176. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000004064915

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-126. "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-23</u>, "<u>Diagnosis Descrip-</u> tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209</u>, "<u>Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-90, "Removal and Installation"</u>.

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

[TYPE 2]

Description	INFOID:00000004064916
	×: 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). 2: After starting engine, brake warning lamp is turned off. 	peration (when switch is ON) or of brake fluid level switch operation
Component Function Check	INFOID:000000004064917
1.BRAKE WARNING LAMP OPERATION CHECK	
Check that the lamp illuminates after the ignition sw started.	vitch 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> .	<u>-177, "Diagnosis Procedure"</u> .
Diagnosis Procedure	INFOID:000000004064918
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) se (ABS)".	elf-diagnosis. Refer to <u>BRC-126, "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".	neter are normal. Refer to <u>MWI-23, "Diagnosis Descrip-</u>
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (o tion".	control unit). Refer to BRC-209, "Removal and Installa-
NO >> Replace combination meter. Refer to <u>MW</u>	I-90, "Removal and Installation".

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VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000004064919

×: 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:000000004064920

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-178, "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-174, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000004064921

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-174, "Diagnosis Procedure"</u>.

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-126, "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-23, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209</u>, "<u>Removal and Installa-</u> tion".

NO >> Replace combination meter. Refer to <u>MWI-90, "Removal and Installation"</u>.

BRC-178

SLIP INDICATOR LAMP

SLIP INDICATOR LAMP

[TYPE 2]

Description	INFOID:00000004064922	
	×: ON –: OFF	
Condition	SLIP indicator lamp	
Ignition switch OFF	-	
For 2 seconds after turning ON ignition switch	x	
2 seconds later after turning ON ignition switch	-	
VDC/TCS function is malfunctioning.	×	
ABS function is malfunctioning.	x	
EBD function is malfunctioning.	X	
Component Function Check	INFOID:000000004064923	
check that the lamp illuminates for approximately 2 s	econds after the ignition switch is turned ON.	
s the inspection result normal?		
YES >> Inspection End		
NO $>>$ Go to diagnosis procedure. Refer to <u>BRC</u>	C-179, "Diagnosis Procedure".	
Diagnosis Procedure	- INFQID:000000004064924	
CHECK SELF-DIAGNOSIS		
Perform ABS actuator and electric unit (control unit) s <u>ABS)</u> ".	elf-diagnosis. Refer to <u>BRC-126, "CONSULT-III Function</u>	
s the inspection result normal?		
YES >> GO TO 2		
NO >> Check items displayed by self-diagnosis.		
CHECK COMBINATION METER		
	meter are normal. Refer to MWI-23. "Diagnosis Descrip-	
ion".		
s the inspection result normal?	(control unit) Pofer to PPC 200, "Permoval and Installa	
YES >> Replace ABS actuator and electric unit (tion".	(control unit). Refer to <u>BRC-209, "Removal and Installa-</u>	
NO >> Replace combination meter. Refer to MV	/I-90, "Removal and Installation".	

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APPLICATION NOTICE

ECU DIAGNOSIS APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

< ECU DIAGNOSIS >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

CONSULT-III MONITOR ITEM

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	D
		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)	E
		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)	BRC
		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)	G
		0 [km/h (MPH)]	Vehicle stopped	Ц
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display $(\pm 10\% \text{ or less})$	Vehicle running (Note 1)	- H
STOP LAMP SW	Ston Jamp quitch gigned status	When brake pedal is depressed	ON	1
STOP LAWP SW	Stop lamp switch signal status	When brake pedal is released	OFF	I
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	J
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	K
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	L
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	M
OFF SW	VDC OFF SWIICH UN/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	- N
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	IN
TAW RATE SEN	sensor	When vehicle turning	–75 to 75 d/s	
ACCEL POS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %	0
AUUEL 103 310	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	Р
		Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s ²)	
		Vehicle turning left	Positive value (m/s ²)	_

BRC-181

INFOID:000000004064926

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< ECU DIAGNOSIS >

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
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°
		With engine stopped	0 rpm
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome- ter display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON
FLOID LEV SVV	Diake liulu level switch signal status	When brake fluid level switch OFF	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 RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III) or actua- tor relay is inactive (in fail-safe mode)	ON
FR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH IN SOL	Operation status of each selencid 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 IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
		Actuator (solenoid valve) is active ("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
	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
RR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
	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
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("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

< ECU DIAGNOSIS >

[TYPE 2]

		Data monitor						
Monitor item	Display content	Condition	Reference value in normal operation					
RR LH OUT SOL		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	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF					
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON					
MOTOR RELAT		When the motor relay and motor are not operating	OFF					
ACTUATOR RLY	Actuator rolay operation	When the actuator relay is operating	ON					
	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					
	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON					
OFF LAMP	(Note 2)	When VDC OFF indicator lamp is OFF	OFF					
	SLIP indicator lamp	When SLIP indicator lamp is ON	ON					
SLIP LAMP	(Note 2)	When SLIP indicator lamp is OFF	OFF					
		EBD is active	ON					
EBD SIGNAL	EBD operation	EBD is inactive	OFF					
		ABS is active	ON					
ABS SIGNAL	ABS operation	ABS is inactive	OFF					
	TCC energian	TCS is active	ON					
TCS SIGNAL	TCS operation	TCS is inactive	OFF					
		VDC is active	ON					
VDC SIGNAL	VDC operation	VDC is inactive	OFF					
		In EBD fail-safe	ON					
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF					
		In ABS fail-safe	ON					
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF					
		In TCS fail-safe	ON					
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF					
		In VDC fail-safe	ON					
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF					
		Crank is active	ON					
CRANKING SIG	Crank operation	Crank is inactive	OFF					
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					

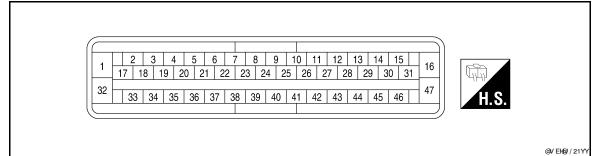
< ECU DIAGNOSIS >

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
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 (igni- tion 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
	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP		When EBD warning lamp is ON	ON
	EBD warning lamp	When EBD warning lamp is OFF	OFF
N POSI SIG	DND quitab signal ON/OFF condition	A/T shift position = N position	ON
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = other than N position	OFF
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
P P031 31G		A/T shift position = other than P position	OFF
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
IX F'U3I 3IG		A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
		4WD model	4WD

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-176, "Description"</u>.
- Brake warning lamp: Refer to BRC-177, "Description".
- VDC OFF indicator lamp: Refer to <u>BRC-178, "Description"</u>.
- SLIP indicator lamp: Refer to BRC-179, "Description".

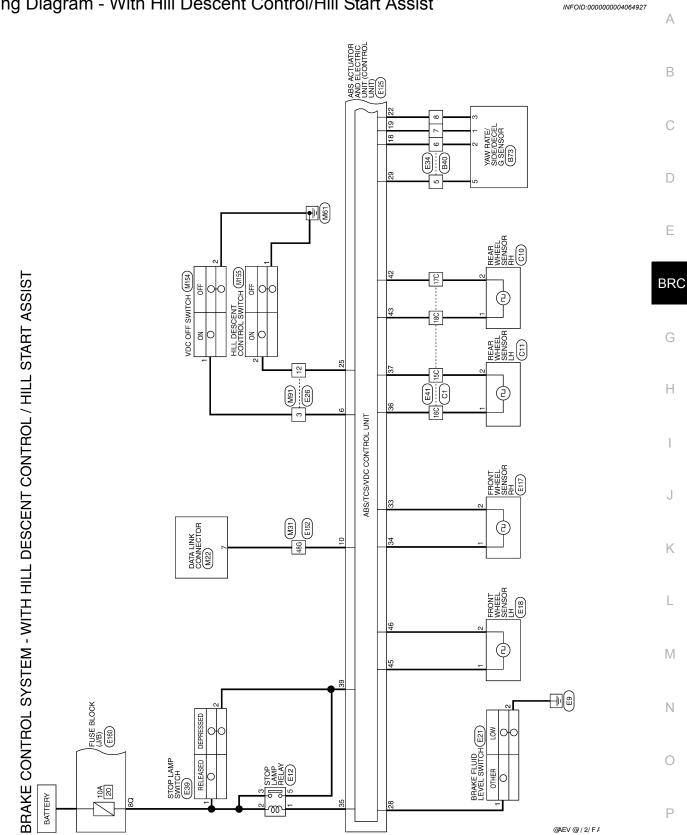
TERMINAL LAYOUT



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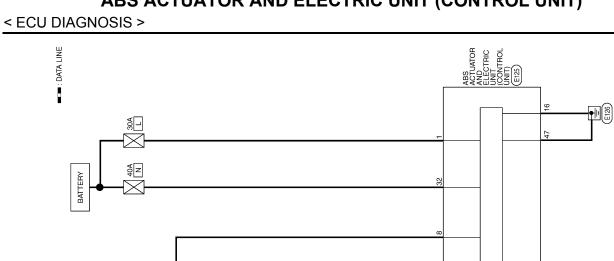


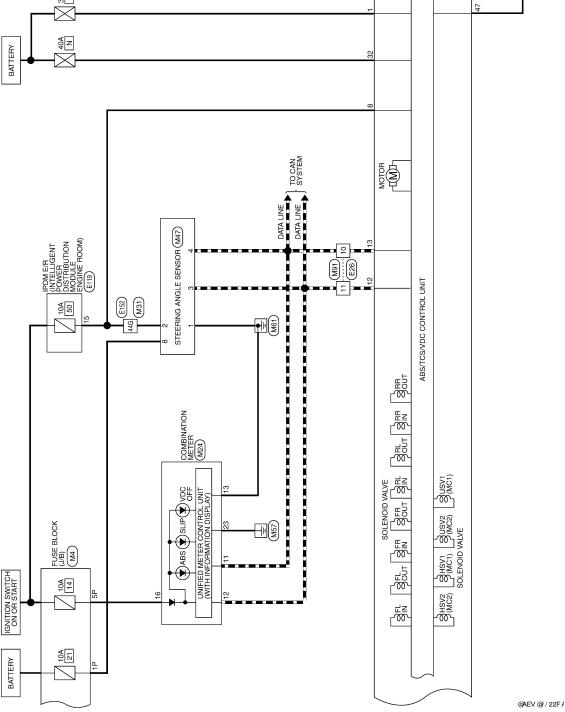




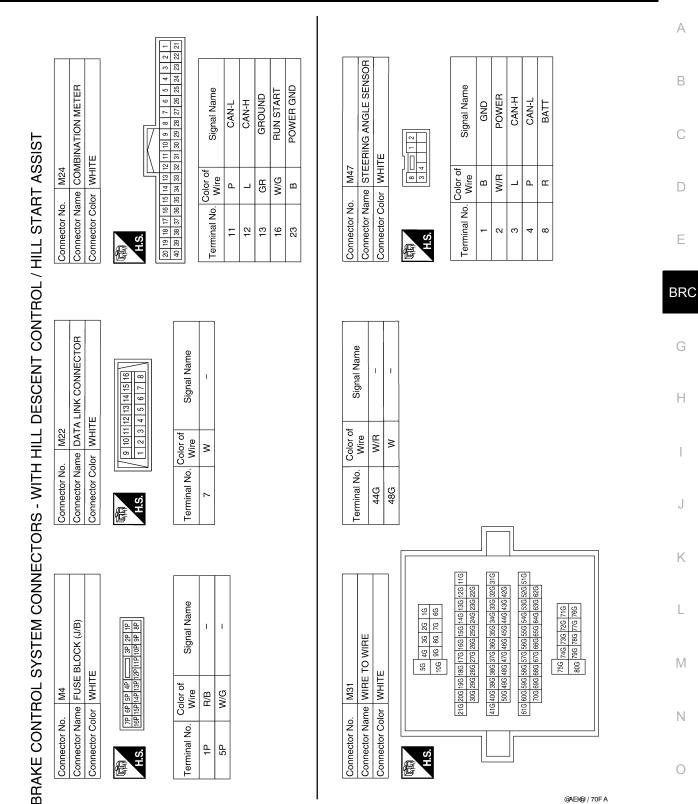


■ : DATA LINE





[TYPE 2]



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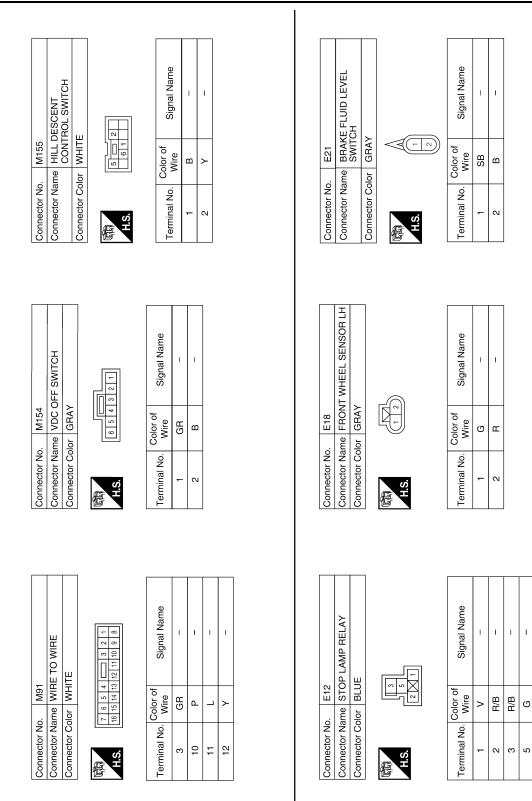
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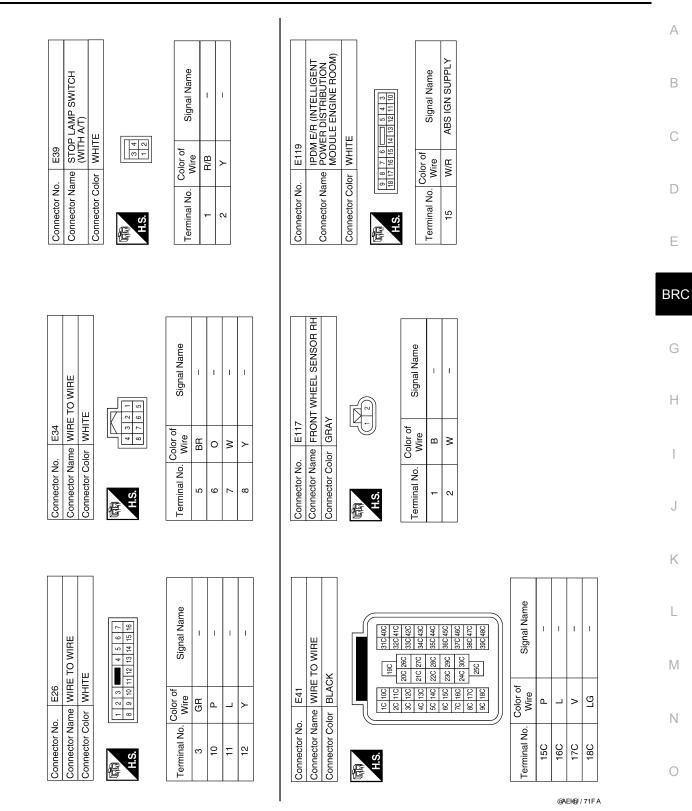
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[TYPE 2]

< ECU DIAGNOSIS >

11G 12G 13G 14G 15G 15G 17G 18G 19G 20G 21G 22G 23G 24G 25G 26G 27G 28G 29G 30G 31G 32G 33G 34G 35G 36G 37G 38G 39G 40G 41G 42G 43G 44G 45G 46G 47G 48G 49G 50G 51G 52G 53G 54G 55G 56G 57G 58G 59G 60G 61G 62G 63G 64G 65G 66G 67G 68G 69G 70G Signal Name 71G 72G 73G 74G 75G 76G 77G 78G 79G 80G
 1G
 2G
 3G
 4G
 5G

 6G
 7G
 8G
 9G
 10G
 Т I. Connector Name WIRE TO WIRE WHITE E152 Color of Wire W/R Connector Color Connector No. Terminal No. 44G 48G H.S. E

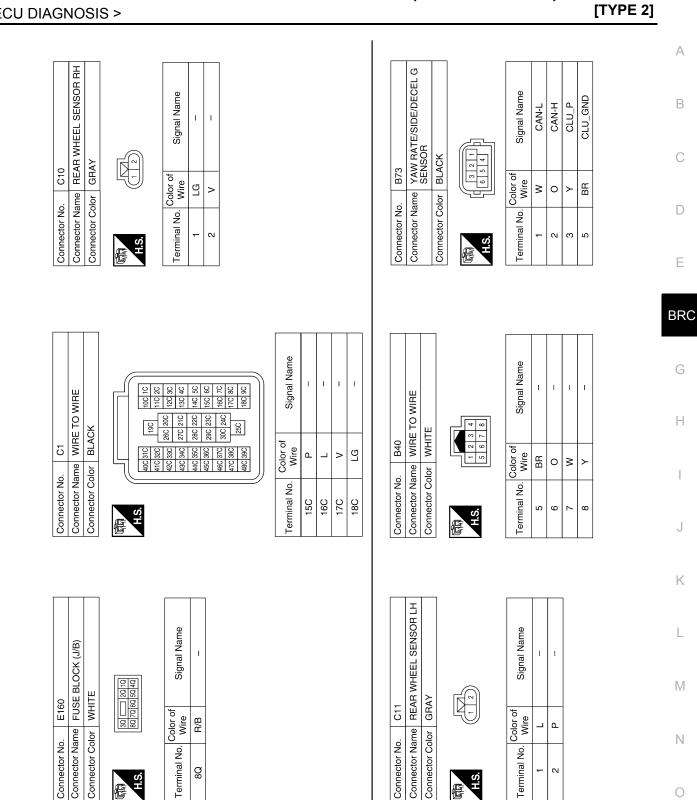
Signal Name	1	I	HDC_SW	1	I	FLUID LEVEL SW	CLUS_GND	I	I	VALVE ECU SUPPLY	FR_RH_SIG	FR_RH_PWR	STOP LAMP SW ON	RR_LH_PWR	RR_LH_SIG	I	STOP LAMP SW	I	Ξ	RR_RH_SIG	RR_RH_PWR	-	FR_LH_PWR	FR_LH_SIG	MOTOR GND
Color of Wire	1	1	≻	ı	ı	GR	ВВ	I	I	≻	×	в	>	Γ	Ч	-	SB	I	-	>	ГG	I	g	В	в
Terminal No.	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

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

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	12	43 44	
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45 46																							
38 39 40 41 42 43 44 45	Signal Name	MOTOR SUPPLY	I	I	I	Ι	VDC OFF SW	Ι	IGN	Ι	DIAG-K	Ι	CAN-H	CAN-L	Ι	Ι	VALVE ECU GND	Ι	CAN2-H	CAN2-L	Ι	I	CLUS_SUP
0 30 3/	Color of Wire	œ	ı	ı	I	I	GR	I	W/R	I	SB	I	_	Ч	I	I	В	I	0	Ν	I	ı	≻
1 33 34 35 36 37	Terminal No.	-	2	з	4	5	9	2	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22

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< ECU DIAGNOSIS >

Fail-Safe

INFOID:000000004064928

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CAUTION:

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

ABS/EBD SYSTEM

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< ECU DIAGNOSIS >

[TYPE 2]

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.

- 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:000000004064929

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	BRC-132, "Description"
C1103	FR RH SENSOR-1	BRC-132, Description
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	BRC-135, "Description"
C1107	FR RH SENSOR-2	BRC-135, Description
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-138, "Description"
C1110	CONTROLLER FAILURE	BRC-140, "DTC Logic"
C1111	PUMP MOTOR	BRC-141, "Description"
C1113	G-SENSOR	BRC-143, "Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-146, "Description"
C1116	STOP LAMP SW	BRC-149, "Description"
C1120	FR LH IN ABS SOL	BRC-151, "Description"
C1121	FR LH OUT ABS SOL	BRC-154, "Description"
C1122	FR RH IN ABS SOL	BRC-151, "Description"
C1123	FR RH OUT ABS SOL	BRC-154, "Description"
C1124	RR LH IN ABS SOL	BRC-151, "Description"
C1125	RR LH OUT ABS SOL	BRC-154, "Description"
C1126	RR RH IN ABS SOL	BRC-151, "Description"
C1127	RR RH OUT ABS SOL	BRC-154, "Description"
C1130	ENGINE SIGNAL 1	
C1131	ENGINE SIGNAL 2	
C1132	ENGINE SIGNAL 3	BRC-157, "Description"
C1133	ENGINE SIGNAL 4	
C1136	ENGINE SIGNAL 6	
C1140	ACTUATOR RLY	BRC-159, "Description"
C1143	ST ANG SEN CIRCUIT	PPC 161 "Description"
C1144	ST ANG SEN SIGNAL	BRC-161, "Description"

< ECU DIAGNOSIS >

[TYPE 2]

Reference	Items (CONSULT screen terms)	DTC
DDC 142 "Description"	YAW RATE SENSOR	C1145
BRC-143, "Description"	SIDE G-SEN CIRCUIT	C1146
BRC-163. "Description"	BR FLUID LEVEL LOW	C1155
BRC-166. "Description"	ST ANG SEN COM CIR	C1156
BRC-167, "Description"	DECEL G SEN SET	C1160
BRC-168. "Description"	ST ANGL SEN SAFE	C1163
	CV1	C1164
DDC 160 "Description"	CV2	C1165
BRC-169, "Description"	SV1	C1166
	SV2	C1167
BRC-140, "DTC Logic"	VARIANT CODING	C1170
BRC-172, "Description"	ABS DIFLOCK CONTROLLER NG	C1187
BRC-173, "Description"	CAN COMM CIRCUIT	U1000

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SYMPTOM DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000004064930

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

VDC/TCS/ABS

< SYMPTOM DIAGNOSIS >

VDC/TCS/ABS

Symptom Table

INFOID:000000004064931

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation fre- quency	Looseness of front and rear axle	BRC-196, "Diag- nosis Procedure"
4	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-197, "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-198, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-199, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-200, "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	BRC-201, "Diag- nosis Procedure"
	ECM	<u>neele rioocdure</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]

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[TYPE 2]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000004064932

[TYPE 2]

1.CHECK START

Check front and rear brake force distribution using a brake tester.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: <u>FAX-5</u>, "<u>On-Vehicle</u> <u>Inspection and Service</u>" or rear: <u>RAX-20</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 harness inspection.

Is the inspection result normal?

YES >> GO TO 4 NO >> • Replace

- >> Replace wheel sensor or sensor rotor. Refer to <u>BRC-207, "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-126</u>, "CONSULT-III Function (ABS)".

NO >> Normal

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS > [TYPE 2]	
UNEXPECTED PEDAL REACTION	٨
Diagnosis Procedure	A
1.CHECK BRAKE PEDAL STROKE	В
Check brake pedal stroke. Refer to <u>BR-15, "Inspection and Adjustment"</u> .	
Is the stroke too large? YES >> • Bleed air from brake tube and hose. Refer to <u>BR-17, "Bleeding Brake System"</u> .	С
 Check brake pedal, brake tobe and nose. Nere to <u>Dicerry. Dieeding Drake System</u>. Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-15. "Inspection and Adjustment"</u> (brake pedal), <u>BR-11. "On Board Inspection"</u> (master cylinder), <u>BR-9. "Inspection"</u> (brake booster). NO >> GO TO 2 	D
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.	E
Is the inspection result normal? YES >> Normal	BRC
NO >> Check brake system.	G
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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

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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

< SYM	PTOM DIAGNOSIS > [T]	YPE 2]
ABS	FUNCTION DOES NOT OPERATE	Δ
Diagn	INFOLD:000	0000004064935
	<mark>ON:</mark> oes not operate when speed is 10 km/h (6 MPH) or lower. ECK ABS WARNING LAMP DISPLAY	В
	sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. <u>nspection result normal?</u>	С
YES NO	>> Normal >> Perform self-diagnosis. Refer to <u>BRC-126, "CONSULT-III Function (ABS)"</u> .	D

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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-126, "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

[TYPE 2]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL < SYMPTOM DIAGNOSIS > [TYPE 2]
VEHICLE JERKS DURING VDC/TCS/ABS CONTROL
Diagnosis Procedure
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-126, "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
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. <u>Are self-diagnosis results indicated?</u> 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 <u>EC-67, "CONSULT-III Function (ENGINE)"</u> .
 TCM: Refer to <u>TM-102, "CONSULT-III Function (TRANSMISSION)"</u>. NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-209, "Removal and Installa-tion"</u>.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000004064938

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condi- tion due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because TCS places the highest priority on the optimum traction (stability).	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.		
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal con- dition is restored, there is no malfunction. At that time, erase the self- diagnosis memory.	
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).		
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).		
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.)	
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.	

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[TYPE 2]

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.

Precaution for Brake System

CAUTION:

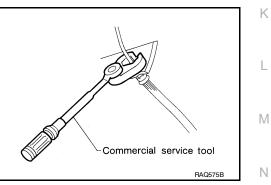
- Refer to MA-11, "Fluids and Lubricants" for recommended brake fluid.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts 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 <u>BR-32, "Brake Burnishing"</u> (front disc brake) or <u>BR-37, "Brake Burnishing"</u> (rear disc brake). WARNING:

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

Precaution for Brake Control

- 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.



PRECAUTIONS

< PRECAUTION >

- 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.

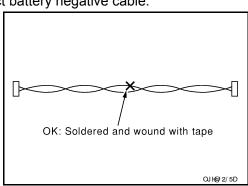
NOTE:

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

Precaution for CAN System

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- 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).

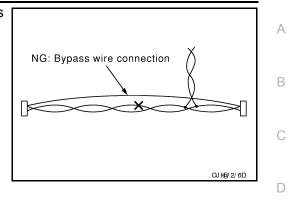


PRECAUTIONS

< PRECAUTION >

[TYPE 2]

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



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PREPARATION

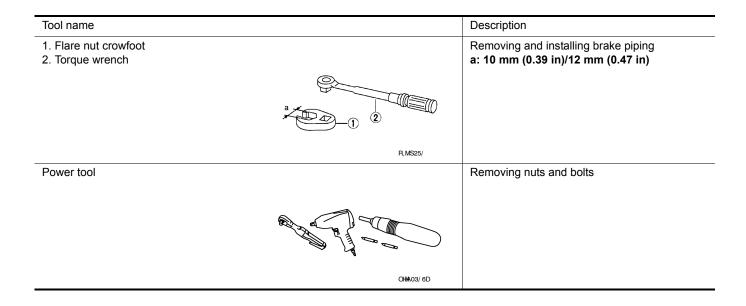
PREPARATION

Special Service Tool

INFOID:000000004471340

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		Checking operation of ABS active wheel sen- sors
ST30031000 (—) Bearing puller	YV@ 6//C	Removing sensor rotor

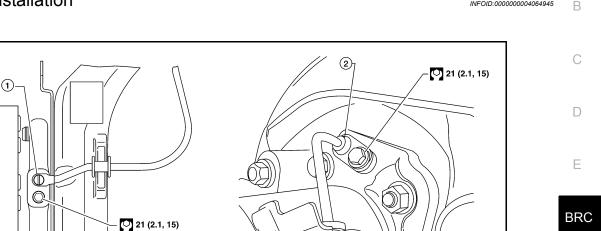


< REMOVAL AND INSTALLATION > **REMOVAL AND INSTALLATION** WHEEL SENSORS

SEC. 476

N·m (kg-m, ft-lb)

Front wheel sensor



REMOVAL

1

- 1. Remove the wheel sensor bolt(s).
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to BR-33, "Removal and Installation of Brake Caliper and Disc Rotor".

Rear wheel sensor (M226 with ELD)

2. Pull the wheel sensor straight out, being careful to turn it as little as possible. **CAUTION:**

2.

- · Be careful not to damage the wheel sensor edge and sensor rotor teeth.
- Do not pull on the wheel sensor harness.
- Disconnect the wheel sensor harness connector, then remove the wheel sensor harness from the mounts 3. 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 Ν installation.

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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 <u>FAX-8</u>, "<u>Removal and Installation</u>".

REAR

Removal

NOTE:

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

- 1. Remove axle shaft assembly. Refer to <u>RAX-21, "Removal and Installation"</u> (M226).
- 2. Pull the sensor rotor of off the axle shaft using Tool and a press.

Tool number : ST30031000 (—)

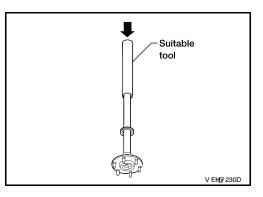
Installation

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

Do not reuse the old sensor rotor.

 Install axle shaft assembly. Refer to <u>RAX-21, "Removal and</u> <u>Installation"</u> (M226).
 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.



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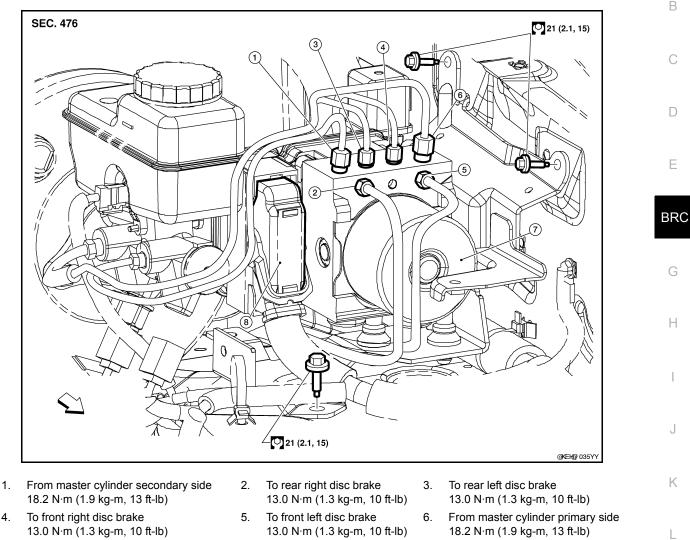
ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

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7. ABS actuator and electric unit (control unit)

REMOVAL

- 1. Disconnect the negative battery terminal.
- 2. Drain the brake fluid. Refer to BR-17, "Drain and Refill".
- 3. Remove air cleaner case. Refer to EM-24, "Exploded View".
- 4. Disconnect the actuator harness from the ABS actuator and electric unit (control unit). CAUTION:

8.

 To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.

Harness connector

Short Front

- Be careful not to splash brake fluid on painted areas.
- 5. Disconnect the brake tubes.
- 6. Remove three bolts and then the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

 If the ABS actuator and electric unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special <u>Repair Requirement"</u>.

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< 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.
- When removing components, cover connections so that no dirt, dust, or other foreign matter gets in.
- 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-17, "Bleeding Brake System"</u>.

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR A Removal and Installation INFOID 0000004491025 REMOVAL B 1. Remove the spiral cable. Refer to <u>SR-6. "Removal and Installation"</u>. B 2. Remove the screws and remove the steering angle sensor from the spiral cable. C INSTALLATION Installation is in the reverse order of removal. C • Reset the neutral position of the steering angle sensor. Refer to <u>BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". D CAUTION: Installation is in the reverse order of removal. D </u>

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-12, "ADJUSTMENT OF STEERING ANGLE SEN-</u><u>SOR NEUTRAL POSITION : Special Repair Requirement"</u>.

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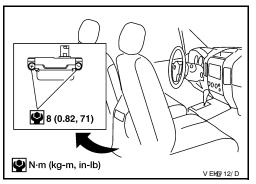
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G SENSOR

Removal and Installation

REMOVAL

- 1. Remove center console. Refer to <u>IP-10, "Exploded View"</u>.
- 2. Remove yaw rate/side/decel G sensor attaching 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 settings of the yaw rate/side/decel G sensor. Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement".

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