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APPLICATION NOTICE

< BASIC INSPECTION > [TYPE 1]

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

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 1]

DIAGNOSIS AND REPAIR WORKFLOW

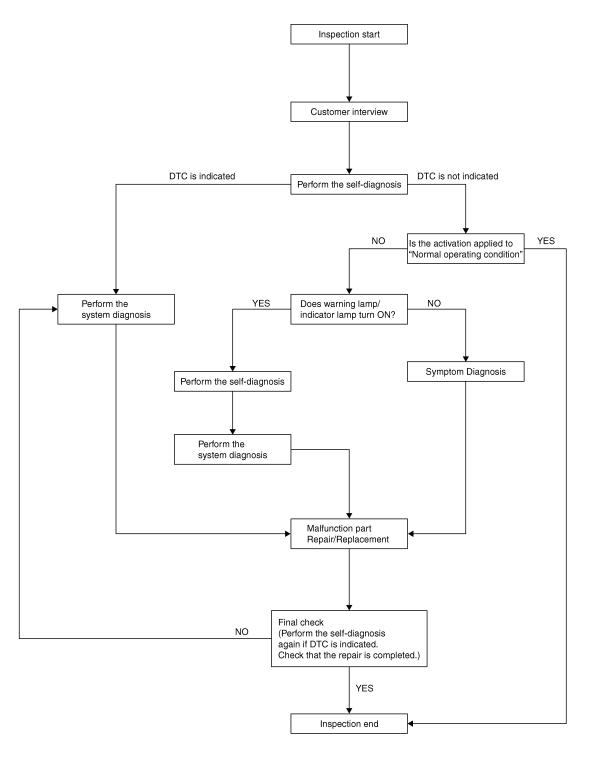
Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-12. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

[TYPE 1] < 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 BRC-11, "Diagnostic Work Sheet".

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 1]

2.perform the self-diagnosis

Check the DTC display with the self-diagnosis function. Refer to BRC-29, "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 BRC-96, "DTC No. Index".

>> GO TO 7

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

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-106</u>, <u>"Description"</u>.

Is the symptom a normal operation?

YES >> INSPECTION END

NO >> GO TO 5

${f 5.}$ CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-78, "Description".
- Brake warning lamp: Refer to BRC-79, "Description".
- VDC OFF indicator lamp: Refer to <u>BRC-80, "Description"</u>.
- SLIP indicator lamp: Refer to BRC-81, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6 NO >> GO TO 2

6. PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8

8. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 1]

Diagnostic Work Sheet

INFOID:0000000003081155

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

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< BASIC INSPECTION > [TYPE 1]

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000003081156

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

INFOID:0000000003081158

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

x: 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	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

Revision: February 2010 BRC-12 2008 Xterra

[TYPE 1] < BASIC INSPECTION > >> GO TO 2 2.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order. Touch "START". **CAUTION:** Do not touch steering wheel while adjusting steering angle sensor. 3. After approximately 10 seconds, touch "END". 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 **BRC** Run vehicle with front wheels in straight-ahead position, then stop. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°. Is the steering angle within the specified range? YES >> GO TO 4 NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1 f 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-29, "CONSULT-III Function (ABS)". • ECM: Refer to EC-68, "CONSULT-III Function (ENGINE)". Are the memories erased? YES >> INSPECTION END >> Check the items indicated by the self-diagnosis. CALIBRATION OF DECEL G SENSOR CALIBRATION OF DECEL G SENSOR: Description INFOID:0000000003081160 Refer to the table below to determine if calibration of the decel G sensor is required. x: Required -: Not required N

	A. Nequired –. Not rec	quii cu
Situation	Calibration of decel G sensor	
Removing/Installing ABS actuator and electric unit (control unit)	_	
Replacing ABS actuator and electric unit (control unit)	×	
Removing/Installing steering angle sensor	×	
Replacing steering angle sensor	×	
Removing/Installing steering components	×	
Replacing steering components	×	
Removing/Installing suspension components	×	
Replacing suspension components	×	
Change tires to new ones	_	
Tire rotation	_	
Adjusting wheel alignment	×	

CALIBRATION OF DECEL G SENSOR: Special Repair Requirement

INFOID:0000000003081161

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CALIBRATION OF DECEL G SENSOR

CAUTION:

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

BRC-13 Revision: February 2010 2008 Xterra

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION > [TYPE 1]

(Calibration cannot be done without CONSULT-III)

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 \pm 0.08G.

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to <u>BRC-29, "CONSULT-III Function (ABS)"</u>.
- ECM: Refer to EC-68, "CONSULT-III Function (ENGINE)".

Are the memories erased?

YES >> INSPECTION END

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

APPLICATION NOTICE

< FUNCTION DIAGNOSIS > [TYPE 1]

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	

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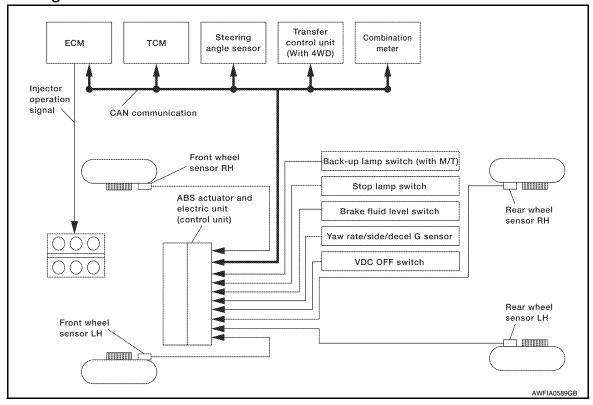
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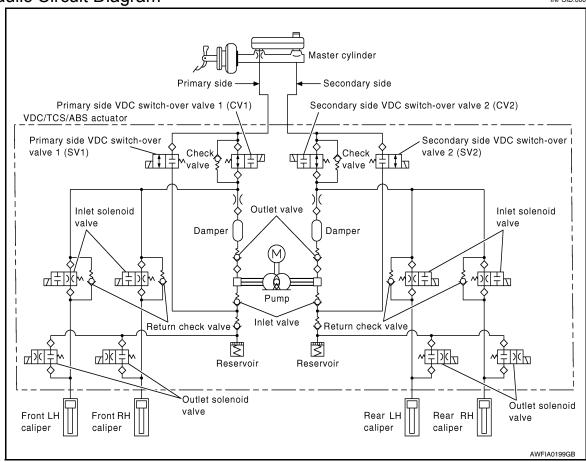
VDC

System Diagram

INFOID:0000000003081163



Hydraulic Circuit Diagram



System Description

· 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.

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• 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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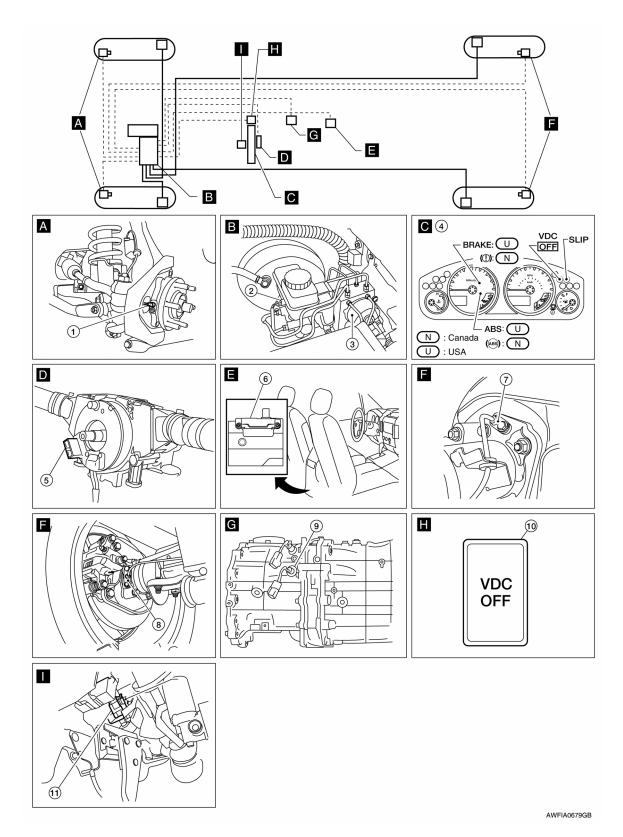
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Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- Steering angle sensor (behind spiral ca- 6. ble) M47
 (Steering wheel removed for clarity)
- ABS actuator and electric unit (control unit) E125
- S. Yaw rate/side/decel G sensor B73

< FUNCTION DIAGNOSIS > [TYPE 1]

 Rear wheel sensor (M226 rear axle) LH C11

Pear wheel sensor (M226 rear

Rear wheel sensor (M226 rear axle) RH C10

. Rear wheel sensor (C200 rear axle) LH 9. Back-up lamp switch F69 (with M/T) C11

Rear wheel sensor (C200 rear axle) RH

C10

11. Stop lamp switch E38

Component Description

10. VDC OFF switch M154

INFOID:0000000003081166

Component parts		Reference
Pump		DDC 44 UD acceptable
	Motor	BRC-44, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-62, "Description"
, and detailed and distance and (see a and)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-72, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Stop lamp switch		BRC-52, "Description"
Steering angle sensor		BRC-64, "Description"
Brake fluid level switch		BRC-66, "Description"
VDC OFF switch		BRC-76, "Description"
ABS warning lamp		BRC-78, "Description"
Brake warning lamp		BRC-79, "Description"
VDC OFF indicator lamp		BRC-80, "Description"
SLIP indicator lamp		BRC-81, "Description"

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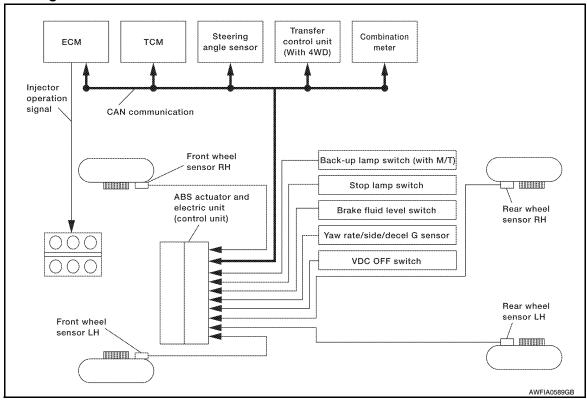
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TCS

System Diagram

INFOID:00000000006028772



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 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.

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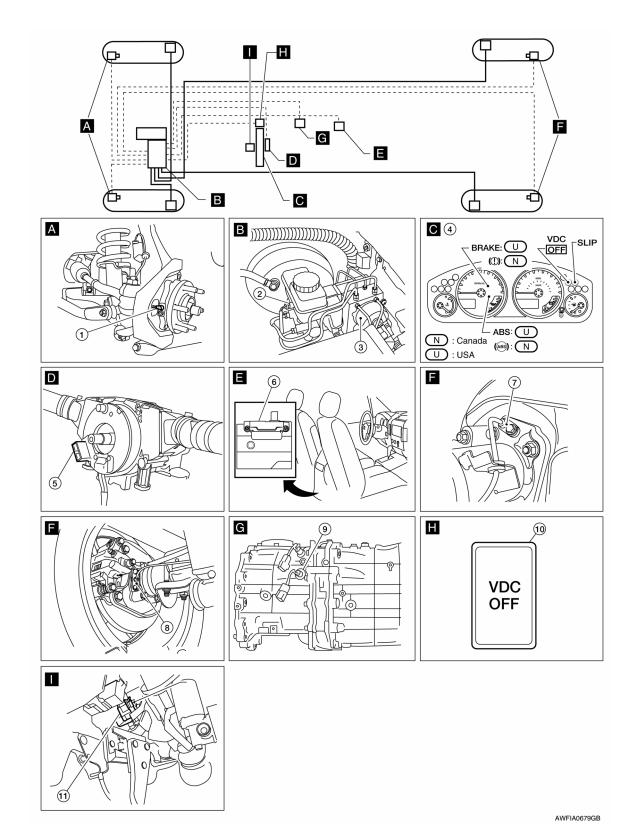
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Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- Steering angle sensor (behind spiral ca- 6. ble) M47 (Steering wheel removed for clarity)
- ABS actuator and electric unit (control unit) E125
- . Yaw rate/side/decel G sensor B73

 Rear wheel sensor (M226 rear axle) LH C11
 Rear wheel sensor (M226 rear

C11
Rear wheel sensor (C200 rear axle) RH

Rear wheel sensor (C200 rear axle) LH 9. Back-up lamp switch F69 (with M/T)

axle) RH C10

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Stop lamp switch E38

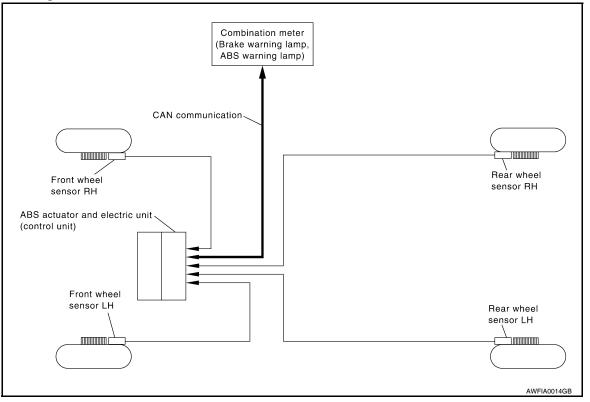
Component Description

10. VDC OFF switch M154

Component parts		Reference
	Pump	PDC 44 "Description"
	Motor	BRC-44, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-62, "Description"
	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-72, "Description"
Wheel sensor	BRC-35, "Description"	
Yaw rate/side/decel G sensor	BRC-46, "Description"	
Stop lamp switch		BRC-52, "Description"
Steering angle sensor	BRC-64, "Description"	
Brake fluid level switch		BRC-66, "Description"
VDC OFF switch		BRC-76, "Description"
ABS warning lamp	BRC-78, "Description"	
Brake warning lamp	BRC-79, "Description"	
VDC OFF indicator lamp	BRC-80, "Description"	
SLIP indicator lamp		BRC-81, "Description"

ABS

System Diagram



System Description

INFOID:0000000003081170

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

• Electrical system diagnosis by CONSULT-III is available.

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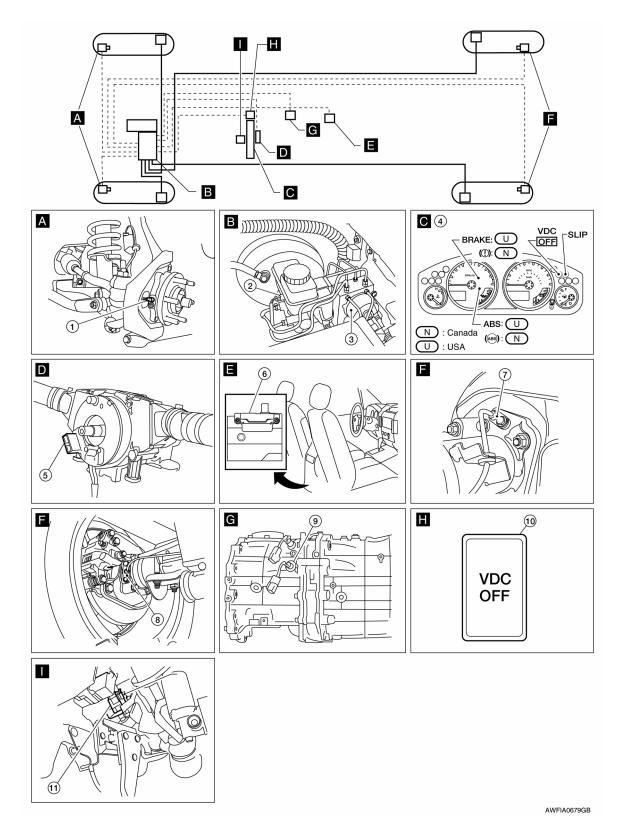
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Component Parts Location



- Front wheel sensor LH E18 Front wheel sensor RH E117
- Combination meter M24
- 2. Brake fluid level switch E21
- Steering angle sensor (behind spiral ca- 6. 5. ble) M47 (Steering wheel removed for clarity)
- ABS actuator and electric unit (control unit) E125

< FUNCTION DIAGNOSIS > [TYPE 1]

7. Rear wheel sensor (M226 rear axle) LH C11

Rear wheel sensor (M226 rear axle) RH C10

. Rear wheel sensor (C200 rear axle) LH 9. Back-up lamp switch F69 (with M/T) C11

Rear wheel sensor (C200 rear axle) RH

C10

11. Stop lamp switch E38

Component Description

10. VDC OFF switch M154

INFOID:00000000006028776

Compo	Reference	
	Pump	PDC 44 "Description"
	Motor	BRC-44, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-62, "Description"
, ibe actuates and clocking and (control and)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-72, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Stop lamp switch	BRC-52, "Description"	
Steering angle sensor	BRC-64, "Description"	
Brake fluid level switch	BRC-66, "Description"	
VDC OFF switch		BRC-76, "Description"
ABS warning lamp	BRC-78, "Description"	
Brake warning lamp	BRC-79, "Description"	
VDC OFF indicator lamp	BRC-80, "Description"	
SLIP indicator lamp	BRC-81, "Description"	

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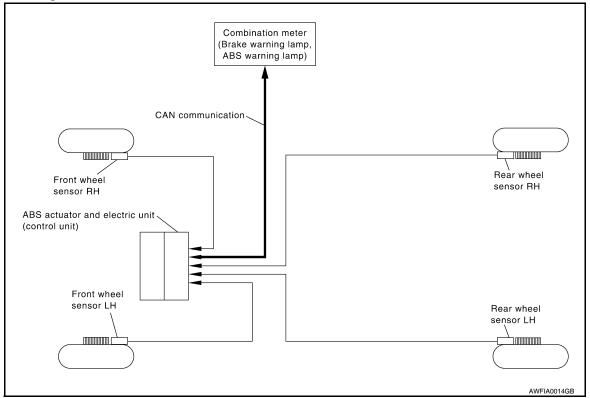
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EBD

System Diagram

INFOID:0000000006028771



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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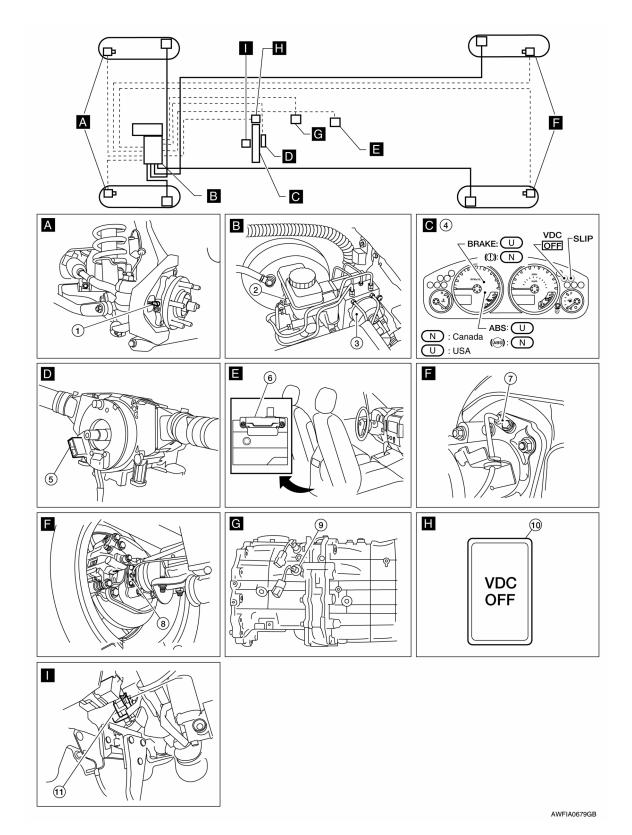
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Component Parts Location

INFOID:00000000006028777



- Front wheel sensor LH E18 Front wheel sensor RH E117
- Combination meter M24

Revision: February 2010

- 2. Brake fluid level switch E21
- Steering angle sensor (behind spiral ca- 6. 5. ble) M47 (Steering wheel removed for clarity)
- ABS actuator and electric unit (control unit) E125
- Yaw rate/side/decel G sensor B73

 Rear wheel sensor (M226 rear axle) LH C11 Rear wheel sensor (M226 rear

Rear wheel sensor (C200 rear axle) LH
 C11
 Rear wheel sensor (C200 rear axle) RH

Rear wheel sensor (C200 rear axle) LH 9. Back-up lamp switch F69 (with M/T)

axle) RH C10

C10

10. VDC OFF switch M154 11.

11. Stop lamp switch E38

Component Description

Component parts		Reference
	Pump	DDC 44 "Decembrica"
	Motor	BRC-44, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-62, "Description"
The detactor and discuss and (control and)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-72, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Stop lamp switch		BRC-52, "Description"
Steering angle sensor		BRC-64, "Description"
Brake fluid level switch		BRC-66, "Description"
VDC OFF switch		BRC-76, "Description"
ABS warning lamp	BRC-78, "Description"	
Brake warning lamp	BRC-79, "Description"	
VDC OFF indicator lamp		BRC-80, "Description"
SLIP indicator lamp		BRC-81, "Description"

< FUNCTION DIAGNOSIS > [TYPE 1]

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

CONSULT-III Function (ABS)

INFOID:0000000003081173

FUNCTION

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

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

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

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

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

Display Item List

Refer to BRC-96, "DTC No. Index".

DATA MONITOR MODE

Display Item List

Item	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
GEAR	×	×	×	Gear position judged by transmission range 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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< FUNCTION DIAGNOSIS >

[TYPE 1]

Item	Data	a monitor item sele	D		
(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 displayed.	
N POSI SIG	-	_	×	Shift position judged by transmission range switch signal.	
P POSI SIG	-	_	×	Shift position judged by transmission range 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 communication signal is displayed.	
STR ANGLE SIG (deg)	×	-	×	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) status is displayed.	
FR LH IN SOL (ON/OFF)	-	×	×	Front LH IN ABS solenoid (ON/ OFF) status is displayed.	
FR LH OUT SOL (ON/OFF)	-	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.	
RR RH IN SOL (ON/OFF)	-	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.	
RR RH OUT SOL (ON/OFF)	-	×	×	Rear RH OUT ABS solenoid (ON/ OFF) status is displayed.	
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.	

< FUNCTION DIAGNOSIS > [TYPE 1]

Item		a monitor item sele		Remarks
(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.
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	-	-	×	Brake warning lamp (ON/OFF) status is displayed.
SLCT LVR POSI	×	×	×	Shift position judged by transmission range switch signal.
R POSI SIG	-	-	×	Shift position judged by transmission range switch signal.
2WD/4WD	-	-	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
CRANKING SIG	-	-	×	The input state of the key SW START position signal is displayed.
RELEASE SW NO	-	-	×	Release switch signal (ON/OFF) status is displayed. "ON" indicates that the brake pedal is depressed. "OFF" is that the brake pedal is released.
RELEASE SW NC	-	-	×	Release switch signal (ON/OFF) status is displayed. "OFF" indicates that the brake pedal is depressed on. "ON" is that the brake pedal is released.
OHB FAIL	_	-	×	OHB fail status is displayed.
HBA FAIL	_	_	×	HBA fail status is displayed.

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< FUNCTION DIAGNOSIS > [TYPE 1]

Item	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
OHB SIG	_	-	×	OHB operation (ON/OFF) status is displayed.
HBA SIG	_	_	×	HBA operation (ON/OFF) status is displayed.
PRES CTRL ACC	_	_	×	This item is not used for this model.
PRES FAIL ACC	_	_	×	This item is not used for this model.
STP OFF RLY	-	-	×	Stop lamp relay signal (ON/OFF) status is displayed.

x: 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.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

NOTE:

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

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/TCS function, select the item menu for each test item.
- For ABS solenoid valve, touch "UP", "KEEP", and "DOWN" on the display screen. For ABS solenoid valve (ACT), touch "UP", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

Operation		AE	3S solenoid va	alve	ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
REAR SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

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

^{-:} Not applicable

< FUNCTION DIAGNOSIS >

[TYPE 1]

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

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APPLICATION NOTICE

< COMPONENT DIAGNOSIS >

[TYPE 1]

COMPONENT DIAGNOSIS

APPLICATION NOTICE

Application Notice

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 >

[TYPE 1]

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:0000000003081175

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or 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 BRC-35, "Diagnosis Procedure".

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.

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[TYPE 1]

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 BRC-111. "Removal and Installation".

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</u>, "On-Vehicle <u>Inspection and Service"</u> (front), <u>RAX-7</u>, "Rear Axle Bearing" (C200 rear axle), or <u>RAX-19</u>, "Rear Axle Bearing" (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-13</u>, "<u>Removal and Installation</u>" (M226 rear axle).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

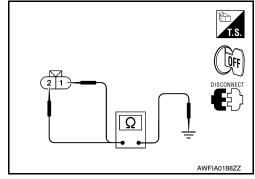
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

 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?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-113</u>, "Removal and Installation".

NO >> Repair the circuit.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[TYPE 1]

Component Inspection

INFOID:0000000003081178

1. CHECK DATA MONITOR

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

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Nearly matches the speedometer dis-
FR RH SENSOR	
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 BRC-35, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081179

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

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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[TYPE 1]

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

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-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	 Harness or connector Wheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

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 BRC-38, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081182

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.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 1]

$\overline{2}$.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-111, "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</u>, "<u>On-Vehicle Inspection and Service</u>" (front), <u>RAX-7</u>, "<u>Rear Axle Bearing</u>" (C200 rear axle), or <u>RAX-19</u>, "<u>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-13</u>, "<u>Removal and Installation</u>" (M226 rear axle).

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.

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.

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[TYPE 1]

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	Yes
	E125	46	EIO	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?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installation".

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)
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-38</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000003081184

INFOID:0000000003081183

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".

>> END

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

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C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply 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 BRC-41, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081187

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 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-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

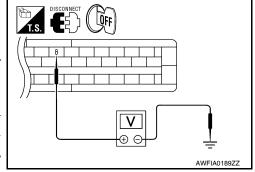
YES >> GO TO 2

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

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

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

ABS actuator and electric unit (control unit)		Condition	Voltage	
Connector Te	rminal			
E125 8	Ground	Ignition switch: ON	Battery voltage	
L 125	0	Giouna	Ignition switch: OFF	Approx. 0V



Turn ignition switch OFF.

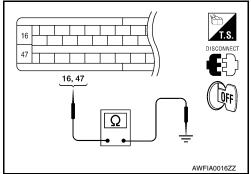
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

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:0000000003081188

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".

>> END

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

< COMPONENT DIAGNOSIS > [TYPE 1]

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

DTC Logic

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.	(control unit)

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-43</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End.

Diagnosis Procedure

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installation".

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). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

Revision: February 2010 BRC-43 2008 Xterra

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:0000000003081192

PUMP

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

MOTOR

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

DTC Logic

DTC DETECTION LOGIC

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

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 BRC-44, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081194

1. CONNECTOR INSPECTION

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminals for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

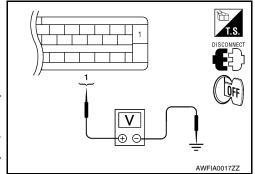
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

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

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



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

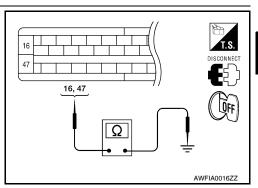
Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



Component Inspection

1. CHECK ACTIVE TEST

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

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 BRC-44, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$.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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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

INFOID:0000000003081199

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

Description INFOID:0000000003081197

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

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

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Calf diamenta manife
Self-diagnosis results
G-SENSOR
YAW RATE SENSOR
SIDE G-SEN CIRCUIT

Is above displayed on the self-diagnosis display?

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

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

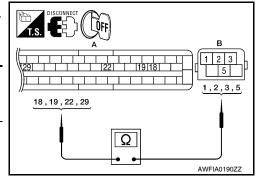
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

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.

		Yaw rate/side/	decel G sensor	Continuity
Connector	Terminal	Connector	Terminal	,
	18		2	
E125 (A)	18	B73 (B)	1	Yes
	22	B/3 (B)	3	res
	29		5	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3.YAW RATE/SIDE/DECEL G SENSOR INSPECTION

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 BRC-113, "Removal and Installation".

NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-116, "Removal and Installation".

Component Inspection

INFOID:0000000003081200

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 BRC-46, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081201

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 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".

>> END

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

C1115 WHEEL SENSOR

Description INFOID:0000000003081202

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:0000000003081203

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

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-49, "Diagnosis Procedure". YES

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081204

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

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

- 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 BRC-111, "Removal and Installation".

3.CHECK TIRES

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BRC-49 Revision: February 2010 2008 Xterra

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

Is the inspection result normal?

YES >> GO TO 5

NO >> Rep

>> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-13</u>, "<u>Removal and Installation</u>" (C200 rear axle), or <u>RAX-24</u>, "<u>Removal and Installation</u>" (M226 rear axle).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

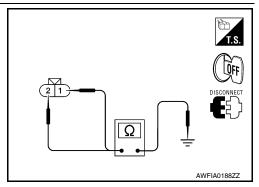
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

 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	
FrontIII		45	E18	1	
Front LH		46	E10	2	Yes
Front RH	E125	34	E117	1	
		33		2	
Rear LH		36		1	
Rear LH		37	OH	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 BRC-113, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000003081205

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.

|--|

Nearly matches the speedometer display (±10% or less) RR LH SENSOR RR RH SENSOR The inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-49. "Diagnosis Procedure". Pecial Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Ilways 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		C1115 WHEEL SENSOR	
Nearly matches the speedometer display (±10% or less) Nearly matc	COMPONENT DIAGNOSIS >		
Play (±10% or less) Play (±10	FR LH SENSOR		
The inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-49, "Diagnosis Procedure". pecial Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".	FR RH SENSOR	Nearly matches the speedometer dis-	
the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-49. "Diagnosis Procedure". pecial Repair Requirement .ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Ilways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Ilways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13. "CALIBRATION OF DECEL G SENSOR: Description".	RR LH SENSOR	play (±10% or less)	
>> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-49, "Diagnosis Procedure". pecial Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways 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 OSITION: Description". >> GO TO 2 .CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".	RR RH SENSOR		
Pocial Repair Requirement ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".	s the inspection result normal?		
ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".			
ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Iways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13 , "CALIBRATION OF DECEL G SENSOR: Description".		_	
Iways 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 OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13 , "CALIBRATION OF DECEL G SENSOR: Description".	Special Repair Requireme	nt INFOID:0000000003081206	
nd electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL OSITION: Description". >> GO TO 2 CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".	.ADJUSTMENT OF STEERING	S ANGLE SENSOR NEUTRAL POSITION	
CALIBRATION OF DECEL G SENSOR Iways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13 , "CALIBRATION OF DECEL G SENSOR: Description".			
lways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13 , "CALIBRATION OF DECEL G SENSOR: Description".	>> GO TO 2		
lways perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). efer to BRC-13 , "CALIBRATION OF DECEL G SENSOR: Description".		SENSOR	
>> END	lways perform calibration of dec	el G sensor when replacing the ABS actuator and electric unit (control unit).	
	>> END		

BRC-51 Revision: February 2010 2008 Xterra

[TYPE 1]

C1116 STOP LAMP SWITCH

Description INFOID.000000003081207

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

DTC Logic

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-52</u>. "<u>Diagnosis Procedure</u>".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081209

INSPECTION 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.

$2.\mathsf{stop}$ LAMP SWITCH INSPECTION

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

Brake pedal depressed : Battery voltage

(approx. 12V)

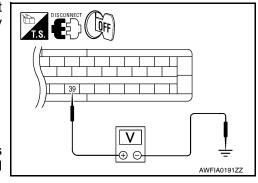
Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installation".

NO >> GO TO 3

 $3.\mathsf{stop}$ Lamp switch circuit inspection



C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 1]

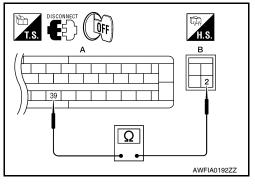
- Disconnect the stop lamp switch harness connector.
- Check the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) terminal 39 and stop lamp switch harness connector E38 (B) terminal 2.

Continuity should exist.

Is the inspection result normal?

YES >> Refer to BRC-8, "Work Flow".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003081210

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). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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[TYPE 1]

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:0000000003081211

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

DTC Logic

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-54, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081213

1. CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

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

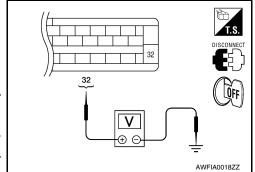
C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

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.

3.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR 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-113</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47 16, 47 AWFIA0016ZZ

Component Inspection

1. CHECK ACTIVE TEST

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

Operation .		ABS solenoid valve			
		Up	Keep	Down	
FR RH SOL		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	
KK KH 30L	RR RH OUT SOL	Off	Of	On*	
RR LH SOL	RR LH IN SOL	Off	On	On	
INIX LIT SOL	RR LH OUT SOL	Off	Off	On*	

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>BRC-54, "Diagnosis Procedure"</u>.

Special Repair Requirement

$1.\mathsf{ADJUSTMENT}$ 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".

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INFOID:0000000003081215

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 1]

>> 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

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 1]

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:0000000003081216

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:0000000003081217

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
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-57, "Diagnosis Procedure". YES

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081218

INSPECTION PROCEDURE

1. CHECK CONNECTOR

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-29, "CONSULT-III Function (ABS)".

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-57 2008 Xterra Revision: February 2010

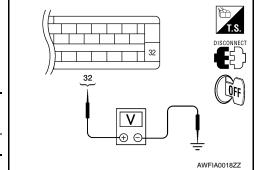
C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 1]

- 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) harness connector terminal 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.

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

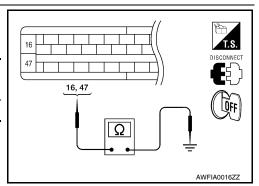
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003081219

Component Inspection

1. CHECK ACTIVE TEST

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

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN OOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

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

Is the inspection result normal?

YES >> INSPECTION END

C1121, C1123, C1125, C1127 OUT ABS SOL

COMPONENT DIAGNOSIS > [TYPE 1] NO >> Go to diagnosis procedure. Refer to BRC-57. "Diagnosis Procedure". 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). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 1]

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description INFOID:0000000003081221

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

DTC Logic

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 unit (control unit) judges that engine fuel cut system is malfunctioning.	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is (control unit)	Harness or connectorABS actuator and electric unit
C1132	ENGINE SIGNAL 3			(control unit)
C1133	ENGINE SIGNAL 4		ECM CAN communication line	
C1136	ENGINE SIGNAL 6			

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-60, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081223

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-68</u>, "<u>CONSULT-III Function (ENGINE)</u>".
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000003081224

${f 1}$.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

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 1]

$\overline{2}$.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-13</u>, "CALIBRATION OF <u>DECEL G SENSOR</u>: <u>Description"</u>.

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[TYPE 1]

< COMPONENT DIAGNOSIS >

C1140 ACTUATOR RLY

Description INFOID.000000003081225

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	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
Gen-diagnosis results
ACTUATOR RLY
ACTUATOR NET

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-62, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081227

INSPECTION 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.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

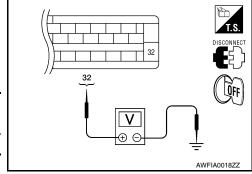
NO >> Poor connection of connector terminal. Repair or replace connector.

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

1. Turn ignition switch OFF.

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

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



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[TYPE 1]

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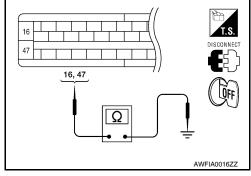
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). YES Refer to BRC-113, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003081228

Component Inspection

1. CHECK ACTIVE TEST

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

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 BRC-62, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081229

${f 1}$. 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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2008 Xterra

Revision: February 2010

BRC-63

C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

C1143, C1144 STEERING ANGLE SENSOR

Description INFOID.000000003081235

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

DTC Logic

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

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 BRC-64, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081237

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-29, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

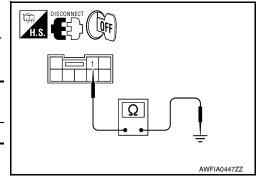
YES >> GO TO 2

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

2. CHECK STEERING ANGLE SENSOR HARNESS

- 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 angle sensor		Continuity
Terminal	_	Continuity
1	Ground	Yes
		Terminal



C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

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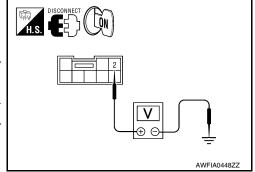
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Turn ignition switch ON.

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

Steering angle 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.
- 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?

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installa-YES tion".

NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-115, "Removal and Installation".

Component Inspection

INFOID:0000000003081238

1. CHECK DATA MONITOR

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

Steering condition STR ANGLE SIG (DATA MONITO		
riving straight 0±2.5 $^{\circ}$		
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-64, "Diagnosis Procedure". NO

Special Repair Requirement

INFOID:0000000003081239

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${f 1}$.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".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000003081241

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

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 connector Brake fluid level switch Brake 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 BRC-66, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081243

[TYPE 1]

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. 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.

	and electric unit ol 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.

-	DISCONNECT OFF	B < 1
		AWFIA0196ZZ

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

Is the inspection result normal?

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 1]

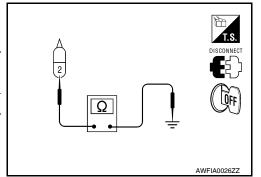
YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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?

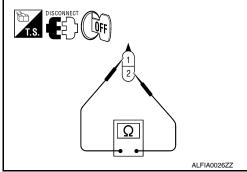
YES >> GO TO 4

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 – Z	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-113, "Removal and Installation".

NO >> Replace brake fluid level switch.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

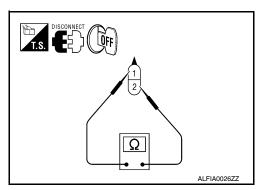
- 1. Turn ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch terminals.

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace brake fluid level switch.



INFOID:0000000003081245

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

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C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 1]

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

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

>> END

C1156 ST ANG SEN COM CIR

< COMPONENT DIAGNOSIS >

[TYPE 1]

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C1156 ST ANG SEN COM CIR

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

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 BRC-69, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connector and perform self-diagnosis. Refer to BRC-29, "CONSULT-III Function (ABS)".

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

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[TYPE 1]

C1160 DECEL G SEN SET

Description INFOID:0000000003081249

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

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 BRC-70, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081251

1.PERFORM SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Self-diagnosis results	
DECEL G SEN SET	

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

YES >> Perform repair or replacement for the item indicated.

NO >> Perform calibration of decel G sensor. Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description". GO TO 2

2.PERFORM SELF-DIAGNOSIS AGAIN

- 1. Turn the ignition switch OFF, then ON.
- Erase self-diagnosis results. Refer to <u>BRC-29, "CONSULT-III Function (ABS)"</u>.
- Perform ABS actuator and electric unit (control unit) self-diagnosis again. Refer to <u>BRC-29</u>, "CONSULT-III <u>Function (ABS)"</u>.

Are any self-diagnosis results displayed?

YES >> Replace yaw rate/side/decel G sensor. Refer to BRC-116, "Removal and Installation".

NO >> Inspection End.

C1163 ST ANGLE SEN SAFE

< COMPONENT DIAGNOSIS >

[TYPE 1]

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

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-71</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End.

Diagnosis Procedure

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: <u>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-29</u>, "CONSULT-III Function (ABS)".

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[TYPE 1]

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:0000000003081255

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

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 BRC-72, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003081257

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 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-29</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

C1164, C1165, C1166, C1167 CV/SV SYSTEM

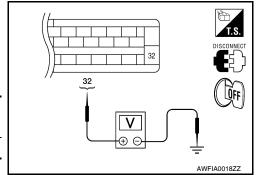
< COMPONENT DIAGNOSIS >

[TYPE 1]

$\overline{2.}$ 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) harness connector terminal 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.

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

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

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

16, 47

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003081258

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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		ABS solenoid valve (ACT)		
O	peration	UP	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLENOID (ACT)	FR RH OUT SOL	Off	Off	Off
FR 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
DD DU ARC COLENOID (ACT)	RR RH OUT SOL	Off	Off	Off
RR RH ABS SOLENOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off

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[TYPE 1]

Operation		ABS solenoid valve (ACT)		
O,	oeration	UP	ACT UP	ACT KEEP
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off
INITELLADO SOLLINOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off

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

Is the inspection result normal?

YES >> Inspection End.

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

Special Repair Requirement

INFOID:0000000003081259

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".

>> END

U1000 CAN COMM CIRCUIT

< COMPONENT DIAGNOSIS >

[TYPE 1]

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U1000 CAN COMM CIRCUIT

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

DTC Logic

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000003081273

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect the ABS actuator and electric unit (control unit) connector.
- 3. Check terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminals.
- Reconnect connector and perform self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

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

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

INFOID:0000000003081274

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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VDC OFF SWITCH

Description INFOID.000000003081275

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

Component Function Check

INFOID:0000000003081276

1. CHECK VDC OFF SWITCH OPERATION

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

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: pressed and released	ON
VDC OFF switch: pressed and released	OFF

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to BRC-76, "Diagnosis Procedure".

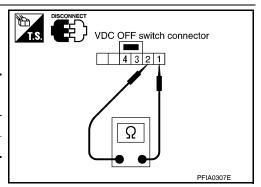
Diagnosis Procedure

INFOID:0000000003081277

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	Continuity
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

- 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 OF	F switch	Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	6	M154 (B)	1	Yes

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 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?

YES >> GO TO 3

< 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

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Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installa-

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

Component Inspection

INFOID:0000000003081278

1. CHECK VDC OFF SWITCH

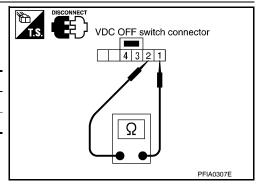
- Turn ignition switch OFF.
- Disconnect VDC OFF switch connector. 2.
- Check continuity between VDC OFF switch terminals.

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

Is the inspection result normal?

YES >> Inspection End.

>> Replace VDC OFF switch. NO



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ABS WARNING LAMP

x: ON -: OFF

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

Component Function Check

INFOID:0000000003081280

1. CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-78, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081281

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-29</u>, "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-113, "Removal and Installation".
- NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

[TYPE 1]

BRAKE WARNING LAMP

Description INFOID:0000000003081282

×: ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
Ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

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

Component Function Check

INFOID:0000000003081283

INFOID:0000000003081284

1.BRAKE WARNING LAMP OPERATION CHECK

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-29, "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-113, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation". **BRC**

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[TYPE 1]

VDC OFF INDICATOR LAMP

×: 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:0000000003081286

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 BRC-80, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check VDC OFF switch. Refer to BRC-76, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081287

1. CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check VDC OFF switch. Refer to BRC-76, "Diagnosis Procedure".

2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-29</u>, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

3. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

SLIP INDICATOR LAMP

< COMPONENT DIAGNOSIS >

[TYPE 1]

SLIP INDICATOR LAMP

×: ON –: OFF

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Condition	SLIP indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003081289

1. CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to BRC-81, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081290

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-29</u>, "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 <u>BRC-113, "Removal and Installation".</u>

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

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APPLICATION NOTICE

< ECU DIAGNOSIS > [TYPE 1]

ECU DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000003081291

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

[TYPE 1] < ECU DIAGNOSIS >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Α Reference Value INFOID:0000000003081292

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		0 [km/h (MPH)]	Vehicle stopped	
R LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
R RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
OTOD LANCE CITY	Our law and the size of the	When brake pedal is depressed	ON	
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is released	OFF	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
0FF 0W	VD0 OFF - 11-1 ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	
AM DATE OFN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	
YAW RATE SEN sensor		When vehicle turning	-75 to 75 d/s	
ACCEL POS SIG Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %		
		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	
		Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s²)	
		Vehicle turning left	Positive value (m/s ²)	

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< ECU DIAGNOSIS > [TYPE 1]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
OTD ANOLE OLO	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 accordance with tachometer display	
FLUID LEV SW	Proke fluid level quiteb signal status	When brake fluid level switch ON	ON	
FLOID LEV 3W	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF	
FR RH IN SOL	Operation status of each calencid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR KH 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	
ED DU QUIT SQU	Operation status of each calencid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR RH OUT SOL Operation	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED LILIN COL		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH IN SOL Operation status of each solenoid valv	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED III OUT OO		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator 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		
DD DLIN COL		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
RR RH IN SOL Oper	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
DD DU OUT OO		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
RR RH OUT SOL O	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
DD I H IN COL	Operation status of each calencid value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator 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	

[TYPE 1] < ECU DIAGNOSIS >

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
R LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
IN EIT OUT GOL	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
IOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
OTORNELAT	Motor and motor relay operation	When the motor relay and motor are not operating	OFF
CTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
STUATOR RET	Actuator relay operation	When the actuator relay is not operating	OFF
BS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
JO WAKIN LAMP	(Note 3)	When ABS warning lamp is OFF	OFF
FF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON
I I LAWF	(Note 3)	When VDC OFF indicator lamp is OFF	OFF
LIDLAMD	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
(Note 3)		When SLIP indicator lamp is OFF	OFF
VD FAIL REQ lote 2)	Transfer control unit fail-safe signal	When transfer control unit is in fail-safe mode	ON
10(6 2)		When transfer control unit is normal	OFF
BD SIGNAL	EBD operation	EBD is active	ON
BD SIGNAL	LBD operation	EBD is inactive	OFF
BS SIGNAL	ABS operation	ABS is active	ON
DO OTOTAL	Abo operation	ABS is inactive	OFF
CS SIGNAL	TCS operation	TCS is active	ON
CO SIGNAL	100 operation	TCS is inactive	OFF
DC SIGNAL	VDC operation	VDC is active	ON
DO SIGNAL	VDG operation	VDC is inactive	OFF
BD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON
DD I AIL OIG	LDD Idil-Sale Signal	EBD is normal	OFF
BS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
	Abo lair-sale signal	ABS is normal	OFF
CS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON
	1 00 Idii dale digilal	TCS is normal	OFF
DC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
2017112 010	120 Idii dale digilal	VDC is normal	OFF
RANKING SIG	Crank operation	Crank is active	ON
	C.a.iii. Operation	Crank is inactive	OFF
V1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
123 311.61. 313. 14110	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	

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< ECU DIAGNOSIS > [TYPE 1]

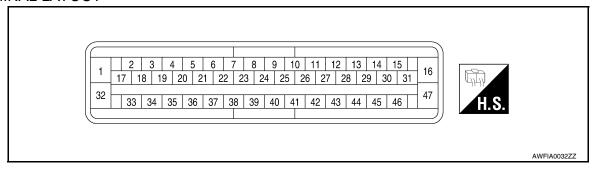
		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
CV2 VDC switch-over valve	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON	
	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF		
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("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	VDC switch-over valve	When actuator (switch-over valve) is active ("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		
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G	
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G	
ERD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON	
	(Note 3)	When EBD warning lamp is OFF	OFF	
N POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = N position	ON	
111 001 010	condition	A/T shift position = other than N position	OFF	
P POSI SIG	Transmission range switch signal ON/OFF condition	A/T shift position = P position	ON	
		A/T shift position = other than P position	OFF	
R POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = R position	ON	
11 001010	condition	A/T shift position = other than R position	OFF	
2\\\D\\A\\\D	Drive axle	2WD model	2WD	
2WD/4WD	Drive axie	4WD model	4WD	

NOTE:

- 1: Confirm tire pressure is normal.
- 2: Only 4WD models.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-78. "Description".
- Brake warning lamp: Refer to BRC-79, "Description".
- VDC OFF indicator lamp: Refer to BRC-80, "Description".
- SLIP indicator lamp: Refer to BRC-81, "Description".

< ECU DIAGNOSIS > [TYPE 1]

TERMINAL LAYOUT



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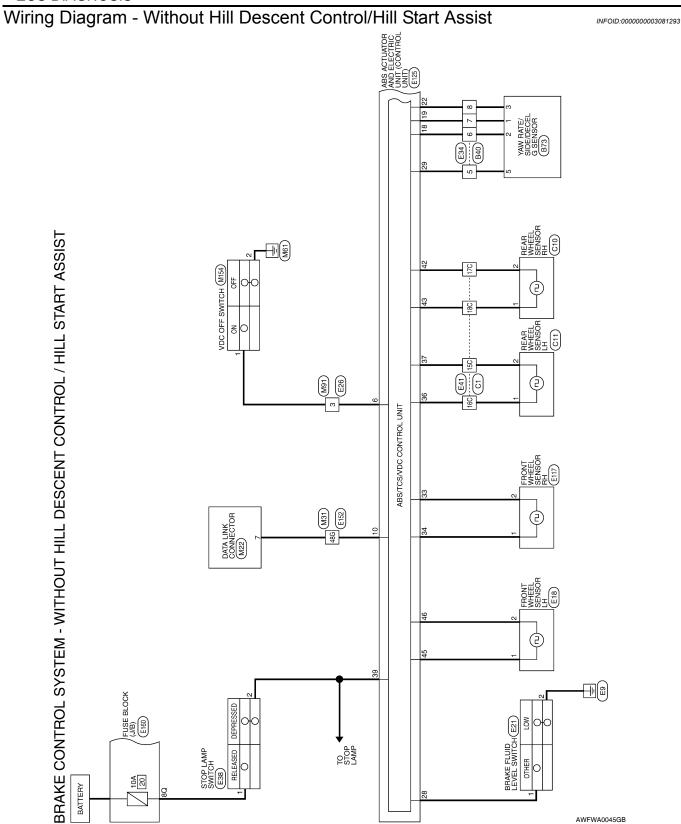
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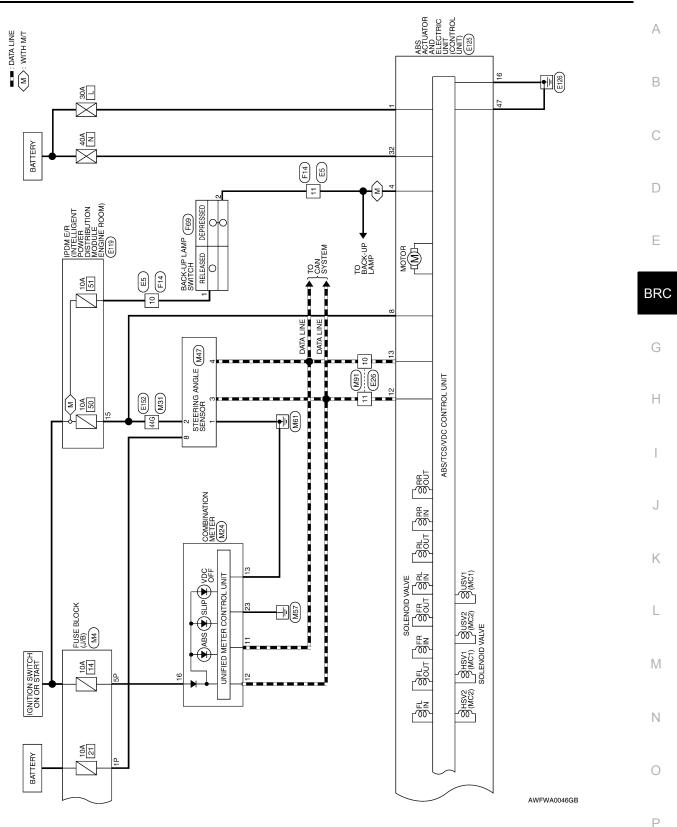
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< ECU DIAGNOSIS > [TYPE 1]



< ECU DIAGNOSIS > [TYPE 1]



Connector No. M24
Connector Name COMBINATION METER
Connector Color WHITE

BRAKE CONTROL SYSTEM CONNECTORS - WITHOUT HILL DESCENT CONTROL/HILL START ASSIST

Connector No. M22
Connector Name DATA LINK CONNECTOR

Connector Color WHITE

Connector No.	M4
Connector Name	Connector Name FUSE BLOCK (J/B)
Sonnector Color WHITE	WHITE

ctor No.	M4
ctor Name	ctor Name FUSE BLOCK (J/B)
ctor Color WHITE	WHITE
_	
7P 6P 5P 16P 15P 14P	6P 5P 4P 3P 2P 1P 15P14P 10P 9P 8P



Signal Name	_	1
Color of Wire	B/B	M/G
Terminal No.	11	4S

Signal Name

Color of Wire ≷

Terminal No.

	11 10 9 8 7 6 5 4 3 2 1	33 32 31 30 29 28 27 26 25 24 23 22 21	Signal Name	CAN-L	CAN-H	GROUND	RUN START	GND (POWER)	
	14 13 12	34 33 32 3	Color of Wire	۵	٦	GR	W/G	В	
H.S.	20 19 18 17 16 15	40 39 38 37 36 35 34	Terminal No.	11	12	13	16	23	

Connector No.	M47
Connector Name	Connector Name STEERING ANGLE SENSOR
Connector Color WHITE	WHITE

COLINECTOR INO.	IVI4/
Connector Name	Connector Name STEERING ANGLI
Connector Color WHITE	WHITE
	8

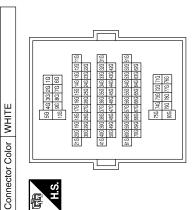
15	1	Signal Name	GND	POWER	CAN-H	CAN-L	BATT
lor WHI	<u>ω</u> ω	Color of Wire	В	W/R	٦	Ь	α
Connector Color WHITE	H.S.	Terminal No.	1	7	е	4	α

Signal Name	I	ı	
Color of Wire	W/R	8	
Terminal No.	44G	48G	

Connector Name | WIRE TO WIRE

M31

Connector No.



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< ECU DIAGNOSIS > [TYPE 1]

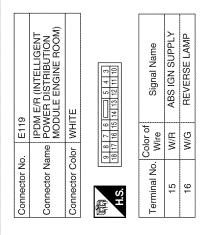
Revision: February 2010 BRC-91 2008 Xterra

	,	·····			,	,
	STOP LAMP SWITCH (WITH M/T)	¥		Signal Name	ĺ	ł
E38		or BLAC	2	Color of Wire	R/B	>
Connector No.	Connector Name	Connector Color BLACK	原 H.S.	Terminal No.	-	2

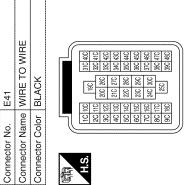
	Signal Name	ı	ł
2 1	Color of Wire	R/B	>
H.S.	Terminal No.	,	2
H.S.	L		2

	STOP LAMP SWITCH (WITH A/T)	ÌΠ		Signal Name	ı	**
E38	ļ	y WHIT	1 3 4	Color of Wire	H/B	>
Connector No.	Connector Name	Connector Color WHITE	fid H.S.	Terminal No.	-	2

	IE TO WIRE	ПЕ	6 2 1	Signal Name		Ī	ŀ	***
E34	ne WIF	or WH	4 8	Color of Wire	BB	0	Μ	>
Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE	原动 H.S.	Terminal No.	5	9	7	8



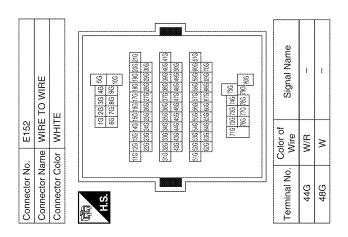
	Connector Name FRONT WHEEL SENSOR RH	,	رج	Signal Name	1	
E117	me FRON	lor GRAY		Color of Wire	В	W
Connector No.	Connector Na	Connector Color GRAY	H.S.	Terminal No.	-	2



	Signal Name	l	ŧ	ł	1	
Color of	Wire	Q.	7	>	re	
	Terminal No.	15C	16C	170	18C	

AWFIA0171GB

< ECU DIAGNOSIS > [TYPE 1]



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



Signal Name	MOTOR SUPPLY	ı	1	REV_SW	ı	VDC OFF SW	1	IGN	I	DIAG-K	1	CAN-H	CAN-L	ı	3	VALVE ECU GND	I	CAN2-H	CAN2-L	e e e	ı	CLUS_SUP
Color of Wire	ш	I	1	>	ı	GR	1	W/R	ı	SB	dea		۵	ı	ı	В	ı	0	3	ı	1	>
Terminal No.	-	2	က	4	5	9	7	8	o	10	<u>-</u>	12	13	14	15	16	17	18	19	20	21	22

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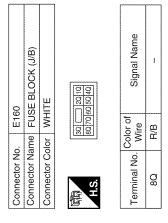
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Connector No.). F69	
Connector Name	ıme BA(BACK-UP LAMP SWITCH
Connector Color	olor WHITE	ITE
雨 H.S.		
Terminal No.	Color of Wire	Signal Name
-	W/G	ł
٥	ay.	1

	SB	Ů.	٥
	W/G	5	-
	Color of Wire	Ö ≶	Terminal No.
			H.S.
HE	WHITE	ğ	Connector Color
BACK-L		ıme	Connector Name
_	F-69	٠.	Connector No.

	WIRE TO WIRE		6 5 4 3 2 1	Signal Name	1	1
F14		or WHITE	24 23 22 21 20 19	Color of Wire	W/G	a
Connector No.	Connector Name	Connector Color WHITE	H.S. 24 23	Terminal No.	10	7



Connector No.	C111	
Connector Name	L	REAR WHEEL SENSOR RH
Connector Color	olor GRAY	AY
H.S.		
Terminal No. Wire	Color of Wire	Signal Name
-		ı
2	Ь	ı

Connector No.	0.10	
Connector Name	ame RE	REAR WHEEL SENSOR LH
Connector Color	olor GRAY	AY
所 H.S.		
Terminal No.	Color of Wire	Signal Name
-	re	
2	>	

 	H.S.
Conr	THE PERSON NAMED IN COURT

Signal Name	ı	ı	ı	ı	
Color of Wire	а	٦	^	re	
Terminal No.	15C	160	17C	18C	

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[TYPE 1] < ECU DIAGNOSIS >

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INFOID:0000000003081295

Connector Name WIRE TO WIRE Connector Color WHITE B40 Connector No.

YAW RATE/SIDE/DECEL G SENSOR

Connector Name Connector Color

B73

Connector No.

BLACK

Signal Name

Color of Wire

Terminal No.

Signal Name

Color of Wire BB

Terminal No. S 9 7 ∞

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CAN-H CLU_P

CAN-L

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Fail-Safe

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

ABS/EBD SYSTEM

< ECU DIAGNOSIS > [TYPE 1]

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 VDC/TCS/ABS system.
- 2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS/ABS 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 VDC/TCS system. In case of an electrical malfunction with the VDC/TCS system, the ABS control continues to operate normally without VDC/TCS control.

DTC No. Index

DTC	Items (CONSULT screen terms)	Reference	
C1101	RR RH SENSOR-1	BRC-35, "Description"	
C1102	RR LH SENSOR-1		
C1103	FR RH SENSOR-1		
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2	BRC-38, "Description"	
C1107	FR RH SENSOR-2		
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-41, "Description"	
C1110	CONTROLLER FAILURE	BRC-43, "DTC Logic"	
C1111	PUMP MOTOR	BRC-44, "Description"	
C1113	G-SENSOR	BRC-46, "Description"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-49, "Description"	
C1116	STOP LAMP SW	BRC-52, "Description"	
C1120	FR LH IN ABS SOL	BRC-54, "Description"	
C1121	FR LH OUT ABS SOL	BRC-57, "Description"	
C1122	FR RH IN ABS SOL	BRC-54, "Description"	
C1123	FR RH OUT ABS SOL	BRC-57, "Description"	
C1124	RR LH IN ABS SOL	BRC-54, "Description"	
C1125	RR LH OUT ABS SOL	BRC-57, "Description"	
C1126	RR RH IN ABS SOL	BRC-54, "Description"	
C1127	RR RH OUT ABS SOL	BRC-57, "Description"	
C1130	ENGINE SIGNAL 1		
C1131	ENGINE SIGNAL 2	BRC-60, "Description"	
C1132	ENGINE SIGNAL 3		
C1133	ENGINE SIGNAL 4		
C1136	ENGINE SIGNAL 6		
C1140	ACTUATOR RLY	BRC-62, "Description"	
C1143	ST ANG SEN CIRCUIT	BRC-64, "Description"	
C1144	ST ANG SEN SIGNAL		

< ECU DIAGNOSIS > [TYPE 1]

DTC	Items (CONSULT screen terms)	Reference	
C1145	YAW RATE SENSOR	BRC-46, "Description"	
C1146	SIDE G-SEN CIRCUIT		
C1155	BR FLUID LEVEL LOW	BRC-66, "Description"	
C1156	ST ANG SEN COM CIR	BRC-69, "Description"	
C1160	DECEL G SEN SET	BRC-70, "Description"	
C1163	ST ANGL SEN SAFE	BRC-71, "Description"	
C1164	CV1	BRC-72, "Description"	
C1165	CV2		
C1166	SV1		
C1167	SV2		
C1170	VARIANT CODING	BRC-43, "DTC Logic"	
U1000	CAN COMM CIRCUIT	BRC-75, "Description"	

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APPLICATION NOTICE

< SYMPTOM DIAGNOSIS > [TYPE 1]

SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

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

INFOID:0000000003081297

VDC/TCS/ABS

< SYMPTOM DIAGNOSIS > [TYPE 1]

VDC/TCS/ABS

Symptom Table

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	
	Looseness of front and rear axle	BRC-100, "Diag- nosis Procedure"
	Wheel sensor and rotor system	<u> </u>
Unexpected pedal reaction	Brake pedal stroke	BRC-101, "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-102, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-103, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-104, "Diag-
	ABS actuator and electric unit (control unit)	nosis Procedure"
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	
	ТСМ	BRC-105, "Diag- nosis Procedure"
	ECM	<u></u>

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.
- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[TYPE 1]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000003081299

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

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

Is the inspection result normal?

YES >> GO TO 4

NO >> • Replace wheel sensor or sensor rotor. Refer to BRC-111, "Removal and Installation".

· Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

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

YES >> Perform self-diagnosis. Refer to BRC-29, "CONSULT-III Function (ABS)".

NO >> Normal

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS > [TYPE 1]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000003081300

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-14, "Inspection and Adjustment".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to <u>BR-16</u>, "<u>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-14</u>. "<u>Inspection and Adjustment</u>" (brake pedal), <u>BR-10</u>. "<u>On Board Inspection</u>" (master cylinder), <u>BR-8</u>. "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS > [TYPE 1]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000003081301

CAUTION:

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

1. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS > [TYPE 1]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

CAUTION:

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

1. CHECK ABS WARNING LAMP DISPLAY

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

YES >> Normal

NO >> Perform self-diagnosis. Refer to BRC-29, "CONSULT-III Function (ABS)".

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[TYPE 1]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000003081303

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 BRC-29, "CONSULT-III Function (ABS)".

3.symptom check 3

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

Do symptoms occur?

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

NO >> Normal

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

[TYPE 1] < SYMPTOM DIAGNOSIS > VEHICLE JERKS DURING VDC/TCS/ABS CONTROL Α Diagnosis Procedure INFOID:0000000003081304 1.SYMPTOM CHECK В Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES >> Normal. NO >> GO TO 2 2.CHECK SELF-DIAGNOSIS RESULTS D Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to BRC-29, "CONSULT-III Function (ABS)". Are self-diagnosis results indicated? Е >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3 BRC 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? Н YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4 f 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-68</u>, "<u>CONSULT-III Function (ENGINE)</u>". TCM: Refer to TM-102, "CONSULT-III Function (TRANSMISSION)". NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-113, "Removal and Installa-K tion". L M N

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[TYPE 1]

NORMAL OPERATING CONDITION

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	The same of the sa	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	
The ABS warning lamp, 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 condition is restored, there is no malfunction. At that time, erase the self-diagnosis memory.	
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 before performing an inspection on a chassis dynamometer.)	
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.	

< PRECAUTION > [TYPE 1]

PRECAUTION

PRECAUTIONS

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

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal
 injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag
 Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

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

Precaution for Brake System

CAUTION:

- Refer to MA-13, "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.

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< PRECAUTION > [TYPE 1]

Precaution for Brake Control

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 During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.

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

NOTE:

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

Precaution for CAN System

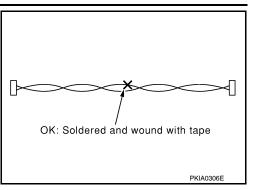
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- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.

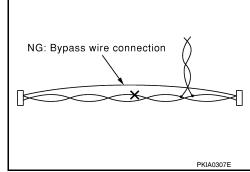
PRECAUTIONS

< PRECAUTION > [TYPE 1]

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



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



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< PREPARATION > [TYPE 1]

PREPARATION

PREPARATION

Special Service Tool

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

Tool number (Kent-Moore No.) Tool name		Description
— (J-45741) ABS active wheel sensor tester	J-45741-80X O O O POGEN MINISTER	Checking operation of ABS active wheel sensors
ST30031000 (—)		Removing sensor rotor
Bearing puller	ZZAO700D	

Commercial Service Tool

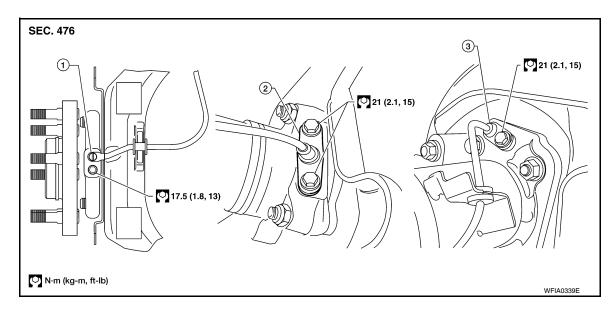
Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
	S-NT360	
Power tool		Removing nuts and bolts
	PIIB1407E	

INFOID:0000000003260901

REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation



1. Front wheel sensor

2. Rear wheel sensor (C200)

3. Rear wheel sensor (M226)

REMOVAL

- Remove 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".
- 2. Pull out the sensor, being careful to turn it as little as possible.

CAUTION:

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

INSTALLATION

- Before installing wheel sensors,
- Inspect wheel sensor assembly and replace if damaged.
- Clean wheel sensor hole and mating surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle.
- Install a new wheel sensor O-ring, then apply a coat of suitable grease to the O-ring and sensor hole. Refer to MA-13.
- Installation is in the reverse order of removal.

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SENSOR ROTOR

Removal and Installation

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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 RAX-8, "Removal and Installation".

REAR (M226)

Removal

NOTE:

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

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

Tool number : ST30031000 (—)

Installation

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

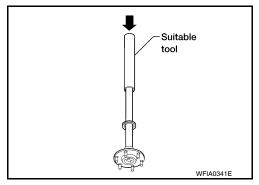
CAUTION:

Do not reuse the old sensor rotor.

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

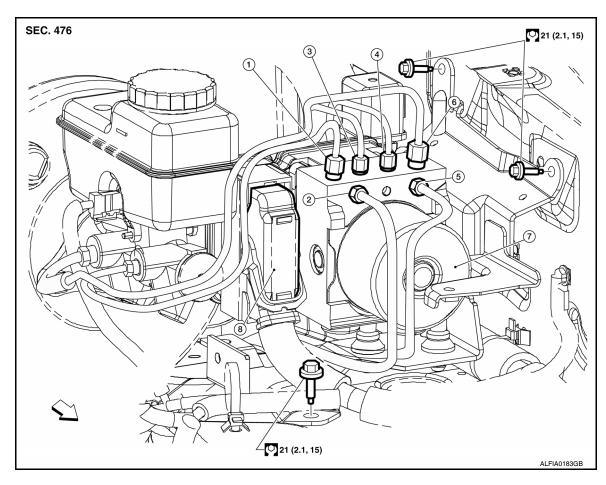


[TYPE 1]

INFOID:0000000005048613

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation



- 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)
- 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
- 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)

REMOVAL

- 1. Disconnect the negative battery terminal.
- Remove air cleaner case. Refer to EM-25, "Exploded View".
- 3. Disconnect the actuator harness from the ABS actuator and electric unit (control unit). **CAUTION:**
 - To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas.
- 4. Disconnect the brake tubes.

NOTE:

Cap or plug opening (s) to prevent fluid from spliing.

5. 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 BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[TYPE 1]

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-16</u>, "<u>Bleeding Brake System"</u>.

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

[TYPE 1]

STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000003260973

REMOVAL

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

CAUTION:

In the case that the ABS actuator and electronic unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

INSTALLATION

1. Installation is in the reverse order of removal.

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[TYPE 1]

G SENSOR

Removal and Installation

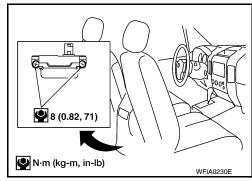
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REMOVAL

- 1. Remove center console. Refer to IP-11, "Exploded View".
- 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 BRC-13, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement".

APPLICATION NOTICE

< BASIC INSPECTION > [TYPE 2]

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

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< BASIC INSPECTION > [TYPE 2]

DIAGNOSIS AND REPAIR WORKFLOW

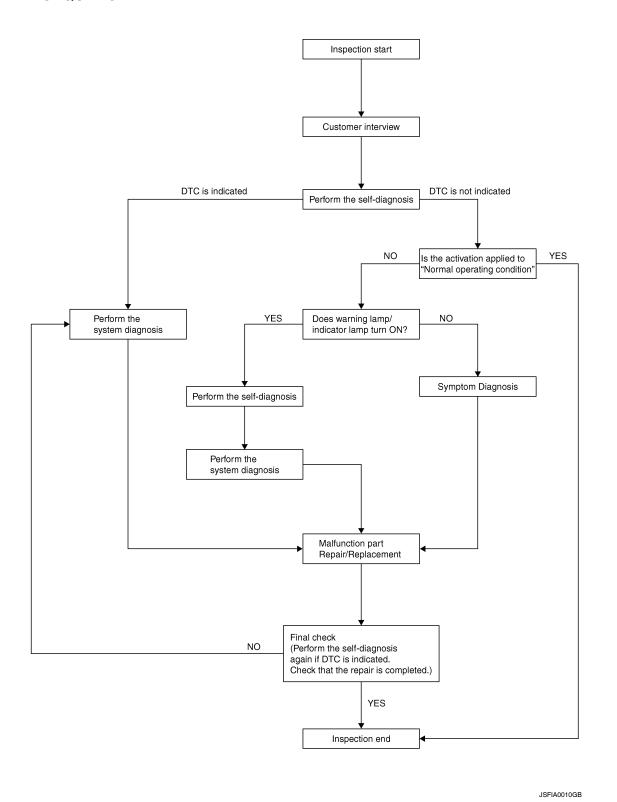
Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-122, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

< BASIC INSPECTION > [TYPE 2]

OVERALL SEQUENCE



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-121, "Diagnostic Work Sheet".

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< BASIC INSPECTION > [TYPE 2]

>> GO TO 2

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-145, "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 BRC-213, "DTC No. Index".

>> GO TO 7

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

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-223. <a href="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 <u>BRC-196</u>, "<u>Description</u>".
- Brake warning lamp: Refer to BRC-197, "Description".
- VDC OFF indicator lamp: Refer to BRC-199, "Description".
- SLIP indicator lamp: Refer to BRC-200, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6 NO >> GO TO 2

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8

8. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-145</u>, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> Inspection End

NO >> GO TO 3

< BASIC INSPECTION > [TYPE 2]

Diagnostic Work Sheet

INFOID:0000000003081319

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

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< BASIC INSPECTION > [TYPE 2]

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000003081320

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-122</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : <u>Special Repair Requirement</u>", GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to BRC-123, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement". ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description

INFOID:0000000003081322

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

x: 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	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

Revision: February 2010 BRC-122 2008 Xterra

< BASIC INSPECTION >	[149E 2]
>> GO TO 2	
2.PERFORM THE NEUTRAL POSITION ADJUSTME	INT FOR THE STEERING ANGLE SENSOR
 On the CONSULT-III screen, touch "WORK SUPPORT Touch "START". 	ORT" and "ST ANG SEN ADJUSTMENT" in order.
CAUTION: Do not touch steering wheel while adjusting steel. After approximately 10 seconds, touch "END".	eering angle sensor.
NOTE: After approximately 60 seconds, it ends automatical Turn ignition switch OFF, then turn it ON again.	ally.
CAUTION:	
Be sure to perform above operation.	
>> GO TO 3	
3.CHECK DATA MONITOR	
Run vehicle with front wheels in straight-ahead pos Select "DATA MONITOR". Then make sure "STR A	
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 10 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 ECM: Refer to <u>EC-68</u>, "CONSULT-III Function (ENGI) 	
Are the memories erased?	<u></u>
YES >> Inspection End	
NO >> Check the items indicated by the self-diagr	nosis.
CALIBRATION OF DECEL G SENSOR	
CALIBRATION OF DECEL G SENSOR : D	Description INFOID:000000000000081324
Refer to the table below to determine if calibration of th	e 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	×
Replacing steering angle sensor	×

1,	- 1-
Calibration of decel G sensor	
-	
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×	
×	
×	
×	
×	
×	
-	
-	
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CALIBRATION OF DECEL G SENSOR: Special Repair Requirement

INFOID:0000000003081325

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

BRC-123 Revision: February 2010 2008 Xterra

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION > [TYPE 2]

(Calibration cannot be done without CONSULT-III)

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 ±0.08G.

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to <u>BRC-145, "CONSULT-III Function (ABS)"</u>.
- ECM: Refer to EC-68, "CONSULT-III Function (ENGINE)".

Are the memories erased?

YES >> Inspection End

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

APPLICATION NOTICE

< FUNCTION DIAGNOSIS > [TYPE 2]

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	

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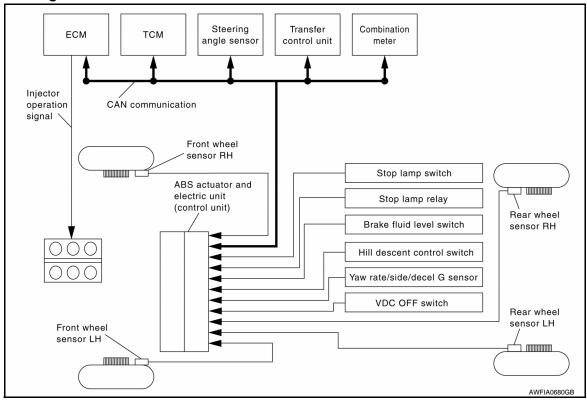
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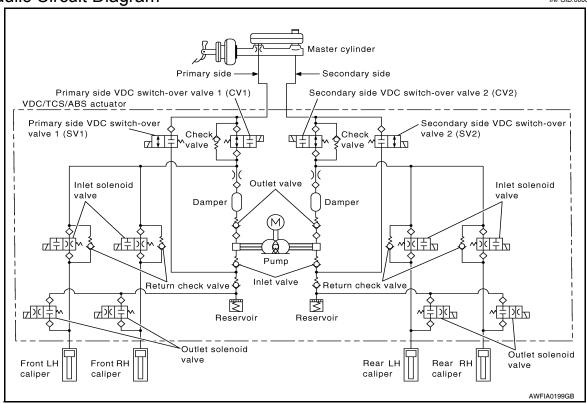
HILL DESCENT CONTROL

System Diagram

INFOID:0000000006028931



Hydraulic Circuit Diagram



HILL DESCENT CONTROL

< FUNCTION DIAGNOSIS > [TYPE 2]

System Description

INFOID:00000000006028933

The hill descent control system will help maintain vehicle speed when driving under 25-35 km/h (15-21 MPH)
on steeper downhill grades. Hill descent control will provide braking allowing the driver to concentrate on
steering while reducing the burden of brake and accelerator operation.

To operate the system, set the 4WD switch to 4H or 4LO and push the hill descent control switch. The hill
descent control indicator in the combination meter will turn on. While hill descent control is operating, the
stop/tail lamps will illuminate.

- If the accelerator or brake pedal is depressed while the hill descent control system is on, the system will stop operating.
- During hill descent control operation, a mechanical noise may be heard. This is normal.
- Electrical system diagnosis by CONSULT-III is available.

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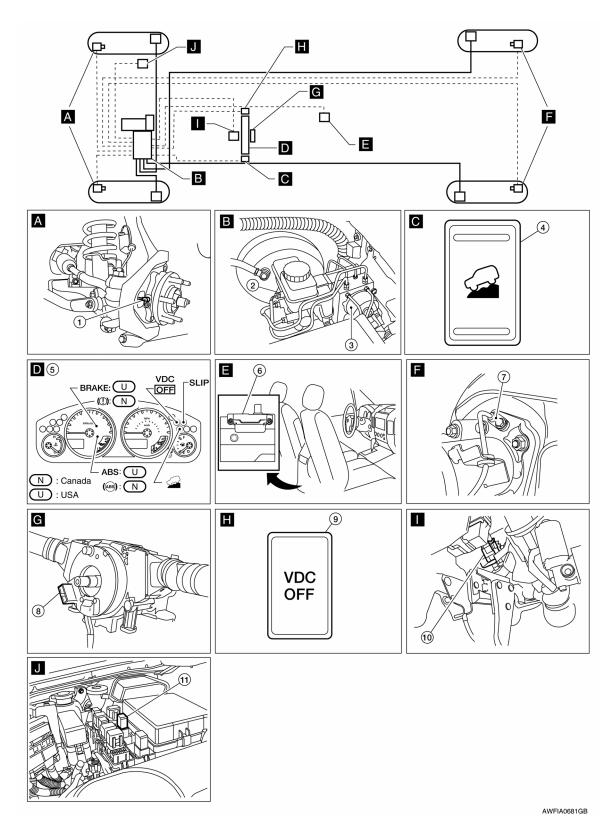
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Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73

HILL DESCENT CONTROL

< FUNCTION DIAGNOSIS > [TYPE 2]

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10 8. Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154

ble) M47 (Steering wheel removed for clarity)

10. Stop lamp switch E38 11. Stop lamp relay E12

Component Description

INFOID:0000000006028935

Component parts		Reference
	Pump	DDC 460 "Deceriation"
	Motor	BRC-160, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-178, "Description"
The detactor and electric and (control and)	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

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HILL START ASSIST

System Diagram

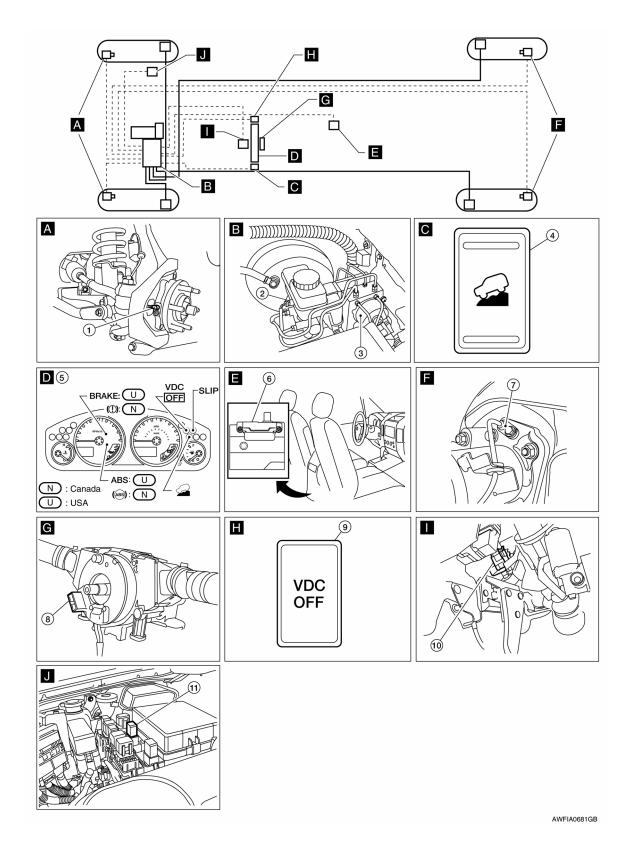
INFOID:00000000006029006 Steering Transfer Combination ECM ТСМ angle sensor control unit meter Injector operation CAN communication signal Front wheel sensor RH Stop lamp switch ABS actuator and electric unit Stop lamp relay (control unit) Rear wheel Brake fluid level switch sensor RH Hill descent control switch Yaw rate/side/decel G sensor VDC OFF switch Rear wheel sensor LH Front wheel sensor LH

System Description

- The hill start assist system will assist the driver by applying the brake automatically and preventing the vehicle from rolling backward when starting on an uphill.
- The maximum holding time is 2 seconds. After 2 seconds, the vehicle will begin to roll back gradually and then hill start assist will stop operating completely.

Component Parts Location

INFOID:00000000006029007



- Front wheel sensor LH E18 Front wheel sensor RH E117
- Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- ABS actuator and electric unit (control unit) E125
- Yaw rate/side/decel G sensor B73

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HILL START ASSIST

< FUNCTION DIAGNOSIS >

[TYPE 2]

 Rear wheel sensor LH C11 Rear wheel sensor RH C10 8. Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154

ble) M47

(Steering wheel removed for clarity)

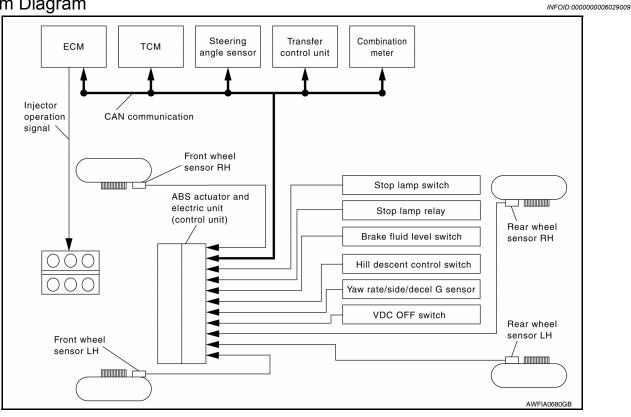
10. Stop lamp switch E38 11. Stop lamp relay E12

Component Description

Component parts		Reference
	Pump Motor	BRC-160, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-178, "Description"
Abo actuator and electric unit (control unit)	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

VDC

System Diagram



System Description

INFOID:0000000003081328

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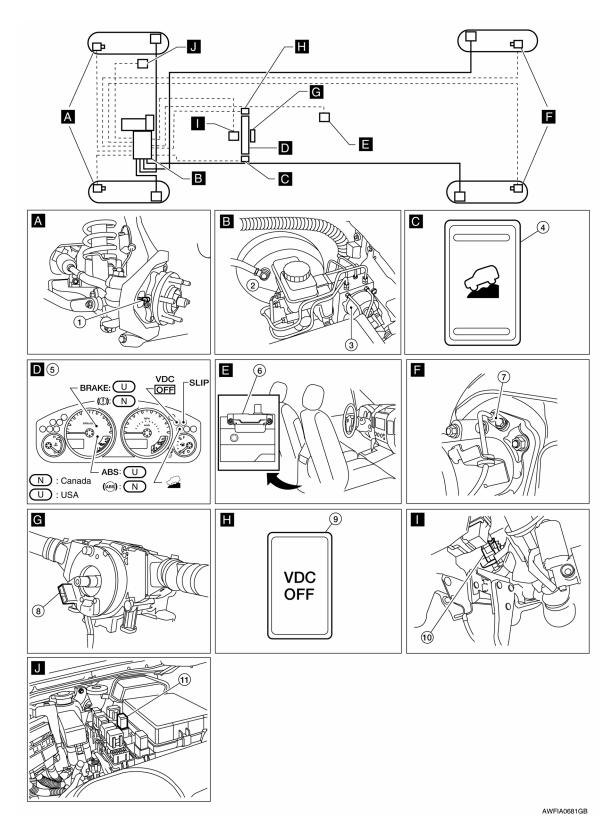
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- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under 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.

Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73

< FUNCTION DIAGNOSIS > [TYPE 2]

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10 Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154 ble) M47

(Steering wheel removed for clarity)

10. Stop lamp switch E38

11. Stop lamp relay E12

Component Description

INFOID:00000000006029012

Component parts		Reference
	Pump	PPC 160 "Description"
	Motor	BRC-160, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-178, "Description"
ADO dotados dia cicotilo dilit (control dilit)	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

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TCS

System Diagram

INFOID:00000000006029010 Steering Transfer Combination **ECM** TCM angle sensor control unit meter Injector operation CAN communication signal Front wheel sensor RH Stop lamp switch ABS actuator and electric unit Stop lamp relay (control unit) Rear wheel Brake fluid level switch sensor RH Hill descent control switch Yaw rate/side/decel G sensor VDC OFF switch Rear wheel sensor LH Front wheel sensor LH - million

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 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.

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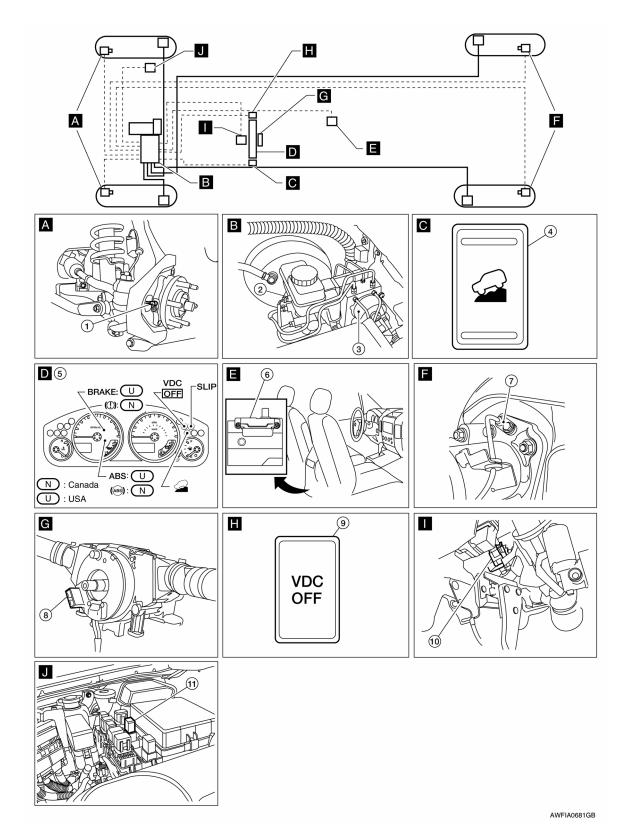
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Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- 3. ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10 Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154 ble) M47

(Steering wheel removed for clarity)

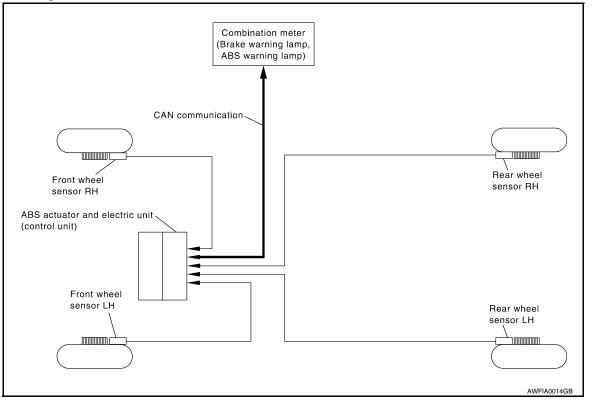
10. Stop lamp switch E38 11. Stop lamp relay E12

Component Description

Component parts		Reference
	Pump	BRC-160, "Description"
	Motor	
ABS actuator and electric unit (control unit)	Actuator relay	BRC-178, "Description"
,	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

ABS

System Diagram



System Description

INFOID:0000000003081334

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

• Electrical system diagnosis by CONSULT-III is available.

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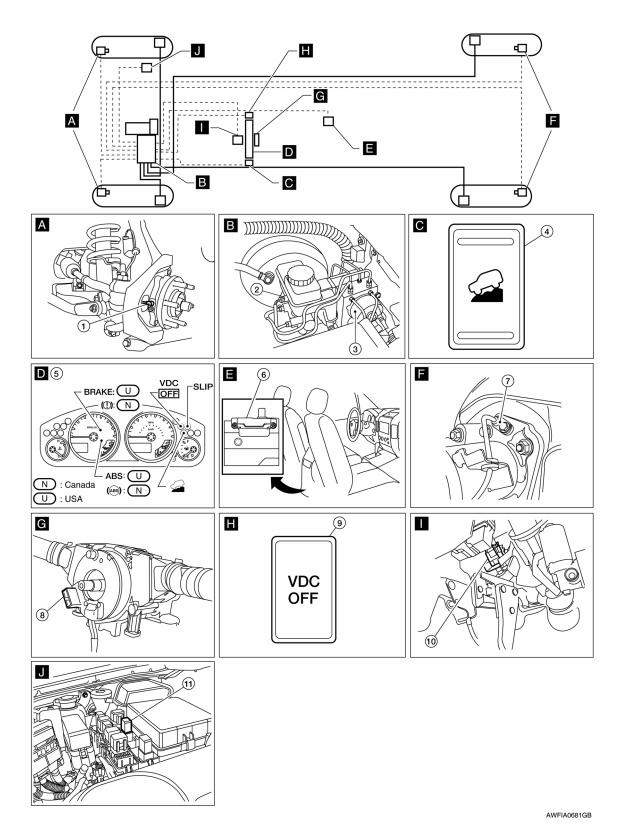
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Component Parts Location



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73

ABS

< FUNCTION DIAGNOSIS > [TYPE 2]

7. Rear wheel sensor LH C11 Rear wheel sensor RH C10 8. Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154

ble) M47 (Steering wheel removed for clarity)

10. Stop lamp switch E38 11. Stop lamp relay E12

Component Description

INFOID:0000000006029017

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	PDC 160 "Description"
	Motor	BRC-160, "Description"
	Actuator relay	BRC-178, "Description"
	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

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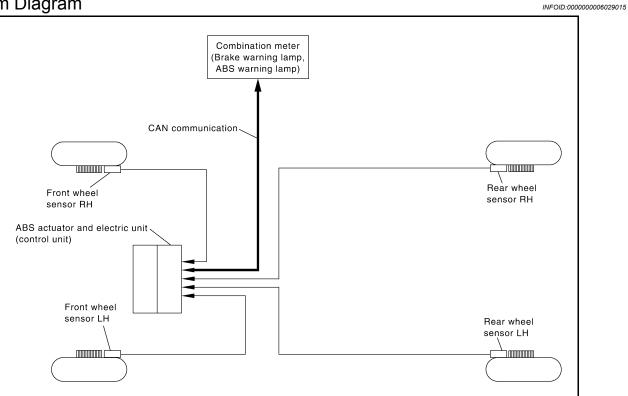
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EBD

System Diagram

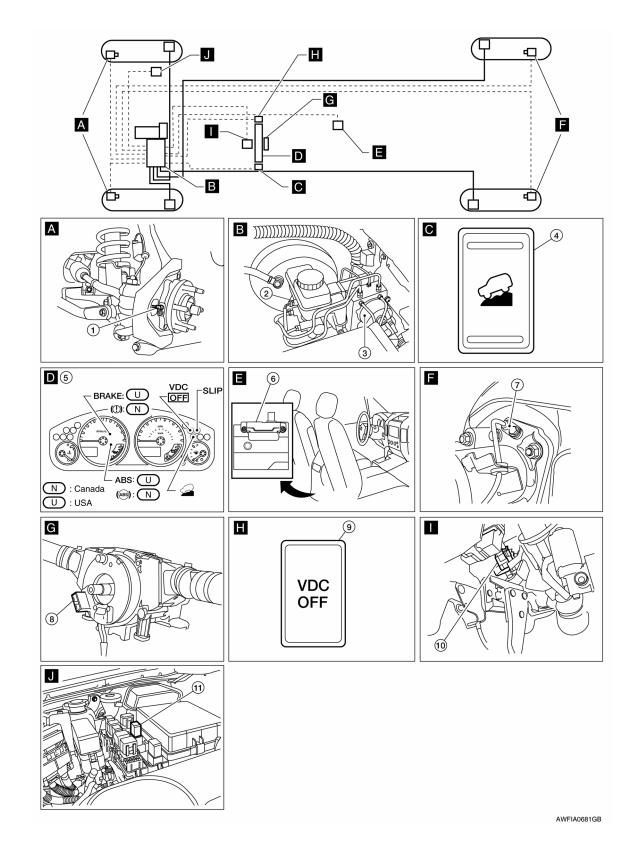


System Description

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

Component Parts Location

INFOID:00000000006029018



- Front wheel sensor LH E18 Front wheel sensor RH E117
- Hill descent control switch M155 5.
- Brake fluid level switch E21
- Combination meter M24
- ABS actuator and electric unit (control unit) E125
- Yaw rate/side/decel G sensor B73

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 Rear wheel sensor LH C11 Rear wheel sensor RH C10 Steering angle sensor (behind spiral ca- 9. VDC OFF switch M154 ble) M47

(Steering wheel removed for clarity)

10. Stop lamp switch E38 11. Stop lamp relay E12

Component Description

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump Motor	BRC-160, "Description"
	Actuator relay	BRC-178, "Description"
	Solenoid valve	BRC-170, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-188, "Description"
Wheel sensor		BRC-151, "Description"
Yaw rate/side/decel G sensor		BRC-162, "Description"
Stop lamp switch		BRC-168, "Description"
Steering angle sensor		BRC-180, "Description"
Brake fluid level switch		BRC-182, "Description"
Hill descent control switch		BRC-192, "Description"
VDC OFF switch		BRC-194, "Description"
ABS warning lamp		BRC-196, "Description"
Brake warning lamp		BRC-197, "Description"
Hill descent control indicator lamp		BRC-198, "Description"
VDC OFF indicator lamp		BRC-199, "Description"
SLIP indicator lamp		BRC-200, "Description"

< FUNCTION DIAGNOSIS > [TYPE 2]

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

CONSULT-III Function (ABS)

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FUNCTION

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

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

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

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

NOTE:

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

Display Item List

Refer to BRC-213, "DTC No. Index".

DATA MONITOR MODE

Display Item List

Item	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
GEAR	×	×	×	Gear position judged by transmission range 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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< FUNCTION DIAGNOSIS >

[TYPE 2]

Item	Data	a monitor item sele			
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LI wheel sensor signal is displayed.	
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuate and electric unit (control unit) is played.	
N POSI SIG	-	_	×	Shift position judged by transmission range switch signal.	
P POSI SIG	-	_	×	Shift position judged by transmission range 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 con munication signal is displayed.	
STR ANGLE SIG (deg)	×	-	×	Steering angle detected by steerin angle sensor is displayed.	
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate ser sor 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) statu is displayed.	
ABS WARN LAMP (ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) statu is displayed.	
SLIP LAMP (ON/OFF)	_	×	×	SLIP indicator lamp (ON/OFF) status is displayed.	
FR LH IN SOL (ON/OFF)	_	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.	
FR LH OUT SOL (ON/OFF)	_	×	×	Front LH OUT ABS solenoid (ON OFF) status is displayed.	
RR RH IN SOL (ON/OFF)	_	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.	
RR RH OUT SOL (ON/OFF)	_	×	×	Rear RH OUT ABS solenoid (ON OFF) status is displayed.	
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/OF 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/OF status is displayed.	

< FUNCTION DIAGNOSIS > [TYPE 2]

Item		a monitor item sele		Remarks	
(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 i displayed.	
SV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) st 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)	×	ı	×	Brake fluid level switch (ON/OFF) status is displayed.	
EBD SIGNAL (ON/OFF)	_	ı	×	EBD operation (ON/OFF) status displayed.	
ABS SIGNAL (ON/OFF)	-	-	×	ABS operation (ON/OFF) status is displayed.	
TCS SIGNAL (ON/OFF)	_	ı	×	TCS operation (ON/OFF) status is displayed.	
VDC SIGNAL (ON/OFF)	-	ı	×	VDC operation (ON/OFF) status is displayed.	
EBD WARN LAMP	-	ı	×	Brake warning lamp (ON/OFF) status is displayed.	
SLCT LVR POSI	×	×	×	Shift position judged by transmission range switch signal.	
R POSI SIG	-	-	×	Shift position judged by transmission range switch signal.	
2WD/4WD	-	-	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.	
CRANKING SIG	-	-	×	The input state of the key SW START position signal is displayed.	
RELEASE SW NO	-	-	×	Release switch signal (ON/OFF) status is displayed. "ON" indicates that the brake pedal is depressed. "OFF" is that the brake pedal is re leased.	
RELEASE SW NC	-	-	×	Release switch signal (ON/OFF) status is displayed. "OFF" indicates that the brake pedal is depressed on. "ON" is that the brake pedal is released.	
OHB FAIL	-	-	×	OHB fail status is displayed.	
HBA FAIL	_	_	×	HBA fail status is displayed.	

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[TYPE 2]

status is displayed.

< FUNCTION DIAGNOSIS >

Wa sa	Data	a monitor item sele			
Item (Unit)	ECU INPUT SIGNALS			Remarks	
OHB SIG	-	-	×	OHB operation (ON/OFF) status is displayed.	
HBA SIG	-	_	×	HBA operation (ON/OFF) status is displayed.	
PRES CTRL ACC	_	_	×	This item is not used for this model.	
PRES FAIL ACC	_	-	×	This item is not used for this model.	
STP OFF RLY	_	_	×	Stop lamp relay signal (ON/OFF)	

x: 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.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

NOTE:

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

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/TCS function, select the item menu for each test item.
- For ABS solenoid valve, touch "UP", "KEEP", and "DOWN" on the display screen. For ABS solenoid valve (ACT), touch "UP", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

Operation		AE	3S solenoid va	alve	ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAR OOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

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

^{-:} Not applicable

< FUNCTION DIAGNOSIS >

[TYPE 2]

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

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APPLICATION NOTICE

< COMPONENT DIAGNOSIS >

[TYPE 2]

COMPONENT DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000003081338

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 >

[TYPE 2]

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:0000000003081339

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:0000000003081340

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?

>> Proceed to diagnosis procedure. Refer to BRC-151, "Diagnosis Procedure". YES

>> Inspection End NO

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

>> Repair or replace as necessary. NO

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.

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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< 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 BRC-228, "Removal and Installation".

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

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-13</u>, "<u>Removal and Installation</u>" (M226 rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

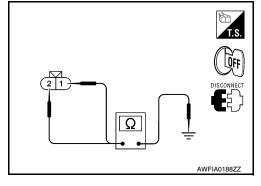
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

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 III		45	E40	1	Yes
Front LH		46	E18	2	
Front RH	F405	34	E117	1	
		33		2	
Rear LH	- E125	36	C11	1	
		37		2	
Rear RH		43	C10	1	
		42		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Repair the circuit.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[TYPE 2]

Component Inspection

INFOID:0000000003081342

1. CHECK DATA MONITOR

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

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-151, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081343

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".

>> END

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[TYPE 2]

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description INFOID:0000000003081344

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	 Harness or connector Wheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric uni (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

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-154, "Diagnosis Procedure"</u>.

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081346

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.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 2]

$\overline{2.}$ 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-228</u>, "Removal and Installation".

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

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-13</u>, "<u>Removal and Installation</u>" (C200 rear), or <u>RAX-24</u>, "<u>Removal and Installation</u>" (M226 rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 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

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

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[TYPE 2]

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	
FIUIIL LIT	E125	46		2	
Front RH		34	E117	1	Yes
FIOHL KIT		33		2	
Rear LH		36	C11	1	
Rear LH		37		2	
Rear RH		43	040	1	
Real RH		42	C10	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000003081347

1. CHECK DATA MONITOR

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

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-154, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:0000000003081348

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".

>> END

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

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C1109 POWER AND GROUND SYSTEM

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply 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 BRC-157, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081351

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-145</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

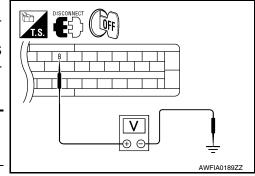
YES >> GO TO 2

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

$2. \mathsf{CHECK}$ ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT AND GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		_	Condition	Voltage
Connector	Terminal			
F125	8	Ground	Ignition switch: ON	Battery voltage
L123	L123 0 GIO		Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

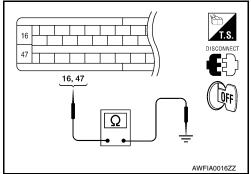
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

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:0000000003081352

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-122, "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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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

[TYPE 2] < COMPONENT DIAGNOSIS >

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

DTC Logic INFOID:0000000003081353

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.	(Control drift)

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?

>> Proceed to diagnosis procedure. Refer to BRC-159, "Diagnosis Procedure". YES

NO >> Inspection End

Diagnosis Procedure

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

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-122, "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 BRC-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:0000000003081356

PUMP

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

MOTOR

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit
OIIII	TOWN WOTOR	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-160</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081358

1. CONNECTOR INSPECTION

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminals for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-145</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

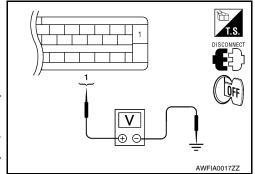
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

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

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



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

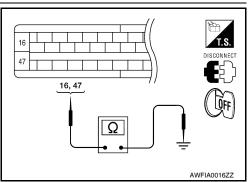
Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



Component Inspection

1. CHECK ACTIVE TEST

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

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 BRC-160, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$.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-122, "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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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INFOID:0000000003081360

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

< COMPONENT DIAGNOSIS >

[TYPE 2]

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

Description INFOID:0000000003081361

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

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

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-162</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081363

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

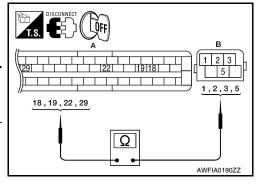
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 2]

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.

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector Terminal		
	18		2	
E125 (A)	19	B73 (B)	1	Yes
	22		3	165
	29		5	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3.YAW RATE/SIDE/DECEL G SENSOR INSPECTION

 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 (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 BRC-230, "Removal and Installation".

NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-233, "Removal and Installation".

Component Inspection

INFOID:0000000003081364

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 BRC-162, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081365

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

< 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-122</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: 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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

[TYPE 2]

C1115 WHEEL SENSOR

Description INFOID:0000000003081366

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:0000000003081367

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

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-165, "Diagnosis Procedure". YES

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081368

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

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

- 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 BRC-228, "Removal and Installation".

3.CHECK TIRES

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

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>" (front), <u>RAX-13</u>, "<u>Removal and Installation</u>" (C200 rear), or <u>RAX-24</u>, "<u>Removal and Installation</u>" (M226 rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

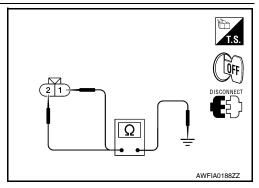
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor harness connector terminals and ground.

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		45	E18	1	Yes
	E125	46		2	
Front RH		34	E117	1	
		33		2	
Rear LH	E125	36	C11	1	
		37		2	
Rear RH		43	C10	1	
		42		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000003081369

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 [TYPE 2] < COMPONENT DIAGNOSIS > FR LH SENSOR Α FR RH SENSOR Nearly matches the speedometer display (±10% or less) RR LH SENSOR RR RH SENSOR В Is the inspection result normal? YES >> Inspection End NO >> Go to diagnosis procedure. Refer to BRC-165, "Diagnosis Procedure". Special Repair Requirement INFOID:0000000003081370 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION D 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 Е POSITION: Description". >> GO TO 2 **BRC** 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 Н M

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C1116 STOP LAMP SWITCH

Description INFOID:0000000003081371

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

DTC Logic

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
STOP LAMP SW	

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081373

INSPECTION 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.

$2.\mathsf{stop}$ Lamp switch inspection

Connect the stop lamp switch harness connector.

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

Brake pedal depressed : Battery voltage

(approx. 12V)

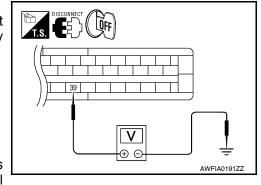
Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> GO TO 3

 $3.\mathsf{stop}$ Lamp switch circuit inspection



C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

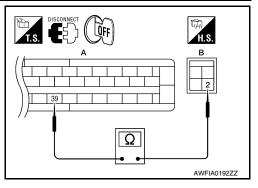
- 1. Disconnect the stop lamp switch harness connector.
- 2. Check the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) terminal 39 and stop lamp switch harness connector E38 (B) terminal 2.

Continuity should exist.

Is the inspection result normal?

YES >> Refer to EXL-4, "Work Flow".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003081374

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-122, "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-123, "CALIBRATION OF DECEL G SENSOR: Description".

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[TYPE 2]

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:0000000003081375

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

DTC Logic

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081377

1. CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-145, "CONSULT-III Function</u> (<u>ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

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

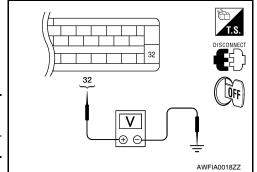
C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

- 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.

3.check solenoid, vdc switch-over valve and acuator 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)	— Continui		
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-230</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47 16, 47 AWFIA0016ZZ

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Component Inspection

1. CHECK ACTIVE TEST

- 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.

			S solenoid va	alve	ABS solenoid valve (ACT)		
Operation		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	OFF	OFF	OFF	OFF
Primary side VDC switch over valve 1 (SV1)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 1 (CV1)		OFF	OFF	OFF	OFF	ON	ON
Primary side VDC switch over valve 2 (SV2)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 2 (CV2)		OFF	OFF	OFF	OFF	ON	ON

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

Is the inspection result normal?

YES >> Inspection End

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C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

NO >> Go to diagnosis procedure. Refer to BRC-170, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081379

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-122, "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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1121, C1123, C1125, C1127 OUT ABS SOL

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

DTC Logic

DTC DETECTION LOGIC

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-173, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

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1. CHECK CONNECTOR

- Turn ignition switch OFF.
 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-145, "CONSULT-III Function (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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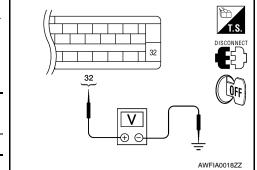
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[TYPE 2]

- 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) harness connector terminal and ground.

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



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

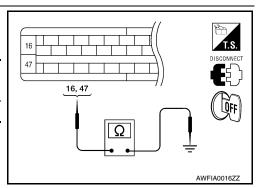
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	— Continui		
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-230</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003081383

Component Inspection

1. CHECK ACTIVE TEST

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

Operation		ABS solenoid valve		alve	ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	OFF	OFF	OFF	OFF
Primary side VDC switch over valve 1 (SV1)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 1 (CV1)		OFF	OFF	OFF	OFF	ON	ON
Primary side VDC switch over valve 2 (SV2)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 2 (CV2)		OFF	OFF	OFF	OFF	ON	ON

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

Is the inspection result normal?

YES >> Inspection End

C1121, C1123, C1125, C1127 OUT ABS SOL

COMPONENT DIAGNOSIS > [TYPE 2] NO >> Go to diagnosis procedure. Refer to BRC-173, "Diagnosis Procedure". 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-122</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 BRC-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description INFOID:0000000003081385

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1130	ENGINE SIGNAL 1	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.		
C1131	ENGINE SIGNAL 2		Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is (control unit)	Harness or connectorABS actuator and electric unit
C1132	ENGINE SIGNAL 3			(control unit)
C1133	ENGINE SIGNAL 4		ECMCAN 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 BRC-176, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081387

INSPECTION PROCEDURE

1. CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-68, "CONSULT-III Function (ENGINE)".
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-145</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> Inspection End

Special Repair Requirement

INFOID:0000000003081388

${f 1}$.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-122. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 2]

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

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1140 ACTUATOR RLY

Description INFOID.000000003081389

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	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 BRC-178, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081391

INSPECTION 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.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-145, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

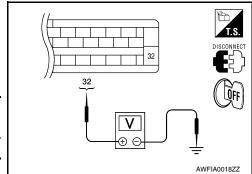
NO >> Poor connection of connector terminal. Repair or replace connector.

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

Turn ignition switch OFF.

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

ABS actuator and 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.

3.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[TYPE 2]

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		
E125	16, 47	Ground	Yes

16, 47 16, 47 AWFIA0016ZZ

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003081392

1. CHECK ACTIVE TEST

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

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 BRC-178, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081393

${f 1}$. 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-122, "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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1143, C1144 STEERING ANGLE SENSOR

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

DTC Logic

DTC DETECTION LOGIC

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

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 BRC-180, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081401

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-145, "CONSULT-III Function (ABS)"

Is any item indicated on the self-diagnosis display?

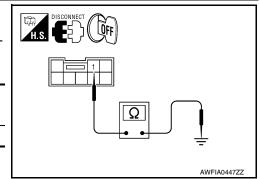
YES >> GO TO 2

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

2.CHECK STEERING ANGLE SENSOR HARNESS

- Turn ignition switch OFF.
- 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



C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 2]

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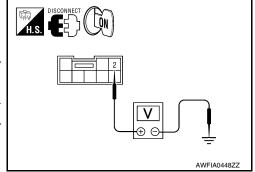
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4. Turn ignition switch ON.

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

Steering angle sensor			Voltage
Connector	Terminal		voitage
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.
- 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-230</u>, "Removal and Installation".

NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to <u>BRC-233</u>, "Removal and Installation".

Component Inspection

INFOID:0000000003081402

1. CHECK DATA MONITOR

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

Steering condition	STR ANGLE SIG (DATA MONITOR)	
Driving straight	0±2.5 °	
Turn 90 ° to left	Approx. +90 °	
Turn 90 ° to right	Approx. –90 °	

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-180, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003081403

${f 1}$. 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-122, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

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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 BRC-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000003081405

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

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 connector Brake fluid level switch Brake 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 BRC-182, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081407

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

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

$2.\mathsf{CHECK}$ 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.

	and electric unit ol 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.

DISCONNECT OFF	B (1)
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ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E125 (A)	28	Ground	No
		•	•

Is the inspection result normal?

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

Δ DISCONNECT Q AWFIA0026ZZ

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

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Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results ______

appear, replace ABS actuator and electric unit (control unit). Refer to <u>BRC-230, "Removal and Installation"</u>.

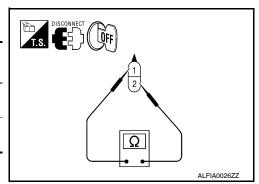
NO >> Replace brake fluid level switch.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

- 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



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-122, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

>> 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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1156 ST ANG SEN COM CIR

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1156 ST ANG SEN COM CIR

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

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 BRC-185, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081412

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.
- 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

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[TYPE 2]

C1160 DECEL G SEN SET

Description INFOID:0000000003081413

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

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 BRC-186, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081415

INSPECTION 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 BRC-123, "CALIBRATION OF DECEL G SENSOR : Description". 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-233</u>, "Removal and Installation".

NO >> Inspection End

C1163 ST ANGLE SEN SAFE

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1163 ST ANGLE SEN SAFE

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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 BRC-187, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to BRC-122, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> 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 BRC-145, "CON-SULT-III Function (ABS)".

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[TYPE 2]

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:0000000003081419

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

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

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

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003081421

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 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-145</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

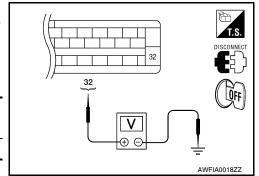
< COMPONENT DIAGNOSIS >

$\overline{2}$.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) harness connector terminal and ground.

ABS actuator and ele		Voltage		
Connector	Terminal		voltage	
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

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

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-230</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

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INFOID:0000000003081422

[TYPE 2]

Component Inspection

1. CHECK ACTIVE TEST

Select each test menu item on "ACTIVE TEST".

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

Operation		ABS solenoid valve		ABS solenoid valve (ACT)			
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL RR RH ABS SOLE- NOID (ACT)	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	OFF	OFF	OFF	OFF
Primary side VDC switch over valve 1 (SV1)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 1 (CV1)		OFF	OFF	OFF	OFF	ON	ON
Primary side VDC switch over valve 2 (SV2)		OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 2 (CV2)		OFF	OFF	OFF	OFF	ON	ON

^{*:} 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 >

[TYPE 2]

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-188</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000003081423

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-122</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: 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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

U1000 CAN COMM CIRCUIT

< COMPONENT DIAGNOSIS >

[TYPE 2]

U1000 CAN COMM CIRCUIT

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

DTC Logic

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000003081437

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect the ABS actuator and electric unit (control unit) connector.
- 3. Check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminals.
- Reconnect connector and perform self-diagnosis. Refer to <u>BRC-145</u>, "CONSULT-III Function (ABS)".

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

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

INFOID:0000000003081438

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-122</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 BRC-123, "CALIBRATION OF DECEL G SENSOR: Description".

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[TYPE 2]

HILL DESCENT CONTROL SWITCH

Description INFOID.0000000006030868

The hill descent control switch activates (turn ON) the hill descent control function when the hill descent control switch is pressed.

Component Function Check

INFOID:0000000006030869

1. CHECK HILL DESCENT CONTROL SWITCH OPERATION

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

Condition	Hill descent control indicator lamp illumination status
Hill descent control switch: ON	ON
Hill descent control switch: OFF	OFF

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to BRC-192, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006030870

1. CHECK HILL DESCENT CONTROL SWITCH

Perform the hill descent control switch component inspection. Refer to <u>BRC-193</u>, <u>"Component Inspection"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 2

NO >> Replace hill descent control switch.

2. CHECK HILL DESCENT CONTROL SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connector.
- Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 25 and hill descent control switch connector M155 (B) terminal 2.

	and electric unit ol unit)	Hill descent	control switch	Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	25	M155 (B)	2	Yes
		_		

3. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 25 and ground.

	DISCONNECT OFF H.S.
•	A B 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1
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ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		Continuity
E125 (A)	25	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

3.check hill descent control switch ground

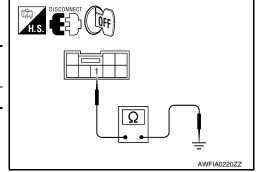
HILL DESCENT CONTROL SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

Check continuity between hill descent control switch connector M155 terminal 1 and ground.

Hill descent control switch		_	Continuity
Connector	Connector Terminal		Continuity
M155	1	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-23, "Diagnosis Description"</u>.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

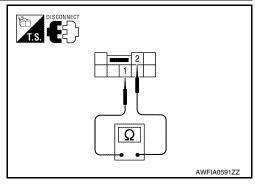
NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

Component Inspection

1. CHECK HILL DESCENT CONTROL SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect hill descent control switch connector.
- 3. Check continuity between hill descent control switch terminals.

Hill descent control switch terminals	Condition	Continuity
1 – 2	Hill descent control switch is ON.	Yes
1 – 2	Hill descent control switch is OFF.	No



Is the inspection result normal?

YES >> Inspection End.

NO >> Replace hill descent control switch.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-122</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: 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-123, "CALIBRATION OF DECEL G SENSOR: Description".

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VDC OFF SWITCH

Description INFOID.000000003081439

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

Component Function Check

INFOID:0000000003081440

1. CHECK VDC OFF SWITCH OPERATION

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

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: pressed and released	ON
VDC OFF switch: pressed and released	OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-194, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081441

1. CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to BRC-195, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

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

	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.

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

Check continuity between VDC OFF switch connector M154 and ground.

VDC OFF switch		_	Continuity
Connector	Terminal		Continuity
M154	2	Ground	Yes

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[TYPE 2]

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

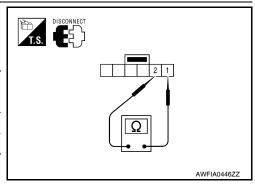
NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

Component Inspection

1. CHECK VDC OFF SWITCH

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

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



Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch.

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[TYPE 2]

ABS WARNING LAMP

 \times : ON -: OFF

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

Component Function Check

INFOID:0000000003081444

1. CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-196, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081445

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-145</u>, "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-230, "Removal and Installation".
- NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

[TYPE 2]

BRAKE WARNING LAMP

Description INFOID:0000000003081446

×: ON -: OFF

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Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
Ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

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

Component Function Check

INFOID:0000000003081447

INFOID:0000000003081448

1.BRAKE WARNING LAMP OPERATION CHECK

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-197, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-145, "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-230, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation". **BRC**

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HILL DESCENT CONTROL INDICATOR LAMP

Description INFOID.000000006030873

x: ON -: OFF

Condition	Hill descent control indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
Hill descent control function is malfunctioning.	-

Component Function Check

INFOID:0000000006030874

1. CHECK HILL DESCENT CONTROL INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to BRC-198, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:00000000006030875

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-145</u>, "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-230, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006030876

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-122</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: 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-123, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

[TYPE 2]

VDC OFF INDICATOR LAMP

Description INFOID:0000000003081449

×: 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:0000000003081450

$1.\mathsf{VDC}$ OFF INDICATOR LAMP OPERATION CHECK 1

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

Is the inspection result normal?

>> GO TO 2 YES

NO >> Go to diagnosis procedure. Refer to BRC-199, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> Inspection End

NO >> Check VDC OFF switch. Refer to BRC-194, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081451

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?

YFS >> GO TO 2

NO >> Check VDC OFF switch. Refer to BRC-194, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-145, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

3. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installa-

>> Replace combination meter. Refer to MWI-89, "Removal and Installation". NO

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[TYPE 2]

SLIP INDICATOR LAMP

x: 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:0000000003081453

1. CHECK SLIP INDICATOR LAMP OPERATION

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

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-200, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003081454

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-145, "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 MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-230, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-89, "Removal and Installation".

APPLICATION NOTICE

< ECU DIAGNOSIS > [TYPE 2]

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

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< ECU DIAGNOSIS > [TYPE 2]

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
		0 [km/h (MPH)]	Vehicle stopped
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Cton lower quitab circual status	When brake pedal is depressed	ON
STOP LAWP SW	Stop lamp switch signal status	When brake pedal is released	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D
OFF CW	VDC OFF quitab ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
VAVA DATE CEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s
YAW RATE SEN	sensor	When vehicle turning	–75 to 75 d/s
ACCEL DOS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %
ACCEL POS SIG	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %
		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)

< ECU DIAGNOSIS > [TYPE 2]

		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°
OTR ANGLE SIG	sensor	Steering wheel turned	–720 to +720°
		With engine stopped	0 rpm
NGINE SPEED	With engine running	Engine running	Almost in accordance with tachometer display
	Bud a fleidle at a flat air and at a	When brake fluid level switch ON	ON
LUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
TR RH IN SOL	Operation status of each soleriold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
TKINI OUT GOL	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
ED I II IN SOL	Operation status of each calencid value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator 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 actuator 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	Operation status of each calencid value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
AR 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
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
ACIAITOUT SOL	Operation Status of each soleliold 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 actuator relay is inactive (in fail-safe mode)	ON
AIX LIT IIN OUL	Operation status of each soleliold valve	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	Operation status of each colonoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
KK 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
WOTOKTELAT	Wotor and motor relay operation	When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator rolay aparation	When the actuator relay is operating	ON
ACTUATOR RET	Actuator relay operation	When the actuator relay is not operating	OFF
ADC WADNII AMD	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	When VDC OFF indicator lamp is ON	ON
OFF LAMP (Note 2)	When VDC OFF indicator lamp is OFF	OFF	
OLID LAMB	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
SLIP LAMP	(Note 2)	When SLIP indicator lamp is OFF	OFF
4WD FAIL REQ	Transfer control unit fail-safe signal	When transfer control unit is in fail-safe mode	ON
	-	When transfer control unit is normal	OFF
EBD SIGNAL	EDD energion	EBD is active	ON
EDD SIGNAL	EBD operation	EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
ABS SIGNAL	Abs operation	ABS is inactive	OFF
TCS SIGNAL	TCS operation	TCS is active	ON
103 SIGNAL	103 operation	TCS is inactive	OFF
VDC SIGNAL	VDC operation	VDC is active	ON
VDC SIGNAL	VDC operation	VDC is inactive	OFF
EDD EAIL SIC	EDD fail cofe signal	In EBD fail-safe	ON
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF
ABS FAIL SIG	ADC fail acfo cional	In ABS fail-safe	ON
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON
TOS FAIL SIG	103 Idii-sale signal	TCS is normal	OFF
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
VDO I AIL OIG	VDO Idii-Sale Sigilal	VDC is normal	OFF
CRANKING SIG	Crank operation	Crank is active	ON
	Grank operation	Crank is inactive	OFF
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("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 > [TYPE 2]

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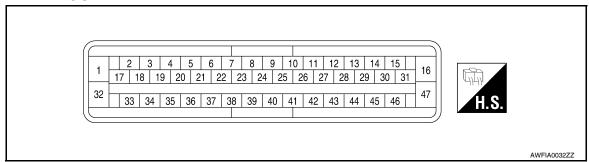
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		Data monitor	_
Monitor item	Display content	Condition	Reference value in normal operation
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("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 active ("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
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON
LDD WAINN LAWF	(Note 3)	When EBD warning lamp is OFF	OFF
N POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = N position	ON
NT OOI OIG	condition	A/T shift position = other than N position	OFF
P POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = P position	ON
F F U 31 31 G	condition	A/T shift position = other than P position	OFF
R POSI SIG	Transmission range switch signal ON/OFF	A/T shift position = R position	ON
N F OOI OIG	condition	A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
200 <i>0/4</i> 00 <i>0</i>	DIIVE AXIC	4WD model	4WD

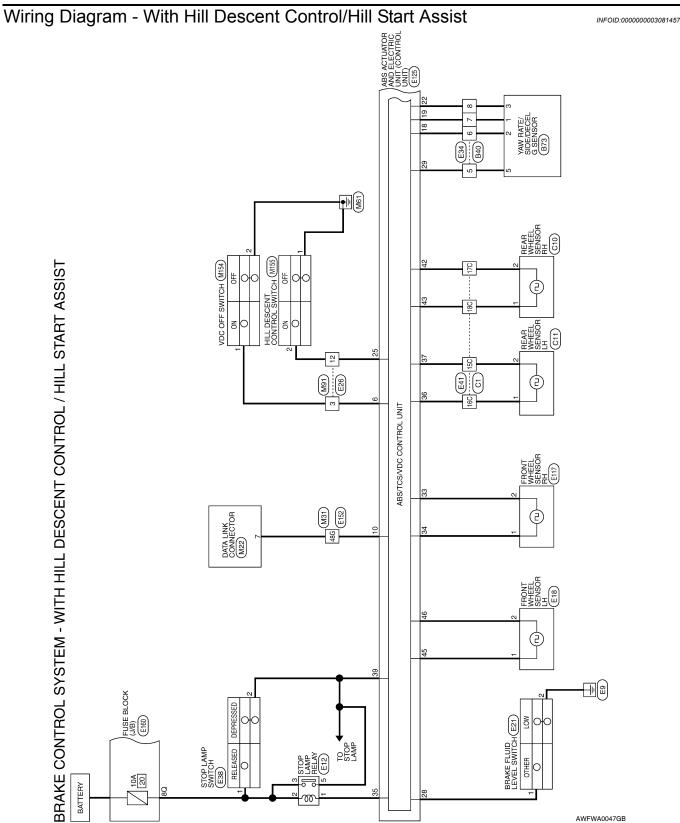
NOTE:

- 1: Confirm tire pressure is normal.
- $\bullet\,$ 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-196, "Description".
- Brake warning lamp: Refer to BRC-197, "Description".
- VDC OFF indicator lamp: Refer to $\underline{\sf BRC-199},$ "Description".
- SLIP indicator lamp: Refer to BRC-200, "Description".

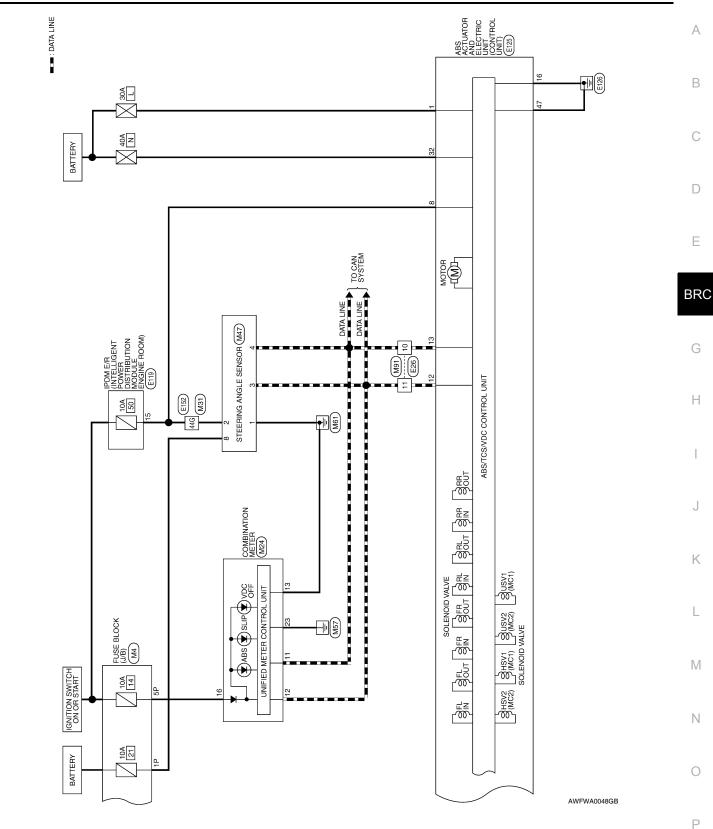
TERMINAL LAYOUT



< ECU DIAGNOSIS > [TYPE 2]



< ECU DIAGNOSIS > [TYPE 2]



GND (POWER)

RUN START GROUND CAN-H CAN-L

> W/G GR

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Connector No. | M24
Connector Name | COMBINATION METER

DATA LINK CONNECTOR

M22

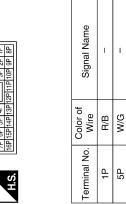
Connector No.

Connector Color WHITE

BRAKE CONTROL SYSTEM CONNECTORS - WITH HILL DESCENT CONTROL/HILL START ASSIST

Connector No.	M4
Connector Name	Connector Name FUSE BLOCK (J/B)
Connector Color WHITE	WHITE

ector No.	M4
ector Name	ector Name FUSE BLOCK (J/B)
ector Color WHITE	WHITE
7P 6P 16P 15P	6P 5P 4P 3P 2P 1P 15P14P13P12P11P10P 9P 8P



-USE	FUSE BLOCK (J/B)	Connector Nar	Connector Name DATA LINK CONNE
WHITE	В	Connector Color WHITE	or WHITE
P 5P 4P C	5P 4P 3P 2P 1P P P P P P P P P P	H.S.	9 10 11 12 13 14 15 16 7 8
olor of Wire	Signal Name	Terminal No.	Color of Signal Na Wire
R/B	ı	7	_ M

Signal Name

Color of Wire

Terminal No. Ξ

Signal Name	_	
Color of Wire	M	
erminal No.	7	

Connector No.	M47
Connector Name	Connector Name STEERING ANGLE SENSO
Connector Color WHITE	WHITE

	Connector Nam Connector Color
--	----------------------------------

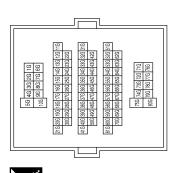
Connector No.	. M47	
Connector Name		STEERING ANGLE SENSOR
Connector Color	lor WHITE	<u> </u>
唇	[@	112
H.S.	3 4	
Terminal No.	Color of Wire	Signal Name
-	В	GND
2	W/R	POWER
3	٦	CAN-H
4	۵	CAN-L
8	æ	BATT

Signal Na	_	-	
Color of Wire	W/R	M	
Terminal No.	44G	48G	

Connector Name | WIRE TO WIRE Connector Color WHITE

M31

Connector No.



< ECU DIAGNOSIS > [TYPE 2]

Connector No.	. M155	
Connector Name	l .	HILL DESCENT CONTROL SWITCH
Connector Color	lor WHITE	111
原 H.S.	9 1	
Terminal No.	Color of Wire	Signal Name
-	В	ı
2	>	1

Connector No.	M154	
Connector Name	ıme VDC (VDC OFF SWITCH
Connector Color GRAY	lor GRAY	
原 H.S.	6 5 4	3 2 1
Terminal No.	Color of Wire	Signal Name
1	ВĐ	I
2	В	1

Connector No.		E TO WAR
w I	Connector Name WIH	WIRE 10 WIRE
	Connector Color WHITE	<u> </u>
	7 6 5 4 16 15 14 13	6 5 4
	Color of Wire	Signal Name
	GR	_
	Ь	_
	٦	_
	٨	I

Connector No.	. E21	
Connector Name		BRAKE FLUID LEVEL SWITCH
Connector Color	lor GRAY	,
H.S.	(- N	
Terminal No.	Color of Wire	Signal Name
1	SB	_
2	В	_

Connector No.	. E18	
Connector Na	me FRON	Connector Name FRONT WHEEL SENSOR LH
Connector Color GRAY	lor GRAY	
臣		
H.S.		<u></u>
Terminal No.	Color of Wire	Signal Name
-	ŋ	ı
٥	α	ı

	STOP LAMP RELAY	<u> </u>		Signal Name	I	ı	-	ı
. E12		lor BLUE		Color of Wire	>	B/B	B/B	ŋ
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	-	2	3	5

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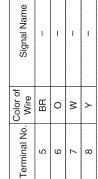
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Connector No.	E38	
Connector Name	L	STOP LAMP SWITCH
Connector Color	lor WHITE	ш
H.S.	1 3 4	[]
Terminal No.	Color of Wire	Signal Name
-	R/B	ı
2	>	ı

		i						
1	ŀ		6	PDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	工	14 13 12 11 10	Signal Name	ABS IGN SUPPLY
Ω Ĉ	>-		E119		wHITE	8 7 6 17 16 15	Color of Wire	W/R
_	2		Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	15

Connector No.	E34
Connector Name WIRE TO WIRE	WIRE TO WIRE
Connector Color	WHITE



1	-	I	ł		2	Connector Name FRONT WHEEL SENSOR RE	AY	
88	0	8	>		E117	ne FR(or GR	
22	9		8		Connector No.	Connector Nar	Connector Color GRAY	H.S.

Connector No. E26 Connector Name WIRE TO WIRE Connector Color WHITE 2
--

Signal Name	ı		***	ı
Color of Wire	GR	а.	L	>
Terminal No. Wire	ო	10		12

Connector No. E		BLACK BLACK BLACK 100 10	
90 180	8	380 440	

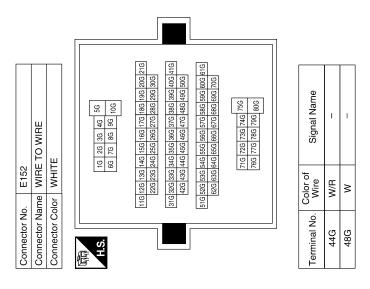
Color of Wire B

Terminal No.

C C C C C C C C C C	Signal Name	1	Ī	ł	1
50 140 220 280 50 140 220 280 50 150 280 280 70 160 280 280 90 180 280 90 180	Color of Wire	a.	7	>	re
	Terminal No.	15C	16C	170	18C

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< ECU DIAGNOSIS > [TYPE 2]



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



Terminal No.	Color of Wire	Signal Name
-	Я	MOTOR SUPPLY
2	I	I
င	-	ı
4	_	_
5	I	ı
9	GR	VDC OFF SW
2	_	ı
8	W/R	IGN
6	Ι	ı
10	SB	DIAG-K
11	_	_
12	L	CAN-H
13	Ь	CAN-L
14	_	1
15	Ι	_
16	В	VALVE ECU GND
17	_	_
18	0	CAN2-H
19	W	CAN2-L
20	_	_
21	I	_
22	Υ	CLUS_SUP

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< ECU DIAGNOSIS > [TYPE 2]

Connector No. C10 Connector Name REAR WHEEL SENSOR RH Connector Color GRAY	Terminal No. Color of 3ignal Name 1 LG		Connector No. B73 Connector Name YAW RATE/SIDE/DECEL G SENSOR Connector Color BLACK H.S.	Terminal No. Color of Wire Signal Name 1 W CAN-L 2 O CAN-H 3 Y CLU_P 5 BR CLU_GND
Connector Name WIRE TO WIRE Connector Color BLACK	44.5. 40.5 (10.5	Terminal No. Color of Vire Signal Name 15C P - 16C L - 17C V - 18C LG -	Connector No. B40 Connector Name WIRE TO WIRE Connector Color WHITE	Terminal No. Color of Wire Signal Name 5 BR - 6 O - 7 W - 8 Y -
mector No.	Terminal No. Wire Signal Name 8Q R/B -		Connector No. C11 Connector Name REAR WHEEL SENSOR LH Connector Color GRAY M.S.	Terminal No. Wire Signal Name

Fail-Safe

CAUTION:

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

ABS/EBD SYSTEM

< 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.

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

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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

DTC	Items (CONSULT screen terms)	Reference	BRC
C1101	RR RH SENSOR-1		
C1102	RR LH SENSOR-1		
C1103	FR RH SENSOR-1	BRC-151, "Description"	G
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		— Н
C1106	RR LH SENSOR-2	DDC 454 IID anninting	11
C1107	FR RH SENSOR-2	BRC-154, "Description"	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-157, "Description"	
C1110	CONTROLLER FAILURE	BRC-159, "DTC Logic"	
C1111	PUMP MOTOR	BRC-160, "Description"	J
C1113	G-SENSOR	BRC-162, "Description"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-165, "Description"	K
C1116	STOP LAMP SW	BRC-168, "Description"	
C1120	FR LH IN ABS SOL	BRC-170, "Description"	
C1121	FR LH OUT ABS SOL	BRC-173, "Description"	L
C1122	FR RH IN ABS SOL	BRC-170, "Description"	
C1123	FR RH OUT ABS SOL	BRC-173, "Description"	M
C1124	RR LH IN ABS SOL	BRC-170, "Description"	
C1125	RR LH OUT ABS SOL	BRC-173, "Description"	
C1126	RR RH IN ABS SOL	BRC-170, "Description"	N
C1127	RR RH OUT ABS SOL	BRC-173, "Description"	
C1130	ENGINE SIGNAL 1		0
C1131	ENGINE SIGNAL 2		0
C1132	ENGINE SIGNAL 3	BRC-176, "Description"	
C1133	ENGINE SIGNAL 4		Р
C1136	ENGINE SIGNAL 6		
C1140	ACTUATOR RLY	BRC-178, "Description"	
C1143	ST ANG SEN CIRCUIT	DDC 100 "Deceriation"	
C1144	ST ANG SEN SIGNAL	BRC-180, "Description"	

< ECU DIAGNOSIS > [TYPE 2]

DTC	Items (CONSULT screen terms)	Reference	
C1145	YAW RATE SENSOR	BRC-162, "Description"	
C1146	SIDE G-SEN CIRCUIT		
C1155	BR FLUID LEVEL LOW	BRC-182, "Description"	
C1156	ST ANG SEN COM CIR	BRC-185, "Description"	
C1160	DECEL G SEN SET	BRC-186, "Description"	
C1163	ST ANGL SEN SAFE	BRC-187, "Description"	
C1164	CV1	BRC-188. "Description"	
C1165	CV2		
C1166	SV1		
C1167	SV2		
C1170	VARIANT CODING	BRC-159. "DTC Logic"	
U1000	CAN COMM CIRCUIT	BRC-191, "Description"	

APPLICATION NOTICE

< SYMPTOM DIAGNOSIS > [TYPE 2]

SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

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

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VDC/TCS/ABS

Symptom Table

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

Symptom	Check item	Reference	
Excessive ABS function operation frequency	Brake force distribution		
	Looseness of front and rear axle	BRC-217, "Diag- nosis Procedure"	
	Wheel sensor and rotor system		
Unexpected pedal reaction	Brake pedal stroke	BRC-218, "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-219, "Diag- nosis Procedure"	
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-220, "Diag- nosis Procedure"	
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-221, "Diag-	
	ABS actuator and electric unit (control unit)	nosis Procedure"	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)		
	TCM	BRC-222, "Diag- nosis Procedure"	
	ECM		

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 [TYPE 2] < SYMPTOM DIAGNOSIS > **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY** Α Diagnosis Procedure INFOID:0000000003081462 1.CHECK START В 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 D Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-5, "On-Vehicle Inspection and Service", Rear: RAX-7, "Rear Axle Bearing" (C200) or RAX-19, "Rear Axle Bearing" (M226). Is the inspection result normal? Е YES >> GO TO 3 NO >> Repair or replace malfunctioning components. 3.check wheel sensor and sensor rotor **BRC** 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? Н YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to BRC-228, "Removal and Installation". Repair harness. 4. CHECK ABS WARNING LAMP DISPLAY Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated? YES >> Perform self-diagnosis. Refer to BRC-145, "CONSULT-III Function (ABS)". NO >> Normal K L M N

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS > [TYPE 2]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000003081463

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-14, "Inspection and Adjustment".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to BR-16, "Bleeding Brake System".
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-14</u>, "<u>Inspection and Adjustment</u>" (brake pedal), <u>BR-10</u>, "<u>On Board Inspection</u>" (master cylinder), <u>BR-8</u>, "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS > [TYPE 2]

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

< SYMPTOM DIAGNOSIS > [TYPE 2]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000003081465

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 BRC-145, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

[TYPE 2] < SYMPTOM DIAGNOSIS > PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS Α Diagnosis Procedure INFOID:0000000003081466 **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] D 1.SYMPTOM CHECK 1 Check that there are pedal vibrations when the engine is started. Е Do vibrations occur? YES >> GO TO 2 NO >> Inspect the brake pedal. BRC 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 BRC-145, "CONSULT-III Function (ABS)". 3. SYMPTOM CHECK 3 Н 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 J K L M Ν 0

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

[TYPE 2]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000003081467

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-145</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 <u>EC-68</u>, "<u>CONSULT-III Function (ENGINE)</u>".
 - TCM: Refer to TM-102, "CONSULT-III Function (TRANSMISSION)".
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-230</u>, "Removal and Installation".

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS > [TYPE 2]

NORMAL OPERATING CONDITION

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is 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 condition 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 before performing an inspection on a chassis dynamometer.)	
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.	

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< PRECAUTION > [TYPE 2]

PRECAUTION

PRECAUTIONS

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

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

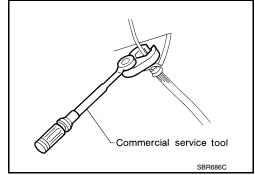
- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious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

Precaution for Brake System

INFOID:0000000003081470

CAUTION:

- Refer to MA-13, "Fluids and Lubricants" for recommended brake fluid.
- · Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- · Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.



Refer to BR-32, "Brake Burnishing" (front disc brake) or BR-37, "Brake Burnishing" (rear disc brake).

WARNING:

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

PRECAUTIONS

< PRECAUTION > [TYPE 2]

Precaution for Brake Control

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 During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.

- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.
- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.
- If the following components are replaced with non-genuine components or modified, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (shock absorbers, struts, springs, bushings, etc.), tires, wheels (exclude specified size), components related to brake system (pads, rotors, calipers, etc.), components related to engine (muffler, ECM, etc.), components related to body reinforcement (roll bar, tower bar, etc.).
- Driving with broken or excessively worn suspension components, tires or brake system components may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. This is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. with VDC turned off may cause the yaw rate/side/decel G sensor to indicate a problem. This is not a problem if normal operation can be resumed after restarting the engine.
- If battery is removed or steering angle sensor is disconnected, power to steering angle sensor is lost and the screen goes into steering angle sensor safe mode.
- When screen goes into steering angle sensor safe mode, perform "Adjustment of Steering Angle Sensor Neutral Position" with CONSUT-III and check that VDC OFF indicator turns off. Additionally, perform 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.

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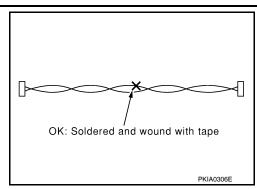
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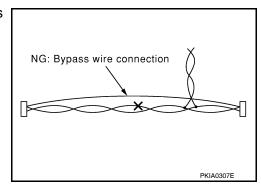
Revision: February 2010 BRC-225 2008 Xterra

< PRECAUTION > [TYPE 2]

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



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



PREPARATION

< PREPARATION > [TYPE 2]

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	- C
— (J-45741) ABS active wheel sensor tester	J-45741-BOX O O O O O O O O O O O O O O O O O O	Checking operation of ABS active wheel sensors	E BRC
ST30031000 (—)		Removing sensor rotor	
Bearing puller	ZZAO7700D		G H

Commercial Service Tool

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

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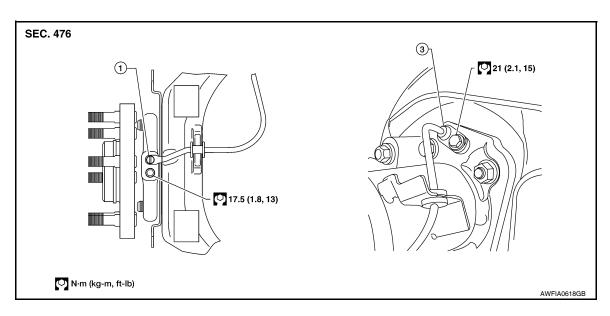
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REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation



1. Front wheel sensor

2. Rear wheel sensor

REMOVAL

- 1. Remove wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to <u>BR-33</u>, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Pull out the sensor, being careful to turn it as little as possible.

CAUTION:

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

INSTALLATION

- Before installing wheel sensors,
- Inspect wheel sensor assembly and replace if damaged.
- Clean wheel sensor hole and mating surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle.
- Install a new wheel sensor O-ring, then apply a coat of suitable grease to the O-ring and sensor hole. Refer to MA-13.
- Installation is in the reverse order of removal.

[TYPE 2]

SENSOR ROTOR

Removal and Installation

INFOID:0000000005048616

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>, "Removal and Installation".

REAR

Removal

NOTE:

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

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

Tool number : ST30031000 (—)

Installation

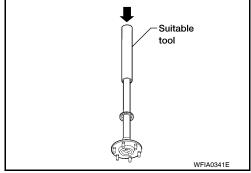
 Install new sensor rotor on axle shaft using a suitable length steel tube and a press. Make sure sensor rotor is fully seated. CAUTION:

Do not reuse the old sensor rotor.

2. Install axle shaft assembly. Refer to RAX-20, "Removal and Installation".

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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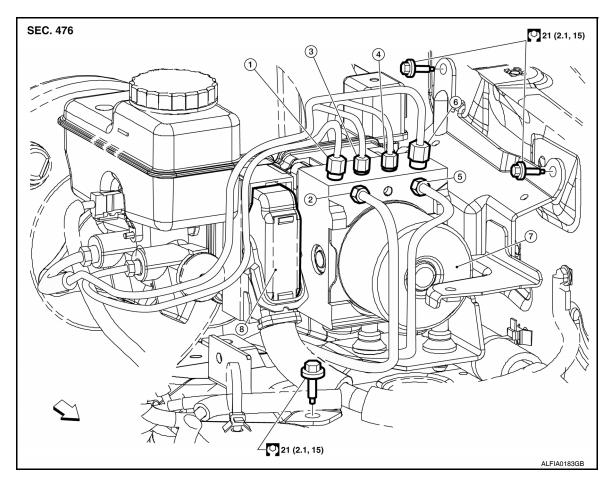
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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation



- 1. From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- 4. To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 7. ABS actuator and electric unit (control unit)
- . To rear right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 5. To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 8. Harness connector
- 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.
- Remove air cleaner case. Refer to <u>EM-25, "Exploded View"</u>.
- 3. Disconnect the actuator harness from the ABS actuator and electric unit (control unit). **CAUTION:**
 - To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas.
- 4. Disconnect the brake tubes.

NOTE:

Cap or plug opening (s) to prevent fluid from spilling.

5. 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-122</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: <u>Special Repair Requirement</u>".

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[TYPE 2]

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-16</u>, "<u>Bleeding Brake System</u>".

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STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

[TYPE 2]

STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000003260974

REMOVAL

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

CAUTION:

In the case that the ABS actuator and electronic unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to BRC-122, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

INSTALLATION

1. Installation is in the reverse order of removal.

G SENSOR

Removal and Installation

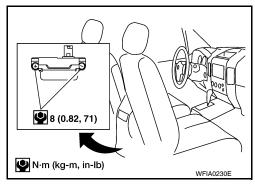
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REMOVAL

- 1. Remove center console. Refer to IP-11, "Exploded View".
- 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 BRC-123, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement".

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