SECTION BRAKE CONTROL SYSTEM

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BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

Adjustment of Steering Angle Sensor

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE</u> <u>SENSOR NEUTRAL POSITION : Description</u>".

Calibration of Decel G Sensor

If yaw rate/side/decel G sensor or ABS actuator and electric unit (control unit) have been replaced, be sure to calibrate decel G sensor before driving. Refer to <u>BRC-10</u>, <u>"CALIBRATION OF DECEL G SENSOR : Description"</u>.

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[VDC/TCS/ABS]

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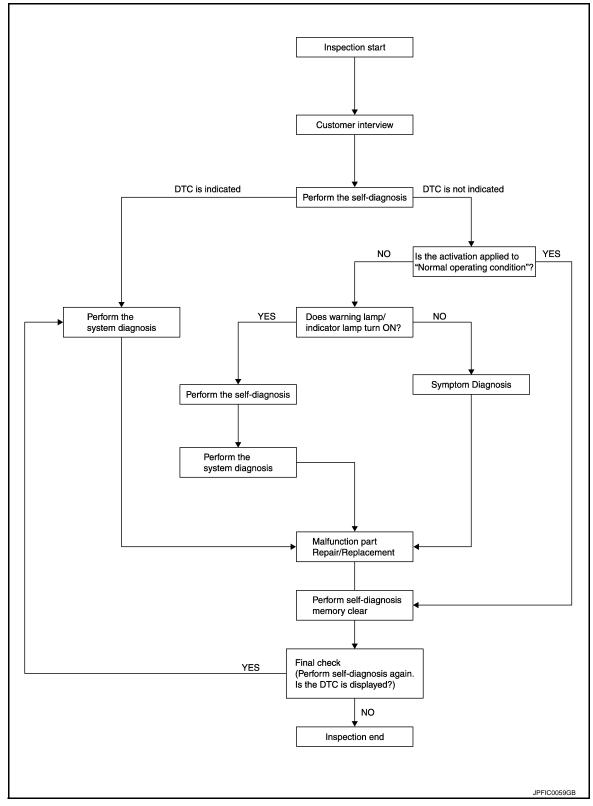
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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

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 <u>BRC-8</u>, "<u>Diagnostic Work Sheet</u>".

>> GO TO 2.

DIAGNOSIS AND REPAIR WORK FLOW
< BASIC INSPECTION > [VDC/TCS/ABS]
2. PERFORM SELF-DIAGNOSIS
Perform self-diagnosis with CONSULT.
Is there any DTC displayed?
YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 3. NO >> GO TO 4.
3. PERFORM THE SYSTEM DIAGNOSIS
Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT. Refer to <u>BRC-111, "DTC No.</u> 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-119.</u> "Description".
<u>Is the symptom a normal operation?</u>
YES >> GO TO 8. 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-96, "Description"</u>. Brake warning lamp: Refer to <u>BRC-97, "Description"</u>.
 VDC warning lamp: Refer to <u>BRC-99, "Description"</u>.
VDC OFF indicator lamp: Refer to <u>BRC-100, "Description"</u> .
<u>Is ON/OFF timing normal?</u> YES >> GO TO 6.
NO $>>$ GO TO 2.
6.PERFORM SELF-DIAGNOSIS
Perform self-diagnosis for "ABS" with CONSULT.
>> GO TO 7.
7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS
Repair or replace the specified malfunctioning parts.
>> GO TO 8.
8.MEMORY CLEAR
Perform self-diagnosis memory clear for "ABS" with CONSULT.
>> GO TO 9.
9.FINAL CHECK
Perform the self-diagnosis again, and check that the malfunction is repaired completely. Is no other DTC present and the repair completed?
YES >> INSPECTION END
NO $>>$ GO TO 3.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000009718212

[VDC/TCS/ABS]

Customer name MR/MS	Model & Year	Model & Year			
Engine #	Trans.	Trans.		Mileage	
Incident Date	Manuf. Date	Manuf. Date		te	
Symptoms	 ☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle) 	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	U When starting After starting	□ When starting □ After starting			
Road conditions	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes				
Driving conditions	 Full-acceleration High speed cornering Vehicle speed: Greater than 10 km/h (6 MPH) Vehicle speed: 10 km/h (6 MPH) or less Vehicle is stopped 				
Applying brake conditions	□ Suddenly □ Gradually				
Other conditions	Operation of electrical equipment Shift change Other descriptions				

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INSPECTION AND ADJUSTMENT

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

Perform the steering angle sensor adjustment and decel G sensor calibration after replacing the ABS actuator and electric unit (control unit).

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement INFOID:000000009718214

1.PERFORM ADJUSTMENT OF STEERING ANGLE SENSOR AND CALIBRATION OF DECEL G SENSOR

Perform steering angle sensor adjustment and decel G sensor calibration.

- Adjustment of steering angle sensor: Refer to <u>BRC-9. "ADJUSTMENT OF STEERING ANGLE SENSOR</u> **NEUTRAL POSITION : Description".**
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> INSPECTION END ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:000000009718215

×: Required -: Not required

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

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	X	

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement INFOID:000000009718216

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

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

1.ALIGN THE VEHICLE STATUS

Stop the vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

[VDC/TCS/ABS]

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INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

- 1. Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in order with CONSULT.
- 2. Select "START". **CAUTION: Never touch steering wheel while adjusting steering angle sensor.**
- After approximately 10 seconds, select "END".
 NOTE:
 After approximately 60 appends, it and a submatically
- After approximately 60 seconds, it ends automatically.
 4. Turn the ignition switch OFF, then turn it ON again.
 CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3.CHECK DATA MONITOR

- 1. Run the vehicle with front wheels in straight-ahead position, then stop.
- 2. Select "ABS", "DATA MONITOR" and "STR ANGLE SIG" in order with CONSULT, and check the steering angle sensor signal.

STR ANGLE SIG $: 0\pm3.5^{\circ}$

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories for "ABS" with CONSULT. Refer to <u>BRC-28, "CONSULT Function"</u>.

Are the memories erased?

YES >> INSPECTION END

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

CALIBRATION OF DECEL G SENSOR

CALIBRATION OF DECEL G SENSOR : Description

INFOID:000000009718217

[VDC/TCS/ABS]

When doing work that applies to the list below, make sure to calibration of decel G sensor before running vehicle.

×: Required –: Not required

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	×
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering components	_
Removing/Installing suspension components	_
Change tires to new ones	
Tire rotation	_
Adjusting wheel alignment	_
Removing/Installing yaw rate/side/decel G sensor	×
Replacing yaw rate/side/decel G sensor	×

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:000000009718218

CALIBRATION OF DECEL G SENSOR

CAUTION:

• To calibrate decel G sensor, make sure to use CONSULT.

- (Calibration cannot be done without CONSULT.)
- Perform the G sensor calibration only with the vehicle parked on level surface.

1.ALIGN THE VEHICLE STATUS

INSPECTION AND ADJUSTMENT

[VDC/TCS/ABS]

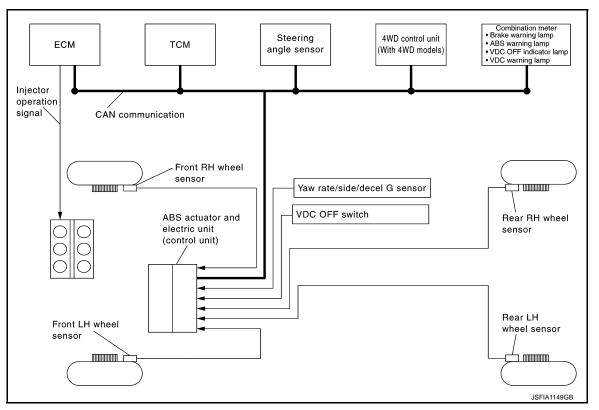
< BASIC INSPECTION >	[VDC/TCS/ABS]
Stop the vehicle with front wheels in straight-ahead position.	
 Keep all tires inflated to correct pressures. Adjust the tire pressure to the s Check that there is specified-load in vehicle other than the driver (or eq 	
driver's position).	5
>> GO TO 2.	
2. PERFORM THE CALIBRATION OF DECEL G SENSOR	
 Select "ABS", "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in ord Select "START". 	er with CONSULT.
 After approximately 10 seconds, select "END". NOTE: 	
After approximately 60 seconds, it ends automatically.4. Turn the ignition switch OFF, then turn it ON again.	
CAUTION:	
Be sure to perform above operation.	
>> GO TO 3.	
3. CHECK DATA MONITOR	
 Run the vehicle with front wheels in straight-ahead position, then stop. Select "ABS", "DATA MONITOR" and "DECEL G-SEN" in order with CONSU sensor signal. 	ILT, and check the decel G
DECEL G-SEN : ±0.08 G	
Is the yaw rate/side/decel G sensor within the specified range?	
YES >> GO TO 4. NO >> Perform the calibration of decel G sensor again, GO TO 1.	
4. ERASE THE SELF-DIAGNOSIS MEMORY	
Erase the self-diagnosis memories for "ABS" with CONSULT. Refer to BRC-28, "C	ONSULT Function".
Are the memories erased? YES >> INSPECTION END	
NO >> Check the items indicated by the self-diagnosis.	

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< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION VDC

System Diagram

INFOID:000000009718219



System Description

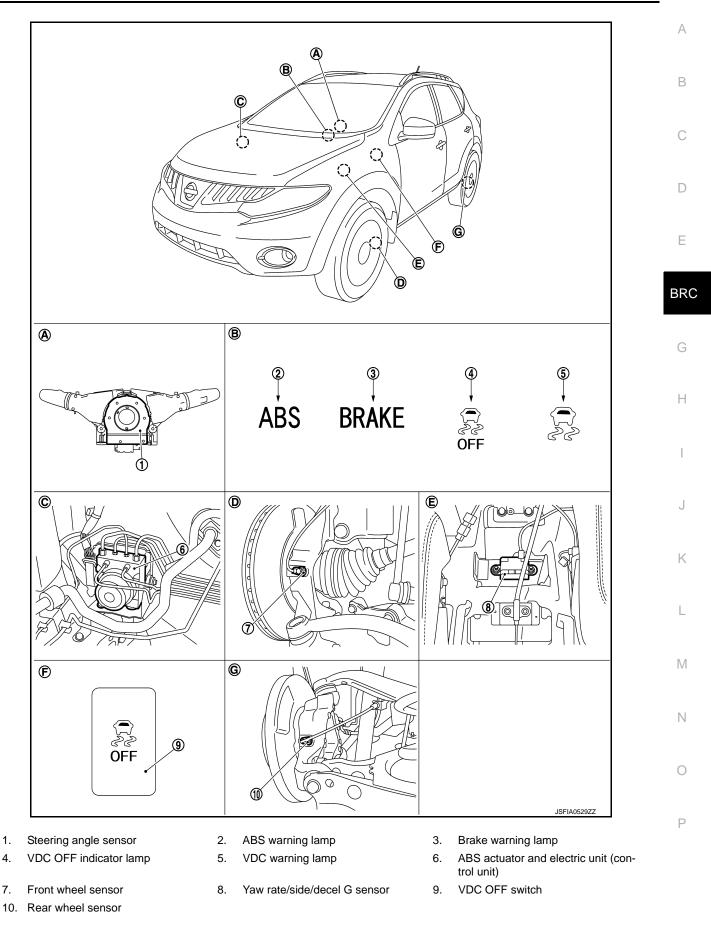
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- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected by the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under steering/ over steering) is determined by the information from the yaw rate/side/decel G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- During VDC operation, it informs driver of system operation by blinking the VDC warning lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:000000009718221

FOR USA



VDC

- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

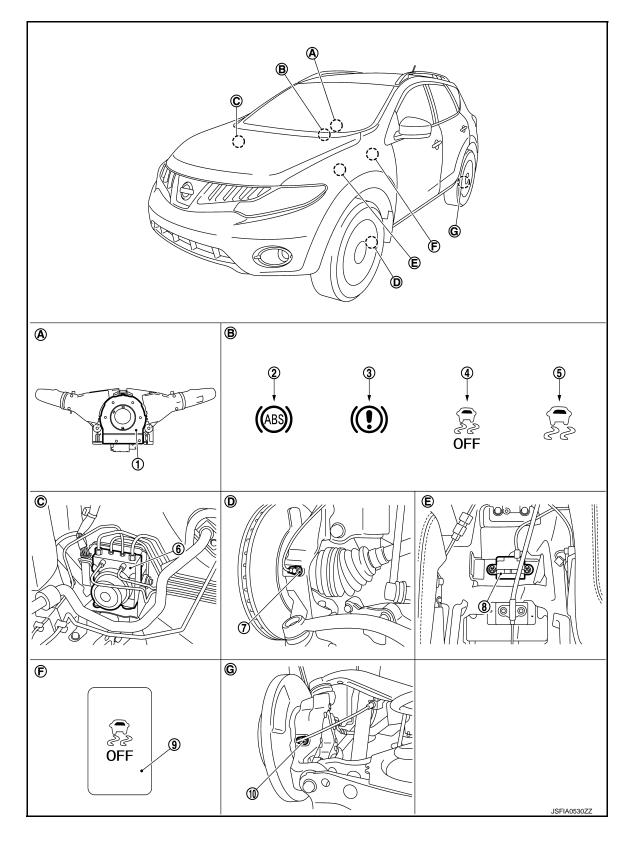
B. Combination meterE. Under center console

VDC

- Engine room (right side)
- F. Instrument driver lower panel

ation meter C.

EXCEPT FOR USA



1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp VDC warning lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	А
7. 10.	Front wheel sensor Rear wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch	В
A. D.	Back of spiral cable assembly Steering knuckle	B. E.	Combination meter Under center console	C. F.	Engine room (right side) Instrument driver lower panel	С

VDC

G. Rear axle

Component Description

INFOID:000000009718222

Compo	onent parts	Reference	F
	Pump	DDC 45 "Description"	
	Motor	BRC-45, "Description"	
	Actuator relay (Main relay)	BRC-64, "Description"	BR
ABS actuator and electric unit (control unit)	ABS IN valve	BRC-58, "Description"	
	ABS OUT valve	BRC-60, "Description"	
	Cut valve 1 (CV1), cut valve 2 (CV2)	BRC-81, "Description"	G
	Suction valve 1 (SV1), suction valve 2 (SV2)	BRC-83, "Description"	
Wheel sensor	BRC-33, "Description"	Н	
Yaw rate/side/decel G sensor		BRC-47, "Description"	
Steering angle sensor		BRC-68, "Description"	
VDC OFF switch		BRC-94, "Description"	
ABS warning lamp		BRC-96, "Description"	
Brake warning lamp		BRC-97, "Description"	J
VDC warning lamp	BRC-99, "Description"		
VDC OFF indicator lamp		BRC-100, "Description"	

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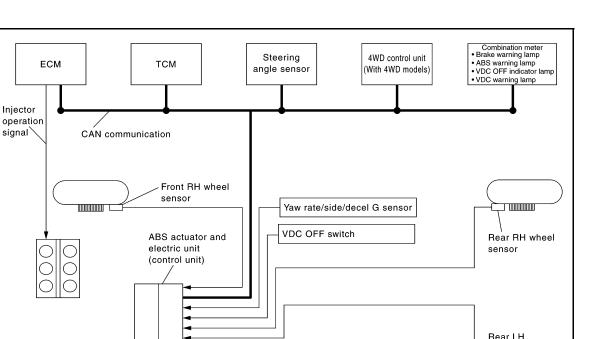
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TCS

System Diagram

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System Description

INFOID:000000009718224

wheel sensor

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- The wheel spin of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from the four wheels, so if wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle valve opening is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the throttle opening is controlled to achieve the optimum engine torque.
- During TCS operation, TCS informs driver of system operation by blinking the VDC warning lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

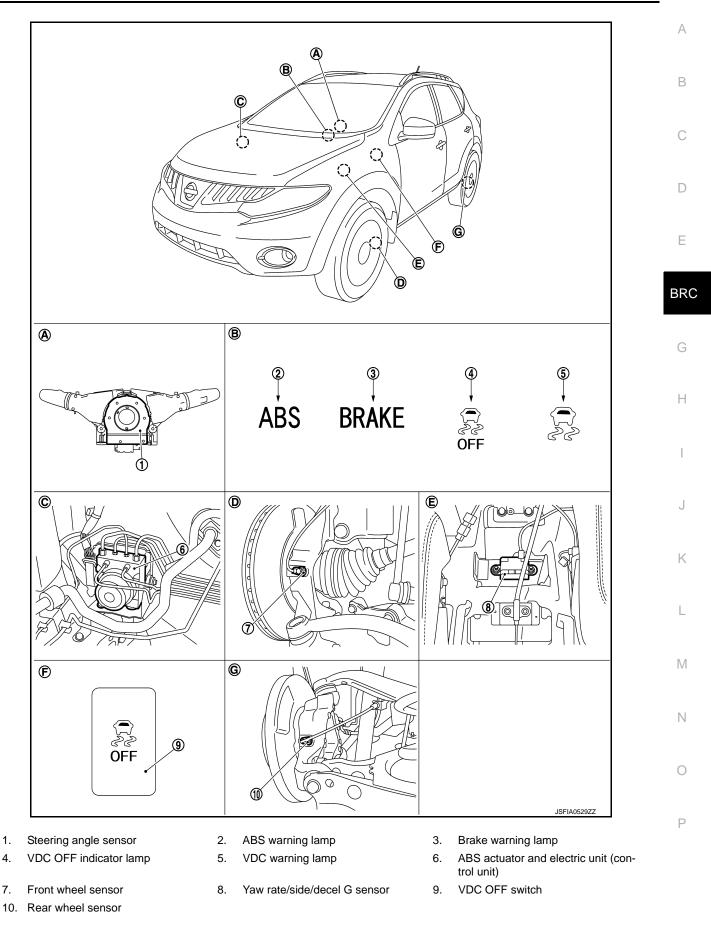
Front LH wheel

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sensor

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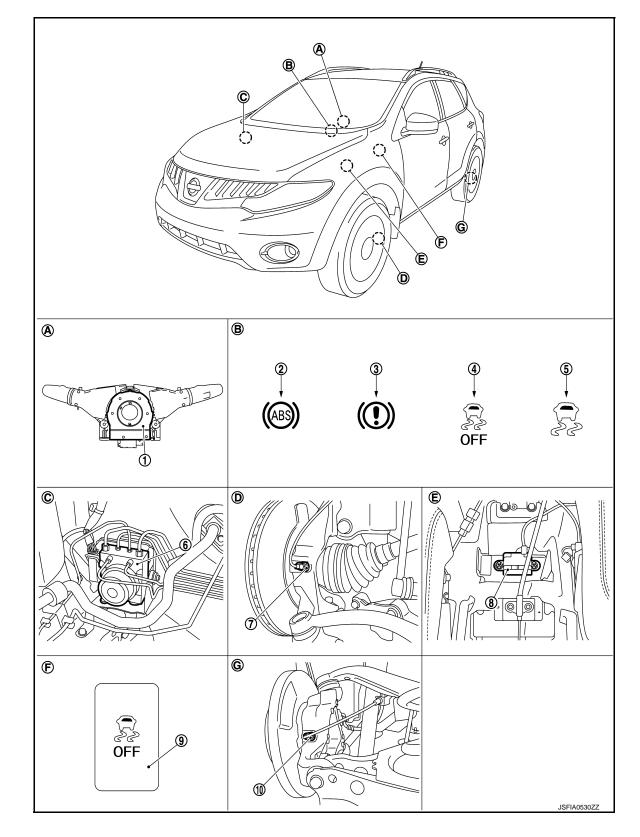
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TCS

- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

- B. Combination meterE. Under center console
- C. Engine room (right side)
- F. Instrument driver lower panel





[VDC/TCS/ABS]

1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp VDC warning lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	А
7. 10.	Front wheel sensor Rear wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch	В
A. D.	Back of spiral cable assembly Steering knuckle	B. E.	Combination meter Under center console	C. F.	Engine room (right side) Instrument driver lower panel	С

TCS

G. Rear axle

Component Description

INFOID:000000009718226

Compo	onent parts	Reference	F
	Pump	BRC-45, "Description"	
	Motor	BRC-45, Description	
	Actuator relay (Main relay)	BRC-64, "Description"	B
ABS actuator and electric unit (control unit)	ABS IN valve	BRC-58, "Description"	
	ABS OUT valve	BRC-60, "Description"	
	Cut valve 1 (CV1), cut valve 2 (CV2)	BRC-81, "Description"	(
	Suction valve 1 (SV1), suction valve 2 (SV2)	BRC-83, "Description"	
Wheel sensor		BRC-33, "Description"	
Yaw rate/side/decel G sensor		BRC-47, "Description"	
Steering angle sensor		BRC-68, "Description"	
VDC OFF switch		BRC-94, "Description"	
ABS warning lamp		BRC-96, "Description"	
Brake warning lamp	BRC-97, "Description"		
VDC warning lamp	BRC-99, "Description"		
VDC OFF indicator lamp		BRC-100, "Description"	

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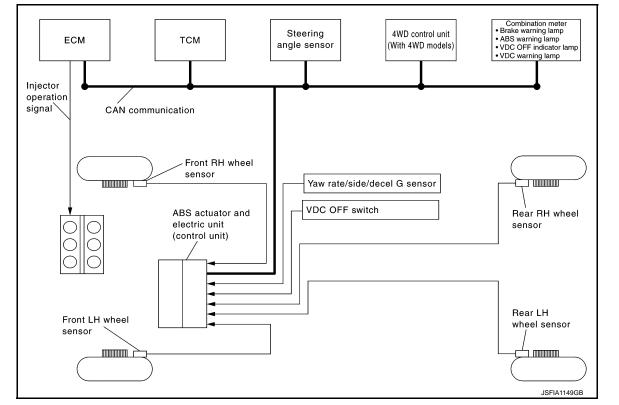
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ABS

System Diagram

INFOID:000000009718227



ABS

System Description

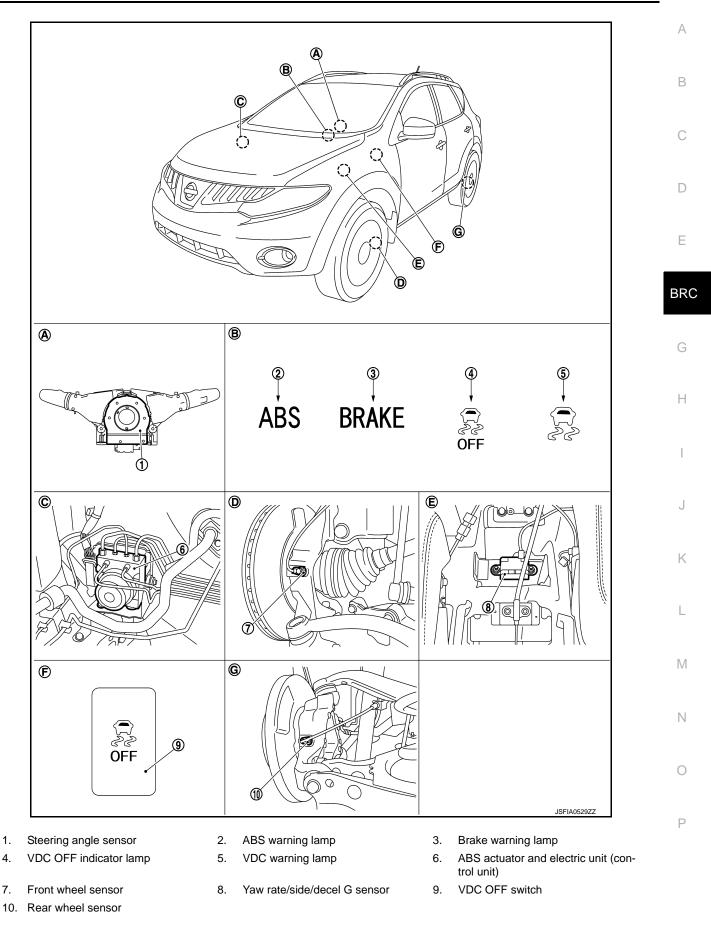
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- The Anti-Lock Braking System detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:000000009718229

FOR USA

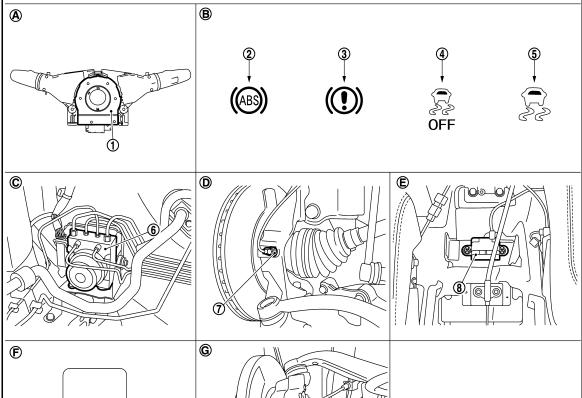


ABS

- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

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- B. Combination meterE. Under center console
- C. Engine room (right side)
- F. Instrument driver lower panel



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1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp VDC warning lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	А
7. 10.	Front wheel sensor Rear wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch	В
A. D.	Back of spiral cable assembly Steering knuckle	В. Е.	Combination meter Under center console	C. F.	Engine room (right side) Instrument driver lower panel	С

ABS

G. Rear axle

Component Description

INFOID:000000009718230

Compo	Reference	F	
	Pump	PBC 45 "Description"	
	Motor	BRC-45, "Description"	
	Actuator relay (Main relay)	BRC-64, "Description"	B
ABS actuator and electric unit (control unit)	ABS IN valve	BRC-58, "Description"	
	ABS OUT valve	BRC-60, "Description"	_
	Cut valve 1 (CV1), cut valve 2 (CV2)	BRC-81, "Description"	(
	Suction valve 1 (SV1), suction valve 2 (SV2)	BRC-83, "Description"	
Wheel sensor	BRC-33, "Description"		
Yaw rate/side/decel G sensor	BRC-47, "Description"		
Steering angle sensor		BRC-68, "Description"	
VDC OFF switch		BRC-94, "Description"	
ABS warning lamp		BRC-96, "Description"	
Brake warning lamp	BRC-97, "Description"		
VDC warning lamp	BRC-99, "Description"		
VDC OFF indicator lamp		BRC-100, "Description"	

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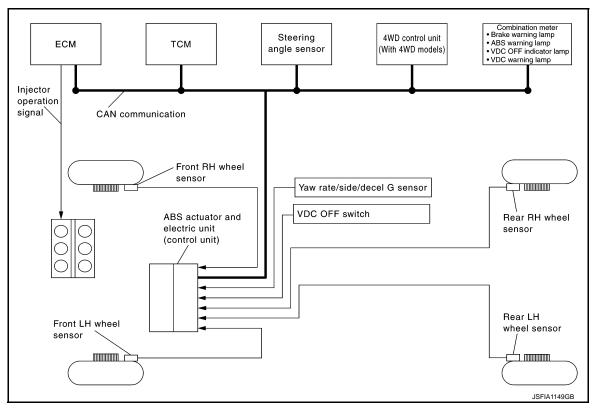
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EBD

System Diagram

INFOID:000000009718231



System Description

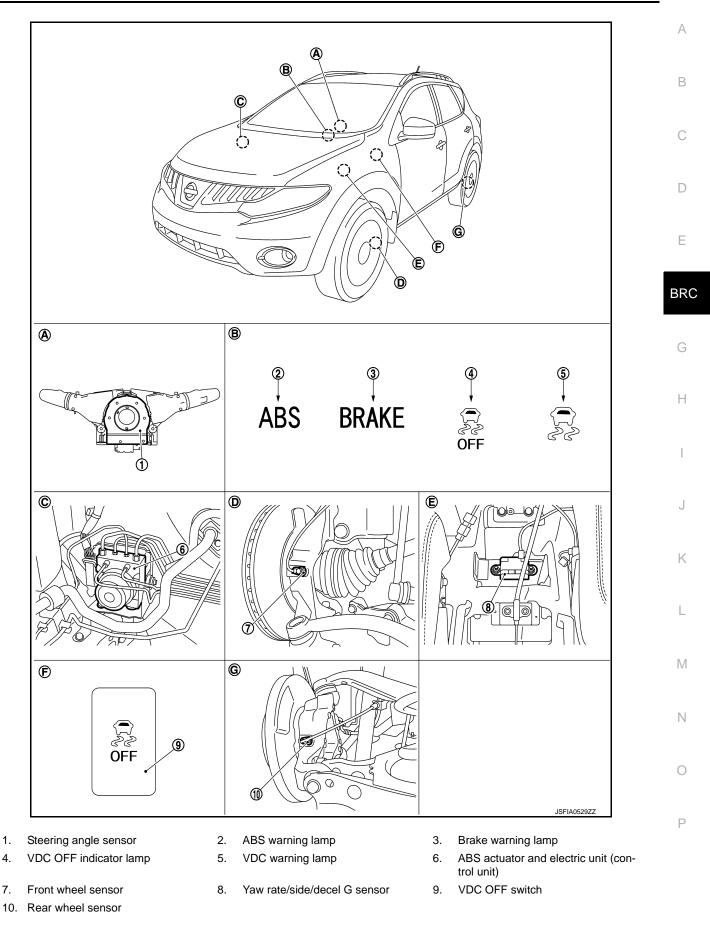
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- Electronic Brake force Distribution detects subtle slippages between front and rear wheels during braking, and it improves handling stability by electronically controlling brake fluid pressure which results in reduced rear wheel slippage.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:000000009718233

FOR USA



EBD

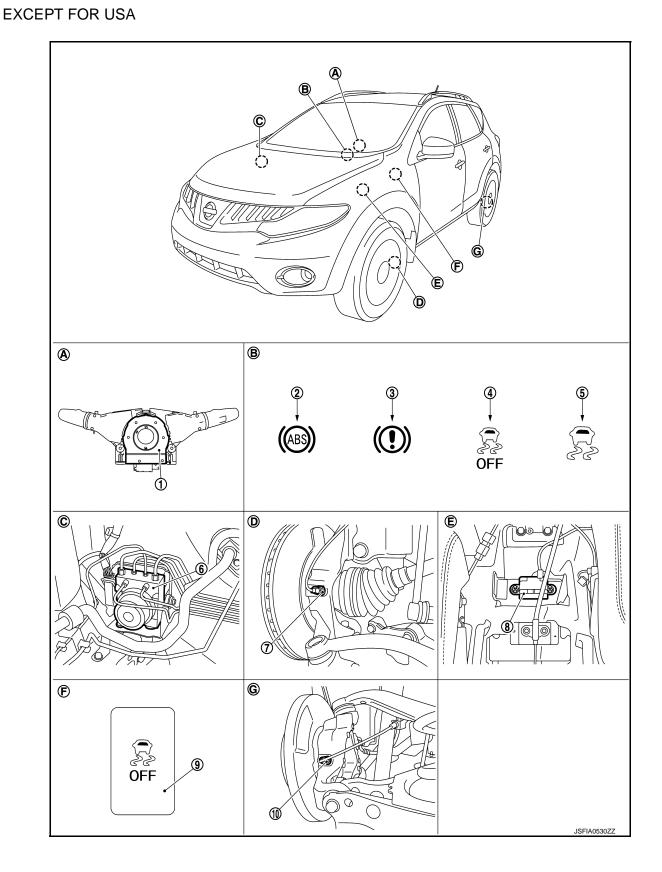
- Back of spiral cable assembly Α.
- D. Steering knuckle
- G. Rear axle

- Combination meter Β. Ε. Under center console
- Engine room (right side)

[VDC/TCS/ABS]

F. Instrument driver lower panel

C.





[VDC/TCS/ABS]

1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp VDC warning lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	А
7. 10.	Front wheel sensor Rear wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch	В
A. D.	Back of spiral cable assembly Steering knuckle	B. E.	Combination meter Under center console	C. F.	Engine room (right side) Instrument driver lower panel	С

EBD

G. Rear axle

Component Description

INFOID:000000009718234

Compo	onent parts	Reference	F
	Pump	BBC 45 "Description"	
	Motor	BRC-45, "Description"	
	Actuator relay (Main relay)	BRC-64, "Description"	BF
ABS actuator and electric unit (control unit)	ABS IN valve	BRC-58, "Description"	
	ABS OUT valve	BRC-60, "Description"	
	Cut valve 1 (CV1), cut valve 2 (CV2)	BRC-81, "Description"	G
	Suction valve 1 (SV1), suction valve 2 (SV2)	BRC-83, "Description"	
Wheel sensor		BRC-33, "Description"	ŀ
Yaw rate/side/decel G sensor		BRC-47, "Description"	
Steering angle sensor		BRC-68, "Description"	
VDC OFF switch		BRC-94, "Description"	_
ABS warning lamp		BRC-96, "Description"	
Brake warning lamp	BRC-97, "Description"	J	
VDC warning lamp	BRC-99, "Description"		
VDC OFF indicator lamp		BRC-100, "Description"	

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

CONSULT Function

INFOID:000000009718235

FUNCTION

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

Diagnostic test mode	Function		
Work supportThis mode enables a technician to adjust some devices faster and more accurately by foll tions on CONSULT.			
Self diagnostic result Self-diagnostic results can be read and erased quickly.			
Data monitor Input/Output data in the ABS actuator and electric unit (control unit) can be read.			
Active test	CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.		
ECU identification ABS actuator and electric unit (control unit) part number can be read.			

WORK SUPPORT

Item	Description
ST ANGLE SENSOR ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.
DECEL G SEN CALIBRATION (only AWD models)	Calibrates decel G sensor.

SELF DIAGNOSTIC RESULT

Operation Procedure

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

Display Item List Refer to <u>BRC-111, "DTC No. Index"</u>.

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT, start the engine and drive the 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 warning lamp and brake warning lamp turn OFF.

CAUTION:

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

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

DATA MONITOR

Display Item List

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MO	ONITOR ITEM	X: Applicable ▼: Optional item	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
FR LH SENSOR [km/h (MPH)]	×	×		
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed	
RR LH SENSOR [km/h (MPH)]	×	×		
RR RH SENSOR [km/h (MPH)]	×	×		
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status	
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)	
GEAR	×	×	Gear position determined by TCM	
R POSI SIG (On/Off)	▼	•	Shift position judged by shift position (R) signal	
N POSI SIG (On/Off)	•	•	Shift position judged by shift position (N) signal	
P POSI SIG (On/Off)	▼	▼	Shift position judged by shift position (P) signal	
SLCT LVR POSI	×	×	Shift position judged by shift position signal	
OFF SW (On/Off)	×	×	VDC OFF switch	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate/side/decel G sensor	
DECEL G-SEN (G)	×	×	Decel G detected by yaw rate/side/decel G sensor	
ACCEL POS SIG (%)	×	•	Throttle actuator opening/closing is displayed (Linked with accelera- tor pedal)	
SIDE G-SENSOR (m/s ²)	×	•	Transverse G detected by yaw rate/side/decel G sensor	
STR ANGLE SIG (°)	×	▼	Steering angle detected by steering angle sensor	
ENGINE RPM [tr/min (rpm)]	×	▼	Engine speed	
FLUID LEV SW (On/Off)	×	•	Brake fluid level switch	
PRESS SENSOR (bar)	×	•	Brake fluid pressure detected by pressure sensor	
FR RH IN SOL (On/Off)	▼	×	Operation status of front RH ABS IN valve	
FR RH OUT SOL (On/Off)	▼	×	Operation status of front RH ABS OUT valve	
FR LH IN SOL (On/Off)	▼	×	Operation status of front LH ABS IN valve	
FR LH OUT SOL (On/Off)	▼	×	Operation status of front LH ABS OUT valve	
RR RH IN SOL (On/Off)	▼	×	Operation status of rear RH ABS IN valve	
RR RH OUT SOL (On/Off)	•	×	Operation status of rear RH ABS OUT valve	

Revision: 2013 August

BRC-29

2014 MURANO

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MO	ONITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
RR LH IN SOL (On/Off)	•	×	Operation status of rear LH ABS IN valve
RR LH OUT SOL (On/Off)	▼	×	Operation status of rear LH ABS OUT valve
MOTOR RELAY (On/Off)	•	×	Motor and motor relay operation
ACTUATOR RLY (On/Off)	▼	×	Actuator relay operation
ABS WARN LAMP (On/Off)	•	×	ABS warning lamp
OFF LAMP (On/Off)	▼	×	VDC OFF indicator lamp
SLIP/VDC LAMP (On/Off)	▼	×	VDC warning lamp
CV1 (On/Off)	▼	▼	Cut valve 1 (CV1) monitor
CV2 (On/Off)	▼	▼	Cut valve 2 (CV2) monitor
SV1 (On/Off)	▼	▼	Suction valve 1 (SV1) monitor
SV2 (On/Off)	▼	▼	Suction valve 2 (SV2) monitor
EBD SIGNAL (On/Off)	•	•	EBD operation
ABS SIGNAL (On/Off)	•	•	ABS operation
TCS SIGNAL (On/Off)	▼	•	TCS operation
VDC SIGNAL (On/Off)	▼	•	VDC operation
EBD FAIL SIG (On/Off)	•	•	EBD fail-safe status
ABS FAIL SIG (On/Off)	▼	▼	ABS fail-safe status
TCS FAIL SIG (On/Off)	▼	•	TCS fail-safe status
VDC FAIL SIG (On/Off)	▼	•	VDC fail-safe status
EBD WARN LAMP (On/Off)	•	•	Brake warning lamp
CRANKING SIG (On/Off)	•	•	Crank operation
4WD FAIL REQ (On/Off)	•	•	AWD fail-safe signal status
2WD/4WD (2WD/4WD)	•	▼	Distinguish 2WD and AWD

NOTE:

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

ACTIVE TEST MODE CAUTION:

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

< SYSTEM DESCRIPTION >

- Never perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be started when ABS warning lamp, VDC warning lamp and brake warning lamp is ON.
- ABS warning lamp, VDC warning lamp and brake warning lamp are ON during active test.
 NOTE:
- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal.
- "TEST IS STOPPED" in "ABS" with CONSULT is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT is displayed, to perform test again.

Test Item

ABS IN Valve and ABS OUT valve

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that each valve operates as shown in the table below.

Testitem	Display item	Display			
Test item	Display item	Up	Кеер	Down	BRC
FR RH SOL	FR RH IN SOL	Off	On	On	
	FR RH OUT SOL	Off	Off	On*	
	FR LH IN SOL	Off	On	On	G
FR LH SOL	FR LH OUT SOL	Off	Off	On*	
	RR RH IN SOL	Off	On	On	
RR RH SOL	RR RH OUT SOL	Off	Off	On*	- H
RR LH SOL	RR LH IN SOL	Off	On	On	
	RR LH OUT SOL	Off	Off	On*	

*: On for 1 to 2 seconds after the select, and then Off.

NOTE:

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

ABS IN Valve (ACT) and ABS OUT valve (ACT)

 Select "Up", "ACT UP" and "ACT KEEP" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that each valve operates as shown in the table below.

Test item	Diaplay itom	Display		
Test nem	Display item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off
(ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLENOID	FR LH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off

[VDC/TCS/ABS]

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Test item	Display itom	Display		
Test item	Display item	Up	ACT UP	ACT KEEP
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID	RR LH OUT SOL	Off	Off	Off
(ACT)	CV1	Off	On	On
	SV1	Off	On*	Off

 $^{\ast}:$ On for 1 to 2 seconds after the select, and then Off.

NOTE:

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

ABS MOTOR

Select "On" and "Off" of "ACTIVE TEST" in "ABS" with CONSULT. Make sure motor relay and actuator relay
operates as shown in table below.

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

NOTE:

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

ECU IDENTIFICATION

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

6.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS > **DTC/CIRCUIT DIAGNOSIS**

C1101, C1102, C1103, C1104 WHEEL SENSOR

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

DTO	Disalawitan		Descible serves
DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	
отс сс	NFIRMATION PROCE	DURE	
1.PREC	CONDITIONING		
f "DTC (CONFIRMATION PROCE	DURE" has been previously conducted, always	turn the ignition switch OFF
		e conducting the next test.	
		-	
_	>> GO TO 2.		
2. ртс і	REPRODUCTION PROCI	EDURE	
. Start	the engine and drive the	vehicle at 30 km/h (19 MPH) or more for approx	kimately 1 minute.
	orm self-diagnosis for "AB		
<u>s DTC "(</u>	<u>C1101", "C1102", "C1103"</u>	or "C1104" detected?	
	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-33, "Diagnosis Proced</u>	lure".
Diagno	sis Procedure		INFOID:000000009718238
CAUTIO	N:		
lever cl	neck the between wheel	sensor harness connector terminals.	
.CHEC	CK WHEEL SENSOR		
. Turn	the ignition switch OFF.		
2. Che	ck the wheel sensor for da	amage.	
	spection result normal?		
	>> GO TO 3.		
`	>> GO TO 2.		
L.REPL	ACE WHEEL SENSOR (1)	
	ace wheel sensor.		
		ONT WHEEL SENSOR : Exploded View". AR WHEEL SENSOR : Exploded View".	
	e self-diagnosis result for		
3. Turn	the ignition switch OFF, a	and wait 10 seconds or more.	
	the engine.		
	e the vehicle at approx. 30) km/h (19 MPH) or more for approx. 1 minute.	

Stop the vehicle.

BRC-33

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

7. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- 3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- 4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 5. Stop the vehicle.
- 6. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts and GO TO 6.

6. PERFORM SELF-DIAGNOSIS (2)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 7.

NO >> INSPECTION END

7.CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric Connector E36 *1: 2WD *2: AWD Measurement connector a ABS actuator and electric Connector E36 E36	Terminal 9 5 3 11 nd terminal for signa unit (control unit) Terminal 8	Wheel ser Connector E22 (Front LH wheel) E39 (Front RH wheel) C3*1 (Rear LH wheel) C5*2 (Rear LH wheel) C4*1 (Rear RH wheel) C6*2 (Rear RH wheel) I circuit Wheel ser Connector	Terminal 1 3 5 7	Existed
E36 *1: 2WD *2: AWD Measurement connector a ABS actuator and electric Connector	9 5 3 11 nd terminal for signa unit (control unit) Terminal 8	E22 (Front LH wheel) E39 (Front RH wheel) C3*1 (Rear LH wheel) C5*2 (Rear LH wheel) C4*1 (Rear RH wheel) C6*2 (Rear RH wheel) I circuit	1 3 5	Existed
*1: 2WD *2: AWD Measurement connector a ABS actuator and electric Connector	5 3 11 nd terminal for signa unit (control unit) Terminal 8	E39 (Front RH wheel) C3 ^{*1} (Rear LH wheel) C5 ^{*2} (Rear LH wheel) C4 ^{*1} (Rear RH wheel) C6 ^{*2} (Rear RH wheel)	3	Existed
*1: 2WD *2: AWD Measurement connector a ABS actuator and electric Connector	11 nd terminal for signa unit (control unit) Terminal 8	C3 ^{*1} (Rear LH wheel) C5 ^{*2} (Rear LH wheel) C4 ^{*1} (Rear RH wheel) C6 ^{*2} (Rear RH wheel) I circuit		Existed
*2: AWD Measurement connector a ABS actuator and electric Connector	nd terminal for signa unit (control unit) Terminal 8	C6 ^{*2} (Rear RH wheel)	7	
*2: AWD Measurement connector a ABS actuator and electric Connector	unit (control unit) Terminal 8	Wheel ser		
ABS actuator and electric Connector	unit (control unit) Terminal 8	Wheel ser		
Connector	Terminal 8			
	8	Connector	isor	
E36			Terminal	Continuity
E36	0	E22 (Front LH wheel)	2	
E36	6	E39 (Front RH wheel)	4	
	2	C3 ^{*1} (Rear LH wheel) C5 ^{*2} (Rear LH wheel)	6	Existed
	12	C4 ^{*1} (Rear RH wheel) C6 ^{*2} (Rear RH wheel)	8	
PERFORM SELF-DI				
Connect wheel sense Erase self-diagnosis Turn the ignition swi Start the engine.	sor harness con s result for "ABS tch OFF, and wa approx. 30 km/h	". ait 10 seconds or more. n (19 MPH) or more for a		
<u>) DTC "C1101", "C1102</u>				
ES >> GO TO 9. O >> INSPECTIO				
REPLACE WHEEL S	ENSOR (2)			
Rear: Refer to <u>BRC</u> . Erase self-diagnosis Turn the ignition swi Start the engine. Drive the vehicle at	-123, "FRONT \ -124, "REAR W s result for "ABS tch OFF, and wa	WHEEL SENSOR : Explo HEEL SENSOR : Explor " with CONSULT. ait 10 seconds or more. n (19 MPH) or more for a	<u>led View"</u> .	
Stop the vehicle. Perform self-diagno	sis for "ARS" wit			
DTC "C1101", "C1102				

NO >> INSPECTION END

BRC-35

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Special Repair Requirement

INFOID:000000009718239

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of decel G sensor: Refer to <u>BRC-10. "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

Description

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

DTC Logic

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D	
C1105	RR RH SENSOR-2	Signal from rear RH wheel sensor does not match other 3 wheel speed signal.		Harness or connector	
C1106	RR LH SENSOR-2	Signal from rear LH wheel sensor does not match other 3 wheel speed signal.	Wheel sensor Sensor rotor	E	
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signal.	(control unit)Sensor rotor	(control unit)	BRC
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.			

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF H and wait at least 10 seconds before conducting the next test.

>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	
 Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute. Perform self-diagnosis for "ABS" with CONSULT. 	J
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>	
 YES >> Proceed to diagnosis procedure. Refer to <u>BRC-37, "Diagnosis Procedure"</u>. NO >> INSPECTION END 	Κ
Diagnosis Procedure	
	L
CAUTION: Never check the between wheel sensor harness connector terminals.	
1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM	Μ
Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-89</u> , "Diagnosis Pro- cedure".	
Is the inspection result normal?	Ν
YES >> GO TO 2.	
NO >> Repair or replace error-detected parts.	
2.CHECK TIRE	0
1. Turn the ignition switch OFF.	
2. Check the tire air pressure, wear and size. Refer to <u>WT-52, "Tire Air Pressure"</u> .	Ρ
Is the inspection result normal?	
YES >> GO TO 5.	
NO >> Adjust air pressure or replace tire and GO TO 3.	
3. CHECK DATA MONITOR (1)	
1. Erase self-diagnosis result for "ABS" with CONSULT.	

2. Turn the ignition switch OFF, and wait 10 seconds or more.

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- 3. Start the engine.
- 4. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4.

NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5.CHECK WHEEL SENSOR

- 1. Turn the ignition switch OFF.
- 2. Check the wheel sensor for damage.
- 3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
 - CAUTION:

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

- Front: Refer to BRC-123, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 6.

6.REPLACE WHEEL SENSOR (1)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-123</u>, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>.
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7.

NO >> GO TO 19.

7. PERFORM SELF-DIAGNOSIS (2)

With CONSULT.

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 19.

[VDC/TCS/ABS]

C DIC/CIRCUIT DIAGNOSIS >	
NO >> INSPECTION END	
B. CHECK CONNECTOR	
 Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconr Check the wheel sensor harness connector for disconnection or looseness. 	nection or looseness.
s the inspection result normal?	
YES >> GO TO 11.	
NO >> Repair or replace error-detected parts, securely lock the harness connector,	and GO TO 9.
9. CHECK DATA MONITOR (2)	
1. Erase self-diagnosis result for "ABS" with CONSULT.	
 Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine 	
 Start the engine. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOF and "RR RH SENSOR" with CONSULT. NOTE: 	۲", "RR LH SENSOR"
Set the "DATA MONITOR" recording speed to "10 msec".	
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting whee	l sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected b	
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel s	sensors, is the differ-
ence within 5%, respectively?	
YES >> GO TO 10. NO >> GO TO 11.	
10. PERFORM SELF-DIAGNOSIS (3)	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	
3. Perform self-diagnosis for "ABS" with CONSULT.	
s DTC "C1105", "C1106", "C1107" or "C1108" detected?	
YES >> GO TO 11.	
NO >> INSPECTION END	
11.CHECK TERMINAL	
1. Turn the ignition switch OFF.	
 Disconnect ABS actuator and electric unit (control unit) harness connector and then ator and electric unit (control unit) pin terminals for damage or loose connection with Disconnect wheel sensor harness connector and check the each wheel sensor pin to or loose connection with harness connector. 	harness connector.
s the inspection result normal?	
YES >> GO TO 14.	
NO >> Repair or replace error-detected parts and GO TO 12.	
12.CHECK DATA MONITOR (3)	
1. Connect ABS actuator and electric unit (control unit) harness connector.	
2. Connect wheel sensor harness connector.	
 Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OEE, and wait 10 seconds or more. 	
 Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. 	
 Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOF and "RR RH SENSOR" with CONSULT. NOTE: 	₹", "RR LH SENSOR"
Set the "DATA MONITOR" recording speed to "10 msec".	
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting whee	l sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected b	
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensor and the normal wheel sense	sensors, is the differ-
YES >> GO TO 13.	
NO $>>$ GO TO 14.	

< DTC/CIRCUIT DIAGNOSIS >

< DTC/CIRCUIT DIAGNOSIS >

13.PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 14.

NO >> INSPECTION END

14.CHECK WHEEL SENSOR HARNESS

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
	9, 8			
E36	5, 6	Ground	Not existed	
E30	3, 2	Giouna	NOT EXISTED	
	11, 12			

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts and GO TO 15.

15.CHECK DATA MONITOR (4)

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS" with CONSULT.
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:
 - Set the "DATA MONITOR" recording speed to "10 msec".
- 7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

- YES >> GO TO 16.
- NO >> GO TO 17.

16.PERFORM SELF-DIAGNOSIS (5)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR (2)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-123</u>, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>.
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.

CTI05, CTI06, CTI07, CTI08 WHEEL SENSOR	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS	5]
 Start the engine. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOF and "RR RH SENSOR" with CONSULT. NOTE: 	R" A
Set the "DATA MONITOR" recording speed to "10 msec".Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	В
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference at a speed detected by the normal wheel sensors.	
ence within 5%, respectively?	С
YES >> GO TO 18. NO >> GO TO 19.	
18. PERFORM SELF-DIAGNOSIS (6)	D
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	
 Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. 	E
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>	
YES >> GO TO 19.	חח
NO >> INSPECTION END	BR
19. REPLACE SENSOR ROTOR	
1. Replace sensor rotor.	G
- Front: Refer to <u>BRC-126</u> , "FRONT SENSOR ROTOR : Exploded View".	
 Rear: Refer to <u>BRC-126, "REAR SENSOR ROTOR : Exploded View"</u>. Erase self-diagnosis result for "ABS" with CONSULT. 	Н
3. Turn the ignition switch OFF, and wait 10 seconds or more.	H
4. Start the engine.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	I
 Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT. 	
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u> .	J
NO >> INSPECTION END	
Special Repair Requirement	²⁴³ K
1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL	G
SENSOR	L
 After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERIN ANGLE SENSOR NEUTRAL POSITION : Description". 	<u>G</u>
- Calibration of decel G sensor: Refer to <u>BRC-10</u> , "CALIBRATION OF DECEL G SENSOR : Description".	M
• After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.	
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	NI
 After removing/replacing a steering angle sensor, be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERIN" 	N G
ANGLE SENSOR NEUTRAL POSITION : Description".	-
 After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure. Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>. 	0

>> END

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C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

INFOID:000000009718245

INFOID:000000009718246

INFOID:000000009718244

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply is lower than normal.	 Harness or connector ABS actuator and electric unit (control unit) Fuse

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1109" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-42, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

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

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

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

Is the inspection result normal?

C1109 POWER AND GROUND SYSTEM

[VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > YES >> GO TO 4. NO >> GO TO 3. ${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT 1. Turn the ignition switch OFF. Check the 20A fusible link (#G). 2. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness con-3. nector terminal (1) and 20A fusible link (#G). Is the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. ${f 4.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT 1. Turn the ignition switch OFF.

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

Connector Terminal Continuity 13 13
E36 Ground Existed
26

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING
- ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".

• After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.

Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.

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INFOID:000000009718247

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C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Description

ABS actuator and electric unit (control unit) is continuously monitoring ECU hardware and software for correct operation.

DTC Logic

INFOID:000000009718249

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[VDC/TCS/ABS]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1110" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-44, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009718250

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

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-127, "Exploded View".

Special Repair Requirement

INFOID:000000009718251

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10. "CALIBRATION OF DECEL G SENSOR : Description".

>> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

PUMP

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

MOTOR

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

MOTOR RELAY

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

DTC Logic

INFOID:000000009718253

DTC DETECTION LOGIC

		T				BRO
DTC	Disp	olay item		tion detected condition	Possible cause	
C1111	PUMP MOTOR	a ti	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 	G
				notor operating with OFF, when the ON, or when the control line for relay	(control unit)	Н
отс со	NFIRMATI	ON PROCEDU	JRE			
1.PREC	ONDITION	ING				
f "DTC C	ONFIRMAT	TION PROCEDL	IRE" has been p	previously conducted, always	turn the ignition switch OFF	
		seconds before of			Ū	1
						0
~	>> GO TO 2					
		TION PROCED				K
		switch OFF to C gnosis for "ABS"				
	C1111" dete	-				L
			ocedure. Refer to	o <u>BRC-45, "Diagnosis Proced</u>	ure".	
-	>> INSPEC	-				M
Diagno	sis Proce	dure			INFOID:000000009718254	IV
1. CHEC		CTOR				N
		switch OFF.				IN
		actuator and ele nal for deformation		ol unit) harness connector.		
	pection resu			003611633, 610.		0
	>> GO TO 2					
NO	>> Repair o	r replace error-d	•			Р
2.CHEC	K ABS MO	TOR AND MOTO	OR RELAY POV	VER SUPPLY		
I. Cheo	ck the voltag	ge between ABS	actuator and el	ectric unit (control unit) harne	ss connector and ground.	
ABS actu	ator and electr	ric unit (control unit)		Voltage		
Co	nnector	Terminal		(Approx.)		
	E36	14	Ground	Battery voltage		



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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

- 2. Turn the ignition switch ON. CAUTION: Never start the engine.
- 3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ic unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	14	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

$\mathbf{3}$.check abs motor and motor relay power supply circuit

- 1. Turn the ignition switch OFF.
- 2. Check the 30A fusible link (#F).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30A fusible link (#F).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6</u>, "Wiring Diagram BATTERY <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

4.CHECK ABS MOTOR AND MOTOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E36	13	Ground	Existed	
E30	26	Ground	LAISteu	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000009718255

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF <u>DECEL</u> G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

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

< DTC/CIRCUIT DIAGNOSIS >

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

Description

Yaw rate/side/decel G sensor detects yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

INFOID:000000009718257

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1113	G SENSOR	Decel G sensor is malfunctioning.		
C1145	YAW RATE SENSOR	 Yaw rate sensor is malfunctioning. Yaw rate/side/decel G sensor power voltage is outside the standard. Yaw rate/side/decel G sensor signal line is open or shorted. 	 Harness or connector ABS actuator and electric unit (control unit) Yaw rate/side/decel G sensor 	E
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning.		BRC

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE
1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for "ABS" with CONSULT.
1. Is DTC "C1113", "C1145" or "C1146" detected?
YES >> Proceed to diagnosis procedure. Refer to BRC-47, "Diagnosis Procedure".
NO >> INSPECTION END
Diagnosis Procedure
NFOID:200000009718259
CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. may cause yaw rate/side/decel G sensor circuit indicate a malfunction. However this is not a malfunction if normal operation can be resumed after restarting engine.
- When on a turntable, such as at a parking structure entrance, or when on a moving object with engine running, the VDC warning lamp might turn ON and self-diagnosis using the CONSULT yaw rate sensor system malfunction might be displayed, but in this case there is no malfunction with yaw rate/side/decel G sensor circuit. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Turn the ignition switch ON.

BRC-47

[VDC/TCS/ABS]

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

< DTC/CIRCUIT DIAGNOSIS >

CAUTION:

Never start the engine.

3. Check the voltage between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor			Voltage
Connector	Terminal	Terminal	
M52	4	Ground	Battery voltage

4. Turn the ignition switch OFF.

5. Check the voltage between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor			Voltage
Connector	Terminal		(Approx.)
M52	4	Ground	0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

$\mathbf{3}$.check yaw rate/side/decel g sensor ground circuit

Check the continuity between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor			Continuity	
Connector	Terminal		Continuity	
M52	1	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

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

- 1. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 2. Check the continuity between yaw rate/side/decel G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	25	M52	2	Existed
230	19	IVIJZ	3	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK DATA MONITOR

1. Connect yaw rate/side/decel G sensor harness connector.

- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Select "ABS" and "DATA MONITOR" in order with CONSULT, select "YAW RATE SEN", "SIDE G-SEN" and "DECEL G-SEN", and check the yaw rate/side/decel G sensor signal.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.
- NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-129</u>, "Exploded View".

Special Repair Requirement

INFOID:000000009718259

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

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

< DTC/CIRCUIT DIAGNOSIS >

• After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.	
- Adjustment of steering angle sensor neutral position: Refer to BRC-9, "ADJUSTMENT OF STEERING	А
ANGLE SENSOR NEUTRAL POSITION : Description"	
- Calibration of decel G sensor: Refer to <u>BRC-10. "CALIBRATION OF DECEL G SENSOR : Description"</u> .	
• After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.	D
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	D
 After removing/replacing a steering angle sensor, be sure to perform the following procedure. 	
- Adjustment of steering angle sensor neutral position: Refer to BRC-9, "ADJUSTMENT OF STEERING	
ANGLE SENSOR NEUTRAL POSITION : Description".	С
 After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure. 	
 Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>. 	
	D

>> END

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C1115 WHEEL SENSOR

Description

INFOID:000000009718260

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:000000009718261

INFOID:000000009718262

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) Sensor rotor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

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

2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-50, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check the between wheel sensor harness connector terminals.

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-89, "Diagnosis Pro-</u> cedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check the tire air pressure, wear and size. Refer to WT-52, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

C1115 WHEEL SENSOR

Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-
ence within 5%, respectively?
YES >> GO TO 4.
NO >> GO TO 5.
4.PERFORM SELF-DIAGNOSIS (1)
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
Perform self-diagnosis for "ABS" with CONSULT.
Is DTC "C1115" detected?
YES >> GO TO 5.
NO >> INSPECTION END
5. CHECK WHEEL SENSOR
1. Turn the ignition switch OFF.
2. Check the wheel sensor for damage.
3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the
wheel sensor mounting hole. CAUTION:
Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified
torque.
 Front: Refer to <u>BRC-123, "FRONT WHEEL SENSOR : Exploded View"</u>.
 Rear: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>.
Is the inspection result normal?
YES >> GO TO 8.
NO >> GO TO 6.
6. REPLACE WHEEL SENSOR (1)
1. Replace wheel sensor.
 Front: Refer to <u>BRC-123, "FRONT WHEEL SENSOR : Exploded View"</u>.
 Rear: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>. 2. Erase self-diagnosis result for "ABS" with CONSULT.
 Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR"
and "RR RH SENSOR" with CONSULT.
NOTE: Set the "DATA MONITOR" recording speed to "10 msec".
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-
ence within 5%, respectively?
YES >> GO TO 7.
NO >> GO TO 19.
. PERFORM SELF-DIAGNOSIS (2)
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for "ABS" with CONSULT.
Is DTC "C1115" detected?
YES >> GO TO 19.
NO >> INSPECTION END
8. CHECK CONNECTOR

1. Turn the ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9.

9.CHECK DATA MONITOR (2)

1. Erase self-diagnosis result for "ABS" with CONSULT.

- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.

2. Stop the vehicle.

3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 11.

NO >> INSPECTION END

11.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 14.
- NO >> Repair or replace error-detected parts and GO TO 12.
- 12.CHECK DATA MONITOR (3)
- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.

3. Erase self-diagnosis result for "ABS" with CONSULT.

- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT. NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13.

NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (4)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

[VDC/TCS/ABS]

< DTC/CIRCUIT DIAGNOSIS > Is DTC "C1115" detected? А YES >> GO TO 14. NO >> INSPECTION END 14. CHECK WHEEL SENSOR HARNESS В 1. Turn the ignition switch OFF. 2. Disconnect ABS actuator and electric unit (control unit) harness connector. Disconnect wheel sensor harness connector. 3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel 4 sensor harness connector. (Check the continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.) D Measurement connector and terminal for power supply circuit Wheel sensor ABS actuator and electric unit (control unit) Continuity Connector Terminal Connector Terminal Е 9 E22 (Front LH wheel) 1 5 E39 (Front RH wheel) 3 BRC C3^{*1} (Rear LH wheel) E36 3 5 Existed C5^{*2} (Rear LH wheel) C4^{*1} (Rear RH wheel) 7 11 C6^{*2} (Rear RH wheel) *1: 2WD *2: AWD Н Measurement connector and terminal for signal circuit ABS actuator and electric unit (control unit) Wheel sensor Continuity Connector Terminal Connector Terminal E22 (Front LH wheel) 8 2 6 E39 (Front RH wheel) 4 C3^{*1} (Rear LH wheel) E36 2 6 Existed C5^{*2} (Rear LH wheel) Κ C4^{*1} (Rear RH wheel) 8 12 C6^{*2} (Rear RH wheel) *1: 2WD L *2: AWD 5. Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground. Μ ABS actuator and electric unit (control unit) Continuity Connector Terminal Ν 9.8 5,6 E36 Ground Not existed 3, 2 11, 12 Is the inspection result normal? Ρ YES >> GO TO 15. NO >> Repair or replace error-detected parts and GO TO 15. 15.CHECK DATA MONITOR (4) 1. Connect ABS actuator and electric unit (control unit) harness connector.

2. Connect wheel sensor harness connector.

3. Erase self-diagnosis result for "ABS" with CONSULT.

4. Turn the ignition switch OFF, and wait 10 seconds or more.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.
 NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.

NO >> GO TO 17.

16.PERFORM SELF-DIAGNOSIS (5)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR (2)

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-123</u>, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-124</u>, "REAR WHEEL SENSOR : Exploded View".
- 2. Erase self-diagnosis result for "ABS" with CONSULT.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR" with CONSULT.

NOTE:

- Set the "DATA MONITOR" recording speed to "10 msec".
- 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18.

NO >> GO TO 19.

18.PERFORM SELF-DIAGNOSIS (6)

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

- 1. Replace sensor rotor.
- Front: Refer to <u>BRC-126. "FRONT SENSOR ROTOR : Exploded View"</u>.
- Rear: Refer to BRC-126, "REAR SENSOR ROTOR : Exploded View".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1115" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

NO >> INSPECTION END

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Special Repair Requirement

INFOID:000000009718263

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G	
SENSOR	

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to BRC-9, "ADJUSTMENT OF STEERING
- ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING"
- ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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C1116 STOP LAMP SWITCH

Description

INFOID:000000009718264

[VDC/TCS/ABS]

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

DTC Logic

INFOID:000000009718265

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When a stop lamp switch signal is not input where the brake pedal is depressed.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1116" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-56, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009718266

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect stop lamp switch harness connector.
- 4. Check the terminal for deformation, disconnection, looseness, etc.
- 5. Reconnect ABS actuator and electric unit (control unit) and stop lamp switch harness connectors securely.
- 6. Start the engine.
- 7. Repeat pumping brake pedal carefully several times, and perform self-diagnosis for "ABS" with CON-SULT.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Repair or replace error-detected parts.

2.CHECK STOP LAMP SWITCH CLEARANCE

Check the stop lamp switch clearance. Refer to <u>BR-9, "Inspection and Adjustment"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Adjust stop lamp switch clearance. Refer to <u>BR-9</u>, "Inspection and Adjustment".

3.CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to BRC-57. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Repair or replace stop lamp switch. А CHECK STOP LAMP SWITCH CIRCUIT 1. Connect ABS actuator and electric unit (control unit) harness connector. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground. 2. ABS actuator and electric unit (control unit) Voltage Condition (Approx.) Terminal Connector Brake pedal is depressed Battery voltage E36 16 Ground Brake pedal is released 0 V D Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-127, "Exploded View". NO >> Repair or replace error-detected parts. Component Inspection INFOID:000000009718267 1.CHECK STOP LAMP SWITCH BRC 1. Turn the ignition switch OFF. Disconnect stop lamp switch harness connector. 2. Check the continuity between stop lamp switch connector terminals. 3. Stop lamp switch Condition Continuity Terminal Н Release stop lamp switch Existed (When brake pedal is depressed.) 1 – 2 Push stop lamp switch Not existed (When brake pedal is released.) Is the inspection result normal? YES >> INSPECTION END >> Replace stop lamp switch. Refer to BR-20, "Exploded View". NO Special Repair Requirement INFOID:000000009718268 Κ 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". Μ Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description". • After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description". After removing/replacing a steering angle sensor, be sure to perform the following procedure. Ν Adjustment of steering angle sensor neutral position: Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure. Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description". >> END Ρ

C1120, C1122, C1124, C1126 IN ABS SOL

Description

The ABS IN 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:000000009718270

INFOID:000000009718269

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 ABS IN valve circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH ABS IN valve circuit.	 Harness or connector ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH ABS IN valve circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH ABS IN valve circuit.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS" with CONSULT.

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

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

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009718271

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS IN VALVE POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ic unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electi	ric unit (control unit)		Voltage		А
Connector	Terminal	—	(Approx.)		
E36	1	Ground	Battery voltage		D
Is the inspection resi	ult normal?				В
YES >> GO TO A					С
3.CHECK ABS IN V	ALVE POWER S	SUPPLY CIRCL	ЛТ		
	usible link (#G).		ABS actuator and	d electric unit (control unit) harness con-	D
Is the inspection resi					Е
YES >> Perform	trouble diagnosi	s for battery po	ower supply. Refe	er to PG-6, "Wiring Diagram - BATTERY	
	<u>SUPPLY -"</u> . or replace error-d	otoctod parts			
4.CHECK ABS IN V	•	•			BRC
			tria unit (control	unit) horrooo connector and ground	
Check the continuity	between ABS at			unit) harness connector and ground.	G
ABS actuator and elect	ric unit (control unit)				
Connector	Terminal	—	Continuity		Н
	13				
E36	26	Ground	Existed		
Is the inspection rest	ult normal?				
	ABS actuator ar		control unit). Ref	er to <u>BRC-127, "Exploded View"</u> .	1
Special Repair F	Requirement			INFOID:000000009718272	J
	•				
	F STEERING AN	IGLE SENSOR	NEUTRAL POS	ITION AND CALIBRATION OF DECEL G	Κ
SENSOR	ABS actuator and	d alactric unit (a	ontrol unit) bo s	ure to perform the following procedure.	
				<u>BRC-9, "ADJUSTMENT OF STEERING</u>	L
ANGLE SENSOR	NEUTRAL POSI	TION : Descript	<u>tion"</u> .		
				<u>F DECEL G SENSOR : Description</u> ure to perform the following procedure.	
- Calibration of dece	el G sensor: Refe	r to <u>BRC-10, "C</u>	ALIBRATION OF	F DECEL G SENSOR : Description"	M
				n the following procedure. 3RC-9, "ADJUSTMENT OF STEERING	
ANGLE SENSOR	<u>NEŬTRĂL POSI</u>	TION : Descript	ion".		Ν
				perform the following procedure.	
	a G Sensor. Rele	$1 \cup \underline{D} \cup \underline{C} \cup \underline{C}$		F DECEL G SENSOR : Description".	~
>> END					0
					Р

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

The ABS OUT 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:000000009718274

INFOID:000000009718273

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 ABS OUT valve circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH ABS OUT valve circuit.	 Harness or connector ABS actuator and electric unit
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH ABS OUT valve circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH ABS OUT valve circuit.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS" with CONSULT.

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

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

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009718275

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS OUT VALVE POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ic unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electr	ric unit (control unit)		Voltage	
Connector	Terminal	_	(Approx.)	
E36	1	Ground	Battery voltage	
s the inspection resu	ult normal?			
YES >> GO TO 4 NO >> GO TO 3	3.			
3. CHECK ABS OU	T VALVE POWEF	R SUPPLY CIR	CUIT	
	usible link (#G). nuity and short ci		ABS actuator and	d electric unit (control unit) harness con-
	1) and 20A fusibl	e link (#G).		
<u>s the inspection resu</u> YES >> Perform		for battony po	wor cupply Dof	er to <u>PG-6, "Wiring Diagram - BATTERY</u>
	<u>SUPPLY -"</u> .	s for ballery pc	wei suppiy. Keit	I to <u>FG-6. Winny Diagram - DATTERT</u>
· ·	or replace error-de	-		
CHECK ABS OU		ID CIRCUIT		
heck the continuity	between ABS ac	tuator and elec	ctric unit (control	unit) harness connector and ground.
			1	
ABS actuator and electr	· · · ·	_	Continuity	
Connector	Terminal			
E36	13	Ground	Existed	
s the inspection resu	26 ult pormal2			
-		d electric unit (control unit) Ref	er to <u>BRC-127, "Exploded View"</u> .
	or replace error-de			er to <u>bito-127, Exploded view</u> .
Special Repair F	Requirement	-		INFOID:000000009718276
	•			
	F STEERING AN	GLE SENSOR	NEUTRAL POS	ITION AND CALIBRATION OF DECEL G
ENSOR				
After replacing an Adjustment of stee	ABS actuator and ering angle sens	or neutral nos	control unit), be s sition: Refer to F	ure to perform the following procedure. <u>3RC-9, "ADJUSTMENT OF STEERING</u>
ANGLE SENSOR	NEUTRAL POSIT	FION : Descript	<u>tion"</u> .	
				F DECEL G SENSOR : Description". ure to perform the following procedure.
				F DECEL G SENSOR : Description".
After removing/rep	lacing a steering	angle sensor, b	be sure to perforr	n the following procedure.
Adjustment of stee				<u> BRC-9. "ADJUSTMENT OF STEERING</u>
After removing/rep	lacing a yaw rate	/side/decel G s	ensor, be sure to	perform the following procedure.
Calibration of dece	a G sensor: Refer	10 <u>BRC-10, "C</u>	ALIDKATION O	F DECEL G SENSOR : Description".
>> END				

C1130 ENGINE SIGNAL

Description

INFOID:000000009718277

[VDC/TCS/ABS]

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

DTC Logic

INFOID-00000009718278

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	Major engine components are malfunctioning.	 ECM ABS actuator and electric unit (control unit) CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- Turn the ignition switch OFF to ON. 1.
- Perform self-diagnosis for "ABS" with CONSULT. 2.

Is DTC "C1130" detected?

- YES >> Proceed to diagnosis procedure. Refer to BRC-62, "Diagnosis Procedure".
- >> INSPECTION END NO

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS (1)

Perform self-diagnosis for "ENGINE" with CONSULT.

Is any item indicated on the self-diagnosis display?

YES >> Check the malfunctioning system. Refer to EC-129, "CONSULT Function".

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (2)

- Erase self-diagnosis results for "ABS" with CONSULT. 1.
- Turn the ignition switch OFF. 2.
- Start the engine. Drive the vehicle for a while. З.
- Make sure that malfunction indicator lamp (MIL) turns OFF.
- Is indicator lamp (MIL) turns OFF?

YES >> GO TO 3.

NO >> Refer to EC-129, "CONSULT Function".

3. PERFORM SELF-DIAGNOSIS (3)

Stop the vehicle. Perform self-diagnosis for "ENGINE" with CONSULT.

Is any item indicated on the self-diagnosis display?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G

BRC-62

2014 MURANO

INFOID:000000009718279

INFOID:000000009718280

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

SENSOR After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>". Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description". After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description". After removing/replacing a steering angle sensor, be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>". After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.

- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.

>> END

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Revision: 2013 August

C1140 ACTUATOR RELAY SYSTEM

Description

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

DTC Logic

INFOID:000000009718282

INFOID:000000009718281

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	When the control unit detects a malfunction in the actua- tor relay system.	 Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1140" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-64, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ACTUATOR RELAY POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ric unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

ABS actuator and electr	ic unit (control unit)	_	Voltage
Connector	Terminal		(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

Revision: 2013 August

BRC-64

INFOID:000000009718283

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 4					
NO >> GO TO 3					
3 .CHECK ACTUATO	OR RELAY POW	ER SUPPLY C	IRCUIT		
. Turn the ignition					
. Check the 20A fu					
 Check the contin nector terminal (² 			ABS actuator a	nd electric unit (control unit) harness con-	
s the inspection resu	It normal?				
	trouble diagnosis <u>SUPPLY -"</u> .	s for battery po	ower supply. Re	efer to PG-6, "Wiring Diagram - BATTERY	
NO >> Repair or	r replace error-de	etected parts.			
1. CHECK ACTUATO	OR RELAY GRO	UND CIRCUIT			
back the continuity	hetween ABS ac	tuator and elec	tric unit (contro	ol unit) harness connector and ground.	
				i unity namess connector and ground.	
ABS actuator and electri					
-			Continuity		E
ABS actuator and electri	c unit (control unit) Terminal			–	E
ABS actuator and electri	c unit (control unit) Terminal 13	Ground		-	Ē
ABS actuator and electri Connector E36	c unit (control unit) Terminal 13 26	_	Continuity		
ABS actuator and electri Connector E36 s the inspection resu	c unit (control unit) Terminal 13 26 It normal?	— Ground	Continuity Existed	- -	E
ABS actuator and electri Connector E36 s the inspection resu YES >> Replace	c unit (control unit) Terminal 13 26 I <u>lt normal?</u> ABS actuator an	Ground d electric unit (Continuity Existed	efer to <u>BRC-127, "Exploded View"</u> .	E
ABS actuator and electri Connector E36 s the inspection resu YES >> Replace NO >> Repair of	c unit (control unit) Terminal 13 26 It normal? ABS actuator an r replace error-de	Ground d electric unit (Continuity Existed	- -	E
ABS actuator and electri Connector E36 s the inspection resu YES >> Replace NO >> Repair of	c unit (control unit) Terminal 13 26 It normal? ABS actuator an r replace error-de	Ground d electric unit (Continuity Existed	- -	E
ABS actuator and electri Connector E36 s the inspection resu YES >> Replace NO >> Repair of Special Repair R	c unit (control unit) Terminal 13 26 It normal? ABS actuator an r replace error-de equirement	Ground d electric unit (etected parts.	Continuity Existed control unit). Re	efer to <u>BRC-127, "Exploded View"</u> .	E
ABS actuator and electri Connector E36 s the inspection resu YES >> Replace NO >> Repair or Special Repair R 1.ADJUSTMENT OF SENSOR	c unit (control unit) Terminal 13 26 It normal? ABS actuator an replace error-de equirement STEERING AN	Ground d electric unit (etected parts. GLE SENSOR	Continuity Existed control unit). Re	efer to <u>BRC-127, "Exploded View"</u> .	

- <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
 Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9. "ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION : Description"</u>.
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10. "CALIBRATION OF DECEL G SENSOR : Description".

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C1142 PRESS SENSOR

Description

INFOID:000000009718285

[VDC/TCS/ABS]

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

DTC Logic

INFOID:000000009718286

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pres- sure sensor is malfunctioning.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1142" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-66, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to BRC-56, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK DATA MONITOR

- 1. Check the brake fluid leakage. Refer to <u>BR-12, "Inspection"</u>.
- 2. Check the front brake piping. Refer to <u>BR-24, "FRONT : Inspection"</u>.
- 3. Check the rear brake piping. Refer to <u>BR-26, "REAR : Inspection"</u>.
- 4. Check the brake pedal. Refer to <u>BR-21, "Inspection and Adjustment"</u>.
- 5. Check the master cylinder. Refer to BR-29, "Inspection".
- 6. Check the brake booster. Refer to <u>BR-31, "Inspection and Adjustment"</u>.
- Check the front disc brake. Refer to <u>BR-42, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection"</u> (1 piston type), <u>BR-46, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection"</u> (2 piston type).
- 8. Check the rear disc brake. Refer to <u>BR-52, "BRAKE CALIPER ASSEMBLY : Inspection"</u>.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected parts.
- **3.** PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

INFOID:000000009718287

C1142 PRESS SENSOR

[VDC/TCS/ABS]

Is any item indicated on the self-diagnosis display? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u> .	А
NO >> Repair or replace error-detected parts.	
Special Repair Requirement	В
1. Adjustment of steering angle sensor neutral position and calibration of decelg sensor	
After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.	С
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>". Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description". 	D
• After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.	
 Calibration of decel G sensor: Refer to <u>BRC-10</u>, "<u>CALIBRATION OF DECEL G SENSOR</u>: <u>Description</u>". After removing/replacing a steering angle sensor, be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING</u> 	Е
 <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>". After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure. 	
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u> .	BR
>> END	G
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< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

Description

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

DTC Logic

INFOID:000000009718290

INFOID:00000000971829

INFOID:000000009718289

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, steering angle sensor is malfunctioning, or wheel align- ment is outside specified range.	 Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Wheel alignment

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1143" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-68, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK WHEEL ALIGNMENT

Check the wheel alignment. Refer to FSU-7, "Inspection" (front), RSU-6, "Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Adjust wheel alignment. Refer to <u>FSU-7</u>, "Inspection" (front), <u>RSU-6</u>, "Adjustment" (rear).

2. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect steering angle sensor harness connector.
- 4. Check the terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${
m 3.}$ CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Check the voltage between steering angle sensor harness connector and ground.

Steering angl	Steering angle sensor		Voltage
Connector	Terminal		(Approx.)
M30	4	Ground	0 V

2. Turn the ignition switch ON.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

CAUTION: Never start the engine. А Check the voltage between steering angle sensor harness connector and ground. 3. Steering angle sensor Voltage В (Approx.) Connector Terminal M30 4 Ground Battery voltage Is the inspection result normal? YES >> GO TO 5. NO >> GO TO 4. D 4.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT Turn the ignition switch OFF. 1. Check the 10A fuse (#3). Е 2. 3. Disconnect fuse block (J/B) harness connector. Check the continuity between steering angle sensor harness connector and fuse block (J/B) harness con-4. nector. BRC Fuse block (J/B) Steering angle sensor Continuity Connector Terminal Connector Terminal M30 4 M1 2A Existed Is the inspection result normal? Н YES >> Perform trouble diagnosis for ignition power supply. Refer to PG-47, "Wiring Diagram - IGNITION POWER SUPPLY -". NO >> Repair or replace error-detected parts. ${f 5.}$ CHECK STEERING ANGLE SENSOR GROUND CIRCUIT Check the continuity between steering angle sensor harness connector and ground. Steering angle sensor Continuity Connector Terminal M30 1 Ground Existed Is the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. **6.**CHECK STEERING WHEEL PLAY Check the steering wheel play. Refer to ST-35, "Inspection" (with heated steering wheel) or ST-80, "Inspec-M tion" (without heated steering wheel). Is the inspection result normal? YES >> GO TO 7. Ν NO >> Repair or replace error-detected parts. **1**.CHECK CAN COMMUNICATION LINE Check the "STRG BRANCH LINE CIRCUIT". Refer to LAN-59, "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 8. P >> Repair or replace error-detected parts. Refer to LAN-24, "FOR USA AND CANADA : Precautions NO for Harness Repair" (for USA and Canada), LAN-26, "FOR MEXICO : Precautions for Harness Repair" (for Mexico).

8.CHECK DATA MONITOR

1. Connect the ABS actuator and electric unit (control unit) harness connector.

2. Connect the steering angle sensor harness connector.

3. Check the steering angle sensor signal. Refer to <u>BRC-102, "Reference Value"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.
- NO >> Replace steering angle sensor. Refer to <u>BRC-130, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000009718292

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

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

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[VDC/TCS/ABS]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1144	ST ANG SEN SIGNAL	Adjustment of steering angle sensor neutral position is not finished.	 Harness or connector Steering angle sensor ABS actuator and electric unit (control unit)
DTC CC	ONFIRMATION PROC	EDURE	
1.PREC	CONDITIONING		
		EDURE" has been previously conducted, always ore conducting the next test.	turn the ignition switch OFF
		bre conducting the next test.	
0	>> GO TO 2.		
2.dtc	REPRODUCTION PRO	CEDURE	
 Seleand 3. Perf 	the ignition switch OFF ect "ABS", "WORK SUP perform adjust the neutr orm self-diagnosis for "A C1144" detected?	PORT" and "ST ANGLE SENSOR ADJUSTMEN al position of steering angle sensor.	NT" in order with CONSULT,
YES	>> Proceed to diagnosis	s procedure. Refer to <u>BRC-71, "Diagnosis Procec</u>	dure".
NO	>> INSPECTION END		
	sis Procedure		INFOID:000000009718295
	CK STEERING ANGLE		
	e steering angle sensor spection result normal?	. Refer to <u>BRC-68, "Diagnosis Procedure"</u> .	
YES NO		or and electric unit (control unit). Refer to <u>BRC-12</u> ror-detected parts.	27, "Exploded View".
Specia	I Repair Requireme	ent	INFOID:000000009718296
1.ADJU		G ANGLE SENSOR NEUTRAL POSITION AND (CALIBRATION OF DECEL G
- Adjusti ANGL	ment of steering angle <u>E SENSOR NEUTRAL F</u>	r and electric unit (control unit), be sure to perform sensor neutral position: Refer to <u>BRC-9, "ADJ</u> <u>POSITION : Description"</u> .	IUSTMENT OF STEERING
 After re Calibra After re Adjustre ANGLE 	emoving an ABS actuato ation of decel G sensor: emoving/replacing a stee ment of steering angle <u>E SENSOR NEUTRAL F</u>	Refer to <u>BRC-10, "CALIBRATION OF DECEL G</u> or and electric unit (control unit), be sure to perfor Refer to <u>BRC-10, "CALIBRATION OF DECEL G</u> oring angle sensor, be sure to perform the followin sensor neutral position: Refer to <u>BRC-9, "ADJ</u> <u>POSITION : Description</u> ".	m the following procedure. SENSOR : Description". ng procedure. JUSTMENT OF STEERING
		rate/side/decel G sensor, be sure to perform the	following procedure.

Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description

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

DTC Logic

INFOID:000000009718298

INFOID:000000009718297

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 ABS actuator and electric unit (control unit) Brake fluid level low Brake fluid level switch Combination meter 	
		· · · · · ·		В

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2. 2.DTC REPRODUCTION PROCEDURE	Н
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. Is DTC "C1155" detected? 	I
YES >> Proceed to diagnosis procedure. Refer to <u>BRC-73, "Diagnosis Procedure"</u> . NO >> INSPECTION END	J
Diagnosis Procedure	K
1.CHECK BRAKE FLUID LEVEL	IX.
 Turn the ignition switch OFF. Check the brake fluid level. Refer to <u>BR-12, "Inspection"</u>. <u>Is the inspection result normal?</u> 	L
YES >> GO TO 2. NO >> Refill brake fluid. Refer to <u>BR-12, "Refilling"</u> . 2. PERFORM SELF-DIAGNOSIS (1)	Μ
 Erase self-diagnosis result for "ABS" with CONSULT. Turn the ignition switch OFF, and wait 10 seconds or more. Turn the ignition switch ON. CAUTION: 	N
Never start the engine. 4. Perform self-diagnosis for "ABS" with CONSULT.	0
Is DTC "C1155" detected? YES >> INSPECTION END NO >> GO TO 3. 3.CHECK BRAKE FLUID LEVEL SWITCH	Ρ
Check the brake fluids level switch. Refer to <u>BRC-75, "Component Inspection"</u> . <u>Is the inspection result normal?</u> YES >> GO TO 5.	

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C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Replace sub tank. Refer to <u>BR-27, "Exploded View"</u>. GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

- 1. Erase self-diagnosis result for "ABS" with CONSULT.
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1155" detected?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK CONNECTOR AND TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- 3. Check the brake fluid level switch harness connector for disconnection or looseness.
- 4. Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- 5. Disconnect combination meter harness connector.
- 6. Check the combination meter harness connector for disconnection or looseness.
- 7. Check the combination meter pin terminals for damage or loose connection with harness connector.
- 8. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 9. Check the ABS actuator and electric unit (control unit) harness connector harness connector for disconnection or looseness.
- 10. Check the ABS actuator and electric unit (control unit) harness connector pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Repair or replace error-detected parts. GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

- 1. Connect brake fluid level switch harness connector.
- 2. Connect combination meter harness connector.
- 3. Connect ABS actuator and electric unit (control unit) harness connector.
- 4. Erase self-diagnosis result for "ABS" with CONSULT.
- 5. Turn the ignition switch OFF, and wait 10 seconds or more.
- Turn the ignition switch ON. CAUTION:

Never start the engine.

7. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1155" detected?

YES >> INSPECTION END

NO >> GO TO 7.

7. CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 4. Disconnect combination meter harness connector.
- 5. Check the continuity between brake fluid level switch harness connector and ABS actuator and electric unit (control unit) harness connector.

Brake fluid level switch		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E37	1	E36	7	Existed

6. Check the continuity between brake fluid level switch harness connector and combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Brake fluid	level switch	Combina	tion meter						А
Connector	Terminal	Connector	Terminal	Continuit	У				
E37	1	M34	27	Existed					
_		-			arness co	onnector and g	round		В
		y between bi		CI SWITCH I			round.		
В	Brake fluid leve	l switch							С
Connec	tor	Terminal		—		Continuity			
E37		1		Ground	N	lot existed			
Is the inspec	tion result n	normal?							D
-	GO TO 8.								
-	•	eplace error-c							Е
8.CHECK E	BRAKE FLU	ID LEVEL S	NITCH GRO	DUND					
Check the co	ontinuity bet	tween brake	fluid level sv	vitch harne	ess conne	ctor and groun	d.		
									BRC
B	Brake fluid leve	l switch		_		Continuity			
Connec	tor	Terminal				Continuity			G
E37		2		Ground		Existed			0
Is the inspec	tion result r	normal?							
	GO TO 9.								Н
•		place error-c	letected par	ts.					
9. CHECK (COMBINATI	ON METER							
Check the co	ombination i	meter. Refer	to <u>MWI-35,</u>	CONSUL	T Functio	<u>n (METER/M&</u>	<u>A)"</u> .		I
Is the inspec	tion result r	normal?							
						fer to <u>BRC-127</u>		<u>l View"</u> .	J
NO >>	Repair or re	place combi	nation meter	r. Refer to	<u>MWI-105</u>	<u>"Exploded Vie</u>	<u>؛₩"</u> .		0
Compone	nt Inspec	tion						INFOID:000000009718300	
1 OUF OK F		ID LEVEL S							Κ
	_	-							
	ignition swi	itch OFF. uid level swit	ch harnoss (connector					1
		y between br			onnector	terminals.			
	-	, ,							
Brake fluid lev	el switch	0	l't'		Orationity	-			M
Termin	al	C	ondition		Continuity				
		en brake fluid is	full in the sub	tank.	Not existed	_			
1 – 2	Wh	en brake fluid is	empty in the s	sub tank.	Existed	_			Ν
Is the inspec	tion result r	normal?				-			
	INSPECTIC								0
		b tank. Refer	to <u>BR-27, "</u>	Exploded \	<mark>∕iew"</mark> .				0
Special R	epair Rec	quirement						INFOID:000000009718301	
	•	•							Ρ
1.ADJUST	MENT OF S	TEERING AI	NGLE SENS	SOR NEUT	RAL POS	SITION AND CA	ALIBRATION	N OF DECEL G	
SENSOR									
						sure to perform			
					Refer to	<u>BRC-9, "ADJL</u>	<u>ISTMENT (</u>	OF STEERING	
		UTRAL POS sensor: Refe				F DECEL G S	ENSOR · D	escription"	
Canoration			<u> </u>					<u>, comparent</u>	

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

Description

Yaw rate/side/decel G sensor detects decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

INFOID:000000009718303

INFOID:000000009718302

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1160	DECEL G SEN SET	Calibration of decel G sensor is not finished.	 yaw rate/side/decel G sensor Harness or connector ABS actuator and electric unit (control unit) Incomplete decel G sensor calibration 	E
			Calibration	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.	Н
2.DTC REPRODUCTION PROCEDURE	
 Turn the ignition switch OFF to ON. Select "ABS", "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order with CONSULT, and perform calibration of decel G sensor. Refer to <u>BRC-10.</u> "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement". 	
 Perform self-diagnosis for "ABS" with CONSULT. 	J
Is DTC "C1160" detected?	
 YES >> Proceed to diagnosis procedure. Refer to <u>BRC-77, "Diagnosis Procedure"</u>. NO >> INSPECTION END 	Κ
Diagnosis Procedure	
1.CHECK YAW RATE/SIDE/DECEL G SENSOR	L
Check the yaw rate/side/decel G sensor. Refer to BRC-102, "Reference Value".	
Is the inspection result normal?	Μ
 YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>. NO >> Repair or replace error-detected parts. 	
Special Repair Requirement	Ν
1. Adjustment of steering angle sensor neutral position and calibration of decelg sensor	0
 After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". 	Ρ
- Calibration of decel G sensor: Refer to <u>BRC-10</u> , "CALIBRATION OF DECEL G SENSOR : Description".	
 After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description". 	
 After removing/replacing a steering angle sensor, be sure to perform the following procedure. 	
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9, "ADJUSTMENT OF STEERING</u> ANGLE SENSOR NEUTRAL POSITION : Description" 	

• After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.

BRC-77

2014 MURANO

[VDC/TCS/ABS]

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C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

Description

Yaw rate/side/decel G sensor detects side 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
C1161	SIDE G SEN SET	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)
отс сс	NFIRMATION PROCE	DURE	
1. PREC	CONDITIONING		
		DURE" has been previously conducted, always the conducting the next test.	turn the ignition switch OFF
_	>> GO TO 2.		
2.dtc	REPRODUCTION PROC	EDURE	
	the ignition switch OFF to orm self-diagnosis for "AB		
	C1161" detected?		
YES NO	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-79, "Diagnosis Proced</u>	ure".
Diagno	sis Procedure		INFOID:000000009718308
		ND ELECTRIC UNIT (CONTROL UNIT)	iteres allow them the
applicabl		c unit (control unit) when self-diagnostic result sh	iows items other than those
	>> Replace ABS actuator	r and electric unit (control unit). Refer to <u>BRC-12</u>	
			7, "Exploded View".
Specia	l Repair Requiremer		7, "Exploded View".
	Repair Requiremen	nt	INFOID:000000009718309
1. adju	STMENT OF STEERING		INFOID:000000009718309
1.ADJU SENSOF • After re - Adjustr	STMENT OF STEERING splacing an ABS actuator nent of steering angle s	ANGLE SENSOR NEUTRAL POSITION AND C and electric unit (control unit), be sure to perform ensor neutral position: Refer to <u>BRC-9, "ADJI</u>	ALIBRATION OF DECEL G
1.ADJU SENSOF • After re • Adjustr <u>ANGLE</u> • Calibra • After re	STMENT OF STEERING eplacing an ABS actuator ment of steering angle s <u>SENSOR NEUTRAL PC</u> ition of decel G sensor: Re emoving an ABS actuator	ANGLE SENSOR NEUTRAL POSITION AND C and electric unit (control unit), be sure to perform ensor neutral position: Refer to <u>BRC-9, "ADJI</u> <u>SITION : Description"</u> . efer to <u>BRC-10, "CALIBRATION OF DECEL G S</u> and electric unit (control unit), be sure to perform	INFOID:00000009718309 ALIBRATION OF DECEL G In the following procedure. USTMENT OF STEERING SENSOR : Description". In the following procedure.
1.ADJU SENSOF • After re • Adjustr <u>ANGLE</u> • Calibra • After re • Calibra	STMENT OF STEERING eplacing an ABS actuator ment of steering angle s <u>SENSOR NEUTRAL PC</u> tion of decel G sensor: Re emoving an ABS actuator tion of decel G sensor: Re emoving/replacing a steer	ANGLE SENSOR NEUTRAL POSITION AND C and electric unit (control unit), be sure to perform ensor neutral position: Refer to <u>BRC-9, "ADJI</u> <u>SITION : Description"</u> . efer to <u>BRC-10, "CALIBRATION OF DECEL G S</u>	ALIBRATION OF DECEL G n the following procedure. USTMENT OF STEERING ENSOR : Description". n the following procedure. ENSOR : Description". g procedure.

BRC-79

>> END

[VDC/TCS/ABS]

INFOID:000000009718306

INFOID:000000009718307

2014 MURANO

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C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

Description

INFOID:000000009718310

[VDC/TCS/ABS]

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

DTC Logic

INFOID:000000009718311

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1162	PRESS SEN SET	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ABS" with CONSULT.

Is DTC "C1162" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-80, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009718312

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

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-127, "Exploded View".

Special Repair Requirement

INFOID:000000009718313

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

• After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

C1164, C1165 CV SYSTEM

Description

INFOID:000000009718314

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

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause			
C1164	CV1	Cut valve 1 (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 	D		
C1165 CV2		Cut valve 2 (CV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)	E		
DTC CONFIRMATION PROCEDURE						
1.PREC	CONDITIONING					
		DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF	G		
	>> GO TO 2.			Н		
2.dtc1	REPRODUCTION PROCE	EDURE				
 Turn the ignition switch OFF to ON. Perform self-diagnosis for "ABS" with CONSULT. DTC "C1164" or "C1165" detected? 						
YES						
Diagno	sis Procedure		INFOID:00000009718316			
1.снес	CK CONNECTOR			K		
2. Disc		electric unit (control unit) harness connector.		L		
	spection result normal?	ation, disconnection, looseness, etc.				
YES	 >> GO TO 2. >> Repair or replace erro 	r-detected parts.		M		

2. CHECK CUT VALVE (CV) POWER SUPPLY

1. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electr	ic unit (control unit)	_	Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

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C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electr	ic unit (control unit)		Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK CUT VALVE (CV) POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6. "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK CUT VALVE (CV) GROUND CIRCUIT

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

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal	_	Continuity	
E36	13	Ground	Existed	
230	26	Giodila	LAISIEU	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000009718317

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

• After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9. "ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION : Description"</u>.
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1166, C1167 SV SYSTEM

Description

INFOID:000000009718318

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

DTC Logic

INFOID:000000009718319

DTC DETECTION LOGIC

DTC	Displa	ay item	Malfund	tion detected condition	Possible cause			
C1166	SV1	c) on the primary side is open circu ntrol line is open or shorted to the ground.	 Harness or connector ABS actuator and electric unit 			
C1167	SV2	c	Suction valve 2 (SV2) on the secondary side is open cir- cuit or shorted, or the control line is open or shorted to the power supply or the ground.					
отс сс	ONFIRMATIO	ON PROCEDI	JRE			В		
1 .PREC	CONDITIONI	NG						
			IRE" has been p conducting the n		s turn the ignition switch OFF	(
	>> GO TO 2							
2.DTC	REPRODUC	TION PROCED	URE					
2. Perf	orm self-diag	switch OFF to C nosis for "ABS" 1167" detected	with CONSULT					
YES		to diagnosis pro		o <u>BRC-83, "Diagnosis Proce</u>	edure".			
Diagno	sis Proce	dure			INFOID:000000009718320			
.снес		TOR						
. Turn	the ignition s	switch OFF.						
				ol unit) harness connector.				
	spection resu			1, 1003011033, 010.				
	>> GO TO 2							
•	•	replace error-d	•	/				
				ectric unit (control unit) harr				
	··- ≁ا من مطئيام				less connector and dround			
	ck the voltage	e between ABS			icos connector and ground.			
I. Che		c unit (control unit)		Voltage				
ABS actu				, , , , , , , , , , , , , , , , , , ,				

2. Turn the ignition switch ON. **CAUTION:**

Never start the engine.

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

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C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electr	ic unit (control unit)		Voltage
Connector Terminal			(Approx.)
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK SUCTION VALVE (SV) POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6</u>, "Wiring Diagram - BATTERY <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK SUCTION VALVE (SV) GROUND CIRCUIT

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

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector Terminal		_	Continuity	
E36	13	Ground	Existed	
E30	26	Ground	Existed	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000009718321

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

• After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000009718323

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.	 Harness or connector CAN communication line ABS actuator and electric unit (control unit)
DTC CC	NFIRMATION PROCE	DURE	
1.PREC	CONDITIONING		
		DURE" has been previously conducted, always re conducting the next test.	turn the ignition switch OFF
	>> GO TO 2.		
2. DTC	REPRODUCTION PROC	EDURE	
	the ignition switch OFF t orm self-diagnosis for "A		
	U1000" detected?		
YES NO	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-85, "Diagnosis Proced</u>	lure".
Diagno	sis Procedure		INFOID:000000009718324
1.PERF	ORM SELF-DIAGNOSIS		
	self-diagnosis for "ABS" v	with CONSULT.	
	U1000" detected?		
YES NO	>> INSPECTION END	Trouble Diagnosis Flow Chart".	
Specia	l Repair Requireme	nt	INFOID:000000009718325
1.adju	ISTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION AND C	ALIBRATION OF DECEL G
SENSOF			
		and electric unit (control unit), be sure to perform sensor neutral position: Refer to <u>BRC-9, "ADJ</u>	
ANGLE	<u>E SENSOR NEŬTRĂL P</u>	OSITION : Description"	
		efer to <u>BRC-10. "CALIBRATION OF DECEL G S</u> and electric unit (control unit), be sure to perforr	
		efer to <u>BRC-10, "CALIBRATION OF DECEL G S</u> ing angle sensor, be sure to perform the followin	
- Adjustr	ment of steering angle s	sensor neutral position: Refer to BRC-9, "ADJ	
ANGLE After re	E SENSOR NEUTRAL PO emoving/replacing a yaw	<u>DSITION : Description</u> . rate/side/decel G sensor, be sure to perform the	following procedure.
- Calibra	ation of decel G sensor: R	efer to BRC-10, "CALIBRATION OF DECEL G S	SENSOR : Description"

BRC-85

INFOID:000000009718322

А

U1002 SYSTEM COMM (CAN)

Description

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

DTC Logic

INFOID:000000009718327

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1002	SYSTEM COMM (CAN)	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal of steering angle sensor for 2 seconds or less.	 Harness or connector CAN communication line ABS actuator and electric unit (control unit)
DTC CC	NFIRMATION PROCE	DURE	G
1.PREC	ONDITIONING		G
		DURE" has been previously conducted, always e conducting the next test.	turn the ignition switch OFF $_{\rm H}$
	>> GO TO 2.		
-	REPRODUCTION PROCI	EDURE	
-	the ignition switch OFF to		
	orm self-diagnosis for "AB	S" with CONSULT.	J
	<u>J1002" detected?</u>	procedure. Refer to <u>BRC-87, "Diagnosis Proced</u>	ure"
	>> INSPECTION END	biocedure. Noter to <u>BRO 07, Blagnosis Proced</u>	<u>ынс</u> . К
Diagno	sis Procedure		INFOID:00000009718328
Use a fTurn t	apply 7.0 V or more to tl tester with open termina	he measurement terminal. Il voltage of 7.0 V or less. and disconnect the battery cable from the	e negative terminal when M
1. CHEC	K CAN DIAGNOSIS SUF	PORT MONITOR	
	ck the malfunction history	osis Support Monitor" in order with CONSULT. between each control unit connected to ABS act	N tuator and electric unit (con-
	e result of "PAST"		0
	s are "OK">>Refer to <u>GI-4</u> SMIT DIAG" is other than		
		uator and electric unit (control unit) is anything c	other than "OK">>GO TO 3. $_{\sf P}$
2.снес	K TRANSMITTING SIDE	UNIT	
or loose	connection.	ric unit (control unit) harness connector terminals	s No. 21 and 23 for damage
	pection result normal?	esults. Then perform self-diagnosis for "ABS" wi	
IL0		esuits. Then perform sell-ulayilosis IUL ADS WI	

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U1002 SYSTEM COMM (CAN)

< DTC/CIRCUIT DIAGNOSIS >

NO >> Recheck the terminals for damage or loose connection. Refer to <u>LAN-8</u>, "Precautions for Harness <u>Repair</u>".

3.CHECK APPLICABLE CONTROL UNIT

Check the damage or loose connection of each CAN communication line harness connector terminals.

- Is the inspection result normal?
- YES >> Erase self-diagnosis results. Then perform self-diagnosis for applicable control unit with CON-SULT.
- NO >> Recheck the terminals for damage or loose connection. Refer to <u>LAN-8</u>, "Precautions for Harness <u>Repair"</u>.

Special Repair Requirement

INFOID:000000009718329

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Description

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

Diagnosis Procedure

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

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

	and electric unit ol unit)	_	Voltage (Approx.)
Connector	Terminal		
E36	20	Ground	0 V

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		_	Voltage (Approx.)	
Connector	Terminal		(Approx.)	
E36	20	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

- 1. Turn the ignition switch OFF.
- 2. Check the 10A fuse (#45).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/ R harness connector.

ABS actuator and electric unit (control unit)		IPDN	Continuity	
Connector	Terminal	Connector	Terminal	
E36	20	E10	25	Existed

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-47, "Wiring Diagram IGNITION</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) BATTERY POWER SUPPLY

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

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electric unit (control unit)			Voltage (Approx.)
Connector	Terminal		(Αρριολ.)
E36	1	Ground	Battery voltage
E30	14	Giodila	Dattery voltage

3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Voltage (Approx.)	
Connector	Terminal		(Applox.)	
E36	1	Ground	Battery voltage	
E30	14	Giouna	Ballery vollage	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) BATTERY POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 20A fusible link (#G) and 30A fusible link (#F).
- 3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20A fusible link (#G).
- 4. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30A fusible link (#F).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-6. "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

${f 5.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E36	13	Ground	Existed
⊏30	26	Giouna	LAISted

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000009718332

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9. "ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

- Calibration of decel G sensor: Refer to BRC-10. "CALIBRATION OF DECEL G SENSOR : Description".

• After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

 Calibration of decel G sensor: Refer to <u>BRC-10</u>, "<u>CALIBRATION OF DECEL G SENSOR</u> : <u>Description</u>". After removing/replacing a steering angle sensor, be sure to perform the following procedure. Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION</u> : <u>Description</u>". 	A
 After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure. Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF <u>DECEL G SENSOR</u> : <u>Description</u>". 	В
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PARKING BRAKE SWITCH

Component Function Check

1.CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake pedal. Then check that the brake warning lamp in the combination meter turns ON/ OFF correctly.

Condition	Brake warning lamp illumination status
When the parking brake pedal is operation	ON
When the parking brake pedal is not oper-	OFF

Is the inspection result normal?

YES >> INSPECTION END

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

Diagnosis Procedure

INFOID:000000009718334

1.CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to <u>BRC-92, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace parking brake switch. Refer to <u>PB-6, "Exploded View"</u>.

2. CHECK COMBINATION METER

Check the indication and operation of combination meter are normal. Refer to <u>MWI-34. "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check the combination meter. Refer to <u>MWI-35, "CONSULT Function (METER/M&A)"</u>.

3.CHECK PARKING BRAKE SWITCH CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect parking brake switch harness connector.
- 3. Disconnect combination meter harness connector.
- 4. Check the continuity between parking brake switch harness connector and combination meter harness connector.

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector Terminal		Continuity
E27	1	M34	26	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.

2. Disconnect parking brake switch harness connector.

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

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INFOID:000000009718333

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Parking brake switch			Condition	Continuity	
Connector	Terminal	_	Condition	Continuity	
E27	E27 1 Ground		When the parking brake switch is operated.	Existed	
	I	Ground	When the parking brake switch is not operated.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to <u>PB-6, "Exploded View"</u>.

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VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF SWITCH

Description

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

Component Function Check

1.CHECK VDC OFF SWITCH OPERATION

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

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to diagnosis procedure. Refer to <u>BRC-94, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000009718338

1.CHECK VDC OFF SWITCH

Check the VDC OFF switch. Refer to BRC-95, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace VDC OFF switch. Refer to <u>BRC-131, "Removal and Installation"</u>.

2. CHECK VDC OFF SWITCH HARNESS

- 1. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 2. Disconnect VDC OFF switch harness connector.
- 3. Check the continuity between VDC OFF switch harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector Terminal		
E36	22	M5	1	Existed

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

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E36	22	Ground	Not existed	

5. Check the continuity between VDC OFF switch harness connector and ground.

VDC OFF switch			Continuity	
Connector	Terminal		Continuity	
M5	2	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 3.

- NO >> Repair or replace error-detected parts.
- **3.**CHECK COMBINATION METER
- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect VDC OFF switch harness connector.
- 3. Check the indication and operation of combination meter are normal. Refer to <u>MWI-34</u>, "Diagnosis <u>Description"</u>.

Is the inspection result normal?

YES >> INSPECTION END

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VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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NO >> Repair or replace combination meter.

Component Inspection

1.CHECK VDC OFF SWITCH

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

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

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace VDC OFF switch. Refer to <u>BRC-131, "Removal and Installation"</u>.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G sensor

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING HANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10. "CALIBRATION OF DECEL G SENSOR : Description"</u>.

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000009718341

[VDC/TCS/ABS]

×: ON -: OFF

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

Component Function Check

INFOID:000000009718342

1.CHECK ABS WARNING LAMP OPERATION

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

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-96, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT.

Is the inspection result normal?

YES >> Check the combination meter. Refer to <u>MWI-35, "CONSULT Function (METER/M&A)"</u>.

NO >> Check items displayed by self-diagnosis for "ABS" with CONSULT.

Special Repair Requirement

INFOID:000000009718344

INFOID:000000009718343

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING"
- ANGLE SENSOR NEUTRAL POSITION : Description". - Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

Revision: 2013 August

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

BRAKE WARNING LAMP

Description

[VDC/TCS/ABS]

INFOID:000000009718345

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Condition	Proke warning lamp (Note 1)
Invition quitab OEE	Brake warning lamp (Note 1)
Ignition switch OFF	
For 2 seconds after turning ignition switch ON	× (Note 2)
2 seconds later after turning ignition switch ON (system is normal)	× (Note 2)
ABS function is malfunctioning.	
EBD function is malfunctioning.	X
NOTE: 1: Brake warning lamp will turn ON in case of parking brake oper (when brake fluid is insufficient). 2: After starting the angine, brake warning lamp is turned off	ration (when switch is ON) or of brake fluid level switch operation
2: After starting the engine, brake warning lamp is turned off.	
Component Function Check	INFOID:000000009718340
1. BRAKE WARNING LAMP OPERATION CHECK 1	
Check that the lamp illuminates for approximately 2 sec	onds after the ignition switch is turned ON.
s the inspection result normal?	
YES >> GO TO 2.	
NO >> Proceed to diagnosis procedure. Refer to B	RC-97, "Diagnosis Procedure".
2. BRAKE WARNING LAMP OPERATION CHECK 2	
Check that the brake warning lamp in the combination m	neter turns ON/OFF correctly when operating the park-
ng brake pedal.	
NOTE: Proke warning lown will turn ON in 2000 of parking brok	(a aparation (when awitch is ON) or of broke fluid lovel
Brake warning lamp will turn ON in case of parking brak switch operation (when brake fluid is insufficient).	te operation (when switch is ON) of of brake huid level
s the inspection result normal?	
YES >> INSPECTION END	
NO $>>$ Check the parking brake switch. Refer to <u>BF</u>	<u>RC-92, "Diagnosis Procedure"</u> .
Diagnosis Procedure	INFOID:000000009718347
CHECK PARKING BRAKE SWITCH	
Check that the brake warning lamp in the combination m	neter turns ON/OFF correctly when operating the park-
ng brake pedal.	
NOTE: Brake warning lamp will turn ON in case of parking brak	e operation (when switch is ON) or of brake fluid level
switch operation (when brake fluid is insufficient).	
s the inspection result normal?	
YES >> GO TO 2.	
NO >> Check the parking brake switch. Refer to BI	<u>RC-92, "Diagnosis Procedure"</u> .
2. PERFORM SELF-DIAGNOSIS	
Perform self-diagnosis for "ABS" with CONSULT.	
s the inspection result normal?	
YES >> Check the combination meter. Refer to <u>MW</u> NO >> Check items displayed by self-diagnosis for	
Special Repair Requirement	INF0ID:000000009718348

BRC-97

SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to BRC-10. "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

VDC WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

VDC WARNING LAMP

Description

INFOID:000000009718349

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[VDC/TCS/ABS]

	×: ON <u></u> : Blink –: OFF	В
Condition	VDC warning lamp	
Ignition switch OFF	-	
For 2 seconds after turning ignition switch ON	×	С
2 seconds later after turning ignition switch ON	-	
VDC/TCS is activated while driving.	Δ	D
VDC/TCS function is malfunctioning.	×	
ABS function is malfunctioning.	×	_
EBD function is malfunctioning.	×	E
Component Function Check	INFOID:00000009718350	
		BR
CHECK VDC WARNING LAMP OPERATION		
Check that the lamp illuminates for approximately 2 se	conds after the ignition switch is turned ON.	
s the inspection result normal?		G
YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to	BRC-00 "Diagnosis Procedure"	
5 1	DICC-99, Diagnosis Procedure.	Н
Diagnosis Procedure	INFOID:00000009718351	
1.PERFORM SELF-DIAGNOSIS		I
Perform self-diagnosis for "ABS" with CONSULT.		-
s the inspection result normal?		
YES >> Check the combination meter. Refer to <u>MV</u> NO >> Check items displayed by self-diagnosis for		J
Special Repair Requirement	INFOID:000000009718352	
		Κ
	IEUTRAL POSITION AND CALIBRATION OF DECEL G	
SENSOR		L
	ntrol unit), be sure to perform the following procedure.	
ANGLE SENSOR NEUTRAL POSITION : Descriptio	on: Refer to <u>BRC-9, "ADJUSTMENT OF STEERING</u>	
Calibration of decel G sensor: Refer to BRC-10, "CA	LIBRATION OF DECEL G SENSOR : Description".	N
	ntrol unit), be sure to perform the following procedure.	
Calibration of decel G sensor: Refer to <u>BRC-10, "CA</u> After removing/replacing a steering angle sensor, be		NI
	on: Refer to <u>BRC-9, "ADJUSTMENT OF STEERING</u>	Ν
ANGLE SENSOR NEUTRAL POSITION : Descriptio	<u>n"</u> .	
After removing/replacing a yaw rate/side/decel G ser Calibration of decel G sensor: Refer to <u>BRC-10</u> , "CA		С
Cambration of decer & sensor. Relef to <u>BRC-10, CA</u>	LIDIATION OF DECEL & SENSOR . Description.	

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VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000009718353

[VDC/TCS/ABS]

×: ON -: OFF

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

Component Function Check

INFOID:000000009718354

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

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the VDC OFF switch. Refer to <u>BRC-94, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000009718355

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIR-CUIT

Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-89, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)

- 1. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order with CONSULT.
- 2. Turn the ignition switch OFF.
- 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON, and then changes to "Off".

CAUTION: Never start engine.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

3.CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

1. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order with CONSULT.

2. Check that data monitor displays "On" or "Off" each time when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Check the combination meter. Refer to <u>MWI-34, "Diagnosis Description"</u>.

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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NO >> Check the VDC OFF switch system. Refer to <u>BRC-94, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G SENSOR

- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF DECEL G SENSOR : Description".
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.
- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : <u>Description</u>".
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

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< ECU DIAGNOSIS INFORMATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000009718357

[VDC/TCS/ABS]

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
		Vehicle stopped	0 [km/h (MPH)]
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
		Vehicle stopped	0 [km/h (MPH)]
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
		Vehicle stopped	0 [km/h (MPH)]
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)
		Vehicle stopped	0 [km/h (MPH)]
RR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)
	Brake pedal operation	When brake pedal is depressed	On
STOP LAMP SW		When brake pedal is not depressed	Off
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position	Vehicle running	1 – 6
R POSI SIG	Select shift position	CVT shift position (R)	On
R P03131G		CVT shift position (other R)	Off
N POSI SIG	Select shift position	CVT shift position (N)	On
N POSI 31G		CVT shift position (other N)	Off
		CVT shift position (P)	On
P POSI SIG	Select shift position	CVT shift position (other P)	Off
			Р
		CVT shift position (P, R, N, D, L)	R
SLCT LVR POSI	Select shift position		N D
			L
		Manual mode	##
	VDC OFF switch ON/OFF status	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On
OFF SW		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off

Revision: 2013 August

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[VDC/TCS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel sen-	Vehicle stopped	Approx. 0 d/s	
TAW RATE SEN	sor	Vehicle running	-100 to 100 d/s	
DECEL G-SEN	Decel G detected by yaw rate/side/decel G	Vehicle stopped	normal operation Approx. 0 d/s	
DECEL G-SEN	sensor	Vehicle running		
ACCEL POS SIG	Open/Close condition of throttle valve	Accelerator pedal not depressed (Engine stopped)	0 %	
ACCEL FOS SIG	(Linked with accelerator pedal)	Depress accelerator pedal (Engine stopped)	0 - 100 %	
	Transverse G detected by yaw rate/side/decel	Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	G sensor	Vehicle running	– 16.7 – 16.7 m/s ²	
	Steering angle detected by steering angle	Driving straight	-3.5 - +3.5°	
STR ANGLE SIG		Turn 90 ° to left		
	sensor	Turn 90 ° to right		
		With engine stopped	Approx. 0 m/s ² $-16.7 - 16.7 \text{ m/s}^2$ $-3.5 - +3.5^\circ$ Approx. -90° Approx. $+90^\circ$ 0 [tr/min (rpm)]Almost in accordance with tachometer displayOnOffIApprox. 0 barI0 - 170 barOnConIOnOnOnOnOnIOnOnIOnOnIOnOnIOnIOnIOnIOnIOnIOnIOnIOnIOnIOnIOnIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII <t< td=""></t<>	
ENGINE RPM	With engine running	Engine running	dance with tachome-	
		When brake fluid level switch ON		
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF		
	Brake fluid pressure detected by pressure	With ignition switch ON and brake pedal released		
PRESS SENSOR	sensor	With ignition switch ON and brake pedal depressed	0 – 170 bar	
FR RH IN SOL	Operation status of front RH ABS IN valve	Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
Note 2)		When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
FR RH OUT SOL		Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)	Operation status of front RH ABS OUT valve	When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	$-16.7 - 16.7 \text{ m/s}^2$ $-3.5 - +3.5^\circ$ Approx90 ° Approx. +90 ° 0 [tr/min (rpm)] Almost in accordance with tachometer display On Off Approx. 0 bar 0 - 170 bar 0 - 170 bar On Off Off On Off Off On Off Off On Off	
	LH IN SOL te 2) Operation status of front LH ABS IN valve	Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
(Note 2)		When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
FR LH OUT SOL	OUT SOL Operation status of front LH ABS OUT valve Operation status of front LH ABS OPERATION s	Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)		When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off	
		Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
RR RH IN SOL (Note 2)	Operation status of rear RH ABS IN valve	When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)		

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
RR RH OUT SOL		Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)	Operation status of rear RH ABS OUT valve	When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR LH IN SOL	Operation status of rear LH ABS IN valve	Actuator (ABS IN valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
(Note 2)		When the actuator (ABS IN valve) is not active and actuator relay is active (ignition switch ON)	Off	
RR LH OUT SOL		Actuator (ABS OUT valve) is active ("ACTIVE TEST" in "ABS" with CON- SULT)	On	
(Note 2)	Operation status of rear LH ABS OUT valve	When the actuator (ABS OUT valve) is not active and actuator relay is active (ignition switch ON) Ignition switch ON or engine running	Off	
MOTOR RELAY	Motor and motor relay operation	Ignition switch ON or engine running (ABS operated)	On	
MOTOR RELAT		Ignition switch ON or engine running (ABS not operated)	Off	
ACTUATOR RLY		Vehicle stopped (Engine running)	On	
(Note 2)	Actuator relay operation	Vehicle stopped (Ignition switch ON)	Off	
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	On Off	
	(Note 3)	When ABS warning lamp is OFF		
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On	
	(Note 3)	When VDC OFF indicator lamp is OFF	Off	
		When VDC warning lamp is ON	_ On	
SLIP/VDC LAMP	VDC warning lamp (Note 3)	When VDC warning lamp is blinking	Ön	
		When VDC warning lamp is OFF	Off	
CV1 Operation status of cut valve 1 (CV1)	Actuator (cut valve 1) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On		
	Operation status of cut valve 1 (CV1)	When the actuator (cut valve 1) is not active and actuator relay is active (ignition switch ON)	Off	
	Operation status of cut valve 2 (CV2)	Actuator (cut valve 2) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On	
CV2		When the actuator (cut valve 2) is not active and actuator relay is active (ignition switch ON)	Off	
SV1	Operation status of suction valve 1 (SV1)	Actuator (suction valve 1) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	
		When the actuator (suction valve 1) is not active and actuator relay is active (ignition switch ON)	Off	

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	A
SV2	Operation status of suction valve 2 (SV2)	Actuator (suction valve 2) is active ("AC- TIVE TEST" in "ABS" with CONSULT)	On	В
		When the actuator (suction valve 2) is not active and actuator relay is active (ignition switch ON)	Off	С
EBD SIGNAL	EBD operation	EBD is active	On	
EBD SIGNAL		EBD is inactive Off	Off	
ABS SIGNAL		ABS is active	On	D
ADG SIGINAL	ABS operation	ABS is inactive	normal operation On Off On Off	
TCS SIGNAL	TCS operation	TCS is active	normal operation On Off On Off	Е
ICS SIGNAL		TCS is inactive		
VDC SIGNAL	VDC operation	VDC is active	normal operation On Off Off On Off On	
VDC SIGNAL	VDC operation	VDC is inactive		BR
EBD FAIL SIG	EPD foil acto signal	In EBD fail-safe	On	
EDD FAIL SIG	EBD fail-safe signal	EBD is normal	Off	G
ABS FAIL SIG	APS fail cofe signal	In ABS fail-safe	On	
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	Off	
TCS FAIL SIG		In TCS fail-safe	On Off On Off	Н
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	Off	
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	On	
		VDC is normal	Off	
EBD WARN LAMP	Brake warning lamp (Note 3)	When brake warning lamp is ON	On	
		When brake warning lamp is OFF	Off	J
CRANKING SIG	Crank operation	Crank is active	On Off On Off On Off On Off On Off	
OLAININING SIG	Crank operation	Crank is inactive		LZ.
	ETS fail status	ETS fail	On	K
4WD FAIL REQ		ETS normal	Off	
	Drive axle	2WD model	2WD	L
2WD/4WD		AWD model	4WD	

NOTE:

• 1: Confirm tire pressure is normal.

• 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to <u>BRC-96, "Description"</u>.
- Brake warning lamp: Refer to BRC-97, "Description".
- VDC warning lamp: Refer to BRC-99, "Description".
- VDC OFF indicator lamp: Refer to BRC-100, "Description".

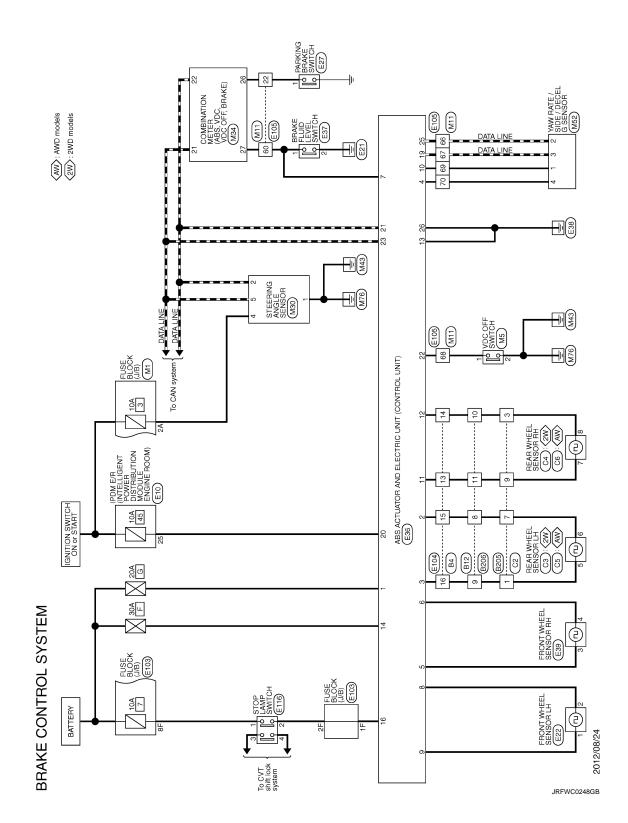
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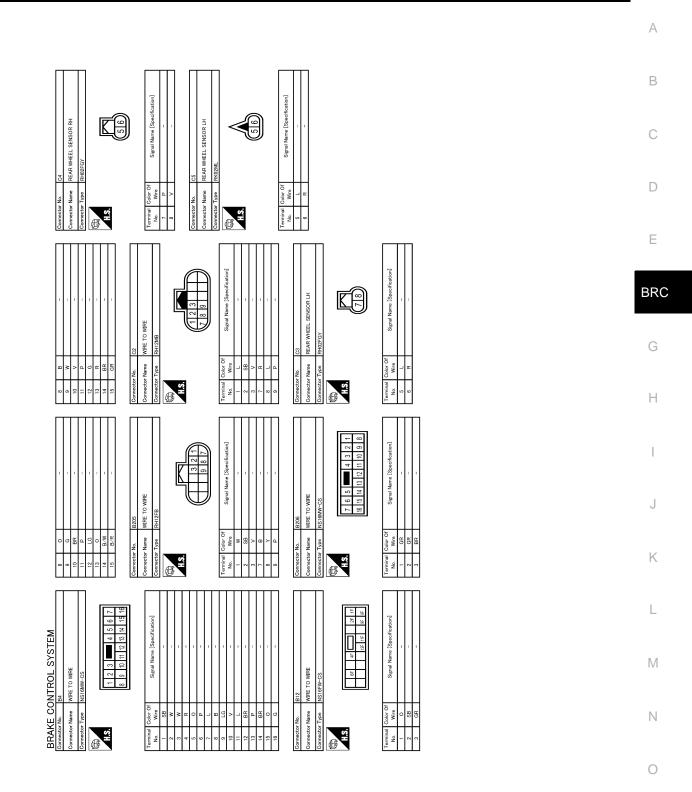
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< ECU DIAGNOSIS INFORMATION >

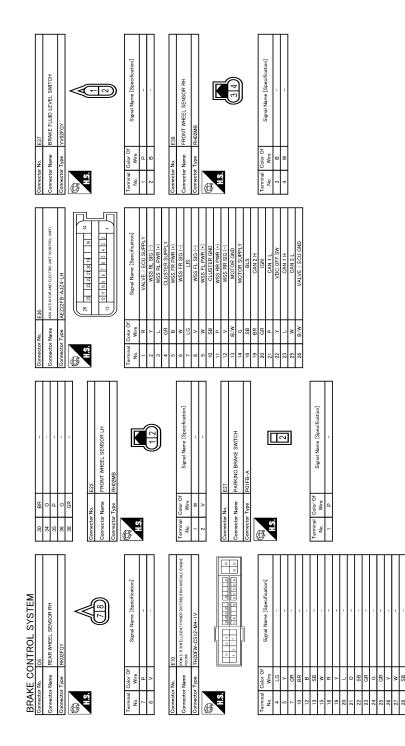
Wiring Diagram -BRAKE CONTROL SYSTEM-

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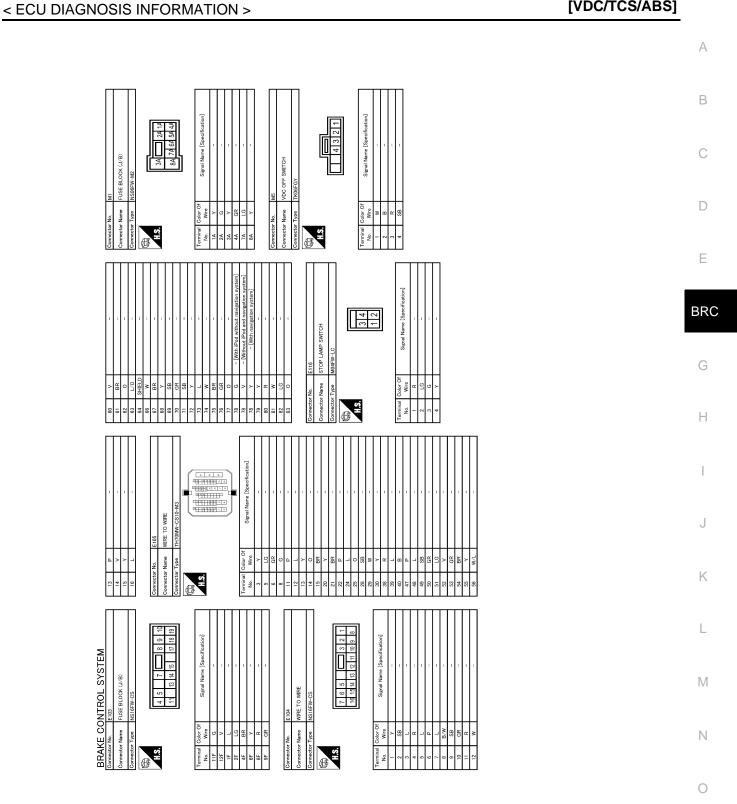


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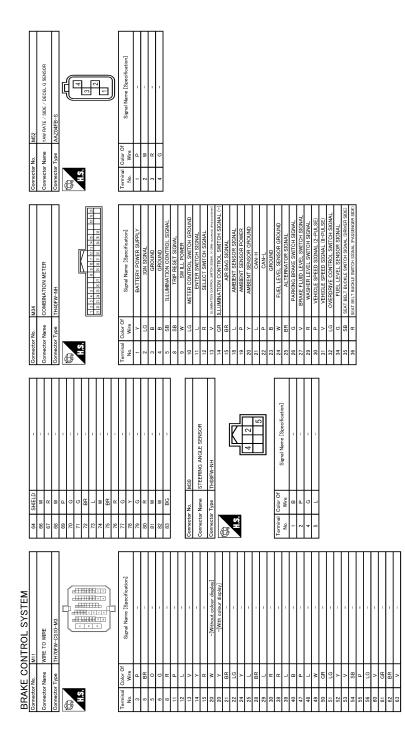
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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) AGNOSIS INFORMATION > [VDC/TCS/ABS]



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ABS, EBD SYSTEM

Fail-Safe

If ABS malfunction electrically, ABS warning lamp and VDC warning lamp will turn ON. If EBD malfunction electrically, brake warning lamp, ABS warning lamp and VDC warning lamp will turn ON. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

BRC-110

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

< ECU DIAGNOSIS INFORMATION >

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC/TCS

If VDC/TCS/ABS system malfunction electrically, VDC warning lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control. CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for "ABS" with CONSULT.

DTC No. Index

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Reference	Items (CONSULT screen terms)	DTC
	RR RH SENSOR-1	C1101
PPC 22 "DTC Logic"	RR LH SENSOR-1	C1102
BRC-33, "DTC Logic"	FR RH SENSOR-1	C1103
	FR LH SENSOR-1	C1104
	RR RH SENSOR-2	C1105
	RR LH SENSOR-2	C1106
BRC-37, "DTC Logic"	FR RH SENSOR-2	C1107
	FR LH SENSOR-2	C1108
BRC-42, "DTC Logic"	BATTERY VOLTAGE [ABNORMAL]	C1109
BRC-44, "DTC Logic"	CONTROLLER FAILURE	C1110
BRC-45, "DTC Logic"	PUMP MOTOR	C1111
BRC-47, "DTC Logic"	G SENSOR	C1113
BRC-50, "DTC Logic"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
BRC-56, "DTC Logic"	STOP LAMP SW	C1116
BRC-58, "DTC Logic"	FR LH IN ABS SOL	C1120
BRC-60, "DTC Logic"	FR LH OUT ABS SOL	C1121
BRC-58, "DTC Logic"	FR RH IN ABS SOL	C1122
BRC-60, "DTC Logic"	FR RH OUT ABS SOL	C1123
BRC-58, "DTC Logic"	RR LH IN ABS SOL	C1124
BRC-60, "DTC Logic"	RR LH OUT ABS SOL	C1125
BRC-58, "DTC Logic"	RR RH IN ABS SOL	C1126
BRC-60, "DTC Logic"	RR RH OUT ABS SOL	C1127
BRC-62, "DTC Logic"	ENGINE SIGNAL 1	C1130
BRC-64, "DTC Logic"	ACTUATOR RLY	C1140
BRC-66, "DTC Logic"	PRESS SEN CIRCUIT	C1142
BRC-68, "DTC Logic"	ST ANG SEN CIRCUIT	C1143
BRC-71, "DTC Logic"	ST ANG SEN SIGNAL	C1144
RPC_47 "DTC Logio"	YAW RATE SENSOR	C1145
BRC-47, "DTC Logic"	SIDE G-SEN CIRCUIT	C1146
BRC-73, "DTC Logic"	BR FLUID LEVEL LOW	C1155
BRC-77, "DTC Logic"	DECEL G SEN SET	C1160
BRC-79, "DTC Logic"	SIDE G SEN SET	C1161

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference
C1162	PRESS SEN SET	BRC-80, "DTC Logic"
C1164	CV1	BRC-81, "DTC Logic"
C1165	CV2	
C1166	SV1	BRC-83, "DTC Logic"
C1167	SV2	
U1000	CAN COMM CIRCUIT	BRC-85, "DTC Logic"
U1002	SYSTEM COMM (CAN)	BRC-87, "DTC Logic"

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]
SYMPTOM DIAGNOSIS
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY
Diagnosis Procedure
1.CHECK START
Check the front and rear brake force distribution using a brake tester. Refer to <u>BR-53, "General Specifica-</u> tions".
Is the inspection result normal?
YES >> GO TO 2. NO >> Check the brake system.
2.CHECK FRONT AND REAR AXLE
Make sure that there is no excessive play in the front and rear axles. • Front - 2WD: Refer to <u>FAX-9, "Inspection"</u> . - AWD: Refer to FAX-36, "Inspection"
 AWD: Refer to <u>FAX-36, "Inspection"</u>. Rear
 2WD: Refer to <u>RAX-6, "Inspection"</u>. AWD: Refer to <u>RAX-13, "Inspection"</u>.
Is the inspection result normal?
YES >> GO TO 3. NO >> Repair or replace error-detected parts.
3. CHECK WHEEL SENSOR AND SENSOR ROTOR
Check the following.
 Wheel sensor installation for damage. Front wheel sensor: Refer to <u>BRC-123, "FRONT WHEEL SENSOR : Exploded View"</u>.
 Rear wheel sensor: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>.
 Wheel sensor connector connection. Wheel sensor harness inspection.
Sensor rotor installation for damage.
 Front sensor rotor: Refer to <u>BRC-126, "FRONT SENSOR ROTOR : Exploded View"</u>. Rear sensor rotor: Refer to <u>BRC-126, "REAR SENSOR ROTOR : Exploded View"</u>.
Is the inspection result normal?
 YES >> GO TO 4. NO >> Replace wheel sensor or sensor rotor. • Front wheel sensor: Refer to BRC-123, "FRONT WHEEL SENSOR : Exploded View".
 Rear wheel sensor: Refer to <u>BRC-124, "REAR WHEEL SENSOR : Exploded View"</u>. Front sensor rotor: Refer to <u>BRC-126, "FRONT SENSOR ROTOR : Exploded View"</u>.
Rear sensor rotor: Refer to <u>BRC-126, "REAR SENSOR ROTOR : Exploded View"</u> . 4. CHECK ABS WARNING LAMP DISPLAY
Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the inspection result normal?
YES >> Normal
NO >> Perform self-diagnosis for "ABS" with CONSULT.

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

1.CHECK BRAKE PEDAL, BRAKE BOOSTER, BRAKE MASTER CYLINDER

Check the brake pedal, brake booster, brake master cylinder mounting condition.

- Brake pedal: Refer to <u>BR-20, "Exploded View"</u>.
- Brake booster: Refer to <u>BR-30, "Exploded View"</u>.
- Brake master cylinder: Refer to <u>BR-27, "Exploded View"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK BRAKE PEDAL STROKE

Check the brake pedal stroke. Refer to BR-9, "Inspection and Adjustment".

Is the stroke too large?

YES >> Bleed air from brake tube and hose. Refer to <u>BR-13, "Bleeding Brake System"</u>.

NO >> GO TO 3.

3. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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[VDC/TCS/ABS]

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

[VDC/TCS/ABS]

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ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

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[VDC/TCS/ABS]

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

YES >> Normal

NO >> Perform self-diagnosis for "ABS" with CONSULT.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS] PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS	
Diagnosis Procedure	A
 CAUTION: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal. When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] 	E
 When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] SYMPTOM CHECK 1 	
Check that there are pedal vibrations when the engine is started. <u>Do vibrations occur?</u> YES >> GO TO 2.	E
NO >> Inspect the brake pedal. Refer to <u>BR-21, "Inspection and Adjustment"</u> . 2.SYMPTOM CHECK 2	Bł
Check that there are ABS operation noises when the engine is started. <u>Do the operation noises occur?</u> YES >> GO TO 3. NO >> Perform self-diagnosis for "ABS" with CONSULT.	(
3. SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated.	ŀ
<u>Do symptoms occur?</u> YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.	I
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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

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[VDC/TCS/ABS]

1.SYMPTOM CHECK

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

Is the inspection result normal?

YES >> Normal.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

Perform self-diagnosis for "ABS" with CONSULT.

Are self-diagnosis results indicated?

YES >> Check the corresponding items, make repairs, and perform self-diagnosis for "ABS" with CON-SULT.

NO >> GO TO 3.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

3. Check the terminal for deformation, disconnection, looseness, etc.

4. Securely connect harness connectors and perform self-diagnosis for "ABS" with CONSULT.

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.PERFORM SELF-DIAGNOSIS (2)

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" with CONSULT.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-127, "Exploded View"</u>.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

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[VDC/TCS/ABS]

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		С
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condi- tion due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration o sharp turn.		D
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.	E
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficien varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	BR
The ABS warning lamp and VDC warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.		G
VDC may not operate normally or the ABS warning lamp and VDC warning lamp may illuminate, when run ning on a special road that is extremely slanted (e.g. bank in a circuit course).	is no malfunction. At	Н
A malfunction may occur in the yaw rate/side G sensor system, when the vehicle turns sharply, such as du ing a spin turn, axle turn, or drift driving, while the VDC function is off (VDC warning lamp illuminated).	that time, erase the self- diagnosis memory.	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function be- fore performing an in- spection on a chassis	I
	dynamometer.)	J

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< PRECAUTION > PRECAUTION PRECAUTIONS FOR USA AND CANADA

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

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.

FOR MEXICO

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

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

PRECAUTIONS

< PRECAUTION >

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the А ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious iniury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

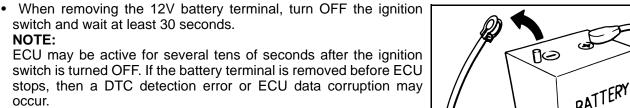
Precaution for Procedure without Cowl Top Cover

Precautions for Removing of Battery Terminal

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

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occur. · For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch. NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

 After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC. NOTE:

The removal of 12V battery may cause a DTC detection error.

Precaution for Brake System

switch and wait at least 30 seconds.

WARNING:

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NOTE:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun. CAUTION:

- Brake fluid use refer to MA-15, "FOR NORTH AMERICA : Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.

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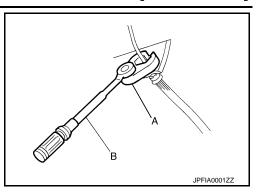
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PRECAUTIONS

< PRECAUTION >

- Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).
- Always confirm the specified tightening torque when installing the brake pipes.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.

Precaution for Brake Control



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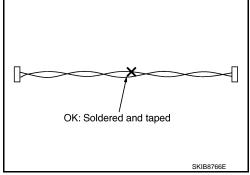
[VDC/TCS/ABS]

- Always perform a pre-driving check to drive the vehicle.
- Always check speed and safety while driving the vehicle.
- To operate CONSULT while driving, more than one person is required to be in the vehicle to avoid interference to driving and ensure safety.
- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check the brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- VDC system may not operate normally or a VDC warning lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

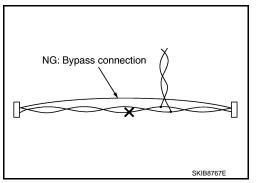
Precaution for Harness Repair

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• Solder the repair part, and wrap it with tape. [Twisted wire fray must be 110 mm (4.33 in) or less.]



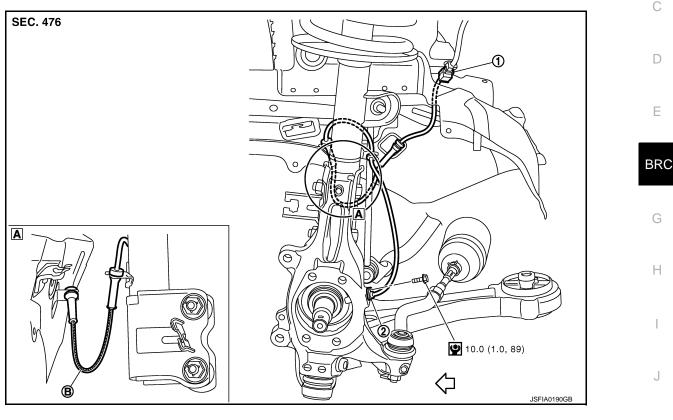
• Never bypass the repair point with wire. (If it is bypassed, the turnout point cannot be separated and the twisted wire characteristics are lost.)



< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View



1. Front LH wheel sensor harness con- 2. Front LH wheel sensor nector

- B. Color line (slant line)
- C : Vehicle front

Refer to <u>GI-4, "Components"</u> for symbol in the figure.

NOTE:

The above figure (front side) shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR : Removal and Installation

REMOVAL

Be careful with the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.
- When you see the harness of the wheel sensor from the front side of the vehicle ensure that the color lines (B) are not twisted.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques.

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WHEEL SENSOR

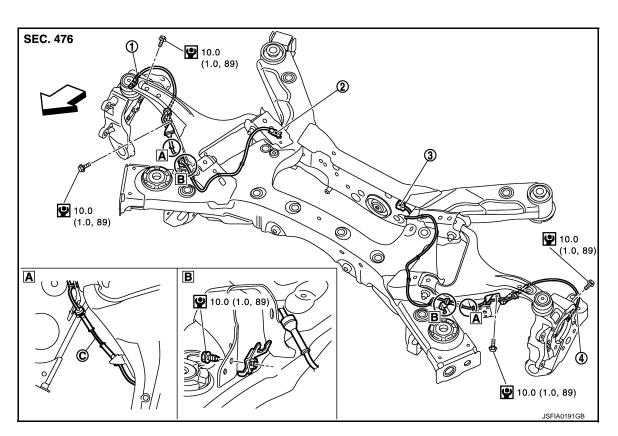
< REMOVAL AND INSTALLATION >

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

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- 1. Rear RH wheel sensor
- 2. Rear RH wheel sensor harness con- 3. Rear LH wheel sensor connector nector
- 4. Rear LH wheel sensor
 - AWD models only C. Color line (slant line)

∠ : Vehicle front

Refer to <u>GI-4, "Components"</u> for symbol in the figure.

REAR WHEEL SENSOR : Removal and Installation

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REMOVAL

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Be careful with the following when removing sensor.

CAUTION:

- Never twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques.

• When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.

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WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

• When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

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SENSOR ROTOR

< REMOVAL AND INSTALLATION >

SENSOR ROTOR FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Exploded View

Refer to FAX-11, "Exploded View" (2WD), FAX-38, "Exploded View" (AWD).

FRONT SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-11, "Removal and Installation" (2WD), FAX-38, "Removal and Installation" (AWD).

INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to <u>FAX-11. "Removal and Installation"</u> (2WD), <u>FAX-38. "Removal and Installation"</u> (AWD). **REAR SENSOR ROTOR**

REAR SENSOR ROTOR : Exploded View

Refer to <u>RAX-7. "Exploded View"</u> (2WD), <u>RAX-15. "Exploded View"</u> (AWD).

REAR SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to RAX-7, "Removal and Installation" (2WD), RAX-15, "Removal and Installation" (AWD).

INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to RAX-7, "Removal and Installation" (2WD), RAX-15, "Removal and Installation" (AWD).

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

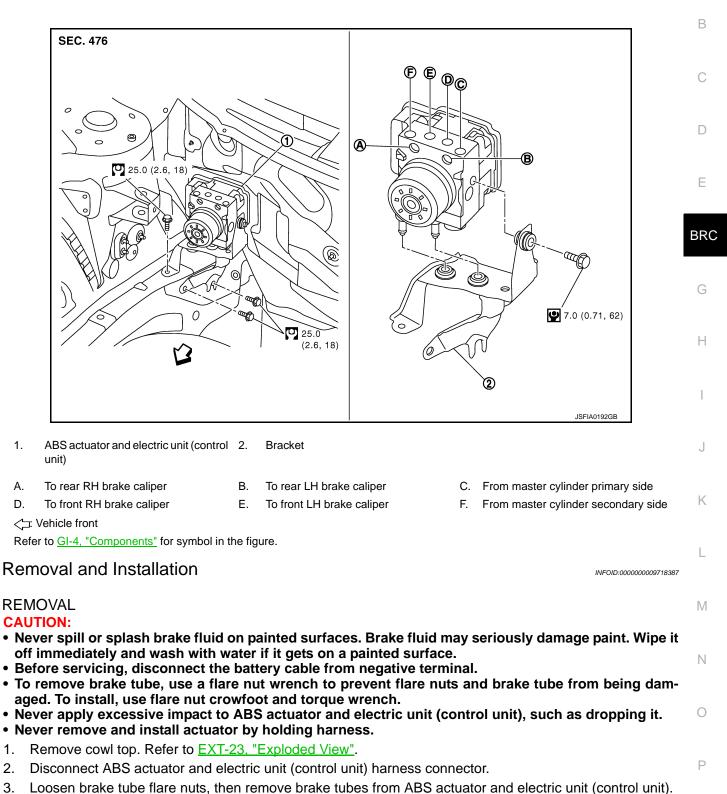
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

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[VDC/TCS/ABS]



- 3. Remove ABS actuator and electric unit (control unit) bracket mounting bolts. 4.
- 5. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

1.

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

Before servicing, disconnect the battery cable from negative terminal.

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

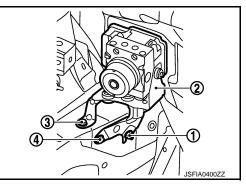
< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-13, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.
- After removing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".
- After replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".

- Calibration of decel G sensor: Refer to <u>BRC-10</u>, "<u>CALIBRATION OF DECEL G SENSOR</u> : <u>Description</u>". Install ABS actuator and electric unit (control unit) as per the following steps.

- 1. Temporarily tighten mounting bolt (1) because the bracket (2) is temporarily being hold.
- 2. Tighten mounting bolt (3) while holding the bracket.
- 3. Tighten mounting bolts to the specified torque in the order of (4), (1).

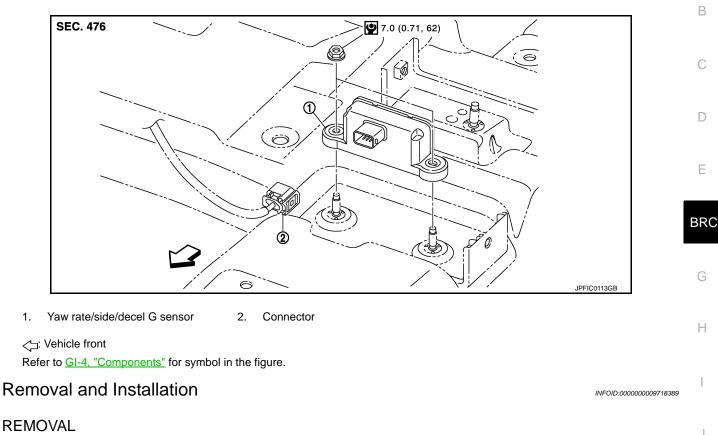


< REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

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CAUTION:

Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/ decel G sensor is sensitive to the impact.

- 1. Remove center console assembly. Refer to IP-22. "Exploded View".
- Remove rear ventilator duct. Refer to <u>VTL-59</u>, "REAR VENTILATOR DUCT 2 : Exploded View" (without 7 inch display), <u>VTL-123</u>, "REAR VENTILATOR DUCT 2 : Exploded View" (with 7 inch display).
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Remove mounting nuts.
- 5. Remove yaw rate/side/decel G sensor.

INSTALLATION

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

- Never drop or strike yaw rate/side/decel G sensor, or never use power tool etc., because yaw rate/side/decel G sensor is sensitive to the impact.
- After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the calibration of decel G sensor. Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Description"</u>.

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STEERING ANGLE SENSOR

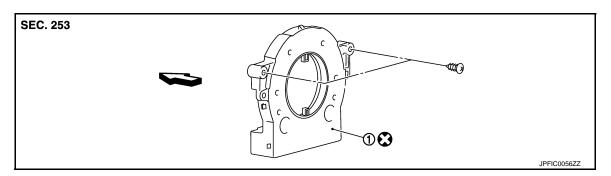
< REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR

Exploded View

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[VDC/TCS/ABS]



1. Steering angle sensor

C: Vehicle front

Removal and Installation

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REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-15, "Exploded View"</u>.
- 2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

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

- Never reuse steering angle sensor.
- After removing/replacing a steering angle sensor, be sure to perform the adjustment of steering angle sensor neutral position. Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : <u>Description</u>".

< REMOVAL AND INSTALLATION >

VDC OFF SWITCH		٨
Removal and Installation	INFOID:000000009718392	A
 REMOVAL Remove lower instrument panel LH. Refer to <u>IP-14, "Exploded View"</u>. Remove VDC OFF switch. 		В
INSTALLATION Installation is the reverse order of removal.		С
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