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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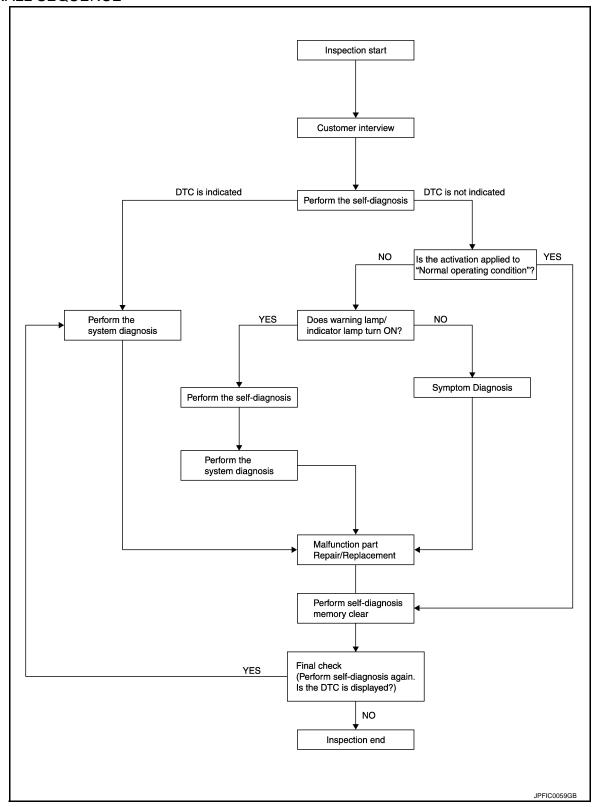
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DIAGNOSIS AND REPAIR WORK FLOW

< 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.

DIACNOSIS AND DEDAID WORK ELOW

DIAGNOSIS AND REPAIR WORK FLOW	
< BASIC INSPECTION > [VDC/TCS/AB	3S]
2.PERFORM THE SELF-DIAGNOSIS	
Perform self-diagnosis for "ABS" with CONSULT-III.	
Is there any DTC displayed?	
YES >> GO TO 3. NO >> GO TO 4.	
3. PERFORM THE SYSTEM DIAGNOSIS	
Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT-III. Refer to <u>BRC-96, "D</u> <u>No. Index"</u> .	TC
>> 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-1</u> "Description".	<u>04,</u>
Is the symptom a normal operation?	
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.	<u> </u>
ABS warning lamp: Refer to <u>BRC-82, "Description"</u> .	
 Brake warning lamp: Refer to <u>BRC-83, "Description"</u>. VDC OFF indicator lamp: Refer to <u>BRC-85, "Description"</u>. 	
 SLIP indicator lamp: Refer to <u>BRC-86, "Description"</u>. 	
Is ON/OFF timing normal?	
YES >> GO TO 6. NO >> GO TO 2.	
6.PERFORM THE DIAGNOSIS BY SYMPTOM	
Perform the diagnosis applicable to the symptom for "ABS" with CONSULT-III.	
>> GO TO 7.	
I.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-III.	
>> 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:000000005517249

[VDC/TCS/ABS]

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

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INSPECTION AND ADJUSTMENT

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:000000005532112

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 BRC-9, "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".

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

INFOID:000000005517250

×: 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:00000000551725

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

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

1.ALIGN THE VEHICLE STATUS

Stop 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-III.
- Select "START".
 CAUTION: Never touch steering wheel while adjusting steering angle sensor.
- After approximately 10 seconds, select "END".
 NOTE:
 After approximately 60 seconds, it onds automatically
- 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-III, and check 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-III. Refer to <u>BRC-28, "CONSULT-III 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:000000005517252

[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:000000005517253

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

(Calibration cannot be done without CONSULT-III.)

Perform the G sensor calibration only with the vehicle parked on level surface.

1.ALIGN THE VEHICLE STATUS

INSPECTION AND ADJUSTMENT

[VDC/TCS/ABS]

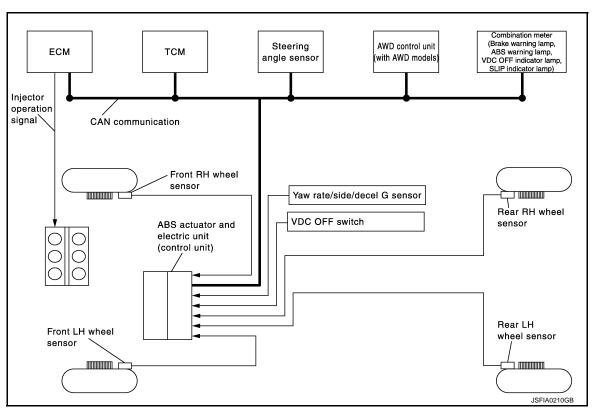
< BASIC INSPECTION >	[VDC/TCS/ABS]
Stop the vehicle with front wheels in straight-ahead position.	Ą
 Keep all tires inflated to correct pressures. Adjust the tire pressure to Check that there is specified-load in vehicle other than the driver (context) 	the specified pressure value.
driver's position).	E
>> GO TO 2.	
2.PERFORM THE CALIBRATION OF DECEL G SENSOR	C
 Select "ABS", "WORK SUPPORT" and "DECEL G SEN CALIBRATION" i Select "START". 	n order with CONSULT-III.
 After approximately 10 seconds, select "END". NOTE: 	C
After approximately 60 seconds, it ends automatically.	
 Turn the ignition switch OFF, then turn it ON again. CAUTION: 	E
Be sure to perform above operation.	
>> GO TO 3.	BF
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 C sensor signal. 	GONSULT-III, and check decel G
DECEL G-SEN : ±0.08 G	H
Is the yaw rate/side/decel G 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-III. Refer to BRC	C-28, "CONSULT-III Function".
Are the memories erased? YES >> INSPECTION END	
YES >> INSPECTION END NO >> Check the items indicated by the self-diagnosis.	k
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< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION VDC

System Diagram

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System Description

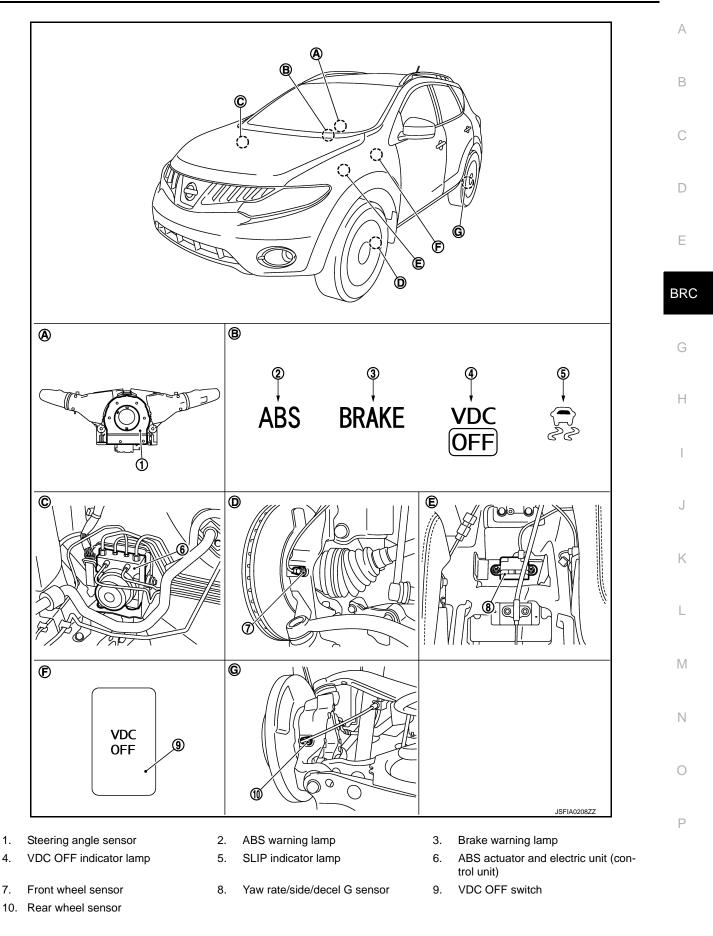
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- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected by the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under steering/ over steering) is determined by 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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

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FOR USA

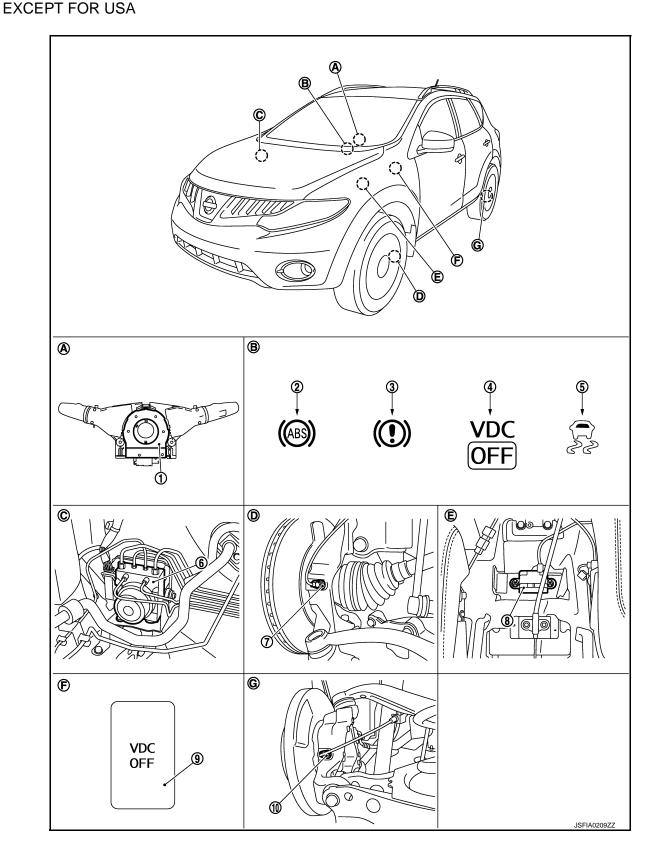


VDC

- 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]



Revision: 2009 September

[VDC/TCS/ABS]

1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp SLIP indicator lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	A
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:000000005517257

Compo	Reference	F	
	Pump	DDC 42 "Description"	L
ABS actuator and electric unit (control unit)	Motor	BRC-42, "Description"	
	Actuator relay (Main relay)	BRC-58, "Description"	BRC
	Solenoid valve	BRC-52, "Description"	
	VDC switch-over valve (CV1, CV2)	BRC-71, "Description"	
	VDC switch-over valve (SV1, SV2)	BRC-73, "Description"	G
Wheel sensor	BRC-33, "Description"		
Yaw rate/side/decel G sensor	BRC-44, "Description"	Н	
Steering angle sensor	BRC-62, "Description"		
VDC OFF switch	BRC-80, "Description"		
ABS warning lamp	BRC-82, "Description"	_	
Brake warning lamp	BRC-83, "Description"		
VDC OFF indicator lamp	BRC-85, "Description"	J	
SLIP indicator lamp	BRC-86, "Description"		

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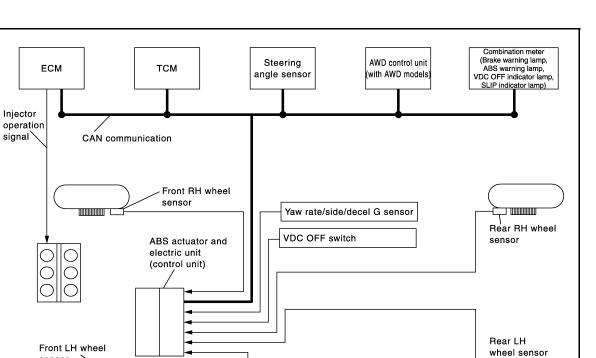
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TCS

System Diagram

INFOID:000000005517258

[VDC/TCS/ABS]



System Description

sensor

INFOID:000000005517259

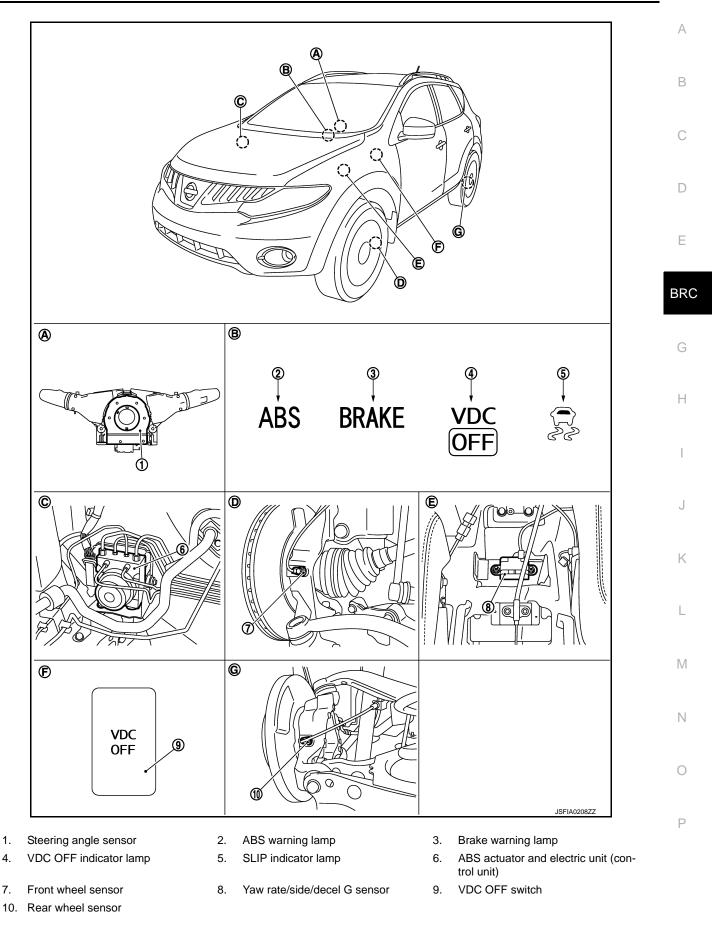
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- The wheel spin of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from the four wheels, so if wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine 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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:000000005517260

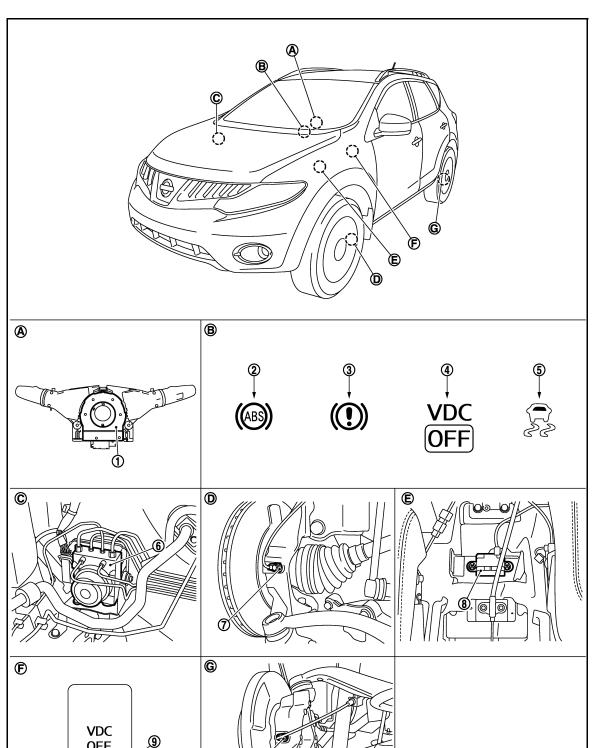
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TCS

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

- Combination meter Β. Ε. Under center console
- C. Engine room (right side)
- F. Instrument driver lower panel



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[VDC/TCS/ABS]

1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp SLIP indicator lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	A
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:000000005517261

Compo	Reference	F	
	Pump	PPC 42 "Description"	
	Motor	BRC-42, "Description"	
APS actuator and algoritic unit (control unit)	Actuator relay (Main relay)	BRC-58, "Description"	BR
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-52, "Description"	
	VDC switch-over valve (CV1, CV2)	BRC-71, "Description"	
	VDC switch-over valve (SV1, SV2)	BRC-73, "Description"	G
Wheel sensor	BRC-33, "Description"		
Yaw rate/side/decel G sensor	BRC-44, "Description"	F	
Steering angle sensor	BRC-62, "Description"		
VDC OFF switch		BRC-80, "Description"	
ABS warning lamp	BRC-82, "Description"	_	
Brake warning lamp	BRC-83, "Description"		
VDC OFF indicator lamp	BRC-85, "Description"	J	
SLIP indicator lamp	BRC-86, "Description"		

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ABS

System Diagram

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Combination meter (Brake warning lamp, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp) AWD control unit Steering ECM тсм angle sensor (with AWD models Injector operation signal CAN communication Front RH wheel sensor Yaw rate/side/decel G sensor Rear RH wheel VDC OFF switch sensor ABS actuator and electric unit (control unit) Rear LH Front LH wheel wheel sensor sensor JSFIA0210GB

ABS

System Description

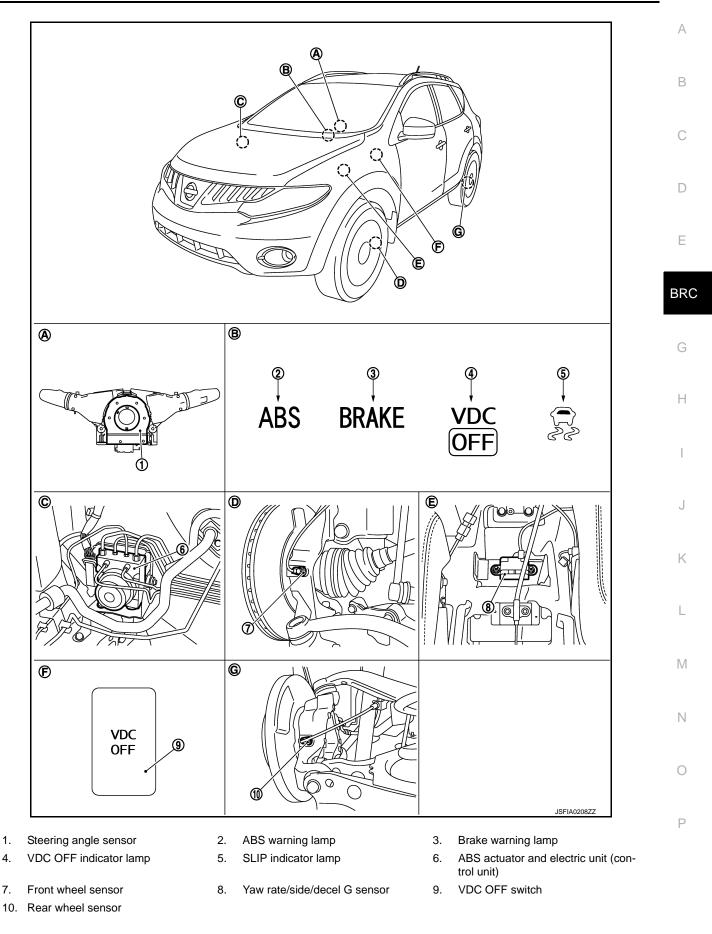
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- The Anti-Lock Braking System detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- Electrical system diagnosis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

Component Parts Location

INFOID:000000005517264

FOR USA



ABS

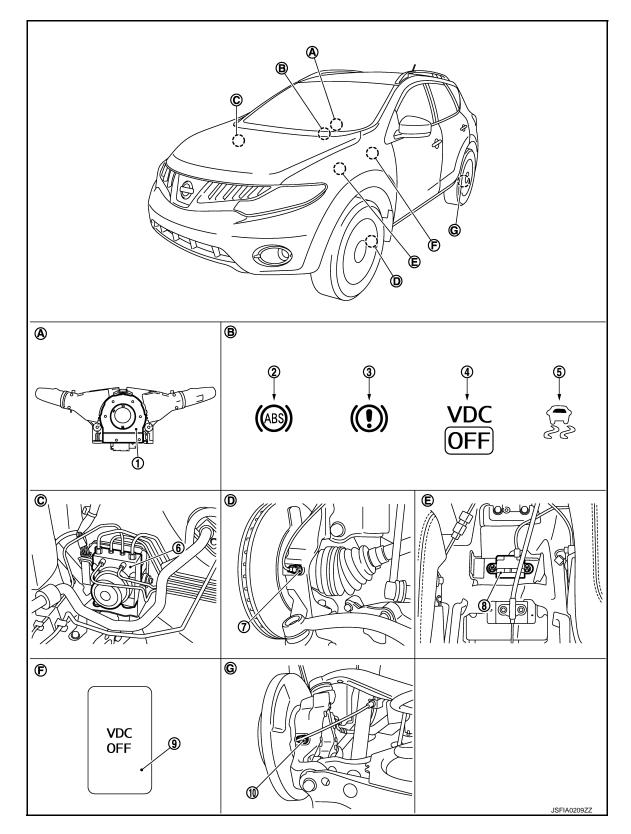
2010 Murano

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

B. Combination meterE. Under center console

ABS

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



1. 4.	Steering angle sensor VDC OFF indicator lamp	2. 5.	ABS warning lamp SLIP indicator 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

ABS

G. Rear axle

Component Description

INFOID:000000005517265

Compo	Reference	F	
	Pump	BRC-42, "Description"	
	Motor	BRC-42, Description	
APS actuator and algoritic unit (control unit)	Actuator relay (Main relay)	BRC-58, "Description"	B
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-52, "Description"	
	VDC switch-over valve (CV1, CV2)	BRC-71, "Description"	G
	VDC switch-over valve (SV1, SV2)	BRC-73, "Description"	
Wheel sensor	BRC-33, "Description"		
Yaw rate/side/decel G sensor	BRC-44, "Description"		
Steering angle sensor	BRC-62, "Description"		
VDC OFF switch		BRC-80, "Description"	
ABS warning lamp	BRC-82, "Description"		
Brake warning lamp	BRC-83, "Description"		
VDC OFF indicator lamp	BRC-85, "Description"	,	
SLIP indicator lamp	BRC-86, "Description"		

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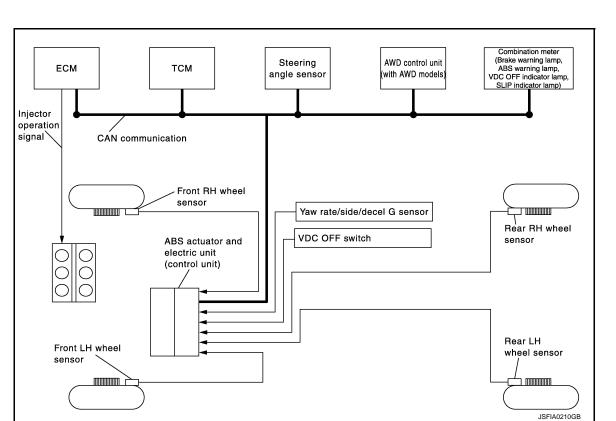
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System Diagram

INFOID:000000005517266

[VDC/TCS/ABS]



System Description

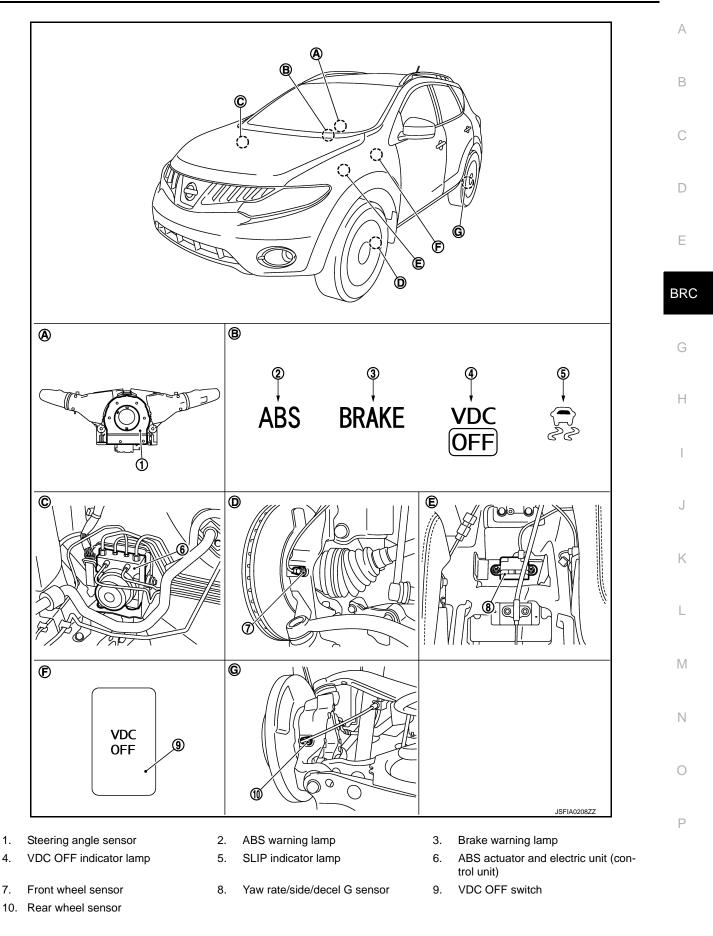
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- Electronic Brake force Distribution detects subtle slippages between front and rear wheels during braking, and it improves handling stability by electronically controlling brake fluid pressure which results in reduced rear wheel slippage.
- Electrical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

Component Parts Location

INFOID:000000005517268

FOR USA



EBD

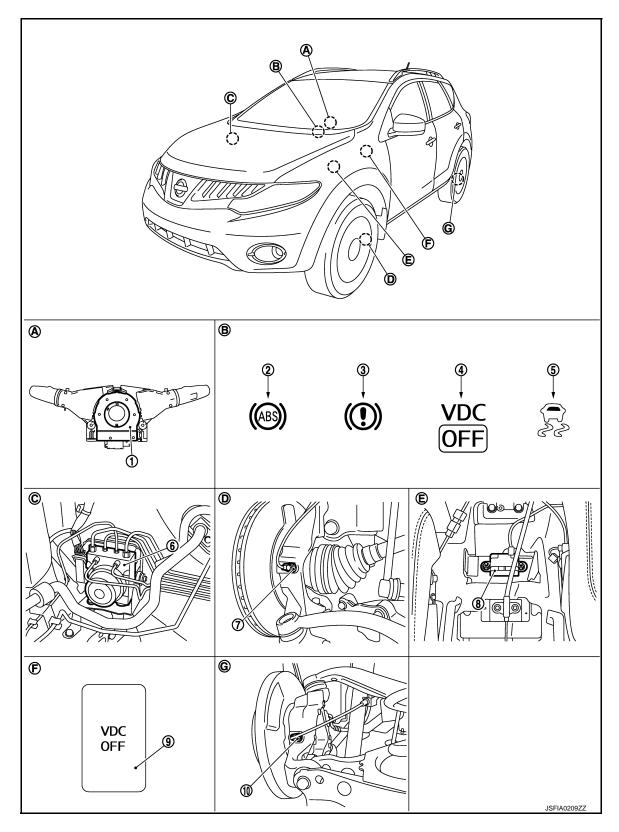
- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

B. Combination meterE. Under center console

EBD

- 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 SLIP indicator lamp	3. 6.	Brake warning lamp ABS actuator and electric unit (con- trol unit)	A	k
7. 10.	Front wheel sensor Rear wheel sensor	8.	Yaw rate/side/decel G sensor	9.	VDC OFF switch	В	5
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	1. P

EBD

G. Rear axle

Component Description

INFOID:000000005517269

Compo	Reference	F	
	Pump	DDC 42 "Description"	
	Motor	BRC-42, "Description"	
ADC actuator and electric unit (control unit)	Actuator relay (Main relay)	BRC-58, "Description"	BRC
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-52, "Description"	
	VDC switch-over valve (CV1, CV2)	BRC-71, "Description"	0
	VDC switch-over valve (SV1, SV2)	BRC-73, "Description"	G
Wheel sensor	BRC-33, "Description"		
Yaw rate/side/decel G sensor	BRC-44, "Description"	Н	
Steering angle sensor	BRC-62, "Description"		
VDC OFF switch		BRC-80, "Description"	
ABS warning lamp	BRC-82, "Description"		
Brake warning lamp	BRC-83, "Description"		
VDC OFF indicator lamp	BRC-85, "Description"	J	
SLIP indicator lamp	BRC-86, "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-III Function

INFOID:000000005517270

FUNCTION

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

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

WORK SUPPORT

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

SELF DIAGNOSTIC RESULT

Operation Procedure

Before performing the self-diagnosis for "ABS" with CONSULT-III, 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-96, "DTC No. Index"</u>.

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT-III, 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 OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

CAUTION:

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

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

DATA MONITOR

Display Item List

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT M	ONITOR ITEM	×: 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)]	×	×	wheel speed
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 accelerator 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

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT M	SELECT MONITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
FR RH IN SOL (On/Off)	▼	×	
FR RH OUT SOL (On/Off)	▼	×	
FR LH IN SOL (On/Off)	▼	×	
FR LH OUT SOL (On/Off)	•	×	Operation status of each solenoid valve
RR RH IN SOL (On/Off)	▼	×	
RR RH OUT SOL (On/Off)	▼	×	
RR LH IN SOL (On/Off)	▼	×	
RR LH OUT SOL (On/Off)	•	×	
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 LAMP (On/Off)	•	×	SLIP indicator lamp
CV1 (On/Off)	▼	•	Cut valve 1 monitor
CV2 (On/Off)	▼	▼	Cut valve 2 monitor
SV1 (On/Off)	▼	▼	Suction valve 1 monitor
SV2 (On/Off)	▼	•	Suction valve 2 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

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

< SYSTEM DESCRIPTION >

	SELECT MONITOR ITEM			^
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	A
EBD WARN LAMP (On/Off)	▼	•	Brake warning lamp	В
CRANKING SIG (On/Off)	▼	•	Crank operation	
4WD FAIL REQ (On/Off)	▼	▼	AWD fail-safe signal status	С
2WD/4WD (2WD/4WD)	•	•	Distinguish 2WD and AWD	D

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:

- · 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 OFF indicator lamp, SLIP indicator lamp and brake warning lamp is ON.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are ON during active test.

NOTE:

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

Test Item

ABS SOLENOID VALVE

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

Test item	Diantovitam	Display			
Test item	Display item	Up	Кеер	Down	•
FR RH SOL	FR RH IN SOL	Off	On	On	L
	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On	On	
	FR LH OUT SOL	Off	Off	On*	N
RR RH SOL	RR RH IN SOL	Off	On	On	-
	RR RH OUT SOL	Off	Off	On*	N
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 SOLENOID VALVE (ACT)

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

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[VDC/TCS/ABS]

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Test item	Display item		Display	
iest item	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
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	SV1	Off	On*	Off

*: 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-III. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Display		
	Display item	On	Off	
ABS MOTOR	MOTOR RELAY	On	Off	
	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.

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

DTC	Display item	Malfunction detected condition	Possible cause		
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open or short circuit.			
C1102	Current signal from sensor is outside limits.				
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) Sensor rotor 		
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.			
DTC CC	NFIRMATION PROCE	DURE	·		
1.DTC	REPRODUCTION PROCE	EDURE			
		vehicle at 30 km/h (19 MPH) or more for approx	ximately 1 minute.		
	orm self-diagnosis for "AB C1101", "C1102", "C1103"				
		procedure. Refer to <u>BRC-33, "Diagnosis Proced</u>	lure".		
NO	>> INSPECTION END				
Diagno	sis Procedure		INFOID:000000005517273		
CAUTIO Never cl 1.CHEC	neck between wheel sen	sor harness connector terminals.			
Check ai	r pressure, wear, and size	e. Refer to WT-60, "Tire Air Pressure".			
	pection result normal?				
	>> GO TO 2. >> Repair or replace erro	r-detected parts.			
2.снес	K WHEEL SENSOR AND	D SENSOR ROTOR			
		, disconnection or looseness.			
	sensor rotor for damage.				
	spection result normal? >> GO TO 3.				
-	>> Repair wheel sensor	mount or replace wheel sensor or replace sensor	sor rotor.		
	 Front wheel sensor: Rear wheel sensor: 	Refer to <u>BRC-110, "FRONT WHEEL SENSOR</u> Refer to BRC-111, "REAR WHEEL SENSOR : I	<u>: Exploded View"</u> . Exploded View"		
	 Front sensor rotor: F 	Refer to BRC-112, "FRONT SENSOR ROTOR :	Exploded View".		
0		efer to <u>BRC-112, "REAR SENSOR ROTOR : E</u>	<u>xploded View"</u> .		
J.CHEC	CK CONNECTOR				
	the ignition switch OFF.				
2. Disc	onnect ABS actuator and	electric unit (control unit) connector.			

BRC-33

- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check terminal to see if it is deformed, disconnected, loose, etc.

[VDC/TCS/ABS]

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK WHEEL SENSOR HARNESS

 Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
Connector	Terminal	Connector		Terminal	Continuity
	6	E39 (Front	RH)	4	
	8	E22 (Front	LH)	2	
E36	12	C4 (2WD models) C6 (AWD models)	(Rear RH)	8	Existed
	2	C3 (2WD models) C5 (AWD models)	(Rear LH)	6	

Measurement termina	I for power supply circuit				
ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
Connector	Terminal	Connector		Terminal	Continuity
	5	E39 (Front	RH)	3	
	9	E22 (Front	LH)	1	
E36	11	C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Existed
	3	C3 (2WD models) C5 (AWD models)	(Rear LH)	5	

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

ABS actuator and electric unit (control unit)				Continuity
Connector	Terminal	Connector	Terminal	Continuity
	6, 5	E36	13, 26	Not existed
E36	8, 9			
	12, 11			
	2, 3			

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE WHEEL SENSOR

- 1. Replace wheel sensor.
- 2. Erase self-diagnosis results for "ABS" with CONSULT-III.
- 3. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

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

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

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

NO >> INSPECTION END

Component Inspection

INFOID:000000005517274

1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" in order with CONSULT-III, select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
	Vehicle stopped	0 [km/h (MPH)]
FR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
FR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)

Is the inspection result normal?

YES >> INSPECTION END

>> Proceed to diagnosis procedure. Refer to <u>BRC-33, "Diagnosis Procedure"</u>. NO

Special Repair Requirement

$1.$ Adjustment of steering angle sensor neutral position and calibration of decel σ sensor	;
After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following pro- cedure.	- -
 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". 	<u>i</u> I
>> END	J
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C1105, C1106, C1107, C1108 WHEEL SENSOR

< 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	
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	
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signal.	ABS actuator and electric unit (control unit) Sensor rotor	
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.	- Sensor rotor	

DTC CONFIRMATION PROCEDURE

1.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-III.

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

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-36. "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check between wheel sensor harness connector terminals.

1.CHECK TIRE

Check air pressure, wear, and size. Refer to WT-60, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. Check wheel sensor and sensor rotor

• Check wheel sensor for damage, disconnection or looseness.

Check sensor rotor for damage.

Is the inspection result normal?

YES >> GO TO 3. NO >> Repair v

- >> Repair wheel sensor mount or replace wheel sensor or replace sensor rotor.
 - Front wheel sensor: Refer to BRC-110, "FRONT WHEEL SENSOR : Exploded View".
 - Rear wheel sensor: Refer to BRC-111, "REAR WHEEL SENSOR : Exploded View".
 - Front sensor rotor: Refer to <u>BRC-112</u>, "FRONT SENSOR ROTOR : Exploded View".
 - Rear sensor rotor: Refer to <u>BRC-112</u>, "REAR SENSOR ROTOR : Exploded View".

3. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect malfunctioning wheel sensor connector.
- 4. Check terminal to see if it is deformed, disconnected, loose, etc.

Is the inspection result normal?

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK WHEEL SENSOR HARNESS

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal	for signal circuit					0
ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	C	
Connector	Terminal	Connect	or	Terminal	Continuity	
	6	E39 (Front	E39 (Front RH)			D
	8	E22 (Front	E22 (Front LH)			
E36	12	C4 (2WD models) C6 (AWD models)	(Rear RH)	8	Existed	E
	2	C3 (2WD models) C5 (AWD models)	(Rear LH)	6		
Measurement terminal	for power supply circuit					BRC
ABS actuator and elect	tric unit (control unit)	Wheel sensor		r	Continuity	
Connector	Terminal	Connect	or	Terminal	Continuity	-

Connector	Terriniai	Connecti		Terrinia		~
	5	E39 (Front	RH)	3		G
	9	E22 (Front	LH)	1		
E36	11	C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Existed	Н
	3	C3 (2WD models) C5 (AWD models)	(Rear LH)	5		

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

ABS actuator and electric unit (control unit)			Continuity		
Connector	Terminal	Connector	Terminal	- Continuity	
	6, 5				
E36	8, 9	E36	13, 26	Not existed	
E30	12, 11	E30	13, 20	NULEXISIEU	
	2, 3				

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE WHEEL SENSOR

- 1. Replace wheel sensor.
- 2. Erase self-diagnosis results for "ABS" with CONSULT-III.
- 3. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 4. Perform self-diagnosis for "ABS" with CONSULT-III.

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

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113, "Exploded View"</u>. NO >> INSPECTION END

Component Inspection

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1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" in order with CONSULT-III, select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
	Vehicle stopped	0 [km/h (MPH)]
FR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
FR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-36, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005532210

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

After removing/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".

>> END

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item		Malfunction detected condition Possible cause		
C1109	BATTERY VOLTAGE [ABNORMAL]		ABS actuator and electric unit (control upply is lower than normal.	ness or connector S actuator and electric unit htrol unit) e	
DTC CC	ONFIRMATION PRC	CEDURE			
1. DTC	REPRODUCTION PR	OCEDURE			
	the ignition switch O				
	orm self-diagnosis for C1109" detected?	"ABS" with C	ONSULT-III.		
YES		osis procedure	e. Refer to <u>BRC-39, "Diagnosis P</u>	rocedure".	
NO	>> INSPECTION EN		<u> </u>		
Diagno	osis Procedure				INFOID:00000000551728
	CK CONNECTOR				
	the ignition switch OI	FF			
			nit (control unit) connector.		
~ ~ .	all tames in all tames later was				
			ection, looseness, etc.		
s the ins	spection result normal		ection, looseness, etc.		
<u>s the ins</u> YES	spection result normal >> GO TO 2.	<u>?</u>			
<u>s the ins</u> YES NO	spection result normal >> GO TO 2. >> Repair or replace	? error-detected	l parts.		
<u>s the ins</u> YES NO 2.CHE0	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR	? error-detected		POWER SUF	PPLY CIRCUIT AND
s the ins YES NO CHEC ROUN	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT	? error-detected AND ELECT	l parts. RIC UNIT (CONTROL UNIT) F		
s the ins YES NO 2.CHE0 GROUN	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT	? error-detected AND ELECT	l parts.		
s the ins YES NO 2.CHE0 GROUN 1. Che	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT	? error-detected AND ELECT	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit)	harness conr	nector and ground.
s the ins YES NO 2.CHE0 GROUN 1. Che ABS	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ck the voltage betwee actuator and electric unit (c	? error-detected AND ELECT	l parts. RIC UNIT (CONTROL UNIT) F	harness conr	
s the ins YES NO 2.CHE0 GROUN 1. Che ABS	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ck the voltage betwee actuator and electric unit (c	? error-detected AND ELECT n ABS actuate	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit)	harness conr	nector and ground.
s the ins YES NO 2.CHEC GROUN 1. Che ABS Ca 2. Turr	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ck the voltage betwee actuator and electric unit (connector Table E36 n the ignition switch OI	? error-detected AND ELECT in ABS actuate control unit) erminal 20	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond	harness conr	Nector and ground.
s the ins YES NO CHEC GROUN I. Che ABS Ca 2. Turr CAL	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ock the voltage betwee actuator and electric unit (connector 0 E36 n the ignition switch Of JTION:	? error-detected AND ELECT in ABS actuate control unit) erminal 20	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond	harness conr	Nector and ground.
s the ins YES NO CHEC BROUN . Che ABS Ca 2. Turr CAL Nev	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ock the voltage betwee actuator and electric unit (connector E36 n the ignition switch Of JTION: rer start the engine.	? error-detected AND ELECT on ABS actuate control unit) erminal 20 N.	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond Ground Ignition sw	ition itich: OFF	Voltage Approx. 0 V
s the ins YES NO 2.CHEC GROUN 1. Che ABS Ca 2. Turr CAL Nev	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ock the voltage betwee actuator and electric unit (connector E36 n the ignition switch Of JTION: rer start the engine.	? error-detected AND ELECT on ABS actuate control unit) erminal 20 N.	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond	ition itich: OFF	Voltage Approx. 0 V
s the ins YES NO 2.CHEC GROUN 1. Che ABS Ca 2. Turr CAL Nev 3. Che	spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT ock the voltage betwee actuator and electric unit (connector E36 n the ignition switch Of JTION: rer start the engine.	? error-detected AND ELECT n ABS actuate control unit) erminal 20 N.	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond Ground Ignition sw	harness conr ition itch: OFF harness conr	Nector and ground.
Is the ins YES NO 2.CHEC GROUN 1. Che ABS Ca 2. Turr CAL Nev 3. Che ABS	Spection result normal >> GO TO 2. >> Repair or replace CK ABS ACTUATOR D CIRCUIT The voltage betwees actuator and electric unit (connector Te E36 The ignition switch OI JTION: The start the engine. The voltage betwees actuator and electric unit (context)	? error-detected AND ELECT n ABS actuate control unit) erminal 20 N.	d parts. RIC UNIT (CONTROL UNIT) F or and electric unit (control unit) — Cond Ground Ignition sw	harness conr ition itch: OFF harness conr	Voltage Approx. 0 V

5. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/ R.

[VDC/TCS/ABS]

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electr	ic unit (control unit)	IPDI	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E36	20	E10	25	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

$\mathbf{3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) 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	
E36 26		Ground	LAISted	

Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. if any malfunction is found, repair errordetected parts.
- NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" and "BATTERY VOLT" in order with CONSULT-III, and check the voltage.

Display item	Display		
BATTERY VOLT	10 – 16 v		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-39</u>, "Diagnosis Procedure".

Special Repair Requirement

INFOID:000000005532211

INFOID:000000005532203

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

After removing/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".

>> END

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 peration.

DTC Logic

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[VDC/TCS/ABS]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
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 CC	NFIRMATION PROCEI	DURE		E
1. DTC F	REPRODUCTION PROCE	EDURE		
	the ignition switch ON. orm self-diagnosis for "AB			BRC
	C1110" detected?			
	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-41, "Diagnosis Proced</u>	<u>ure"</u> .	G
Diagno	sis Procedure		INFOID:000000005517287	Н
1.REPL	ACE ABS ACTUATOR AN	ND ELECTRIC UNIT (CONTROL UNIT)		
	ABS actuator and electric	unit (control unit) when self-diagnostic result sh	nows items other than those	I
	>> Replace ABS actuator	and electric unit (control unit). Refer to BRC-11	3. "Exploded View".	J
Special	Repair Requiremer	nt	INFOID:000000005532212	
1.ADJU SENSOR		ANGLE SENSOR NEUTRAL POSITION AND C	ALIBRATION OF DECEL G	К
	oving/replacing an ABS a	ctuator and electric unit (control unit), be sure t	o perform the following pro-	L
		ensor neutral position: Refer to <u>BRC-9, "ADJI</u>	USTMENT OF STEERING	
	E SENSOR NEUTRAL PO tion of decel G sensor: Re	<u>SITION : Description"</u> . efer to BRC-10, "CALIBRATION OF DECEL G S	ENSOR : Description".	M
	>> END			Ν
				0
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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:000000005517290

INFOID:000000005517291

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-42</u>, "Diagnosis Procedure".

NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

3. Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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	Connector Terminal		voltage
E36	14	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

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

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

BRC-42

INFOID:000000005517289

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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			1	-
	nd electric unit (control unit)	_	Continuity	
Connecto				<u>.</u>
E36	13	Ground	Existed	
	26			
YES >> R	<u>on result normal?</u> eplace ABS actuator an epair or replace error-de		(control unit). Re	fer to <u>BRC-113, "Exploded View"</u> .
Componen	t Inspection			INFOID:000000005517292
1. CHECK AC	CTIVE TEST BS", "ACTIVE TEST" an	d "ABS MOTO	R" in order with	CONSULT-III.
				ctuator relay operates as shown in table
		Di	isplay	
Test item	Display item	On	Off	
	MOTOR RELAY	On	Off	
ABS MOTOR	ACTUATOR RLY	On	On	
operation fo Is the inspecti YES >> IN			-	h turned ON. This is not malfunction because it is a gnosis Procedure".
Special Re	pair Requirement			INFOID:000000005532213
		GLE SENSOR	NEUTRAL POS	SITION AND CALIBRATION OF DECEL G
 Adjustment ANGLE SEN 	of steering angle sens	or neutral pos	sition: Refer to t	nit), be sure to perform the following pro- BRC-9, "ADJUSTMENT OF STEERING F DECEL G SENSOR : Description".
>> E	ND			

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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:000000005517295

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[VDC/TCS/ABS]

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
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 	
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning.		

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1113", "C1145" or "C1146" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-44, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000005517296

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 OFF indicator lamp might turn on and self-diagnosis using the CONSULT-III 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) connector.
- 3. Disconnect yaw rate/side/decel G sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

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

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Yaw rate/side/dece	el G sensor		Valtara		
Connector	Terminal		Voltage		
M52	4	Ground	Battery voltage		
Turn the ignition s					
Check the voltage	e between yaw r	ate/side/decel	G sensor harnes	s connector and g	round.
Yaw rate/side/dece	el G sensor				
Connector	Terminal	—	Voltage		
M52	4	Ground	Approx. 0 V		
the inspection resul	It normal?				
/ES >> GO TO 3.					
•	replace error-de	•			
CHECK YAW RAT	E/SIDE/DECEL	G SENSOR G	ROUND CIRCUI	Т	
neck the continuity b	between yaw rat	e/side/decel G	sensor harness	connector and gro	ound.
Yaw rate/side/dece		_	Continuity		
Connector M52	Terminal 1	Cround	Eviated		
_	-	Ground	Existed		
the inspection resul					
		etected parts.			
IO >> Repair or CHECK YAW RAT	replace error-de E/SIDE/DECEL	G SENSOR H			<u> </u>
IO >> Repair or CHECK YAW RATI	replace error-de E/SIDE/DECEL	G SENSOR H		connector and AE	S actuator and electric
IO >> Repair or CHECK YAW RATI	replace error-de E/SIDE/DECEL petween yaw rat	G SENSOR H e/side/decel G			
IO >> Repair or CHECK YAW RATI neck the continuity k it (control unit) harn	replace error-de E/SIDE/DECEL petween yaw rat	G SENSOR H re/side/decel G	sensor harness		S actuator and electric
NO >> Repair or CHECK YAW RATH neck the continuity b it (control unit) harn ABS actuator and ele	replace error-de E/SIDE/DECEL Detween yaw rat ness connector.	G SENSOR H re/side/decel G	Sensor harness Yaw rate/side/deco	el G sensor	
NO >> Repair or CHECK YAW RATH heck the continuity b hit (control unit) harn ABS actuator and ele Connector	replace error-de E/SIDE/DECEL petween yaw rat ness connector. ectric unit (control ur Terminal	G SENSOR H re/side/decel G	S sensor harness Yaw rate/side/deco	el G sensor Terminal	- Continuity
NO >> Repair or CHECK YAW RATH neck the continuity to hit (control unit) harn ABS actuator and ele	replace error-de E/SIDE/DECEL Detween yaw rat ness connector. ectric unit (control ur Terminal 25	G SENSOR H re/side/decel G	Sensor harness Yaw rate/side/deco	el G sensor Terminal 2	
NO >> Repair or CHECK YAW RATH heck the continuity b hit (control unit) harn ABS actuator and ele Connector	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Ectric unit (control ur Terminal 25 19	G SENSOR H re/side/decel G	S sensor harness Yaw rate/side/deco	el G sensor Terminal 2 3	- Continuity
IO >> Repair or CHECK YAW RATE heck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection result	replace error-de E/SIDE/DECEL Detween yaw rate ness connector. ectric unit (control ur Terminal 25 19 4 10 <u>t normal?</u>	G SENSOR H re/side/decel G	S sensor harness Yaw rate/side/deco	el G sensor Terminal 2 3 4	- Continuity
IO >> Repair or CHECK YAW RATIN Neck the continuity bit it (control unit) harn ABS actuator and ele Connector E36 the inspection result ES >> GO TO 5.	replace error-de E/SIDE/DECEL Detween yaw rat ness connector. ectric unit (control ur Terminal 25 19 4 10 <u>t normal?</u>	G SENSOR H	S sensor harness Yaw rate/side/deco	el G sensor Terminal 2 3 4	- Continuity
IO >> Repair or CHECK YAW RATIN Neck the continuity bit (control unit) harm ABS actuator and ele Connector E36 the inspection result (ES >> GO TO 5. IO >> Repair or	replace error-de E/SIDE/DECEL Detween yaw rat ness connector. ectric unit (control ur Terminal 25 19 4 10 <u>It normal?</u> replace error-de	G SENSOR H	S sensor harness Yaw rate/side/deco	el G sensor Terminal 2 3 4	- Continuity
IO >> Repair or CHECK YAW RAT heck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul (ES >> GO TO 5. IO >> Repair or CHECK DATA MO	replace error-de E/SIDE/DECEL Detween yaw rat ness connector. ectric unit (control ur Terminal 25 19 4 10 <u>It normal?</u> replace error-de NITOR	G SENSOR H	Sensor harness Yaw rate/side/dece	el G sensor Terminal 2 3 4	- Continuity
IO >> Repair or CHECK YAW RATI heck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul ES >> GO TO 5. IO >> Repair or CHECK DATA MOI Connect yaw rate	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Detric unit (control ur Terminal 25 19 4 10 11 10 11 normal? replace error-de NITOR	G SENSOR H e/side/decel G hit) c etected parts.	Sensor harness Yaw rate/side/dece	el G sensor Terminal 2 3 4 1	- Continuity
O >> Repair or CHECK YAW RATI eck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul ES >> GO TO 5. O >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actor Select "ABS" and	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Detric unit (control ur Terminal 25 19 4 10 10 11 normal? replace error-de NITOR s/side/decel G se uator and electr "DATA MONITO	G SENSOR H e/side/decel G nit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi	Sensor harness Yaw rate/side/deco Connector M52 M52 connector. unit) harness cor th CONSULT-III, s	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE	- Continuity
IO >> Repair or CHECK YAW RATI leck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul ES >> GO TO 5. IO >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actu Select "ABS" and and "DECEL G-S	replace error-de E/SIDE/DECEL Detween yaw rat hess connector. ectric unit (control ur Terminal 25 19 4 10 <u>th normal?</u> replace error-de NITOR e/side/decel G se uator and electri "DATA MONITC EN", and check	G SENSOR H e/side/decel G nit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi	Sensor harness Yaw rate/side/deco Connector M52 M52 connector. unit) harness cor th CONSULT-III, s	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE	Existed
O >> Repair or CHECK YAW RATH eck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul ES >> GO TO 5. O >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actu Select "ABS"and and "DECEL G-S the inspection resul	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Detric unit (control ur Terminal 25 19 4 10 14 10 14 10 15 replace error-de NITOR Side/decel G se uator and electri "DATA MONITO EN", and check It normal?	G SENSOR H e/side/decel G nit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi yaw rate/side/	Sensor harness Yaw rate/side/dece Connector M52 Connector. unit) harness cor th CONSULT-III, s decel G sensor s	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE ignal.	E SEN", "SIDE G-SEN"
IO >> Repair or CHECK YAW RATH neck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul 'ES >> GO TO 5. IO >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actu Select "ABS" and and "DECEL G-S the inspection resul 'ES >> Replace A	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Detric unit (control ur Terminal 25 19 4 10 14 10 14 10 15 19 4 10 14 10 15 19 4 10 10 14 10 15 19 4 10 10 15 19 19 19 19 19 19 19 19 19 19 19 19 19	G SENSOR H e/side/decel G hit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi yaw rate/side/	Sensor harness Yaw rate/side/deco Connector M52 Connector. unit) harness cor th CONSULT-III, 'decel G sensor s (control unit). Ref	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE	E SEN", "SIDE G-SEN"
IO >> Repair or CHECK YAW RATH neck the continuity b it (control unit) harn ABS actuator and ele Connector E36 the inspection resul 'ES >> GO TO 5. IO >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actu Select "ABS" and and "DECEL G-S the inspection resul 'ES >> Replace A	replace error-de E/SIDE/DECEL Detween yaw rat hess connector. ectric unit (control ur Terminal 25 19 4 10 14 10 14 10 14 10 15 19 4 10 16 10 17 19 4 10 10 17 19 4 10 10 17 19 19 19 19 19 19 19 19 19 19 19 19 19	G SENSOR H e/side/decel G hit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi yaw rate/side/	Sensor harness Yaw rate/side/deco Connector M52 Connector. unit) harness cor th CONSULT-III, 'decel G sensor s (control unit). Ref	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE ignal.	E SEN", "SIDE G-SEN"
IO >> Repair or CHECK YAW RATH neck the continuity bit it (control unit) harm ABS actuator and ele Connector E36 the inspection resul ES >> GO TO 5. IO >> Repair or CHECK DATA MO Connect yaw rate Connect ABS actu Select "ABS" and and "DECEL G-S the inspection resul ES >> Replace A IO >> Replace y	replace error-de E/SIDE/DECEL Detween yaw rat Dess connector. Detric unit (control ur Terminal 25 19 4 10 14 10 14 10 15 replace error-de NITOR 15 Side/decel G se uator and electri "DATA MONITO EN", and check It normal? ABS actuator an yaw rate/side/de ection	G SENSOR H e/side/decel G hit) c etected parts. etected parts. ensor harness ic unit (control DR" in order wi yaw rate/side/	Sensor harness Yaw rate/side/deco Connector M52 Connector. unit) harness cor th CONSULT-III, 'decel G sensor s (control unit). Ref	el G sensor Terminal 2 3 4 1 1 nnector. select "YAW RATE ignal.	E SEN", "SIDE G-SEN"

BRC-45

[VDC/TCS/ABS]

DECEL G SENSOR

Vehicle condition	DATA MONITOR	
Vehicle stopped	Approx. 0 G	
Vehicle acceleration	Positive value	
Vehicle deceleration	Negative value	
YAW RATE SENSOR		
Vehicle condition	DATA MONITOR	
Vehicle stopped	Approx. 0 d/s	
Vehicle turning right	Negative value	
Vehicle turning left	Positive value	
SIDE G SENSOR		
Vehicle condition	DATA MONITOR	
Vehicle stopped	Approx. 0 m/s ²	
Vehicle turning right	Negative value	
Vehicle turning left	Positive value	

Is the inspection result normal?

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

Special Repair Requirement

INFOID:000000005517298

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

- 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".
- After removing/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".

>> END

C1115 WHEEL SENSOR

Description

INFOID:000000005517299

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

DTC Logic

INFOID:000000005517300

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit) Sensor rotor 	Е
-	NFIRMATION PROCEI			BRC
1. DTC I	REPRODUCTION PROCE	DURE		
2. Perfo <u>Is DTC "(</u>	orm self-diagnosis for "AB C1115" detected?	vehicle at 30 km/h (19 MPH) or more for appro S" with CONSULT-III. procedure. Refer to <u>BRC-47, "Diagnosis Procec</u>		G
	>> INSPECTION END			Н
Diagno	sis Procedure		INFOID:000000005517301	
CAUTIO				
4		sor harness connector terminals.		
				J
	r pressure, wear, and size pection result normal?	. Refer to <u>WT-60, "Tire Air Pressure"</u> .		
YES	>> GO TO 2.			Κ
•	>> Repair or replace error K WHEEL SENSOR AND	•		
		disconnection or looseness.		L
	sensor rotor for damage.	disconnection of looseness.		
	pection result normal?			M
-		mount or replace wheel sensor or replace sen		
	 Front wheel sensor: Rear wheel sensor: I 	Refer to <u>BRC-110, "FRONT WHEEL SENSOR</u> Refer to <u>BRC-111, "REAR WHEEL SENSOR :</u>	<u>: Exploded View"</u> . Exploded View"	Ν
	 Front sensor rotor: R 	efer to BRC-112, "FRONT SENSOR ROTOR :	Exploded View".	
3 CHEC	Rear sensor rotor: R K CONNECTOR	efer to <u>BRC-112, "REAR SENSOR ROTOR : E</u>	xploded View".	0
	the ignition switch OFF.			
2. Disc	onnect ABS actuator and	electric unit (control unit) connector.		Р
	onnect wheel sensor conr ck terminal to see if it is de	ector. formed, disconnected, loose, etc.		
Is the ins	pection result normal?			
	>> GO TO 4. >> Repair or replace error	-detected parts.		
4	CK WHEEL SENSOR HAP	•		

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C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Management of the sector of the strength strength

[VDC/TCS/ABS]

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal	for signal circuit				
ABS actuator and elect	ric unit (control unit)	Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	Continuity
	6	E39 (Front	E39 (Front RH)		
	8	E22 (Front	LH)	2	
E36	12	C4 (2WD models) C6 (AWD models) (Rear RH)		8	Existed
	2	C3 (2WD models) C5 (AWD models)	(Rear LH)	6	
Measurement terminal	for power supply circuit	t			
ABS actuator and elect	ric unit (control unit)	Wheel sensor		r	Continuity
Connector	Terminal	Connecte	or	Terminal	Continuity
	5	E39 (Front	RH)	3	
	9	E22 (Front	E22 (Front LH)		
E36	11	C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Existed
	3	C3 (2WD models) C5 (AWD models)	(Rear LH)	5	

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

	Continuity				
Connector	Connector Terminal Connector Terminal				
	6, 5	- E36		Not existed	
E26	8, 9		13, 26		
E36	12, 11		13, 20		
	2, 3				

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE WHEEL SENSOR

1. Replace wheel sensor.

- 2. Erase self-diagnosis results for "ABS" with CONSULT-III.
- 3. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 4. Perform self-diagnosis for "ABS" with CONSULT-III.

Is DTC "C1115" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113, "Exploded View"</u>. NO >> INSPECTION END

Component Inspection

INFOID:000000005517302

1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" in order with CONSULT-III, select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
	Vehicle stopped	0 [km/h (MPH)]
FR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)

C1115 WHEEL SENSOR

[VDC/TCS/ABS]

< DTC/CIRCUI	T DIAGNOSIS >		[VDC/TCS/ABS]
Wheel sensor	Condition	Vehicle speed (DATA MONITOR)	
	Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display ($\pm 10\%$ or less)	
	Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display ($\pm 10\%$ or less)	
	Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display ($\pm 10\%$ or less)	
NO >> Pro	PECTION END	ocedure. Refer to <u>BRC-47, "Diac</u>	INFOID:000000005532214
1.ADJUSTMEN	NT OF STEERING A	NGLE SENSOR NEUTRAL POS	ITION AND CALIBRATION OF DECEL G
After removing/r	eplacing an ABS ac	tuator and electric unit (control u	nit), be sure to perform the following pro-

cedure. • 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 BRC-10, "CALIBRATION OF DECEL G SENSOR : Description". Н

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C1116 STOP LAMP SWITCH

Description

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

DTC Logic

INFOID:000000005517305

INFOID:000000005517304

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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1116" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-50, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000005517306

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 terminal for deformation, disconnection, looseness, etc.
- 5. Reconnect ABS actuator and electric unit (control unit) and stop lamp switch connectors securely.
- 6. Start the engine.
- 7. Repeat pumping brake pedal carefully several times, and perform self-diagnosis for "ABS" with CON-SULT-III.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Poor connection of connector terminal. Replace or repair error-detected parts.

2.CHECK STOP LAMP SWITCH CLEARANCE

Check 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 stop lamp switch. Refer to <u>BRC-51, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace stop lamp switch.

4.CHECK STOP LAMP SWITCH CIRCUIT

1. Turn the ignition switch OFF.

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

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator an	d electric unit (control unit)	_	Condition	Voltage
Connector	Terminal			Volkago
E36	16	Ground	Brake pedal is depressed Brake pedal is released	Battery voltage Approx. 0 V
s the inspection re	esult normal?			
	ce ABS actuator and elect r or replace error-detected		unit). Refer to <u>BRC-113, "Ex</u>	<u>ploded View"</u> .
Component In	spection			INFOID:00000000551730
.CHECK STOP	LAMP SWITCH			
2. Disconnect st	on switch OFF. op lamp switch connector. htinuity between stop lamp		tor terminals.	
Stop lamp switch Terminal	Condition	Con	tinuity	
1 – 2	Release stop lamp switch (When brake pedal is depress	ed.) Exi	isted	
1 2	Push stop lamp switch (When brake pedal is released	d.) Not e	existed	
Special Repair	ce stop lamp switch. Refe [.] Requirement OF STEERING ANGLE S		<u>oloded View"</u> . RAL POSITION AND CALIBF	INFOID:0000000055322
ENSOR				
edure. Adjustment of s ANGLE SENSO	teering angle sensor neu R NEUTRAL POSITION :	utral position: F	(control unit), be sure to perfe Refer to <u>BRC-9, "ADJUSTM</u>	ENT OF STEERING
Calibration of de	cel G sensor: Refer to BR	<u>C-10, "CALIBR.</u>	ATION OF DECEL G SENSO	<u> DR : Description"</u> .
>> END				

C1120, C1122, C1124, C1126 IN ABS SOL

Description

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

DTC Logic

INFOID:000000005517310

INFOID:000000005517311

INFOID:000000005517309

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-52, "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) connector.

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

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

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		voltage	
E36	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

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

Check the continuity 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 electric unit (control unit)			Continuity
Connector	Terminal	—	Continuity
E36	13	Ground	Existed
	26	Ground	Existed

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000005517312

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1.CHECK ACTIVE TEST

1. Select "ABS", "ACTIVE TEST" and each test menu item in order with CONSULT-III.

2. Select "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

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

*: On for 1 to 2 seconds after the 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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-52, "Diagnosis Procedure"</u>.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECELG SENSOR

After removing/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".

>> END

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INEOID:000000005532216

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

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

DTC Logic

INFOID:000000005517315

INFOID:000000005517316

INFOID:000000005517314

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

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

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-54, "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) connector.

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair error-detected parts.

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

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		voltage	
E36	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

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

Check the continuity 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 electric unit (control unit)			Continuity	
Connector	Terminal	—	Continuity	
E36	13	Ground	Existed	
	26	Ground	LAISIEU	

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000005517317

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1.CHECK ACTIVE TEST

1. Select "ABS", "ACTIVE TEST" and each test menu item in order with CONSULT-III.

2. Select "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

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

*: On for 1 to 2 seconds after the 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.

Is the inspection result normal?

YES >> INSPECTION END

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

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECELG SENSOR

After removing/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".

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INEOID:000000005532217

C1130 ENGINE SIGNAL

Description

INFOID:000000005517319

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

DTC Logic

INFOID:000000005517320

INFOID:000000005517321

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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1130" detected?

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

Diagnosis Procedure

1.PERFORM ECM SELF-DIAGNOSIS

Perform self-diagnosis for "ENGINE" with CONSULT-III.

Is any item indicated on the self-diagnosis display?

YES >> Check the malfunctioning system. Refer to EC-116, "CONSULT-III Function".

NO >> GO TO 2.

2. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS (1)

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

Is indicator lamp (MIL) turns OFF?

YES >> GO TO 3.

NO >> Refer to <u>EC-116</u>, "CONSULT-III Function".

3. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS (2)

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

Is any item indicated on the self-diagnosis display?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000005532218

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

After removing/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".

BRC-56

	C1130 ENGINE SIGNAL	
< DTC/CIRCUIT DIAGNOSIS >		[VDC/TCS/ABS]
>> END		A
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C1140 ACTUATOR RELAY SYSTEM

Description

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

DTC Logic

INFOID:000000005517324

INFOID:000000005517325

INFOID:000000005517323

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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1140" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-58, "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) connector.
- 3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace or repair error-detected parts.

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

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		voltage
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) 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
	26		

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

BRC-58

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

[VDC/TCS/ABS]

INFOID:000000005517326

INFOID:000000005532219

1.CHECK ACTIVE TEST

- 1. Select "ABS", "ACTIVE TEST" and "ABS MOTOR" in order with CONSULT-III.
- Select "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Dis	play
rest item	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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-58</u>, "Diagnosis Procedure".

Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION AND CALIBRATION OF DECEL G
 SENSOR
 After removing/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</u>, "CALIBRATION OF DECEL G SENSOR : Description".

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C1142 PRESS SENSOR

Description

INFOID:000000005517328

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:000000005517329

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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1142" detected?

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

NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK STOP LAMP SWITCH

Check stop lamp switch system. Refer to BRC-50, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK DATA MONITOR

Check pressure sensor signal. Refer to <u>BRC-60, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

- NO >> Check brake pedal, brake booster and master cylinder for mount play, looseness, brake system fluid leakage, etc.
 - Brake fluid leakage: Refer to <u>BR-12, "Inspection"</u>.
 - Brake pedal: Refer to <u>BR-21</u>, "Inspection and Adjustment".
 - Master cylinder: Refer to <u>BR-29</u>, "Inspection".
 - Brake booster: Refer to <u>BR-31, "Inspection and Adjustment"</u>.

${\it 3.}$ perform abs actuator and electric unit (control unit) self-diagnosis

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

Is any item indicated on the self-diagnosis display?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000005517331

1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" and "PRESS SENSOR" in order with CONSULT-III, and check the brake fluid pressure.

BRC-60

INFOID:000000005517330

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Condition	PRESS SENSOR (DATA MONITOR)		А
With ignition switch turned ON and brake pedal released.	Approx. 0 bar		_
With ignition switch turned ON and brake pedal depressed.	0 to 170 bar		В
Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Reference	r to <u>BRC-60, "Diagnosis</u>	s Procedure".	С
Special Repair Requirement		INFOID:000000005532220)
1. ADJUSTMENT OF STEERING ANGLE SENSOR	R NEUTRAL POSITION	N AND CALIBRATION OF DECEL G	
After removing/replacing an ABS actuator and ele	ctric unit (control unit), b	be sure to perform the following pro-	E
 cedure. Adjustment of steering angle sensor neutral p <u>ANGLE SENSOR NEUTRAL POSITION : Desci</u> Calibration of decel G sensor: Refer to <u>BRC-10</u>, 	iption".		BRC
>> END			G
			Н
			J
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			Μ
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			0
			Р

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:000000005517334

INFOID:000000005517335

INFOID:000000005517333

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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1143" detected?

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

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK WHEEL ALIGNMENT

Check wheel alignment. Refer to FSU-8, "Inspection" (front), RSU-6, "Inspection" (rear).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Adjust wheel alignment. Refer to <u>FSU-8</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) connector.
- 3. Disconnect steering angle sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace or repair error-detected parts.

 $\mathbf{3}.$ check steering angle sensor harness

1. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

Steering angl	e sensor		Voltage	
Connector	Terminal			
M30	4	Ground	Battery voltage	

3. Turn ignition switch OFF.

4. Check the continuity between steering angle sensor harness connector and ground.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Steering angle	e sensor		Ocatia ii		
Connector	Terminal		Continuity		
M30	1	Ground	Existed		
the inspection resu	<u>ilt normal?</u>				
YES >> GO TO 4 NO >> Repair of CHECK STEERIN	r replace error-	detected parts.			
heck steering whee	l play. Refer to	ST-14, "Inspection	on".		
the inspection resu	<u>ilt normal?</u>				
YES >> GO TO 5					
	r replace error-	detected parts.			
CHECK DATA MC					
. Connect the stee	ering angle sen ingle sensor sig	sor harness conr	rol unit) harness co nector. <u>C-63, "Component</u>		В
YES >> Replace	ABS actuator a		control unit). Refer BRC-116, "Explode	to <u>BRC-113, "Exploded View"</u> . ed View".	
omponent Insp	ection			INFOID:000000005517336	
CHECK DATA MC					
elect "ABS", "DATA ensor signal.	MONITOR" an	d "STR ANGLE S	SIG" in order with C	ONSULT-III, and check steering angle	
erieer eignan					
Steering conc	dition	STR ANGLE SIG (DATA MONITOR)		
Driving straight		-3.5 -	+3.5°		
Turn 90 ° to right		Approx.	-90 °		
Turn 90 ° to left		Approx.	+90 °		
the inspection resu	It normal?				
YES >> INSPEC	TION END				
NO >> Proceed	to diagnosis pr	ocedure. Refer t	o <u>BRC-62, "Diagno</u>	<u>sis Procedure"</u> .	
pecial Repair R	Requirement			INFOID:00000005517337	
	F STEERING A	NGLE SENSOR	NEUTRAL POSITI	ON AND CALIBRATION OF DECEL G	
ENSOR	• • •				
	ering angle ser	nsor neutral pos	ition: Refer to BR	he following procedure. C-9, "ADJUSTMENT OF STEERING	
procedure.	-		ectric unit (control u	unit), be sure to perform the following C-9, "ADJUSTMENT OF STEERING	
Adjustment of stee	ering angle ser	nsor neutral pos	ectric unit (control u ition: Refer to <u>BR</u> <u>ion"</u> .		
procedure. Adjustment of stee ANGLE SENSOR N	ering angle ser	nsor neutral pos	ectric unit (control u ition: Refer to <u>BR</u> <u>ion"</u> .	C-9. "ADJUSTMENT OF STEERING	

Revision: 2009 September

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

Description

INFOID:000000005532204

[VDC/TCS/ABS]

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:000000005517338

INFOID:000000005517339

INFOID:000000005532205

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 CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch ON.
- Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in order with CONSULT-III, and perform adjust the neutral position of steering angle sensor.
- 3. Perform self-diagnosis for "ABS" with CONSULT-III.

Is DTC "C1144" detected?

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

Diagnosis Procedure

1.CHECK STEERING ANGLE SENSOR

Check steering angle sensor. Refer to BRC-62, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-113. "Exploded View".

NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK DATA MONITOR

Select "ABS", "DATA MONITOR" and "STR ANGLE SIG" in order with CONSULT-III, and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	-3.5 - +3.5°
Turn 90 ° to right	Approx. –90 °
Turn 90 ° to left	Approx. +90 °

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-62, "Diagnosis Procedure"</u>.

Special Repair Requirement

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

• After removing/replacing a steering angle sensor, be sure to perform the following procedure.

BRC-64

INFOID:000000005532221

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >	[VDC/TCS/ABS]	
- Adjustment of steering angle sensor neutral position: <u>ANGLE SENSOR NEUTRAL POSITION : Description</u> ".	А	1
 After removing/replacing an ABS actuator and electric procedure. 	unit (control unit), be sure to perform the following	
- Adjustment of steering angle sensor neutral position: ANGLE SENSOR NEUTRAL POSITION : Description".	B	3
 Calibration of decel G sensor: Refer to <u>BRC-10, "CALIB</u> 	RATION OF DECEL G SENSOR : Description".	
>> END	C	2
	C)
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C1155 BRAKE FLUID LEVEL SWITCH

Description

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

DTC Logic

INEOID-000000005517342

INFOID:000000005517343

INFOID:000000005517341

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

Turn the ignition switch ON. 1.

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

Is DTC "C1155" detected?

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

Diagnosis Procedure

1.CHECK BRAKE FLUID LEVEL

Check the brake fluid level.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refill the brake fluid.

2. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector. 2.
- 3. Disconnect combination meter harness connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace or repair error-detected parts.

 ${
m 3.}$ CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-67, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Brake fluid level switch is malfunction. Replace reservoir tank. Refer to <u>BR-27, "Exploded View"</u>.

 ${f 4}$. CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

Check the continuity between brake fluid level switch harness connector and ABS actuator and electric 1 unit (control unit) harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Brake fluid I	evel switch	ABS actuator	and electric unit	ctric unit (control unit)		
Connector	Terminal	Connecto	or Te	erminal	Continuity	
M37	1	E36		7	Existed	
Check the connector	•	etween brake	e fluid level sw	ritch harness	connector and com	bination meter harness
Brake fluid I	evel switch	Combina	ation meter			
Connector	Terminal	Connector	Terminal	- Continuity	1	
M37	1	E34	27	Existed		
Check the	continuity be	etween brake	fluid level sw	itch harness	connector and grou	nd.
	e fluid level swit	-	_	Continuity		
Connector	10	erminal		F 1.4.1		
E37		2	Ground	Existed	<u> </u>	
Check the	continuity be	etween combi	ination meter	harness con	nector and ground.	
Co	mbination meter	r				
Connector		erminal	—	Continuity		
E34		27	Ground	Existed		
ES >> Re IO >> Re omponent	epair or repla t Inspectio	actuator and e ice error-dete n	cted parts.	ontrol unit). I	Refer to <u>BRC-113, "F</u>	Exploded View".
YES >> Ro NO >> Ro Omponen CHECK BR	eplace ABS a epair or repla t Inspectio AKE FLUID	actuator and e ice error-dete n LEVEL SWIT	cted parts.	ontrol unit). I	Refer to <u>BRC-113, "E</u>	
YES >> Re NO >> Re Omponen CHECK BR Turn the ig Disconned	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch ct brake fluid	actuator and e ice error-dete n LEVEL SWIT OFF. level switch c	Cted parts.			
(ES >> Re NO >> Re omponen .CHECK BR Turn the ig Disconned	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch ct brake fluid	actuator and e ice error-dete n LEVEL SWIT OFF. level switch c	Cted parts.			
YES >> Re NO >> Re OMPONEN CHECK BR Turn the ig Disconned Check the	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch to brake fluid continuity be	actuator and e ice error-dete n LEVEL SWIT OFF. level switch c etween brake	Cted parts. CH connector. fluid level sw	itch connecte	or terminals.	
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch to brake fluid continuity be	actuator and e ice error-dete n LEVEL SWIT OFF. level switch c	Cted parts. CH connector. fluid level sw		or terminals.	
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconneo Check the Brake fluid level Terminal	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch When t	Actuator and e ice error-dete IN LEVEL SWIT I OFF. level switch c etween brake Condit	cted parts. CH connector. fluid level sw tion	itch connecto Continui ank. Not exist	or terminals.	
YES >> Re NO >> Re OMPONEN CHECK BR Turn the ig Disconned Check the	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch When t	Actuator and e ice error-dete IN LEVEL SWIT I OFF. level switch c etween brake Condit	Cted parts. CH connector. fluid level sw	itch connecto Continui ank. Not exist	or terminals.	
YES >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch to brake fluid continuity be switch when t tank.	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch c etween brake Condit prake fluid is full prake fluid is emp	cted parts. CH connector. fluid level sw tion	itch connecto Continui ank. Not exist	or terminals.	
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1 - 2 the inspectio	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch t brake fluid continuity be switch when t When t tank.	Actuator and e ice error-dete IN LEVEL SWIT I OFF. level switch c etween brake Condit prake fluid is full prake fluid is emp mal?	cted parts. CH connector. fluid level sw tion	itch connecto Continui ank. Not exist	or terminals.	
YES >> Re OMPONENT CHECK BR Turn the ig Disconneo Check the Brake fluid level Terminal 1 – 2 the inspectio YES >> IN	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch t brake fluid continuity be switch when t tank. on result norr SPECTION	Actuator and e ice error-dete in LEVEL SWIT i OFF. level switch c etween brake Condit orake fluid is full orake fluid is emp mal? END	cted parts. CH connector. fluid level sw tion	itch connecte Continui ank. Not exist ir Existed	or terminals.	
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Terminal 1 - 2 the inspection YES >> IN NO >> Re	eplace ABS a epair or repla t Inspectio AKE FLUID gnition switch t brake fluid continuity be switch when t When t tank. on result norr SPECTION eplace reserv	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch c etween brake Condit orake fluid is full orake fluid is emp mal? END yoir tank. Refe	cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservo	itch connecte Continui ank. Not exist ir Existed	or terminals.	
(ES >> Re Omponent CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1-2 the inspection (ES >> IN NO >> Re pecial Rep	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch when t when t tank. on result norr SPECTION eplace reserv pair Requi	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch o etween brake Condit orake fluid is full orake fluid is emp mal? END voir tank. Refe rement	cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservoir er to <u>BR-27. "</u>	itch connecte Continui ank. Not exist ir Existed Exploded Vie	or terminals.	INFOID:000000005517344
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1 - 2 the inspection YES >> IN NO >> Re pecial Rep	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch when t when t tank. on result norr SPECTION eplace reserv pair Requi	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch o etween brake Condit orake fluid is full orake fluid is emp mal? END voir tank. Refe rement	cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservoir er to <u>BR-27. "</u>	itch connecte Continui ank. Not exist ir Existed Exploded Vie	or terminals.	INFOID:00000005517344
YES >> Re NO >> Re OMPONEN CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1 - 2 the inspection YES >> IN NO >> Re pecial Rep NSOR	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch when t tank. on result norr SPECTION eplace reserv coair Requi ENT OF STE	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch c etween brake Condit orake fluid is full orake fluid is emp mal? END voir tank. Refe rement ERING ANGL	Cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservoir er to <u>BR-27.</u> "	itch connecte Continui ank. Not exist ^{ir} Existed Exploded Vie NEUTRAL PO	or terminals.	INFOID:000000005517344
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1 - 2 the inspection YES >> IN NO >> Re pecial Rep ADJUSTME ENSOR	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch when t tank. on result norr SPECTION eplace reserv coair Requi ENT OF STE	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch c etween brake Condit orake fluid is full orake fluid is emp mal? END voir tank. Refe rement ERING ANGL	Cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservoir er to <u>BR-27.</u> "	itch connecte Continui ank. Not exist ^{ir} Existed Exploded Vie NEUTRAL PO	or terminals.	INFOID:000000005517344
YES >> Re NO >> Re OMPONENT CHECK BR Turn the ig Disconned Check the Brake fluid level Terminal 1 - 2 the inspection YES >> IN NO >> Re pecial Rep ADJUSTME ENSOR tter removing edure. Adjustment	eplace ABS a epair or repla t Inspection AKE FLUID gnition switch t brake fluid continuity be switch when t tank. on result norr SPECTION eplace reserved oair Requi ENT OF STE	Actuator and e ice error-dete in LEVEL SWIT n OFF. level switch o etween brake Conditionake fluid is full prake fluid is full prake fluid is emp mal? END voir tank. Refe rement ERING ANGL in ABS actuato	Cted parts. CH connector. fluid level sw tion in the reservoir ta pty in the reservoir er to <u>BR-27. "</u> E SENSOR N or and electric	itch connecto Continui ank. Not exist ir Existed Exploded Vie NEUTRAL PO cunit (contro ion: Refer to	or terminals. ty ed a a a a a a b c c c c c c c c c c c c c	INFOID:000000005517344

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:000000005517347

INFOID:000000005517346

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch ON.
- Select "ABS", "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order with CONSULT-III, and perform calibration of decel G sensor. Refer to <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : Special</u> <u>Repair Requirement"</u>.
- 3. Perform self-diagnosis for "ABS" with CONSULT-III.

Is DTC "C1160" detected?

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

Diagnosis Procedure

INFOID:000000005517348

1.CHECK YAW RATE/SIDE/DECEL G SENSOR

Check yaw rate/side/decel G sensor. Refer to BRC-45. "Component Inspection".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113, "Exploded View"</u>.
- NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000005532223

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

- 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".
- After removing/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".

>> END

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	D
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)	
DTC CC	NFIRMATION PROCEI	DURE		Е
1. DTC F	REPRODUCTION PROCE	DURE		
1. Turn	the ignition switch ON.			BRC
	orm self-diagnosis for "AB	S" with CONSULT-III.		
	C1161" detected?			G
	>> INSPECTION END	procedure. Refer to <u>BRC-69, "Diagnosis Proced</u>	<u>ure"</u> .	G
Diagno	sis Procedure		INFOID:000000005517352	
			111 CID.000000000 17002	Н
	K YAW RATE/SIDE/DEC			
Replace applicabl		unit (control unit) when self-diagnostic result sh	nows items other than those	
applicabl	с.			
	>> Replace ABS actuator	and electric unit (control unit). Refer to BRC-11	3. "Exploded View".	J
Special	Repair Requiremer	ıt	INFOID:000000005683362	
1.adju	STMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION AND C	ALIBRATION OF DECEL G	К
SENSOR				
	oving/replacing an ABS a	ctuator and electric unit (control unit), be sure t	o perform the following pro-	I
cedure.Adjustr	nent of steering angle se	ensor neutral position: Refer to <u>BRC-9, "ADJ</u>	USTMENT OF STEERING	
ANGLE	SENSOR NEUTRAL PO	SITION : Description"		
 Calibra 	tion of decel G sensor: Re	fer to <u>BRC-10, "CALIBRATION OF DECEL G S</u>	SENSOR : Description".	M
	>> END			
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[VDC/TCS/ABS]

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INFOID:000000005517351

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C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

Description

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

DTC Logic

unit).]

INEOID:000000005517355

INFOID:000000005517354

[VDC/TCS/ABS]

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.DTC REPRODUCTION PROCEDURE

Turn the ignition switch ON. 1.

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

Is DTC "C1162" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-70, "Diagnosis Procedure"</u>.

>> INSPECTION END NO

Diagnosis Procedure

INFOID:000000005517356

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 <u>BRC-113, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000005532225

1.m adjustment of steering angle sensor neutral position and calibration of decel g SENSOR

After removing/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 BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

Description

INFOID:000000005517358

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

DTC Logic

INFOID:000000005517359

DTC DETECTION LOGIC

DTC	Displa	ay item	Malfun	ction detected condition	Possible cause	
C1164	CV1	s	ide is open circuit o	lenoid valve (CV1) on the primary or shorted, or the control line is open wer supply or the ground.	Harness or connector ABS actuator and electric unit	D
C1165	CV2	s	ide is open circuit o	lenoid valve (CV2) on the secondary or shorted, or the control line is open wer supply or the ground.	(control unit)	E
DTC CC	NFIRMATIC	ON PROCEDU	JRE			BR
1.dtc1	REPRODUC	TION PROCED	URE			
2. Perf	•	nosis for "ABS"	with CONSUL	Γ-ΙΙΙ.		G
YES				to <u>BRC-71, "Diagnosis Procec</u>	<u>lure"</u> .	Н
Diagno	sis Proced	dure			INFOID:000000005517360	
1.снес		TOR				I
2. Disc		actuator and ele	ectric unit (cont disconnection,	rol unit) connector. looseness, etc.		J
YES	pection resul >> GO TO 2. >> Replace o		letected parts.			K
•	•	•	•	'E AND ACTUATOR RELAY P	OWER SUPPLY CIRCUIT	
				ic unit (control unit) harness c		
			1			
		c unit (control unit)		Voltage		M
0	nnector E36	Terminal 1	Ground	Battery voltage		
le the inc	pection resul		Ground	Ballery Vollage		Ν
YES NO	- >> GO TO 3. >> Repair or	replace error-c	•			0
				E AND ACTUATOR RELAY G		
Check th	e continuity b	between ABS a	ctuator and ele	ctric unit (control unit) harness	s connector and ground.	Ρ
ABS actu	ator and electric	c unit (control unit)				

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

Is the inspection result normal?

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C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000005517361

1.CHECK ACTIVE TEST

- 1. Select "ABS", "ACTIVE TEST" and each test menu item in order with CONSULT-III.
- 2. Select "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Test item	Diaplay itam	Display		
rest tiem	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
	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

*: 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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-71, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005532226

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

After removing/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".

>> END

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1166, C1167 SV SYSTEM

Description

INFOID:000000005517363

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

DTC Logic

INFOID:000000005517364

DTC DETECTION LOGIC

DTC	Disp	ay item	Malfun	ction detected condition	Possible cause				
C1166	SV1	5	side is open circuit o	lenoid valve (SV1) on the primary or shorted, or the control line is ope wer supply or the ground.	 Harness or connector ABS actuator and electric unit 	C			
C1167	VDC switch-over solenoid valve (SV2) on the secondary (control unit)								
ртс со	NFIRMATI	ON PROCED	JRE			BF			
1. DTC F	REPRODUC	TION PROCED	DURE						
2. Perfo	-		' with CONSULT	Γ-ΙΙΙ.		G			
YES NO	>> Proceed >> INSPEC	to diagnosis pr TION END	_	to <u>BRC-73, "Diagnosis Proce</u>	adure".	Н			
Diagno	sis Proce	dure			INFOID:000000005517365	1			
1. CHEC		TOR				1			
2. Disco		actuator and el	ectric unit (conti disconnection, l	rol unit) connector. looseness, etc.		J			
YES	pection resu >> GO TO 2	2				K			
~	•	or repair error-o	•	'E AND ACTUATOR RELAY					
				ic unit (control unit) harness		L			
	e vollage be	IWEEN ADS ALL			connector and ground.				
ABS actu	ator and electri	c unit (control unit)		Voltago		N			
Co	nnector	Terminal		Voltage					
	E36	1	Ground	Battery voltage		N			
YES NO	•	s. r replace error-o	•			C			
				'E AND ACTUATOR RELAY					
Uneck th	e continuity	Detween ABS a	ictuator and elec	ctric unit (control unit) harnes	ss connector and ground.	Ρ			
ABS actu	ator and electri	c unit (control unit)							

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

Is the inspection result normal?

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C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000005517366

1.CHECK ACTIVE TEST

- 1. Select "ABS", "ACTIVE TEST" and each test menu item in order with CONSULT-III.
- 2. Select "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Test item	Dianlay itam		Display	
rest item	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
	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

*: 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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-73, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000005532352

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

After removing/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".

>> END

< DTC/CIRCUIT DIAGNOSIS >

U1000, U1002 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:000000005517369

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	E					
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	Harness or connectorCAN communication line	BRC					
U1002	U1002 SYSTEM COOM 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. • ABS actuator and electric unit (control unit)								
DTC CC	NFIRMATION PROCE	DURE							
1. DTC F	REPRODUCTION PROCE	EDURE		Н					
	the ignition switch ON.								
	orm self-diagnosis for "AB J1000" or "U1002" detecte			1					
		procedure. Refer to <u>BRC-75, "Diagnosis Proced</u>	ure".	I					
	>> INSPECTION END								
Diagno	sis Procedure		INFOID:000000005517370	J					
1.PERF	ORM ABS ACTUATOR A	ND ELECTRIC UNIT (CONTROL UNIT) SELF-	DIAGNOSIS						
Perform self-diagnosis for "ABS" with CONSULT-III.									
Is the inspection result normal?									
YES >> Refer to LAN-17, "Trouble Diagnosis Flow Chart".									
	>> INSPECTION END								
Special	Repair Requiremer	nt	INFOID:000000005533017	M					
1.adju	STMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION AND C	ALIBRATION OF DECEL G						
SENSOR				Ν					
		ng angle sensor, be sure to perform the followin		IN					
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description". 									
 After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure. 									
- Adjustr	nent of steering angle so	ensor neutral position: Refer to BRC-9, "ADJ	USTMENT OF STEERING						
	ANGLE SENSOR NEUTRAL POSITION : Description". - Calibration of decel G sensor: Refer to BRC-10, "CALIBRATION OF DECEL G SENSOR : Description".								
2 0	- Calibration of decer & sensor. Relef to <u>BRC-10, CALIBRATION OF DECEL & SENSOR . Description</u> .								
	>> END								

INFOID:000000005517368

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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

INFOID:000000005517373

INFOID:000000005517372

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.

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

 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.

	and electric unit ol unit)	_	Voltage	
Connector	Terminal			
E36	20	Ground	Battery voltage	
	_			

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

	and electric unit ol unit)	_	Voltage			
Connector Terminal						
E36	1	Ground	Battery 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.

	and electric unit ol unit)	_	Voltage	
Connector	Terminal			
E36	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

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

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

BRC-76

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:000000005532206

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E36	13	Ground	Existed
L30	26	Ground	LAISted

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Special Repair Requirement

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

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

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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-78, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005517375

1.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to BRC-78, "Component Inspection".

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-33. "Diagnosis Descrip-</u>tion".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check combination meter. Refer to <u>MWI-34, "CONSULT-III Function (METER/M&A)"</u>.

3.CHECK PARKING BRAKE SWITCH CIRCUIT

- 1. Turn 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 bi	rake switch	Combina	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 harness connector and ground.

INFOID:000000005517376

INFOID:000000005517374

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Parking brake swite			Condition Continuity	Continuity
Connector	Terminal	_	Condition	Continuity
E27	1	Ground	When the parking brake switch is operated.	Existed
E27	I	Giouna	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-80, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005517379

1.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to BRC-81, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

- 1. Disconnect ABS actuator and electric unit (control unit) 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 electr	ric 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-33</u>, "Diagnosis <u>Description"</u>.

Is the inspection result normal?

BRC-80

INFOID:000000005517377

INFOID:000000005517378

VDC OFF SWITCH

Terminal

< DTC/CIRCUIT DIAGNOSIS >

Component Inspection

NO

1. 2.

3.

>> Repair or replace combination meter.

		Is the	inspectio	n result	normal?
--	--	--------	-----------	----------	---------

YES >> INSPECTION END

NO >> Replace VDC OFF switch. INFOID:000000005517380

1.CHECK VDC OFF SWITCH Turn the ignition switch OFF. Disconnect VDC OFF switch harness connector. Check the continuity between VDC OFF switch harness connector terminals. VDC OFF switch Condition Condition When VDC OFF switch is hold pressed. Existed 1 – 2 When releasing VDC OFF switch. Not existed

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ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000005517381

[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	_
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:000000005517382

1.CHECK ABS WARNING LAMP OPERATION

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

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-82. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

YES >> Check combination meter. Refer to <u>MWI-34, "CONSULT-III Function (METER/M&A)"</u>.

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

Special Repair Requirement

INFOID:000000005532354

INFOID:000000005517383

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

After removing/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>.

>> END

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

BRAKE WARNING LAMP

[VDC/TCS/ABS]

Description	INFOID:00000000551738
	×: ON –: OFF
Condition	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	× (Note 2)
EBD function is malfunctioning.	×
 NOTE: 1: Brake warning lamp will turn on in case of parking brake oper (when brake fluid is insufficient). 2: After starting the engine, brake warning lamp is turned off. 	eration (when switch is ON) or of brake fluid level switch operation
Component Function Check	INFOID:000000005517388
1. BRAKE WARNING LAMP OPERATION CHECK 1	
Check that the lamp illuminates for approximately 2 se Is the inspection result normal? YES >> GO TO 2. NO >> Proceed to diagnosis procedure. Refer to 1	
2. BRAKE WARNING LAMP OPERATION CHECK 2	
ing brake pedal. NOTE: Brake warning lamp will turn on in case of parking bra switch operation (when brake fluid is insufficient). <u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Check parking brake switch. Refer to <u>BRC</u>	ke operation (when switch is ON) or of brake fluid level 2-78, "Diagnosis Procedure".
Diagnosis Procedure	INFO/D:00000000551738;
1. CHECK PARKING BRAKE SWITCH	
ing brake pedal. NOTE:	meter turns ON/OFF correctly when operating the park- ke operation (when switch is ON) or of brake fluid leve
Is the inspection result normal?	
YES >> GO TO 2.	
NO >> Check parking brake switch. Refer to BRC	-18, "Diagnosis Procedure".
Perform self-diagnosis for "ABS" with CONSULT-III.	
2.CHECK SELF-DIAGNOSIS Perform self-diagnosis for "ABS" with CONSULT-III. Is the inspection result normal? YES >> Check combination meter. Refer to <u>MWI-3</u> NO >> Check items displayed by self-diagnosis for	

SENSOR

BRC-83

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

After removing/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</u>, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000005517389

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[VDC/TCS/ABS]

Condition	VDC OFF indicator lamp
gnition switch OFF	
For 2 seconds after turning ignition switch ON	X
2 seconds later after turning ignition switch ON	
/DC OFF switch turned ON. (VDC function is OFF.)	×
/DC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×
component Function Check	INFOID:000000005517390
.VDC OFF INDICATOR LAMP OPERATION CHEC	
heck that the lamp illuminates for approximately 2 s	seconds after the ignition switch is turned ON.
the inspection result normal? YES >> GO TO 2.	
NO >> Proceed to diagnosis procedure. Refer to	o BRC-85, "Diagnosis Procedure".
VDC OFF INDICATOR LAMP OPERATION CHEC	-
	ination meter turns ON/OFF correctly when operating the
DC OFF switch.	hadon meter tants on or recorded when operating the
the inspection result normal?	
YES >> INSPECTION END	
NO >> Check VDC OFF switch. Refer to <u>BRC-8</u>	<u>0, "Diagnosis Procedure"</u> .
liagnosis Procedure	INFOID:000000005517391
CHECK VDC OFF SWITCH	
	inction motor turns ON/OFF correctly when energing the
DC OFF switch.	ination meter turns ON/OFF correctly when operating the
the inspection result normal?	
YES >> GO TO 2.	
NO >> Check VDC OFF switch. Refer to <u>BRC-8</u>	<u>0, "Diagnosis Procedure"</u> .
CHECK SELF-DIAGNOSIS	
erform self-diagnosis for "ABS" with CONSULT-III.	
the inspection result normal?	
	-34, "CONSULT-III Function (METER/M&A)".
NO >> Check items displayed by self-diagnosis	

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SLIP INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

SLIP INDICATOR LAMP

Description

INFOID:000000005517393

×: ON A: Blink -: OFF

[VDC/TCS/ABS]

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

Component Function Check

INFOID:000000005517394

1. CHECK SLIP INDICATOR LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-86, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000005517395

1.CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

YES >> Check combination meter. Refer to <u>MWI-34, "CONSULT-III Function (METER/M&A)"</u>.

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

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

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000005517397 В

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VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		Vehicle stopped	0 [km/h (MPH)]	
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	On	
STOP LAWF SW		When brake pedal is not depressed	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position	Vehicle running	1 – 6	
R POSI SIG	Select shift position	CVT shift position (R)	On	
K F 031 313		CVT shift position (other R)	Off	
N POSI SIG	Select shift position	CVT shift position (N)	On	
		CVT shift position (other N)	Off	
P POSI SIG	Select shift position	CVT shift position (P)	On	
1 1 001 010		CVT shift position (other P)	Off	
SLCT LVR POSI	Select shift position	CVT shift position (P, R, N, D, L)	P R N D L	
		Manual mode	##	
OFF SW	VDC OFF switch ON/OFF status	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On	
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel sen-	Vehicle stopped	Approx. 0 d/s	
IAW NATE SEN	sor	Vehicle running	-100 to 100 d/s	

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
DECEL G-SEN	Decel G detected by yaw rate/side/decel G	Vehicle stopped	Approx. 0 G
DECEL G-SEN	sensor	Vehicle running	–1.7 – +1.7 G
ACCEL POS SIG	Open/Close condition of throttle valve	Accelerator pedal not depressed (Engine stopped)	0 %
ACCELLOS SIG	(Linked with accelerator pedal)	Depress accelerator pedal (Engine stopped)	0 - 100 %
SIDE G-SENSOR	Transverse G detected by yaw rate/side/decel	Vehicle stopped	Approx. 0 m/s ²
	G sensor	Vehicle running	– 16.7 – 16.7 m/s ²
STR ANGLE SIG		Driving straight	-3.5 - +3.5°
	Steering angle detected by steering angle sensor	Turn 90 ° to right	Approx. –90 $^\circ$
		Turn 90 ° to left	Approx. +90 $^\circ$
		With engine stopped	0 [tr/min (rpm)]
ENGINE RPM	With engine running	Engine running	Almost in accor- dance with tachome- ter display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	On
I LOID LL V SVV	Diake huld level switch signal status	When brake fluid level switch OFF	Off
PRESS SENSOR	Brake fluid pressure detected by pressure	With ignition switch ON and brake pedal released	Approx. 0 bar
FILESS SENSOR	sensor	With ignition switch ON and brake pedal depressed	0 – 170 bar
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
(Note 2)		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Motor and motor relay operation	Ignition switch ON or engine running (ABS operated)	On
MOTOR RELAY	Motor and motor relay operation	Ignition switch ON or engine running (ABS not operated)	Off
ACTUATOR RLY (Note 2)	Actuator relay operation	Vehicle stopped (Engine running)	On
		Vehicle stopped (Ignition switch ON)	Off
	ABS warning lamp	When ABS warning lamp is ON	On
ABS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	Off
	VDC OFF indicator lamp (Note 3)	When VDC OFF indicator lamp is ON	On
OFF LAMP		When VDC OFF indicator lamp is OFF	Off
	SLIP indicator lamp (Note 3)	When SLIP indicator lamp is ON	On
SLIP LAMP		When SLIP indicator lamp is blinking	
		When SLIP indicator lamp is OFF	Off
CV1	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
CV2	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
S)/4	Operation status of each colonaid using	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
SV1	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

	Display content	Data monitor	
Monitor item		Condition	Reference value in normal operation
SV2	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT- III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
EBD SIGNAL	EBD operation	EBD is active	On
		EBD is inactive	Off
ABS SIGNAL	ABS operation	ABS is active	On
ABS SIGNAL		ABS is inactive	Off
TCS SIGNAL	700	TCS is active	On
103 SIGNAL	TCS operation	TCS is inactive	Off
VDC SIGNAL	VPC operation	VDC is active	On
VDC SIGNAL	VDC operation	VDC is inactive	Off
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	On
		EBD is normal	Off
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	On
		ABS is normal	Off
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	On
		TCS is normal	Off
	VDC fail-safe signal	In VDC fail-safe	On
VDC FAIL SIG		VDC is normal	Off
EBD WARN LAMP	Brake warning lamp (Note 3)	When brake warning lamp is ON	On
EDD WARIN LAWF		When brake warning lamp is OFF	Off
	Crank operation	Crank is active	On
CRANKING SIG		Crank is inactive	Off
4WD FAIL REQ	ETS fail status	ETS fail	On
		ETS normal	Off
214/0/414/0	Drive axle	2WD model	2WD
2WD/4WD		AWD model	4WD

NOTE:

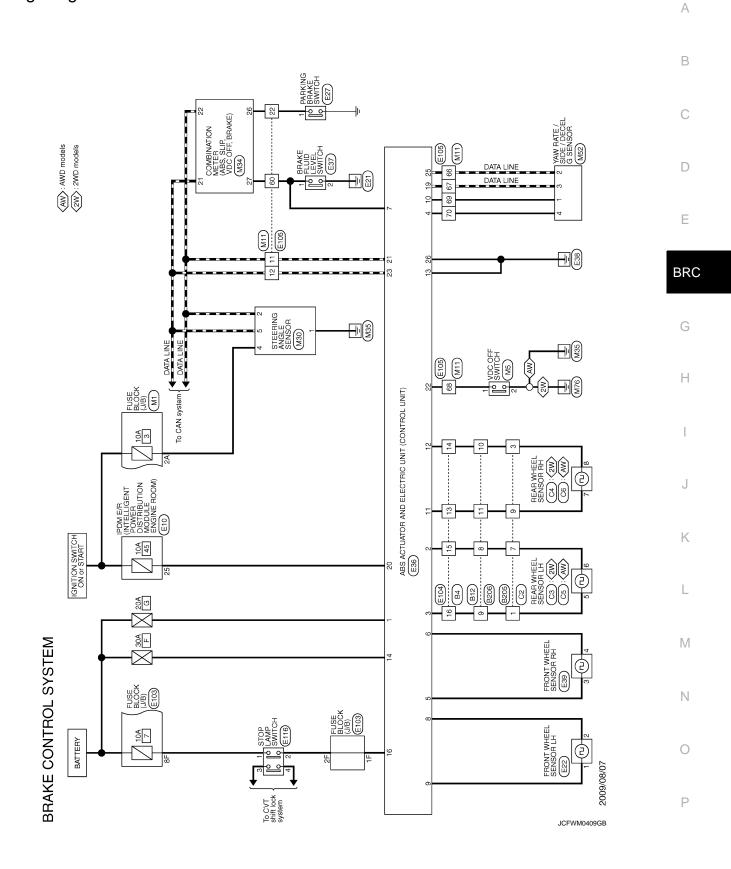
- 1: Confirm tire pressure is normal.
- 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-82, "Description".
- Brake warning lamp: Refer to BRC-83, "Description".
- VDC OFF indicator lamp: Refer to BRC-85, "Description".
- SLIP indicator lamp: Refer to <u>BRC-86, "Description"</u>.

< ECU DIAGNOSIS INFORMATION >

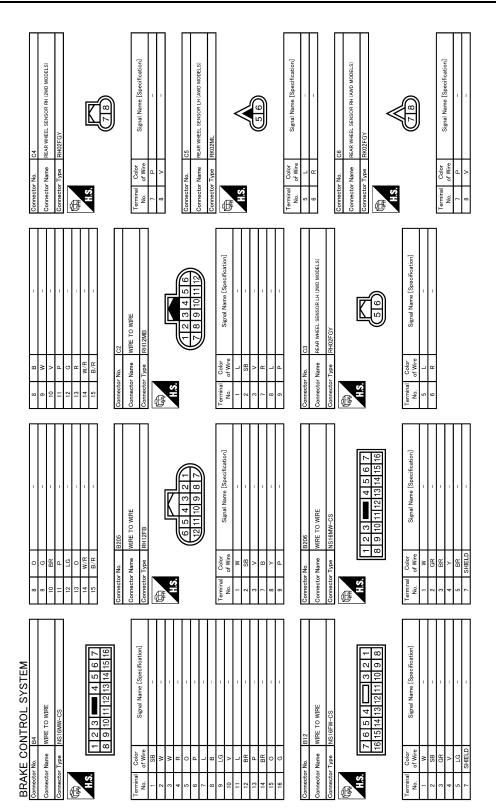
[VDC/TCS/ABS]

Wiring Diagram -BRAKE CONTROL SYSTEM-





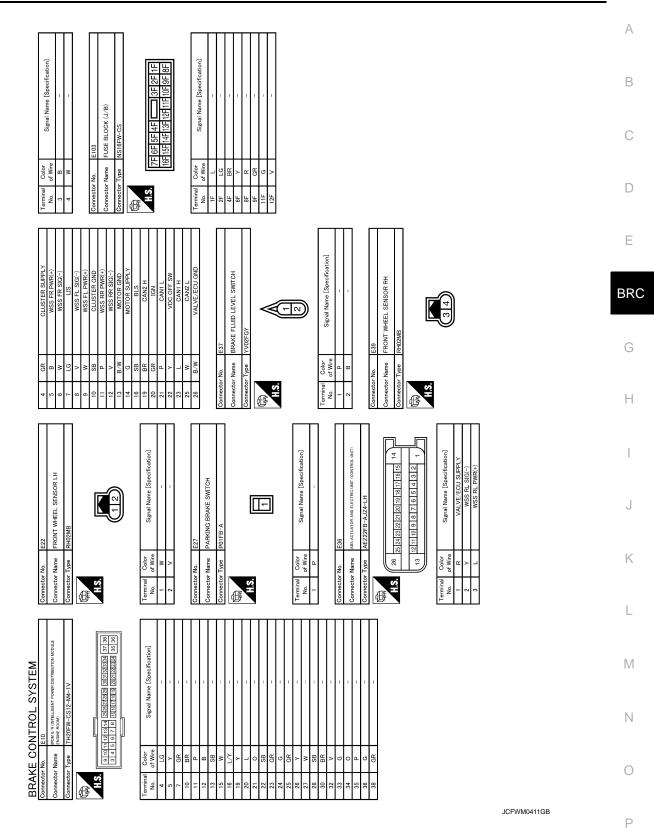
< ECU DIAGNOSIS INFORMATION >



JCFWM0410GB

< ECU DIAGNOSIS INFORMATION >

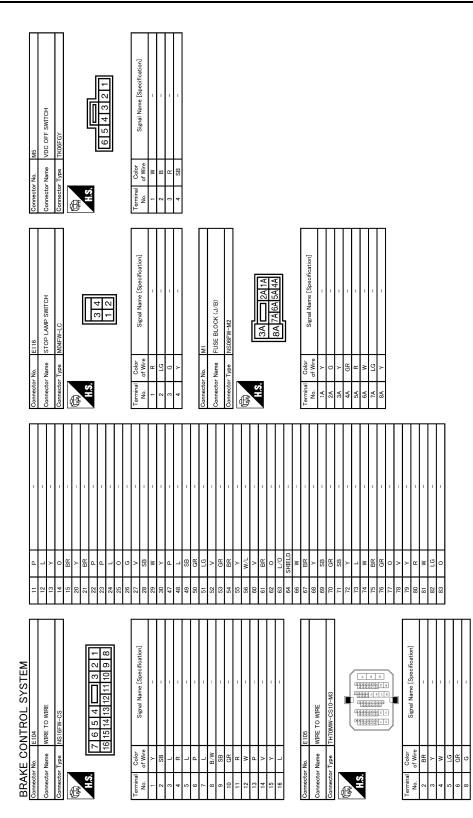
(VDC/TCS/ABS)



Revision: 2009 September

< ECU DIAGNOSIS INFORMATION >

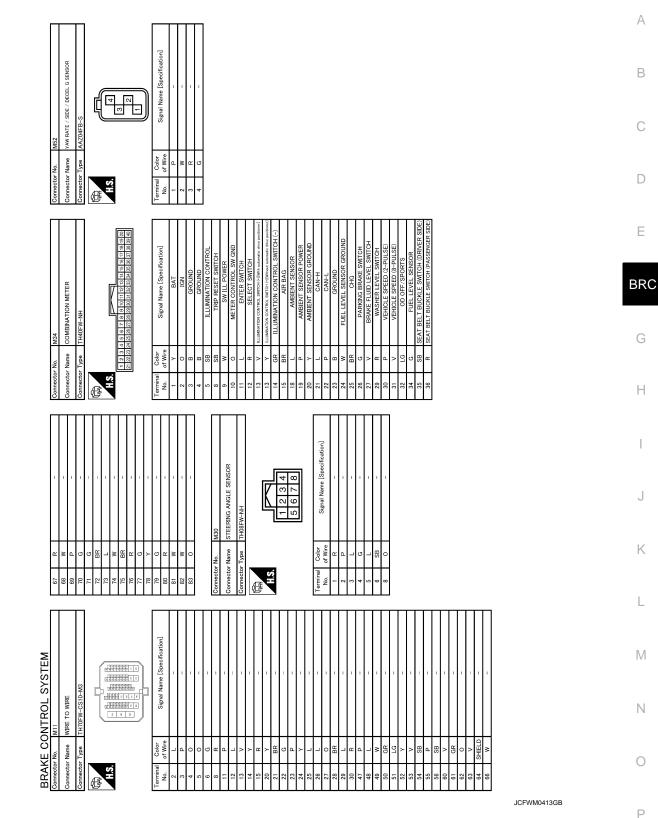
[VDC/TCS/ABS]



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< ECU DIAGNOSIS INFORMATION >

(VDC/TCS/ABS)



Fail-Safe

INFOID:000000005517399

ABS, EBD SYSTEM

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

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

• 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 OFF indicator lamp, SLIP indicator 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-III.

DTC No. Index

INFOID:000000005517400

DTC	Items (CONSULT screen terms)	Reference	
C1101	RR RH SENSOR-1	BRC-33, "DTC Logic"	
C1102	RR LH SENSOR-1		
C1103	FR RH SENSOR-1		
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2		
C1107	FR RH SENSOR-2	BRC-36, "DTC Logic"	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-39, "DTC Logic"	
C1110	CONTROLLER FAILURE	BRC-41, "DTC Logic"	
C1111	PUMP MOTOR	BRC-42, "DTC Logic"	
C1113	G SENSOR	BRC-44, "DTC Logic"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-47, "DTC Logic"	
C1116	STOP LAMP SW	BRC-50, "DTC Logic"	
C1120	FR LH IN ABS SOL	BRC-52, "DTC Logic"	
C1121	FR LH OUT ABS SOL	BRC-54, "DTC Logic"	
C1122	FR RH IN ABS SOL	BRC-52, "DTC Logic"	
C1123	FR RH OUT ABS SOL	BRC-54, "DTC Logic"	
C1124	RR LH IN ABS SOL	BRC-52, "DTC Logic"	
C1125	RR LH OUT ABS SOL	BRC-54, "DTC Logic"	
C1126	RR RH IN ABS SOL	BRC-52, "DTC Logic"	
C1127	RR RH OUT ABS SOL	BRC-54, "DTC Logic"	
C1130	ENGINE SIGNAL 1	BRC-56, "DTC Logic"	
C1140	ACTUATOR RLY	BRC-58, "DTC Logic"	
C1142	PRESS SEN CIRCUIT	BRC-60, "DTC Logic"	
C1143	ST ANG SEN CIRCUIT	BRC-62, "DTC Logic"	
C1144	ST ANG SEN SIGNAL	BRC-64, "DTC Logic"	
C1145	YAW RATE SENSOR		
C1146	SIDE G-SEN CIRCUIT	BRC-44, "DTC Logic"	
C1155	BR FLUID LEVEL LOW	BRC-66, "DTC Logic"	
C1160	DECEL G SEN SET	BRC-68, "DTC Logic"	
C1161	SIDE G SEN SET	BRC-69, "DTC Logic"	

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

< ECU DIAGNOSIS INFORMATION >

DTC	Items (CONSULT screen terms)	Reference	_
C1162	PRESS SEN SET	BRC-70, "DTC Logic"	- A
C1164	CV1		-
C1165	CV2	BRC-71, "DTC Logic"	В
C1166	SV1		-
C1167	SV2	BRC-73, "DTC Logic"	
U1000	CAN COMM CIRCUIT	PPC 75 "DTC Logic"	C
U1002	SYSTEM COMM (CAN)	BRC-75, "DTC Logic"	

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000005517401

1.CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-47, "General Specifications"</u>. <u>Is the inspection result normal?</u>

YES >> GO TO 2.

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles.

- Front
- 2WD models: Refer to FAX-8, "Inspection".
- AWD models: Refer to FAX-35, "Inspection".
- Rear
- 2WD models: Refer to <u>RAX-4, "Inspection"</u>.
- AWD models: Refer to RAX-11, "Inspection"
- Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 $\mathbf{3}$. Check wheel sensor and sensor rotor

Check the following.

- Wheel sensor installation for damage.
- Front wheel sensor: Refer to <u>BRC-110, "FRONT WHEEL SENSOR : Exploded View"</u>.
- Rear wheel sensor: Refer to BRC-111, "REAR WHEEL SENSOR : Exploded View".
- Wheel sensor connector connection.
- Wheel sensor harness inspection.
- Sensor rotor installation for damage.
- Front sensor rotor: Refer to BRC-112, "FRONT SENSOR ROTOR : Exploded View".
- Rear sensor rotor: Refer to BRC-112, "REAR SENSOR ROTOR : Exploded View".

Is the inspection result normal?

YES >> GO TO 4.

- >> Replace wheel sensor or sensor rotor.
 - Front wheel sensor: Refer to BRC-110, "FRONT WHEEL SENSOR : Exploded View".
 - Rear wheel sensor: Refer to <u>BRC-111, "REAR WHEEL SENSOR : Exploded View"</u>.
 - Front sensor rotor: Refer to <u>BRC-112, "FRONT SENSOR ROTOR : Exploded View"</u>.
 - Rear sensor rotor: Refer to <u>BRC-112, "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-III.

UNEXPECTED PEDAL REACTION

UNEXPECTED PEDAL REACTION	
< SYMPTOM DIAGNOSIS >	[VDC/TCS/ABS]
UNEXPECTED PEDAL REACTION	
Diagnosis Procedure	A
1. CHECK BRAKE PEDAL, BRAKE BOOSTER, BRAKE MASTER CYLINDER	E
 Check 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>. 	C
<u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK BRAKE PEDAL STROKE	C
Check brake pedal stroke. Refer to <u>BR-9</u> , "Inspection and Adjustment".	E
<u>Is the stroke too large?</u> YES >> Bleed air from brake tube and hose. Refer to <u>BR-13, "Bleeding Brake System"</u> NO >> GO TO 3.	BF
3. CHECK FUNCTION	
Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Chec normal in this condition. Connect connector after inspection.	k if braking force is
Is the inspection result normal? YES >> Normal NO >> Check brake system.	F
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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000005517403

[VDC/TCS/ABS]

CAUTION:

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]	
ABS FUNCTION DOES NOT OPERATE	A
Diagnosis Procedure	
CAUTION: ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1.CHECK ABS WARNING LAMP DISPLAY	В
Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?	С
YES >> Normal NO >> Perform self-diagnosis.	D

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000005517405

[VDC/TCS/ABS]

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

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

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal. Refer to <u>BR-21, "Inspection and Adjustment"</u>.

2.SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3.

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

3.SYMPTOM CHECK 3

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

Do symptoms occur?

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

SYMPTOM DIAGNOSIS > [VDC/TCS/ABS VEHICLE JERKS DURING VDC/TCS/ABS CONTROL Diagnosis Procedure I.syMPTOM CHECK Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES >> Normal. No >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III. Are applied in provide indicated 19
Diagnosis Procedure 1.symptom CHECK Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES YES SO >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
1.SYMPTOM CHECK Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES >> Normal. NO >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
Check if the vehicle jerks during VDC/TCS/ABS control. <u>Is the inspection result normal?</u> YES >> Normal. NO >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
Is the inspection result normal? YES >> Normal. NO >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
YES >> Normal. NO >> GO TO 2. 2. CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
NO >> GO TO 2. 2.CHECK SELF-DIAGNOSIS RESULTS Perform self-diagnosis for "ABS" with CONSULT-III.
Perform self-diagnosis for "ABS" with CONSULT-III.
•
Are self-diagnosis results indicated?
YES >> Check corresponding items, make repairs, and perform self-diagnosis for "ABS" with CONSULT III.
NO >> GO TO 3.
3. CHECK CONNECTOR
1. Turn the ignition switch OFF.
 Disconnect ABS actuator and electric unit (control unit) harness connector. Check terminal for deformation, disconnection, looseness, etc.
 Securely connect connectors and perform self-diagnosis for "ABS" with CONSULT-III.
Are self-diagnosis results indicated?
YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4.
4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS
Perform self-diagnosis for "ENGINE" and "TRANSMISSION" with CONSULT-III.
<u>Are self-diagnosis results indicated?</u>
YES >> Check the corresponding items.
NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-113. "Exploded View"</u> .

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< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000005517407

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

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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" INFOID:000000005688780

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:

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

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

WARNING:

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

FOR USA AND CANADA : Precaution Necessary for Steering Wheel Rotation after INFOID:000000005688783

Battery Disconnect

NOTE:

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

Ν For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

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

OPERATION PROCEDURE

- Connect both battery cables. NOTE: Supply power using jumper cables if battery is discharged.
- 2. Turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- Perform the necessary repair operation. 4

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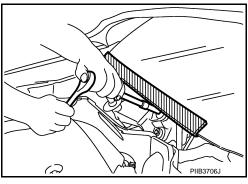
< PRECAUTION >

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

FOR USA AND CANADA : Precaution for Procedure without Cowl Top Cover

INFOID:000000005688785

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



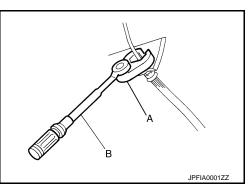
FOR USA AND CANADA : Precaution for Brake System

WARNING:

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

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.
- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



FOR USA AND CANADA : Precaution for Brake Control

INFOID:000000005517411

- 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 brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.

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INFOID:000000005517410

< PRECAUTION >

- 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.

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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:

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

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

WARNING:

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

FOR MEXICO : Precaution Necessary for Steering Wheel Rotation after Battery Dis-

INFOID:000000005688784

NOTE:

connect

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

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

OPERATION PROCEDURE

- Connect both battery cables.
 NOTE: Supply power using jumper cables if battery is discharged.
- 2. Turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.

< PRECAUTION >

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

FOR MEXICO : Precaution for Procedure without Cowl Top Cover

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

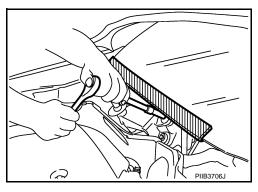
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FOR MEXICO : Precaution for Procedure without Cowl Top Cover

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INFOID:000000005517414

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



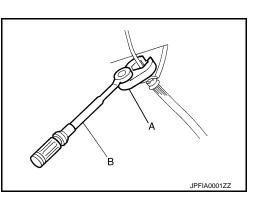
FOR MEXICO : Precaution for Brake System

WARNING:

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Brake fluid use refer to <u>MA-16, "FOR MEXICO : Fluids and Lubricants"</u>.
- 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.
- 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) connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



< PRECAUTION >

FOR MEXICO : Precaution for Brake Control

- 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 В (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.). BRC
- When driving with worn or deteriorated suspension, tires and brake-related parts.

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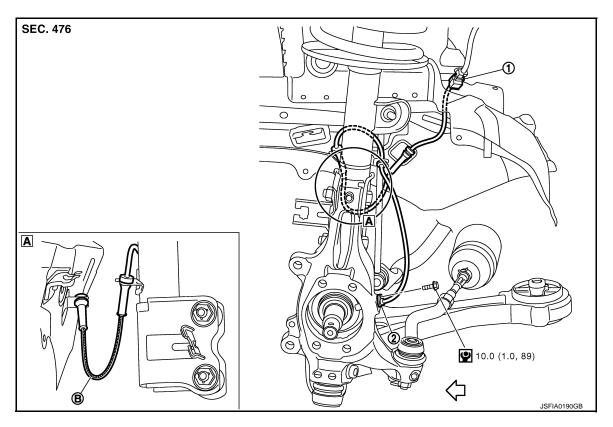
[VDC/TCS/ABS]

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000005517416



- 1. Front LH wheel sensor connector 2. Front LH wheel sensor
- B. White line (slant line)
- : 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

INFOID:000000005517417

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 white lines (B) are not twisted.

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 >

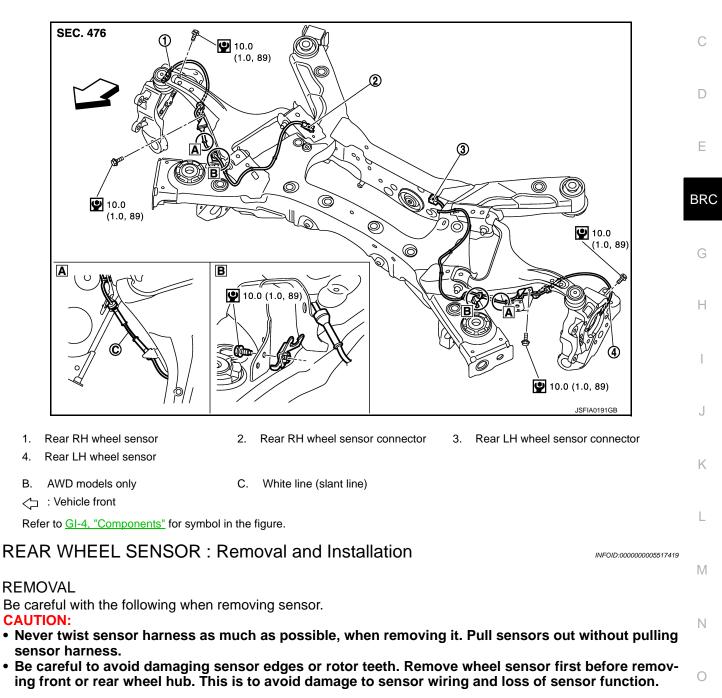
• When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:000000005517418 B

[VDC/TCS/ABS]



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.
- 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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RAX-5, "Removal and Installation" (2WD models), RAX-15, "Removal and Installation" (AWD models).

INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to RAX-5, "Removal and Installation" (2WD models), RAX-15, "Removal and Installation" (AWD models).

< REMOVAL AND INSTALLATION >

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Exploded View

Refer to FAX-10, "Exploded View" (2WD models), FAX-37, "Exploded View" (AWD models).

FRONT SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-10, "Removal and Installation" (2WD models), FAX-37, "Removal and Installation" (AWD models).

SENSOR ROTOR

INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to FAX-10, "Removal and Installation" (2WD models), FAX-37, "Removal and Installation" (AWD models). REAR SENSOR ROTOR

REAR SENSOR ROTOR : Exploded View

Refer to RAX-5, "Exploded View" (2WD models), RAX-13, "Exploded View" (AWD models).

REAR SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to

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< REMOVAL AND INSTALLATION >

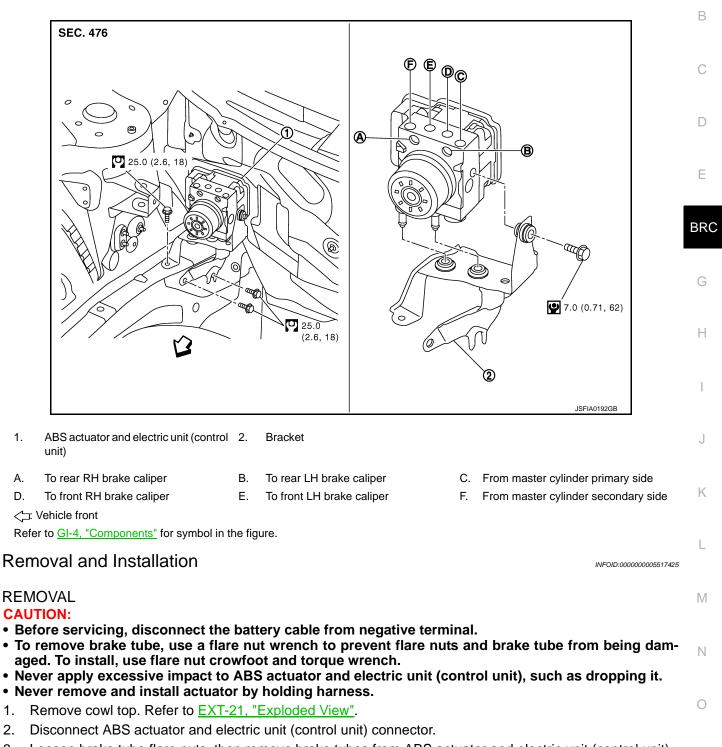
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

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[VDC/TCS/ABS]



- Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- Remove ABS actuator and electric unit (control unit) bracket mounting nut. 4.
- 5. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

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

CAUTION:

1.

2.

1.

Before servicing, disconnect the battery cable from negative terminal.

BRC-113

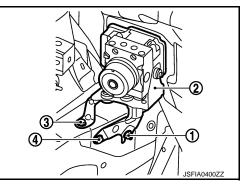
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< REMOVAL AND INSTALLATION >

- 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 connector is securely locked.
- After removing/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 <u>BRC-10, "CALIBRATION OF DECEL G SENSOR : 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).

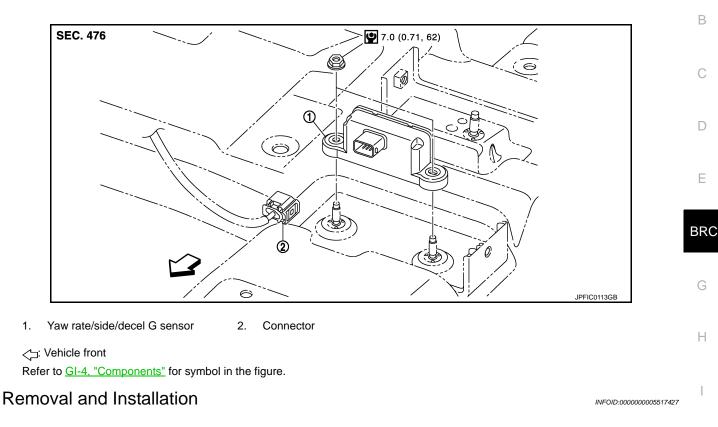


< REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

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REMOVAL

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-20, "Exploded View".
- 2. Disconnect yaw rate/side/decel G sensor harness connector.
- 3. Remove mounting nuts.
- 4. Remove yaw rate/side/decel G sensor.

INSTALLATION

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

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.
- After work, make sure to calibration of decel G sensor. Refer to <u>BRC-10, "CALIBRATION OF DECEL</u>
 <u>G SENSOR : Description"</u>.

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STEERING ANGLE SENSOR

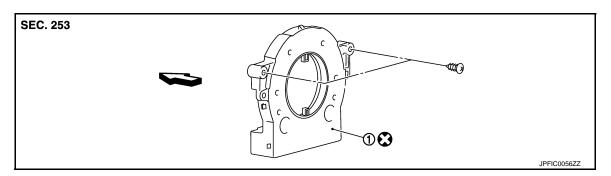
< REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR

Exploded View

INFOID:000000005517428

[VDC/TCS/ABS]



1. Steering angle sensor

C: Vehicle front

Removal and Installation

INFOID:000000005517429

REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-14, "Exploded View"</u>.
- 2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

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

- Never reuse steering angle sensor.
- After work, make sure to adjust neutral position of steering angle sensor. Refer to <u>BRC-9, "ADJUST-</u> <u>MENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.