# SECTION BRAKE CONTROL SYSTEM

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# < PRECAUTION > PRECAUTION PRECAUTIONS

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

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

### WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

### WARNING:

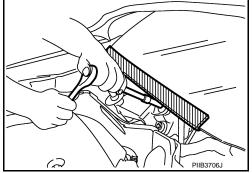
Always observe the following items for preventing accidental activation.

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

### Precaution for Procedure without Cowl Top Cover

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



# PRECAUTIONS

### Precautions for Removing Battery Terminal

• When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

### NOTE:

< PRECAUTION >

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

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

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

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

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

### Precaution for Brake System

### WARNING:

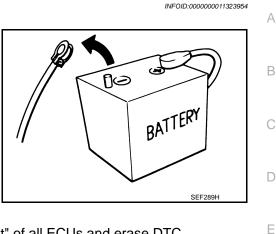
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed <sup>G</sup> with a dust collector. Never splatter the dust with an air blow gun.

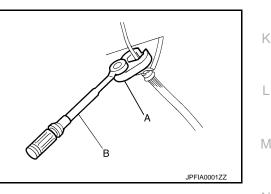
- Brake fluid use refer to <u>MA-10, "Fluids and Lubricants"</u>.
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- 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 a crowfoot (A) and torque wrench (B).
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.

# Precaution for Brake Control System

- Always perform a pre-driving check to drive the vehicle.
- Always check speed and safety while driving the vehicle.
- To operate CONSULT while driving, more than one person is required to be in the vehicle to avoid interference to driving and ensure safety.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC function, TCS function, ABS function EBD function or brake limited slip differential (BLSD) function operates. This is not a malfunction because it is caused by VDC function, TCS function, ABS function EBD function or brake limited slip differential (BLSD) function that is normally operated.
- 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.
- Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.

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## PRECAUTIONS

### < PRECAUTION >

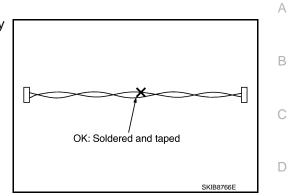
- When a malfunction is indicated, always collect information from the customer about conditions of occurrence, estimate cause and perform operation. Check brake booster operation, brake fluid level and brake fluid leakage, as well as electrical system.
- The optimum performance is achieved by control for VDC function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function when all of brakes, suspensions and tires installed on the vehicle are the specified size and parts. Brake performance and controllability may be negatively affected when other parts than the specified are installed.
- Brake stopping distance may become longer and steering stability may be negatively affected, when tires in different size and combination or other parts than the specified are used.
- When a radio (including wiring), antenna and antenna lead line are located near ABS actuator and electric unit (control unit), a malfunction or improper operation may occur for the control of VDC function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- When the following items are replaced by other parts than genuine parts or modified, ABS warning lamp, brake warning lamp and VDC warning lamp may turn ON, and the control may not operate normally for VDC function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- Suspension component parts (shock absorber, spring, bushing and others)
- Tire and wheel (other than the specified size)
- Brake component parts (brake pad, disc rotor, brake caliper and others)
- Engine component parts (ECM, muffler and others)
- Body reinforcement component parts (rollover bar, tower bar and others)
- When suspension, tire and brake component parts are excessively worn or deteriorated and the vehicle is driven, ABS warning lamp, brake warning lamp and VDC warning lamp may turn ON, and the control may not operate normally for VDC function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- ABS warning lamp, brake warning lamp and VDC warning lamp may turn ON, when only front wheel or rear wheel is rotated using a free roller. This is not a malfunction, because it is caused by wheel speed difference between wheel that is rotated and wheel that is not rotated. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.
- When power supply voltage is not normal, ABS warning lamp, brake warning lamp and VDC warning lamp turn ON. ABS actuator and electric unit (control unit) stops control for VDC function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function. Ordinary brake operates. After power supply returns to normal, ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF. The control becomes operative for VDC function, TCS function, ABS function, ABS function (BLSD) function and brake limited slip differential (BLSD) function and brake limited slip differential (BLSD) function.
- Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function or brake limited slip differential (BLSD) function is operated. This is not a malfunction because it is caused by VDC function, TCS function or brake limited slip differential (BLSD) function that is operated normally.
- VDC warning lamp may turn ON and VDC function, TCS function and brake limited slip differential (BLSD) function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course). This is not a malfunction if the status returns to normal for VDC function, TCS function and brake limited slip differential (BLSD) function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.
- A malfunction in yaw rate/side G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function, TCS function and brake limited slip differential (BLSD) function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal for VDC function, TCS function and brake limited slip differential (BLSD) function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.

# PRECAUTIONS

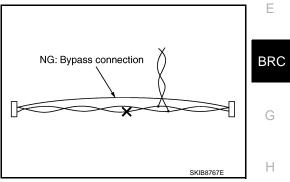
### < PRECAUTION >

# Precaution for Harness Repair

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



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





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# < PREPARATION > PREPARATION

# PREPARATION

# **Commercial Service Tool**

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Tool name		Description
Power tool	PBIC0190E	Loosening bolts and nuts

### **COMPONENT PARTS**

### < SYSTEM DESCRIPTION >

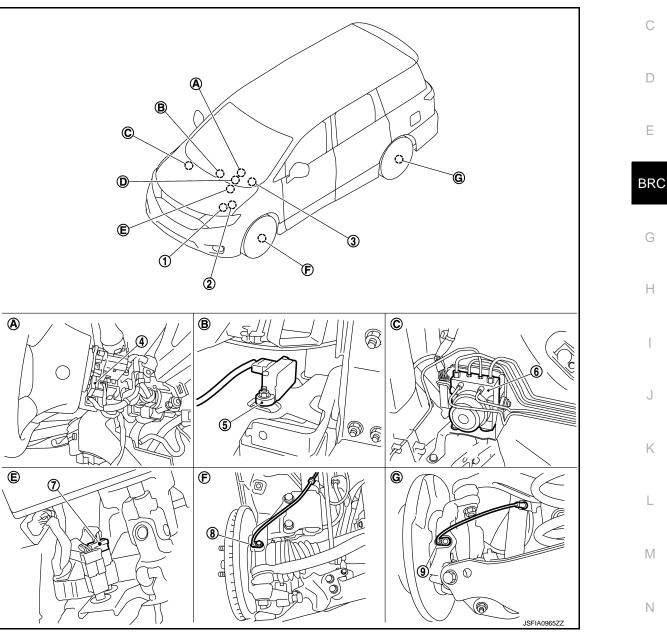
# SYSTEM DESCRIPTION COMPONENT PARTS

**Component Parts Location** 

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[WITH VDC]



- A. Back of spiral cable assembly
- D. ABS warning lamp, brake warning lamp, VDC warning lamp, VDC OFF indicator lamp (in combination meter)
- G. Rear axle housing

- B. Inside instrument stay cover
- E. Brake pedal

- C. Inside engine room (RH side)F. Steering knuckle
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# **COMPONENT PARTS**

### < SYSTEM DESCRIPTION >

No.	Components	Function
1.	тсм	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Shift position signal</li> <li>Current gear position signal</li> <li>P range signal</li> <li>R range signal</li> <li>N range signal</li> </ul>
2.	ECM	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Accelerator pedal position signal</li> <li>Engine speed signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Target throttle position signal</li> </ul>
3.	VDC OFF switch	BRC-12, "VDC OFF Switch"
4.	Steering angle sensor	BRC-11, "Steering Angle Sensor"
5.	Yaw rate/side G sensor	BRC-11, "Yaw Rate/Side G Sensor"
6.	ABS actuator and electric unit (control unit)	BRC-10, "ABS Actuator and Electric Unit (Control Unit)"
7.	Stop lamp switch	BRC-11, "Stop Lamp Switch"
8.	Front wheel sensor	BRC-11, "Wheel Sensor and Sensor Rotor"
9.	Rear wheel sensor	

## ABS Actuator and Electric Unit (Control Unit)

INFOID:000000011323960

Electric unit (control unit) is integrated with actuator and comprehensively controls VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.

### ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure, engine and transaxle are controlled according to signals from each sensor.
- If malfunction is detected, the system enters fail-safe mode.

### ACTUATOR

The following components are integrated with ABS actuator.

Pump

Feeds brake fluid by the motor.

Motor

Activates the pump according to signals from ABS actuator and electric unit (control unit).

Motor Relay

Operates the motor ON/OFF according to signals from ABS actuator and electric unit (control unit).

### Actuator Relay (Main Relay)

Operates each valve ON/OFF according to signals from ABS actuator and electric unit (control unit).

ABS IN Valve

Switches the fluid pressure line to increase or hold according to signals from control unit.

NOTE:

Valve is a solenoid valve.

ABS OUT Valve

Switches the fluid pressure line to increase, hold or decrease according to signals from control unit. **NOTE:** 

Valve is a solenoid valve.

Cut Valve 1, Cut Valve2

Shuts off the ordinary brake line from master cylinder, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.

Suction Valve 1, Suction Valve 2

### **BRC-10**

### **COMPONENT PARTS** [WITH VDC] < SYSTEM DESCRIPTION > Supplies the brake fluid from master cylinder to the pump, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated. А Inlet Valve Brake fluid sucked from the reservoir by the pump does not backflow. NOTE: В Valve is a check valve. **Outlet Valve** Brake fluid discharged from the pump does not backflow. NOTE: Valve is a check valve. D Return Check Valve Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released. Е Pressure sensor Detects the brake fluid pressure and transmits signal to control unit. Reservoir BRC Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper. Damper Reduces the vibrations travelling to the brake pedal during the operation of the VDC function, TCS function, ABS function, EBD function, or brake limited slip differential (BLSD) function. Wheel Sensor and Sensor Rotor INFOID:000000011323961 Н NOTE: Wheel sensor of front wheel is installed on steering knuckle. Sensor rotor of front wheel is integrated in wheel hub and bearing assembly. Wheel sensor of rear wheel is installed on axle housing. Sensor rotor of rear wheel is integrated in wheel hub and bearing assembly. Never measure resistance and voltage value using a tester because sensor is active sensor. • Downsize and weight reduction is aimed. IC for detection portion -Line of magnetic force and magnet for sensor rotor are adopted. Sensor rotor Power supply is supplied to detection portion so that magnetic field S line is read. Magnetic field that is detected is converted to current Ν signal. When sensor rotor rotates, magnetic field changes. Magnetic field Sensor Amplifier circuit change is converted to current signals (rectangular wave) and is transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed. M JPFIC0131GB Stop Lamp Switch INFOID:000000011323962 Ν Detects the operation status of brake pedal and transmits converted electric signal to ABS actuator and electric unit (control unit). C Steering Angle Sensor INFOID:000000011323963

Detects the following information and transmits steering angle signal to ABS actuator and electric unit (control unit) via CAN communication.

- Steering wheel rotation amount
- Steering wheel rotation angular velocity
- Steering wheel rotation direction

### Yaw Rate/Side G Sensor

Calculates the following information that affects the vehicle, and transmits a signal to ABS actuator and electric unit (control unit) via communication lines.

# BRC-11

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# **COMPONENT PARTS**

### < SYSTEM DESCRIPTION >

• Vehicle rotation angular velocity (yaw rate signal)

Vehicle lateral acceleration (side G signal)

### Brake Fluid Level Switch

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[WITH VDC]

Detects the brake fluid level in reservoir tank and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication, when brake fluid level is the specified level or less.

## VDC OFF Switch

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- This is an integrated switch with switches for other functions.
- Non-operational status or standby status of the following functions can be selected using VDC OFF switch.
   VDC OFF indicator lamp indicates the operation status of function. (ON: Non-operational status, OFF: Standby status)
- VDC function
- TCS function

### NOTE:

- ABS function, EBD function and Brake limited slip differential (BLSD) function control operates.
- VDC OFF indicator lamp turns OFF (standby status) when the engine is started again after it is stopped once while VDC OFF indicator lamp is ON (non-operational status).

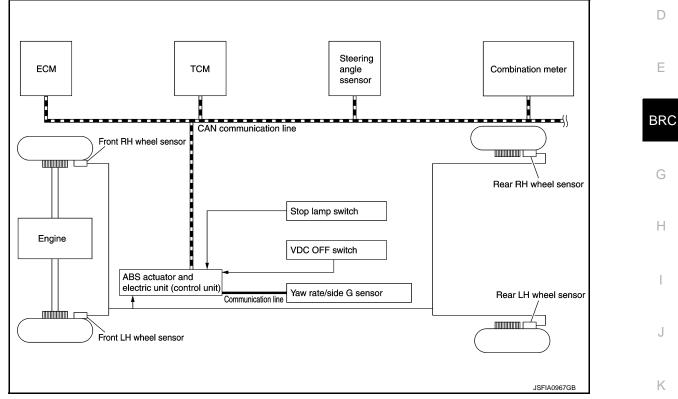
### < SYSTEM DESCRIPTION >

# SYSTEM

### System Description

- The system switches fluid pressure of each brake caliper to increase, to hold or to decrease according to signals from control unit in ABS actuator and electric unit (control unit). This control system is applied to VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

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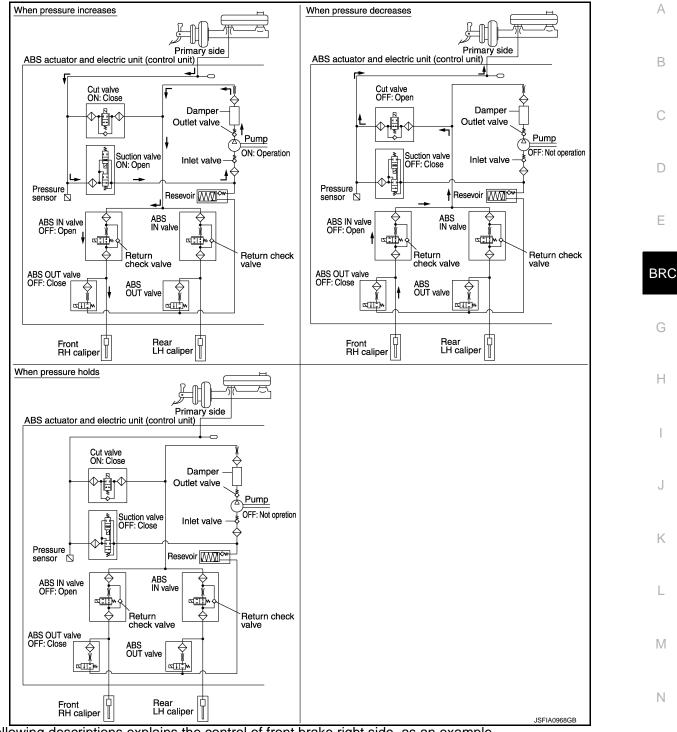
Component	Signal description
Yaw rate/side G sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line<sup>*</sup>.</li> <li>Yaw rate signal</li> <li>Side G sensor signal</li> </ul>
ECM	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Accelerator pedal position signal</li> <li>Engine speed signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Target throttle position signal</li> </ul>
ТСМ	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Shift position signal</li> <li>Current gear position signal</li> <li>P range signal</li> <li>N range signal</li> <li>R range signal</li> </ul>
Steering angle sensor	<ul><li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li><li>Steering angle sensor signal</li></ul>
Combination meter	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>ABS warning lamp signal</li> <li>Brake warning lamp signal</li> <li>VDC warning lamp signal</li> <li>VDC OFF indicator lamp signal</li> </ul>

\*: Communication line between yaw rate/side G sensor and ABS actuator and electric unit (control unit)

VALVE OPERATION [VDC FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

### < SYSTEM DESCRIPTION >

### [WITH VDC]



The following descriptions explains the control of front brake right side, as an example.

### When Pressure Increases

The control unit closes the cut valve 1 port and opens the suction valve 1 port by supplying current to the cut valve 1 and the suction valve 1. Fluid pressure generated in the master cylinder passes through the suction valve 1 and the fluid pressure is pressurized by the pump. Since power is not applied to the ABS IN valve and the ABS OUT valve, the port of ABS IN valve is open and that of the ABS out valve is closed. This enables the supply of intensified fluid pressure to the front RH caliper.

### When Pressure Holds

The control unit closes the cut valve 1 port by supplying current to the cut valve 1. Since power is not applied to the suction valve 1, the suction valve 1 port closes. The ABS IN valve port opens and the ABS OUT valve port closes because power is not supplied to the ABS OUT valve. Since each port of the cut valve 1 and suc-

### < SYSTEM DESCRIPTION >

tion valve 1 is closed, the paths to the master cylinder, front RH caliper, and pump and reservoir are cut to maintain fluid pressure of the front RH caliper.

### When Pressure Decreases

Since power is not supplied to the cut valve 1, suction valve 1, ABS IN valve, and ABS OUT valve, each port of the suction valve 1 and the ABS OUT valve is closed and the ports of the cut valve 1 and the ABS IN valve are open. This allows front RH caliper fluid pressure to flow into the cylinder side.

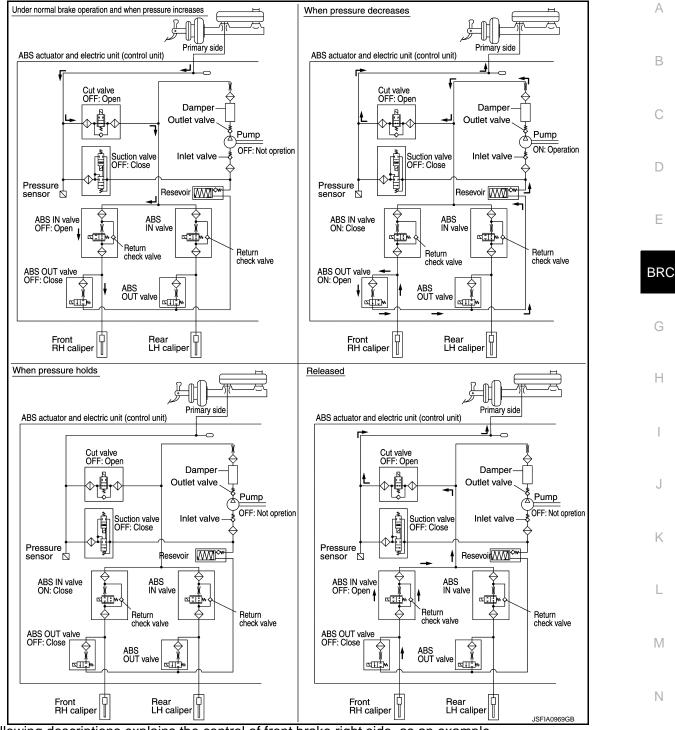
### Component Parts and Function

Component	Function
Pump	Feeds brake fluid by the motor.
Motor	Activates the pump according to signals from ABS actuator and electric unit (control unit).
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.
Inlet valve	Brake fluid sucked from the reservoir by the pump does not backflow.
Outlet valve	Brake fluid discharged from the pump does not backflow.
Return check valve	Returns the brake fluid from brake caliper and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released.
Pressure sensor	Detects the brake fluid pressure and transmits signal to control unit.
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreas- es when decreasing pressure of brake caliper and wheel cylinder.
Damper	Reduces the vibrations travelling to the brake pedal during the operation of the VDC function, TCS function, ABS function, EBD function, or brake limited slip differential (BLSD) function.

VALVE OPERATION (ABS FUNCTION AND EBD FUNCTION)

### < SYSTEM DESCRIPTION >

[WITH VDC]



The following descriptions explains the control of front brake right side, as an example.

### Under Normal Brake Operation

Since power is not supplied to the ABS IN valve and the ABS OUT valve, the ABS IN valve port is open and the ABS OUT valve port is closed. This allows the master cylinder fluid pressure to be sent to the front RH caliper and blocks the brake fluid passage to the reservoir.

### When Pressure Increases

The control unit pressurizes the inside of the brake caliper by opening the ABS IN valve port and closing the ABS OUT valve port. After breaking the circuit, the valves operate in the same way as described in "Under Normal Brake Operation." The fluid amount supplied from the master cylinder to the brake caliper is controlled, according to the power supply cut-off time (time to open the port) to the ABS IN valve.

When Pressure Holds

### < SYSTEM DESCRIPTION >

The control unit passes an electric current to the ABS IN valve and closes the ABS IN valve port. Since power is not supplied to the ABS OUT valve, its port is closed. The paths to the brake caliper, master cylinder, and reservoir are cut off. This allows the front RH caliper fluid pressure to be maintained.

### When Pressure Decreases

The control unit closes the ABS IN valve port and opens the ABS OUT valve port by supplying power to the ABS IN valve and the ABS OUT valve. The brake fluid of the front RH caliper passes through the ABS OUT valve to the reservoir and stays in the reservoir. After this the brake fluid is pumped up to return to the master cylinder.

### When brake released

The fluid pressure returns from the front RH caliper to the master cylinder through the return check valve opened by the ABS IN valve port and fluid pressure.

### Component Parts and Function

Component	Function
Pump	Feeds brake fluid by the motor.
Motor	Activates the pump according to signals from ABS actuator and electric unit (control unit).
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.
Inlet valve	Brake fluid sucked from the reservoir by the pump does not backflow.
Outlet valve	Brake fluid discharged from the pump does not backflow.
Return check valve	Returns the brake fluid from brake caliper and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released.
Pressure sensor	Detects the brake fluid pressure and transmits signal to control unit.
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper and wheel cylinder.
Damper	Reduces the vibrations travelling to the brake pedal during the operation of the VDC function, TCS function, ABS function, EBD function, or brake limited slip differential (BLSD) function.

### CONDITION FOR TURN ON THE WARNING LAMP

Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	ABS warning lamp	Brake warning lamp	VDC warning lamp
Ignition switch OFF	OFF	OFF	OFF
For approx. 2 seconds after the ignition switch is turned ON	ON	ON	ON
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF	OFF	OFF
When parking brake operates (parking brake switch ON)	OFF	ON	OFF
When brake fluid is less than the specified level (brake fluid level switch ON)	OFF	ON	OFF
VDC function is malfunctioning	OFF	OFF	ON
TCS function is malfunctioning	OFF	OFF	ON
ABS function is malfunctioning	ON	OFF	ON
EBD function is malfunctioning	ON	ON	ON
Brake limited slip differential (BLSD) function is malfunctioning	OFF	OFF	ON
VDC function is operating	OFF	OFF	Blinking
TCS function is operating	OFF	OFF	Blinking

### CONDITION FOR TURN ON THE INDICATOR LAMP

### < SYSTEM DESCRIPTION >

### [WITH VDC]

 Turns ON when VDC function and TCS function are switched to non-operational status (OFF) by VDC OFF switch.

• Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	VDC OFF indicator lamp	В
Ignition switch OFF	OFF	
For approx. 2 seconds after the ignition switch is turned ON	ON	-
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF	С
When VDC OFF switch is ON (VDC function and TCS function are OFF)	ON	D

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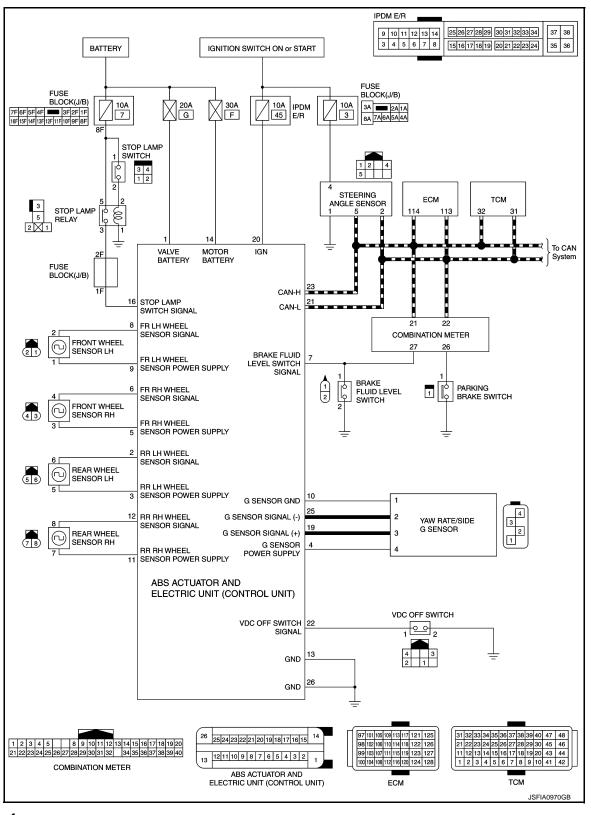
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## Circuit Diagram

INFOID:000000011323968

[WITH VDC]



Fail-safe

INFOID:000000011323969

VDC FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function and brake limited slip dif-

### < SYSTEM DESCRIPTION >

[WITH VDC]

ferential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated А normally.

### **ABS FUNCTION**

В ABS warning lamp and VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. However, EBD function is operated normally.

### NOTE:

ABS self-diagnosis sound may be heard the same as in the normal condition, because self-diagnosis is performed when ignition switch turns ON and when vehicle initially starts.

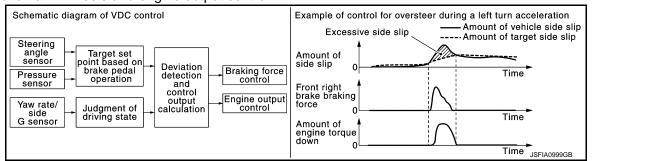
### EBD FUNCTION

ABS warning lamp, brake warning lamp and VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function BRC and brake limited slip differential (BLSD) function.

### VDC FUNCTION

### VDC FUNCTION : System Description

- Side slip or tail slip may occur while driving on a slippery road or intending an urgent evasive driving. VDC function detects side slip status using each sensor when side slip or tail slip is about to occur and improves vehicle stability by brake control and engine output control during driving.
- In addition to ABS function, EBD function and TCS function, target side slip amount is calculated according to steering operation amount from steering angle sensor. By comparing this information with vehicle side slip amount that is calculated from information from yaw rate/side G sensor and wheel sensor, vehicle driving conditions (conditions of understeer or oversteer) are judged and vehicle stability is improved by brake force control on all 4 wheels and engine output control.



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to BRC-20, "Fail-safe". Ρ NOTE:

VDC has the characteristic as described here, This is not the device that helps reckless driving.

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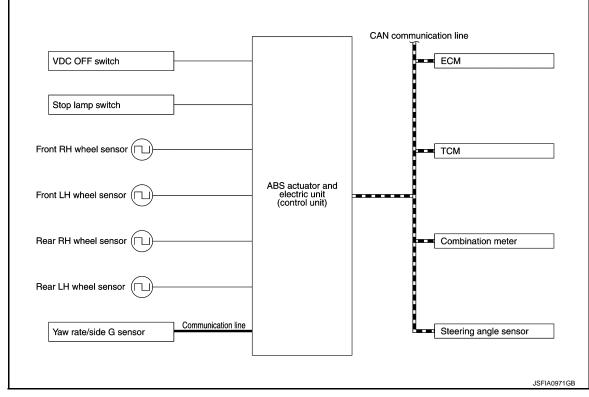
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### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

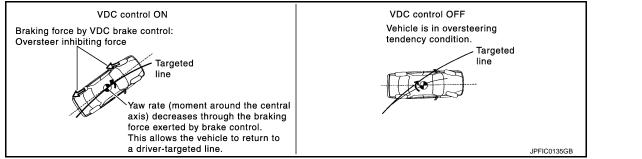
Component	Signal description			
Yaw rate/side G sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line<sup>*</sup>.</li> <li>Yaw rate signal</li> <li>Side G sensor signal</li> </ul>			
ECM	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Acceleration pedal position signal</li> <li>Engine speed signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Target throttle position signal</li> </ul>			
ТСМ	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Shift position signal</li> <li>Current gear position signal</li> <li>P range signal</li> <li>R range signal</li> <li>N range signal</li> </ul>			
Steering angle sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Steering angle sensor signal</li> </ul>			
Combination meter	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Brake fluid level switch signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>VDC warning lamp signal</li> <li>VDC OFF indicator lamp signal</li> </ul>			

\*: Communication line between yaw rate/side G sensor and ABS actuator and electric unit (control unit)

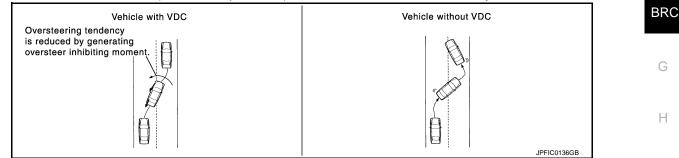
## OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

 During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the outer side of turn. Moment directing towards the outer side of turn is generated. Oversteer is prevented.

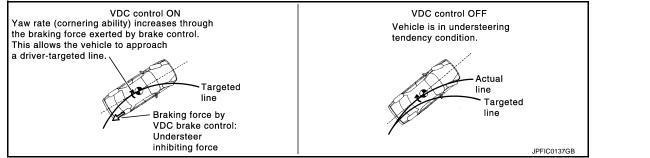


 Changing driving lane on a slippery road, when oversteer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

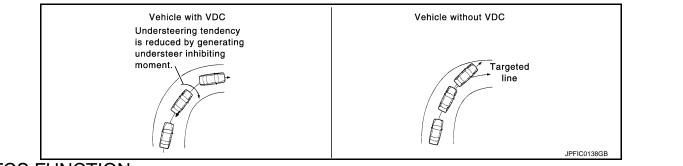


VDC Function That Prevents Understeer Tendency

• During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the inner side of turn. Moment directing towards the inner side of turn is generated. Understeer is prevented.



• Applying braking during a cornering on a slippery road, when understeer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of four wheels. Understeer tendency decreases.



# TCS FUNCTION

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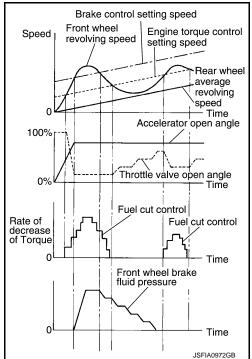
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[WITH VDC]

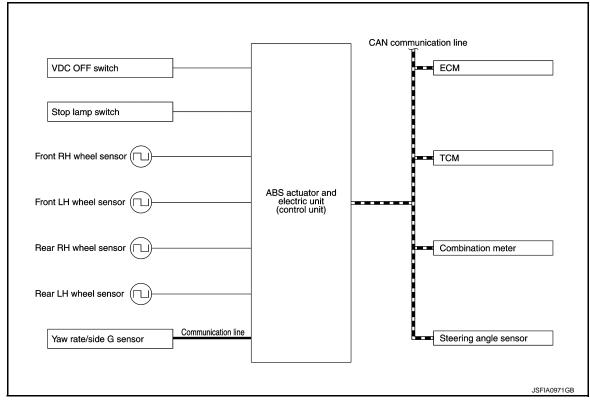
< SYSTEM DESCRIPTION >

### **TCS FUNCTION : System Description**

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to BRC-20, "Fail-safe".



### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

INFOID:0000000011323971

### < SYSTEM DESCRIPTION >

### [WITH VDC]

Component	Signal description
Yaw rate/side G sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line<sup>*</sup>.</li> <li>Yaw rate signal</li> <li>Side G sensor signal</li> </ul>
ECM	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Acceleration pedal position signal</li> <li>Engine speed signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Target throttle position signal</li> </ul>
ТСМ	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Shift position signal • Current gear position signal • P range signal • R range signal • N range signal
Steering angle sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Steering angle sensor signal</li> </ul>
Combination meter	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Brake fluid level switch signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>VDC warning lamp signal</li> <li>VDC OFF indicator lamp signal</li> </ul>

\*: Communication line between yaw rate/side G sensor and ABS actuator and electric unit (control unit) ABS FUNCTION

# ABS FUNCTION : System Description

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be easily bypassed by steering operation.
- During braking, control units calculates wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.

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### < SYSTEM DESCRIPTION >

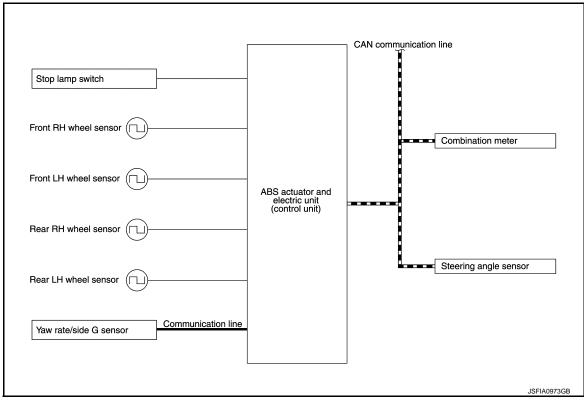
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. However, EBD function is operated normally. Refer to <u>BRC-20, "Fail-safe"</u>.

### NOTE:

- ABS has the characteristic as described here, but it is not the device that helps reckless driving.
- To stop vehicle efficiently, ABS does not operate and ordinary brake operates at low speed [approx. 10 km/h (6.2 MPH) or less, but differs subject to road conditions).
- Self-diagnosis is performed immediately after when engine starts and when vehicle initially is driven [by vehicle speed approx. 15 km/h (9.3 MPH)]. Motor sounds are generated during self-diagno-

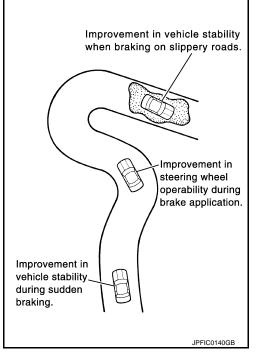
sis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.



[WITH VDC]

Component	Signal description		
Yaw rate/side G sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line<sup>*</sup>.</li> <li>Yaw rate signal</li> <li>Side G sensor signal</li> </ul>		
Steering angle sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Steering angle sensor signal</li> </ul>		
Combination meter	<ul> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>VDC warning lamp signal</li> <li>ABS warning lamp signal</li> </ul>		

\*: Communication line between yaw rate/side G sensor and ABS actuator and electric unit (control unit) EBD FUNCTION

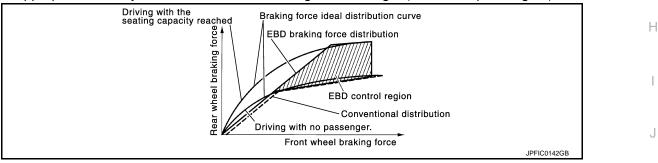
# **EBD FUNCTION : System Description**

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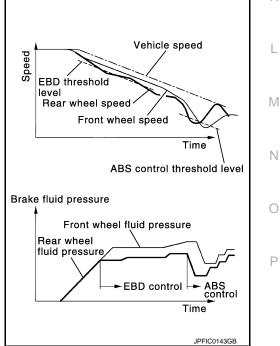
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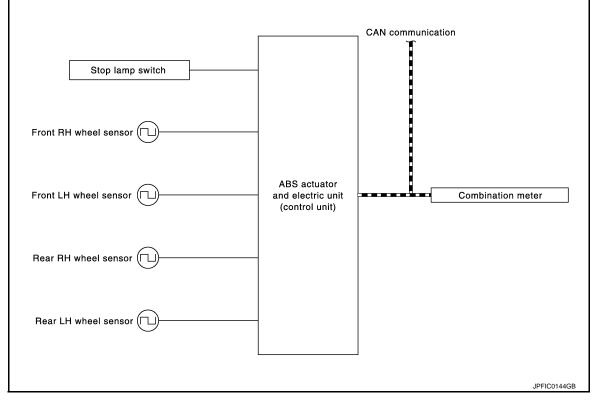
- By preventing rear wheel slip increase through rear wheel brake force (brake fluid pressure) control that is electronically controlled when slight skip on front and rear wheels are detected during braking, stability during braking is improved.
- EBD function is expanded and developed from conventional ABS function and corrects rear wheel brake force to appropriate level by electronic control according to load weight (number of passengers).



- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. Refer to <u>BRC-20, "Fail-safe"</u>.



### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description	
Combination meter	<ul> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>VDC warning lamp signal</li> <li>ABS warning lamp signal</li> <li>Brake warning lamp signal</li> </ul>	

## BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

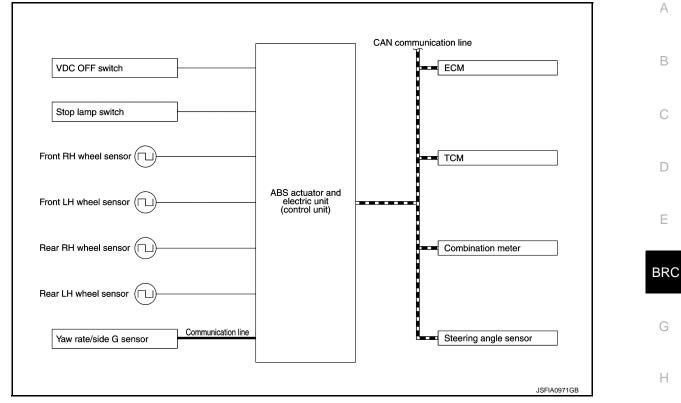
### BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION : System Description

INFOID:000000011323974

- LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved.
- Brake limited slip differential (BLSD) function operates while VDC function is in non-operational status (OFF) by VDC OFF switch.
- VDC warning lamp blinking while brake limited slip differential (BLSD) function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when brake limited slip differential (BLSD) function operates. This is not a malfunction because it is caused by brake limited slip differential (BLSD) function that is normally operated.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in brake limited slip differential (BLSD) function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-20, "Fail-safe"</u>.



### SYSTEM DIAGRAM



### INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description			
Yaw rate/side G sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line<sup>*</sup>.</li> <li>Yaw rate signal</li> <li>Side G sensor signal</li> </ul>			
ECM	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Acceleration pedal position signal</li> <li>Engine speed signal</li> <li>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Target throttle position signal</li> </ul>			
ТСМ	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Shift position signal</li> <li>Current gear position signal</li> <li>P range signal</li> <li>R range signal</li> <li>N range signal</li> </ul>			
Steering angle sensor	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Steering angle sensor signal</li> </ul>			
Combination meter	<ul> <li>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</li> <li>Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</li> <li>VDC warning lamp signal</li> </ul>			

\*: Communication line between yaw rate/side G sensor and ABS actuator and electric unit (control unit)

< SYSTEM DESCRIPTION >

[WITH VDC]

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

# **CONSULT** Function

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### APPLICATION ITEMS

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

Mode	Function description		
ECU identification	Parts number of ABS actuator and electric unit (control unit) can be read.		
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*		
DATA MONITOR	nput/Output data in the ABS actuator and electric unit (control unit) can be read.		
ACTIVE TEST	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and elec- tric unit (control unit) and also shifts some parameters in a specified range.		
Function Test	Although "Function Test" is selectable, do not use its.		
Work support	Components can be quickly and accurately adjusted.		

\*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

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

### SELF DIAGNOSTIC RESULT Refer to <u>BRC-38. "DTC Index"</u>.

When "CRNT" is displayed on self-diagnosis result • The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

• System malfunction in the past is detected, but the system is presently normal.

### Freeze frame data (FFD)

When DTC is detected, a vehicle state shown below is recorded and displayed on CONSULT.

Item name	Display item			
IGN counter (0 – 39)	<ul> <li>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</li> <li>When "0" is displayed: It indicates that the system is presently malfunctioning.</li> <li>When except "0" is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal.</li> <li>NOTE:</li> <li>Each time when ignition switch is turned OFF to ON, numerical number increases in 1 → 2 → 338 → 39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.</li> </ul>			

# DATA MONITOR NOTE:

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

×: Applicable

Item (Unit)	Monitor iter	m selection	Note	
item (Onit)	ECU INPUT SIGNALS	MAIN SIGNALS	- NOLE	
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.	
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.	

### < SYSTEM DESCRIPTION >

### [WITH VDC]

Itom (I Init)	Monitor item selection		Note	
Item (Unit)	ECU INPUT SIGNALS MAIN SIGN		- Note	
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.	
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.	
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.	
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.	
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.	
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.	
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.	
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.	
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.	
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.	
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. *	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.	
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.	
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.	
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. *	
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. *	
OFF SW (On/Off)	×	×	VDC OFF switch signal input status is displayed.	
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status is displayed. *	
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
GEAR	×	×	Current gear position judged from current gear position signal is displayed.	
SLCT LVR POSI	×	×	Current shift position judged from shift position signal is displayed.	
ENGINE SPEED [tr/min (rpm)]	×	×	Engine speed status is displayed.	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.	
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.	
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.	
P POSI SIG (On/Off)			P range signal input status judged from P range signal is displayed.	

### < SYSTEM DESCRIPTION >

[WITH VDC]

	Monitor item selection		Note	
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	- Note	
CV1 (On/Off)			Cut valve 1 operation status is displayed.	
CV2 (On/Off)			Cut valve 2 operation status is displayed.	
SV1 (On/Off)			Suction valve 1 operation status is displayed.	
SV2 (On/Off)			Suction valve 2 operation status is displayed.	
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position	
SIDE G-SENSOR (m/s2)	×		Side G detected by side G sensor is displayed.	
STR ANGLE SIG (deg)	×		Steering angle detected by steering angle sensor is displayed.	
PRESS SENSOR (bar)	×		Brake fluid pressure detected by pressure sensor is displayed.	
EBD SIGNAL (On/Off)			EBD operation status is displayed.	
ABS SIGNAL (On/Off)			ABS operation status is displayed.	
TCS SIGNAL (On/Off)			TCS operation status is displayed.	
VDC SIGNAL (On/Off)			VDC operation status is displayed.	
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.	
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.	
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.	
CRANKING SIG (On/Off)			Cranking status is displayed.	
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communica- tion is displayed.	

\*: Refer to <u>BRC-13</u>, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.

### ACTIVE TEST

The active test is used to determine and identify details of a malfunction, based on self-diagnosis test result sand data obtained in the DATA MONITOR. In response to instructions from CONSULT, instead of those from ABS actuator and electric unit (control unit) on the vehicle, a drive signal is sent to the actuator to check its operation.

### **CAUTION:**

- Never perform ACTIVE TEST while driving the vehicle.
- Always bleed air from brake system before ACTIVE TEST.
- Never perform ACTIVE TEST when system is malfunctioning.

### NOTE:

- When active test is performed while depressing the pedal, the pedal depressing stroke may change. This is not a malfunction.
- "TEST IS STOPPED" is displayed approx. 10 seconds after operation start.
- When performing active test again after "TEST IS STOPPED" is displayed, select "BACK".
- ABS warning lamp and brake warning lamp may turn ON during active test. This is not a malfunction.

### **BRC-32**

### < SYSTEM DESCRIPTION >

### [WITH VDC]

BRC

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### ABS IN Valve and ABS OUT Valve

When "Up", "Keep" or "Down" is selected on display screen, the following items are displayed when system is A normal.

Test item	Display item	Display			E
		Up	Keep	Down	
	FR RH IN SOL	Off	On	On	
FR RH SOL	FR RH OUT SOL	Off	Off	On*	
	FRLH IN SOL	Off	On	On	
FR LH SOL	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On	On	
KK KH SOL	RR RH OUT SOL	Off	Off	On*	
	RR LH IN SOL	Off	On	On	
RR LH SOL	RR LH OUT SOL	Off	Off	On*	

\*: Immediately after being selected, status is "On". Status changes to "Off" after approx. 2 seconds. **NOTE:** 

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

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

When "Up", "ACT KEEP" or "ACT UP" is selected on display screen, the following items are displayed when system is normal.

Test item	Disalawitan	Display		
	Display item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLE-	FR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	FRLH IN SOL	Off	Off	Off
FR LH ABS SOLE-	FR LH OUT SOL	Off	Off	Off
NOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLE-	RR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	SV1	Off	On*	Off

\*: Immediately after being selected, status is "On". Status changes to "Off" after approx. 2 seconds. **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

When "On" or "Off" is selected on display screen, the following items are displayed when system is normal.

### < SYSTEM DESCRIPTION >

[WITH VDC]

Test item	Display item	Display	
		On	Off
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY	On*	On*

\*: When the ignition switch is turned ON, the indication switches between "On" and "Off" for an extremely brief moment at irregular intervals. This is not a malfunction. The symptom is merely a result of confirmatory checks.

### WORK SUPPORT

Item	Description	
ST ANGLE SENSOR ADJUSTMENT	Perform neutral position adjustment of steering angle sensor.	

### **ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)**

< ECU DIAGNOSIS INFORMATION >

# ECU DIAGNOSIS INFORMATION

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### **Reference Value**

### CONSULT DATA MONITOR STANDARD VALUE

### NOTE:

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

Monitor item	Condition	Reference values in normal operation	D
FR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)	
	When driving straight ahead <sup>*1</sup>	Nearly matches the speedometer display (within ±10%)	Е
FR RH SENSOR	Vehicle stopped	0.00 km/h (MPH)	
	When driving straight ahead <sup>*1</sup>	Nearly matches the speedometer display (within ±10%)	BR
RR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)	
	When driving straight ahead <sup>*1</sup>	Nearly matches the speedometer display (within ±10%)	G
	Vehicle stopped	0.00 km/h (MPH)	
RR RH SENSOR	When driving straight ahead <sup>*1</sup>	Nearly matches the speedometer display (within ±10%)	Η
FR RH IN SOL <sup>*2</sup>	Active	On	
	Not activated	Off	I
*2	Active	On	
FR RH OUT SOL <sup>*2</sup>	Not activated	Off	
	Active	On	0
FR LH IN SOL <sup>*2</sup>	Not activated	Off	
FR LH OUT SOL <sup>*2</sup>	Active	On	Κ
	Not activated	Off	
RR RH IN SOL <sup>*2</sup>	Active	On	1
	Not activated	Off	-
RR RH OUT SOL <sup>*2</sup>	Active	On	
	Not activated	Off	M
RR LH IN SOL <sup>*2</sup>	Active	On	
KK LH IN SUL -	Not activated	Off	NI
RR LH OUT SOL <sup>*2</sup>	Active	On	Ν
	Not activated	Off	
EBD WARN LAMP	When brake warning lamp is $ON^{*3}$	On	0
	When brake warning lamp is OFF*3	Off	
STOP LAMP SW	Brake pedal depressed	On	Р
STOP LAWIF SVV	Brake pedal not depressed	Off	P
	Active	On	
MOTOR RELAY	Not activated	Off	
	Active	On	
ACTUATOR RLY	Not activated (in fail-safe mode)	Off	

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# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### < ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Reference values in normal operation
ABS WARN LAMP	When ABS warning lamp is ON <sup>*3</sup>	On
	When ABS warning lamp is OFF <sup>*3</sup>	Off
OFF LAMP	When VDC OFF indicator lamp is ON <sup>*3</sup>	On
	When VDC OFF indicator lamp is OFF <sup>*3</sup>	Off
	VDC OFF switch ON	On
OFF SW	VDC OFF switch OFF	Off
	When VDC warning lamp is ON <sup>*3</sup>	On
SLIP/VDC LAMP	When VDC warning lamp is OFF <sup>*3</sup>	Off
BATTERY VOLT	Ignition switch ON	10 – 16 V
		1-6
GEAR	Driving	Depending on shift status
SLCT LVR POSI	When ignition switch is ON	P, R, N, D
ENGINE SPEED	Engine stopped	0 rpm
	Engine running	Almost same reading as tachometer
	Vehicle stopped	Approx. 0 d/s
YAW RATE SEN	Turning right	Negative value
	Turning left	Positive value
R POSI SIG	When selector lever is in the R position	On
	When selector lever is in the other position than R	Off
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off
P POSI SIG	When selector lever is in the P position	On
	When selector lever is in the other position than P	Off
CV1 <sup>*2</sup>	Active	On
CVI	Not activated	Off
CV2*2	Active	On
0.42	Not activated	Off
SV1 <sup>*2</sup>	Active	On
501	Not activated	Off
SV2*2	Active	On
572	Not activated	Off
ACCEL POS SIG	Never depress accelerator pedal (with ignition switch ON)	0%
	Depress accelerator pedal (with ignition switch ON)	0 – 100%
	Vehicle stopped	Approx. 0 m/s <sup>2</sup>
SIDE G-SENSOR	Turning right	Negative value
	Turning left	Positive value
	When driving straight	0±3.5°
STR ANGLE SIG	When steering wheel is steered to LH by $90^\circ$	Approx. –90°
	When steering wheel is steered to RH by $90^\circ$	Approx. +90°
PRESS SENSOR	Brake pedal not depressed	Approx. 0 bar
FREDD DENDUK	Brake pedal depressed	(–40) – (+300 bar)
	EBD is activated	On
EBD SIGNAL	EBD is not activated	Off

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

# < ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Monitor item	Condition	Reference values in normal operation
ABS SIGNAL	ABS is activated	On
ADS SIGNAL	ABS is not activated	Off
TCS SIGNAL	TCS is activated	On
ICS SIGNAL	TCS is not activated	Off
VDC SIGNAL	VDC is activated	On
VDC SIGNAL	VDC is not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
EDD FAIL SIG	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
ADS FAIL SIG	ABS is normal	Off
TCS FAIL SIG	In TCS fail-safe	On
TCS FAIL SIG	TCS is normal	Off
VDC FAIL SIG	In VDC fail-safe	On
VDC FAIL SIG	VDC is normal	Off
	At cranking	On
CRANKING SIG	Other than at cranking	Off
FLUID LEV SW	When brake fluid level switch is ON (brake fluid level is less than the specified level)	On
	When brake fluid level switch is OFF	Off

\*1: Confirm tire pressure is standard value.

\*2: Refer to "valve operation" in <u>BRC-13, "System Description"</u> for valve operation of each valve.

\*3: Refer to <u>BRC-13</u>, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.

# Fail-safe

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# VDC FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally.

### ABS FUNCTION

ABS warning lamp and VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. However, EBD function is operated normally.

### NOTE:

ABS self-diagnosis sound may be heard the same as in the normal condition, because self-diagnosis is performed when ignition switch turns ON and when vehicle initially starts.

### EBD FUNCTION

ABS warning lamp, brake warning lamp and VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.

# DTC Inspection Priority Chart

INFOID:0000000011323978

When multiple DTCs are displayed simultaneously, check one by one depending on the following priority list.

# **ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)**

# < ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Priority		Detected item (D	ΓC)
1	U1000 CAN COMM     U1002 SYSTEM CO		
2	C1110 CONTROLL	ER FAILURE	
3	C1130 ENGINE SIG	GNAL 1	
4	C1109 BATTERY V     C1111 PUMP MOTO     C1140 ACTUATOR		
5	<ul> <li>C1101 RR RH SEN</li> <li>C1102 RR LH SEN</li> <li>C1103 FR RH SEN</li> <li>C1103 FR RH SEN</li> <li>C1105 RR RH SEN</li> <li>C1105 RR RH SEN</li> <li>C1106 RR LH SENS</li> <li>C1107 FR RH SENS</li> <li>C1107 FR RH SENS</li> <li>C1115 ABS SENSCE</li> <li>C1116 STOP LAMF</li> <li>C1120 FR LH IN AB</li> <li>C1121 FR LH OUT</li> <li>C1122 FR RH IN AB</li> <li>C1123 FR RH OUT</li> <li>C1126 RR RH IN AB</li> <li>C1127 RR RH OUT</li> <li>C1126 RR RH IN AB</li> <li>C1127 RR RH OUT</li> <li>C1127 RR RH OUT</li> <li>C1128 RR H IN AB</li> <li>C1127 RR RH OUT</li> <li>C1127 RR RH OUT</li> <li>C1142 PRESS SEN</li> <li>C1144 ST ANG SE</li> <li>C1145 YAW RATE SEN</li> <li>C1146 SIDE G SEN</li> <li>C1161 SIDE G SEN</li> <li>C1164 CV 1</li> <li>C1165 CV 2</li> <li>C1166 SV 1</li> <li>C1167 SV 2</li> </ul>	SOR-1 SOR-1 SOR-1 SOR-2 SOR-2 SOR-2 SOR-2 OR [ABNORMAL SIGNAL] P SW 3S SOL ABS SOL ABS SOL ABS SOL ABS SOL ABS SOL ABS SOL CIRCUIT N CIRCUIT N SIGNAL SENSOR I CIRCUIT I SET	
6	C1155 BR FLUID L	EVEL LOW	
DTC Index			INFOID:000000011323979
	DTC	Display Item	Refer to
	C1101	RR RH SENSOR-1	
	C1102	RR LH SENSOR-1	
	C1103	FR RH SENSOR-1	BRC-51, "DTC Logic"
	C1104	FR LH SENSOR-1	

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DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	BRC-51, "DTC Logic"
C1103	FR RH SENSOR-1	BRC-51, DTC Logic
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	BRC-54, "DTC Logic"
C1107	FR RH SENSOR-2	BRC-34, DTC LOgic
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-59, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-61, "DTC Logic"
C1111	PUMP MOTOR	BRC-62, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-64, "DTC Logic"
C1116	STOP LAMP SW	BRC-70, "DTC Logic"

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[OC	Í [WITH VD	< ECU DIAGNOSIS INFORMATION >		
	Refer to	Display Item	DTC	
	BRC-73, "DTC Logic"	FR LH IN ABS SOL	C1120	
	BRC-75, "DTC Logic"	FR LH OUT ABS SOL	C1121	
	BRC-73, "DTC Logic"	FR RH IN ABS SOL	C1122	
	BRC-75, "DTC Logic"	FR RH OUT ABS SOL	C1123	
	BRC-73, "DTC Logic"	RR LH IN ABS SOL	C1124	
	BRC-75, "DTC Logic"	RR LH OUT ABS SOL	C1125	
	BRC-73, "DTC Logic"	RR RH IN ABS SOL	C1126	
	BRC-75, "DTC Logic"	RR RH OUT ABS SOL	C1127	
	BRC-77, "DTC Logic"	ENGINE SIGNAL 1	C1130	
	BRC-78, "DTC Logic"	ACTUATOR RLY	C1140	
	BRC-80, "DTC Logic"	PRESS SEN CIRCUIT	C1142	
	BRC-82, "DTC Logic"	ST ANG SEN CIRCUIT	C1143	
В	BRC-85, "DTC Logic"	ST ANG SEN SIGNAL	C1144	
D		YAW RATE SENSOR	C1145	
	BRC-86, "DTC Logic"	SIDE G SEN CIRCUIT	C1146	
	BRC-89, "DTC Logic"	BR FLUID LEVEL LOW	C1155	
	BRC-92, "DTC Logic"	SIDE G SEN SET	C1161	
	BRC-93, "DTC Logic"	PRESS SEN SET	C1162	
		CV 1	C1164	
	BRC-94, "DTC Logic"	CV 2	C1165	
		SV 1	C1166	
	BRC-96, "DTC Logic"	SV 2	C1167	
	BRC-98, "DTC Logic"	CAN COMM CIRCUIT	U1000	
	BRC-99, "DTC Logic"	SYSTEM COMM(CAN)	U1002	

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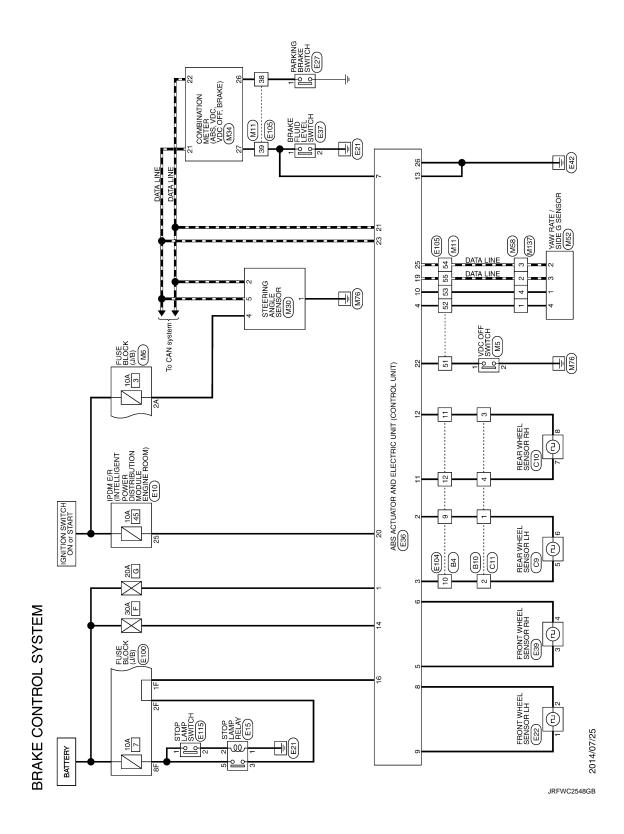
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# WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000011323980



ang diagram >	
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E10       Image: a minute of minute	В
	C
Connector Mu.         Connector Mu.           Connector Name         Connector Name           Connector Name         Connector Name           P         V           V         V           1         P           2         P           3         P           3         P           3         P           3         P           3         P           3         P           3         P           3         P           P	E
CIO REAR WHEEL SENSOR RH HM00FGV Signal Name [Specification] Signal Name [Specification]	BRC
mmenter Ma. monocitar Name menter Tapa Name	G
BIO WRE TO WRE BHOATB Signal Name [Specification] Signal Name [Specification]	l J
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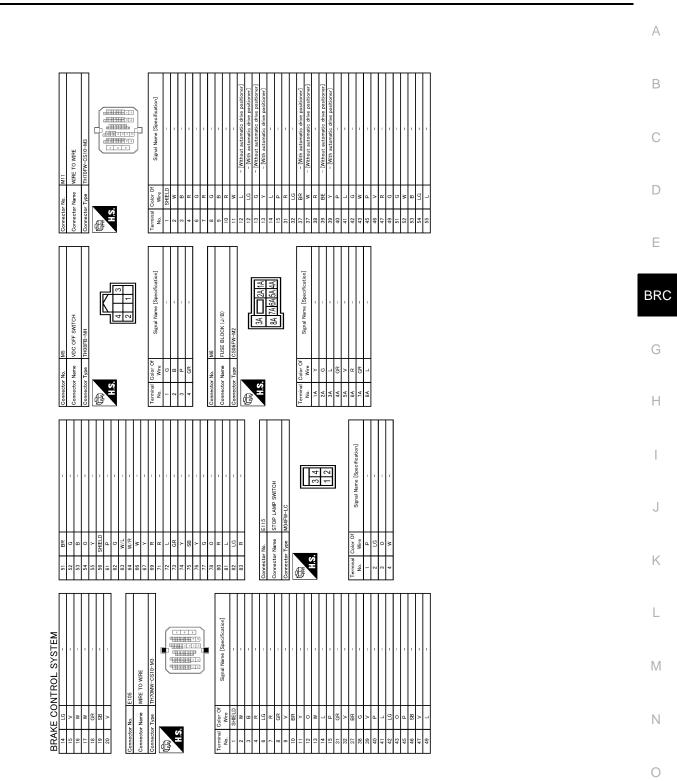
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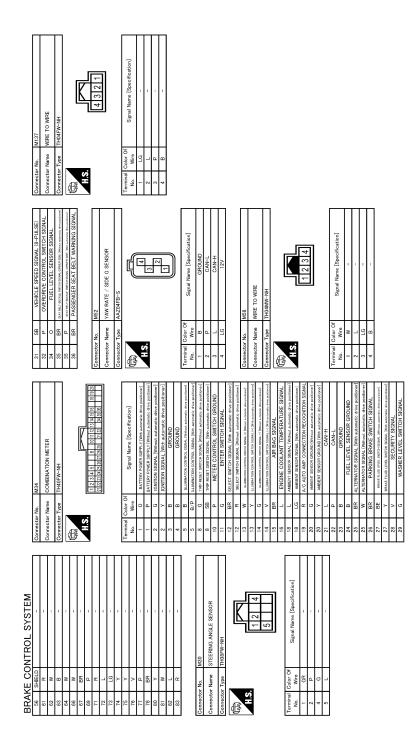
BRAKE CONTROL SYSTEM

	Connector No.	No. E27	23 L CAN-H	Connector No. E100	Γ
Connector Name STOP   AMD BEI AV	Connector Name	Name DARING PRAKE SMITCH	0 G SEN	Connector Name ELISE BLOCK (1/B)	
			26 B GROUND		
Connector Type MS02FL-M2-LC	Connector Type	Type P01FB-A	Т	Connector Type NS16FW-CS	٦
	ł		Gennector No. E37		
14F	ĨŢ		Т		
H.S.	N H S	Ţ	Connector Name BRAKE FLUID LEVEL SWITCH	H.S. 6F 4F - 2F 1F	
		-	Connector Type YV02FGY	126 Ht 9F 8F	
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Timeted Adding	C Transferrer H	0.11.05		Times 1 Add to 6	Γ
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		Γ	No Wire Signal Name [Specification]	╞	Г
	Connector Name	Name ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	╈		Т
Connector No. E22	Connector Type	Tvpe AEZ22FB-AJZ4-LH	2 B/W -	┝	Τ
Ι		1			
Connector Name FRONT WHEEL SENSOR LH	ł				1
Connector Type RH02MB	Ň	25 23 23 22 21 20 19 16 14	Connector No. E39		1
ą			Connector Name FRONT WHEEL SENSOR RH	Connector No. E104	
[ [		1/1/1/10/08/7/6/5/4/3/2/		Connector Name WIRE TO WIRE	
K		13 41 10 10 10 10 10 10 10 10 10 10 10 10 10	Connector Type RH02MB		
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)		Wire Signal Name [Specification]	H.S.		
	-	R VALVE BATTERY		> 	
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No. Wire Signal Name [Specification]	e	L RR LH WHEEL SENSOR POWER SUPPLY	12	20 19 10 17 10 10 10 10 10 10 10 10 10 10 10 10 10	
-	4	G G SENSOR POWER SUPPLY		01 11	-1
2 LG -	5	B FR RH WHEEL SENSOR POWER SUPPLY	Terminal C		
	9	W FR RH WHEEL SENSOR SIGNAL	No. Wire	Terminal Color Of Simul Name [Same]	Γ
	7	V BRAKE FLUID LEVEL SWITCH SIGNAL	NL 3 B -	No. Wire Specmoauonj	
	8	LG FR LH WHEEL SENSOE SIGNAL	4 W –		Π
	6	L FR LH WHEEL SENSOR POWER SUPPLY	1.Y	2 GR –	
	10	B G SENSOR GND		3 BR -	
	1	RR	PLY	4 L –	Π
	12	RR RH WHE		5 R	
	13	B GROUND		e LG -	Τ
	14	C MOTOD DATTEDV	_		_

# **BRAKE CONTROL SYSTEM**



# **BRAKE CONTROL SYSTEM**



JRFWC2552GB

DIAGNOSIS AND REPAIR WORK FLOW < BASIC INSPECTION >	[WITH VDC]
BASIC INSPECTION	
DIAGNOSIS AND REPAIR WORK FLOW	
Work Flow	INFOID:000000011323981
DETAILED FLOW	
1.INTERVIEW FROM THE CUSTOMER	
Clarify customer complaints before inspection. First of all, perform an interview u Work Sheet" and reproduce the symptom as well as fully understand it. Ask custor carefully. Check symptoms by driving vehicle with customer, if necessary. CAUTION:	
Customers are not professional. Never guess easily like "maybe the cust maybe the customer mentions this symptom".	tomer means that," or "
>> GO TO 2.	
2. СНЕСК ЅҮМРТОМ	
Reproduce the symptom that is indicated by the customer, based on the info obtained by interview. Also check that the symptom is not caused by fail-safe mo safe". CAUTION:	
When the symptom is caused by normal operation, fully inspect each port standing of customer that the symptom is not caused by a malfunction.	tion and obtain the under-
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS	
3.PERFORM THE SELF-DIAGNOSIS	
3.PERFORM THE SELF-DIAGNOSIS With CONSULT Perform self-diagnosis.	
3.PERFORM THE SELF-DIAGNOSIS With CONSULT Perform self-diagnosis.	O TO 4.
3.PERFORM THE SELF-DIAGNOSIS With CONSULT Perform self-diagnosis. <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and freeze frame data (FFD). G NO >> GO TO 6.	O TO 4.
<ul> <li>3.PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4.RECHECK THE SYMPTOM With CONSULT 1. Erase self-diagnostic results. 2. Perform DTC confirmation procedures for the error-detected system.</li></ul>	O TO 4.
3.PERFORM THE SELF-DIAGNOSIS With CONSULT Perform self-diagnosis. <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and freeze frame data (FFD). G NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT 1. Erase self-diagnostic results.	ning the diagnosis based on
<ul> <li>3.PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4.RECHECK THE SYMPTOM With CONSULT <ol> <li>Erase self-diagnostic results.</li> <li>Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for perform <u>BRC-37</u>, "DTC Inspection Priority Chart" [ABS actuator and electric unit (cont Is any DTC detected? </li> </ol></li></ul>	ning the diagnosis based on
<ul> <li>3.PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4.RECHECK THE SYMPTOM With CONSULT <ol> <li>Erase self-diagnostic results.</li> <li>Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for perform BRC-37, "DTC Inspection Priority Chart" [ABS actuator and electric unit (context) </li> </ol></li></ul>	ning the diagnosis based on rol unit)].
<ul> <li>3.PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4.RECHECK THE SYMPTOM </li> <li>With CONSULT 1. Erase self-diagnostic results. 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for perform BRC-37, "DTC Inspection Priority Chart" [ABS actuator and electric unit (cont  Is any DTC detected? YES &gt;&gt; GO TO 5. NO &gt;&gt; Check harness and connectors based on the information obtained the</li></ul>	ning the diagnosis based on rol unit)].
<ul> <li>3.PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4.RECHECK THE SYMPTOM </li> <li>With CONSULT 1. Erase self-diagnostic results. 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for perform BRC-37, "DTC Inspection Priority Chart" [ABS actuator and electric unit (cont  Is any DTC detected? YES &gt;&gt; GO TO 5. NO &gt;&gt; Check harness and connectors based on the information obtained by</li></ul>	ning the diagnosis based on rol unit)].
<ul> <li>3. PERFORM THE SELF-DIAGNOSIS</li> <li>With CONSULT Perform self-diagnosis. Is DTC detected? YES &gt;&gt; Record or print self-diagnosis results and freeze frame data (FFD). G NO &gt;&gt; GO TO 6. </li> <li>4. RECHECK THE SYMPTOM With CONSULT <ol> <li>Erase self-diagnostic results.</li> <li>Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for perform BRC-37, "DTC Inspection Priority Chart" [ABS actuator and electric unit (cont  Is any DTC detected? YES &gt;&gt; GO TO 5. NO &gt;&gt; Check harness and connectors based on the information obtained to  "Intermittent Incident". </li> <li>5. REPAIR OR REPLACE ERROR-DETECTED PART </li> <li>Repair or replace error-detected parts.</li> <li>Reconnect part or connector after repairing or replacing.</li> </ol></li></ul>	ning the diagnosis based on rol unit)].

Estimate error-detected system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

# **BRC-45**

# DIAGNOSIS AND REPAIR WORK FLOW

### < BASIC INSPECTION >

[WITH VDC]

# YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-42</u>, <u>"Intermittent Incident"</u>.

# 7.FINAL CHECK

### With CONSULT

- 1. Check the reference value for "ABS".
- 2. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

### Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

### Diagnostic Work Sheet

INFOID:000000011323982

### Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

### INTERVIEW SHEET SAMPLE

			Intervie	w sheet						
Customer	MR/MS	Registration number					al year stration			
name	Vehicle type				VIN					
Storage date		Engine				Mile	age	km	n (	Mile)
		Does not op	berate (						) fu	unction
		□ Warning lar	np for (						) turr	ns ON.
Symptom		□ Noise □ Vibration								
		□ Other (								)
First occurrence		□ Recently	□ Ot	her (						)
Frequency of occurrence		□ Always	🗆 Un	der a certai	n condi	tions of	□ Son	netimes (	time(s	s)/day)
		□ Irrelevant								
Climate con-	Weather	□ Fine □	Cloud	🗆 Ra	in	□Snow	🗆 Oth	iers (		)
ditions	Temperature	□ Hot □W	/arm	Cool	ΠC	old l	□ Tempera	ature [Approx.	°C (	°F)]
	Relative humidity	🗆 High		Moderate		Lo'	W			
Road conditions		□ Urban area □ Mountainou		□ Suburb (uphill or do			□ Highwa □ Rough			
Operating condition, etc.		Irrelevant         When engin         During drivi         During deca         During corn         When steer	ng eleratioi iering (r	During n ight curve d	or left c	ration urve)		onstant speed	driving	

# DIAGNOSIS AND REPAIR WORK FLOW

# < BASIC INSPECTION >

1		Interview she			
Customer	MR/MS	Registration number	Initial year registration		
name		Vehicle type	VIN		
Storage date		Engine	Mileage	km (	Mile)
Other conditions					
Memo					

# ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< BASIC INSPECTION >

[WITH VDC]

# ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELEC-TRIC UNIT (CONTROL UNIT)

# Description

INFOID:000000011323983

When replaced the ABS actuator and electric unit (control unit), Perform steering angle sensor neutral position. Refer to <u>BRC-49, "Work Procedure"</u>.

# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION < BASIC INSPECTION > [WITH VDC]

# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

# Description

INFOID:000000011323984

А

# Always adjust the neutral position of steering angle sensor before driving when the following operation is per-

Procedure	Adjust the neutral position of steering angle sensor
Removing/ installing ABS actuator and electric unit (control unit)	
Replacing ABS actuator and electric unit (control unit)	×
Removing/installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/installing steering components	X
Leplacing steering components	X
Removing/installing suspension components	X
Replacing suspension components	X
temoving/installing tire	
Replacing tire	<u> </u>
ire rotation	
Adjusting wheel alignment.	×
/ork Procedure	
lways use CONSULT when adjusting the neutral p djusted other than with CONSULT.)	position of steering angle sensor. (It cannot be
AUTION: Iways use CONSULT when adjusting the neutral p djusted other than with CONSULT.) .CHECK THE VEHICLE STATUS	
Iways use CONSULT when adjusting the neutral p djusted other than with CONSULT.) .CHECK THE VEHICLE STATUS top vehicle with front wheels in the straight-ahead position	
Iways use CONSULT when adjusting the neutral p djusted other than with CONSULT.) .CHECK THE VEHICLE STATUS top vehicle with front wheels in the straight-ahead position tops the vehicle stay in the straight-ahead position?	
Iways use CONSULT when adjusting the neutral pdjusted other than with CONSULT.).CHECK THE VEHICLE STATUStop vehicle with front wheels in the straight-ahead positionoes the vehicle stay in the straight-ahead position?YES >> GO TO 2.	on.
Iways use CONSULT when adjusting the neutral pdjusted other than with CONSULT.).CHECK THE VEHICLE STATUStop vehicle with front wheels in the straight-ahead positionoes the vehicle stay in the straight-ahead position?YES >> GO TO 2.	on. d position. Stop the vehicle.
Iways use CONSULT when adjusting the neutral pdjusted other than with CONSULT.).CHECK THE VEHICLE STATUStop vehicle with front wheels in the straight-ahead positionoes the vehicle stay in the straight-ahead position?YESYES>> GO TO 2.NO>> Steer the steering wheel to the straight-ahead.ADJUST NEUTRAL POSITION OF STEERING ANGLE	on. d position. Stop the vehicle.
Iways use CONSULT when adjusting the neutral producted other than with CONSULT.)         .CHECK THE VEHICLE STATUS         top vehicle with front wheels in the straight-ahead position         top vehicle stay in the straight-ahead position?         YES       >> GO TO 2.         NO       >> Steer the steering wheel to the straight-ahead         .ADJUST NEUTRAL POSITION OF STEERING ANGL         With CONSULT         Turn the ignition switch ON.	on. d position. Stop the vehicle.
Iways use CONSULT when adjusting the neutral product of the other than with CONSULT.)         .CHECK THE VEHICLE STATUS         top vehicle with front wheels in the straight-ahead position         oes the vehicle stay in the straight-ahead position?         YES       >> GO TO 2.         NO       >> Steer the steering wheel to the straight-ahead         .ADJUST NEUTRAL POSITION OF STEERING ANGL         With CONSULT         Turn the ignition switch ON.         CAUTION:	on. d position. Stop the vehicle.
ways use CONSULT when adjusting the neutral particulation of the straight of th	on. d position. Stop the vehicle. E SENSOR
ways use CONSULT when adjusting the neutral pliusted other than with CONSULT.) .CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead position? YES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahead .ADJUST NEUTRAL POSITION OF STEERING ANGLE With CONSULT Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE S Select "START".	on. d position. Stop the vehicle. E SENSOR
ways use CONSULT when adjusting the neutral particulation of the straight of th	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.
ways use CONSULT when adjusting the neutral particulation of the straight of th	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.
Iways use CONSULT when adjusting the neutral producted other than with CONSULT.)         .CHECK THE VEHICLE STATUS         top vehicle with front wheels in the straight-ahead position         oes the vehicle stay in the straight-ahead position?         YES       >> GO TO 2.         NO       >> Steer the steering wheel to the straight-ahead         .ADJUST NEUTRAL POSITION OF STEERING ANGLE         With CONSULT         Turn the ignition switch ON.         CAUTION:         Select "ABS", "WORK SUPPORT" and "ST ANGLE S         Select "START".         CAUTION:         Never touch steering wheel while adjusting steering         After approx. 10 seconds, select "END".         Turn ignition switch OFF, and then turn it ON again.	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.
<ul> <li>Iways use CONSULT when adjusting the neutral particulated other than with CONSULT.)</li> <li>.CHECK THE VEHICLE STATUS</li> <li>top vehicle with front wheels in the straight-ahead position?</li> <li>YES &gt;&gt; GO TO 2.</li> <li>NO &gt;&gt; Steer the steering wheel to the straight-ahead</li> <li>.ADJUST NEUTRAL POSITION OF STEERING ANGLE</li> <li>With CONSULT Turn the ignition switch ON.</li> <li>CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE S Select "START".</li> <li>CAUTION: Never touch steering wheel while adjusting steering After approx. 10 seconds, select "END". Turn ignition switch OFF, and then turn it ON again.</li> <li>CAUTION:</li> </ul>	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.
<ul> <li>Iways use CONSULT when adjusting the neutral particulated other than with CONSULT.)</li> <li>.CHECK THE VEHICLE STATUS</li> <li>top vehicle with front wheels in the straight-ahead position</li> <li>top vehicle stay in the straight-ahead position?</li> <li>YES &gt;&gt; GO TO 2.</li> <li>NO &gt;&gt; Steer the steering wheel to the straight-ahead</li> <li>.ADJUST NEUTRAL POSITION OF STEERING ANGLE</li> <li>With CONSULT</li> <li>Turn the ignition switch ON.</li> <li>CAUTION:</li> <li>Never start engine.</li> <li>Select "ABS", "WORK SUPPORT" and "ST ANGLE S Select "START".</li> <li>CAUTION:</li> <li>Never touch steering wheel while adjusting steering After approx. 10 seconds, select "END".</li> <li>Turn ignition switch OFF, and then turn it ON again.</li> </ul>	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.
<ul> <li>Iways use CONSULT when adjusting the neutral particulated other than with CONSULT.)</li> <li>.CHECK THE VEHICLE STATUS</li> <li>top vehicle with front wheels in the straight-ahead position?</li> <li>YES &gt;&gt; GO TO 2.</li> <li>NO &gt;&gt; Steer the steering wheel to the straight-ahead</li> <li>.ADJUST NEUTRAL POSITION OF STEERING ANGLE</li> <li>With CONSULT Turn the ignition switch ON.</li> <li>CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE S Select "START".</li> <li>CAUTION: Never touch steering wheel while adjusting steering After approx. 10 seconds, select "END". Turn ignition switch OFF, and then turn it ON again.</li> <li>CAUTION:</li> </ul>	on. d position. Stop the vehicle. E SENSOR SENSOR ADJUSTMENT" in this order.

(
)With CONSULT

The vehicle is either pointing straight ahead, or the vehicle needs to be moved [30 – 50 km/h (19 – 31 MPH). Stop when it is pointing straight ahead.

# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

2. Select "ABS", "DATA MONITOR", "ECU INPUT SIGNALS" and "STR ANGLE SIG" in the order. Check that the signal is within the specified value.

### STR ANGLE SIG $: 0\pm 3.5^{\circ}$

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 1.

**4.**ERASE SELF-DIAGNOSIS MEMORY

With CONSULT
 Erase self-diagnosis result of "ABS".

Are the memories erased?

YES >> INSPECTION END

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

# C1101, C1102, C1103, C1104 WHEEL SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

# DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

А

н

[WITH VDC]

### INFOID:000000011323986 B

# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1101	RR RH SENSOR-1	When an open circuit is detected in rear RH wheel sensor circuit.	
C1102	RR LH SENSOR-1	When an open circuit is detected in rear LH wheel sensor circuit.	<ul><li>Harness or connector</li><li>Wheel sensor</li></ul>
C1103	FR RH SENSOR-1	When an open circuit is detected in front RH wheel sensor circuit.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	When an open circuit is detected in front LH wheel sensor circuit.	
DTC CC	ONFIRMATION PROCI	EDURE	
1.PREC	CONDITIONING		

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

>> GO TO 2.	Η
2. CHECK DTC DETECTION	
<ul> <li>With CONSULT</li> <li>Stat the engine.</li> </ul>	
<ol> <li>Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.</li> <li>Stop the vehicle.</li> <li>Perform self-diagnosis for "ABS".</li> </ol>	J
<u>Is DTC "C1101", "C1102", "C1103" or "C1104" detected?</u>	
YES >> Proceed to <u>BRC-51, "Diagnosis Procedure"</u> . NO >> INSPECTION END	K
Diagnosis Procedure	L
CAUTION: Never check between wheel sensor harness connector terminals.	M
1.CHECK WHEEL SENSOR	IVI
<ol> <li>Turn the ignition switch OFF.</li> <li>Check wheel sensor for damage.</li> <li><u>Is the inspection result normal?</u></li> </ol>	Ν
YES >> GO TO 3.	
NO >> GO TO 2.	0
2.REPLACE WHEEL SENSOR (1)	
<ul> <li>With CONSULT</li> <li>Replace wheel sensor.</li> </ul>	Ρ
<ul> <li>Front: Refer to <u>BRC-119, "FRONT WHEEL SENSOR : Removal and Installation"</u>.</li> <li>Rear: Refer to <u>BRC-120, "REAR WHEEL SENSOR : Removal and Installation"</u>.</li> </ul>	
2. Erase self-diagnosis result for "ABS".	
<ol> <li>Turn the ignition switch OFF, and wait 10 seconds or more.</li> <li>Start the engine</li> </ol>	

- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.

# BRC-51

# C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

7. Perform self-diagnosis for "ABS".

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

YES >> GO TO 3.

NO >> INSPECTION END

# 3.CHECK CONNECTOR

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

Is the inspection result normal?

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

**4.**PERFORM SELF-DIAGNOSIS (1)

### () With CONSULT

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

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

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK TERMINAL

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

Is the inspection result normal?

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

**6.**PERFORM SELF-DIAGNOSIS (2)

### (D) With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS".
- Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

### YES >> GO TO 7.

NO >> INSPECTION END

# 7.CHECK WHEEL SENSOR HARNESS

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

# C1101, C1102, C1103, C1104 WHEEL SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)	Wheel se	nsor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	9	E22 (Front LH wheel)	1		
F20	5	E39 (Front RH wheel)	3	Eviated	
E36	3	C9 (Rear LH wheel)	5	Existed	
	11	C10 (Rear RH wheel)	7		
Measurement conne	ctor and terminal for signal	circuit			
ABS actuator and ele	ectric unit (control unit)	Wheel se	nsor	<b></b>	
Connector	Terminal	Connector	Terminal	Continuity	
	8	E22 (Front LH wheel)	2		
	6	E39 (Front RH wheel)	4		
E36	2	C9 (Rear LH wheel)	6	Existed	
	12	C10 (Rear RH wheel)	8		
With CONSULT Connect ABS a Connect wheel	sensor harness conr		ss connector.		-
Connect wheel Erase self-diagr Turn the ignition Start the engine Drive the vehicle Stop the vehicle Perform self-dia	sensor harness conr nosis result for "ABS" n switch OFF, and wa e. e at approx. 30 km/h e. agnosis for "ABS".	nector. ". ait 10 seconds or more. (19 MPH) or more for a			_
With CONSULT Connect ABS a Connect wheel Erase self-diagr Turn the ignition Start the engine Drive the vehicle Stop the vehicle Perform self-dia DTC "C1101", "C2 ES >> GO TO	sensor harness conmosis result for "ABS" a switch OFF, and wa e at approx. 30 km/h gnosis for "ABS". 1102", "C1103" or "C 9. CTION END	nector. ". ait 10 seconds or more. (19 MPH) or more for a			
With CONSULT Connect ABS a Connect wheel Erase self-diagr Turn the ignitior Start the engine Drive the vehicle Perform self-dia DTC "C1101". "C" ES >> GO TO O >> INSPEC REPLACE WHEI With CONSULT Replace wheel	sensor harness conr nosis result for "ABS" a switch OFF, and wa a e at approx. 30 km/h agnosis for "ABS". 1102". "C1103" or "C 9. CTION END EL SENSOR	nector. ". ait 10 seconds or more. (19 MPH) or more for a <u>1104" detected?</u>	approx. 1 minute.	00"	_
With CONSULT Connect ABS a Connect wheel Erase self-diagr Turn the ignition Start the engine Drive the vehicle Perform self-dia DTC "C1101". "C" ES >> GO TO O >> INSPEC REPLACE WHEI With CONSULT Replace wheel Front: Refer to <u>E</u> Erase self-diagr Turn the ignition	sensor harness conr nosis result for "ABS" a switch OFF, and wa e at approx. 30 km/h agnosis for "ABS". <u>1102", "C1103" or "C"</u> 9. CTION END EL SENSOR <u>BRC-119, "FRONT V</u> <u>3RC-120, "REAR WH</u> nosis result for "ABS" a switch OFF, and wa	Nector. ". ait 10 seconds or more. (19 MPH) or more for a <u>1104" detected?</u> <u>VHEEL SENSOR : Remo</u>	approx. 1 minute.	<u>on"</u> . <u>1"</u> .	_
With CONSULT Connect ABS a Connect wheel Erase self-diagr Turn the ignition Start the engine Drive the vehicle Perform self-dia DTC "C1101". "C" ES >> GO TO O >> INSPEC REPLACE WHEI With CONSULT Replace wheel Front: Refer to I Rear: Refer to I Erase self-diagr Turn the ignition Start the engine Drive the vehicle Perform self-diag	sensor harness conr nosis result for "ABS" a switch OFF, and wa e at approx. 30 km/h agnosis for "ABS". <u>1102", "C1103" or "C"</u> 9. CTION END EL SENSOR <u>BRC-119, "FRONT V</u> <u>BRC-120, "REAR Wh</u> nosis result for "ABS" a switch OFF, and wa b. e at approx. 30 km/h	An ector. ait 10 seconds or more. (19 MPH) or more for a <u>1104" detected?</u> <u>VHEEL SENSOR : Remo</u> <u>HEEL SENSOR : Remo</u> ait 10 seconds or more. (19 MPH) or more for a	approx. 1 minute. noval and Installation	<u>on"</u> . <u>1"</u> .	_

< DTC/CIRCUIT DIAGNOSIS >

# C1105, C1106, C1107, C1108 WHEEL SENSOR

# **DTC** Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	<ul> <li>When a short circuit is detected in rear RH wheel sensor circuit.</li> <li>When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large.</li> <li>When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal.</li> </ul>	
C1106	RR LH SENSOR-2	<ul> <li>When a short circuit is detected in rear LH wheel sensor circuit.</li> <li>When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large.</li> <li>When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal.</li> </ul>	<ul> <li>Harness or connector</li> <li>Wheel sensor</li> <li>ABS actuator and electric unit</li> </ul>
C1107	FR RH SENSOR-2	<ul> <li>When a short circuit is detected in front RH wheel sensor circuit.</li> <li>When distance between front RH wheel sensor and front RH wheel sensor rotor is large.</li> <li>When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal.</li> </ul>	<ul><li>(control unit)</li><li>Sensor rotor</li><li>Tire</li></ul>
C1108	FR LH SENSOR-2	<ul> <li>When a short circuit is detected in front LH wheel sensor circuit.</li> <li>When distance between front LH wheel sensor and front LH wheel sensor rotor is large.</li> <li>When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal.</li> </ul>	

# DTC CONFIRMATION PROCEDURE

# 1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

# With CONSULT

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

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

YES >> Proceed to <u>BRC-54</u>, "Diagnosis Procedure".

NO >> INSPECTION END

# Diagnosis Procedure

### CAUTION:

### Never check between wheel sensor harness connector terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-101, "Diagnosis Proce-dure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

Revision: 2014 August

# BRC-54

INFOID:000000011323989

INFOID:0000000011323988

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
NO >> Repair or replace error-detected parts.	
2.CHECK TIRE	
<ol> <li>Turn the ignition switch OFF.</li> <li>Check tire air pressure, wear and size. Refer to <u>WT-50, "Tire Air Pressure"</u>.</li> </ol>	
Is the inspection result normal?	
YES >> GO TO 5.	
NO >> Adjust air pressure or replace tire and GO TO 3. 3.CHECK DATA MONITOR (1)	
<ul> <li>With CONSULT</li> <li>Erase self-diagnosis result for "ABS".</li> </ul>	
2. Turn the ignition switch OFF, and wait 10 seconds or more.	
<ol> <li>Start the engine.</li> <li>Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "R</li> </ol>	RIH SENSOR"
and "RR RH SENSOR".	
<b>NOTE:</b> Set the "DATA MONITOR" recording speed to "10 msec".	
<ol> <li>Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel ser</li> </ol>	nsor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the	e error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sense ence within 5%, respectively?	ors, is the differ-
YES $>>$ GO TO 4.	
NO $>>$ GO TO 5.	
<b>4.</b> PERFORM SELF-DIAGNOSIS (1)	
(P)With CONSULT	
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.	
<ol> <li>Stop the vehicle.</li> <li>Perform self-diagnosis for "ABS".</li> </ol>	
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?	
YES >> GO TO 5.	
NO >> INSPECTION END	
5.CHECK WHEEL SENSOR	
<ol> <li>Turn the ignition switch OFF.</li> <li>Check wheel sensor for damage.</li> </ol>	
<ol> <li>Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust college</li> </ol>	ector through the
wheel sensor mounting hole.	-
CAUTION: Install wheel sensor with no backlash and float, and tighten the mounting bolt t	to the specified
torque.	·
<ul> <li>Front: Refer to <u>BRC-119, "FRONT WHEEL SENSOR : Exploded View"</u>.</li> <li>Rear: Refer to <u>BRC-120, "REAR WHEEL SENSOR : Exploded View"</u>.</li> </ul>	
Is the inspection result normal?	
YES >> GO TO 8.	
NO >> GO TO 6.	
<b>6.</b> REPLACE WHEEL SENSOR (1)	
<ol> <li>Replace wheel sensor.</li> <li>Front: Refer to <u>BRC-119</u>, "FRONT WHEEL SENSOR : Removal and Installation".</li> </ol>	
<ul> <li>Rear: Refer to <u>BRC-120, "REAR WHEEL SENSOR : Removal and Installation"</u>.</li> </ul>	
2. Erase self-diagnosis result for "ABS".	
<ol> <li>Turn the ignition switch OFF, and wait 10 seconds or more.</li> <li>Start the engine.</li> </ol>	
5. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "R	R LH SENSOR"
and "RR RH SENSOR".	

NOTE:

< DTC/CIRCUIT DIAGNOSIS >

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

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

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

YES >> GO TO 7.

NO >> GO TO 19.

**7.** PERFORM SELF-DIAGNOSIS (2)

### With CONSULT

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

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

YES >> GO TO 19.

NO >> INSPECTION END

8. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 11.

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

**9.**CHECK DATA MONITOR (2)

### With CONSULT

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

NOTE:

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

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

YES >> GO TO 10.

NO >> GO TO 11.

**10.** PERFORM SELF-DIAGNOSIS (3)

### (I) With CONSULT

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

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

- YES >> GO TO 11.
- NO >> INSPECTION END
- **11.**CHECK TERMINAL
- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

< DTC/CIRCUIT DI	•	, C1107, C1108	B WHEEL SENS	SOR [WITH VDC]
	or replace error-detect	ed parts and GO To	D 12.	<u> </u>
<ol> <li>Connect wheel</li> <li>Erase self-diagr</li> <li>Turn the ignition</li> <li>Start the engine</li> <li>Select "ABS" and "RR RH SE NOTE: Set the "DATA N</li> <li>Read a value (v</li> <li>Regarding the defe</li> <li>wheel sensor and the ence within 5%, response</li> <li>YES &gt;&gt; GO TO</li> <li>NO &gt;&gt; GO TO</li> <li>PERFORM SE</li> <li>With CONSULT</li> <li>Drive the vehicle</li> <li>Stop the vehicle</li> <li>Perform self-dial</li> <li>Is DTC "C1105", "C"</li> </ol>	ctuator and electric un sensor harness conne- nosis result for "ABS". a switch OFF, and wait " "NSOR". MONITOR" recording s wheel speed) of both n rence at 30 km/h (19 he maximum/minimum pectively? 13. 14. LF-DIAGNOSIS (4) e at approx. 30 km/h ( s. ignosis for "ABS". 106", "C1107" or "C11	ector. 10 seconds or more , check "FR LH SE speed to "10 msec". ormal wheel senso <u>MPH) between the</u> m wheel speed deter 19 MPH) or more for	re. NSOR", "FR RH SE rs and error-detectin <u>e wheel speed dete</u> ccted by the normal	ENSOR", "RR LH SENSOR" g wheel sensor. ected by the error detecting wheel sensors. is the differ-
14.CHECK WHEE 1. Turn the ignition 2. Disconnect ABS 3. Disconnect whe	CTION END EL SENSOR HARNES Soution Strategies Strategies Soution and electric Soution and electric Soution Strategies Str	unit (control unit) h nnector.		s connector and the ground.
ABS actuator and ele	ectric unit (control unit)			-
Connector	Terminal	_	Continuity	
E36	9, 8 5, 6 3, 2	Ground	Not existed	-
Is the inspection res YES >> GO TO NO >> Repair of 15.CHECK DATA	15. or replace error-detect	ed parts and GO To	D 15.	-
<ol> <li>Connect ABS a.</li> <li>Connect wheel</li> <li>Erase self-diagr</li> <li>Turn the ignitior</li> <li>Start the engine</li> <li>Select "ABS" an and "RR RH SE NOTE: Set the "DATA N</li> </ol>	nd "DATA MONITOR"	ector. 10 seconds or moi , check "FR LH SE speed to "10 msec".	e. NSOR", "FR RH SE	ENSOR", "RR LH SENSOR" g wheel sensor.

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

YES >> GO TO 16.

NO >> GO TO 17.

**16.**PERFORM SELF-DIAGNOSIS (5)

### With CONSULT

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

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

- YES >> GO TO 17.
- NO >> INSPECTION END

**17.**REPLACE WHEEL SENSOR

### With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-119</u>, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-120, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

### NOTE:

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

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

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

YES >> GO TO 18.

NO >> GO TO 19.

**18.**PERFORM SELF-DIAGNOSIS (6)

(B) With CONSULT

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

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

- YES >> GO TO 19.
- NO >> INSPECTION END
- **19.**REPLACE SENSOR ROTOR

### With CONSULT

- 1. Replace sensor rotor.
- Front: Refer to <u>BRC-122</u>, "FRONT SENSOR ROTOR : Removal and Installation".
- Rear: Refer to BRC-122, "REAR SENSOR ROTOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

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

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".
- NO >> INSPECTION END

# BRC-58

# **C1109 POWER AND GROUND SYSTEM**

# < DTC/CIRCUIT DIAGNOSIS >

# C1109 POWER AND GROUND SYSTEM

# DTC Logic

# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
	BATTERY VOLTAGE	<ul> <li>When ignition power supply voltage is in following state.</li> <li>Ignition power supply voltage: 10 V ≥ Ignition pow-</li> </ul>	Harness or connector     ABS actuator and electric unit     (control unit)
C1109	[ABNORMAL]	<ul> <li>Ignition power supply voltage. To V ≥ Ignition power er supply voltage.</li> <li>Ignition power supply voltage: 16 V ≤ Ignition power er supply voltage.</li> </ul>	<ul> <li>Fusible link</li> <li>Battery power supply system</li> <li>Battery</li> </ul>
DTC CO	ONFIRMATION PROCED	URE	E
1.PRE	CONDITIONING		Les l
	CONFIRMATION PROCED	JRE" has been previously conducted, always ducting the next test.	s turn ignition switch OFF and BR
		5	
2	>> GO TO 2.		G
	CK DTC DETECTION		
1. Turr	CONSULT n the ignition switch OFF to ( form self-diagnosis for "ABS		Н
	C1109" detected?		
YES NO	>> Proceed to <u>BRC-59, "Di</u> >> INSPECTION END	agnosis Procedure".	1
Diagno	osis Procedure		INFOID:000000011323991
<b>1.</b> CHE	CK CONNECTOR		
2. Che	n the ignition switch OFF. eck ABS actuator and electric spection result normal?	c unit (control unit) harness connector for dis	connection or looseness.
YES NO 2.PERI	>> GO TO 3. >> Repair or replace error- FORM SELF-DIAGNOSIS	detected parts, securely lock the connector, a	and GO TO 2.
-	self-diagnosis for "ABS" aga	ain.	M
	C1109" detected?		
YES NO	>> GO TO 3. >> INSPECTION END		Ν
		ELECTRIC UNIT (CONTROL UNIT) BATTER	
-	n the ignition switch OFF.	· · · · · · · · · · · · · · · · · · ·	0
2. Disc	connect ABS actuator and el	ectric unit (control unit) harness connector. tuator and electric unit (control unit) harness	

ABS actuator and ele	ABS actuator and electric unit (control unit) Connector Terminal E36 1		Voltage
Connector			vollage
E36	1	Ground	10 – 16 V

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

### Never start engine.

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

# **BRC-59**

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В

INFOID:000000011323990

# C1109 POWER AND GROUND SYSTEM

# < DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E36	1	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

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

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12. "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

# 5.check abs actuator and electric unit (control unit) ground circuit

1. Turn the ignition switch OFF.

2. Check 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	Ground	LAIsted	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## **6.**CHECK TERMINAL

Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

# C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

# C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

# **DTC** Logic

INFOID:000000011323992

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# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS ac- tuator and electric unit (control unit).	ABS actuator and electric unit (control unit)
DTC CO	ONFIRMATION PROCE	DURE	
1.PREG	CONDITIONING		
	CONFIRMATION PROCED east 10 seconds before cor	OURE" has been previously conducted, always nducting the next test.	turn ignition switch OFF and
	>> GO TO 2.		
2.CHE	CK DTC DETECTION		
1. Turr 2. Perl	CONSULT n the ignition switch OFF to form self-diagnosis for "AB <u>"C1110" detected?</u>		
YES NO	>> Proceed to <u>BRC-61, "[</u> >> INSPECTION END	<u>Diagnosis Procedure"</u> .	
Diagno	osis Procedure		INFOID:000000011323993
<b>1.</b> CHE	CK SELF-DIAGNOSIS RE	SULTS	
	ABS actuator and electric is for "ABS".	c unit (control unit) even if other display than	"C1110" is displayed in self-
	>> Replace ABS actuator <u>tion</u> .	and electric unit (control unit). Refer to <u>BRC</u>	-123, "Removal and Installa-

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

# < DTC/CIRCUIT DIAGNOSIS >

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

# DTC Logic

INFOID:000000011323994

[WITH VDC]

# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1111	PUMP MOTOR	When a malfunction is detected in motor or motor re- lay.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> <li>Fusible link</li> <li>Battery power supply system</li> </ul>

# DTC CONFIRMATION PROCEDURE

# 1.PRECONDITIONING

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

### >> GO TO 2.

# 2. CHECK DTC DETECTION

### With CONSULT

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

### Is DTC "C1111" detected?

YES >> Proceed to <u>BRC-62, "Diagnosis Procedure"</u>. NO >> INSPECTION END

# Diagnosis Procedure

INFOID:000000011323995

# 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

# 2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1111" detected?

YES >> GO TO 3.

NO >> INSPECTION END

# **3.**CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

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

ABS actuator and electric unit (control unit)		Voltage		
Connector	Terminal		vollage	
E36	14	Ground	10 – 16 V	

4. Turn the ignition switch ON. CAUTION:

### Never start engine.

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

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

# < DTC/CIRCUIT DIAGNOSIS >

Connector         Terminal         Image: Connector           E36         14         Ground         10 - 16 V           E the inspection result normal?         YES         >> GO TO 5.           NO         >> GO TO 4.         .           .CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT         .           . Turn the ignition switch OFF.         .           . Check 30 A fusible link (#F).         .           . Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).           . The inspection result normal?           YES         >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY"           NO         >> Repair or replace error-detected parts.           . CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT           . Turn the ignition switch OFF.           . Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.           ABS actuator and electric unit (control unit)	ABS actuator and ele	ectric unit (control unit)				/
it the inspection result normal?         YES       >> GO TO 5.         NO       >> GO TO 4.	Connector	Terminal	_	Voltage		
YES       >> GO TO 5.         NO       >> GO TO 4.         -CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT         Turn the ignition switch OFF.         Check 30 A fusible link (#F).         Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).         Sthe inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY".         NO       >> Repair or replace error-detected parts.         CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT         Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)	E36	14	Ground	10 – 16 V		F
NO       >> GO TO 4.         •.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT         •. Turn the ignition switch OFF.         •. Check 30 A fusible link (#F).         •. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).         •. Ethe inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY".         NO       >> Repair or replace error-detected parts.         •. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT         •. Turn the ignition switch OFF.         •. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)         E36       13         26       Ground         E316       13         276       Ground         E318       Ground         E319       26         Sthe inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.        CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         .* CHECK TERMINAL	s the inspection re	esult normal?				
CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT     Turn the ignition switch OFF.     Check 30 A fusible link (#F).     Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector     terminal (14) and 30 A fusible link (#F).     Sthe inspection result normal?     YES >> Perform trouble diagnosis for battery power supply. Refer to PG-12, "Wiring Diagram - BATTERY <u>POWER SUPPLY -".</u> NO >> Repair or replace error-detected parts.     CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT     Turn the ignition switch OFF.     Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. <u>ABS actuator and electric unit (control unit)</u> <u>13 Ground Existed</u> the inspection result normal?     YES >> GO TO 6. NO >> Repair or replace error-detected parts.     .CHECK TERMINAL     check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness     onnector.     sthe inspection result normal?     YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Removal and Installation".     </u>						
<ul> <li>Turn the ignition switch OFF.</li> <li>Check 30 A fusible link (#F).</li> <li>Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).</li> <li>a the inspection result normal?</li> <li>YES &gt;&gt; Perform trouble diagnosis for battery power supply. Refer to <u>PG-12</u>. "Wiring Diagram - BATTERY <u>POWER SUPPLY -"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT</li> <li>Turn the ignition switch OFF.</li> <li>Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.</li> </ul> ABS actuator and electric unit (control unit) <ul> <li><u>Connector</u> Terminal</li> <li><u>13</u> Ground</li> <li><u>26</u></li> </ul> Sequence of the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected partsCHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connectorCHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connectorS Peplace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u> . "Removal and Installation".	A					
<ul> <li>Check 30<sup>A</sup> fusible link (#F).</li> <li>Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).</li> <li>The inspection result normal?</li> <li>YES &gt;&gt; Perform trouble diagnosis for battery power supply. Refer to <u>PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT</li> <li>Turn the ignition switch OFF.</li> <li>Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.</li> </ul> ABS actuator and electric unit (control unit)           E36         13         Ground         Existed           St the inspection result normal?         YES >> GO TO 6.         Scheck TERMINAL           CHECK TERMINAL         Control unit) pin terminals for damage or loose connection with harness connector.           St the inspection result normal?         YES >> Repair or replace error-detected parts.			IN RELATIFOU	VER SUFFLI (		
<ul> <li>Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (14) and 30 A fusible link (#F).</li> <li>athe inspection result normal?</li> <li>YES &gt;&gt; Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -".</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT</li> <li>Turn the ignition switch OFF.</li> <li>Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.</li> </ul> ABS actuator and electric unit (control unit)						
a the inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY".         NO       >> Repair or replace error-detected parts.         O.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT         Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)         Connector         Terminal         26         Ground         E36         26         Ground         Existed         Sthe inspection result normal?         YES	6. Check continu	ity and short circuit		actuator and el	ectric unit (control unit) harness connector	
YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".         NO       >> Repair or replace error-detected parts.         O.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT         . Turn the ignition switch OFF.         . Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)         Connector       Terminal         26       Ground         Existed         Sthe inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         .CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".	( )		< (#⊢).			
POWER SUPPLY -".       NO         NO       >> Repair or replace error-detected parts.         O.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT         . Turn the ignition switch OFF.         . Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)       —         Connector       Terminal         E36       13         26       Ground         Existed         Sthe inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation".</u>	•		s for battery po	wer supply Ref	er to PG-12 "Wiring Diagram - BATTERY	
CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT  Turn the ignition switch OFF. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.  ABS actuator and electric unit (control unit) Connector Terminal Ground Existed  Terminal Ground Existed  Terminal?  YES >> GO TO 6.  CHECK TERMINAL  Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.  Terminal?  YES >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness CHECK TERMINAL  YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installa- tion".	POWE	<u>ER SUPPLY -".</u>				
<ul> <li>Turn the ignition switch OFF.</li> <li>Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.</li> <li>ABS actuator and electric unit (control unit)         <ul> <li>Connector</li> <li>Terminal</li> <li>Continuity</li> </ul> </li> <li>ABS actuator and electric unit (control unit)         <ul> <li>Connector</li> <li>Terminal</li> <li>Continuity</li> </ul> </li> <li>ABS actuator and electric unit (control unit)         <ul> <li>Connector</li> <li>Terminal</li> <li>Continuity</li> <li>Continuity</li> <li>Ease</li> <li>Tai</li> <li>Ground</li> <li>Existed</li> </ul> </li> <li>The inspection result normal?</li> <li>YES &gt;&gt; GO TO 6.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK TERMINAL</li> </ul> <li>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.</li> <li>The inspection result normal?</li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation"</u>.</li>		•	•			E
ABS actuator and electric unit (control unit)	<b>D.</b> CHECK ABS A	CTUATOR AND EL	ECTRIC UNIT	(CONTROL UI	NIT) GROUND CIRCUIT	
ABS actuator and electric unit (control unit)        Continuity         Connector       Terminal          E36       13       Ground       Existed         a the inspection result normal?       YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL       Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         a the inspection result normal?       YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".				atria cusit (a a stru		
Connector       Terminal       Continuity         E36       13       Ground       Existed         26       26       Existed         27       26       Existed         28       26       Existed         29       26       Existed         29       26       Existed         20       26       Existed         21       26       Existed         21       26       Existed         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL       Existed         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         26       Existed         27       YES         28       Peplace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installa-tion".	. Check continu	ity between ABS a	ctuator and ele	ctric unit (contro	bi unit) harness connector and the ground.	
Connector       Terminal       Continuity         E36       13       Ground       Existed         26       26       Existed         27       26       Existed         28       26       Existed         29       26       Existed         29       26       Existed         20       26       Existed         21       26       Existed         21       26       Existed         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL       Existed         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         26       Existed         27       YES         28       Peplace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installa-tion".	ABS actuator and ele	ectric unit (control unit)				
E36       Ground       Existed         26       26         Sthe inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".			—	Continuity		
26         s the inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         S the inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123, "Removal and Installation".		13			-	
<ul> <li>YES &gt;&gt; GO TO 6.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK TERMINAL</li> <li>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.</li> <li>S the inspection result normal?</li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-tion"</u>.</li> </ul>	E36	26	Ground	Existed		
<ul> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK TERMINAL</li> <li>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.</li> <li><u>s the inspection result normal?</u></li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Removal and Installa-tion"</u>.</li> </ul>	s the inspection re	esult normal?		I	-	
CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector. <u>S the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u> , " <u>Removal and Installa-</u> <u>tion</u> ".						
Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.           S the inspection result normal?           YES         >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-tion"</u> .	· '	•	etected parts.			
onnector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-</u> <u>tion"</u> .						
<u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-tion"</u> .		or and electric unit	(control unit) p	in terminals for	damage or loose connection with harness	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Removal and Installa-</u> tion".		sult normal?				
tion".			nd electric unit	(control unit). F	Refer to BRC-123, "Removal and Installa-	
NO >> Repair or replace error-detected parts.	tion".					
	NO >> Repair	r or replace error-d	etected parts.			

# C1115 WHEEL SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

# C1115 WHEEL SENSOR

# DTC Logic

INFOID:000000011323996

[WITH VDC]

# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified.	<ul> <li>Harness or connector</li> <li>Wheel sensor</li> <li>Sensor rotor</li> <li>ABS actuator and electric unit (control unit)</li> <li>Tire</li> </ul>

# DTC CONFIRMATION PROCEDURE

# 1.PRECONDITIONING

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

>> GO TO 2.

# 2. CHECK DTC DETECTION

### With CONSULT

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

# Is DTC "C1115" detected?

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

# Diagnosis Procedure

### **CAUTION:**

### For wheel sensor, never check between terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-101, "Diagnosis Proce-</u> dure".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

# 2.CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check tire air pressure, wear and size. Refer to <u>WT-50, "Tire Air Pressure"</u>.
- Is the inspection result normal?

YES >> GO TO 5.

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

# **3.**CHECK DATA MONITOR (1)

### With CONSULT

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

Revision: 2014 August

# BRC-64

INFOID-000000011323997

# **C1115 WHEEL SENSOR**

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS > [IIIII 100]	
Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	А
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting	
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ- ence within 5%, respectively?	В
YES >> GO TO 4. NO >> GO TO 5.	
4.PERFORM SELF-DIAGNOSIS (1)	С
<ol> <li>Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.</li> <li>Stop the vehicle.</li> </ol>	D
<ol> <li>Perform self-diagnosis for "ABS".</li> <li><u>Is DTC "C1115" detected?</u></li> </ol>	
YES >> GO TO 5.	Е
NO >> INSPECTION END 5.CHECK WHEEL SENSOR	
1. Turn the ignition switch OFF.	BRC
2. Check wheel sensor for damage.	
<ol> <li>Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.</li> <li>CAUTION:</li> </ol>	G
Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified	
torque. • Front: Refer to <u>BRC-119, "FRONT WHEEL SENSOR : Exploded View"</u> .	Η
<ul> <li>Rear: Refer to <u>BRC-120, "REAR WHEEL SENSOR : Exploded View"</u>.</li> <li><u>Is the inspection result normal?</u></li> </ul>	
YES >> GO TO 8.	I
NO >> GO TO 6.	
6.REPLACE WHEEL SENSOR (1)	J
With CONSULT  Replace wheel sensor.	
<ul> <li>Front: Refer to <u>BRC-119, "FRONT WHEEL SENSOR : Removal and Installation"</u>.</li> <li>Rear: Refer to <u>BRC-120, "REAR WHEEL SENSOR : Removal and Installation"</u>.</li> </ul>	Κ
<ol> <li>Erase self-diagnosis result for "ABS".</li> <li>Turn the ignition switch OFF, and wait 10 seconds or more.</li> </ol>	L
4. Start the engine.	L
<ol> <li>Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".</li> </ol>	N /I
NOTE: Set the "DATA MONITOR" recording speed to "10 msec".	Μ
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?	Ν
YES >> GO TO 7.	0
NO $>>$ GO TO 19.	
/.PERFORM SELF-DIAGNOSIS (2)	Р
With CONSULT <ol> <li>Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.</li> </ol>	
<ol> <li>Stop the vehicle.</li> <li>Perform self-diagnosis for "ABS".</li> </ol>	
Is DTC "C1115" detected?	
YES >> GO TO 19.	
NO >> INSPECTION END	

< DTC/CIRCUIT DIAGNOSIS >

# < DTC/CIRCUIT DIAGNOSIS >

# 8. CHECK CONNECTOR

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

### Is the inspection result normal?

YES >> GO TO 11.

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

# **9.**CHECK DATA MONITOR (2)

### (I) With CONSULT

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

NOTE:

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

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

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

- YES >> GO TO 10.
- NO >> GO TO 11.

**10.**PERFORM SELF-DIAGNOSIS (3)

With CONSULT

- T. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1115" detected?
- YES >> GO TO 11.
- NO >> INSPECTION END
- **11.**CHECK TERMINAL
- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace error-detected parts and GO TO 12.

12. CHECK DATA MONITOR (3)

### ()With CONSULT

- T. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
  - NOTE:

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

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

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

# **BRC-66**

<b>C1115 WHEEL \$</b>	SENSOR
-----------------------	--------

	ບ ບ	1115 WHEEL SI	ENSOR		
< DTC/CIRCUIT DI	AGNOSIS >			[WITH VDC	C]
YES >> GO TO					
NO >> GO TO					
<b>J.</b> PERFORM SE	LF-DIAGNOSIS (4)				
		(19 MPH) or more fo	r approx. 1 minute.		
<ul> <li>Stop the vehicle</li> <li>Perform self-dia</li> </ul>	gnosis for "ABS".				
DTC "C1115" dete	-				
YES >> GO TO					
NO >> INSPEC					
4.CHECK WHEE	L SENSOR HARNE	SS			
<ul> <li>Disconnect whe</li> <li>Check continuity sor harness continuity</li> </ul>	S actuator and electr el sensor harness c y between ABS actu nector. (Check conti	ator and electric unit	(control unit) harnes	ss connector and wheel se H and LH, or center harnes	ss
in wheel housing	g is moved.)				
Measurement connect	ctor and terminal for power	r supply circuit			
ABS actuator and ele	ectric unit (control unit)	Wheel	sensor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	9	E22 (Front LH wheel)	1		
E36	5	E39 (Front RH wheel)	3	Existed	
200	3	C9 (Rear LH wheel)	5		
	11	C10 (Rear RH wheel)	7		
Measurement connect	ctor and terminal for signal	circuit			
ABS actuator and ele	ectric unit (control unit)	Wheel	sensor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	8	E22 (Front LH wheel)	2		
E36	6	E39 (Front RH wheel)	4	Existed	
E30	2	C9 (Rear LH wheel)	6		
	12	C10 (Rear RH wheel)	8		
. Check continuity	y between ABS actu	ator and electric unit	(control unit) harnes	s connector and the groun	ıd.
ABS actuator and ele	ectric unit (control unit)			•	
	1	!	Continuity		

	ABS actuator and electric unit (control unit)			Continuity		в. Л
-	Connector	Terminal		Continuity		IVI
-		9, 8			-	
	E36	5, 6	Ground	Not existed		Ν
	E30	3, 2	Giouna	NOT EXISTED		
		11, 12				
						$\cap$

### Is the inspection result normal?

YES >> GO TO 15.

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

15. CHECK DATA MONITOR (4)

- With CONSULT
  Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- Erase self-diagnosis result for "ABS". 3.
- Turn the ignition switch OFF, and wait 10 seconds or more. 4.
- Start the engine. 5.

# **BRC-67**

Ρ

# **C1115 WHEEL SENSOR**

< DTC/CIRCUIT DIAGNOSIS >

 Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
 NOTE:

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

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

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

YES >> GO TO 16.

NO >> GO TO 17.

**16.**PERFORM SELF-DIAGNOSIS (5)

### With CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR

### With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to BRC-119, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-120, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

### NOTE:

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

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

YES >> GO TO 18.

NO >> GO TO 19.

**18.**PERFORM SELF-DIAGNOSIS (6)

### With CONSULT

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

Is DTC "C1115" detected?

### YES >> GO TO 19.

NO >> INSPECTION END

# **19.**REPLACE SENSOR ROTOR

### With CONSULT

- 1. Replace sensor rotor.
- Front: Refer to BRC-122, "FRONT SENSOR ROTOR : Removal and Installation".
- Rear: Refer to <u>BRC-122</u>, "REAR SENSOR ROTOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

# **BRC-68**

# < DTC/CIRCUIT DIAGNOSIS >

Is DTC	"C1115" detected?								
YES	>> Replace ABS a	ctuator and	electric unit (d	control unit).	Refer to	BRC-123,	"Removal	and	Installa-
NO	tion" >> INSPECTION E	ND	,						

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# C1116 STOP LAMP SWITCH

# < DTC/CIRCUIT DIAGNOSIS >

# C1116 STOP LAMP SWITCH

# DTC Logic

INFOID:000000011323998

# DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1116	STOP LAMP SW	When stop lamp switch signal is not input when brake pedal operates.	<ul> <li>Harness or connector</li> <li>Stop lamp switch</li> <li>Stop lamp relay</li> <li>ABS actuator and electric unit (control unit)</li> <li>Battery power supply system</li> </ul>

# DTC CONFIRMATION PROCEDURE

# 1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

### (D) With CONSULT

- 1. Turn the ignition switch OFF.
- 2. Perform self-diagnosis for "ABS".

### Is DTC "C1116" detected?

- YES >> Proceed to <u>BRC-70, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

# Diagnosis Procedure

# **1.**CHECK CONNECTOR

### With CONSULT

- 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.

Is the inspection result normal?

YES >> GO TO2.

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

**2.**CHECK STOP LAMP SWITCH CLEARANCE

- 1. Turn the ignition switch OFF.
- 2. 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. "Inspection and Adjustment"</u>.

3.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to <u>BRC-71, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 4.

INFOID:000000011323999

# **C1116 STOP LAMP SWITCH**

DTO/OIDOU		C1116 STOP L	AMP SWITCH		[WITH VDC]
	IT DIAGNOSIS >	itab Dafar ta DD 20	"Demoval and Instal	llation"	
4	place stop lamp sw DP LAMP RELAY	ritch. Refer to <u>BR-20, '</u>	Removal and Instal		
		0.74 10 (1	(1) 0		
-	np relay. Refer to <u>Br</u> n result normal?	RC-71, "Component Ir	nspection".		
•	TO 5.				
		itch. Refer to <u>BR-20,</u>	Removal and Instal	llation".	
5.CHECK STO	OP LAMP SWITCH	CIRCUIT			
	op lamp switch har				
2. Check volt	age between ABS a	actuator and electric u	nit (control unit) har	ness connecto	or and ground.
ABS actuator an	d electric unit (control ur	hit)			
Connector	Terminal		Condition		Voltage
			Brake pedal depr	essed	10 – 16 V
E36	16	Ground	Brake pedal not de		Approx. 0 V
Is the inspectio	n result normal?				
-		r and electric unit (co	ntrol unit). Refer to	BRC-123, "Re	emoval and Installa-
NO >> Re		r detected parts			
_	pair or replace erro	r-delected parts.			
Component	Inspection				INFOID:000000011324000
STOP LAMP	SWITCH				
	OP LAMP SWITCH				
	nition switch OFF. t stop lamp switch h	arness connector			
		mp switch is operated	I.		
Stop lamp s	switch	Condition	Continuity		
Termina					
		lamp switch is released ke pedal is depressed)	Existed		
1 – 2	•	lamp switch is pressed			
		ke pedal is released)	Not existed		
Is the inspectio	n result normal?		1		
	SPECTION END				
NO >> Re	place stop lamp sw	itch. Refer to <u>BR-20, '</u>	"Removal and Instal	<u>llation"</u> .	
STOP LAMP	RELAY				
1.CHECK STO	OP LAMP RELAY				
1. Turn the ig	nition switch OFF.				
2. Disconnec	t stop lamp relay ha				
<ol> <li>Apply 12 V CAUTION:</li> </ol>		o relay connector term	inals (2 and 1)		
	ake the terminals	short.			
<ul> <li>Connect</li> </ul>	the fuse between	terminals when app	lying the voltage.		
	Sto	p lamp relay		Continuit	ty
Terminal	A 1 40 14	Condition			
5 – 3		p lamp relay connector ter		Existed	
	Do not apply 12 V betw	een stop lamp relay conne	ctor terminals (2 and 1)	Not existe	ed

 Do not apply 12 V between stop lamp relay connector terminals (2 and 1)

 Is the inspection result normal?

# C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

- YES >> INSPECTION END
- NO >> Replace stop lamp relay.

## C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

## **DTC Logic**

[WITH VDC]

INFOID:000000011324001

А

	Display Item	Malfunction detected condition	Possible causes
C1120	FR LH IN ABS SOL	When a malfunction is detected in front LH ABS IN valve.	
C1122	FR RH IN ABS SOL	When a malfunction is detected in front RH ABS IN valve.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
C1124	RR LH IN ABS SOL	When a malfunction is detected in rear LH ABS IN valve.	<ul> <li>Fusible link</li> <li>Battery power supply system</li> </ul>
C1126	RR RH IN ABS SOL	When a malfunction is detected in rear RH ABS IN valve.	
DTC CO	ONFIRMATION PROC	EDURE	
<b>1.</b> PRE	CONDITIONING		
		CEDURE" has been previously conducted, alway conducting the next test.	s turn ignition switch OFF and
2.сне	>> GO TO 2. CK DTC DETECTION		
1. Turr 2. Per			
NO	>> INSPECTION END		
	osis Procedure		INFOID:00000001132400
Diagno			
	CK CONNECTOR		
1.CHE 1. Turr 2. Che <u>Is the in</u> YES	n the ignition switch OF eck ABS actuator and el spection result normal? >> GO TO 3.	ectric unit (control unit) harness connector for dis	
1.CHE 1. Turr 2. Che Is the in YES NO	n the ignition switch OF eck ABS actuator and el spection result normal? >> GO TO 3.	ectric unit (control unit) harness connector for dis rror-detected parts, securely lock the connector,	
1.CHE 1. Turr 2. Che Is the in YES NO 2.PERI	n the ignition switch OF eck ABS actuator and el spection result normal? >> GO TO 3. >> Repair or replace e	ectric unit (control unit) harness connector for dis rror-detected parts, securely lock the connector, IS	
1.CHE 1. Turr 2. Che Is the in YES NO 2.PERI Perform IS DTC 1	n the ignition switch OF eck ABS actuator and el <u>spection result normal?</u> >> GO TO 3. >> Repair or replace e FORM SELF-DIAGNOS self-diagnosis for "ABS (C1120", "C1122", "C112	ectric unit (control unit) harness connector for dis rror-detected parts, securely lock the connector, IS	
1.CHE 1. Turr 2. Che Is the in YES NO 2.PERI Perform	n the ignition switch OF eck ABS actuator and el <u>spection result normal?</u> >> GO TO 3. >> Repair or replace e FORM SELF-DIAGNOS self-diagnosis for "ABS	ectric unit (control unit) harness connector for dis rror-detected parts, securely lock the connector, IS " again.	

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E36	1	Ground	10 – 16 V

## C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E36	1	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

#### **4.**CHECK ABS IN VALVE POWER SUPPLY CIRCUIT

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

#### Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

**5.**CHECK ABS IN VALVE GROUND CIRCUIT

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

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Connector Terminal		Continuity
E36	13	Ground	Existed
230	26	Ground	Existed

#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

#### **6.**CHECK TERMINAL

Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

## C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

## **DTC** Logic

[WITH VDC]

#### INFOID:000000011324003

DTC	Display Item	Malfunction detected condition	Possible causes	
C1121	FR LH OUT ABS SOL	When a malfunction is detected in front LH ABS OUT valve.		
C1123	FR RH OUT ABS SOL	HOUT ABS SOL       When a malfunction is detected in front RH ABS OUT valve.       • Harness or call         • ABS actuator (control unit)		
C1125	RR LH OUT ABS SOL	When a malfunction is detected in rear LH ABS OUT valve.	<ul> <li>Fusible link</li> <li>Battery power supply system</li> </ul>	
C1127	RR RH OUT ABS SOL	When a malfunction is detected in rear RH ABS OUT valve.		
	ONFIRMATION PROCE	DURE		
.PRE	CONDITIONING			
	CONFIRMATION PROCE east 10 seconds before co	DURE" has been previously conducted, always onducting the next test.	turn ignition switch OFF and	
	>> GO TO 2.			
.CHE	CK DTC DETECTION			
)) With	CONSULT			
. Tur	n the ignition switch OFF t			
. Turi . Per	n the ignition switch OFF t form self-diagnosis for "Al	3S".		
. Tur . Per <u>a DTC :</u>	n the ignition switch OFF f form self-diagnosis for "Al "C1121", "C1123", "C1125	BS". " or "C1127" detected?		
. Turi 2. Per <u>s DTC '</u> YES	n the ignition switch OFF t form self-diagnosis for "Al	BS". " or "C1127" detected?		
. Turi . Per <u>s DTC /</u> YES NO	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, "</u> >> INSPECTION END	BS". " or "C1127" detected?	INFOID-00000001132400	
. Turi . Per <u>s DTC /</u> YES NO Diagno	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, '</u> >> INSPECTION END Osis Procedure	BS". " or "C1127" detected?	INFOID:00000001132400	
. Turi 2. Per <u>s DTC '</u> YES NO Diagno	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, "</u> >> INSPECTION END	BS". " or "C1127" detected?	INFOID:00000001132400	
. Turi . Per <u>s DTC '</u> YES NO Diagno .CHE	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75.</u> >> INSPECTION END Osis Procedure CK CONNECTOR n the ignition switch OFF.	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> .		
. Turn . Per <u>s DTC</u> YES NO Diagno . CHE . Turn . Che	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, "</u> >> INSPECTION END Osis Procedure CK CONNECTOR n the ignition switch OFF. eck ABS actuator and elect	BS". " or "C1127" detected?		
. Turi 2. Per <u>s DTC '</u> YES NO Diagno Diagno I.CHE . Turi 2. Che s the in	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75.</u> >> INSPECTION END Osis Procedure CK CONNECTOR n the ignition switch OFF. eck ABS actuator and elect ispection result normal?	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> .		
. Turi . Per <u>s DTC</u> YES NO Diagno . CHE . Turi . Che <u>s the in</u> YES	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75."</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect ispection result normal? >> GO TO 3.	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> .	connection or looseness.	
. Turn . Per <u>SDTC</u> YES NO Diagno . CHE . Turn . Che <u>Sthe in</u> YES NO	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75."</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect ispection result normal? >> GO TO 3.	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> . etric unit (control unit) harness connector for dis pr-detected parts, securely lock the connector, a	connection or looseness.	
. Turn . Per <u>s DTC</u> YES NO Diagno . CHE . Turn . Che <u>s the in</u> YES NO . PER	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, "</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> . etric unit (control unit) harness connector for dis pr-detected parts, securely lock the connector, a	connection or looseness.	
. Turn . Per <u>s DTC</u> YES NO Diagno . CHE . CHE . Che <u>s the in</u> YES NO . PER	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75.</u> >> INSPECTION END Osis Procedure CK CONNECTOR n the ignition switch OFF. eck ABS actuator and elect <u>spection result normal?</u> >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> . etric unit (control unit) harness connector for dis pr-detected parts, securely lock the connector, a s again.	connection or looseness.	
. Turn . Per SDTC YES NO Diagno . CHE . Turn . Che Sthe in YES NO Perform SDTC YES	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75.</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect ispection result normal? >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS is self-diagnosis for "ABS" a <u>"C1121", "C1123", "C1125</u> >> GO TO 3.	BS". <u>" or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> . etric unit (control unit) harness connector for dis pr-detected parts, securely lock the connector, a s again.	connection or looseness.	
. Turn . Per <u>5 DTC</u> YES NO Diagno . CHE . Turn . Che <u>5 the in</u> YES NO PER Perform <u>5 DTC</u> YES NO	n the ignition switch OFF f form self-diagnosis for "Al <u>"C1121", "C1123", "C1125</u> >> Proceed to <u>BRC-75, "</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect ispection result normal? >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS in self-diagnosis for "ABS" a <u>"C1121", "C1123", "C1125</u>	3S". <u>"or "C1127" detected?</u> <u>"Diagnosis Procedure"</u> . etric unit (control unit) harness connector for discon- por-detected parts, securely lock the connector, a sagain. <u>" or "C1127" detected?</u>	connection or looseness.	

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

ABS actuator and	electric unit (control unit)		- Voltage	
Connector	Connector Terminal		voltage	
E36	1	Ground	10 – 16 V	

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## C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E36	1	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

### CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

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

#### Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5. CHECK ABS OUT VALVE GROUND CIRCUIT

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

ABS actuator and ele	ctric unit (control unit)		Continuity
Connector	Terminal		
E36	13	Ground	Existed
E36 26		Ground	LAISIEU

#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

#### **6.**CHECK TERMINAL

Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

## **C1130 ENGINE SIGNAL**

### < DTC/CIRCUIT DIAGNOSIS >

## C1130 ENGINE SIGNAL

### DTC Logic

INFOID:000000011324005

[WITH VDC]

#### DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** ECM · ABS actuator and electric unit C1130 **ENGINE SIGNAL 1** When a malfunction is detected in ECM system. (control unit) CAN communication line D DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING Е If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. BRC >> GO TO 2. 2. CHECK DTC DETECTION With CONSULT Turn the ignition switch OFF to ON. 1. Perform self-diagnosis for "ABS". 2. Н Is DTC "C1130" detected? YES >> Proceed to BRC-77, "Diagnosis Procedure". >> INSPECTION END NO **Diagnosis** Procedure INFOID:000000011324006 1.CHECK ENGINE SYSTEM (P)With CONSULT Perform self-diagnosis for "ENGINE". Κ Is any DTC detected? YES >> Check the DTC. NO >> GO TO 2. **2.**CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) L (P)With CONSULT 1. Erase self-diagnosis result for "ABS". M Turn the ignition switch OFF. 2. 3. Start the engine and drive the vehicle for a short period of time. 4. Stop the vehicle. Ν 5. Check that the malfunction indicator lamp (MIL) turns OFF. After the vehicle stops, perform self-diagnosis for "ABS". 6. Is DTC "C1130" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "Removal and Installation". >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair or NO replace error-detected parts.

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## C1140 ACTUATOR RELAY SYSTEM

### < DTC/CIRCUIT DIAGNOSIS >

## C1140 ACTUATOR RELAY SYSTEM

### DTC Logic

INFOID:000000011324007

[WITH VDC]

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1140	ACTUATOR RLY	When a malfunction is detected in actuator relay.	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> <li>Fusible link</li> <li>Battery power supply system</li> </ul>

#### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

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

#### >> GO TO 2.

### 2. CHECK DTC DETECTION

#### With CONSULT

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

#### Is DTC "C1140" detected?

YES >> Proceed to <u>BRC-78, "Diagnosis Procedure"</u>. NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000011324008

## 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

### 2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

#### Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

## ${\it 3.}$ check actuator relay power supply

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E36	1	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

#### Never start engine.

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

## C1140 ACTUATOR RELAY SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Connector	Terminal	_	Voltage	
E36	1	Ground	10 – 16 V	
the inspection re	-			
ES >> GO TO	D 5.			
CHECK ACTU	ATOR RELAY POV	VER SUPPLY (	CIRCUIT	
	on switch OFF. sible link (#G).			
Check continu	ity and short circui		actuator and e	ectric unit (control unit) harness connector
. ,	nd 20 A fusible link	(#G).		
the inspection re YES >> Perfor		s for battery or	wer supply Re	er to PG-12, "Wiring Diagram - BATTERY
POWE	<u>ER SUPPLY -".</u>			
•	r or replace error-d	•		
	ATOR RELAY GRO	UND CIRCUIT		
	on switch OFF.	etuator and alc	octric unit (contr	ol unit) harness connector and the ground.
	ity Detween ADS a			
ABS actuator and ele	ectric unit (control unit)		<b>.</b>	
	Terminal	-	Continuity	
Connector				
	13	Ground	Existed	
Connector E36	13 26	Ground	Existed	
E36 the inspection re	26 esult normal?	Ground	Existed	- -
E36 the inspection re YES >> GO TO	26 esult normal? D 6.		Existed	
E36 the inspection re YES >> GO TO NO >> Repai	26 esult normal? D 6. r or replace error-d		Existed	- -
E36 the inspection re YES >> GO TO NO >> Repai .CHECK TERM	26 esult normal? D 6. r or replace error-d NAL	etected parts.		
E36 the inspection re YES >> GO TO NO >> Repai .CHECK TERM	26 esult normal? D 6. r or replace error-d NAL	etected parts.		damage or loose connection with harness
E36 the inspection re YES >> GO TO NO >> Repai •CHECK TERMI heck ABS actuat	26 26 26 26 26 26 26 26 26 27 26 26 26 26 26 26 26 26 26 26 26 26 26	etected parts.		damage or loose connection with harness
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal?	etected parts.	oin terminals for	damage or loose connection with harness Refer to <u>BRC-123, "Removal and Installa-</u>
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal?	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	
E36 the inspection re YES >> GO TO NO >> Repai CHECK TERMI heck ABS actuat onnector. the inspection re YES >> Repla tion".	26 esult normal? O 6. r or replace error-d NAL or and electric unit esult normal? ce ABS actuator a	etected parts. (control unit) p nd electric unit	oin terminals for	

### < DTC/CIRCUIT DIAGNOSIS >

## C1142 PRESS SENSOR

### DTC Logic

DTC	Display Item	Malfunction detected condition	Possible causes
C1142	PRESS SEN CIRCUIT	<ul> <li>Pressure sensor signal line is open or shorted.</li> <li>When an open circuit is detected in pressure sensor circuit</li> <li>When an short circuit is detected in pressure sensor circuit</li> </ul>	<ul> <li>Stop lamp switch system</li> <li>ABS actuator and electric unit (control unit)</li> <li>Brake system</li> </ul>

#### DTC CONFIRMATION PROCEDURE

### 1.PRECONDITIONING

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

#### >> GO TO 2.

### 2. CHECK DTC DETECTION

#### ()With CONSULT

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

#### Is DTC "C1142" detected?

YES >> Proceed to <u>BRC-80, "Diagnosis Procedure"</u>. NO >> INSPECTION END

### Diagnosis Procedure

1.CHECK STOP LAMP SWITCH

Check stop lamp switch system. Refer to BRC-70, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

### 2. CHECK DATA MONITOR

#### With CONSULT

- 1. Erase self--diagnosis result for "ABS".
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Stat the engine.

#### CAUTION:

#### Stop the vehicle.

4. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor display. Refer to <u>BRC-35, "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK BRAKE FLUID LEAKAGE

Check brake fluid leakage. Refer to BR-12. "Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

**4.**CHECK BRAKE PIPING

INFOID:000000011324009

INFOID:000000011324010

## C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
Check brake piping. <ul> <li>Front: Refer to <u>BR-24, "FRONT : Inspection"</u>.</li> <li>Rear: Refer to <u>BR-27, "REAR : Inspection"</u>.</li> </ul>	A
<u>Is the inspection result normal?</u> YES >> GO TO 5. NO >> Repair or replace error-detected parts.	В
5. CHECK BRAKE PEDAL	
Check brake pedal. Refer to BR-21, "Inspection and Adjustment".	C
Is the inspection result normal?	
YES >> GO TO 6. NO >> Repair or replace error-detected parts.	D
6. CHECK MASTER CYLINDER	
Check master cylinder. Refer to <u>BR-32, "Inspection"</u> .	E
Is the inspection result normal?	
YES >> GO TO 7.	DD
NO >> Repair or replace error-detected parts.	BRC
CHECK BRAKE BOOSTER	
Check brake booster. Refer to <u>BR-34, "Inspection and Adjustment"</u> .	G
<u>Is the inspection result normal?</u> YES >> GO TO 8.	
NO >> Repair or replace error-detected parts.	Н
8. CHECK VACUUM PIPING	
Check vacuum piping. Refer to <u>BR-35, "Inspection"</u> .	
Is the inspection result normal?	I
YES >> GO TO 9.	
NO >> Repair or replace error-detected parts. 9.CHECK FRONT DISC BRAKE	J
Check front disc brake. Refer to <u>BR-44. "BRAKE CALIPER ASSEMBLY : Inspection"</u> . <u>Is the inspection result normal?</u>	K
YES $>>$ GO TO 10.	
NO >> Repair or replace error-detected parts.	
10.CHECK REAR DISC BRAKE	L
Check rear disc brake. Refer to BR-52, "BRAKE CALIPER ASSEMBLY : Inspection".	
Is the inspection result normal?	M
YES >> GO TO 11. NO >> Repair or replace error-detected parts.	
11. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	Ν
<ul> <li>With CONSULT</li> <li>Erase selfdiagnosis result for "ABS".</li> </ul>	
2. Start the engine and drive the vehicle for a short period of time.	0
<ol> <li>After the vehicle stops, perform self-diagnosis for "ABS".</li> <li>Is DTC"C1142" detected?</li> </ol>	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u> , "Remova	al and Installa-
tion".	
NO >> Check pin terminals and connection of ABS actuator and electric unit (control unit	) narness con-

nector for abnormal conditions. Repair or replace error-detected parts.

#### < DTC/CIRCUIT DIAGNOSIS >

## C1143 STEERING ANGLE SENSOR

### DTC Logic

INFOID:0000000011324011

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1143	ST ANG SEN CIRCUIT	<ul> <li>When a malfunction is detected in steering angle sensor.</li> <li>When an open circuit is detected in steering angle sensor circuit</li> <li>When an short circuit is detected in steering angle sensor circuit</li> <li>Wheel alignment is outside specified range.</li> </ul>	<ul> <li>Harness or connector</li> <li>Steering angle sensor</li> <li>ABS actuator and electric unit (control unit)</li> <li>Fuse</li> <li>Ignition power supply system</li> <li>CAN communication line</li> <li>Wheel alignment</li> </ul>

### DTC CONFIRMATION PROCEDURE

## 1.PRECONDITIONING

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

>> GO TO 2.

## 2. CHECK DTC DETECTION

#### (D) With CONSULT

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

#### Is DTC "C1143" detected?

- YES >> Proceed to <u>BRC-82, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

### Diagnosis Procedure

**1.**CHECK STEERING WHEEL PLAY

Check steering wheel play. Refer to ST-11, "Inspection".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

### 2. CHECK WHEEL ALIGNMENT

#### Check wheel alignment.

- Front: Refer to FSU-7, "Inspection".
- Rear: Refer to <u>RSU-6, "Inspection"</u>.

#### Is the inspection result normal?

YES >> GO TO 3. NO >> Adjust w

- >> Adjust wheel alignment.
  - Front: Refer to <u>FSU-7, "Adjustment"</u>.
  - Rear: Refer to <u>RSU-6, "Adjustment"</u>.

## 3.check connector

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

#### Is the inspection result normal?

YES >> GO TO 4.

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

### **BRC-82**

INFOID:0000000011324012

## **C1143 STEERING ANGLE SENSOR**

Perform self-dia	anosis for "ARS	S" again.			
s DTC "C1143"	•	o uguni.			
YES >> GO	TO 5.				
	PECTION END				
<b>D.</b> CHECK STE	ERING ANGLE	E SENSOR PO	NER SUPPLY		
	nition switch OF				
		sensor harness eering angle ser		onnector and ground.	
	0	0 0		5	
Steering an	igle sensor		Voltage		
Connector	Terminal		voltage		
M30	4	Ground	Approx. 0 V		
	nition switch ON	N			
CAUTION: Never start	engine				
		eering angle sei	nsor harness co	onnector and ground.	
Steering an	igle sensor		Voltage		
0	Terminal		vollage		
Connector	Terminar				
M30 <u>M30</u> <u>s the inspection</u> YES >> GO NO >> GO	4 result normal? TO 7.	Ground	10 – 16 V		
M30 s the inspection YES >> GO NO >> GO O.CHECK STE	4 TO 7. TO 6. ERING ANGLE	2 E SENSOR PO		CIRCUIT	
M30 <u>s the inspection</u> YES >> GO NO >> GO D.CHECK STE . Turn the ign 2. Check 10 A	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3).	2 E SENSOR POV FF.	WER SUPPLY	CIRCUIT	
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B	2 E SENSOR POV FF. 3) harness conn	WER SUPPLY		
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B	2 E SENSOR POV FF. 3) harness conn	WER SUPPLY	CIRCUIT connector and fuse block (J/B) harness co	onnec-
M30 S the inspection YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A . Disconnect . Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B	2 E SENSOR PO F. ) harness conn steering angle s	WER SUPPLY ector. sensor harness		onnec-
M30 <u>s the inspection</u> YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A 3. Disconnect . Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between	2 E SENSOR PO F. ) harness conn steering angle s	WER SUPPLY	connector and fuse block (J/B) harness co	onnec-
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A . Disconnect . Check conti tor.	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between	2 E SENSOR PO F. ) harness conn steering angle s	WER SUPPLY ector. sensor harness		onnec-
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect 4. Check conti tor. Steering an Connector M30	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between ngle sensor Terminal 4	2 E SENSOR PON FF. 3) harness conn steering angle s Fuse bl Connector M6	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A	connector and fuse block (J/B) harness co Continuity Existed	onnec-
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A . Disconnect . Check conti tor. Steering an Connector M30	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between ngle sensor Terminal 4	2 E SENSOR PON FF. 3) harness conn steering angle s Fuse bl Connector M6	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A	connector and fuse block (J/B) harness co Continuity	onnec-
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A B. Disconnect . Check conti tor. Steering an Connector M30 5. Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between ngle sensor Terminal 4 inuity between	2 E SENSOR PON FF. 3) harness conn steering angle s Fuse bl Connector M6	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A	connector and fuse block (J/B) harness co Continuity Existed	onnec-
M30 s the inspection YES >> GO NO >> GO D.CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect 4. Check conti tor. Steering an Connector M30 5. Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between agle sensor Terminal 4 inuity between	2 E SENSOR PON FF. 3) harness conn steering angle s Fuse bl Connector M6	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A	connector and fuse block (J/B) harness co Continuity Existed	onnec-
M30 s the inspection YES >> GO NO >> GO CHECK STE . Turn the ign . Check 10 A . Disconnect . Check conti tor. Steering an Connector M30 . Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between gle sensor Terminal 4 inuity between gle sensor Terminal	2 E SENSOR POV FF. B) harness conn steering angle s Fuse bl Connector M6 steering angle s	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A sensor harness Continuity	connector and fuse block (J/B) harness co Continuity Existed	onnec-
M30 s the inspection YES >> GO NO >> GO D.CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect 4. Check conti tor. Steering an Connector M30 5. Check conti Steering an Connector M30	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between agle sensor Terminal 4 inuity between agle sensor Terminal 4	2 E SENSOR POV F. B) harness conn steering angle s Fuse bl Connector M6 steering angle s 	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A sensor harness	connector and fuse block (J/B) harness co Continuity Existed	onnec-
M30 s the inspection YES >> GO NO >> GO D.CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect 4. Check conti tor. Steering an Connector M30 5. Check conti Steering an Connector M30 s the inspection YES >> Per	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between ngle sensor Terminal 4 inuity between gle sensor Terminal 4 n result normal? form trouble dia	2 E SENSOR POV FF. B) harness conn steering angle s Fuse bl Connector M6 steering angle s 	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A sensor harness Continuity Not existed	connector and fuse block (J/B) harness co Continuity Existed	
M30 s the inspection YES >> GO NO >> GO D.CHECK STE . Turn the ign 2. Check 10 A 3. Disconnect 4. Check conti tor. Steering an Connector M30 5. Check conti Steering an Connector M30 5. Check conti Steering an Connector M30 5. Check conti Steering an Connector M30 5. Check conti Steering an Connector M30 5. Check conti	4 TO 7. TO 6. ERING ANGLE hition switch OF fuse (#3). fuse block (J/B inuity between ngle sensor Terminal 4 inuity between gle sensor Terminal 4 n result normal? form trouble dia WER SUPPLY	2 E SENSOR POV FF. B) harness conn steering angle s Fuse bl Connector M6 steering angle s 	WER SUPPLY ector. sensor harness ock (J/B) Terminal 2A sensor harness Continuity Not existed ion power supp	connector and fuse block (J/B) harness co Continuity Existed connector and ground.	

## C1143 STEERING ANGLE SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

Steering angle sensor			Continuity
Connector	Connector Terminal		Continuity
M30	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK TERMINAL

1. Check steering angle sensor pin terminals for damage or loose connection with harness connector.

2. Check fuse block (J/B) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

**9.**CHECK CAN COMMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to LAN-62, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> <u>tion</u>".

NO >> Repair or replace error-detected parts. Refer to <u>BRC-7</u>, "Precaution for Harness Repair".

### **C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT** [WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

## **DTC** Logic

INFOID:000000011324013

А

DTC DI	ETECTION LOGIC		
DTC	Display Item	Malfunction detected condition	Possible causes
C1144	ST ANG SEN SIGNAL	When neutral position adjustment of steering angle sensor is not complete.	<ul> <li>Harness or connector</li> <li>Steering angle sensor</li> <li>ABS actuator and electric unit (control unit)</li> <li>Incomplete neutral position ad- justment of steering angle sen- sor</li> </ul>
	ONFIRMATION PROCED	URE	
1.PRE	CONDITIONING		
		URE" has been previously conducted, alway	s turn ignition switch OFF and
wall at l	east 10 seconds before con	ducting the next test.	-
	>> GO TO 2.		
2.сне	CK DTC DETECTION		
	CONSULT		
	n the ignition switch OFF to form self-diagnosis for "ABS		
	"C1144" detected?		
YES NO	>> Proceed to <u>BRC-85, "D</u> >> INSPECTION END	iagnosis Procedure".	
-			
	osis Procedure		INFOID:000000011324014
1.ADJI	JST THE NEUTRAL POSIT	ION OF STEERING ANGLE SENSOR	
Perform	neutral position adjustment	of steering angle sensor. Refer to <u>BRC-49.</u>	"Work Procedure".
	>> GO TO 2.		
2.сне		ELECTRIC UNIT (CONTROL UNIT)	
	CONSULT		
Perform	self-diagnosis for "ABS".		
	"C1144" detected?		
YES NO	>> GO TO 3. >> INSPECTION END		
<b>3.</b> сне	CK STEERING ANGLE SE	NSOR SYSTEM	
1. Tur	n the ignition switch OFF.		
	eck steering angle sensor sy spection result normal?	stem. Refer to <u>BRC-82, "Diagnosis Procedu</u>	<u>re"</u> .
YES		and electric unit (control unit). Refer to BRC	C-123, "Removal and Installa-
	<u>tion"</u>		
NO	>> Repair or replace error-		

< DTC/CIRCUIT DIAGNOSIS >

## C1145, C1146 YAW RATE/SIDE G SENSOR

## **DTC Logic**

INFOID:000000011324015

[WITH VDC]

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1145	YAW RATE SENSOR	<ul> <li>Yaw rate sensor is malfunctioning.</li> <li>Yaw rate/side G sensor signal line is open or shorted.</li> <li>When yaw rate/side G sensor power supply voltage is in following state.</li> <li>Yaw rate/side G sensor power supply voltage: 10 V ≥ Yaw rate/side G sensor.</li> <li>Yaw rate/side G sensor power supply voltage: 16 V ≤ Yaw rate/side G sensor power supply voltage.</li> </ul>	<ul> <li>Harness or connector</li> <li>Yaw rate/side G sensor</li> <li>ABS actuator and electric unit (control unit)</li> </ul>
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning.	

#### DTC CONFIRMATION PROCEDURE

#### **1.**PRECONDITIONING

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

#### >> GO TO 2.

### 2. CHECK DTC DETECTION

#### ()With CONSULT

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

#### Is DTC "C1145" or "C1146" detected?

- YES >> Proceed to <u>BRC-86</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

#### **Diagnosis Procedure**

INFOID:000000011324016

#### **CAUTION:**

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. may cause yaw rate/side G sensor circuit indicate a malfunction. However this is not a malfunction if normal operation can be resumed after restarting engine.
- When on a turntable, such as at a parking structure entrance, or when on a moving object with engine running, the VDC warning lamp might turn on and self-diagnosis using the CONSULT yaw rate sensor system malfunction might be displayed, but in this case there is no malfunction with yaw rate/side 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 ignition switch OFF.
- 2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- 3. Check yaw rate/side G sensor harness connector for disconnection or looseness.

Is the inspection result normal?

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1145" or "C1146" detected?

- YES >> GO TO 3.
- NO >> INSPECTION END

## C1145, C1146 YAW RATE/SIDE G SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

	ate/side G sensor harı	ness connector. S sensor harness conne	ector and ground.	
Yaw rate/s	side G sensor		Voltage	
Connector	Terminal		voltage	
M52	4	Ground	Approx. 0 V	
. Turn the ignition s CAUTION: Never start engli . Check voltage be	ne.	sensor harness conne	ector and ground.	
Yaw rate/s	side G sensor		Valtara	
Connector	Terminal		Voltage	
M52	4	Ground	Approx. 12 V	
CHECK YAW RAT	E/SIDE G SENSOR P	OWER SUPPLY CIRCI	JIT	
. Turn ignition swite . Disconnect ABS a	ch OFF. actuator and electric u between yaw rate/side	nit (control unit) harnes e G sensor harness co	s connector.	ator and electric u
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity</li> <li>(control unit) harn</li> </ul>	ch OFF. actuator and electric u between yaw rate/side	nit (control unit) harnes	s connector. nnector and ABS actu	
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector	s connector. nnector and ABS actua tric unit (control unit) Terminal	Continuity
Turn ignition swite Disconnect ABS a Check continuity (control unit) harn Yaw rate/si Connector M52	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36	s connector. nnector and ABS actua tric unit (control unit) Terminal 4	
Turn ignition swite Disconnect ABS a Check continuity (control unit) harn Yaw rate/si Connector M52	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector	s connector. nnector and ABS actua tric unit (control unit) Terminal 4	Continuity
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground.	Continuity
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36	s connector. nnector and ABS actua tric unit (control unit) Terminal 4	Continuity
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground.	Continuity
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>the inspection result</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor Terminal 4 t normal?	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36 e G sensor harness con Ground	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground. Continuity Not existed	Continuity Existed
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Sthe inspection result</li> <li>YES &gt;&gt; Replace A <u>tion</u>".</li> <li>NO &gt;&gt; Repair or</li> <li>CHECK YAW RATI</li> <li>Turn ignition swite</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor Terminal 4 t normal? ABS actuator end elect replace error-detected ch OFF.	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36 e G sensor harness con Ground ctric unit (control unit). d parts. ROUND CIRCUIT	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground. Continuity Not existed Refer to <u>BRC-123, "R</u>	Continuity Existed
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Sthe inspection result</li> <li>YES &gt;&gt; Replace a</li> <li>tion".</li> <li>NO &gt;&gt; Repair or</li> <li>D.CHECK YAW RAT</li> <li>Turn ignition swite</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor Terminal 4 t normal? ABS actuator end elect replace error-detected E/SIDE G SENSOR G ch OFF. between yaw rate/side	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36 e G sensor harness con Ground ctric unit (control unit).	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground. Continuity Not existed Refer to <u>BRC-123, "R</u> nector and ground.	Continuity Existed
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Sthe inspection result</li> <li>YES &gt;&gt; Replace a</li> <li>tion".</li> <li>NO &gt;&gt; Repair or</li> <li>CHECK YAW RAT</li> <li>Turn ignition swite</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor Terminal 4 t normal? ABS actuator end elect replace error-detected ch OFF.	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36 e G sensor harness con Ground ctric unit (control unit). d parts. ROUND CIRCUIT	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground. Continuity Not existed Refer to <u>BRC-123, "R</u>	Continuity Existed
<ul> <li>Turn ignition swite</li> <li>Disconnect ABS a</li> <li>Check continuity (control unit) harn</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Check continuity</li> <li>Yaw rate/si</li> <li>Connector</li> <li>M52</li> <li>Sthe inspection result</li> <li>YES &gt;&gt; Replace a</li> <li>tion".</li> <li>NO &gt;&gt; Repair or</li> <li>CHECK YAW RAT</li> <li>Turn ignition swite</li> <li>Check continuity</li> </ul>	ch OFF. actuator and electric u between yaw rate/side ess connector. de G sensor Terminal 4 between yaw rate/side side G sensor Terminal 4 t normal? ABS actuator end electron replace error-detected E/SIDE G SENSOR G ch OFF. between yaw rate/side	nit (control unit) harnes e G sensor harness co ABS actuator and elec Connector E36 e G sensor harness con Ground ctric unit (control unit). d parts. ROUND CIRCUIT	s connector. nnector and ABS actua tric unit (control unit) Terminal 4 nector and ground. Continuity Not existed Refer to <u>BRC-123, "R</u> nector and ground.	Continuity Existed

 $6. {\sf CHECK YAW RATE/SIDE G SENSOR SIGNAL CIRCUIT}$ 

## C1145, C1146 YAW RATE/SIDE G SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

Check continuity between yaw rate/side G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Yaw rate/si	de G sensor	ABS actuator and electric unit (control unit)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M52	2	E36	25	- Existed	
INI32	3	L30	19	LXISIEU	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

#### 7.CHECK TERMINAL

- 1. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 2. Disconnect yaw rate/side G sensor harness connector and check yaw rate/side G sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Repair or replace error-detected parts.

**8.**REPLACE YAW RATE/SIDE G SENSOR

#### With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector
- 2. Replace yaw rate/side G sensor. Refer to <u>BRC-125, "Removal and Installation"</u>.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF.
- 5. Turn the ignition switch ON.

#### CAUTION:

#### Never start engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1145" or "c1146" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".
- NO >> INSPECTION END

[WITH VDC]

#### < DTC/CIRCUIT DIAGNOSIS >

## C1155 BRAKE FLUID LEVEL SWITCH

## DTC Logic

## DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1155	BR FLUID LEVEL LOW	<ul> <li>When brake fluid level low signal is detected.</li> <li>When an open circuit is detected in brake fluid level switch circuit.</li> <li>When an short circuit is detected in brake fluid level switch circuit.</li> </ul>	<ul> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> <li>Brake fluid level switch</li> <li>Combination meter</li> </ul>
DTC CC	ONFIRMATION PROCED	URE	
1.PREC	CONDITIONING		
If "DTC (	CONFIRMATION PROCED	JRE" has been previously conducted, always	turn ignition switch OFF and
wait at le	east 10 seconds before cond	ducting the next test.	
	>> GO TO 2.		
2.CHE	CK DTC DETECTION		
1. Turr	n the ignition switch OFF to		
	orm self-diagnosis for "ABS C1155" detected?		
YES	>> Proceed to <u>BRC-89, "Di</u>	agnosis Procedure".	
NO	>> INSPECTION END		
Diagno	osis Procedure		INFOID:000000011324018
1.сне	CK BRAKE FLUID LEVEL		
	the ignition switch OFF.		
	ck brake fluid level. Refer to	BR-12, "Inspection".	
YES	spection result normal? >> GO TO 3.		
NO		to <u>BR-12, "Refilling"</u> . GO TO 2.	
2.PERF	FORM SELF-DIAGNOSIS (*	1)	
9			
	se self-diagnosis result for "/ the ignition switch OFF, an		
	the ignition switch ON.		
Nev	er start the engine.		
	orm self-diagnosis for "ABS	" -	
YES	<u>C1155" detected?</u> >> GO TO 3.		
NO	>> INSPECTION END		
<b>З.</b> СНЕ(	CK BRAKE FLUID LEVEL S	WITCH	
		er to <u>BRC-91, "Component Inspection"</u> .	
<u>Is the ins</u> YES	spection result normal?		
YES NO	>> GO TO 5. >> Replace reservoir tank.	Refer to BR-29. "Removal and Installation".	GO TO 4.
	FORM SELF-DIAGNOSIS (2	2)	

INFOID:000000011324017

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< DTC/CIRCUIT DIAGNOSIS >

#### (I)With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Turn the ignition switch ON. CAUTION:
  - Never start the engine.
- Perform self-diagnosis for "ABS".
- Is DTC "C1155" detected?
- YES >> INSPECTION END

NO >> GO TO 5.

#### 5.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 7.

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

**6.**PERFORM SELF-DIAGNOSIS (3)

#### ()With CONSULT

- 1. Connect brake fluid level switch harness connector.
- 2. Connect combination meter harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Turn the ignition switch ON.

## CAUTION:

- Never start the engine.
- 6. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> INSPECTION END

NO >> GO TO 7.

7. CHECK BRAKE FLUID LEVEL SWITCH HARNESS

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

Brake fluid	level switch	Combina	tion meter	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E37	1	M34	27	Existed

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

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

## **C1155 BRAKE FLUID LEVEL SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

7. Check continuity between brake fluid level switch harness connector and ground.

Brake fluid	Brake fluid level switch		Continuity
Connector	Connector Terminal		Continuity
E37	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts. GO TO 8.

 ${f 8}.$ CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

Brake fluid	level switch		Continuity	
Connector	Terminal		Continuity	
E37	2	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts. GO TO 9.

### 9. CHECK COMBINATION METER

Check combination meter. Refer to MWI-35, "CONSULT Function".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to MWI-90, "Removal and Installation".

#### **Component Inspection**

### 1.CHECK BRAKE FLUID LEVEL SWITCH

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

Terminal     When brake fluid level in reservoir tank is within the specified level.     Not existed       1 - 2     When brake fluid level in reservoir tank is less than the specified     Existed	Brake fluid level switch	Condition	Continuity	•
1 - 2 When brake fluid level in reservoir tank is less than the specified Existed	Terminal	Condition	Continuity	I
Fxisted		When brake fluid level in reservoir tank is within the specified level.	Not existed	-
level.	1 – 2	When brake fluid level in reservoir tank is less than the specified level.	Existed	-

#### the inspection result normal?

YES >> INSPECTION END

>> Replace reservoir tank. Refer to <u>BR-29</u>, "Removal and Installation". NO

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[WITH VDC]

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INFOID:000000011324019

### C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

## C1161 INCOMPLETE SIDE G SENSOR CALIBRATION

### **DTC Logic**

INFOID:000000011324020

[WITH VDC]

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1161	SIDE G SEN SET	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

### DTC CONFIRMATION PROCEDURE

### 1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

#### ()With CONSULT

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

Is DTC "C1161" detected?

YES >> Proceed to <u>BRC-92</u>, "Diagnosis Procedure".

NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000011324021

### **1.**CHECK YAW RATE/SIDE G SENSOR

Replace ABS actuator and electric unit (control unit) even if other display than "C1161" is displayed in selfdiagnosis for "ABS".

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-</u> tion".

#### **C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION** [WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

## DTC Logic

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DTC Lo	ogic		INFOID:000000011324022	
DTC DE	TECTION LOGIC			В
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)	С
DTC CC	NFIRMATION PROCEI	DURE		D
<b>1</b> .PREC	ONDITIONING			D
	CONFIRMATION PROCED ast 10 seconds before col	DURE" has been previously conducted, always t nducting the next test.	turn ignition switch OFF and	E
	>> GO TO 2.			
2.снес	K DTC DETECTION			BR
1. Turn 2. Perfe <u>Is DTC "(</u>	CONSULT the ignition switch OFF to orm self-diagnosis for "AB C1162" detected?	S".		G
	>> Proceed to <u>BRC-93, "I</u> >> INSPECTION END	Diagnosis Procedure.		Η
Diagno	sis Procedure		INFOID:000000011324023	
1.REPL	ACE ABS ACTUATOR AN	ND ELECTRIC UNIT (CONTROL UNIT)		
	ABS actuator and electrics for "ABS".	c unit (control unit) even if other display than "	C1162" is displayed in self-	J
	> Replace ABS actuator tion <sup>"</sup> .	and electric unit (control unit). Refer to <u>BRC-</u>	123. "Removal and Installa-	K
				L

Revision: 2014 August

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## C1164, C1165 CV SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

## C1164, C1165 CV SYSTEM

### DTC Logic

INFOID:000000011324024

[WITH VDC]

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1164	CV 1	When a malfunction is detected in cut valve 1.	Harness or connector
C1165	CV 2	When a malfunction is detected in cut valve 2.	<ul> <li>ABS actuator and electric unit (control unit)</li> <li>Fusible link</li> <li>Battery power supply system</li> </ul>

#### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

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

#### >> GO TO 2.

### 2. CHECK DTC DETECTION

#### ()With CONSULT

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

#### Is DTC "C1164" or "C1165" detected?

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

### Diagnosis Procedure

INFOID:000000011324025

### **1.**CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

#### Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> INSPECTION END

**3.**CHECK CUT VALVE POWER SUPPLY

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

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		vollage
E36	1	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

#### Never start engine.

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

#### BRC-94

## C1164, C1165 CV SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

	ctric unit (control unit)			
Connector	Terminal	—	Voltage	
E36	1	Ground	10 – 16 V	
s the inspection re	esult normal?			
YES >> GO T				
	ALVE POWER SUP	PLY CIRCUIT		
	on switch OFF. Isible link (#G).			
Check continu	ity and short circuit		actuator and ele	ectric unit (control unit) harness connector
	nd 20 A fusible link	(#G).		
the inspection re YES >> Perfor		s for battery po	wer supply Ref	er to PG-12, "Wiring Diagram - BATTERY
POW	<u>ER SUPPLY -".</u>			
•	r or replace error-de	•		
	ALVE GROUND CI	RCUIT		
	on switch OFF.	ctuator and elec	ctric unit (contro	l unit) harness connector and the ground.
Oneok contine	ity between ADO at			runny namess connector and the ground.
ABS actuator and e	lectric unit (control unit)			-
Connector	Terminal		Continuity	
E36	13	Ground	Existed	-
	26	Croana	Exiotod	
				_
•				-
YES >> GO T	O 6.	etected parts		-
YES >> GO To NO >> Repai	O 6. r or replace error-de	etected parts.	]	-
YES >> GO TO NO >> Repai	O 6. r or replace error-de INAL		in terminals for	-
YES >> GO TO NO >> Repai CHECK TERM heck ABS actuat	O 6. r or replace error-de INAL		in terminals for	- damage or loose connection with harness
NO >> Repai CHECK TERM check ABS actuat onnector. the inspection re	O 6. r or replace error-de INAL tor and electric unit esult normal?	(control unit) pi		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actuat onnector. the inspection ro YES >> Repla	O 6. r or replace error-de INAL tor and electric unit esult normal?	(control unit) pi		damage or loose connection with harness efer to <u>BRC-123. "Removal and Installa-</u>
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal?	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		
YES >> GO TO NO >> Repai CHECK TERM heck ABS actual onnector. the inspection ro YES >> Repla tion".	O 6. r or replace error-de INAL tor and electric unit esult normal? ce ABS actuator ar	(control unit) pi nd electric unit		

## C1166, C1167 SV SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

## C1166, C1167 SV SYSTEM

### DTC Logic

INFOID:0000000011324026

[WITH VDC]

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1166	SV 1	When a malfunction is detected in suction valve 1.	Harness or connector
C1167	SV 2	When a malfunction is detected in suction valve 2.	<ul> <li>ABS actuator and electric unit (control unit)</li> <li>Fusible link</li> <li>Battery power supply system</li> </ul>

#### DTC CONFIRMATION PROCEDURE

### **1.**PRECONDITIONING

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

#### >> GO TO 2.

### 2. CHECK DTC DETECTION

#### ()With CONSULT

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

#### Is DTC "C1166" or "C1167" detected?

YES >> Proceed to <u>BRC-96, "Diagnosis Procedure"</u>. NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000011324027

### **1.**CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

#### 2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

#### Is DTC "C1166" or "C1167" detected?

YES >> GO TO 3.

NO >> INSPECTION END

## **3.**CHECK SUCTION VALVE POWER SUPPLY

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		vollage
E36	1	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

#### Never start engine.

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



## C1166, C1167 SV SYSTEM

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Connector       Terminal       Coltage         E38       1       Ground       10-16 V         Sthe inspection result normal?       YES       >> GO TO 5.         YES       >> GO TO 4.	ABS actuator and ele	ctric unit (control unit)				ŀ
attend to the inspection result normal?         YES       >> GO TO 5.         NO       >>> GO TO 4.         4.CHECK SUCTION VALVE POWER SUPPLY CIRCUIT         Turn the ignition switch OFF.         Check 20 A fusible link (#G).         Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G).         s the inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -"."         NO       >> Repair or replace error-detected parts.         CHECK SUCTION VALVE GROUND CIRCUIT         Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)       Continuity         Connector       Terminal         26       13         26       26         30       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         Sthe inspection result normal?         YES       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric			—	Voltage		
YES       ⇒> GO TO 5.         NO       ⇒> GO TO 4.         •.CHECK SUCTION VALVE POWER SUPPLY CIRCUIT         •.Turn the ignition switch OFF.         •.Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G).         •.The inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY"         NO       >> Repair or replace error-detected parts.         •.CHECK SUCTION VALVE GROUND CIRCUIT       •. Turn the ignition switch OFF.         •. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit) <u>Continuity</u> <u>Connector</u> Terminal         E36       13       Ground         265       Stele inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         .CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.         s the inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123, "Removal and Installation".         NO       >> Repair or replace e	E36	1	Ground	10 – 16 V		r
NO       ⇒> GO TO 4.         LCHECK SUCTION VALVE POWER SUPPLY CIRCUIT        Turn the ignition switch OFF.        Check 20 A fusible link (#G).         1. Check to A fusible link (#G).         sthe inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY         NO       >> Repair or replace error-detected parts.         O.CHECK SUCTION VALVE GROUND CIRCUIT        Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit) <u>Connector</u> Terminal <u>26</u> Sthe inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.        CHECK TERMINAL         NO       >> Repair or replace error-detected parts.        CHECK ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.        CHECK TERMINAL         Check ABS actuator and electric unit (control unit), in terminals for damage or loose connection with harness connector.        CHECK TERMINAL         The inspection result normal?         YES <td>Is the inspection re</td> <td>esult normal?</td> <td></td> <td></td> <td></td> <td>E</td>	Is the inspection re	esult normal?				E
CHECK SUCTION VALVE POWER SUPPLY CIRCUIT     Turn the ignition switch OFF.     Check 20 A fusible link (#G).     Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G).     Sthe inspection result normal?     YES >> Perform trouble diagnosis for battery power supply. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY".     NO >> Repair or replace error-detected parts.     CHECK SUCTION VALVE GROUND CIRCUIT     Turn the ignition switch OFF.     Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. <u>ABS actuator and electric unit (control unit)</u> <u>connector Terminal Continuity     <u>26</u> <u>36</u> <u>36</u> <u>36</u> <u>37</u> <u>37</u> <u>38</u> <u>38</u> <u>CHECK TERMINAL     Check ABS actuator and electric unit (control unit), Refer to <u>BRC-123, "Removal and Installation"</u>.     NO &gt;&gt; Repair or replace error-detected parts.     <u>CHECK TERMINAL     Check ABS actuator and electric unit (control unit), Refer to <u>BRC-123, "Removal and Installation"</u>.     NO &gt;&gt; Repair or replace error-detected parts.     Sub inspection result normal?     YES &gt;&gt; Replace ABS actuator and electric unit (control unit), Refer to <u>BRC-123, "Removal and Installation"</u>.     NO &gt;&gt; Repair or replace error-detected parts. </u></u></u>						
Turn the ignition switch OFF.       Check 20 A fusible link (#G).         Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G).         sthe inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -: ".         NO       >> Repair or replace error-detected parts.         C-HECK SUCTION VALVE GROUND CIRCUIT         . Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit) <u>Connector</u> Terminal <u>Connector</u> Continuity         E36       13       Ground         E36       13       Ground         E36       13       Continuity         E36       13	4					(
<ul> <li>Check 20<sup>2</sup> A fusible link (#G).</li> <li>Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G).</li> <li><u>a the inspection result normal?</u></li> <li>YES &gt;&gt; Perform trouble diagnosis for battery power supply. Refer to <u>PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -".</u></li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li><u>CHECK SUCTION VALVE GROUND CIRCUIT</u></li> <li>Turn the ignition switch OFF.</li> <li>Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.</li> <li><u>ABS actuator and electric unit (control unit)</u> <u>Connector Terminal</u></li> <li><u>Connector Terminal</u></li> <li><u>Connector Terminal</u></li> <li><u>Continuity</u></li> <li><u>E36</u></li> <li><u>13</u></li> <li><u>Ground Existed</u></li> <li><u>s the inspection result normal?</u></li> <li>YES &gt;&gt; GO TO 6.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li><u>CHECK TERMINAL</u></li> <li><u>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.</u></li> <li><u>s the inspection result normal?</u></li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> </ul>			R SUPPLY CIF	RCUIT		
A. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (1) and 20 A fusible link (#G). <u>sthe inspection result normal?</u> YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12. "Wiring Diagram - BATTERY POWER SUPPLY -".</u> NO >> Repair or replace error-detected parts. CHECK SUCTION VALVE GROUND CIRCUIT Turn the ignition switch OFF. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.  ABS actuator and electric unit (control unit) <u>a for a second actuator and electric unit (control unit) between ABS actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit)     <u>a for a second actuator and electric unit (control unit) in terminals for damage or loose connection with harness     <u>a the inspection result normal?</u>     YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation"</u>     NO &gt;&gt; Repair or replace error-detected parts. NO &gt;&gt; Repair or replace error-detected parts. </u></u></u></u></u></u></u></u></u></u></u></u></u>						
as the inspection result normal?         YES       >> Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY_".         NO       >> Repair or replace error-detected parts.         2.CHECK SUCTION VALVE GROUND CIRCUIT         Turn the ignition switch OFF.         2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit) <u>Connector</u> Terminal <u>Connector</u> 13       Ground         26         27         8 statuator and electric unit (control unit) <u>Connector</u> Terminal <u>Connector</u> 28         8 the inspection result normal?         YES	3. Check continu	ity and short circuit	between ABS	actuator and el	ectric unit (control unit) harness connector	
YES       > Perform trouble diagnosis for battery power supply. Refer to PG-12. "Wiring Diagram - BATTERY POWER SUPPLY			(#G).			
POWER SUPPLY!.       NO       >> Repair or replace error-detected parts.         O. >> Repair or replace error-detected parts.       Ocheck SUCTION VALVE GROUND CIRCUIT         . Turn the ignition switch OFF.       .         . Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)			e for battory pe	wor supply Pof	for to PC 12 "Wiring Diagram BATTERY	
D.CHECK SUCTION VALVE GROUND CIRCUIT         Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)	POW	<u>ER SUPPLY -"</u> .		wei suppiy. Kei	er to <u>FG-12. Willing Diagram - DATTERT</u>	
Turn the ignition switch OFF.         Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.         ABS actuator and electric unit (control unit)	-		-			В
ABS actuator and electric unit (control unit)	D.CHECK SUCTI	ION VALVE GROUI	ND CIRCUIT			
ABS actuator and electric unit (control unit)      Continuity         Connector       Terminal      Continuity         E36       13       Ground       Existed         st the inspection result normal?       YES       >> GO TO 6.       NO       >> Repair or replace error-detected parts.         OCHECK TERMINAL       Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.         St the inspection result normal?       YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".         NO       >> Repair or replace error-detected parts.       NO			atuator and ala	otrio unit (contro	al unit) harmone connector and the ground	
Connector       Terminal       Continuity         E36       13       Ground       Existed         s the inspection result normal?       YES       >> GO TO 6.       NO         NO       >> Repair or replace error-detected parts.       S.CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.       S the inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".         NO       >> Repair or replace error-detected parts.	2. Check continu	illy between ABS a		ectric unit (contre	of unit) harness connector and the ground.	
Connector       Terminal       Connector         E36       13       Ground       Existed         26       26       Existed         st the inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness onnector.         st he inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".         NO       >> Repair or replace error-detected parts.	ABS actuator and el	lectric unit (control unit)			-	
E36       Ground       Existed         as the inspection result normal?       YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.       Scheck TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.       Sthe inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".         NO       >> Repair or replace error-detected parts.	Connector	Terminal		Continuity		
26         s the inspection result normal?         YES       >> GO TO 6.         NO       >> Repair or replace error-detected parts.         D.CHECK TERMINAL         Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.         s the inspection result normal?         YES       >> Replace ABS actuator and electric unit (control unit). Refer to BRC-123. "Removal and Installation".         NO       >> Repair or replace error-detected parts.	F36	13	Ground	Existed	_	
YES >> GO TO 6. NO >> Repair or replace error-detected parts. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa- tion"</u> . NO >> Repair or replace error-detected parts.	200	26	Croand	Existed	_	
<ul> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> <li>CHECK TERMINAL</li> <li>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.</li> <li><u>s the inspection result normal?</u></li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> </ul>						
<ul> <li>CHECK TERMINAL</li> <li>Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.</li> <li><u>s the inspection result normal?</u></li> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installation"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> </ul>			etected parts			
Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Removal and Installa- tion"</u> . NO >> Repair or replace error-detected parts.	<b>`</b>	•				
<pre>sonnector. s the inspection result normal? YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa- tion"</u>. NO &gt;&gt; Repair or replace error-detected parts.</pre>			(control unit) r	in terminals for	damage or loose connection with harness	
<ul> <li>YES &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123. "Removal and Installa-tion"</u>.</li> <li>NO &gt;&gt; Repair or replace error-detected parts.</li> </ul>	connector.				damage of loose connection with namess	
NO >> Repair or replace error-detected parts.	<u>s the inspection re</u>	esult normal?				
NO >> Repair or replace error-detected parts.		ce ABS actuator a	nd electric unit	(control unit). F	Refer to BRC-123, "Removal and Installa-	
		r or replace error-d	etected parts.			

## **U1000 CAN COMM CIRCUIT**

### Description

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

### DTC Logic

INFOID:000000011324029

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U1000	CAN COMM CIRCUIT	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	CAN communication system mal- function

#### DTC CONFIRMATION PROCEDURE

### 1.PRECONDITIONING

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

#### >> GO TO 2.

## 2. CHECK DTC DETECTION

#### (P)With CONSULT

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

#### Is DTC "U1000" detected?

- >> Proceed to BRC-98, "Diagnosis Procedure". YES
- >> INSPECTION END NO

#### Diagnosis Procedure

Proceed to LAN-17, "Trouble Diagnosis Flow Chart".

INFOID:000000011324030

INFOID:000000011324028

#### < DTC/CIRCUIT DIAGNOSIS >

## U1002 SYSTEM COMM (CAN)

### Description

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

### DTC Logic

INFOID:000000011324032

#### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1002	SYSTEM COMM(CAN)	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.	<ul> <li>CAN communication line</li> <li>ABS actuator and electric unit (control unit)</li> <li>Steering angle sensor</li> </ul>
DTC CC	NFIRMATION PROCE	DURE	
1.PREC	ONDITIONING		
		DURE" has been previously conducted, always t	urn ignition switch OFF and
wait at le	ast 10 seconds before co	nducting the next test.	
_	>> GO TO 2.		
2.DTC	REPRODUCTION PROCE	EDURE	
	ONSULT		
	the ignition switch ON. orm self-diagnosis for "AB	S".	
	J1002" detected?		
	>> Proceed to <u>BRC-99, "I</u> >> INSPECTION END	<u>Diagnosis Procedure"</u> .	
-	sis Procedure		INFOID:000000011324033
CAUTIO	N·		
• Never	apply 7.0 V or more to th	ne measurement terminal.	
• Turn t	he ignition switch OFF	I voltage of 7.0 V or less. and disconnect the battery cable from the	e negative terminal when
	ng the harness.		
	K CAN DIAGNOSIS SUF		
		osis Support Monitor" in order with CONSULT. ween each control unit connected to ABS actua	tor and electric unit (control
unit)	•		X
	<u>e result of "PAST"?</u> s are "OK">>Refer to <u>GI-4</u>	2 "Intermittent Incident"	
"TRANS	SMIT DIAG" is other than	"OK">>GO TO 2.	
<b>^</b>		uator and electric unit (control unit) is anything c	other than "OK">>GO TO 3.
	K TRANSMITTING SIDE		
	e ABS actuator and electi connection.	ic unit (control unit) harness connector terminal	s No. 23 and 21 for damage
	pection result normal?		
YES	>> Erase self-diagnosis re	esults. Then perform self-diagnosis for "ABS" wi	th CONSULT.

### **BRC-99**

INFOID:000000011324031

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### U1002 SYSTEM COMM (CAN)

< DTC/CIRCUIT DIAGNOSIS >

NO >> Recheck terminals for damage or loose connection. Refer to <u>LAN-24</u>, "Precautions for Harness <u>Repair</u>".

## 3. CHECK APPLICABLE CONTROL UNIT

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

Is the inspection result normal?

- YES >> Erase self-diagnosis results. Then perform self-diagnosis for applicable control unit with CON-SULT.
- NO >> Recheck terminals for damage or loose connection. Refer to <u>LAN-24</u>, "Precautions for Harness <u>Repair"</u>.

## POWER SUPPLY AND GROUND CIRCUIT

## < DTC/CIRCUIT DIAGNOSIS >

## POWER SUPPLY AND GROUND CIRCUIT

### **Diagnosis Procedure**

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

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

ABS actuator and ele	ectric unit (control unit)	— Voltage	
Connector	Terminal		Voltage
E36	20	Ground	Approx. 0 V

4. Turn the ignition switch ON

#### CAUTION: Never start engine.

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

ABS actuator and ele	ectric unit (control unit)		Voltago	
Connector	Terminal	_	Voltage	
E36	20	Ground	10 – 16 V	

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

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

AE	ABS actuator and electric unit (control unit)		IPDM E/R		Continuity	
	Connector	Terminal	Connector	Terminal	Continuity	
	E36	20	E10	25	Existed	

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

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E36	20	Ground	Not existed

#### Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-56, "Wiring Diagram IGNITION</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

## $\mathbf{3.}$ Check motor and motor relay power supply

#### 1. Turn the ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E36	14	Ground	10 – 16 V	

### **BRC-101**

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## POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and	electric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E36	14	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

### **4.**CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

#### Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

**5.**CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE, CUT VALVE, SUCTION VALVE POWER SUPPLY

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	—	voltage	
E36	1	Ground	10 – 16 V	

3. Turn the ignition switch ON CAUTION:

#### Never start engine.

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	—	voltage	
E36	1	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

**O**.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE, CUT VALVE, SUCTION VALVE POWER SUPPLY CIRCUIT

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

#### Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-12, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

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

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

### **BRC-102**

## POWER SUPPLY AND GROUND CIRCUIT

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

## 8. CHECK TERMINAL

1. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

2. Check IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-104</u>, "Diagnosis Procedure".

### Diagnosis Procedure

## 1. CHECK PARKING BRAKE SWITCH CIRCUIT

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

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

5. Check continuity between parking brake switch harness connector and ground.

Parking b	ake switch		- Continuity	
Connector	Terminal		Continuity	
E27	1	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to BRC-104, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to <u>PB-7, "Removal and Installation"</u>.

**3.**CHECK COMBINATION METER

Check combination meter. Refer to <u>MWI-35, "CONSULT Function"</u>.

Is the inspection result normal?

- YES >> Check each pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.
- NO >> Repair or replace combination meter. Refer to MWI-90, "Removal and Installation".

#### Component Inspection

## 1. CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.

2. Disconnect parking brake switch harness connector.

3. Check continuity between parking brake switch harness connector.

INFOID:000000011324035

INFOID:000000011324036

INFOID:000000011324037

## **PARKING BRAKE SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Parking brake switch		Condition	Continuity	A
Terminal	—	Condition	Continuity	
1	Ground	When the parking brake switch is operated.	Existed	В
I	Ground	When the parking brake switch is not operated.	Not existed	D
<u>s the inspection resu</u> YES >> INSPEC <sup>-</sup> NO >> Replace	TION END	witch. Refer to <u>PB-7, "Removal and Installa</u>	i <mark>tion"</mark> .	С
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### < DTC/CIRCUIT DIAGNOSIS >

## VDC OFF SWITCH

Component Function Check

INFOID:000000011324038

[WITH VDC]

## 1. CHECK VDC OFF SWITCH OPERATION

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated. Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-106, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:0000000011324039

**1.**CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to BRC-107, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace VDC OFF switch. Refer to <u>BRC-127</u>, "Removal and Installation".

2. CHECK VDC OFF SWITCH CIRCUIT

1. Turn the ignition switch OFF.

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

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

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

ABS actuator and electric unit (con- trol unit)		_	Continuity	
Connector	Terminal			
E36	22	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${f 3.}$  CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch harness connector and ground.

VDC OF	F switch		Continuity
Connector	Terminal		Continuity
M5	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

**4.**CHECK VDC OFF SWITCH SIGNAL

#### With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect VDC OFF switch harness connector.
- 3. Select "ABS", "DATA MONITOR" and "OFF SW" according to this order. Check VDC OFF switch signal.

### **BRC-106**

## **VDC OFF SWITCH**

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Condition		DATA MONITOR		А
When VDC OFF switch is pressed and VDC OFF indicator lamp in combination meter is in ON status		On		
When VDC OFF switch is pressed and VDC lamp in combination meter is in OFF status	OFF indicator	Off		В
Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.				С
5. CHECK TERMINAL				D
<ol> <li>Check ABS actuator and electric ness connector.</li> <li>Check VDC OFF switch pin term</li> </ol>				E
Is the inspection result normal?         YES       >> Replace ABS actuator a tion".         NO       >> Repair or replace error-or		· · · · ·	C-123, "Removal and Installa-	BRC
Component Inspection	·		INFOID:000000011324040	
1.CHECK VDC OFF SWITCH				G
<ol> <li>Turn the ignition switch OFF.</li> <li>Disconnect triple switch harness</li> <li>Check continuity between termin</li> </ol>		OFF switch connector.		Н
•				
VDC OFF switch				
VDC OFF switch Terminal		Condition	Continuity	I
Terminal	hen VDC OFF s		Continuity Existed	1
Terminal W 1 - 2 W		Condition	-	l
Terminal       1-2       W       Is the inspection result normal?       YES       >> INSPECTION END	hen VDC OFF s	Condition switch is pressed	Existed Not existed	I J K
Terminal       1-2       W       Is the inspection result normal?       YES       >> INSPECTION END	hen VDC OFF s	Condition switch is pressed switch is not pressed	Existed Not existed	I J K L
Terminal       1-2       W       Is the inspection result normal?       YES       >> INSPECTION END	hen VDC OFF s	Condition switch is pressed switch is not pressed	Existed Not existed	L
Terminal       1-2       W       Is the inspection result normal?       YES       >> INSPECTION END	hen VDC OFF s	Condition switch is pressed switch is not pressed	Existed Not existed	L

### ABS WARNING LAMP

### Component Function Check

**1.**CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp in combination meter turns ON for approx. 2 second after ignition switch is turned ON.

#### CAUTION:

#### Never start engine.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-108</u>, "Diagnosis Procedure".

### Diagnosis Procedure

INFOID:000000011324042

# 1 .check abs actuator and electric unit (control unit) power supply and ground circuit

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-101, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-38, "DTC Index"</u>.

NO >> GO TO 3.

**3.**CHECK ABS WARNING LAMP SIGNAL

#### (B) With CONSULT

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

## CAUTION:

### Never start engine.

Is the inspection result normal?

- YES >> Check combination meter. Refer to <u>MWI-35, "CONSULT Function"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".

## **BRAKE WARNING LAMP**

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]
BRAKE WARNING LAMP	Δ
Component Function Check	A
<b>1.</b> CHECK BRAKE WARNING LAMP FUNCTION (1)	E
Check that brake warning lamp in combination meter turns ON for approx. 2 second after turned ON. CAUTION: Never start engine.	r ignition switch is
Is the inspection result normal?	
YES >> GO TO 2. NO >> Proceed to <u>BRC-109, "Diagnosis Procedure"</u> .	C
2.CHECK BRAKE WARNING LAMP FUNCTION (2)	E
Check that brake warning lamp in combination meter turns ON/OFF when parking brake is o <b>NOTE:</b>	operated.
Brake warning lamp turns ON when parking brake is operated (when parking brake switch is <u>Is the inspection result normal?</u>	S ON). BF
YES >> GO TO 3. NO >> Check parking brake switch system. Refer to <u>BRC-104, "Diagnosis Procedure"</u> . <b>3.</b> CHECK BRAKE WARNING LAMP FUNCTION (3)	G
Check that brake warning lamp in combination meter turns ON/OFF when brake fluid level s while brake fluid level in reservoir tank is with the specified level.	switch is operated ⊢
Brake warning lamp turns ON when brake fluid is less than the specified level (when brake fl ON).	luid level switch is
<u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Check brake fluid level switch system. Refer to <u>BRC-89, "Diagnosis Procedure"</u> .	
Diagnosis Procedure	INFOID:000000011324044
<b>1.</b> CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AN CUIT	ID GROUND CIR- k
Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply a Refer to <u>BRC-101, "Diagnosis Procedure"</u> . Is the inspection result normal?	ind ground circuit.
YES >> GO TO 2. NO >> Repair or replace error-detected parts.	Ν
2.PERFORM THE SELF-DIAGNOSIS	
With CONSULT     Perform self-diagnosis for "ABS".	Ν
<u>Is any DTC detected?</u> YES >> Check the DTC. Refer to <u>BRC-38, "DTC Index"</u> .	C
NO >> GO TO 3. 3.CHECK COMBINATION METER	
Check combination meter. Refer to <u>MWI-35, "CONSULT Function"</u> .	F
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Rem</u> tion".	
NO >> Repair or replace combination meter. Refer to MWI-90, "Removal and Installation	<u>n"</u> .

## VDC WARNING LAMP

## Component Function Check

1. CHECK VDC WARNING LAMP FUNCTION

Check that VDC warning lamp in combination meter turns ON for approx. 2 second after ignition switch is turned ON.

#### CAUTION:

#### Never start engine.

Is the inspection result normal?

#### YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-110, "Diagnosis Procedure"</u>.

#### Diagnosis Procedure

INFOID:000000011324046

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-101, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM THE SELF-DIAGNOSIS

#### () With CONSULT

Perform self-diagnosis for "ABS".

#### Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-38, "DTC Index"</u>.

NO >> GO TO 3.

**3.**CHECK VDC WARNING LAMP SIGNAL

#### With CONSULT

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

## CAUTION:

#### Never start engine.

Is the inspection result normal?

- YES >> Check combination meter. Refer to <u>MWI-35, "CONSULT Function"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u>, "<u>Removal and Installa-</u> tion".

## VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >	[WITH VDC]	
VDC OFF INDICATOR LAMP	٨	
Component Function Check	INFOID:000000011324047	
<b>1.</b> CHECK VDC OFF INDICATOR LAMP FUNCTION (1)	В	
Check that VDC OFF indicator lamp in combination meter turns ON for approx. 2 second after is turned ON. CAUTION:	ignition switch	
Never start engine.		
<u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Proceed to diagnosis procedure. Refer to <u>BRC-111, "Diagnosis Procedure"</u> .	D	
2. CHECK VDC OFF INDICATOR LAMP FUNCTION (2)		
Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch Is the inspection result normal?		
YES >> INSPECTION END NO >> Check VDC OFF switch system. Refer to <u>BRC-106, "Diagnosis Procedure"</u> .	BR	С
Diagnosis Procedure	INFOID:000000011324048	
<b>1.</b> CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND CUIT	GROUND CIR-	
Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and Refer to <u>BRC-101, "Diagnosis Procedure"</u> .	ground circuit.	
Is the inspection result normal? YES >> GO TO 2.	I	
NO >> Repair or replace error-detected parts.		
2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)	J	
<ul> <li>With CONSULT</li> <li>Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order.</li> <li>Turn the ignition switch OFF.</li> </ul>		
3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned changes to "Off".	I ON, and then	
CAUTION: Never start engine.	L	
Is the inspection result normal?		
<ul> <li>YES &gt;&gt; GO TO 3.</li> <li>NO &gt;&gt; Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123, "Remove tion"</u>.</li> </ul>	al and Installa- M	
<b>3.</b> CHECK VDC OFF INDICATOR LAMP SIGNAL (2)		
With CONSULT	N	
<ol> <li>Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order.</li> <li>Check that data monitor displays "On" or "Off" each time when VDC OFF switch is operated</li> </ol>	d. O	
<u>Is the inspection result normal?</u> YES >> Check combination meter. Refer to <u>MWI-35</u> , "CONSULT Function".		
NO >> Check VDC OFF switch system. Refer to <u>BRC-106, "Diagnosis Procedure"</u> .	Р	

## SYMPTOM DIAGNOSIS EXCESSIVE OPERATION FREQUENCY

## Description

VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function operates in excessive operation frequency.

#### Diagnosis Procedure

1. CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.

- Front axle: Refer to <u>FAX-7, "Inspection"</u>.
  Rear axle: Refer to <u>RAX-5, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${
m 3.check}$  wheel sensor

Check wheel sensor.

- Check installation and damage of wheel sensor.
- Check connection of wheel sensor harness connector.
- Check terminal of wheel sensor harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO

- >> Repair or replace wheel sensor.
  - Front wheel sensor: Refer to <u>BRC-119</u>, "FRONT WHEEL SENSOR : Removal and Installation".
    Rear wheel sensor: Refer to <u>BRC-120</u>, "REAR WHEEL SENSOR : Removal and Installation".

**4**.CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

YES >> GO TO 5.

- NO >> Repair installation or replace sensor rotor.
  - Front sensor rotor: Refer to BRC-122, "FRONT SENSOR ROTOR : Removal and Installation".
  - Rear sensor rotor. Refer to BRC-122, "REAR SENSOR ROTOR : Removal and Installation".

5.CHECK WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 2 second after key switch is turned ON and stay in OFF status during driving.

- CAUTION:
- Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

Is the inspection result normal?

YES >> Normal

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

INFOID:000000011324050

## UNEXPECTED BRAKE PEDAL REACTION

UNEXPECTED BRAKE PEDAL REACTION	
< SYMPTOM DIAGNOSIS >	[WITH VDC]
UNEXPECTED BRAKE PEDAL REACTION	
Description	INFOID:000000011324051
A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed.	
Diagnosis Procedure	INFOID:000000011324052
1. CHECK FRONT AND REAR AXLE	
<ul> <li>Check that there is no excessive looseness in front and rear axle.</li> <li>Front axle: Refer to <u>FAX-7, "Inspection"</u>.</li> <li>Rear axle: Refer to <u>RAX-5, "Inspection"</u>.</li> </ul>	
Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK DISC ROTOR	
<ul> <li>Check disc rotor runout.</li> <li>Front: Refer to <u>BR-16, "DISC ROTOR : Inspection and Adjustment"</u>.</li> <li>Rear: Refer to <u>BR-18, "DISC ROTOR : Inspection and Adjustment"</u>.</li> </ul>	
<u>Is the inspection result normal?</u> YES >> GO TO 3. NO >> Refinish disc rotor. • Front: Refer to <u>BR-16, "DISC ROTOR : Inspection and Adjustment"</u> .	
• Rear: Refer to <u>BR-18</u> , " <u>DISC ROTOR</u> : <u>Inspection and Adjustment</u> ". <b>3.</b> CHECK BRAKE FLUID LEAKAGE	
<ul> <li>Check fluid leakage.</li> <li>Front: Refer to <u>BR-24, "FRONT : Inspection"</u>.</li> <li>Rear: Refer to <u>BR-27, "REAR : Inspection"</u>.</li> </ul>	
Is the inspection result normal?	
YES >> GO TO 4. NO >> Repair or replace error-detected parts.	
4. CHECK BRAKE PEDAL	
Check each item of brake pedal. Refer to <u>BR-9, "Inspection and Adjustment"</u> .	
<u>Is the inspection result normal?</u> YES >> GO TO 5.	
NO >> Adjust each item of brake pedal. Refer to <u>BR-9, "Inspection and Adjustment"</u> .	
5.CHECK BRAKING FORCE	
Check brake force using a brake tester.	
<u>Is the inspection result normal?</u> YES >> GO TO 6.	
NO >> Check each components of brake system.	
6.CHECK BRAKE PERFORMANCE	
Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not opera brake force is normal in this condition. Connect harness connectors after checking.	ate. Check that
Is the inspection result normal? YES >> Normal	

NO >> Check each components of brake system.

< SYMPTOM DIAGNOSIS >

## THE BRAKING DISTANCE IS LONG

#### Description

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

#### CAUTION:

Brake stopping distance on slippery road like rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated.

**1.**CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check each components of brake system.

2. CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check brake stopping distance in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal

NO >> Check each components of brake system.

INFOID:000000011324053

[WITH VDC]

## **DOES NOT OPERATE**

#### < SYMPTOM DIAGNOSIS >

## DOES NOT OPERATE

## Description

VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function  $_{\rm B}$  does not operate.

#### Diagnosis Procedure

INFOID:000000011324056

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#### **CAUTION:**

- VDC function, ABS function and EBD function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less.
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

**1.**CHECK WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF approx. 2 second after key switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp and stay in OFF status during driving.

- Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF G indicator lamp turns ON).

Is the inspection result normal?

YES >> Normal

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

## **BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS**

#### < SYMPTOM DIAGNOSIS >

## BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

## Description

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the engine starts.
- Brake pedal vibrates during braking.

#### CAUTION:

Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal.

- · When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 15 km/h (9.3 MPH) or higher]

## **Diagnosis Procedure**

INFOID:000000011324058

[WITH VDC]

INFOID:000000011324057

**1.**SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2.

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

2.SYMPTOM CHECK 2

Check that motor noise from ABS actuator and electric unit (control unit) occurs when the engine starts. Does the operation sound occur?

YES >> GO TO 3.

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

3. SYMPTOM CHECK 3

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

Does the symptom occur?

- YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).
- NO >> Normal

## **VEHICLE JERKS DURING**

< SYMPTOM DIAGNOSIS > [WITH V	/DC]
VEHICLE JERKS DURING	A
The vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake limited slip diff tial (BLSD) function operates.	eren- B
Diagnosis Procedure	011324060
1. СНЕСК ЗҮМРТОМ	С
Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake lisslip differential (BLSD) function operates. Is the inspection result normal? YES >> Normal NO >> GO TO 2. 2.PERFORM SELF-DIAGNOSIS	mited D
	BR
Perform self-diagnosis for "ABS".	
Is any DTC detected? YES >> Check the DTC. Refer to <u>BRC-38, "DTC Index"</u> . NO >> GO TO 3.	G
3. CHECK CONNECTOR	
With CONSULT	— H
<ol> <li>Turn the ignition switch OFF.</li> <li>Disconnect ABS actuator and electric unit (control unit) harness connector.</li> <li>Check connector terminal for deformation, disconnection and looseness.</li> <li>Connect harness connector and perform self-diagnosis for "ABS" again.</li> </ol>	I
Is the inspection result normal? YES >> GO TO 4.	J
NO >> Poor connection of connector terminal. Repair or replace connector terminal.	-
4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS	K
With CONSULT     Development of the second sec	
Perform self-diagnosis for "ENGINE" and "TRANSMISSION". Is any DTC detected?	L
YES >> Check the DTC.	
NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-123</u> , " <u>Removal and Ins</u> <u>tion</u> ".	i <u>talla-</u> M
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#### < SYMPTOM DIAGNOSIS >

## NORMAL OPERATING CONDITION

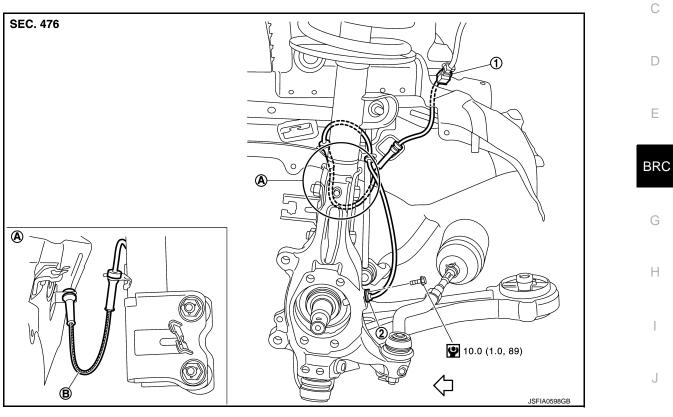
## Description

Symptom	Result	
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspen- sion) occurs when VDC function, TCS function, ABS function, EBD function or brake limited differential (BLSD) function operates.	This is not a malfunction, The symptom occurs VDC function, TCS function, ABS function, EBD function and brake limited differential (BLSD) function that are nor- mally operated.	
Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.		
Brake pedal vibrates and operation sound occurs during sudden acceleration and corner- ing, when VDC function, TCS function or brake limited slip differential (BLSD) function is operated.		
Brake pedal vibrates and motor sound from the engine room occurs, when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction, because it is caused by operation check of ABS actuator and electric unit (control unit).	
Acceleration may be felt insufficient depending on the road conditions.	This is not a malfunction, because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).	
TCS function may operate momentarily, while driving on a road where friction coefficient varies, or when downshifting, or fully depressing accelerator pedal.		
VDC warning lamp may turn ON, when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.	In this case, restart the engine on a nor- mal road. If the normal condition is re- stored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.	
VDC warning lamp may turn ON and VDC function, TCS function and brake limited slip dif- ferential (BLSD) function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course).		
A malfunction in yaw rate/side G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function, TCS function and brake limited slip differential (BLSD) function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status).		
The vehicle speed does not increase, when the accelerator pedal is depressed while the vehicle is on a 2-wheel chassis dynamometer for speedometer check.	This is not a malfunction. (When checking the vehicle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)	

#### < REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View



<ol> <li>Front LH wheel sensor harness con- 2. Front LH wheel sensor nector</li> </ol>		Κ
B. Identification line		1
∠⊐: Vehicle front		L
₽: N·m (kg-m, in-lb)		
<b>NOTE:</b> Front RH wheel sensor is symmetrically opposite of LH.		M
FRONT WHEEL SENSOR : Removal and Installation	INFOID:000000011324063	Ν
REMOVAL		14
1. Remove tires with power tool.		0
<ol> <li>Remove front wheel sensor from steering knuckle.</li> <li>CAUTION:</li> </ol>		-
Never rotate and never pull front wheel sensor as much as possible, when pull	lling out.	Ρ
3. Remove front wheel sensor harness from the vehicle.		
CAUTION: Never twist or pull front wheel sensor harness, when removing.		
INSTALLATION		

#### INSTALLATION

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

INFOID:000000011324062

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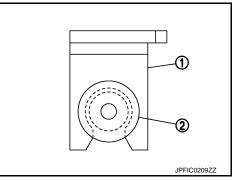
## WHEEL SENSOR

#### < REMOVAL AND INSTALLATION >

- Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.

#### **CAUTION:**

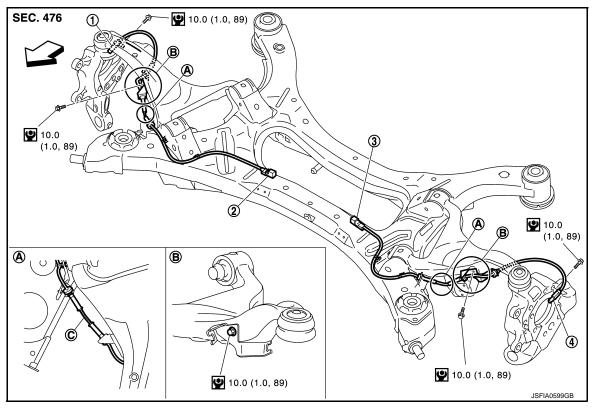
Check that the identification line of the front wheel sensor is faced vehicle front.



## REAR WHEEL SENSOR

## REAR WHEEL SENSOR : Exploded View

INFOID:0000000011324064



2. Rear RH wheel sensor harness con- 3. Rear LH wheel sensor harness con-

nector

- 1. Rear RH wheel sensor
- 4. Rear LH wheel sensor
- C. Identification line

∠: Vehicle front

L: N·m (kg-m, in-lb)

## **REAR WHEEL SENSOR : Removal and Installation**

nector

#### REMOVAL

1. Remove rear wheel sensor from rear axle housing. CAUTION: INFOID:000000011324065

## BRC-120

## WHEEL SENSOR

#### < REMOVAL AND INSTALLATION >

#### Never rotate or pull rear wheel sensor as much as possible, when pulling out.

2. Remove rear wheel sensor harness from the vehicle. **CAUTION:** 

#### Never twist and never pull rear wheel sensor harness, when removing.

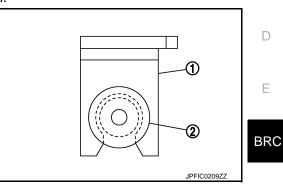
#### **INSTALLATION**

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

- Check that there is no foreign material like iron powder or damage on inner surface of rear wheel sensor mounting hole of wheel hub and bearing assembly and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.

#### **CAUTION:**

Check that the identification line of the rear wheel sensor is faced vehicle front.



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< REMOVAL AND INSTALLATION >

## SENSOR ROTOR FRONT SENSOR ROTOR

#### FRONT SENSOR ROTOR : Removal and Installation

INFOID:000000011324066

[WITH VDC]

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to FAX-9. "Removal and Installation".

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to RAX-7, "Removal and Installation".

REAR SENSOR ROTOR

#### **REAR SENSOR ROTOR : Removal and Installation**

INFOID:000000011324067

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to RAX-7, "Removal and Installation".

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to RAX-7, "Removal and Installation".

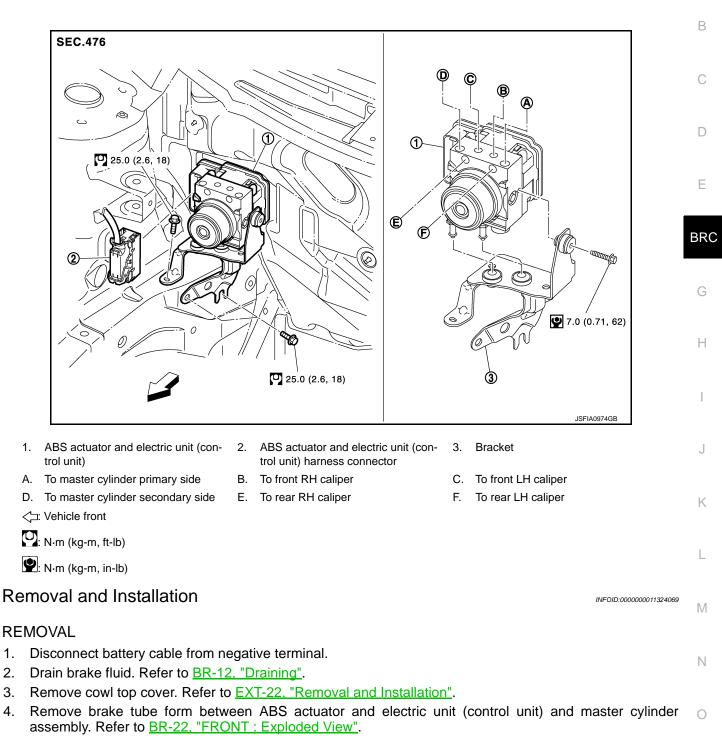
## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

#### < REMOVAL AND INSTALLATION >

## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

## **Exploded View**

INFOID:000000011324068



- 5. Remove vacuum piping. Refer to <u>BR-35, "Removal and Installation"</u>.
- 6. Move the High-pressure pipe. Refer to HA-36, "HIGH-PRESSURE PIPE : Removal and Installation".

[WITH VDC]

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## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

#### < REMOVAL AND INSTALLATION >

- 7. Disconnect ABS actuator and electric unit (control unit) harness connector (1), follow the procedure described below.
- a. Push the pawl (A).
- b. Move the lever (B) in the direction (C) until locked.
- c. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 8. Remove ABS actuator and electric unit (control unit) and bracket.

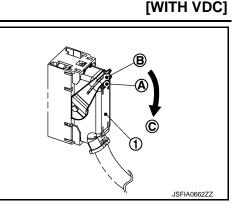
#### **CAUTION:**

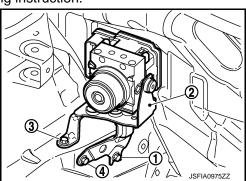
- Never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.
- Be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.
- 9. Remove bracket from ABS actuator and electric unit (control unit).

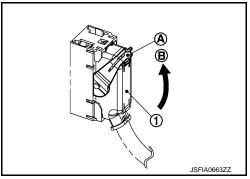
#### INSTALLATION

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

- When replacing with a new ABS actuator and electric unit (control unit), never remove the protector of the brake tube mounting hole until right before the brake tube is installed.
- Install ABS actuator and electric unit (control unit) as per the following instruction.
- Temporarily tighten mounting bolt (1) and temporarily fix bracket (2). Tighten mounting bolts to the specified torque, according to the tightening order  $(3) \rightarrow (4) \rightarrow (1)$ .
- When installing brake tube, tighten to the specified torque using a crowfoot and torque wrench so that flare nut and brake tube are not damaged. Refer to <u>BR-22</u>, "FRONT : Exploded View".
- Never remove and install ABS actuator and electric unit (control unit) by holding actuator harness.
- Bleed the brake piping after installation. Refer to <u>BR-13</u>, "<u>Bleeding</u> <u>Brake System</u>".
- Never apply excessive impact to actuator, such as by dropping it.
- After installing the ABS actuator and electric unit (control unit) harness connector (1), move the lever (A) in the direction (B) to secure the locking.
- Perform steering angle sensor neutral position adjustment when ABS actuator and electric unit (control unit) is replaced. Refer to <u>BRC-49, "Work Procedure"</u>.







## < REMOVAL AND INSTALLATION >

**Exploded View** 

## YAW RATE/SIDE/DECEL G SENSOR

INFOID:000000011324070

А

В SEC. 476 9.0 (0.71, 62) Ø 0 60 D Е BRC 2 6 JPFIC0113GB Yaw rate/side G sensor 2. Yaw rate/side G sensor harness con-1. Н nector <□: Vehicle front L: N·m (kg-m, in-lb) **Removal and Installation** INFOID:0000000011324071 J REMOVAL **CAUTION:** Never drop or strike yaw rate/side G sensor, because it has little endurance to impact. Never use a pneumatic tool. Κ 1. Remove instrument lower cover LH and RH. Refer to IP-14, "Removal and Installation". 2. Disconnect yaw rate/side G sensor harness connector. L 3. Remove yaw rate/side G sensor. INSTALLATION Note the following, and install in the reverse order of removal. Μ • Never drop or strike yaw rate/transverse G sensor, because it has little endurance to impact. Never use a power tool. Ν

## STEERING ANGLE SENSOR

[WITH VDC]

INFOID:000000011324072

## Removal and Installation

#### REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-15, "Removal and Installation"</u>.
- 2. Remove steering angle sensor.

#### INSTALLATION

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

• Perform steering angle sensor neutral position adjustment when steering angle sensor is removed and installed, or replaced. Refer to <u>BRC-49, "Work Procedure"</u>.

< RE	MC	OVAL A	STALLATION >

## VDC OFF SWITCH

# Removal and Installation

## REMOVAL

1. Remove lower instrument panel. Refer to IP-14, "Removal and Installation".

2. Remove VDC OFF switch.

## **INSTALLATION**

Installation is the reverse order of removal.

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