

# BRC

## SECTION

### BRAKE CONTROL SYSTEM

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## PRECAUTION

### PRECAUTIONS

#### Precaution for Technicians Using Medical Electric

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##### OPERATION PROHIBITION

###### **WARNING:**

- Parts with strong magnet is used in this vehicle.
- Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.

##### NORMAL CHARGE PRECAUTION

###### **WARNING:**

- If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.
- As radiated electromagnetic wave generated by on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.

##### PRECAUTION AT TELEMATICS SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.

##### PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.

#### Point to Be Checked Before Starting Maintenance Work

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The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.

###### **NOTE:**

If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:000000007633504

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



## PRECAUTIONS

< PRECAUTION >

[WITH VDC]

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 power switch ON, 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 power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.

## Precautions for Removing Battery Terminal

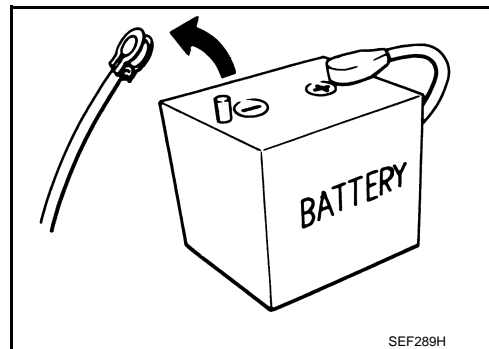
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- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.

### **NOTE:**

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

- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.



## WORK PROCEDURE

1. Check that EVSE is not connected.

### **NOTE:**

If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.

2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).
3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.

### **NOTE:**

If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.

4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.

### **CAUTION:**

- After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.
- After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.

### **NOTE:**

Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.



## PRECAUTIONS

[WITH VDC]

### < PRECAUTION >

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.

#### NOTE:

If the power 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.

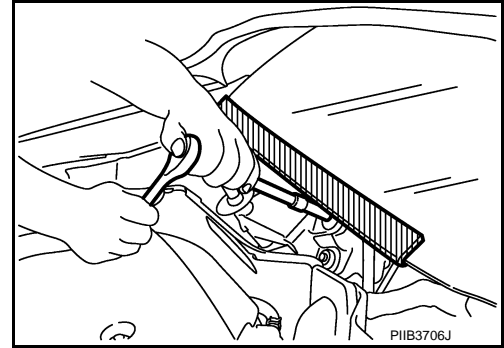
#### NOTE:

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

### Precaution for 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.



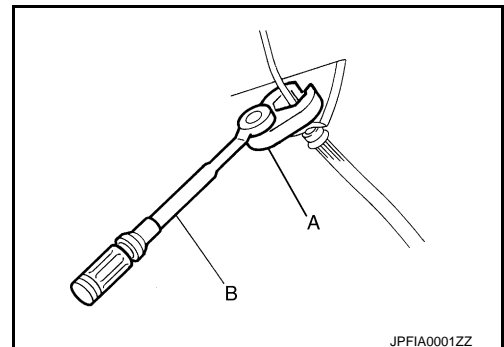
### Precaution for Brake System

INFOID:000000007633507

#### WARNING:

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

- Brake fluid use refer to [MA-13, "FOR NORTH AMERICA : Fluids and Lubricants"](#) (for North America), [MA-14, "FOR BRAZIL : Fluids and Lubricants"](#) (for Brazil).
- 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. For brake component parts, never wash them with water.
- 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 crow-foot (A) and torque wrench (B).
- Turn the power switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the 12V battery negative terminal before performing the work. Refer to [BRC-5, "Precautions for Removing Battery Terminal"](#).
- Check that no brake fluid leakage is present after replacing the parts.



### Precaution for Brake Control system

INFOID:000000007633508

- 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, brake limited slip differential (BLSD) function or brake assist function oper-



## PRECAUTIONS

< PRECAUTION >

[WITH VDC]

- ates. This is not a malfunction because it is caused by VDC function, TCS function, ABS function EBD function brake limited slip differential (BLSD) function or brake assist function that is normally operated.
- When power switch ON or when starting vehicle just after power switch ON, brake pedal may vibrate or motor operating noise may be heard from traction motor 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.
  - 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, brake limited slip differential (BLSD) function and brake assist 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, brake limited slip differential (BLSD) function and brake assist 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, brake limited slip differential (BLSD) function and brake assist 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)
  - Traction motor component parts (VCM, traction motor inverter)
  - 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, brake limited slip differential (BLSD) function and brake assist 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.

### CAUTION:

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
  - **Turn power switch from OFF → ON before self-diagnosis. Repeat two or more times.**
  - **Set the vehicle to READY.**
  - **Turn the power switch OFF → ON → OFF after erase self-diagnosis result.**
- 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, brake limited slip differential (BLSD) function and brake assist 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 EBD function, brake limited slip differential (BLSD) function and brake assist function.
  - Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function, brake limited slip differential (BLSD) function or brake assist function is operated. This is not a malfunction because it is caused by VDC function, TCS function, brake limited slip differential (BLSD) function or brake assist function that is operated normally.
  - VDC warning lamp may turn ON and VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist 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, brake limited slip differential (BLSD) function and brake assist function after the traction motor is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.

### CAUTION:

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Turn power switch from OFF → ON before self-diagnosis. Repeat two or more times.**
- **Set the vehicle to READY.**
- **Turn the power switch OFF → ON → OFF after erase self-diagnosis result.**

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## PRECAUTIONS

[WITH VDC]

### < PRECAUTION >

- A malfunction in yaw rate/side/decel 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 traction motor is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.

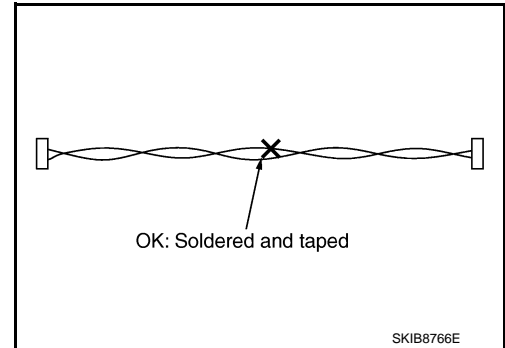
#### **CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Turn power switch from OFF → ON before self-diagnosis. Repeat two or more times.**
- **Set the vehicle to READY.**
- **Turn the power switch OFF → ON → OFF after erase self-diagnosis result.**

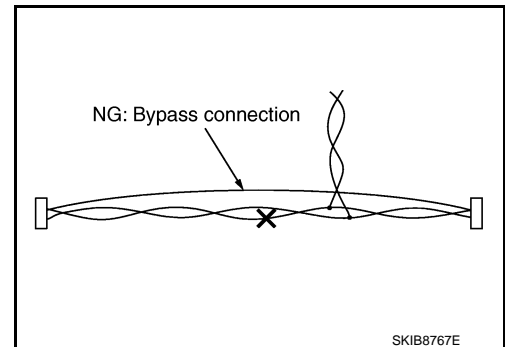
### Precaution for Harness Repair

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



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





# PREPARATION

< PREPARATION >

[WITH VDC]

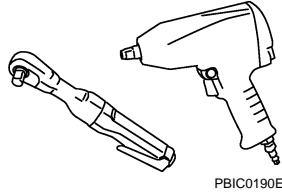
## PREPARATION

### PREPARATION

#### Commercial Service Tools

INFOID:0000000007633510

Tool name	Description
Power tool	Loosening bolts and nuts.



A  
B  
C  
D  
E  
BRC  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P



# COMPONENT PARTS

< SYSTEM DESCRIPTION >

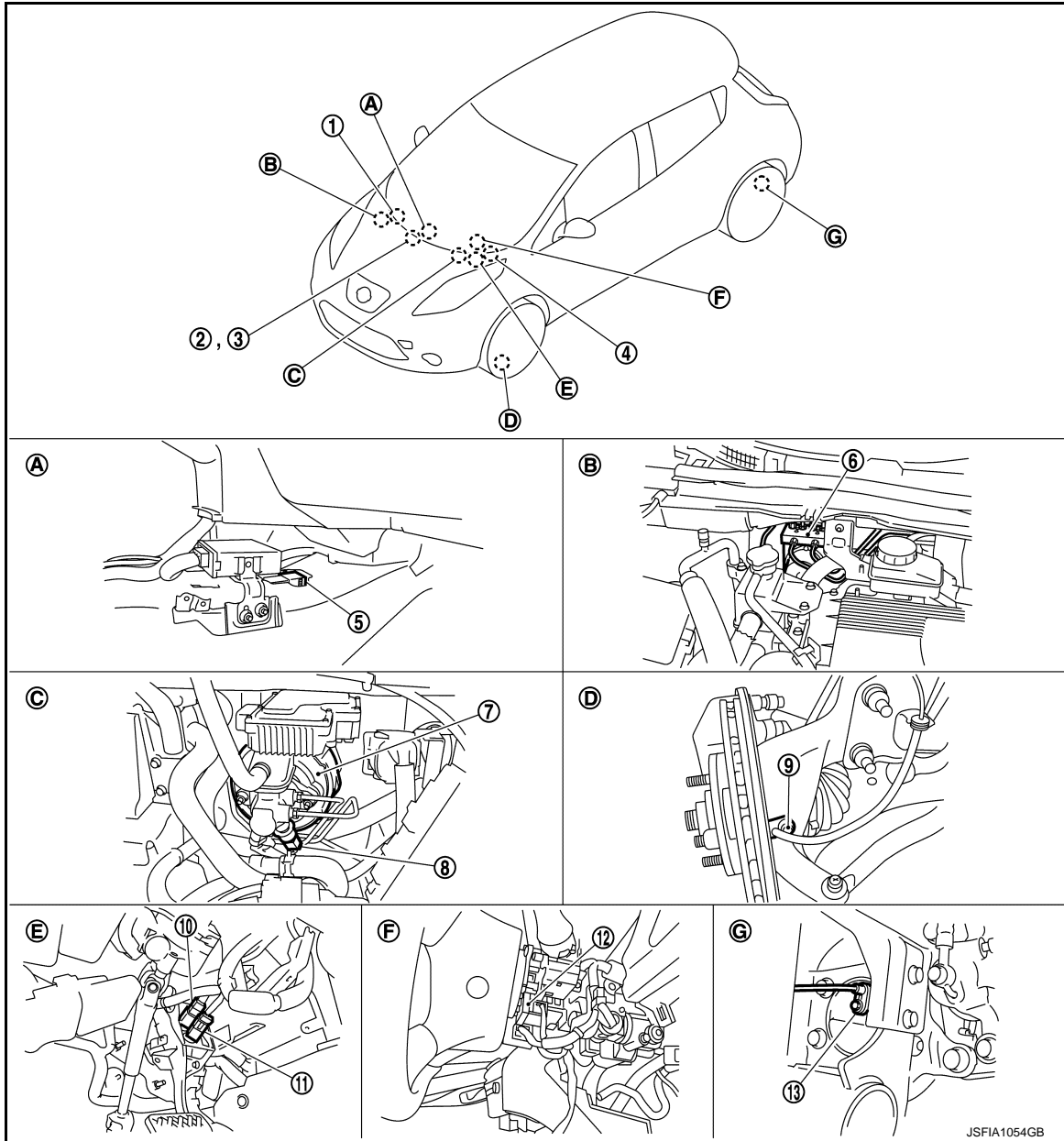
[WITH VDC]

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000007633511



- |  |                              |                                  |
|--|------------------------------|----------------------------------|
| A. Console body assembly               | B. Inside motor room (right) | C. Inside motor room (left)      |
| D. Steering knuckle                    | E. Brake pedal               | F. Back of spiral cable assembly |
| G. Rear wheel hub and bearing assembly |                              |                                  |

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# COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH VDC]

No.	Component parts	Function
1.	VCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Accelerator pedal position signal</li> <li>• Motor torque control signal</li> <li>• VCM control signal</li> <li>• Shift position signal</li> </ul> Refer to <a href="#">EVC-17, "Component Parts Location"</a> for detailed installation location.
2.	ABS warning lamp (in combination meter) Brake warning lamp (in combination meter) VDC warning lamp (in combination meter) VDC OFF indicator lamp (in combination meter)	<a href="#">BRC-16, "System Description"</a>
3.	Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Brake fluid level switch signal</li> <li>• Parking brake switch signal</li> </ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <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> Refer to <a href="#">MWI-7, "METER SYSTEM : Component Parts Location"</a> for detailed installation location.
4.	VDC OFF switch	<a href="#">BRC-15, "VDC OFF Switch"</a>
5.	Yaw rate/side/decel G sensor	<a href="#">BRC-14, "Yaw Rate/Side/Decel G Sensor"</a>
6.	ABS actuator and electric unit (control unit)	<a href="#">BRC-12, "ABS Actuator and Electric Unit (Control Unit)"</a>
7.	Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication and brake communication line* <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> </ul>
8.	Master cylinder pressure sensor2	<a href="#">BRC-13, "Master Cylinder Pressure Sensor2"</a>
9.	Front wheel sensor	<a href="#">BRC-11, "Wheel Sensor and Sensor Rotor"</a>
10.	Stop lamp switch	<a href="#">BRC-13, "Stop Lamp Switch"</a>
11.	ASCD brake switch	<a href="#">BRC-14, "ASCD Brake Switch"</a>
12.	Steering angle sensor	<a href="#">BRC-14, "Steering Angle Sensor"</a>
13.	Rear wheel sensor	<a href="#">BRC-11, "Wheel Sensor and Sensor Rotor"</a>

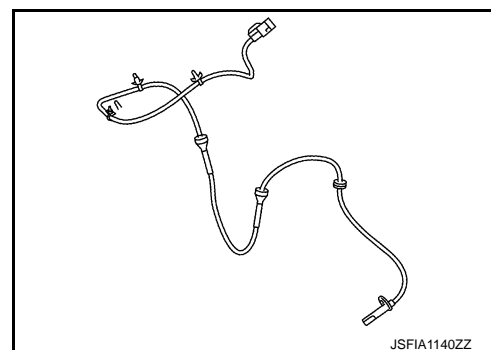
\*: Brake communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## Wheel Sensor and Sensor Rotor

INFOID:000000007633512

### NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated in wheel hub and bearing assembly.



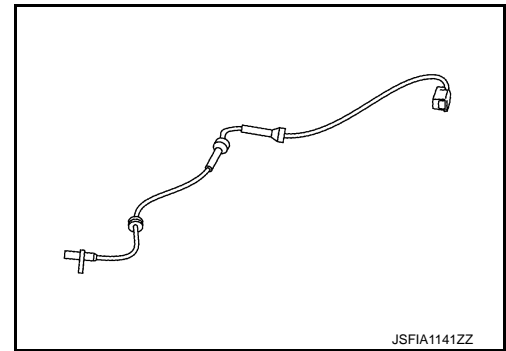


## COMPONENT PARTS

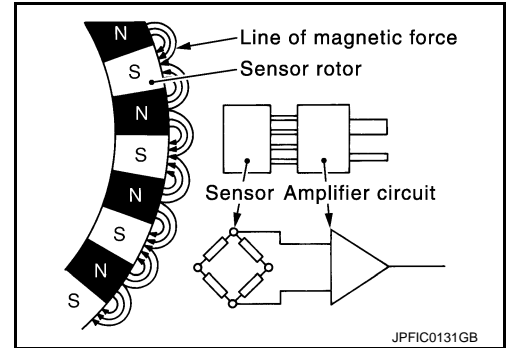
[WITH VDC]

### < SYSTEM DESCRIPTION >

- Wheel sensor of rear wheel is installed on wheel hub and bearing assembly.
- 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.



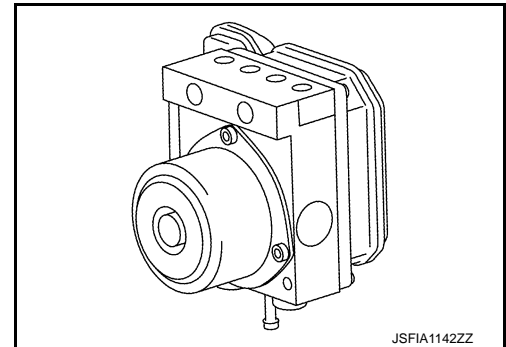
- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field changes. Magnetic field 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.



INFOID:000000007633513

### ABS Actuator and Electric Unit (Control Unit)

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



### ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure and traction motor 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

VDC function, TCS function, Brake limited slip differential (BLSD) function and brake assist function are in operation (during pressure increases)

- Pressurized brake fluid from electrically-driven intelligent brake unit is supplied to each caliper.

ABS function and EBD function are in operation (during pressure decreases)

- Returns the brake fluid reserved in reservoir to electrically-driven intelligent brake unit by reducing pressure.

#### Motor

Activates the pump according to signals from control unit part.

#### Motor Relay

Operates the motor ON/OFF according to signals from control unit part.

#### Actuator Relay (Main Relay)

Operates each valve ON/OFF according to signals from control unit part.

#### ABS IN Valve



## COMPONENT PARTS

### < SYSTEM DESCRIPTION >

[WITH VDC]

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

**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 part.

**NOTE:**

Valve is a solenoid valve.

Cut Valve 1, Cut Valve2

Shuts off the ordinary brake line from electrically-driven intelligent brake unit, when VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function are activated.

Suction Valve 1, Suction Valve 2

Supplies the brake fluid from electrically-driven intelligent brake unit to the pump, when VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function are activated.

Inlet Valve

Brake fluid sucked from the reservoir by the pump does not backflow.

**NOTE:**

Valve is a check valve.

Outlet Valve

Brake fluid discharged from the pump does not backflow.

**NOTE:**

Valve is a check valve.

Return Check Valve

Returns the brake fluid from brake caliper to electrically-driven intelligent brake unit by bypassing orifice of each valve when brake is released.

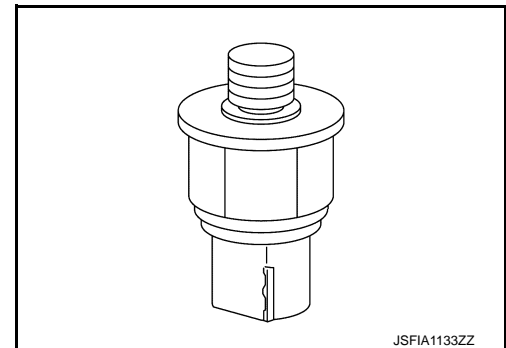
Reservoir

Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper.

### Master Cylinder Pressure Sensor2

INFOID:000000007633514

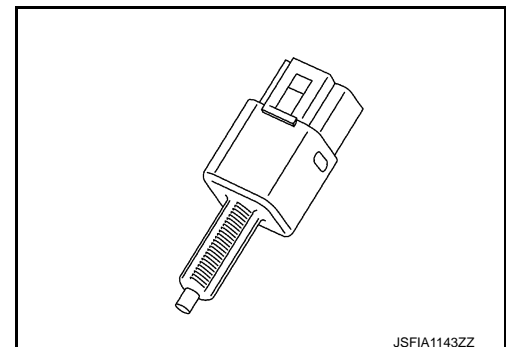
Detects the brake fluid pressure of master cylinder part and transmits signal to ABS actuator and electric unit (control unit).



### Stop Lamp Switch

INFOID:000000007633515

Detects the operation status of brake pedal and transmits converted electric signal to ABS actuator and electric unit (control unit).



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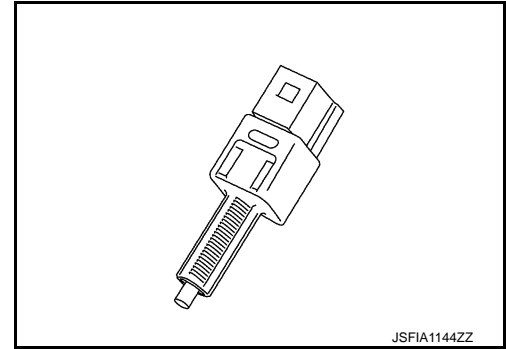
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## ASCD Brake Switch

INFOID:000000007633516

Detects the operation status of brake pedal and transmits converted electric signal to ABS actuator and electric unit (control unit).

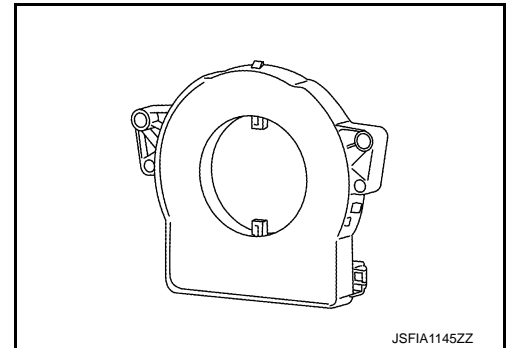


## Steering Angle Sensor

INFOID:000000007633517

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

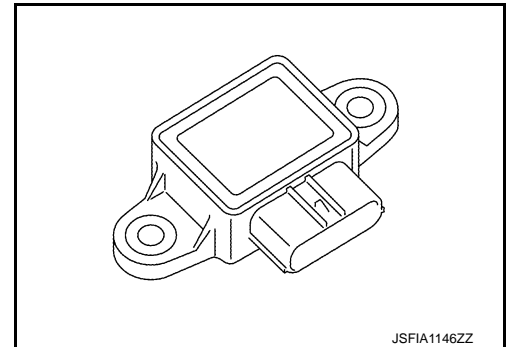


## Yaw Rate/Side/Decel G Sensor

INFOID:000000007633518

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

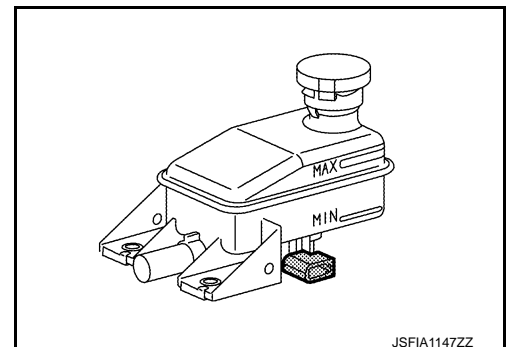
- Vehicle rotation angular velocity (yaw rate signal)
- Vehicle lateral acceleration (side G signal) and longitudinal acceleration (decel G signal)



## Brake Fluid Level Switch

INFOID:000000007633519

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.

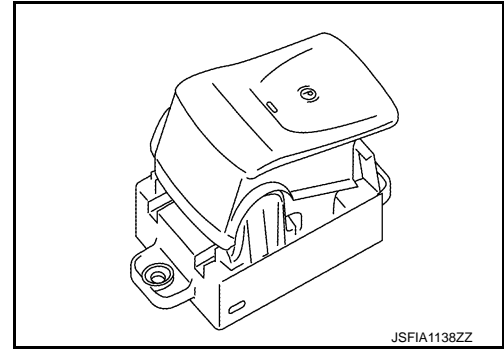




## Parking Brake Switch

INFOID:000000007633520

Detects the operation status of parking brake switch and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit).



## VDC OFF Switch

INFOID:000000007633521

- 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)

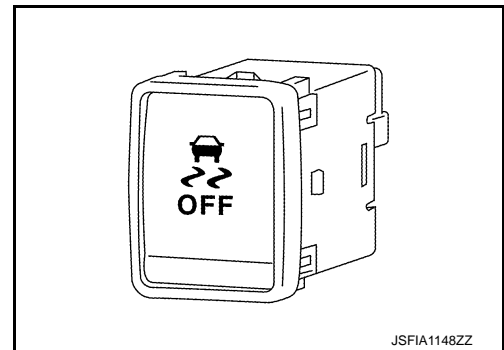
- VDC function

**NOTE:**

Brake limited slip differential (BLSD) function control operates.

- TCS function

- VDC OFF indicator lamp turns OFF (standby status) when the READY is started again after it is stopped once while VDC OFF indicator lamp is ON (non-operational status).



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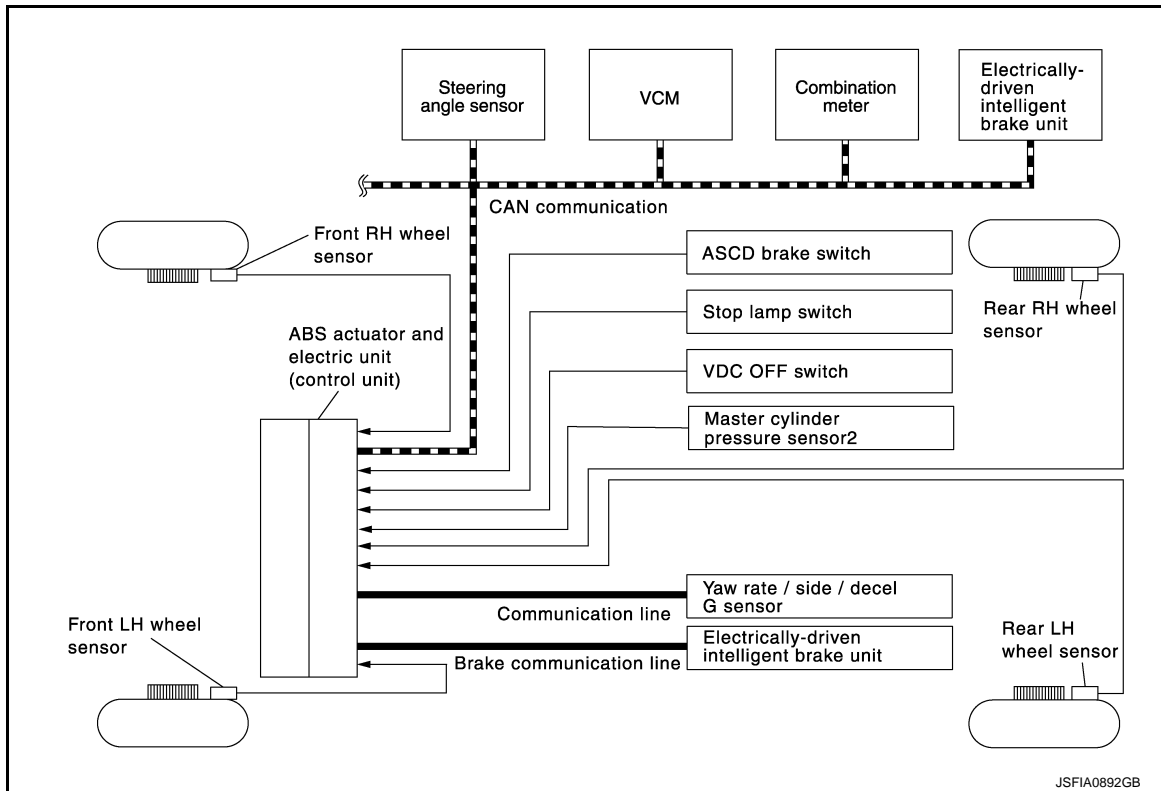
## SYSTEM

### System Description

INFOID:000000007633522

- 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, brake limited slip differential (BLSD) function and brake assist function.
- If a malfunction occurs in the electrically-driven intelligent brake unit, the VDC function performs control (boost operation).
- 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.

Component	Signal description
Yaw rate/side/decel G sensor	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1</p> <ul style="list-style-type: none"> <li>• Yaw rate signal</li> <li>• Side G sensor signal</li> <li>• Decel G sensor signal</li> </ul>
VCM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> <li>• Accelerator pedal position signal</li> <li>• Motor torque control signal</li> <li>• VCM control signal</li> <li>• Shift position signal</li> </ul>
Electrically-driven intelligent brake	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication and brake communication line*2</p> <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> </ul>



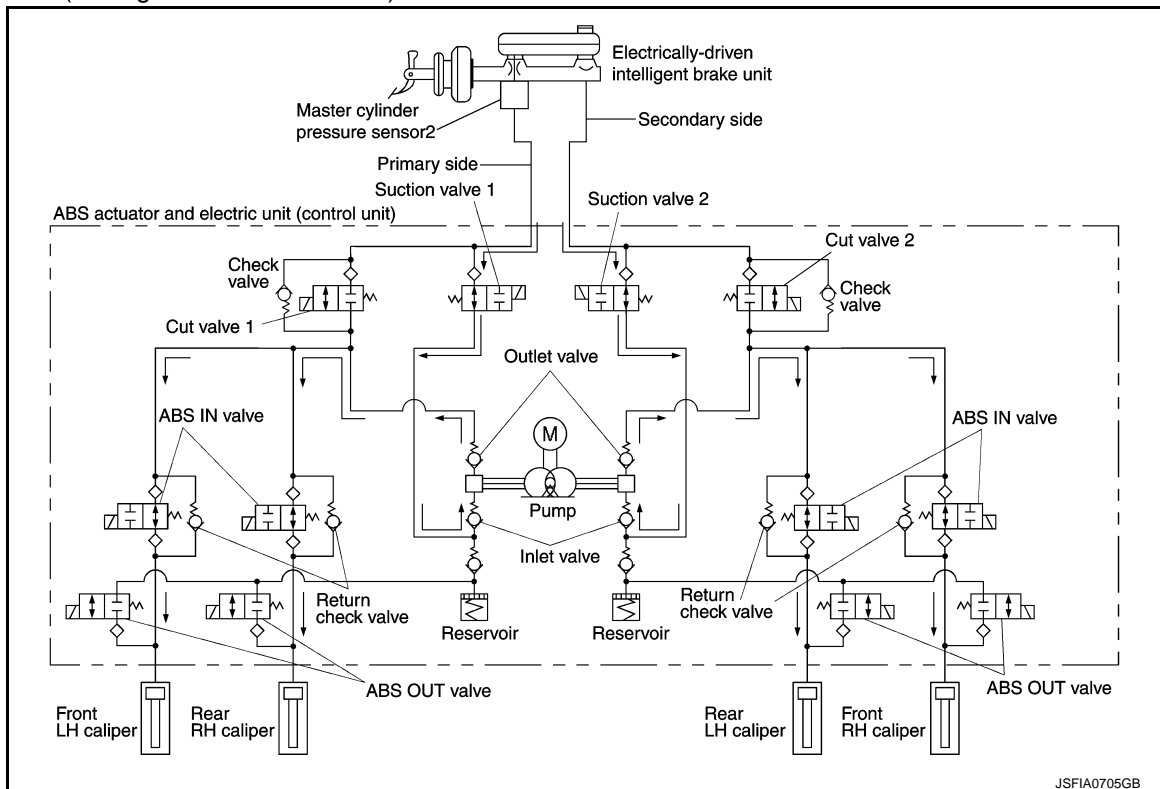
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>Steering angle sensor signal</li> </ul>
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>Brake fluid level switch signal</li> <li>Parking brake switch signal</li> </ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <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>

\*1: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit)  
\*2: Communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

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

The control unit built in the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers, respectively, by operating each valve.

When VDC Function, TCS Function, Brake Limited Slip Differential (BLSD) Function and Brake Assist Function are in Operation (During Pressure Increases)



Name	Not activated	During pressure increases
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)
Suction valve 1	Power supply is not supplied (close)	Power supply is supplied (open)
Suction valve 2	Power supply is not supplied (close)	Power supply is supplied (open)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)



# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

Name	Not activated	During pressure increases
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure increases

During pressure front RH brake caliper increases

- Brake fluid is conveyed to the pump from the electrically-driven intelligent brake unit through suction valve 2 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the front RH brake caliper through the ABS IN valve. For the left caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure front LH brake caliper increases

- Brake fluid is conveyed to the pump from the electrically-driven intelligent brake unit through suction valve 1 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the front LH brake caliper through the ABS IN valve. For the right caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right caliper is controlled separately from the left caliper.

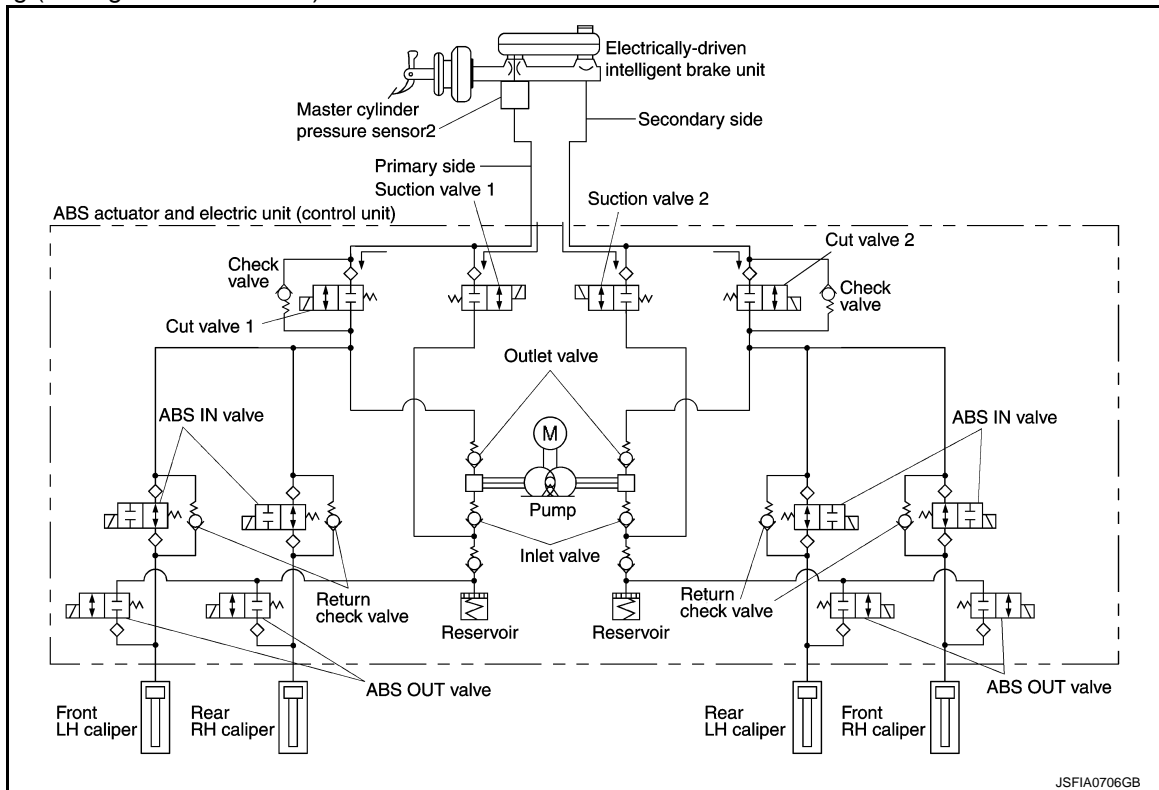
During pressure rear RH brake caliper increases

- Brake fluid is conveyed to the pump from the electrically-driven intelligent brake unit through suction valve 1 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the rear RH brake caliper through the ABS IN valve. For the left caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear LH brake caliper increases

- Brake fluid is conveyed to the pump from the electrically-driven intelligent brake unit through suction valve 2 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the rear LH brake caliper through the ABS IN valve. For the right caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right caliper is controlled separately from the left caliper.

When VDC Function, TCS Function, Brake Limited Slip Differential (BLSD) Function Brake Assist Function are Starts Operating (During Pressure Holds)



Name	Not activated	During pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)



# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

Name	Not activated	During pressure holds
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure holds

During pressure front RH brake caliper holds

- Since the cut valve 2 and the suction valve 2 are closed, the front RH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the front RH brake caliper. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure front LH brake caliper holds

- Since the cut valve 1 and the suction valve 1 are closed, the front LH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the front LH brake caliper. The pressurization for the right caliper is controlled separately from the left caliper.

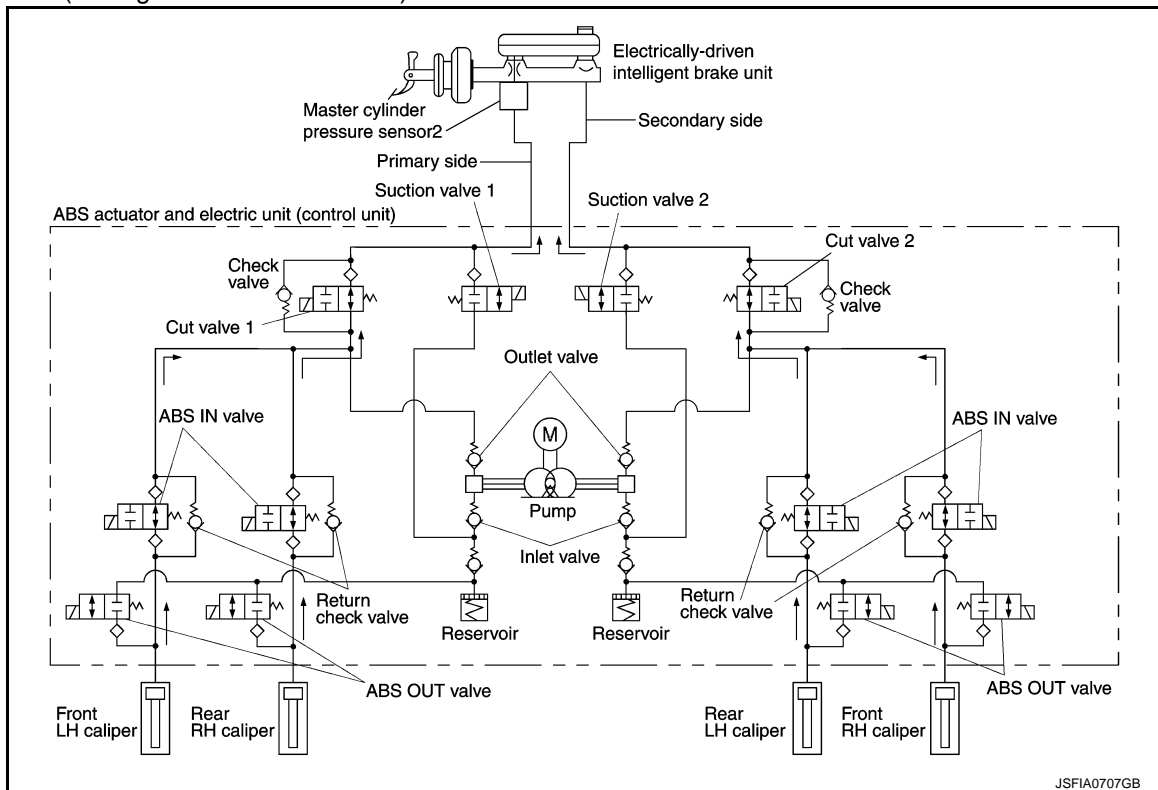
During pressure rear RH brake caliper holds

- Since the cut valve 1 and the suction valve 1 are closed, the rear RH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the rear RH brake caliper. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear LH brake caliper holds

- Since the cut valve 2 and the suction valve 2 are closed, the rear LH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the rear LH brake caliper. The pressurization for the right caliper is controlled separately from the left caliper.

When VDC Function, TCS Function, Brake Limited Slip Differential (BLSD) Function and Brake Assist Function are in Operation (During Pressure Decreases)



Name	Not activated	During pressure decreases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)



# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

Name	Not activated	During pressure decreases
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure decreases

During pressure front RH brake caliper decreases

- Since the suction valve 2 and the ABS OUT valve close and the cut valve 2 and the ABS IN valve open, the fluid pressure applied on the front RH brake caliper is reduced by supplying the fluid pressure to the electrically-driven intelligent brake unit via the ABS IN valve and the cut valve 2. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure front LH brake caliper decreases

- Since the suction valve 1 and the ABS OUT valve close and the cut valve 1 and the ABS IN valve open, the fluid pressure applied on the front LH brake caliper is reduced by supplying the fluid pressure to the electrically-driven intelligent brake unit via the ABS IN valve and the cut valve 2. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear RH brake caliper decreases

- Since the suction valve 1 and the ABS OUT valve close and the cut valve 1 and the ABS IN valve open, the fluid pressure applied on the rear RH brake caliper is reduced by supplying the fluid pressure to the electrically-driven intelligent brake unit via the ABS IN valve and the cut valve 2. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure rear LH brake caliper decreases

- Since the suction valve 2 and the ABS OUT valve close and the cut valve 2 and the ABS IN valve open, the fluid pressure applied on the rear LH brake caliper is reduced by supplying the fluid pressure to the electrically-driven intelligent brake unit via the ABS IN valve and the cut valve 2. The pressurization for the left caliper is controlled separately from the right caliper.

## Component Parts and Function

Component	Function
Pump	Pressurized brake fluid from electrically-driven intelligent brake unit is supplied to each caliper.
Motor	Activates the pump according to signals from control unit part.
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from electrically-driven intelligent brake unit.
Suction valve 1 Suction valve 2	Supplies the brake fluid from electrically-driven intelligent brake unit to the pump.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit part.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit part.
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 electrically-driven intelligent brake unit by bypassing orifice of each valve when brake is released.
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper.
Master cylinder pressure sensor2	Detects the brake fluid pressure from master cylinder part and transmits signal to ABS actuator and electric unit (control unit).

## VALVE OPERATION (ABS FUNCTION AND EBD FUNCTION)

The control unit built in the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers, respectively, by operating each valve.

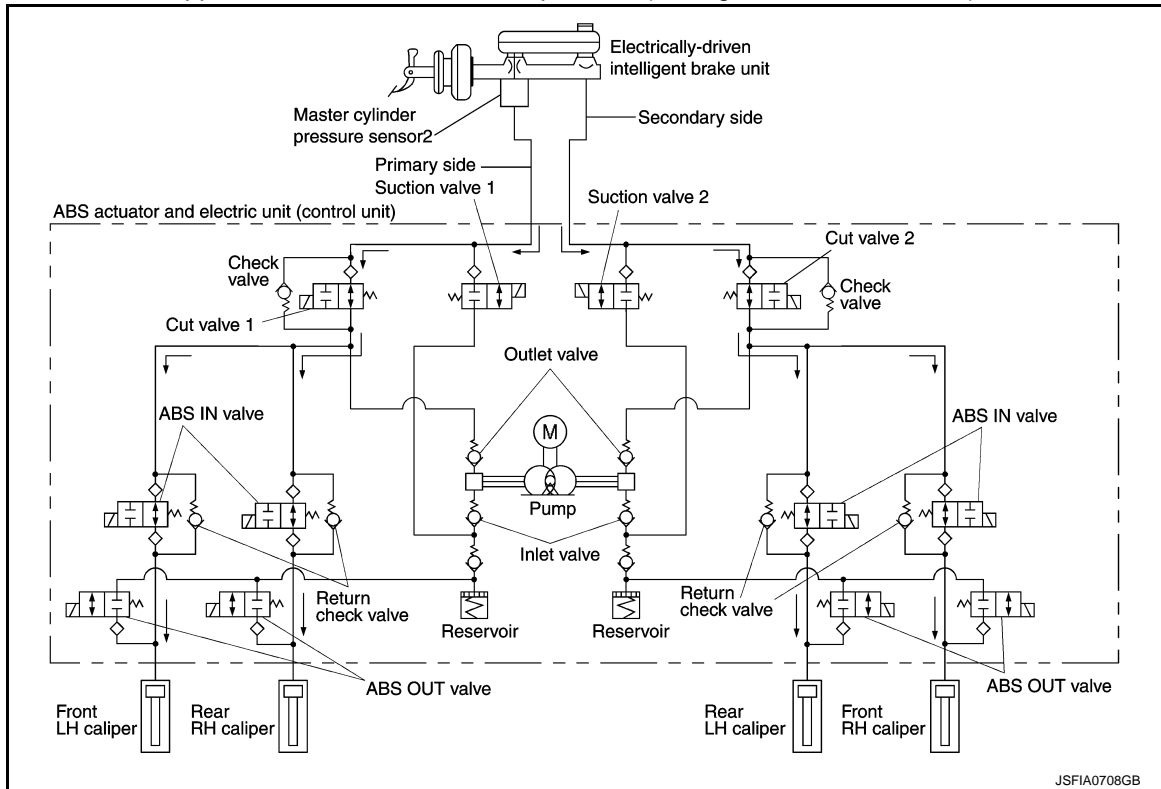


# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

When Brake Pedal is Applied or ABS Function is in Operation (During Pressure Increases)



Name	Not activated	During pressure increases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure increases

During pressure front RH brake caliper increases

- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the front RH brake caliper from the electrically-driven intelligent brake unit through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

During pressure front LH brake caliper increases

- When the cut valve 1 and the ABS IN valve opens, brake fluid is supplied to the front LH brake caliper from the electrically-driven intelligent brake unit through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

During pressure rear RH brake caliper increases

- When the cut valve 1 and the ABS IN valve opens, brake fluid is supplied to the rear RH brake caliper from the electrically-driven intelligent brake unit through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

During pressure rear LH brake caliper increases

- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear LH brake caliper from the electrically-driven intelligent brake unit through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

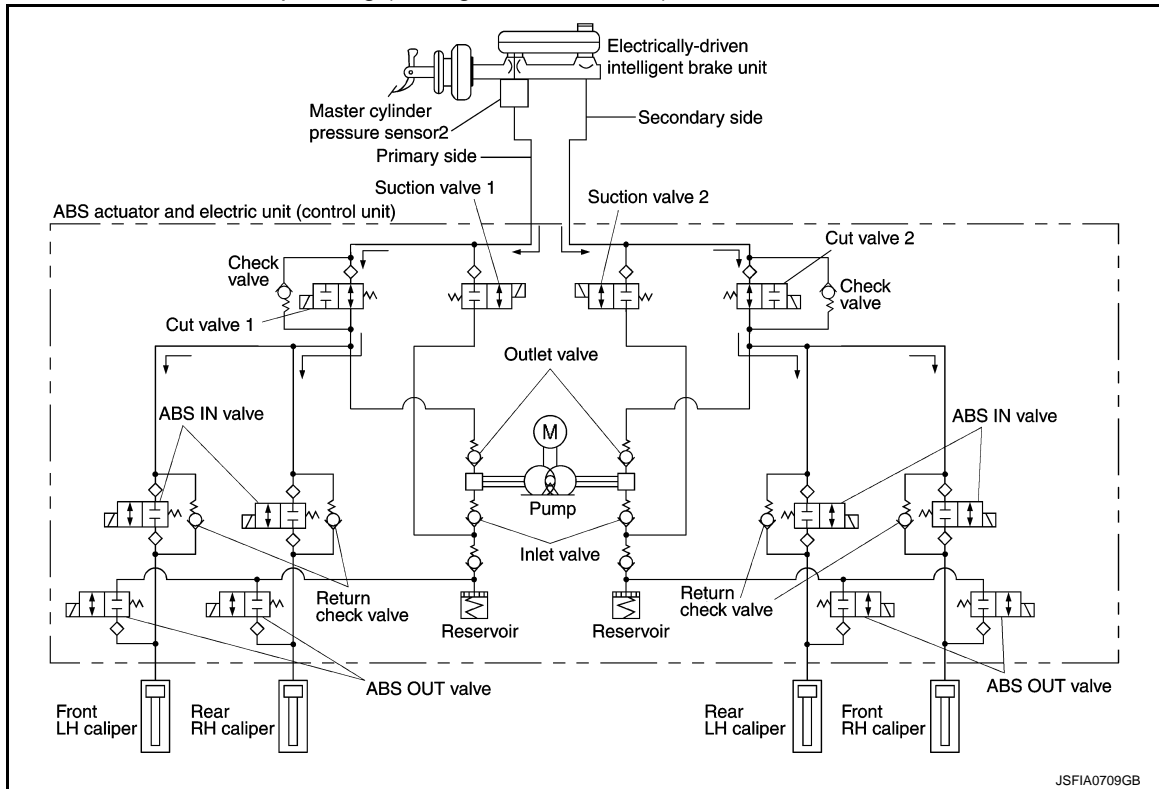


# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

When ABS Function is Starts Operating (During Pressure Holds)



Name	Not activated	During pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure holds

During pressure front RH brake caliper holds

- Since the ABS IN valve and the ABS OUT valve are closed, the front RH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the front RH brake caliper.

During pressure front LH brake caliper holds

- Since the ABS IN valve and the ABS OUT valve are closed, the front LH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the front LH brake caliper.

During pressure rear RH brake caliper holds

- Since the ABS IN valve and the ABS OUT valve are closed, the rear RH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the rear RH brake caliper.

During pressure rear LH brake caliper holds

- Since the ABS IN valve and the ABS OUT valve are closed, the rear LH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the rear LH brake caliper.

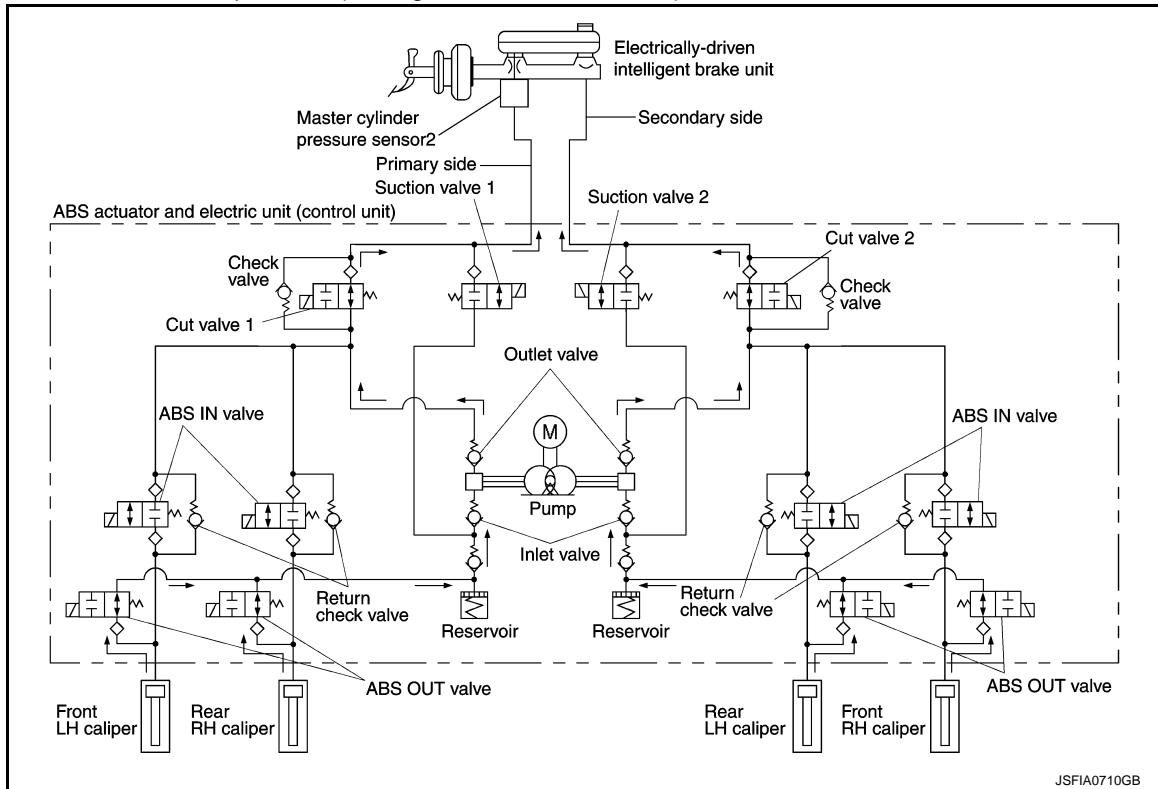


# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

When ABS Function is in Operation (During Pressure Decreases)



Name	Not activated	During pressure decreases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is supplied (open)
Each brake caliper (fluid pressure)	—	Pressure decreases

During pressure front RH brake caliper decreases

- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the front RH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the electrically-driven intelligent brake unit by the pump.

During pressure front LH brake caliper decreases

- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the front LH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the electrically-driven intelligent brake unit by the pump.

During pressure rear RH brake caliper decreases

- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear RH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the electrically-driven intelligent brake unit by the pump.

During pressure rear LH brake caliper decreases

- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear LH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the electrically-driven intelligent brake unit by the pump.

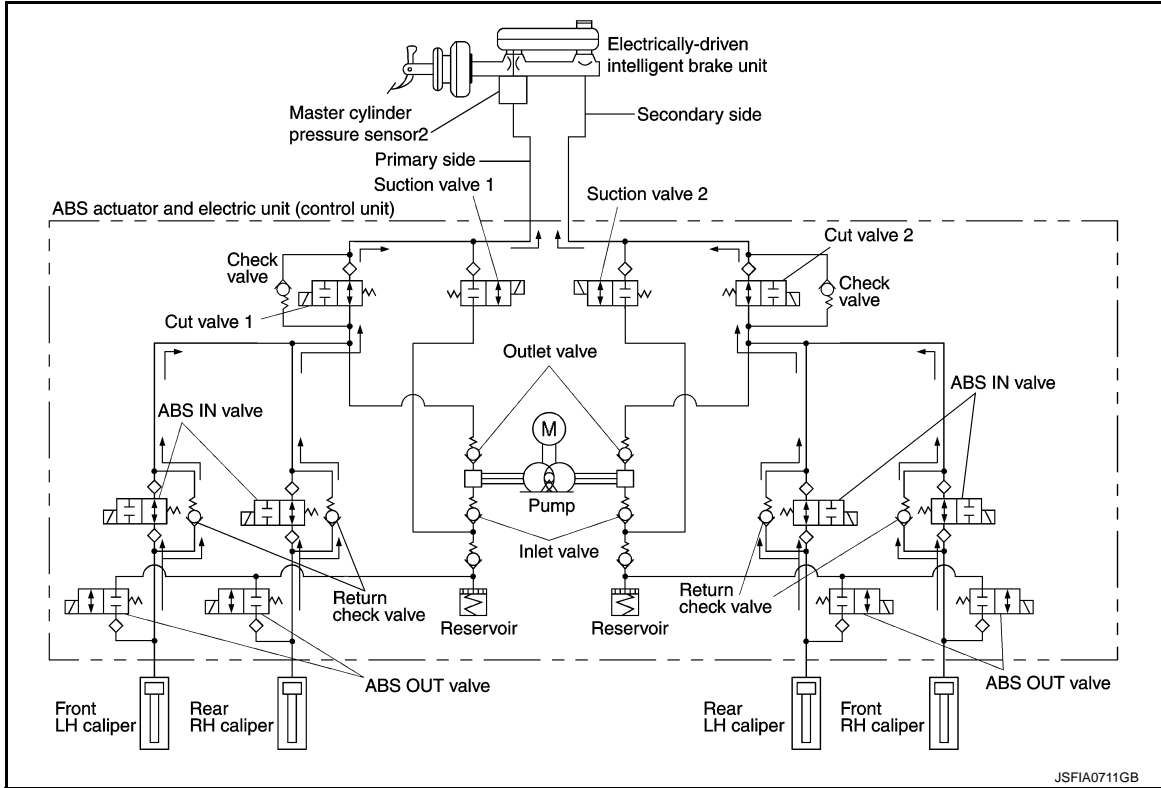


# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

### When Brake Release



Name	Not activated	During brake release
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper (fluid pressure)	—	Pressure decreases

#### During front RH brake caliper release

- Brake fluid is supplied to the front RH brake caliper through the return check valve of the ABS IN valve and the cut valve 2, and returns to the electrically-driven intelligent brake unit.

#### During front LH brake caliper release

- Brake fluid is supplied to the front LH brake caliper through the return check valve of the ABS IN valve and the cut valve 1, and returns to the electrically-driven intelligent brake unit.

#### During rear RH brake caliper release

- Brake fluid is supplied to the rear RH brake caliper through the return check valve of the ABS IN valve and the cut valve 1, and returns to the electrically-driven intelligent brake unit.

#### During rear LH brake caliper release

- Brake fluid is supplied to the rear LH brake caliper through the return check valve of the ABS IN valve and the cut valve 2, and returns to the electrically-driven intelligent brake unit.

### Component Parts and Function

Component	Function
Pump	Returns the brake fluid reserved in reservoir to electrically-driven intelligent brake unit by reducing pressure.
Motor	Activates the pump according to signals from control unit part.



# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

Component	Function
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from electrically-driven intelligent brake unit.
Suction valve 1 Suction valve 2	Supplies the brake fluid from electrically-driven intelligent brake unit to the pump.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit part.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit part.
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 to electrically-driven intelligent brake unit by bypassing orifice of each valve when brake is released.
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper.
Master cylinder pressure sensor2	Detects the brake fluid pressure from master cylinder part and transmits signal to ABS actuator and electric unit (control unit).

## CONDITION FOR TURN ON THE WARNING LAMP

Turns ON when power 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
Power switch OFF	OFF	OFF	OFF
For several seconds after the power switch is turned ON	ON	ON	ON
Several seconds after power switch is turned ON (when the system is in normal operation)	OFF	OFF	OFF
Set the vehicle READY	OFF	OFF	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
Electrically-driven intelligent brake unit function is malfunctioning	ON	ON	ON
Brake limited slip differential (BLSD) function is malfunctioning	OFF	OFF	ON
Brake assist 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

- Turns ON when VDC function and TCS function are switched to non-operational status (OFF) by VDC OFF switch.
- Turns ON when power switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	VDC OFF indicator lamp
Power switch OFF	OFF
For several seconds after the power switch is turned ON	ON
Several seconds after power switch is turned ON (when the system is in normal operation)	OFF
When VDC OFF switch is ON (VDC function and TCS function are OFF)	ON



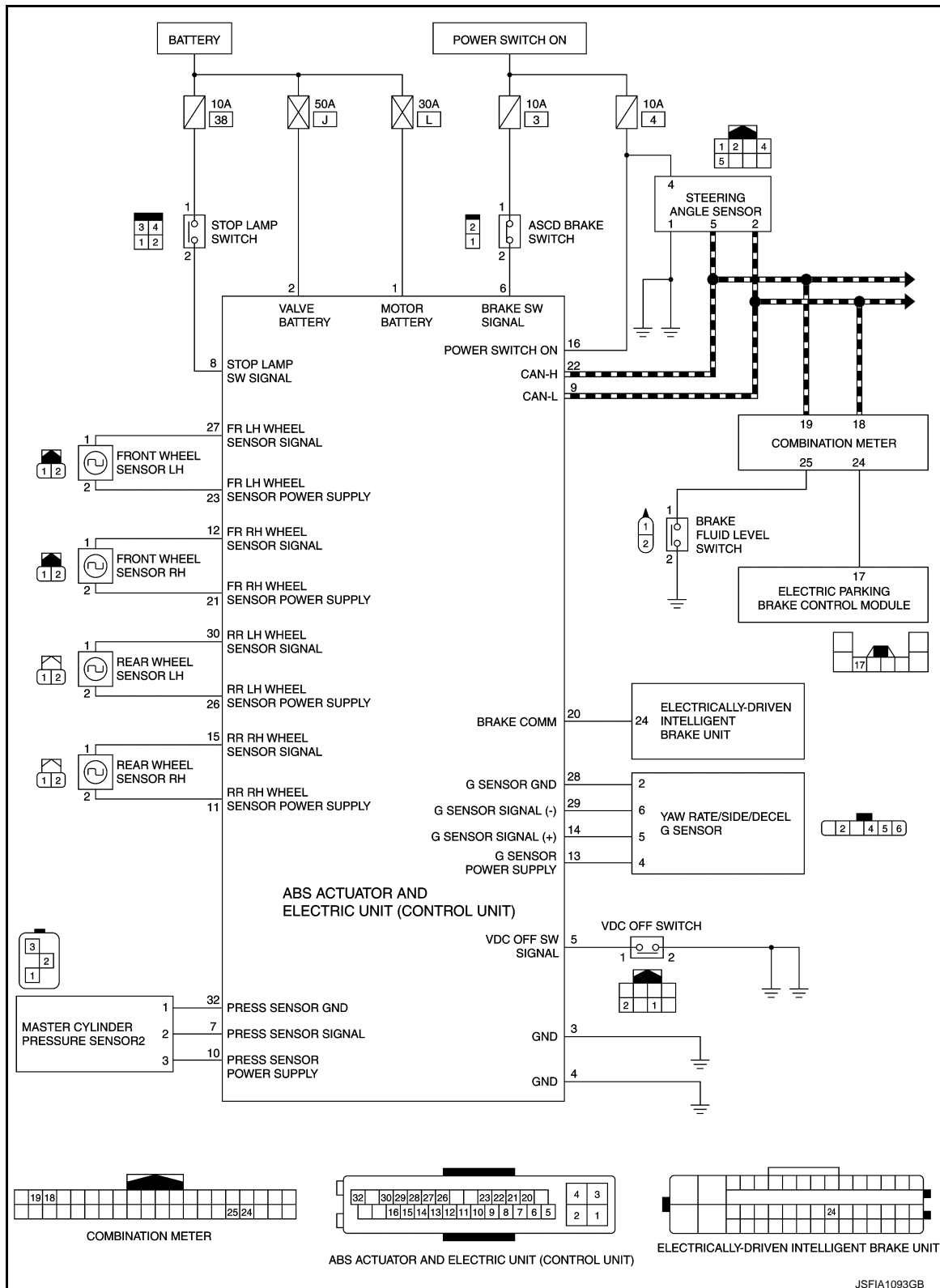
# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

## Circuit Diagram

INFOID:000000007633523



## Fail-safe

INFOID:000000007633524

VDC FUNCTION, TCS FUNCTION, BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION, BRAKE ASSIST 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, brake limited slip differential (BLSD) function and brake assist 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 power 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function and brake assist function.

DTC	Vehicle condition
C1101	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function (only when both 2 rear wheels are malfunctioning)</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1102	
C1103	
C1104	
C1105	
C1106	
C1107	
C1108	
C1109	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1110	
C1111	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1113	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1115	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>



# SYSTEM

## < SYSTEM DESCRIPTION >

[WITH VDC]

DTC	Vehicle condition
C1116	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1120	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1121	
C1122	
C1123	
C1124	
C1125	
C1126	
C1127	
C1140	
C1142	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1143	
C1144	
C1145	
C1146	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1155	
C1164	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1165	
C1166	
C1167	
C1176	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C118A	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C118C	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
U1000	
U1010	
U110D	The following functions are suspended. <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>

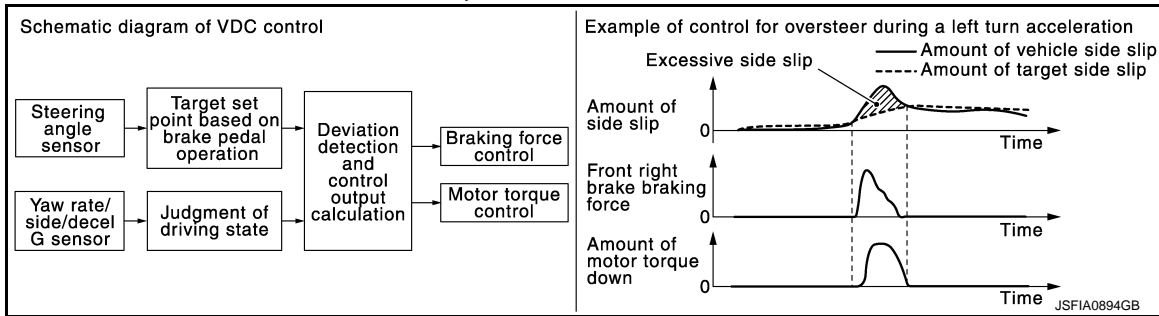


## VDC FUNCTION

### VDC FUNCTION : System Description

INFOID:000000007633525

- 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 motor torque 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/decel 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 motor torque control.



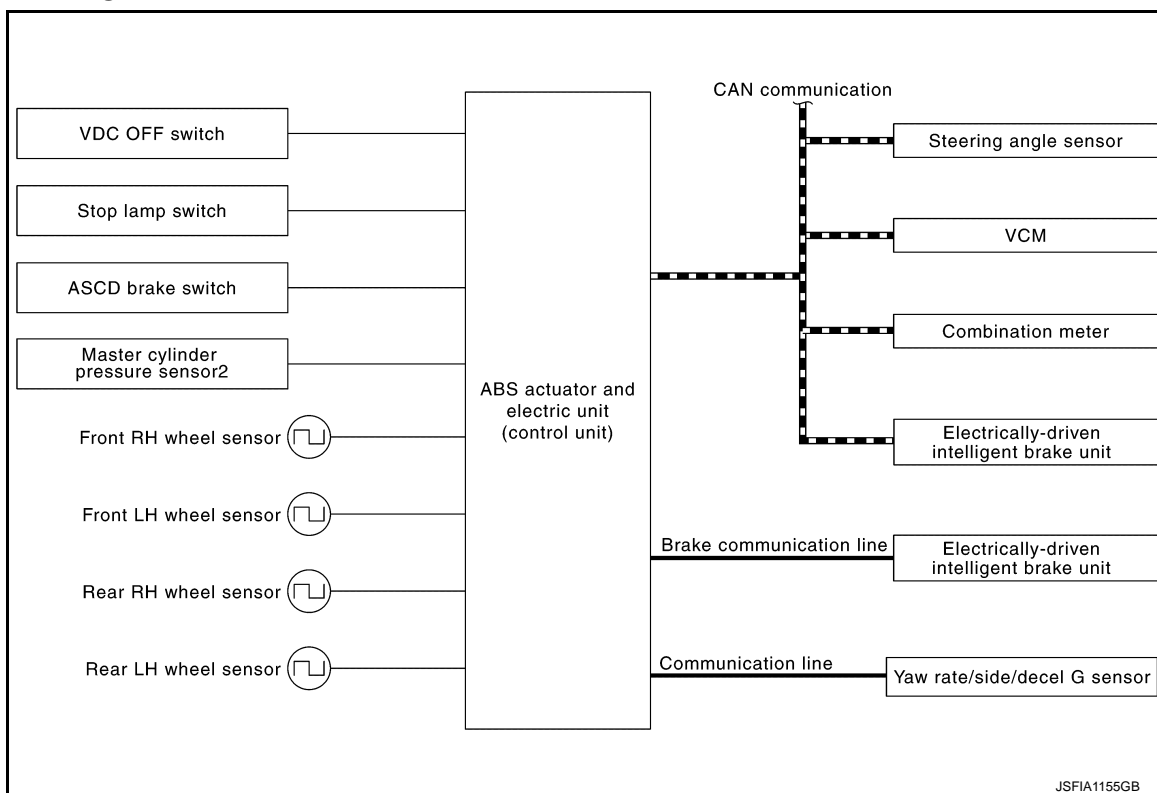
- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as motor torque control, by transmitting drive signal to 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-47, "Fail-safe"](#).

#### NOTE:

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



## 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/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1 <ul style="list-style-type: none"> <li>• Yaw rate signal</li> <li>• Side G sensor signal</li> <li>• Decel G sensor signal</li> </ul>
VCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Accelerator pedal position signal</li> <li>• Motor torque control signal</li> <li>• VCM control signal</li> <li>• Shift position signal</li> </ul>
Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*2 <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> </ul>
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Steering angle sensor signal</li> </ul>
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Brake fluid level switch signal</li> <li>• Parking brake switch signal</li> </ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• VDC warning lamp signal</li> <li>• VDC OFF indicator lamp signal</li> </ul>

\*1: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit)

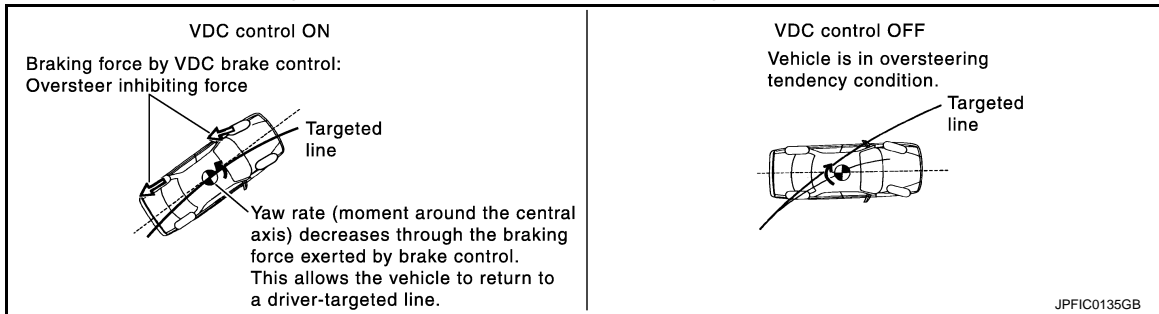
\*2: Communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)



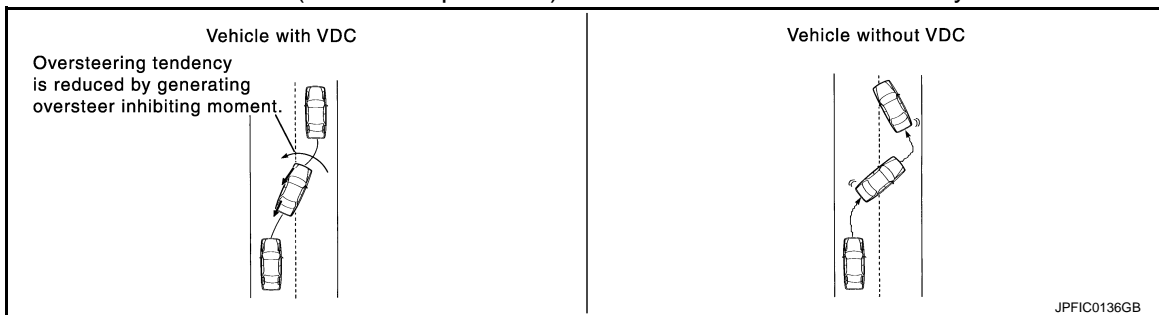
## OPERATION CHARACTERISTICS

### 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.

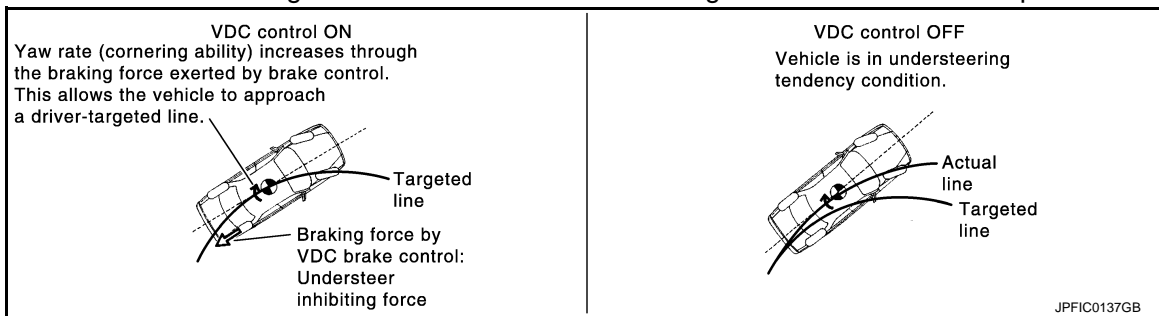


- Changing driving lane on a slippery road, when oversteer tendency is judged large, motor torque is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

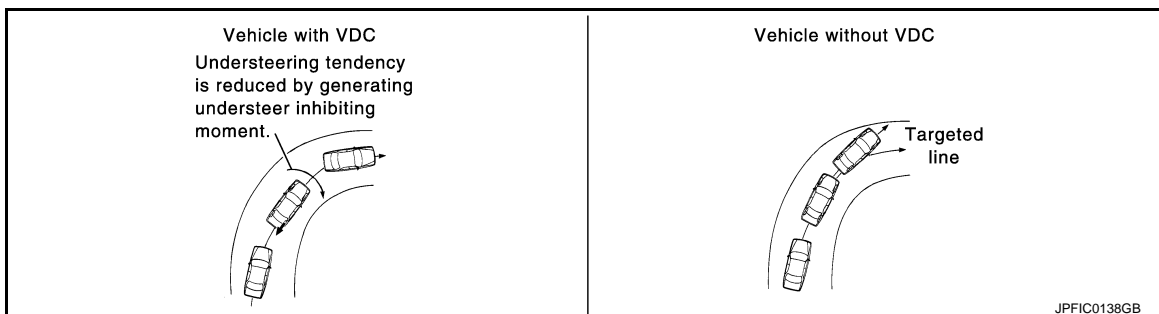


### VDC Function That Prevents Understeer Tendency

- 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, motor torque is controlled as well as brake force (brake fluid pressure) of four wheels. Understeer tendency decreases.



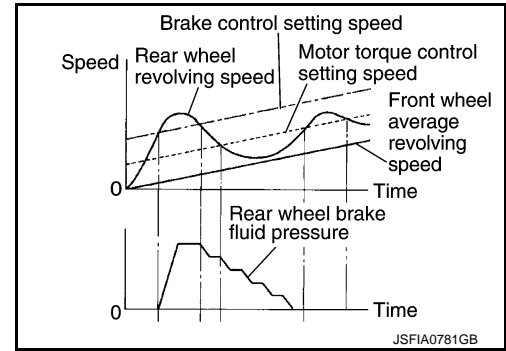
## TCS FUNCTION



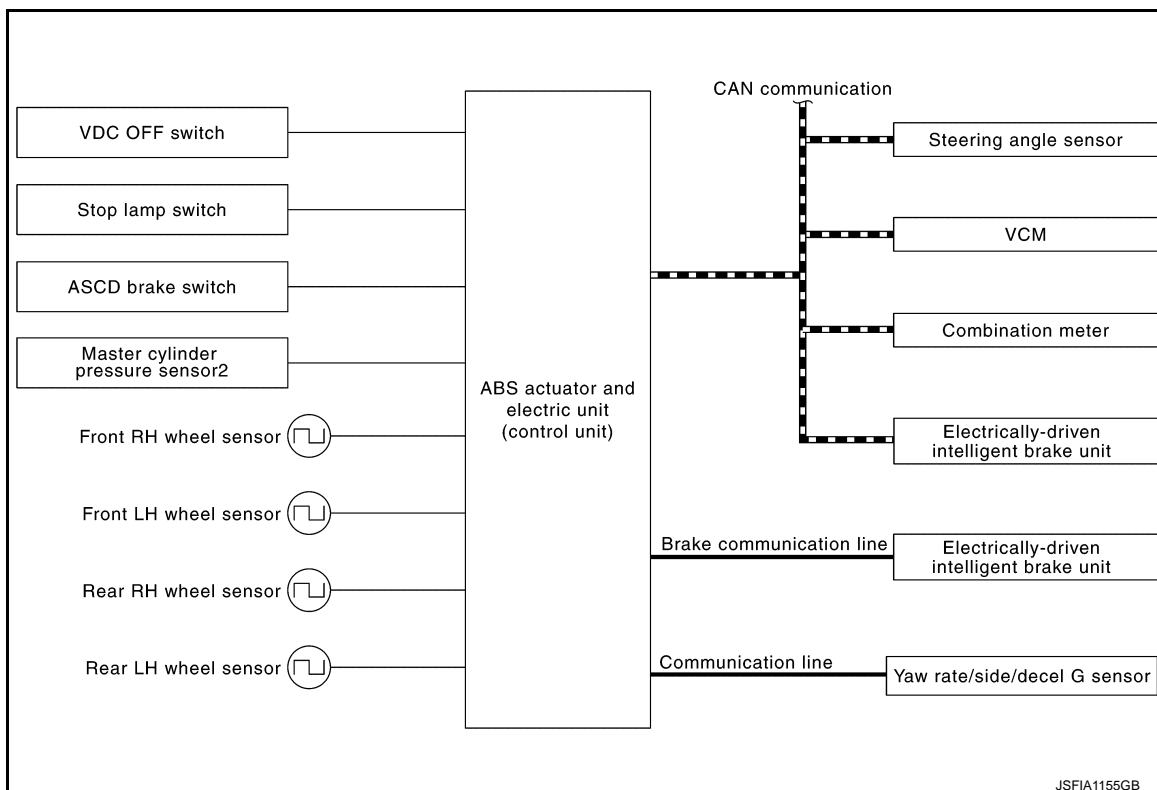
## TCS FUNCTION : System Description

INFOID:000000007633526

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Motor torque 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 motor torque by motor torque control. Wheel spin amount decreases. Motor 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-47, "Fail-safe"](#).



## SYSTEM DIAGRAM



## INPUT SIGNAL AND OUTPUT SIGNAL

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



# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1 <ul style="list-style-type: none"> <li>• Yaw rate signal</li> <li>• Side G sensor signal</li> <li>• Decel G sensor signal</li> </ul>
VCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Accelerator pedal position signal</li> <li>• Motor torque control signal</li> <li>• VCM control signal</li> <li>• Shift position signal</li> </ul>
Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*2 <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> </ul>
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Steering angle sensor signal</li> </ul>
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Brake fluid level switch signal</li> <li>• Parking brake switch signal</li> </ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• VDC warning lamp signal</li> <li>• VDC OFF indicator lamp signal</li> </ul>

\*1: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit)

\*2: Communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## ABS FUNCTION

### ABS FUNCTION : System Description

INFOID:000000007633527

- 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.



# SYSTEM

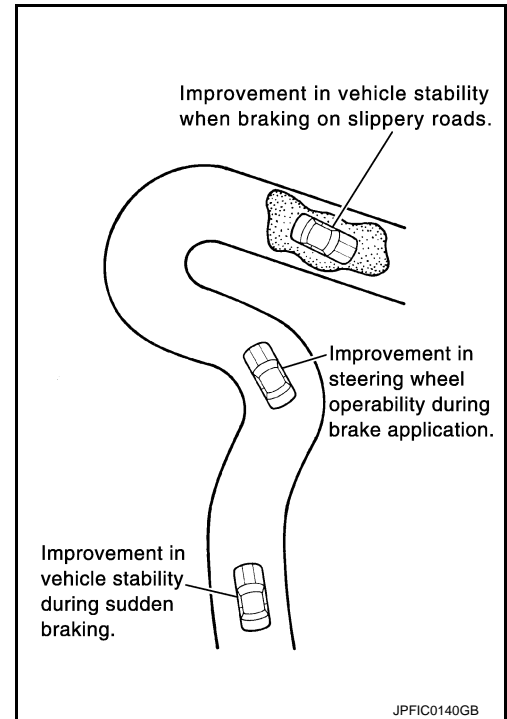
## < SYSTEM DESCRIPTION >

[WITH VDC]

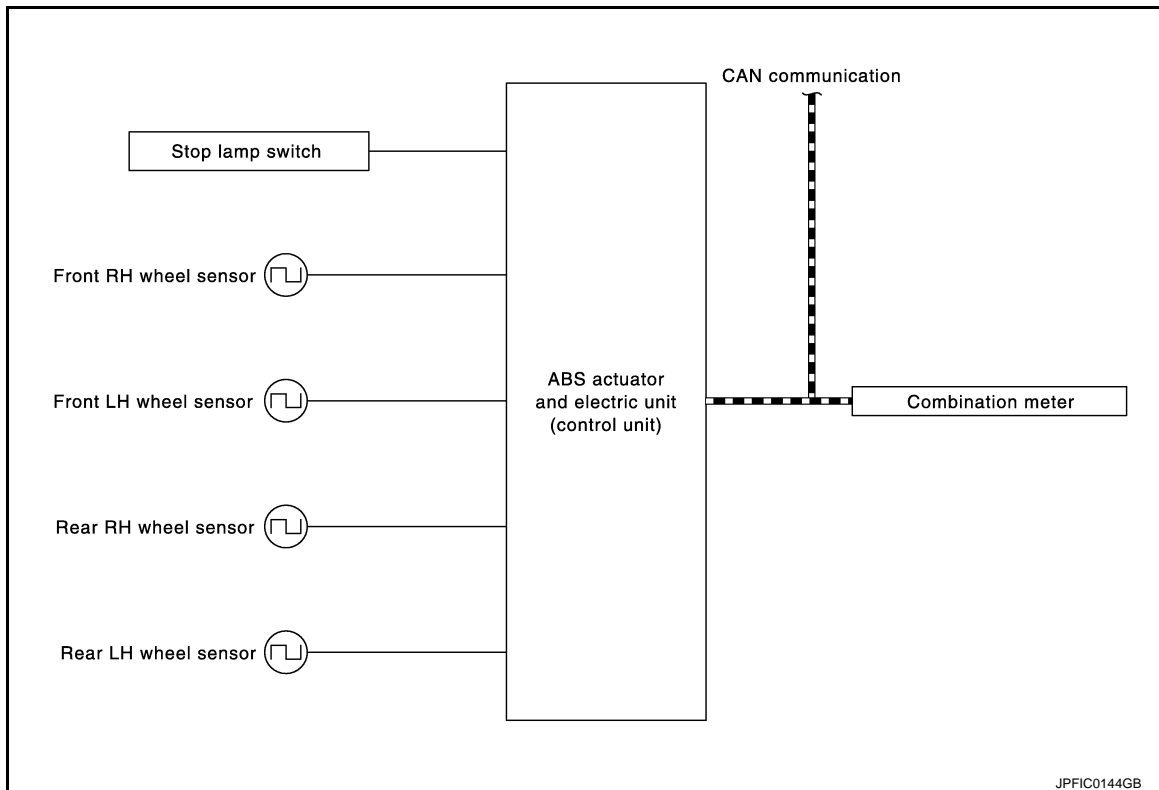
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, brake limited slip differential (BLSD) function and brake assist function. However, EBD function is operated normally. Refer to [BRC-47](#), "Fail-safe".

### 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 motor starts and when vehicle initially is driven [by vehicle speed approx. 15 km/h (9.3 MPH)]. Motor sounds are generated during self-diagnosis. 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.



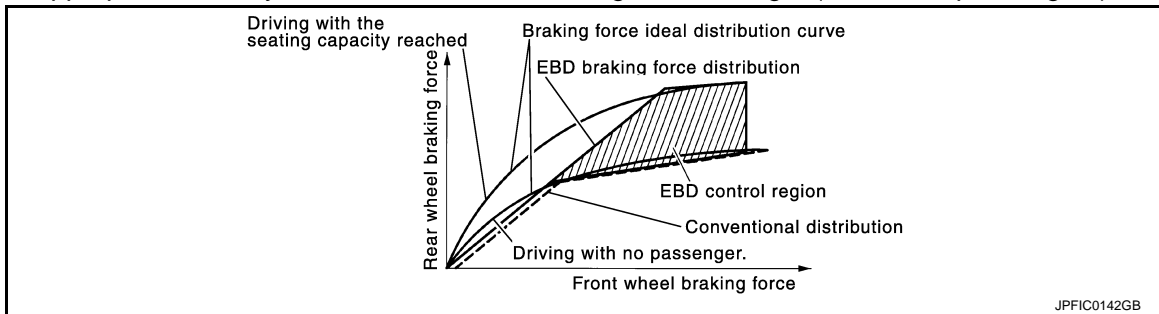
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• VDC warning lamp signal</li> <li>• ABS warning lamp signal</li> </ul>

## EBD FUNCTION

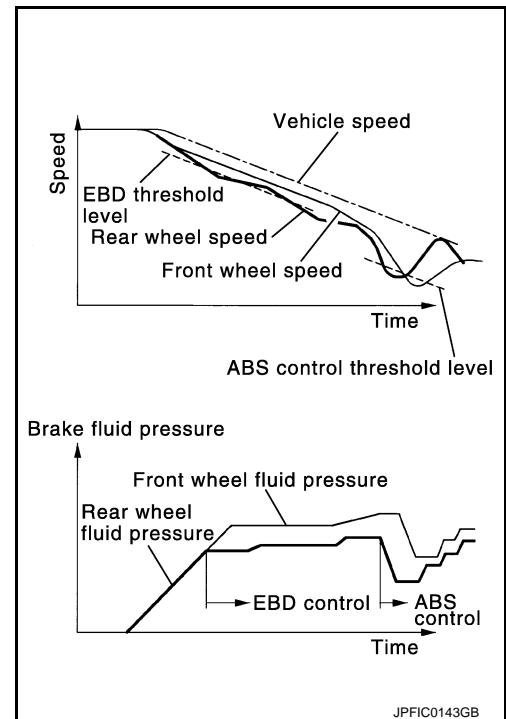
### EBD FUNCTION : System Description

INFOID:000000007633528

- 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).

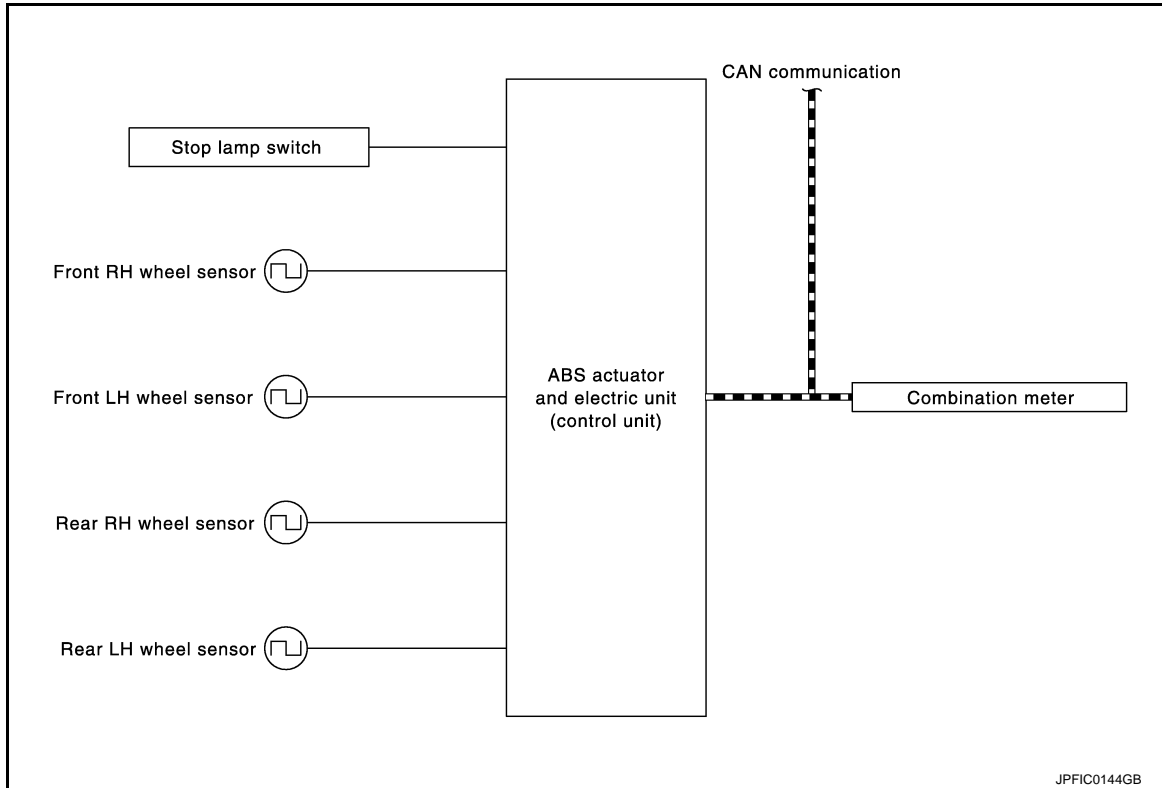


- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function and brake assist function. Refer to [BRC-47, "Fail-safe"](#).





## 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	<p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> <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

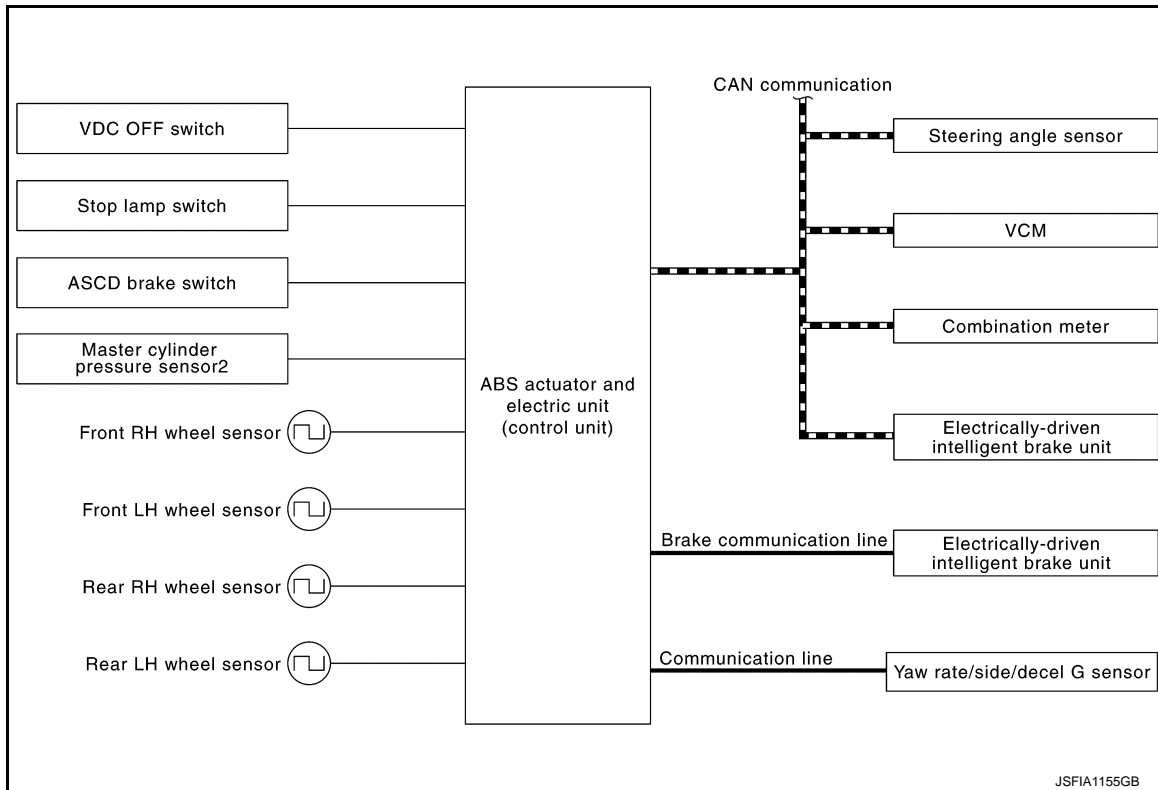
### BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION : System Description

INFOID:000000007633529

- 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.
- 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-47, "Fail-safe"](#).



## 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/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1 <ul style="list-style-type: none"> <li>• Yaw rate signal</li> <li>• Side G sensor signal</li> <li>• Decel G sensor signal</li> </ul>
VCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Accelerator pedal position signal</li> <li>• Motor torque control signal</li> <li>• VCM control signal</li> <li>• Shift position signal</li> </ul>
Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*2 <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> </ul>
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Steering angle sensor signal</li> </ul>
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• Brake fluid level switch signal</li> <li>• Parking brake switch signal</li> </ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>• VDC warning lamp signal</li> </ul>

\*1: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit)  
\*2: Communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## BRAKE ASSIST FUNCTION

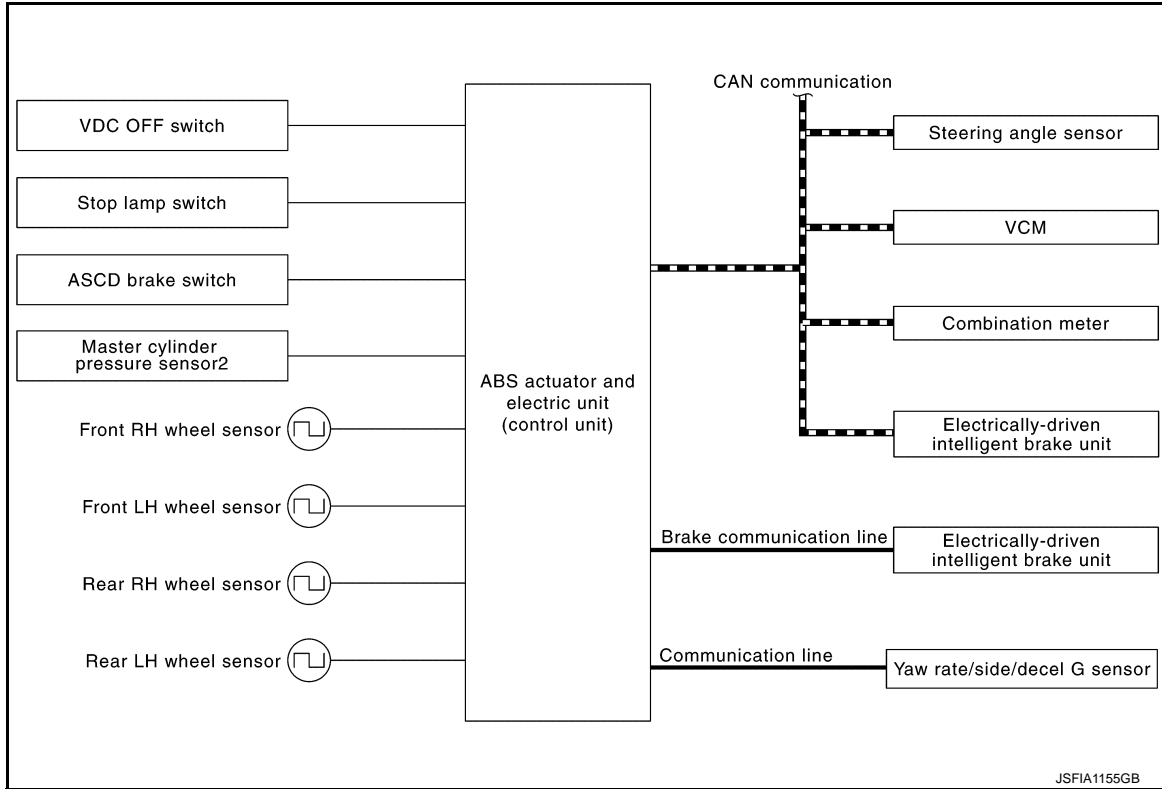


## BRAKE ASSIST FUNCTION : System Description

INFOID:000000007633530

- When the driver brakes hard in an emergency, the stopping distance is reduced by increasing brake fluid pressure.
- Fail-safe function is adopted. When a malfunction occurs in brake assist function, the control is suspended for VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-47, "Fail-safe"](#).

### 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/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1 <ul style="list-style-type: none"> <li>Yaw rate signal</li> <li>Side G sensor signal</li> <li>Decel G sensor signal</li> </ul>
VCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> <li>Accelerator pedal position signal</li> <li>Motor torque control signal</li> <li>VCM control signal</li> <li>Shift position signal</li> </ul>
Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*2 <ul style="list-style-type: none"> <li>Electrically-driven intelligent brake control signal</li> </ul>



SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"><li>Steering angle sensor signal</li></ul>
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"><li>Brake fluid level switch signal</li><li>Parking brake switch signal</li></ul> Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"><li>VDC warning lamp signal</li></ul>

\*1: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit)  
\*2: Communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

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BRC



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

< SYSTEM DESCRIPTION >

[WITH VDC]

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

### CONSULT Function

INFOID:0000000007633531

### 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	Input/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 electric unit (control unit) and also shifts some parameters in a specified range.
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 [BRC-50, "DTC Index"](#).

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 – 256)	<p>The number of times that power switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none"> <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> </ul> <p><b>NOTE:</b> Each time when power switch is turned OFF → ON, numerical number increases in 1 → 2 → 3...255 → 256. When the operation number of times exceeds 256, the number do not increase and "39" is displayed until self-diagnosis is erased.</p>

### DATA MONITOR

×: Applicable

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



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

< SYSTEM DESCRIPTION >

[WITH VDC]

Item (Unit)	Monitor item selection		Note
	ECU INPUT SIGNALS	MAIN SIGNALS	
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position
SIDE G-SENSOR (m/s <sup>2</sup> )	×		Side G detected by side G sensor is displayed.
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
DECEL G-SEN (G)	×	×	Decel G detected by decel G sensor is displayed.
STR ANGLE SIG (deg)	×		Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×		Fluid pressure detected by master cylinder pressure sensor2 is displayed.
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate 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 operation status is displayed.
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF 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.
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. *
OFF SW (On/Off)	×	×	VDC OFF switch operation status is displayed.
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status 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.

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

< SYSTEM DESCRIPTION >

[WITH VDC]

Item (Unit)	Monitor item selection		Note
	ECU INPUT SIGNALS	MAIN SIGNALS	
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.
GEAR	×	×	Current gear position judged from current gear position 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.
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communication is displayed.
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 1 operation status is displayed.
STOP LAMP SW2 (On/Off)			ASCD brake switch operation status is displayed.

\*: Refer to [BRC-16, "System Description"](#) for ON/OFF conditions of each warning lamp.

## ACTIVE TEST

The active test is used to determine and identify details of a malfunction, based on self-diagnosis test result and 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.

### 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 normal.



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

< SYSTEM DESCRIPTION >

[WITH VDC]

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

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

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

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

ABS Motor

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



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

< SYSTEM DESCRIPTION >

[WITH VDC]

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

## 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 >

[WITH VDC]

## ECU DIAGNOSIS INFORMATION

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

Reference Value

INFOID:0000000007633532

#### CONSULT DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
FR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within $\pm 10\%$ )
FR RH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within $\pm 10\%$ )
RR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within $\pm 10\%$ )
RR RH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within $\pm 10\%$ )
ACCEL POS SIG	Never depress accelerator pedal (with power switch ON)	0%
	Depress accelerator pedal (with power switch ON)	0 – 100%
SIDE G-SENSOR	Vehicle stopped	Approx. 0 m/s <sup>2</sup>
	Turning right	Negative value
	Turning left	Positive value
BATTERY VOLT	Power switch ON	10 – 16 V
DECEL G-SEN	When stopped	-0.11 – 0.11 G
	During acceleration	Negative value
	During deceleration	Positive value
STR ANGLE SIG	When driving straight	0 $\pm$ 2.5°
	When steering wheel is steered to LH by 90°	Approx. +90°
	When steering wheel is steered to RH by 90°	Approx. -90°
PRESS SENSOR	Brake pedal not depressed	Approx. 0 bar
	Brake pedal depressed	0 – 255 bar
YAW RATE SEN	Vehicle stopped	Approx. 0 d/s
	Turning right	Negative value
	Turning left	Positive value
FR RH IN SOL*2	Active	On
	Not activated	Off
FR RH OUT SOL*2	Active	On
	Not activated	Off
FR LH IN SOL*2	Active	On
	Not activated	Off
FR LH OUT SOL*2	Active	On
	Not activated	Off



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Monitor item	Condition	Reference values in normal operation
RR RH IN SOL <sup>*2</sup>	Active	On
	Not activated	Off
RR RH OUT SOL <sup>*2</sup>	Active	On
	Not activated	Off
RR LH IN SOL <sup>*2</sup>	Active	On
	Not activated	Off
RR LH OUT SOL <sup>*2</sup>	Active	On
	Not activated	Off
EBD WARN LAMP	When brake warning lamp is ON <sup>*3</sup>	On
	When brake warning lamp is OFF <sup>*3</sup>	Off
STOP LAMP SW	Brake pedal depressed	On
	Brake pedal not depressed	Off
ABS WARN LAMP	When ABS warning lamp is ON <sup>*3</sup>	On
	When ABS warning lamp is OFF <sup>*3</sup>	Off
MOTOR RELAY	Active	On
	Not activated	Off
ACTUATOR RLY	Active	On
	Not activated (in fail-safe mode)	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
OFF SW	VDC OFF switch ON	On
	VDC OFF switch OFF	Off
SLIP/VDC LAMP	When VDC warning lamp is ON <sup>*3</sup>	On
	When VDC warning lamp is OFF <sup>*3</sup>	Off
EBD SIGNAL	EBD is activated	On
	EBD is not activated	Off
ABS SIGNAL	ABS is activated	On
	ABS is not activated	Off
TCS SIGNAL	TCS is activated	On
	TCS is not activated	Off
VDC SIGNAL	VDC is activated	On
	VDC is not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
	ABS is normal	Off
TCS FAIL SIG	In TCS fail-safe	On
	TCS is normal	Off
VDC FAIL SIG	In VDC fail-safe	On
	VDC is normal	Off
GEAR	Driving	D, R, N/P
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Monitor item	Condition	Reference values in normal operation
P POSI SIG	When selector lever is in the P position	On
	When selector lever is in the other position than P	Off
R POSI SIG	When selector lever is in the R position	On
	When selector lever is in the other position than R	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
CV1*2	Active	On
	Not activated	Off
CV2*2	Active	On
	Not activated	Off
SV1*2	Active	On
	Not activated	Off
SV2*2	Active	On
	Not activated	Off
STOP LAMP SW2	Brake pedal depressed	On
	Brake pedal not depressed	Off

\*1: Confirm tire pressure is standard value.

\*2: Refer to "valve operation" in [BRC-16. "System Description"](#) for valve operation of each valve.

\*3: Refer to [BRC-16. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

## Fail-safe

INFOID:000000007633533

## VDC FUNCTION, TCS FUNCTION, BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION, BRAKE ASSIST 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSD) function and brake assist 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, brake limited slip differential (BLSD) function and brake assist 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 power 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, brake limited slip differential (BLSD) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function and brake assist function.



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

DTC	Vehicle condition
C1101	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function (only when both 2 rear wheels are malfunctioning)</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1102	
C1103	
C1104	
C1105	
C1106	
C1107	
C1108	
C1109	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1110	
C1111	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1113	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1115	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1116	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1120	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1121	
C1122	
C1123	
C1124	
C1125	
C1126	
C1127	
C1140	
C1142	
C1143	<p>The following functions are suspended.</p> <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
C1144	
C1145	



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

DTC	Vehicle condition	
C1146	The following functions are suspended.	A
C1155	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	B
C1164	The following functions are suspended.	C
C1165	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> </ul>	
C1166	<ul style="list-style-type: none"> <li>• ABS function</li> <li>• EBD function</li> </ul>	D
C1167	<ul style="list-style-type: none"> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	
C1176	The following functions are suspended.	E
	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	BRC
C118A	The following functions are suspended.	G
	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	H
C118C	The following functions are suspended.	
U1000	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> </ul>	I
U1010	<ul style="list-style-type: none"> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	
U110D	The following functions are suspended.	J
	<ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• ABS function</li> <li>• EBD function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>	K

## DTC Inspection Priority Chart

INFOID:000000007633534

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

Priority	Detected item (DTC)	
1	<ul style="list-style-type: none"> <li>• U1000 CAN COMM CIRCUIT</li> <li>• U1010 CONTROL UNIT (CAN)</li> <li>• U110D E-DRIVEN INTELLIGENT BRAKE COMM</li> </ul>	M
2	<ul style="list-style-type: none"> <li>• C1110 CONTROLLER FAILURE</li> </ul>	N
3	<ul style="list-style-type: none"> <li>• C1144 ST ANG SEN SIGNAL</li> <li>• C118A E-DRIVEN INTELLIGENT BRAKE SYSTEM</li> <li>• C118C EV/HEV SYSTEM</li> </ul>	O
4	<ul style="list-style-type: none"> <li>• C1109 BATTERY VOLTAGE [ABNORMAL]</li> <li>• C1111 PUMP MOTOR</li> <li>• C1140 ACTUATOR RLY</li> </ul>	P



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Priority	Detected item (DTC)
5	<ul style="list-style-type: none"> <li>• C1101 RR RH SENSOR-1</li> <li>• C1102 RR LH SENSOR-1</li> <li>• C1103 FR RH SENSOR-1</li> <li>• C1104 FR LH SENSOR-1</li> <li>• C1105 RR RH SENSOR-2</li> <li>• C1106 RR LH SENSOR-2</li> <li>• C1107 FR RH SENSOR-2</li> <li>• C1108 FR LH SENSOR-2</li> <li>• C1113 G-SENSOR</li> <li>• C1115 ABS SENSOR [ABNORMAL SIGNAL]</li> <li>• C1116 STOP LAMP SW</li> <li>• C1120 FR LH IN ABS SOL</li> <li>• C1121 FR LH OUT ABS SOL</li> <li>• C1122 FR RH IN ABS SOL</li> <li>• C1123 FR RH OUT ABS SOL</li> <li>• C1124 RR LH IN ABS SOL</li> <li>• C1125 RR LH OUT ABS SOL</li> <li>• C1126 RR RH IN ABS SOL</li> <li>• C1127 RR RH OUT ABS SOL</li> <li>• C1142 PRESS SEN CIRCUIT</li> <li>• C1143 ST ANG SEN CIRCUIT</li> <li>• C1145 YAW RATE SENSOR</li> <li>• C1146 SIDE G-SEN CIRCUIT</li> <li>• C1164 CV 1</li> <li>• C1165 CV 2</li> <li>• C1166 SV 1</li> <li>• C1167 SV 2</li> <li>• C1176 STOP LAMP SW2</li> </ul>
6	<ul style="list-style-type: none"> <li>• C1155 BR FLUID LEVEL LOW</li> </ul>

## DTC Index

INFOID:000000007633535

DTC	Display Item	Reference
C1101	RR RH SENSOR-1	<a href="#">BRC-61, "DTC Logic"</a>
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	<a href="#">BRC-65, "DTC Logic"</a>
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	<a href="#">BRC-72, "DTC Logic"</a>
C1110	CONTROLLER FAILURE	<a href="#">BRC-74, "DTC Logic"</a>
C1111	PUMP MOTOR	<a href="#">BRC-75, "DTC Logic"</a>
C1113	G-SENSOR	<a href="#">BRC-78, "DTC Logic"</a>
C1115	ABS SENSOR [ABNORMAL SIGNAL]	<a href="#">BRC-82, "DTC Logic"</a>
C1116	STOP LAMP SW	<a href="#">BRC-89, "DTC Logic"</a>
C1120	FR LH IN ABS SOL	<a href="#">BRC-94, "DTC Logic"</a>
C1121	FR LH OUT ABS SOL	<a href="#">BRC-96, "DTC Logic"</a>
C1122	FR RH IN ABS SOL	<a href="#">BRC-94, "DTC Logic"</a>
C1123	FR RH OUT ABS SOL	<a href="#">BRC-96, "DTC Logic"</a>
C1124	RR LH IN ABS SOL	<a href="#">BRC-94, "DTC Logic"</a>
C1125	RR LH OUT ABS SOL	<a href="#">BRC-96, "DTC Logic"</a>



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

DTC	Display Item	Reference
C1126	RR RH IN ABS SOL	<a href="#">BRC-94, "DTC Logic"</a>
C1127	RR RH OUT ABS SOL	<a href="#">BRC-96, "DTC Logic"</a>
C1140	ACTUATOR RLY	<a href="#">BRC-98, "DTC Logic"</a>
C1142	PRESS SEN CIRCUIT	<a href="#">BRC-100, "DTC Logic"</a>
C1143	ST ANG SEN CIRCUIT	<a href="#">BRC-103, "DTC Logic"</a>
C1144	ST ANG SEN SIGNAL	<a href="#">BRC-106, "DTC Logic"</a>
C1145	YAW RATE SENSOR	<a href="#">BRC-78, "DTC Logic"</a>
C1146	SIDE G-SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	<a href="#">BRC-108, "DTC Logic"</a>
C1164	CV 1	<a href="#">BRC-112, "DTC Logic"</a>
C1165	CV 2	
C1166	SV 1	<a href="#">BRC-114, "DTC Logic"</a>
C1167	SV 2	
C1176	STOP LAMP SW2	<a href="#">BRC-116, "DTC Logic"</a>
C118A	E-DRIVEN INTELLIGENT BRAKE SYSTEM	<a href="#">BRC-121, "DTC Logic"</a>
C118C	EV/HEV SYSTEM	<a href="#">BRC-123, "DTC Logic"</a>
U1000	CAN COMM CIRCUIT	<a href="#">BRC-125, "DTC Logic"</a>
U1010	CONTROL UNIT (CAN)	<a href="#">BRC-126, "DTC Logic"</a>
U110D	E-DRIVEN INTELLIGENT BRAKE COMM	<a href="#">BRC-127, "DTC Logic"</a>

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


## WIRING DIAGRAM

### BRAKE CONTROL SYSTEM

#### Wiring Diagram

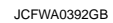
INFOID:000000007633536

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-12, "Connector Information"](#).



**[WITH VDC]**

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## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

#### Work Flow

INFOID:000000007633537

#### DETAILED FLOW

#### 1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [BRC-55, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

**CAUTION:**

**Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.**

>> GO TO 2.

#### 2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-47, "Fail-safe"](#).

**CAUTION:**

**When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.**

>> GO TO 3.

#### 3. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis.

Is any DTC detected?

YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 4.

NO >> GO TO 6.

#### 4. RECHECK SYMPTOM

 With CONSULT

1. Erase self-diagnostic results for “ABS”.
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Perform DTC confirmation procedures for the error-detected system.

**NOTE:**

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-49, "DTC Inspection Priority Chart"](#) [ABS actuator and electric unit (control unit)].

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-51, "Intermittent Incident"](#).

#### 5. REPAIR OR REPLACE ERROR-DETECTED PART

- Repair or replace error-detected parts.
- Reconnect part or connector after repairing or replacing.



# DIAGNOSIS AND REPAIR WORK FLOW

[WITH VDC]

## < BASIC INSPECTION >

- When DTC is detected, erase self-diagnostic result for "ABS".

### CAUTION:

- Turn the power switch OFF → ON → OFF after erase self-diagnosis result.
- Be sure to wait of 10 seconds after turning power switch OFF or ON.

>> GO TO 7.

## 6.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection.

Can the error-detected system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-51](#), "[Intermittent Incident](#)".

## 7.FINAL CHECK

With CONSULT

- Check the reference value for "ABS".
- 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:000000007633538

### 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

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Traction Motor		Mileage	km ( Mile)
Symptom		<input type="checkbox"/> Does not operate ( ) function			
		<input type="checkbox"/> Warning lamp for ( ) turns ON.			
		<input type="checkbox"/> Noise <input type="checkbox"/> Vibration			
		<input type="checkbox"/> Other ( )			
First occurrence		<input type="checkbox"/> Recently <input type="checkbox"/> Other ( )			
Frequency of occurrence		<input type="checkbox"/> Always <input type="checkbox"/> Under a certain conditions of <input type="checkbox"/> Sometimes ( time(s)/day)			
Climate con- ditions		<input type="checkbox"/> Irrelevant			
	Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloud <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Others ( )			
	Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Temperature [Approx. °C ( °F)]			
	Relative humidity	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low			
Road conditions		<input type="checkbox"/> Urban area <input type="checkbox"/> Suburb area <input type="checkbox"/> Highway <input type="checkbox"/> Mountainous road (uphill or downhill) <input type="checkbox"/> Rough road			
Operating condition, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> When steering wheel is steered (to right or to left)			



# DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH VDC]

## Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Traction Motor		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 ELECTRIC UNIT (CONTROL UNIT)

Description

INFOID:0000000007633539

When replaced the ABS actuator and electric unit (control unit), Perform steering angle sensor neutral position. Refer to [BRC-58. "Work Procedure"](#).

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- N
- O
- P

BRC



# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

### Description

INFOID:000000007633540

Always adjust the neutral position of steering angle sensor before driving when the following operation is performed.

×: Required —: Not required

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	×
Replacing steering components	×
Removing/installing suspension components	×
Replacing suspension components	×
Removing/installing tire	—
Replacing tire	—
Tire rotation	—
Adjusting wheel alignment.	×

### Work Procedure

INFOID:000000007633541

#### ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

##### **CAUTION:**

**Always use CONSULT when adjusting the neutral position of steering angle sensor. (It cannot be adjusted other than with CONSULT.)**

#### 1. CHECK THE VEHICLE STATUS (1)


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

Does the vehicle stay in the straight-ahead position?

YES >> GO TO 2.

NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle.

#### 2. ADJUST NEUTRAL POSITION OF STEERING ANGLE SENSOR

 With CONSULT

1. Turn the power switch ON.

##### **CAUTION:**

**Never set the vehicle to READY.**

2. Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in this order.

3. Select "START".

##### **CAUTION:**

**Never touch steering wheel while adjusting steering angle sensor.**

4. After approx. 10 seconds, select "END".


5. Turn power switch OFF, and then turn it ON again.

##### **CAUTION:**

**Be sure to perform the operation above.**

>> GO TO 3.

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

 With CONSULT

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved. Stop when it is pointing straight ahead.



# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

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 :  $0 \pm 2.5^\circ$**

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> GO TO 4.

## 4.CHECK STEERING COMPONENT PARTS

Check the installation conditions of steering component parts.

- With heated steering wheel: Refer to [ST-28. "Inspection"](#).
- Without heated steering wheel: Refer to [ST-50. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.  
NO >> Repair or replace error-detected parts. GO TO 5.

## 5.CHECK SUSPENSION COMPONENT PARTS

Check the installation conditions of suspension component parts.

- Front: Refer to [FSU-10. "Inspection"](#).
- Rear: Refer to [RSU-6. "Inspection"](#).

Is the inspection result normal?

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

## 6.CHECK WHEEL ALIGNMENT

Check the wheel alignment.

- Front: Refer to [FSU-11. "Inspection"](#).
- Rear: Refer to [RSU-7. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 7.  
NO >> Adjust the wheel alignment. GO TO 7.
  - Front: Refer to [FSU-11. "Adjustment"](#).
  - Rear: Refer to [RSU-7. "Inspection"](#).

## 7.CHECK THE VEHICLE STATUS (2)


Check the vehicle stay in the straight-ahead position.

- With heated steering wheel: Refer to [ST-13. "Inspection"](#).
- Without heated steering wheel: Refer to [ST-47. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 8.  
NO >> Adjust the vehicle stay in the straight-ahead position. GO TO 8.

## 8.CHECK DATA MONITOR (2)

 With CONSULT


1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved again. Stop when it is pointing straight ahead.
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 :  $0 \pm 2.5^\circ$**

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> GO TO 9.

## 9.CHECK DATA MONITOR (3)

 With CONSULT

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved.



# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

[WITH VDC]

## < BASIC INSPECTION >

### **CAUTION:**

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for 300 m (985 ft) or more.
  - Never use tester.
2. Stop when it is pointing straight ahead.
  3. 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 :  $0 \pm 2.5^\circ$**

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 1.

## 10. ERASE SELF-DIAGNOSIS MEMORY

 With CONSULT

1. Erase self-diagnosis result of "ABS".
2. Turn the power switch OFF → ON → OFF.

### **CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

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 >

[WITH VDC]

## DTC/CIRCUIT DIAGNOSIS

### C1101, C1102, C1103, C1104 WHEEL SENSOR

#### DTC Logic

INFOID:0000000007633542

#### 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.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• Wheel sensor</li><li>• ABS actuator and electric unit (control unit)</li></ul>
C1102	RR LH SENSOR-1	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	FR RH SENSOR-1	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	FR LH SENSOR-1	When an open circuit is detected in front LH wheel sensor circuit.	

#### DTC CONFIRMATION PROCEDURE

##### 1. PRECONDITIONING

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

>> GO TO 2.

##### 2. CHECK DTC DETECTION

④ With CONSULT

1. Set the vehicle to READY.
2. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
3. Stop the vehicle.
4. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

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

- YES >> Proceed to [BRC-61, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:0000000007633543

#### CAUTION:

Never check the between wheel sensor harness connector terminals.

##### 1. CHECK WHEEL SENSOR

1. Turn the power switch OFF.
2. Check the wheel sensor for damage.

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> GO TO 2.

##### 2. REPLACE WHEEL SENSOR (1)

④ With CONSULT

1. Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).



## C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

4. Set the vehicle to READY.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Turn the power switch OFF → ON.

**CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Set the vehicle to READY.**

8. Repeat step 7 two or more times.
9. 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 power switch OFF.
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

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

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

 With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Set the vehicle to READY.
4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
5. Stop the vehicle.
6. Turn the power switch OFF → ON.

**CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Set the vehicle to READY.**

7. Repeat step 6 two or more times.
8. 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 power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.

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

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

 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".



# C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

- Set the vehicle to READY.
- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Turn the power switch OFF → ON.

**CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Set the vehicle to READY.**

- Repeat step 8 two or more times.
- 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

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

Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	23	E22	(Front LH wheel	Existed
	21	E39	Front RH wheel	
	26	B101	Rear LH wheel	
	11	B102	Rear RH wheel	

Measurement connector and terminal for signal circuit


ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	27	E22	Front LH wheel	Existed
	12	E39	Front RH wheel	
	30	B101	Rear LH wheel	
	15	B102	Rear RH wheel	

Is the inspection result normal?

YES >> GO TO 9.

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

## 8. PERFORM SELF-DIAGNOSIS (3)

 With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the power switch OFF → ON → OFF.

**CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**



## C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

- Set the vehicle to READY.

9. Repeat step 8 two or more times.
10. Perform self-diagnosis for "ABS".

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

YES >> GO TO 9.

NO >> INSPECTION END

### 9. REPLACE WHEEL SENSOR (2)

Ⓟ With CONSULT

1. Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

#### **CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

4. Set the vehicle to READY.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Turn the power switch OFF → ON.

#### **CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

8. Repeat step 7 two or more times.
9. Perform self-diagnosis for "ABS".

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

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> INSPECTION END



# C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1105, C1106, C1107, C1108 WHEEL SENSOR

### DTC Logic

INFOID:000000007633544

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	<ul style="list-style-type: none"><li>When a short circuit is detected in rear RH wheel sensor circuit.</li><li>When power supply voltage of rear RH wheel sensor is in following state.<ul style="list-style-type: none"><li>Rear RH wheel sensor power supply voltage: 7.5 V <math>\geq</math> Rear RH wheel sensor power supply voltage</li><li>Rear RH wheel sensor power supply voltage: 16 V <math>\leq</math> Rear RH wheel sensor power supply voltage</li></ul></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>	<ul style="list-style-type: none"><li>Harness or connector</li><li>Wheel sensor</li><li>ABS actuator and electric unit (control unit)</li><li>Sensor rotor</li><li>Tire</li></ul>
C1106	RR LH SENSOR-2	<ul style="list-style-type: none"><li>When a short circuit is detected in rear LH wheel sensor circuit.</li><li>When power supply voltage of rear LH wheel sensor is in following state.<ul style="list-style-type: none"><li>Rear LH wheel sensor power supply voltage: 7.5 V <math>\geq</math> Rear LH wheel sensor power supply voltage</li><li>Rear LH wheel sensor power supply voltage: 16 V <math>\leq</math> Rear LH wheel sensor power supply voltage</li></ul></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>	
C1107	FR RH SENSOR-2	<ul style="list-style-type: none"><li>When a short circuit is detected in front RH wheel sensor circuit.</li><li>When power supply voltage of front RH wheel sensor is in following state.<ul style="list-style-type: none"><li>Front RH wheel sensor power supply voltage: 7.5 V <math>\geq</math> Front RH wheel sensor power supply voltage</li><li>Front RH wheel sensor power supply voltage: 16 V <math>\leq</math> Front RH wheel sensor power supply voltage</li></ul></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>	
C1108	FR LH SENSOR-2	<ul style="list-style-type: none"><li>When a short circuit is detected in front LH wheel sensor circuit.</li><li>When power supply voltage of front LH wheel sensor is in following state.<ul style="list-style-type: none"><li>Front LH wheel sensor power supply voltage: 7.5 V <math>\geq</math> Front LH wheel sensor power supply voltage</li><li>Front LH wheel sensor power supply voltage: 16 V <math>\leq</math> Front LH wheel sensor power supply voltage</li></ul></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 power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.



**2.CHECK DTC DETECTION**

 With CONSULT

1. Set the vehicle to READY.
2. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
3. Stop the vehicle.
4. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

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

- YES >> Proceed to [BRC-66, "Diagnosis Procedure"](#).  
 NO >> INSPECTION END

**Diagnosis Procedure**

INFOID:000000007633545

**CAUTION:**

**Never check the between wheel sensor harness connector terminals.**

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

Check the ABS actuator and electric unit (control unit) power supply system. Refer to [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

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


**2.CHECK TIRE**

1. Turn the power switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-50, "Tire Air Pressure"](#).

Is the inspection result normal?

- YES >> GO TO 5.  
 NO >> Adjust air pressure or replace tire and GO TO 3.

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

 With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Set the vehicle to READY.
4. Select "ABS" and "DATA MONITOR", check the "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 4.  
 NO >> GO TO 5.

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

 With CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.

**CAUTION:**



# C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

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

YES >> GO TO 5.

NO >> INSPECTION END

## 5.CHECK WHEEL SENSOR

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

### CAUTION:

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

- Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Exploded View"](#).
- Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

## 6.REPLACE WHEEL SENSOR (1)

ⓂWith CONSULT

1. Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.
4. Set the vehicle to READY.
5. Select "ABS" and "DATA MONITOR", check the "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 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. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. 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 power switch OFF.



## C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

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

#### Is the inspection result normal?

YES >> GO TO 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 power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
3. Set the vehicle to READY.
4. Select "ABS" and "DATA MONITOR", check the "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

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.  
**CAUTION:**
  - Be sure to wait of 10 seconds after turning power switch OFF or ON.
  - Set the vehicle to READY.
4. Repeat step 3 two or more times.
5. 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 power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

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

### 12.CHECK DATA MONITOR (3)

#### 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 power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
5. Set the vehicle to READY.
6. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".



# C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## NOTE:

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

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

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

YES >> GO TO 13.

NO >> GO TO 14.

## 13.PERFORM SELF-DIAGNOSIS (4)

### ⓂWith CONSULT

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

- Repeat step 3 two or more times.
- Perform self-diagnosis for "ABS".

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

YES >> GO TO 14.

NO >> INSPECTION END

## 14.CHECK WHEEL SENSOR HARNESS

- Turn the power switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Disconnect wheel sensor harness connector.
- check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	23, 27	Ground	Not existed
	21, 12		
	26, 30		
	11, 15		

Is the inspection result normal?

YES >> GO TO 15.

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

## 15.CHECK DATA MONITOR (4)

### ⓂWith CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the power switch OFF → ON → OFF.

### CAUTION:

Be sure to wait of 10 seconds after turning power switch OFF or ON.

- Set the vehicle to READY.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

## NOTE:

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

- 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?



## C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

- 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. Turn the power switch OFF → ON.

#### **CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

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

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

### 17.REPLACE WHEEL SENSOR (2)

#### With CONSULT

1. Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

#### **CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

4. Set the vehicle to READY.
5. Select "ABS" and "DATA MONITOR", check the "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. Turn the power switch OFF → ON.

#### **CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. 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 [BRC-150, "FRONT SENSOR ROTOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-150, "REAR SENSOR ROTOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.



## C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

4. Set the vehicle to READY.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Turn the power switch OFF → ON.

**CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

8. Repeat step 7 two or more times.
9. Perform self-diagnosis for "ABS".

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

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151. "Removal and Installation"](#).

NO >> INSPECTION END

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## C1109 POWER AND GROUND SYSTEM

## DTC Logic

INFOID:000000007633546

## DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1109	BATTERY VOLTAGE [ABNORMAL]	When power switch ON power supply voltage is in following state. <ul style="list-style-type: none"> <li>Power switch ON power supply voltage: <math>10\text{ V} \geq</math> Power switch ON power supply voltage.</li> <li>Power switch ON power supply voltage: <math>16\text{ V} \leq</math> Power switch ON power supply voltage.</li> </ul>	<ul style="list-style-type: none"> <li>Harness or connector</li> <li>ABS actuator and electric unit (control unit)</li> <li>Fuse</li> <li>Power switch ON power supply system</li> <li>12V battery</li> </ul>


## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1109" detected?

YES >> Proceed to [BRC-72, "Diagnosis Procedure"](#).

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633547

## 1. CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the 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

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> INSPECTION END

## 3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SWITCH ON POWER SUPPLY



# C1109 POWER AND GROUND SYSTEM

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	16	Ground	0 V

4. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	16	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) POWER SWITCH ON POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check the 10A fuse (#4).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (16) and 10A fuse (#4).

Is the inspection result normal?

YES >> Perform trouble diagnosis for power switch ON power supply. Refer to [PG-30. "Wiring Diagram - ON POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

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

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK TERMINAL

Check the 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 [BRC-151. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



# C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### DTC Logic

INFOID:000000007633548

#### DTC DETECTION LOGIC

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

#### DTC CONFIRMATION PROCEDURE

##### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

##### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1110" detected?

- YES >> Proceed to [BRC-74, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000007633549

##### 1.CHECK SELF-DIAGNOSIS RESULTS

Replace ABS actuator and electric unit (control unit) even if other display than "C1110" is displayed in self-diagnosis for "ABS".

>> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).



# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1111 ABS MOTOR, MOTOR RELAY SYSTEM

### DTC Logic

INFOID:000000007633550

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1111	PUMP MOTOR	When a malfunction is detected in motor or motor relay.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• ABS actuator and electric unit (control unit)</li><li>• Fusible link</li><li>• 12V battery power supply system</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
3. Stop the vehicle.
4. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

Is DTC "C1111" detected?

- YES >> Proceed to [BRC-75. "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633551

#### 1.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the 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

Ⓔ With CONSULT

1. Turn the power switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
3. Stop the vehicle.
4. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

Is DTC "C1111" detected?



# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

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

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	1	Ground	10 – 16 V

4. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	1	Ground	10 – 16 V

Is the inspection result normal?

- YES >> GO TO 6.  
NO >> GO TO 4.


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

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts. GO TO 5.

## 5.ERASE SELF-DIAGNOSIS RESULT (1)

 With CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Erase self-diagnosis result for "ABS".
4. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

>> INSPECTION END

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

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?



# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

## < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- YES >> GO TO 8.  
NO >> Repair or replace error-detected parts.GO TO 7.

### 7.ERASE SELF-DIAGNOSIS RESULT (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. Erase self-diagnosis result for "ABS".
4. Turn the power switch OFF → ON → OFF.

#### **CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

>> INSPECTION END

### 8.CHECK TERMINAL

1. Turn the power switch OFF.
2. Check the 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 [BRC-151. "Removal and Installation"](#).

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

### 9.ERASE SELF-DIAGNOSIS RESULT (3)

#### ⓂWith CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Erase self-diagnosis result for "ABS".
4. Turn the power switch OFF → ON → OFF.

#### **CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

>> INSPECTION END

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

### DTC Logic

INFOID:000000007633552

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G-SENSOR	When a malfunction is detected in decel G signal.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• Yaw rate/side/decel G sensor</li><li>• ABS actuator and electric unit (control unit)</li></ul>
C1145	YAW RATE SENSOR	<ul style="list-style-type: none"><li>• When a malfunction is detected in yaw rate signal.</li><li>• When a signal line of yaw rate/side/decel G sensor is open or shorted.</li><li>• When power supply voltage of yaw rate/side/decel G sensor is in following state.<ul style="list-style-type: none"><li>- Yaw rate/side/decel G sensor power supply voltage: <math>4.8\text{ V} \geq</math> yaw rate/side/decel G sensor power supply voltage</li><li>- Yaw rate/side/decel G sensor power supply voltage: <math>5.2\text{ V} \leq</math> yaw rate/side/decel G sensor power supply voltage</li></ul></li></ul>	
C1146	SIDE G-SEN CIRCUIT	When a malfunction is detected in side G signal.	

### DTC CONFIRMATION PROCEDURE

#### 1. PRECONDITIONING

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

>> GO TO 2.

#### 2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

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

YES >> Proceed to [BRC-78, "Diagnosis Procedure"](#).

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633553

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

Check the ABS actuator and electric unit (control unit) power supply system. Refer to [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2. CHECK CONNECTOR

1. Turn the power switch OFF.

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

3. Check the yaw rate/side/decel G 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 3.



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## 3.PERFORM SELF-DIAGNOSIS

④ With CONSULT

1. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

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

YES >> GO TO 4.

NO >> INSPECTION END

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

1. Turn power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect yaw rate/side/decel G sensor harness connector.
4. Check the continuity between yaw rate/side/decel G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	13	B38	4	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

## 5.CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	28	B38	2	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK YAW RATE/SIDE/DECEL G SENSOR SIGNAL CIRCUIT

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	14	B38	5	Existed
	29		6	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

## 7.CHECK YAW RATE/SIDE/DECEL G SENSOR CIRCUIT

Check the continuity between each terminals of yaw rate/side/decel G sensor harness connector.



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	
B38	2 - 4	Not existed
	2 - 5	
	2 - 6	
	4 - 5	
	4 - 6	
	5 - 6	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

## 8.CHECK YAW RATE/SIDE/DECEL G SENSOR (1)

④ With CONSULT

1. Connect yaw rate/side/decel G sensor harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

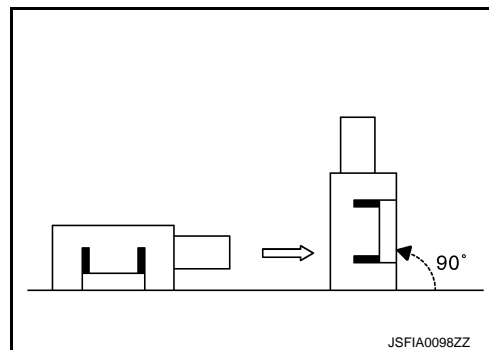
4. Select "ABS", "DATA MONITOR" and "DECEL G-SEN" in order.
5. Move yaw rate/side/decel G sensor as shown in the figure to check the output of before and after moving the sensor.

Condition	DATA MONITOR
Horizontal	Approx. 0 G
Vertical	Approx. +1 G

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace yaw rate/side/decel G sensor. Refer to [BRC-153. "Removal and Installation"](#).



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## 9.CHECK YAW RATE/SIDE/DECEL G SENSOR (2)

1. Turn the power switch OFF.
2. Connect following terminals between yaw rate/side/decel G sensor and harness connector (test harness).

Yaw rate/side/decel G sensor	Harness connector	
	Connector	Terminal
2	B38	2
4		4
5		5
6		6

3. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

4. Check the voltage between yaw rate/side/decel G sensor harness connector terminals.

**CAUTION:**

**Never short out the terminals while measuring voltages.**



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Yaw rate/side/decel G sensor		Voltage (Approx.)
connector	Terminal	
B38	5 - 2	2.5 - 4.5 V
	6 - 2	0.5 - 2.5 V

Is the inspection result normal?

YES >> Replace ABS actuator end electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Replace yaw rate/side/decel G sensor. Refer to [BRC-153, "Removal and Installation"](#).

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## C1115 WHEEL SENSOR

## DTC Logic

INFOID:000000007633554

## 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 style="list-style-type: none"> <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 power switch OFF and wait at least 10 seconds before conducting the next test.

&gt;&gt; GO TO 2.

## 2. CHECK DTC DETECTION

Ⓔ With CONSULT

1. Set the vehicle to READY.
2. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
3. Stop the vehicle.
4. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

- YES >> Proceed to [BRC-82, "Diagnosis Procedure"](#).  
 NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633555

**CAUTION:**

**Never check the between wheel sensor harness connector terminals.**

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

Check the ABS actuator and electric unit (control unit) power supply system. Refer to [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

## 2. CHECK TIRE

1. Turn the power switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-50, "Tire Air Pressure"](#).

Is the inspection result normal?

- YES >> GO TO 5.  
 NO >> Adjust air pressure or replace tire and GO TO 3.

## 3. CHECK DATA MONITOR (1)

Ⓔ With CONSULT

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



# C1115 WHEEL SENSOR

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

- Turn the power switch OFF → ON → OFF.

### CAUTION:

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

- Set the vehicle to READY.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

### NOTE:

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

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

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

YES >> GO TO 4.

NO >> GO TO 5.

## 4.PERFORM SELF-DIAGNOSIS (1)

### With CONSULT

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Turn the power switch OFF → ON.

### CAUTION:

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

- Repeat step 3 two or more times.
- Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 5.

NO >> INSPECTION END

## 5.CHECK WHEEL SENSOR

- Turn the power switch OFF.
- Check the wheel sensor for damage.
- Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

### CAUTION:

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

• **Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Exploded View"](#).**

• **Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Exploded View"](#).**

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

## 6.REPLACE WHEEL SENSOR (1)

### With CONSULT

- Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).
- Erase self-diagnosis result for "ABS".
- Turn the power switch OFF → ON → OFF.

### CAUTION:

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

- Set the vehicle to READY.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

### NOTE:

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

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



## C1115 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

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. Turn the power switch OFF → ON.

#### **CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 19.  
NO >> INSPECTION END

### 8.CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 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 power switch OFF → ON → OFF.

#### **CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.

3. Set the vehicle to READY.
4. Select "ABS" and "DATA MONITOR", check the "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

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.

#### **CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 11.  
NO >> INSPECTION END



## &lt; DTC/CIRCUIT DIAGNOSIS &gt;

**11.CHECK TERMINAL**

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

Is the inspection result normal?

YES >> GO TO 14.

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

**12.CHECK DATA MONITOR (3)**

 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 power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

5. Set the vehicle to READY.
6. Select "ABS" and "DATA MONITOR", check the "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 13.

NO >> GO TO 14.

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

 With CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.

**CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 14.

NO >> INSPECTION END

**14.CHECK WHEEL SENSOR HARNESS**

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



# C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	23	E22	Front LH wheel	2
	21	E39	Front RH wheel	
	26	B101	Rear LH wheel	
	11	B102	Rear RH wheel	

Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	27	E22	Front LH wheel	1
	12	E39	Front RH wheel	
	30	B101	Rear LH wheel	
	15	B102	Rear RH wheel	

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	23, 27	Ground	Not existed
	21, 12		
	26, 30		
	11, 15		

Is the inspection result normal?

YES >> GO TO 15.

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

## 15.CHECK DATA MONITOR (4)

⑧ 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 power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

5. Set the vehicle to READY.
6. Select "ABS" and "DATA MONITOR", check the "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)

⑧ With CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.



# C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 17.

NO >> INSPECTION END

## 17. REPLACE WHEEL SENSOR (2)

④ With CONSULT

1. Replace wheel sensor.
  - Front: Refer to [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-148, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

## CAUTION:

Be sure to wait of 10 seconds after turning power switch OFF or ON.

4. Set the vehicle to READY.
5. Select "ABS" and "DATA MONITOR", check the "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 difference 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)

④ With CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Turn the power switch OFF → ON.

## CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

## 19. REPLACE SENSOR ROTOR

④ With CONSULT

1. Replace sensor rotor.
  - Front: Refer to [BRC-150, "FRONT SENSOR ROTOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-150, "REAR SENSOR ROTOR : Removal and Installation"](#).
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

## CAUTION:

Be sure to wait of 10 seconds after turning power switch OFF or ON.

4. Set the vehicle to READY.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Turn the power switch OFF → ON.

## CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.



## C1115 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

---

- **Set the vehicle to READY.**

8. Repeat step 7 two or more times.
9. Perform self-diagnosis for "ABS".

#### Is DTC "C1115" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).
- NO >> INSPECTION END



# C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1116 STOP LAMP SWITCH

### DTC Logic

INFOID:000000007633556

### 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 style="list-style-type: none"><li>• Harness or connector</li><li>• Stop lamp switch</li><li>• ABS actuator and electric unit (control unit)</li><li>• 12V battery power supply system</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF, and wait 10 seconds or more.
2. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

3. Wait 1 minute or more.

**CAUTION:**

**Never depress brake pedal.**

4. Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.
5. Release brake pedal, and wait 1 minute or more.
6. Repeat step 4 to 5 ten or more times.
7. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

8. Repeat step 7 two or more times.
9. Perform self-diagnosis for "ABS".

Is DTC "C1116" detected?

- YES >> Proceed to [BRC-89, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633557

#### NOTE:

DTC "C1116" may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction.

#### 1.INTERVIEW FROM THE CUSTOMER

Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

- YES >> GO TO 2.  
NO >> GO TO 3.

#### 2.PERFORM SELF-DIAGNOSIS



# C1116 STOP LAMP SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

### Ⓢ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
3. Set the vehicle to READY.  
**CAUTION:**  
**Stop the vehicle.**
4. Depress the brake pedal several times.
5. Turn the power switch OFF → ON.  
**CAUTION:**
  - Be sure to wait of 10 seconds after turning power switch OFF or ON.
  - Set the vehicle to READY.
6. Repeat step 5 two or more times.
7. Perform self-diagnosis for "ABS".

#### Is DTC "C1116" detected?

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

## 3. STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

#### Does stop lamp turn ON?

- YES >> GO TO 5.  
NO >> Check the stop lamp system. Refer to [EXL-43. "Wiring Diagram"](#). GO TO 4.

## 4. CHECK DATA MONITOR (1)

### Ⓢ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
3. Set the vehicle to READY.  
**CAUTION:**  
**Stop the vehicle.**
4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45. "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45. "Reference Value"](#).

#### Is the inspection result normal?

- YES >> INSPECTION END  
NO >> GO TO 5.

## 5. CHECK STOP LAMP SWITCH CLEARANCE

1. Turn the power switch OFF.
2. Check the stop lamp switch clearance. Refer to [BR-239. "Inspection and Adjustment"](#).

#### Is the inspection result normal?

- YES >> GO TO 7.  
NO >> Adjust stop lamp switch clearance. Refer to [BR-239. "Inspection and Adjustment"](#). GO TO 6.

## 6. CHECK DATA MONITOR (2)

### Ⓢ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
3. Set the vehicle to READY.  
**CAUTION:**  
**Stop the vehicle.**



# C1116 STOP LAMP SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

## 7.CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to [BRC-93, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace stop lamp switch. Refer to [BR-248, "Removal and Installation"](#). GO TO 8.

## 8.CHECK DATA MONITOR (3)

 With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 9.

## 9.CHECK CONNECTOR AND TERMINAL


1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp switch harness connector.
6. Check the stop lamp switch harness connector for disconnection or looseness.
7. Check the stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts. GO TO 10.

## 10.CHECK DATA MONITOR (4)

 With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase self-diagnosis result for "ABS".
4. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

5. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
7. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).



# C1116 STOP LAMP SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 11.

### 11.CHECK STOP LAMP SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E35	8	Ground	Brake pedal depressed	10 – 16 V
			Brake pedal not depressed	0 V

4. Turn the power switch ON.
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E35	8	Ground	Brake pedal depressed	10 – 16 V
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

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

### 12.CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the power switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp switch harness connector.

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	8	E102	2	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	8	Ground	Not existed

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts. GO TO 13.

### 13.CHECK DATA MONITOR (5)

Ⓟ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Erase self-diagnosis result for "ABS".
3. Turn the power switch OFF → ON → OFF.

#### CAUTION:

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

4. Set the vehicle to READY.



# C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## CAUTION:

Stop the vehicle.

5. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
6. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

## Component Inspection

INFOID:000000007633558

### 1.CHECK STOP LAMP SWITCH

1. Turn the power switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check the continuity when stop lamp switch is operated.

Stop lamp switch	Condition	Continuity
Terminal		
1 – 2	When stop lamp switch is released (When brake pedal is depressed)	Existed
	When stop lamp switch is pressed (When brake pedal is released)	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-248, "Removal and Installation"](#).



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

### DTC Logic

INFOID:000000007633559

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1120	FR LH IN ABS SOL	When a malfunction is detected in front LH ABS IN valve.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• ABS actuator and electric unit (control unit)</li><li>• Fusible link</li><li>• 12V battery power supply system</li></ul>
C1122	FR RH IN ABS SOL	When a malfunction is detected in front RH ABS IN valve.	
C1124	RR LH IN ABS SOL	When a malfunction is detected in rear LH ABS IN valve.	
C1126	RR RH IN ABS SOL	When a malfunction is detected in rear RH ABS IN valve.	

#### DTC CONFIRMATION PROCEDURE

##### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

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

YES >> Proceed to [BRC-94, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000007633560

##### 1.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the 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

Ⓔ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

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

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



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## 3.CHECK ABS IN VALVE POWER SUPPLY

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	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 power switch OFF.
2. Check the 50A fusible link (#J).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

## 5.CHECK ABS IN VALVE GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK TERMINAL

Check the 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 [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

### DTC Logic

INFOID:000000007633561

#### DTC DETECTION LOGIC

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.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• ABS actuator and electric unit (control unit)</li><li>• Fusible link</li><li>• 12V battery power supply system</li></ul>
C1123	FR RH OUT ABS SOL	When a malfunction is detected in front RH ABS OUT valve.	
C1125	RR LH OUT ABS SOL	When a malfunction is detected in rear LH ABS OUT valve.	
C1127	RR RH OUT ABS SOL	When a malfunction is detected in rear RH ABS OUT valve.	

#### DTC CONFIRMATION PROCEDURE

##### 1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

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

YES >> Proceed to [BRC-96, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000007633562

##### 1. CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the 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

ⓘ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

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

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



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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## 3.CHECK ABS OUT VALVE POWER SUPPLY

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

## 4.CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check the 50A fusible link (#J).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

## 5.CHECK ABS OUT VALVE GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK TERMINAL

Check the 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 [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



# C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1140 ACTUATOR RELAY SYSTEM

### DTC Logic

INFOID:000000007633563

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1140	ACTUATOR RLY	When a malfunction is detected in actuator relay.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• ABS actuator and electric unit (control unit)</li><li>• Fusible link</li><li>• 12V battery power supply system</li></ul>

#### DTC CONFIRMATION PROCEDURE

##### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1140" detected?

YES >> Proceed to [BRC-98, "Diagnosis Procedure"](#).

NO >> INSPECTION END

#### Diagnosis Procedure

INFOID:000000007633564

##### 1.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the 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

Ⓔ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

##### 3.CHECK ACTUATOR RELAY POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.



# C1140 ACTUATOR RELAY SYSTEM

## < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

## 4.CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check the 50A fusible link (#J).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

## 5.CHECK ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK TERMINAL

Check the 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 [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



# C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1142 PRESS SENSOR

### DTC Logic

INFOID:000000007633565

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1142	PRESS SEN CIRCUIT	When a malfunction is detected in master cylinder pressure sensor2.	<ul style="list-style-type: none"><li>• Stop lamp switch system</li><li>• ABS actuator and electric unit (control unit)</li><li>• Master cylinder pressure sensor2</li></ul>


### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1142" detected?

YES >> Proceed to [BRC-100. "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633566


#### 1.CHECK CONNECTOR

1. Turn the power switch OFF
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
3. Check the master cylinder pressure sensor2 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 (1)

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1142" detected?

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

#### 3.CHECK MASTER CYLINDER PRESSURE SENSOR2 CIRCUIT

1. Turn the power switch OFF
2. Disconnect ABS actuator and electric unit (control unit) harness connector.



# C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

3. Disconnect master cylinder pressure sensor2 harness connector.
4. Check the continuity between master cylinder pressure sensor2 harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		Master cylinder pressure sensor2		Continuity
Connector	Terminal	Connector	Terminal	
E35	10	E32	1	Not existed
	10		2	Not existed
	10		3	Existed
	7		1	Not existed
	7		2	Existed
	7		3	Not existed
	32		1	Existed
	32		2	Not existed
	32		3	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

## 4.CHECK MASTER CYLINDER PRESSURE SENSOR2 POWER SUPPLY

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Turn the power switch ON.
- CAUTION:**  
**Never set the vehicle to READY.**
3. Check the voltage master cylinder pressure sensor2 harness connector terminals.

Master cylinder pressure sensor2		Voltage (Approx.)
Connector	Terminal	
E32	1 – 2	5 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151. "Removal and Installation"](#).

## 5.CHECK DATA MONITOR

④ With CONSULT

1. Turn the power switch OFF.
2. Connect master cylinder pressure sensor2 harness connector.
3. "ABS", "DATA MONITOR" and "PRESSURE SENSOR" according to this order.
4. Check that the indication changes with the depth of pedal depression. Refer to [BRC-45. "Reference Value"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 7.

## 6.PERFORM SELF-DIAGNOSIS (2)

④ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1142" detected?



## C1142 PRESS SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).
- NO >> INSPECTION END

### 7. CHECK MASTER CYLINDER PRESSURE SENSOR2

1. Turn the power switch OFF.
2. Connect following terminals between master cylinder pressure sensor2 and harness connector (test harness).

Master cylinder pressure sensor2	Harness connector	
	Connector	Terminal
1	E32	1
2		2
3		3

3. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
4. Check that the voltage between master cylinder pressure sensor2 harness connectors changes with the depth of pedal depression.  
**CAUTION:**  
**Never short out the terminals while measuring voltages.**

Master cylinder pressure sensor2		Voltage (Approx.)
Connector	Terminal	
E32	1 – 2	0.5 – 4.5 V

#### Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).
- NO >> Replace master cylinder pressure sensor2. Refer to [BR-258, "Removal and installation"](#).



# C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1143 STEERING ANGLE SENSOR

### DTC Logic

INFOID:000000007633567

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1143	ST ANG SEN CIRCUIT	When a malfunction is detected in steering angle sensor.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• Steering angle sensor</li><li>• ABS actuator and electric unit (control unit)</li><li>• Fuse</li><li>• Power switch ON power supply system</li><li>• CAN communication line</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1. PRECONDITIONING

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

>> GO TO 2.

#### 2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

Is DTC "C1143" detected?

YES >> Proceed to [BRC-103. "Diagnosis Procedure"](#).

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633568

#### 1. CHECK CONNECTOR

1. Turn the power switch OFF.

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

3. Check the steering angle sensor 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

④ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

Is DTC "C1143" detected?

YES >> GO TO 3.

NO >> INSPECTION END



# C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## 3.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect steering angle sensor harness connector.
3. Check the voltage between steering angle sensor harness connector and ground.

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

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M30	4	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

## 4.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check the 10A fuse (#4).
3. Check the continuity and short circuit between steering angle sensor harness connector terminal (4) and 10A fuse (#4).

Is the inspection result normal?

YES >> Perform trouble diagnosis for power switch ON power supply. Refer to [PG-30, "Wiring Diagram - ON POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

## 5.CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

1. Turn the power switch OFF.
2. Check the continuity between steering angle sensor harness connector and ground.

Steering angle sensor		—	Continuity
Connector	Terminal		
M30	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

## 6.CHECK TERMINAL

Check the steering angle 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.

## 7.CHECK CAN COMMUNICATION LINE

Check the "STRG BRANCH LINE CIRCUIT". Refer to [LAN-59, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts. Refer to [LAN-25, "Precautions for Harness Repair"](#).



## C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

### 8. CHECK DATA MONITOR

④ With CONSULT

1. "ABS", "DATA MONITOR" and "STR ANGLE SIG" according to this order.
2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to [BRC-45. "Reference Value"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151. "Removal and Installation"](#).

NO >> Replace steering angle sensor. Refer to [BRC-154. "Removal and Installation"](#).

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# C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

### DTC Logic

INFOID:000000007633569

### DTC DETECTION 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 style="list-style-type: none"><li>• Harness or connector</li><li>• Steering angle sensor</li><li>• ABS actuator and electric unit (control unit)</li><li>• Incomplete neutral position adjustment of steering angle sensor</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

##### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1144" detected?

YES >> Proceed to [BRC-106. "Diagnosis Procedure"](#).

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633570

#### 1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-58. "Work Procedure"](#).

>> GO TO 2.

#### 2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Ⓔ With CONSULT

1. Turn the power switch OFF → ON.

##### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> INSPECTION END

#### 3.CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the power switch OFF.
2. Check the steering angle sensor system. Refer to [BRC-103. "Diagnosis Procedure"](#).

Is the inspection result normal?



C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151. "Removal and Installation"](#).
- NO >> Repair or replace error-detected parts.

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# C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1155 BRAKE FLUID LEVEL SWITCH

### DTC Logic

INFOID:000000007633571

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1155	BR FLUID LEVEL LOW	<ul style="list-style-type: none"><li>When brake fluid level low signal is detected.</li><li>When an open circuit is detected in brake fluid level switch circuit.</li></ul>	<ul style="list-style-type: none"><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 CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

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

>> GO TO 2.

#### 2.CHECK DTC DETECTION

④With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> Proceed to [BRC-108. "Diagnosis Procedure"](#).

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633572

#### 1.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect brake fluid level switch harness connector.

Is the inspection result normal?

YES >> GO TO 3.

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

#### 2.PERFORM SELF-DIAGNOSIS (1)

④With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> INSPECTION END

#### 3.CHECK BRAKE FLUID LEVEL

1. Turn the power switch OFF.
2. Check the brake fluid level. Refer to [BR-241. "Inspection"](#).



# C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 5.

NO >> Refill brake fluid. Refer to [BR-241, "Refilling"](#). GO TO 4.

### 4.PERFORM SELF-DIAGNOSIS (2)

Ⓐ With CONSULT

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

2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Turn the power switch OFF → ON.

**CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

4. Repeat step 3 two or more times.

5. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> INSPECTION END

### 5.CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluids level switch. Refer to [BRC-110, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace reservoir tank. Refer to [BR-258, "Removal and installation"](#). GO TO 6.

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

Ⓑ With CONSULT

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

2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Turn the power switch OFF → ON.

**CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

4. Repeat step 3 two or more times.

5. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> INSPECTION END

### 7.CHECK CONNECTOR AND TERMINAL

1. Turn the power switch OFF.

2. Disconnect combination meter harness connector.

3. Check the combination meter harness connector for disconnection or looseness.

4. Check the combination meter pin terminals for damage or loose connection with harness connector.

5. Disconnect brake fluid level switch harness connector.

6. Check the brake fluid level switch harness connector for disconnection or looseness.

7. Check the brake fluid level switch 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. GO TO 8.

### 8.PERFORM SELF-DIAGNOSIS (4)

Ⓒ With CONSULT

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

2. Turn the power switch OFF → ON → OFF.

**CAUTION:**



# C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Turn the power switch OFF → ON.

### **CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Set the vehicle to READY.**

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 9.

NO >> INSPECTION END

## 9.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

1. Turn the power switch OFF.
2. Disconnect brake fluid level switch harness connector.
3. Disconnect combination meter harness connector.
4. Check the continuity between brake fluid level switch harness connector and combination meter harness connector.

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E37	1	M34	25	Existed

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

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

Is the inspection result normal?

YES >> GO TO 10.

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

## 10.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts. GO TO 11.

## 11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-51, "CONSULT Function"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace combination meter. Refer to [MWI-96, "Removal and Installation"](#).

## Component Inspection

INFOID:0000000007633573

## 1.CHECK BRAKE FLUID LEVEL SWITCH

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



## C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to [BR-258. "Removal and installation"](#).

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## C1164, C1165 CV SYSTEM

## DTC Logic

INFOID:000000007633574

## DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1164	CV 1	When a malfunction is detected in cut valve 1.	<ul style="list-style-type: none"> <li>• Harness or connector</li> <li>• ABS actuator and electric unit (control unit)</li> <li>• Fusible link</li> <li>• 12V battery power supply system</li> </ul>
C1165	CV 2	When a malfunction is detected in cut valve 2.	


## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

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

&gt;&gt; GO TO 2.

## 2. CHECK DTC DETECTION

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1164" or "C1165" detected?

YES >> Proceed to [BRC-112, "Diagnosis Procedure"](#).

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633575

## 1. CHECK CONNECTOR


1. Turn the power switch OFF.
2. Check the 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 (1)

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is any "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> INSPECTION END

## 3. CHECK CUT VALVE POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.



## C1164, C1165 CV SYSTEM

### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

### 4.CHECK CUT VALVE POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.  
2. Check the 50A fusible link (#J).  
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

### 5.CHECK CUT VALVE GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

### 6.CHECK TERMINAL

Check the 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 [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



## C1166, C1167 SV SYSTEM

## DTC Logic

INFOID:000000007633576

## DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1166	SV 1	When a malfunction is detected in suction valve 1.	<ul style="list-style-type: none"> <li>• Harness or connector</li> <li>• ABS actuator and electric unit (control unit)</li> <li>• Fusible link</li> <li>• 12V battery power supply system</li> </ul>
C1167	SV 2	When a malfunction is detected in suction valve 2.	

## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

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

&gt;&gt; GO TO 2.

## 2. CHECK DTC DETECTION

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C1166" or "C1167" detected?

YES >> Proceed to [BRC-114. "Diagnosis Procedure"](#).

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633577

## 1. CHECK CONNECTOR


1. Turn the power switch OFF.
2. Check the 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 (1)

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is any "C1166" or "C1167" detected?

YES >> GO TO 3.

NO >> INSPECTION END

## 3. CHECK SUCTION VALVE POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.



## C1166, C1167 SV SYSTEM

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

4. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

### 4.CHECK SUCTION VALVE POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.  
2. Check the 50A fusible link (#J).  
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

### 5.CHECK SUCTION VALVE GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

### 6.CHECK TERMINAL

Check the 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 [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



## C1176 STOP LAMP SW2

## DTC Logic

INFOID:000000007633578

## DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1176	STOP LAMP SW2	When ASCD brake switch signal is not input when brake pedal operates.	<ul style="list-style-type: none"> <li>• Harness or connector</li> <li>• ASCD brake switch</li> <li>• ABS actuator and electric unit (control unit)</li> <li>• Power switch ON power supply system</li> </ul>

## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF, and wait 10 seconds or more.
2. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

3. Depress the brake pedal several time.
4. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

5. Repeat step 4 two or more times.
6. Perform self-diagnosis for "ABS".

Is DTC "C1176" detected?

- YES >> Proceed to [BRC-116. "Diagnosis Procedure"](#).  
 NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633579

**NOTE:**

DTC "C1176" may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction.

## 1. INTERVIEW FROM THE CUSTOMER

Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

- YES >> GO TO 2.  
 NO >> GO TO 3.

## 2. CHECK CONNECTOR

1. Turn the power switch OFF.
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

- YES >> GO TO 4.  
 NO >> Repair or replace error-detected parts. GO TO 3.



## &lt; DTC/CIRCUIT DIAGNOSIS &gt;

**3.PERFORM SELF-DIAGNOSIS**

④ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

4. Depress the brake pedal several times.
5. Turn the power switch OFF → ON.

**CAUTION:**

• **Be sure to wait of 10 seconds after turning power switch OFF or ON.**

• **Set the vehicle to READY.**

6. Repeat step 5 two or more times.
7. Perform self-diagnosis for "ABS".

Is DTC "C1176" detected?

YES >> GO TO 4.

NO >> INSPECTION END

**4.CHECK ASCD BRAKE SWITCH CLEARANCE**

1. Turn the power switch OFF.
2. Check the ASCD brake switch clearance. Refer to [BR-239, "Inspection and Adjustment"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust ASCD brake switch clearance. Refer to [BR-239, "Inspection and Adjustment"](#). GO TO 5.

**5.CHECK DATA MONITOR (1)**

④ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON → OFF.

**CAUTION:**

**Be sure to wait of 10 seconds after turning power switch OFF or ON.**

3. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

**6.CHECK ASCD BRAKE SWITCH**

Check the ASCD brake switch. Refer to [BRC-119, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace ASCD brake switch. Refer to [BR-248, "Removal and Installation"](#). GO TO 7.

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

④ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF, and wait 10 seconds or more.
3. Set the vehicle to READY.

**CAUTION:**

**Stop the vehicle.**



## C1176 STOP LAMP SW2

### < DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

### 8.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 10.

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

### 9.CHECK DATA MONITOR (3)

ⒺWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect ASCD brake switch harness connector.
3. Erase self-diagnosis result for "ABS".
4. Turn the power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
5. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
7. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 10.

### 10.CHECK ASCD BRAKE SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E35	6	Ground	Brake pedal depressed	0 V
			Brake pedal not depressed	0 V

4. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.



# C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E35	6	Ground	Brake pedal depressed	0 V
			Brake pedal not depressed	10 – 16 V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts. GO TO 11.

## 11.CHECK ASCD BRAKE SWITCH CIRCUIT (2)

- Turn the power switch OFF.
- Disconnect ASCD brake switch harness connector.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and ASCD brake switch harness connector.

ABS actuator and electric unit (control unit)		ASCD brake switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	6	E112	2	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	6	Ground	Not existed

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

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

## 12.CHECK DATA MONITOR (4)

Ⓜ With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect ASCD brake switch harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the power switch OFF → ON → OFF.  
**CAUTION:**  
**Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- Set the vehicle to READY.  
**CAUTION:**  
**Stop the vehicle.**
- Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-45, "Reference Value"](#).
- Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-45, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

## Component Inspection

INFOID:000000007633580

## 1.CHECK ASCD BRAKE SWITCH

- Turn the power switch OFF.
- Disconnect ASCD brake switch harness connector.



## C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

3. Check the continuity between ASCD brake switch harness connector terminals.

ASCD brake switch	Condition	Continuity
Terminal		
1 – 2	When ASCD brake switch is release. (When brake pedal is slightly depressed.)	Not existed
	When ASCD brake switch is pressed. (When brake pedal is fully released.)	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD brake switch. Refer to [BR-248. "Removal and Installation"](#).



# C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

### DTC Logic

INFOID:000000007633581

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C118A	E-DRIVEN INTELLIGENT BRAKE SYSTEM	When a malfunction is detected in electrically-driven intelligent brake system.	<ul style="list-style-type: none"><li>Electrically-driven intelligent brake unit</li><li>ABS actuator and electric unit (control unit)</li><li>CAN communication line</li></ul>

### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn power 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 power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C118A" detected?

- YES >> Proceed to [BRC-121. "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633582

#### 1.CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM (1)

Ⓔ With CONSULT

Perform self-diagnosis for "BRAKE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BR-27. "DTC Index"](#).  
NO >> GO TO 2.

#### 2.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Get out of the vehicle, close all doors (including back door), and wait for 3 minutes or more.
3. Disconnect ABS actuator and electric unit (control unit) harness connector.
4. Disconnect electrically-driven intelligent brake unit harness.
5. Check the 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 3.

#### 3.CHECK SELF-DIAGNOSIS (1)

Ⓔ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect electrically-driven intelligent brake unit harness.
3. Turn the power switch OFF → ON.

#### CAUTION:



# C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C118A" detected?

YES >> GO TO 4.

NO >> INSPECTION END

## 4.CHECK CAN COMMUNICATION

Check the CAN communication line. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

>> GO TO 5.

## 5.CHECK SELF-DIAGNOSIS (2)

 With CONSULT

1. Turn the power switch OFF.
2. Get out of the vehicle, close all doors (including back door), and wait for 3 minutes or more.
3. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

4. Repeat step 3 two or more times.
5. Perform self-diagnosis for "ABS".

Is DTC "C118A" detected?

YES >> GO TO 6.

NO >> INSPECTION END

## 6.CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM (2)

 With CONSULT


Perform self-diagnosis for "BRAKE".

Is any DTC detected?

YES >> Check the DTC. Refer to [BR-27, "DTC Index"](#).

NO >> GO TO 7.

## 7.CHECK SELF-DIAGNOSIS (3)

 With CONSULT

1. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C118A" detected?

YES >> GO TO 4.

NO >> INSPECTION END



## C118C EV SYSTEM

## DTC Logic

INFOID:000000007633583

## DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C118C	EV/HEV SYSTEM	When a malfunction is detected in VCM system.	<ul style="list-style-type: none"> <li>• VCM</li> <li>• ABS actuator and electric unit (control unit)</li> <li>• CAN communication line</li> </ul>

## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

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

&gt;&gt; GO TO 2.

## 2. CHECK DTC DETECTION

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "C118C" detected?

- YES >> Proceed to [BRC-123, "Diagnosis Procedure"](#).  
 NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633584

## 1. CHECK VCM SYSTEM

 With CONSULT

Perform self-diagnosis for "EV/HEV". Refer to [EVC-55, "CONSULT Function"](#).

Is any DTC detected?


- YES >> Check the DTC. Refer to [EVC-84, "DTC Index"](#).  
 NO >> GO TO 2.

## 2. CHECK CAN COMMUNICATION

Check the CAN communication line. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).

&gt;&gt; GO TO 3.

## 3. CHECK SELF-DIAGNOSIS

 With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

3. Repeat step 2 two or more times.
4. Perform self-diagnosis for "ABS".

Is DTC "C118C" or "U1000" detected?

- YES ("C118C") >> GO TO 1.



## C118C EV SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

---

YES ("U1000")>>Refer to [BRC-125. "Diagnosis Procedure"](#).

NO >> INSPECTION END



## U1000 CAN COMM CIRCUIT

## Description

INFOID:000000007633585

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:000000007633586

## 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 malfunction

BRC


## DTC CONFIRMATION PROCEDURE

## 1. PRECONDITIONING

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

&gt;&gt; GO TO 2.

## 2. CHECK DTC DETECTION

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "U1000" detected?

- YES >> Proceed to [BRC-125, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:000000007633587

Proceed to [LAN-15, "Trouble Diagnosis Flow Chart"](#).



## U1010 CONTROL UNIT (CAN)

### Description

INFOID:000000007633588

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:000000007633589

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible causes
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of 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 power 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 power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "U1010" detected?

YES >> Proceed to [BRC-126, "Diagnosis Procedure"](#).

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633590

#### 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check the ABS actuator and electric unit (control unit) harness connector for disconnection and deformation.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



# U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

### Description

INFOID:000000007633591

ABS actuator and electric unit (control unit) and electrically-driven intelligent brake unit transmit/receive information to/from each other for optimum control of the ABS actuator and electric unit (control unit) with the specified brake communication line.

### DTC Logic

INFOID:000000007633592

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U110D	E-DRIVEN INTELLIGENT BRAKE COMM	When ABS actuator and electric unit (control unit) is not transmitting or receiving brake communication signal for 4 seconds or more.	<ul style="list-style-type: none"><li>ABS actuator and electric unit (control unit)</li><li>Brake communication line*</li><li>Electrically-driven intelligent brake unit</li></ul>

\*:Brake communication line between ABS actuator and electric unit (control unit) and electrically-driven intelligent brake unit.

### DTC CONFIRMATION PROCEDURE

#### 1.PRECONDITIONING

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

>> GO TO 2.

#### 2.CHECK DTC DETECTION

④ With CONSULT

1. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "U110D" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-127, "Diagnosis Procedure"](#).  
NO >> INSPECTION END

### Diagnosis Procedure

INFOID:000000007633593

#### 1.CHECK CONNECTOR

1. Turn the power switch OFF.
2. Get out of the vehicle and close all doors (including back door).
3. Disconnect 12V battery cable from negative terminal. Refer to [BRC-5, "Precautions for Removing Battery Terminal"](#)
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Disconnect electrically-driven intelligent brake unit harness.
6. Check the connector for disconnection or looseness.

Is the inspection result normal?

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

#### 2.CHECK BRAKE COMMUNICATION LINE

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and electrically-driven intelligent brake unit harness connector.



# U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and electric unit (control unit)		Electrically-driven intelligent brake unit		Continuity
Connector	Terminal	Connector	Terminal	
E35	20	E34	24	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	20	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors. Refer to [BRC-8, "Precaution for Harness Repair"](#). GO TO 3.

## 3.PERFORM SELF-DIAGNOSIS (1)

ⓘ With CONSULT

1. Turn the power switch OFF.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Connect electrically-driven intelligent brake unit harness.
4. Get out of the vehicle, close all doors (including back door), and wait for 3 minutes or more.
5. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

6. Repeat step 5 two or more times.
7. Perform self-diagnosis for "ABS".

Is DTC "C118A", "U1000" or "U110D" detected?

YES ("C118A")>>Refer to [BRC-121, "Diagnosis Procedure"](#).

YES ("U1000")>>Refer to [BRC-125, "Diagnosis Procedure"](#).

YES ("U110D")>>GO TO 4.

NO >> INSPECTION END

## 4.CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

ⓘ With CONSULT

Perform self-diagnosis for "BRAKE".

Is any DTC detected?

YES >> Check the DTC. Refer to [BR-27, "DTC Index"](#).

NO >> GO TO 5.

## 5.PERFORM SELF-DIAGNOSIS (2)

ⓘ With CONSULT

1. Turn the power switch OFF → ON.

### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is DTC "U110D" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> INSPECTION END



# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## POWER SUPPLY AND GROUND CIRCUIT

### Diagnosis Procedure

INFOID:000000007633594

#### 1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SWITCH ON POWER SUPPLY (1)

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	16	Ground	0 V

4. Turn the power switch ON  
**CAUTION:**  
**Never set the vehicle to READY.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	16	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) POWER SWITCH ON POWER SUPPLY (2)

1. Turn the power switch OFF.
2. Check the 10A fuse (#4).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (16) and 10A fuse (#4).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for power switch ON power supply. Refer to [PG-30. "Wiring Diagram - ON POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

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

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	1	Ground	10 – 16 V

3. Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	1	Ground	10 – 16 V

Is the inspection result normal?

- YES >> GO TO 5.



## POWER SUPPLY AND GROUND CIRCUIT

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 4.

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

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

### 5.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

3. Turn the power switch ON

**CAUTION:**

**Never set the vehicle to READY.**

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

### 6.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check the 50A fusible link (#J).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#J).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to [PG-16, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

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

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Existed
	4		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

### 8.CHECK TERMINAL

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



POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace error-detected parts.

A  
B  
C  
D  
E  
BRC  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P



# VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## VDC OFF SWITCH

### Component Function Check

INFOID:0000000007633595

#### 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 [BRC-132. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:0000000007633596

#### 1.CHECK VDC OFF SWITCH CIRCUIT

1. Turn the power switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect VDC OFF switch harness connector.
4. Check the 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	
E35	5	M28	1	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	5	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2.CHECK VDC OFF SWITCH GROUND CIRCUIT

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

VDC OFF switch		—	Continuity
Connector	Terminal		
M28	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

#### 3.CHECK VDC OFF SWITCH


Check the VDC OFF switch. Refer to [BRC-133. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace VDC OFF switch. Refer to [BRC-155. "Removal and Installation"](#).

#### 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 the VDC OFF switch signal.



# VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Condition	DATA MONITOR
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 OFF indicator lamp in combination meter is in OFF status	Off

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

## 5.CHECK TERMINAL

- Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Check the VDC OFF switch 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 [BRC-151. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:0000000007633597

## 1.CHECK VDC OFF SWITCH

1. Turn the power switch OFF.
2. Disconnect triple switch harness connector.
3. Check the continuity between terminals of VDC OFF switch connector.

VDC OFF switch	Condition	Continuity
Terminal		
1 – 2	When VDC OFF switch is pressed	Existed
	When VDC OFF switch is not pressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch. Refer to [BRC-155, "Removal and Installation"](#).



&lt; DTC/CIRCUIT DIAGNOSIS &gt;

## ABS WARNING LAMP

### Component Function Check

INFOID:000000007633598

#### 1. CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp in combination meter turns ON for several seconds after power switch is turned ON.

**CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

- YES >> INSPECTION END  
 NO >> Proceed to [BRC-134, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000007633599

#### 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 [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

#### 2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).  
 NO >> GO TO 3.

#### 3. CHECK ABS WARNING LAMP SIGNAL

 With CONSULT

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

**CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

- YES >> Check the combination meter. Refer to [MWI-51, "CONSULT Function"](#).  
 NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).



## BRAKE WARNING LAMP

## Component Function Check

INFOID:000000007633600

## 1. CHECK BRAKE WARNING LAMP FUNCTION (1)

Check that brake warning lamp in combination meter turns ON for several seconds after power switch is turned ON.

**CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [BRC-135, "Diagnosis Procedure"](#).

## 2. CHECK BRAKE WARNING LAMP FUNCTION (2)

Check that brake warning lamp in combination meter turns ON/OFF when brake fluid level switch is operated while brake fluid level in reservoir tank is with the specified level.

**NOTE:**

Brake warning lamp turns ON when brake fluid is less than the specified level (when brake fluid level switch is ON).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the brake fluid level switch system. Refer to [BRC-108, "Diagnosis Procedure"](#).

## Diagnosis Procedure

INFOID:000000007633601

## 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 [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

## 2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).

NO >> GO TO 3.

## 3. CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-51, "CONSULT Function"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

NO >> Repair or replace combination meter. Refer to [MWI-96, "Removal and Installation"](#).



## VDC WARNING LAMP

## Component Function Check

INFOID:000000007633602

## 1. CHECK VDC WARNING LAMP FUNCTION

Check that VDC warning lamp in combination meter turns ON for several seconds after power switch is turned ON.

**CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to [BRC-136, "Diagnosis Procedure"](#).

## Diagnosis Procedure

INFOID:000000007633603

## 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 [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

## 2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).

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 power switch OFF.

3. Check that data monitor displays "On" for approx. several seconds after power switch is turned ON, and then changes to "Off".

**CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

YES >> Check the combination meter. Refer to [MWI-51, "CONSULT Function"](#).

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).



# VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## VDC OFF INDICATOR LAMP

### Component Function Check

INFOID:000000007633604

#### 1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp in combination meter turns ON for several seconds after power switch is turned ON.

#### **CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-137, "Diagnosis Procedure"](#).

#### 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 operated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the VDC OFF switch system. Refer to [BRC-132, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000007633605

#### 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 [BRC-129, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)

Ⓐ With CONSULT

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

2. Turn the power switch OFF.

3. Check that data monitor displays "On" for several seconds after power switch is turned ON, and then changes to "Off".

#### **CAUTION:**

**Never set the vehicle to READY.**

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).

#### 3.CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

Ⓐ With CONSULT

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

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

Is the inspection result normal?

YES >> Check the combination meter. Refer to [MWI-51, "CONSULT Function"](#).

NO >> Check the VDC OFF switch system. Refer to [BRC-132, "Diagnosis Procedure"](#).



## SYMPTOM DIAGNOSIS

## EXCESSIVE OPERATION FREQUENCY

## Description

INFOID:000000007633606

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

## Diagnosis Procedure

INFOID:000000007633607

## 1. CHECK BRAKING FORCE

Check the brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check the brake system.

## 2. CHECK AXLE

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

- Front axle: Refer to [FAX-8, "Inspection"](#).

- Rear axle: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

## 3. CHECK WHEEL SENSOR

Check the wheel sensor.

- Check the installation and damage of wheel sensor.
- Check the connection of wheel sensor harness connector.
- Check the 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 [BRC-147, "FRONT WHEEL SENSOR : Removal and Installation"](#).

- Rear wheel sensor: Refer to [BRC-148, "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-150, "FRONT SENSOR ROTOR : Removal and Installation"](#).

- Rear sensor rotor: Refer to [BRC-150, "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. 1 second after power switch is turned ON and stay in OFF status during driving.

**CAUTION:**


**Brake warning lamp turns ON when brake fluid is less than the specified level (brake fluid level switch is ON).**

Is the inspection result normal?

YES >> Normal

NO >> GO TO 6.

## 6. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**



## EXCESSIVE OPERATION FREQUENCY

[WITH VDC]

### < SYMPTOM DIAGNOSIS >

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

#### Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).

NO >> INSPECTION END

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# UNEXPECTED BRAKE PEDAL REACTION

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## UNEXPECTED BRAKE PEDAL REACTION

### Description

INFOID:000000007633608

A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed.

### Diagnosis Procedure

INFOID:000000007633609

#### 1.CHECK FRONT AXLE AND REAR AXLE

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

- Front axle: Refer to [FAX-8, "Inspection"](#).
- Rear axle: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

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

#### 2.CHECK DISC ROTOR

Check the disc rotor runout.

- Front: Refer to [BR-244, "DISC ROTOR : Inspection and Adjustment"](#).
- Rear: Refer to [BR-246, "DISC ROTOR : Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Refinish disc rotor.
  - Front: Refer to [BR-244, "DISC ROTOR : Inspection and Adjustment"](#).
  - Rear: Refer to [BR-246, "DISC ROTOR : Inspection and Adjustment"](#).

#### 3.CHECK BRAKE FLUID LEAKAGE

Check the brake fluid leakage.

- Front: Refer to [BR-254, "FRONT : Inspection"](#).
- Rear: Refer to [BR-257, "REAR : Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace error-detected parts.

#### 4.CHECK BRAKE PEDAL

Check the each item of brake pedal. Refer to [BR-239, "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Adjust each item of brake pedal. Refer to [BR-239, "Inspection and Adjustment"](#).

#### 5.CHECK BRAKING FORCE

Check the brake force using a brake tester.

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Check the each components of brake system.

#### 6.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

- YES >> Normal
- NO >> Check the each components of brake system.



# THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## THE BRAKING DISTANCE IS LONG

### Description

INFOID:000000007633610

Brake stopping distance is long when ABS function is operated.

### Diagnosis Procedure

INFOID:000000007633611

#### 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 the brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check the 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 the brake stopping distance in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal

NO >> Check the each components of brake system.

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# DOES NOT OPERATE

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## DOES NOT OPERATE

### Description

INFOID:000000007633612

VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function and brake assist function does not operate.

### Diagnosis Procedure

INFOID:000000007633613

#### CAUTION:

- VDC function, TCS function, ABS function, EBD function and brake assist 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. 1 second after power switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp and stay in OFF status during driving.

#### CAUTION:

Brake warning lamp turns ON when brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

- YES >> Normal  
NO >> GO TO 2.

#### 2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
  - Set the vehicle to READY.
2. Repeat step 1 two or more times.
  3. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).  
NO >> INSPECTION END



# BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

### Description

INFOID:000000007633614

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the traction motor 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 READY status [at approx. 10 km/h (6.2 MPH) or higher]

### Diagnosis Procedure

INFOID:000000007633615

#### 1. SYMPTOM CHECK 1

Check that there are pedal vibrations when the vehicle to READY.

Do vibrations occur?

YES >> GO TO 2.

NO >> Check brake pedal. Refer to [BR-239, "Inspection and Adjustment"](#).

#### 2. SYMPTOM CHECK 2

Check that motor noise from ABS actuator and electric unit (control unit) occurs when the vehicle to READY.

Does the operation sound occur?

YES >> GO TO 3.

NO >> GO TO 4.

#### 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 >> GO TO 4.

#### 4. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

#### CAUTION:

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).

NO >> INSPECTION END



## VEHICLE JERKS DURING

### Description

INFOID:000000007633616

The vehicle jerks when VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function or brake assist function operates.

### Diagnosis Procedure

INFOID:000000007633617

#### 1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake limited slip differential (BLSD) function operates.

Is the inspection result normal?

- YES    >> Normal  
NO     >> GO TO 2.

#### 2.PERFORM SELF-DIAGNOSIS (1)

⑧ With CONSULT

1. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES    >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).  
NO     >> GO TO 3.

#### 3.CHECK CONNECTOR

⑧ With CONSULT

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

Is the inspection result normal?

- YES    >> GO TO 4.  
NO     >> Poor connection of connector terminal. Repair or replace connector terminal.

#### 4.PERFORM SELF-DIAGNOSIS (2)

⑧ With CONSULT

1. Connect harness connector.
2. Turn the power switch OFF → ON.

**CAUTION:**

- Be sure to wait of 10 seconds after turning power switch OFF or ON.
- Set the vehicle to READY.

3. Repeat step 2 two or more times.
4. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES    >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).  
NO     >> GO TO 5.

#### 5.CHECK VCM SYSTEM

⑧ With CONSULT

Perform self-diagnosis for "EV/HEV".

Is any DTC detected?

- YES    >> Check the DTC.  
NO     >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-151, "Removal and Installation"](#).



# THE DRIVING WHEELS SKID GREATLY ON ACCELERATION

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## THE DRIVING WHEELS SKID GREATLY ON ACCELERATION

### System Description

INFOID:0000000007633618

The driving wheels skid greatly on acceleration.

### Diagnosis Procedure

INFOID:0000000007633619

#### 1.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

Does stop lamp turn ON?

YES >> GO TO 2.

NO >> Check the stop lamp system. Refer to [EXL-43, "Wiring Diagram"](#).

#### 2.PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the power switch OFF → ON.

##### **CAUTION:**

- **Be sure to wait of 10 seconds after turning power switch OFF or ON.**
- **Set the vehicle to READY.**

2. Repeat step 1 two or more times.

3. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-50, "DTC Index"](#).

NO >> Normal

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# NORMAL OPERATING CONDITION

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## NORMAL OPERATING CONDITION

### Description

INFOID:000000007633620

Symptom	Result
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspension) occurs when VDC function, TCS function, ABS function, EBD function, brake limited differential (BLSD) function or brake assist function operates.	This is not a malfunction, The symptom occurs VDC function, TCS function, ABS function, EBD function, brake limited differential (BLSD) function and brake assist function that are normally 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 cornering, when VDC function, TCS function, brake limited slip differential (BLSD) function or brake assist function is operated.	
Brake pedal vibrates and motor sound from the motor room occurs, when the traction motor starts or the vehicle starts just after starting the traction motor.	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 traction motor is running.	In this case, restart the traction motor on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.
VDC warning lamp may turn ON and VDC function and TCS 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/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function and TCS function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status).	<b>CAUTION:</b> <ul style="list-style-type: none"> <li>• Turn the power switch OFF → ON → OFF after erase self-diagnosis result.</li> <li>• Be sure to wait of 10 seconds after turning power switch OFF or ON.</li> </ul>
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.)



# WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

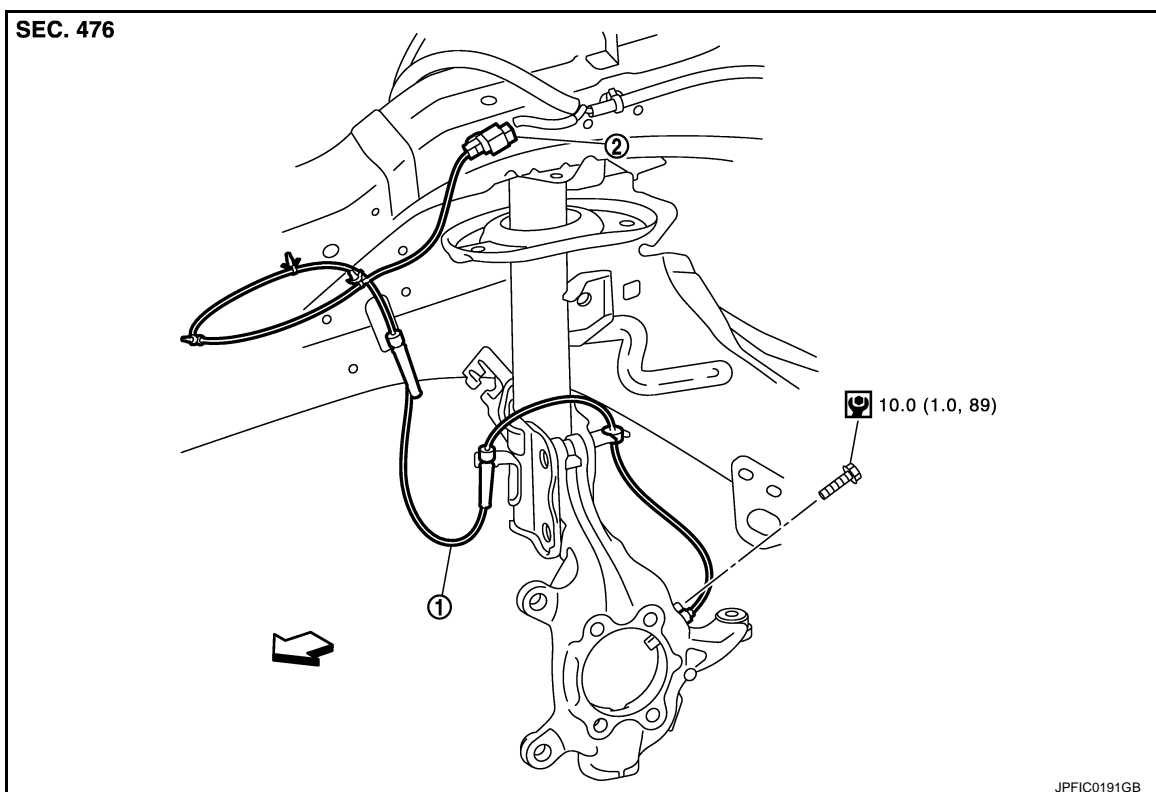
## REMOVAL AND INSTALLATION

### WHEEL SENSOR

### FRONT WHEEL SENSOR

### FRONT WHEEL SENSOR : Exploded View

INFOID:0000000007633621



1. Front LH wheel sensor

2. Front LH wheel sensor harness connector

↔: Vehicle front

⊙: N·m (kg-m, in-lb)

#### NOTE:

Front RH wheel sensor is symmetrically opposite of LH.

### FRONT WHEEL SENSOR : Removal and Installation

INFOID:0000000007633622

#### REMOVAL

1. Remove with power tool.
2. Remove the fender protector (front). Refer to [EXT-21, "FENDER PROTECTOR : Removal and Installation"](#).
3. Remove front wheel sensor from steering knuckle.  
**CAUTION:**  
To prevent damage to the parts, never rotate and never pull front wheel sensor as much as possible, when pulling out.
4. Remove front wheel sensor harness from the vehicle.  
**CAUTION:**  
To prevent damage to the parts, never twist or pull front wheel sensor harness, when removing.

#### INSTALLATION

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



## WHEEL SENSOR

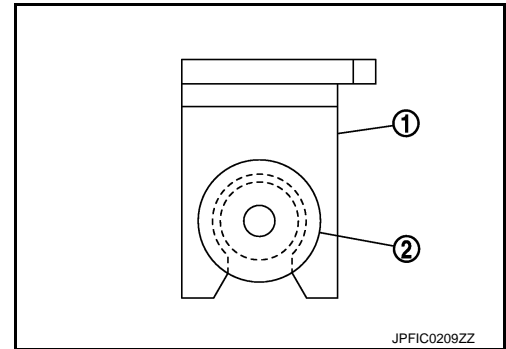
### < REMOVAL AND INSTALLATION >

[WITH VDC]

- 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:

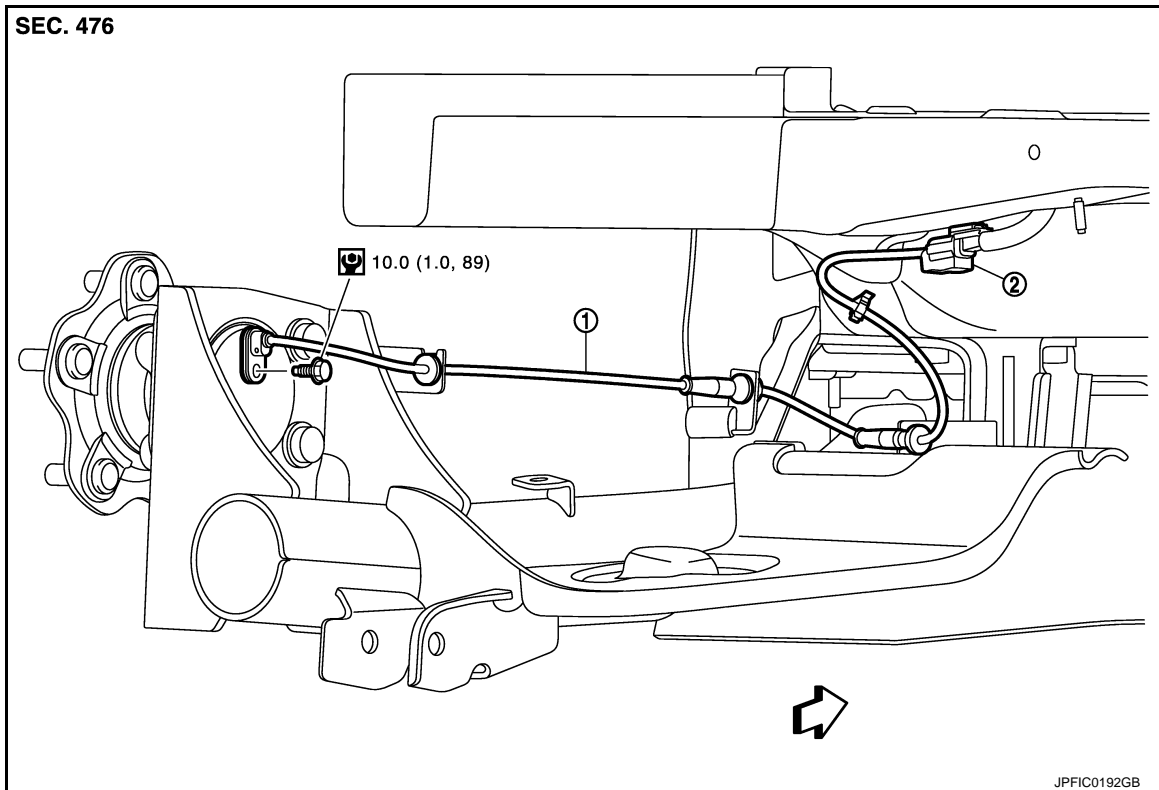
Check that the identification line of the front wheel sensor is faced vehicle front.



## REAR WHEEL SENSOR

### REAR WHEEL SENSOR : Exploded View

INFOID:000000007633623



1. Rear LH wheel sensor

2. Rear LH wheel sensor harness connector

↩: Vehicle front

⚙: N·m (kg-m, in-lb)

#### NOTE:

Rear RH wheel sensor is symmetrically opposite of LH.

### REAR WHEEL SENSOR : Removal and Installation

INFOID:000000007633624

#### REMOVAL

1. Remove rear wheel sensor from wheel hub and bearing assembly.

#### CAUTION:



## WHEEL SENSOR

### < REMOVAL AND INSTALLATION >

[WITH VDC]

To prevent damage to the parts, never rotate or pull rear wheel sensor as much as possible, when pulling out.

2. Remove rear wheel sensor harness from the vehicle.

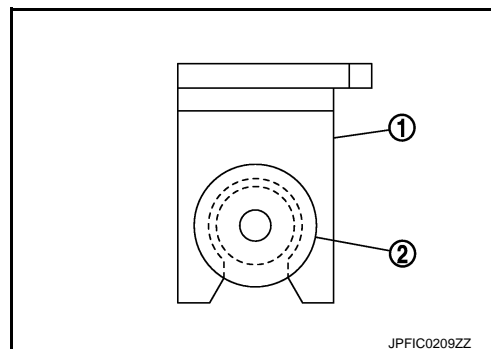
**CAUTION:**

To prevent damage to the parts, never twist and never pull rear wheel sensor harness, when removing.

### INSTALLATION

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

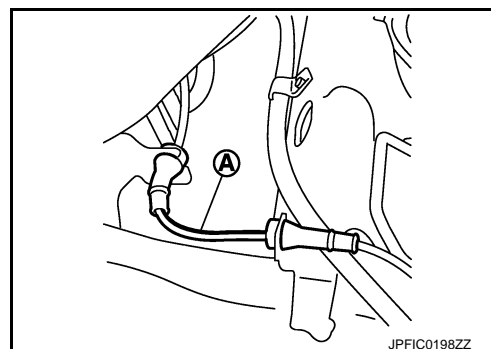
- Check that there is no foreign material like iron powder or damage on inner surface of rear wheel sensor mounting hole of wheel hub and bearing assembly and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist rear 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.



BRC

**CAUTION:**

Check that the identification line (A) of the rear wheel sensor is faced upward.





## SENSOR ROTOR

### FRONT SENSOR ROTOR

#### FRONT SENSOR ROTOR : Removal and Installation

INFOID:000000007633625

##### REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [FAX-10, "Removal and Installation"](#).

##### INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [FAX-10, "Removal and Installation"](#).

### REAR SENSOR ROTOR

#### REAR SENSOR ROTOR : Removal and Installation

INFOID:000000007633626

##### REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [RAX-6, "Removal and Installation"](#).

##### INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [RAX-6, "Removal and Installation"](#).



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

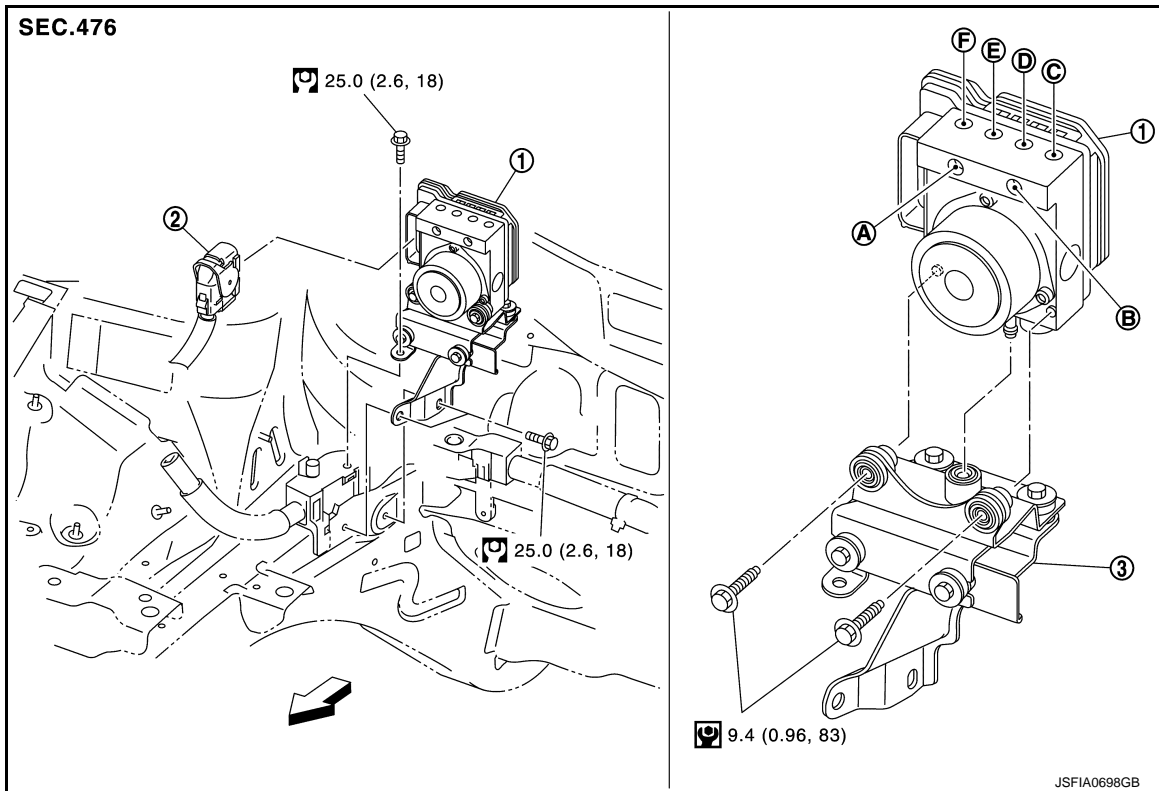
< REMOVAL AND INSTALLATION >

[WITH VDC]

## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000007633627



- |   |  |                        |
|---|--|------------------------|
| 1. ABS actuator and electric unit (control unit)                | 2. ABS actuator and electric unit (control unit) harness connector | 3. Bracket             |
| A. To electrically-driven intelligent brake unit secondary side | B. To electrically-driven intelligent brake unit primary side      | C. To front LH caliper |
| D. To rear RH caliper   | E. To rear LH caliper  | F. To front RH caliper |

Vehicle front

N·m (kg-m, ft-lb)

N·m (kg-m, in-lb)

## Removal and Installation

INFOID:000000007633628

### REMOVAL

1. Turn the power switch OFF.
2. Disconnect 12V battery cable from negative terminal. Refer to [BRC-5, "Precautions for Removing Battery Terminal"](#).
3. Drain brake fluid. Refer to [BR-241, "Draining"](#).

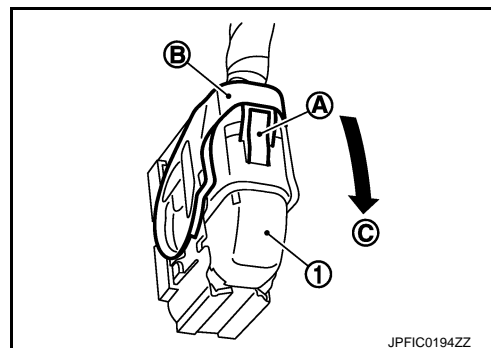


## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[WITH VDC]

### < REMOVAL AND INSTALLATION >

4. 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.
5. Loosen flare nut of brake tube using a flare nut wrench, and then remove brake tube from ABS actuator and electric unit (control unit). Refer to [BR-251, "FRONT : Exploded View"](#).
6. Remove ABS actuator and electric unit (control unit) and bracket.



#### CAUTION:

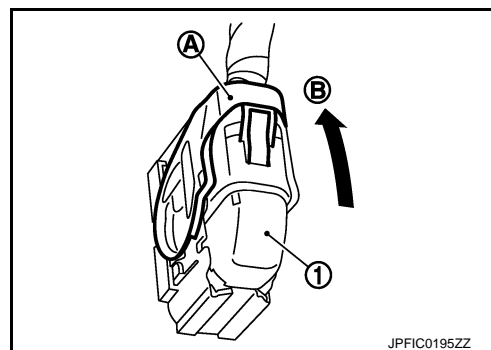
- To prevent damage to the parts, never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.
- To prevent damage to the parts, be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.

7. Remove bracket and bushing 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.
- 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 [BR-251, "FRONT : Exploded View"](#).
- Never remove and install ABS actuator and electric unit (control unit) by holding actuator harness.
- Bleed air from brake piping after installation. Refer to [BR-242, "Bleeding Brake System"](#).
- 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 [BRC-58, "Work Procedure"](#).





# YAW RATE/SIDE/DECEL G SENSOR

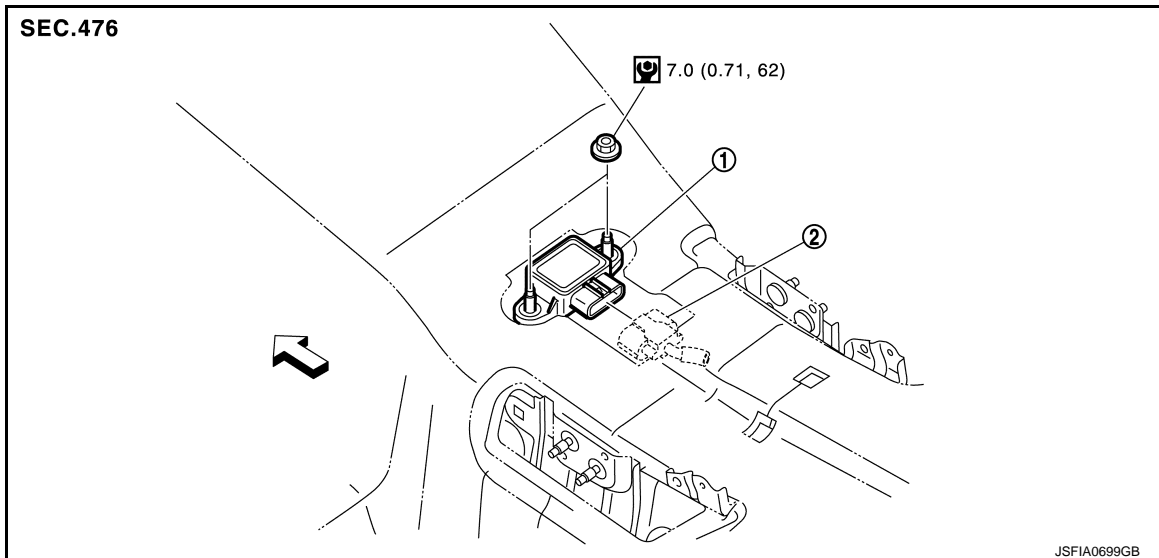
< REMOVAL AND INSTALLATION >

[WITH VDC]

## YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:0000000007633629



1. Yaw rate/side/decel G sensor
2. Yaw rate/side/decel G sensor harness connector

Vehicle front

N·m (kg-m, in-lb)

## Removal and Installation

INFOID:0000000007633630

### REMOVAL

#### CAUTION:

To prevent damage to the parts, never drop or strike yaw rate/side/decel G sensor, because it has little endurance to impact. Never use a pneumatic tool.

1. Remove instrument lower cover LH and instrument lower cover RH. Refer to [IP-14. "Removal and Installation"](#).
2. Disconnect yaw rate/side/decel G sensor harness connector.
3. Remove yaw rate/side/decel G sensor.

### INSTALLATION

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

- Never drop or strike yaw rate/transverse/decel G sensor, because it has little endurance to impact. Never use a power tool.



## STEERING ANGLE SENSOR

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### Removal and Installation

INFOID:000000007633631

#### REMOVAL

1. Remove spiral cable assembly. Refer to [SR-22, "Removal and Installation"](#).
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 [BRC-58, "Work Procedure"](#).



# VDC OFF SWITCH

< REMOVAL AND INSTALLATION >

[WITH VDC]

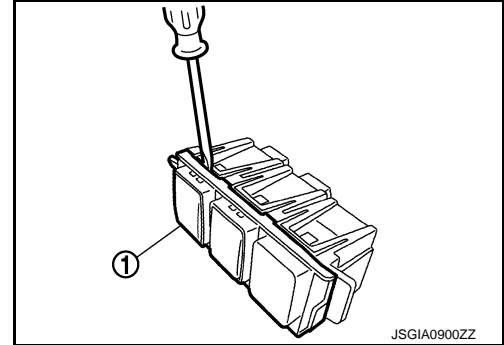
## VDC OFF SWITCH

### Removal and Installation

INFOID:000000007633632

#### REMOVAL

1. Remove lower instrument panel. Refer to [IP-14, "Removal and Installation"](#).
2. Remove switch panel. Refer to [IP-14, "Removal and Installation"](#).
3. Push the pawl of VDC OFF switch (1) and remove VDC OFF switch from switch panel.



#### INSTALLATION

Installation is the reverse order of removal.

A  
B  
C  
D  
E  
BRC  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P