

# SECTION **BRC**

## BRAKE CONTROL SYSTEM

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# PRECAUTIONS

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[WITH VDC]

## PRECAUTION

### PRECAUTIONS

#### Precaution for Technicians Using Medical Electric

INFOID:000000010120010

##### 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 PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition 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

INFOID:000000010120011

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:000000010120012

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

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< PRECAUTION >

system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

## WARNING:

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

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

### WARNING:

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

## Precaution for Removing 12V Battery

INFOID:000000010120013

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 within 1 hour after turning the power switch OFF → ON → OFF.

### NOTE:

- The 12V battery automatic charge control may start automatically even when the power switch is in OFF state.
- Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

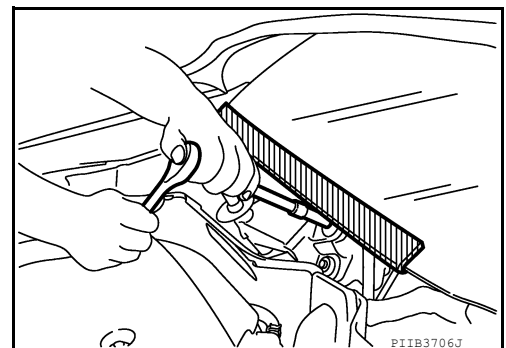
### CAUTION:

- 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.

## Precaution for Procedure without Cowl Top Cover

INFOID:000000010120014

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



# PRECAUTIONS

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[WITH VDC]

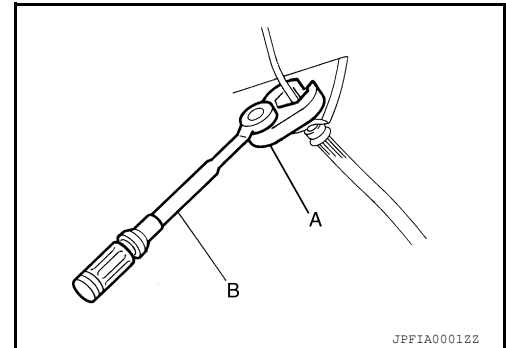
## Precaution for Brake System

INFOID:000000010120015

### 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-16, "FOR USA AND CANADA : Fluids and Lubricants"](#).
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface. 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 to exit CONSULT. Close all doors (including back door), check that the room lamp is OFF, get out of the vehicle, and wait for 3 minutes or more with all doors closed. Disconnect the electrically-driven intelligent brake unit, the ABS actuator and electric unit (control unit) harness connector or the 12V battery negative terminal before performing the work. Refer to [BRC-5, "Precaution for Removing 12V Battery"](#).



### CAUTION:

Never operate the vehicle and CONSULT while waiting.

- Check that no brake fluid leakage is present after replacing the parts.

## Precaution for Brake Control system

INFOID:0000000010120016

- 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 operates. 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)

# PRECAUTIONS

[WITH VDC]

< PRECAUTION >

- 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 after driving, 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.**
- **Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.**
- **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 that 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.**
- **Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.**
- **Turn the power switch OFF → ON → OFF after erase self-diagnosis result.**
- 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.**
- **Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.**
- **Turn the power switch OFF → ON → OFF after erase self-diagnosis result.**

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# PRECAUTIONS

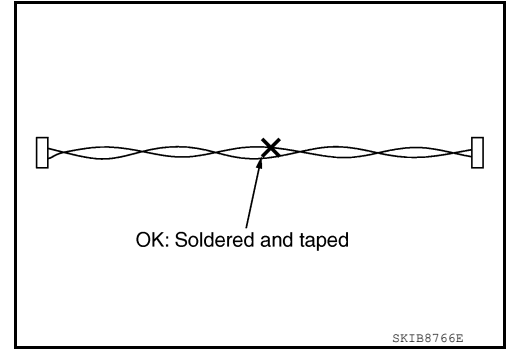
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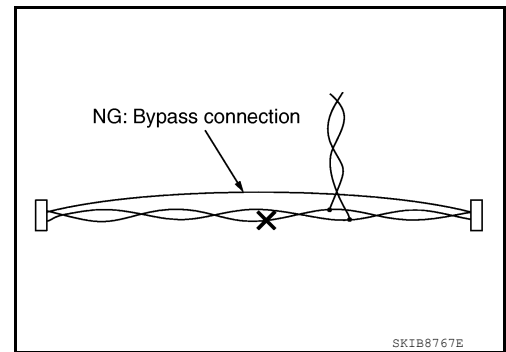
## Precaution for Harness Repair

INFOID:000000010120017

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



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





# PREPARATION

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[WITH VDC]

## PREPARATION

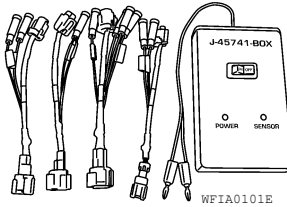
### PREPARATION

#### Special Service Tool

INFOID:0000000010575178

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741-A) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors



WFIA0101E

#### Commercial Service Tools

INFOID:0000000010120018

Tool name	Description
Power tool	Loosening nuts, screws and bolts.



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# COMPONENT PARTS

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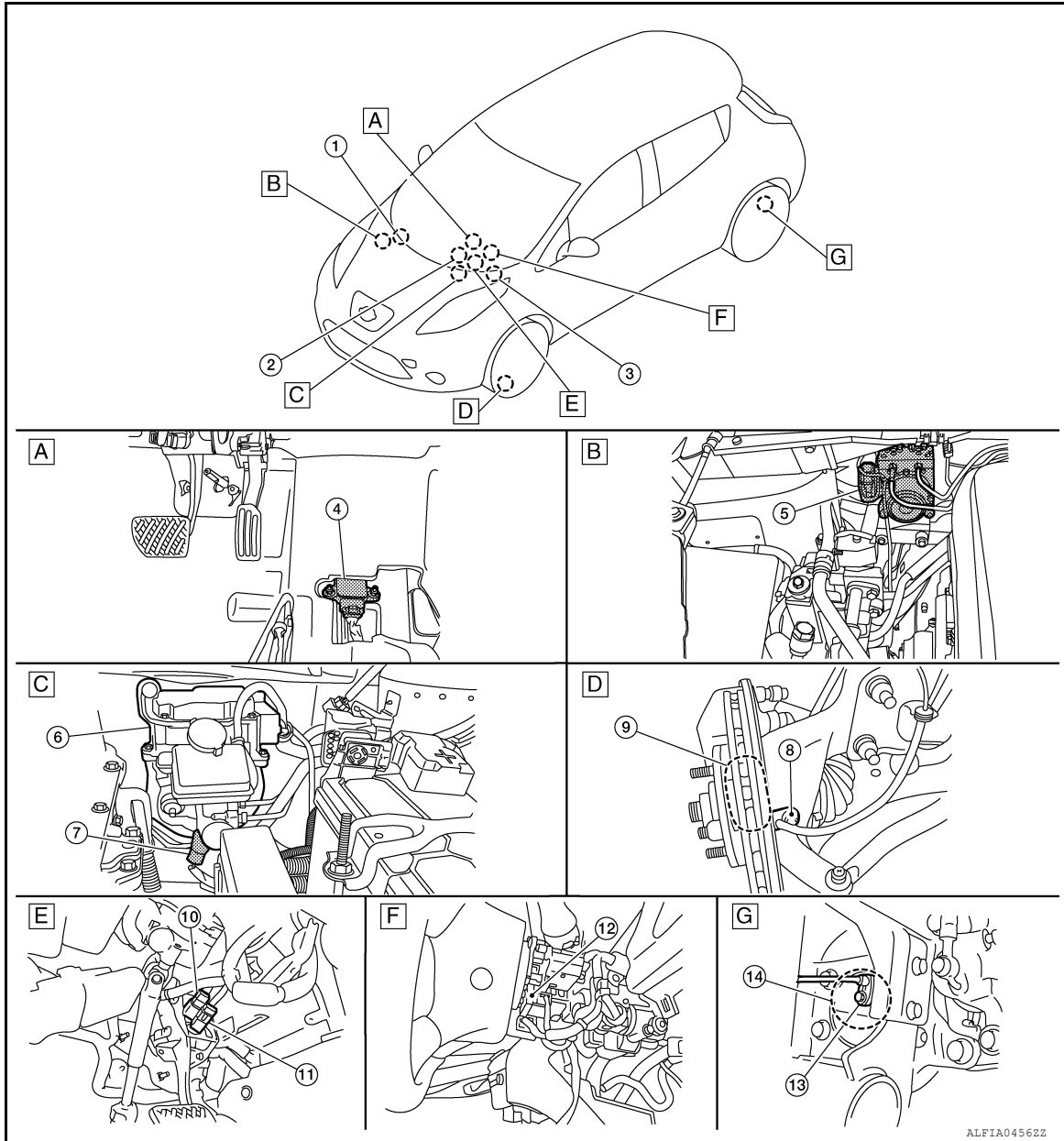
[WITH VDC]

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000010120019



**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 assembly

ALFIA0456ZZ

# 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>• VCM control signal</li> <li>• Shift position signal</li> </ul> Refer to <a href="#">EVC-15, "Component Parts Location"</a> for detailed installation location.
②	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>• VDC warning lamp signal</li> <li>• Brake warning lamp signal</li> <li>• Brake system warning lamp signal</li> <li>• VDC OFF indicator lamp signal</li> </ul> Refer to <a href="#">MWI-6, "METER SYSTEM : Component Parts Location"</a> for detailed installation location.
③	VDC OFF switch	<a href="#">BRC-15, "VDC OFF Switch"</a>
④	Yaw rate/side/decel G sensor	<a href="#">BRC-14, "Yaw Rate/Side/Decel G Sensor"</a>
⑤	ABS actuator and electric unit (control unit)	<a href="#">BRC-12, "ABS Actuator and Electric Unit (Control Unit)"</a>
⑥	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> <li>• Brake warning lamp request signal</li> <li>• Brake system warning lamp request signal</li> </ul>
⑦	Master cylinder pressure sensor	<a href="#">BRC-13, "Master Cylinder Pressure Sensor"</a>
⑧	Front wheel sensor	<a href="#">BRC-11, "Wheel Sensor and Sensor Rotor"</a>
⑨	Front sensor rotor	
⑩	Stop lamp switch	<a href="#">BRC-13, "Stop Lamp Switch"</a>
⑪	Brake pedal position switch	<a href="#">BRC-14, "Brake Pedal Position 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>
⑭	Rear sensor rotor	

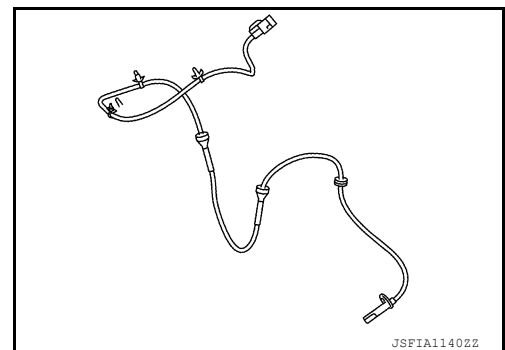
\*: CAN communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## Wheel Sensor and Sensor Rotor

INFOID:000000010120020

**NOTE:**

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

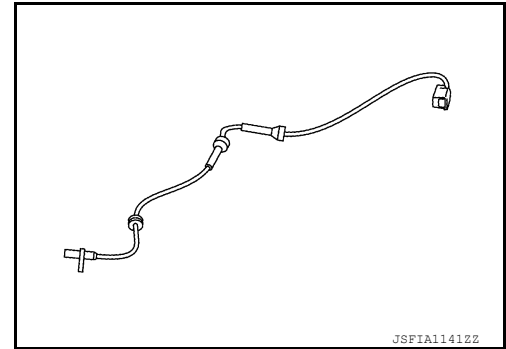


# COMPONENT PARTS

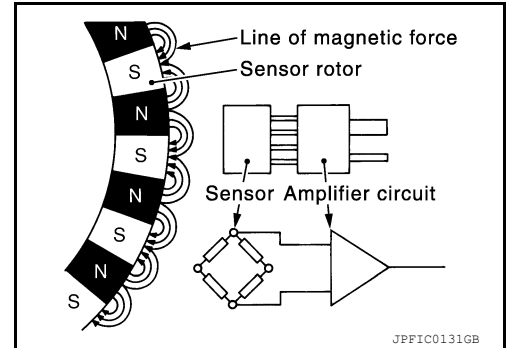
[WITH VDC]

## < SYSTEM DESCRIPTION >

- Wheel sensor of rear wheel is installed on wheel hub assembly.
- Sensor rotor of rear wheel is integrated in wheel hub assembly.
- Never measure resistance and voltage value using a tester because sensor is active sensor.



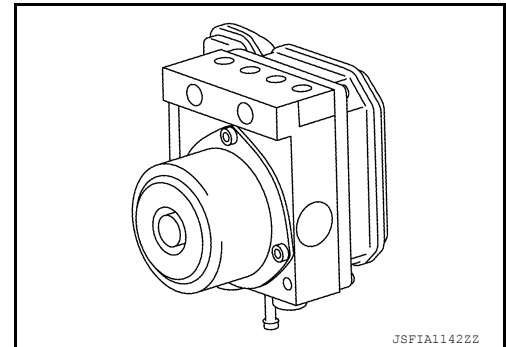
- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field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



## ABS Actuator and Electric Unit (Control Unit)

INFOID:000000010120021

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.

# COMPONENT PARTS

[WITH VDC]

## < SYSTEM DESCRIPTION >

### ABS IN Valve

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 hold or decrease according to signals from control unit part.

**NOTE:**

Valve is a solenoid valve.

### Cut Valve 1, Cut Valve 2

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.

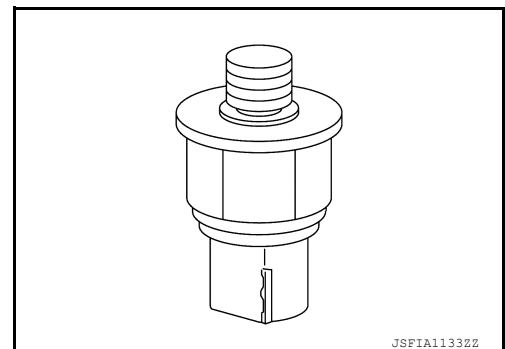
### Reservoir

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

## Master Cylinder Pressure Sensor

INFOID:000000010120022

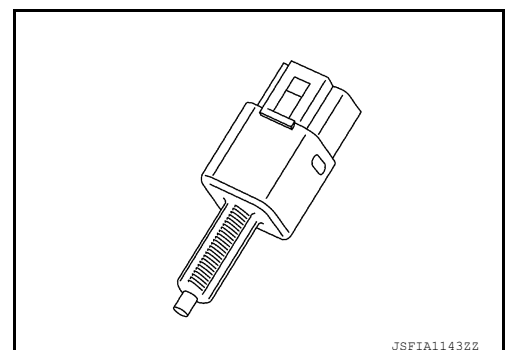
Detects the brake fluid pressure of master cylinder part and transmits signal to ABS actuator and electric unit (control unit).



## Stop Lamp Switch

INFOID:000000010120023

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



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# COMPONENT PARTS

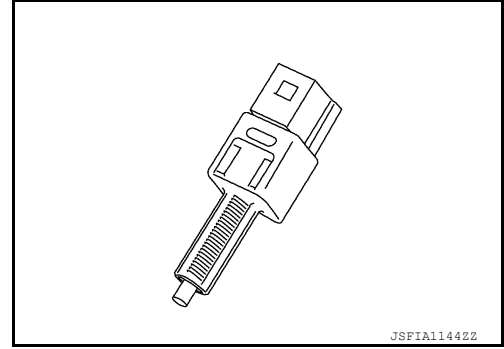
< SYSTEM DESCRIPTION >

[WITH VDC]

## Brake Pedal Position Switch

INFOID:000000010120024

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

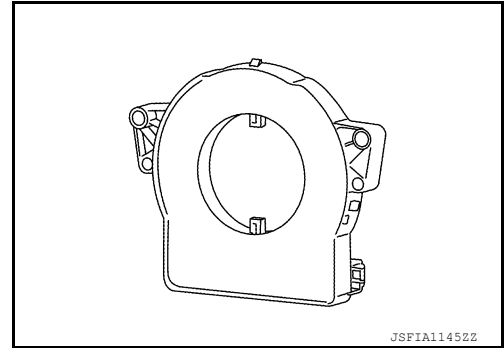


## Steering Angle Sensor

INFOID:000000010120025

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

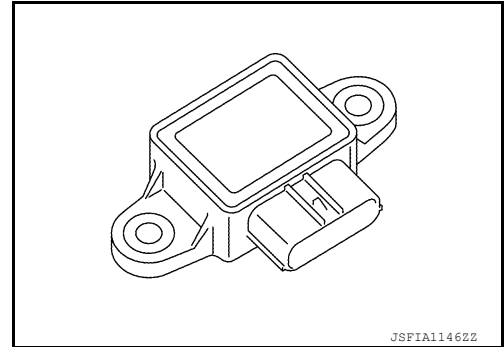


## Yaw Rate/Side/Decel G Sensor

INFOID:000000010120026

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

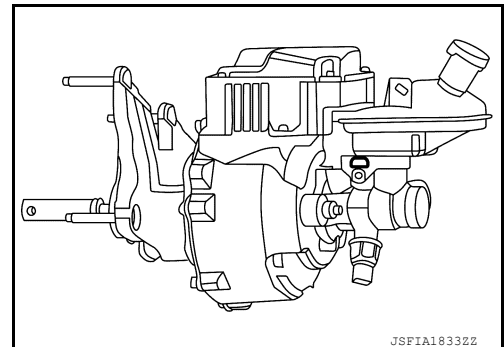
- Vehicle rotation angular velocity (yaw rate signal)
- Vehicle lateral acceleration (side G signal) and longitudinal acceleration (decel G signal)



## Brake Fluid Level Switch

INFOID:000000010120027

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.



# COMPONENT PARTS

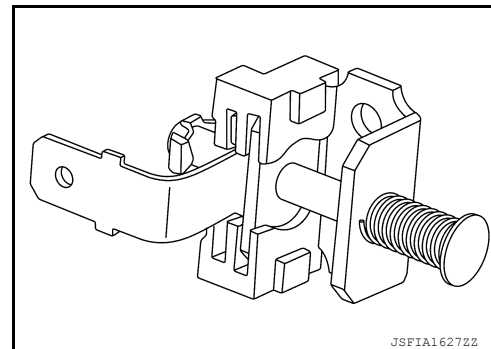
< SYSTEM DESCRIPTION >

[WITH VDC]

## Parking Brake Switch

INFOID:000000010120028

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



## VDC OFF Switch

INFOID:000000010120029

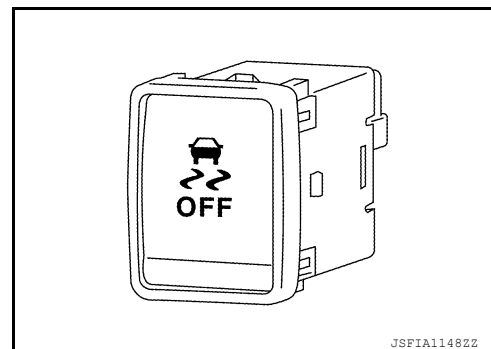
- Non-operational status or standby status of the following functions can be selected using VDC OFF switch. VDC OFF indicator lamp indicates the operation status of function (ON: Non-operational status, OFF: Standby status):

- VDC function
- TCS function

**NOTE:**

Brake limited slip differential (BLSD) function control operates:

- 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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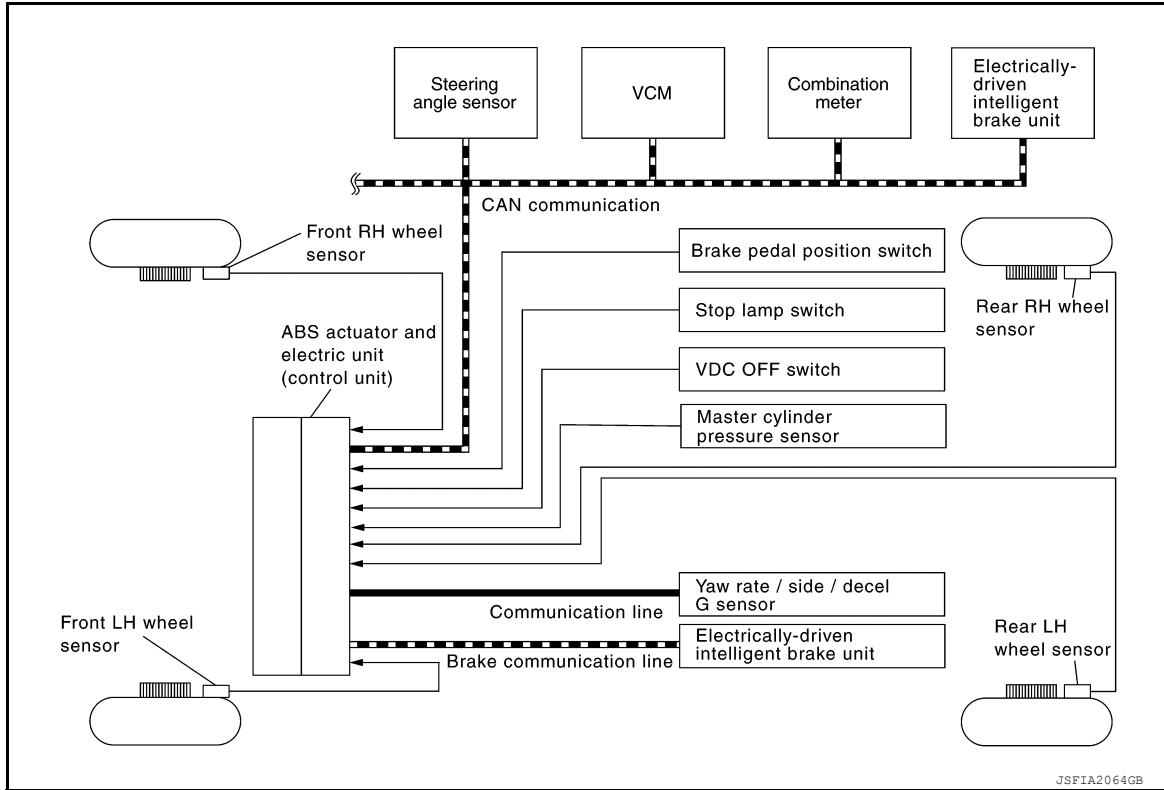
SYSTEM

System Description

INFOID:000000010120030

- 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	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>• 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 CAN communication and brake communication line*2: <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> <li>• Brake warning lamp request signal</li> <li>• Brake system warning lamp request signal</li> </ul>



# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

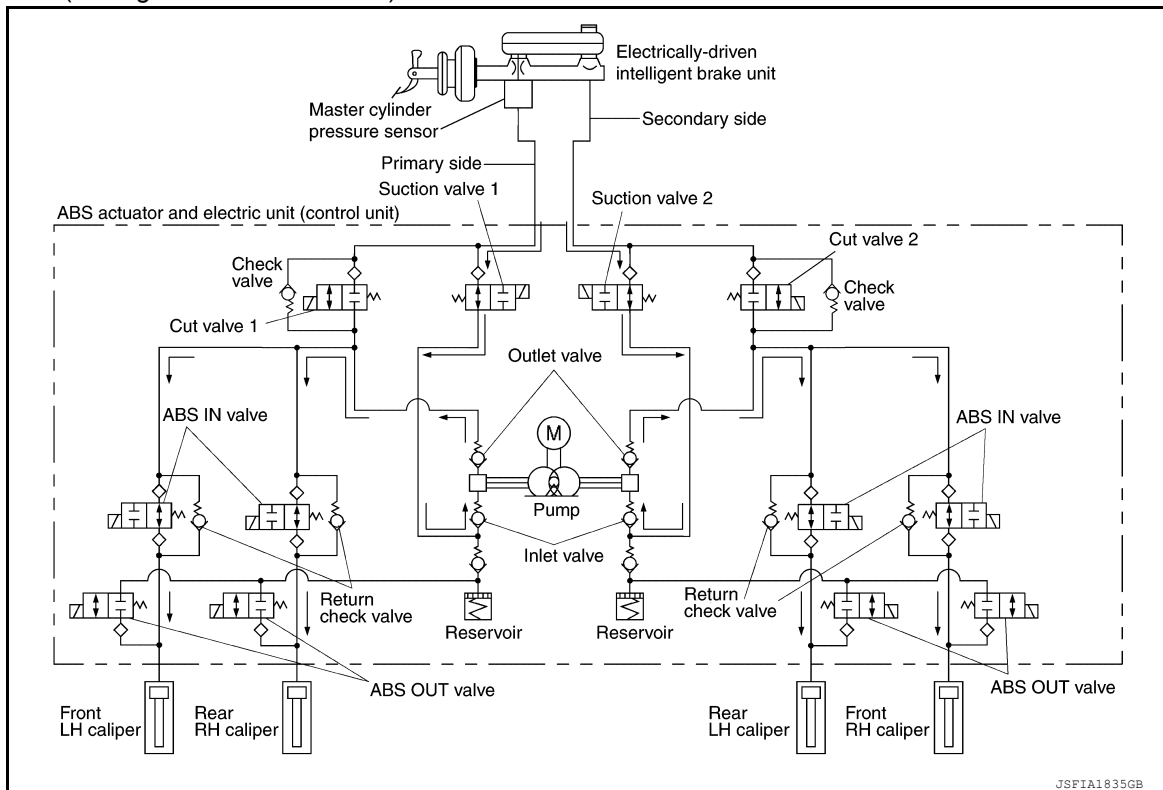
Component	Signal description
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> <li>Steering angle sensor signal</li> </ul>
Combination meter	Mainly transmits the following signals to ABS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

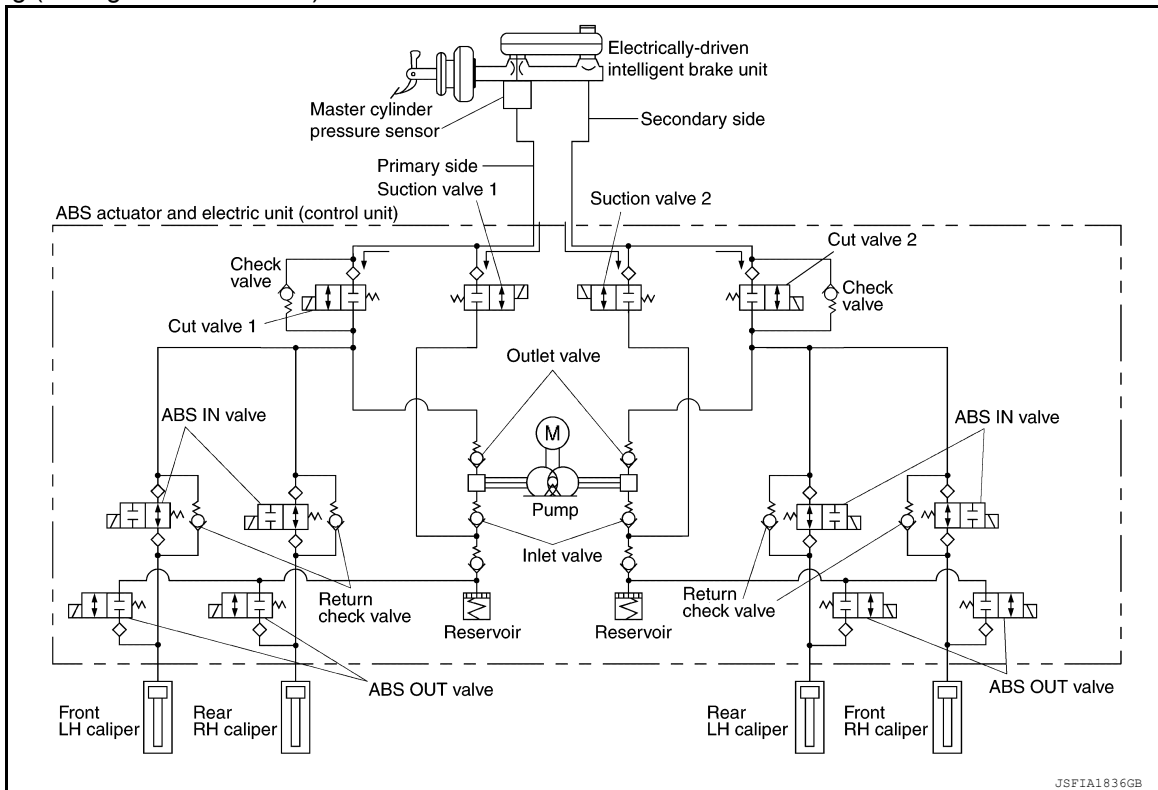
During pressure rear RH brake caliper increases

- 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.

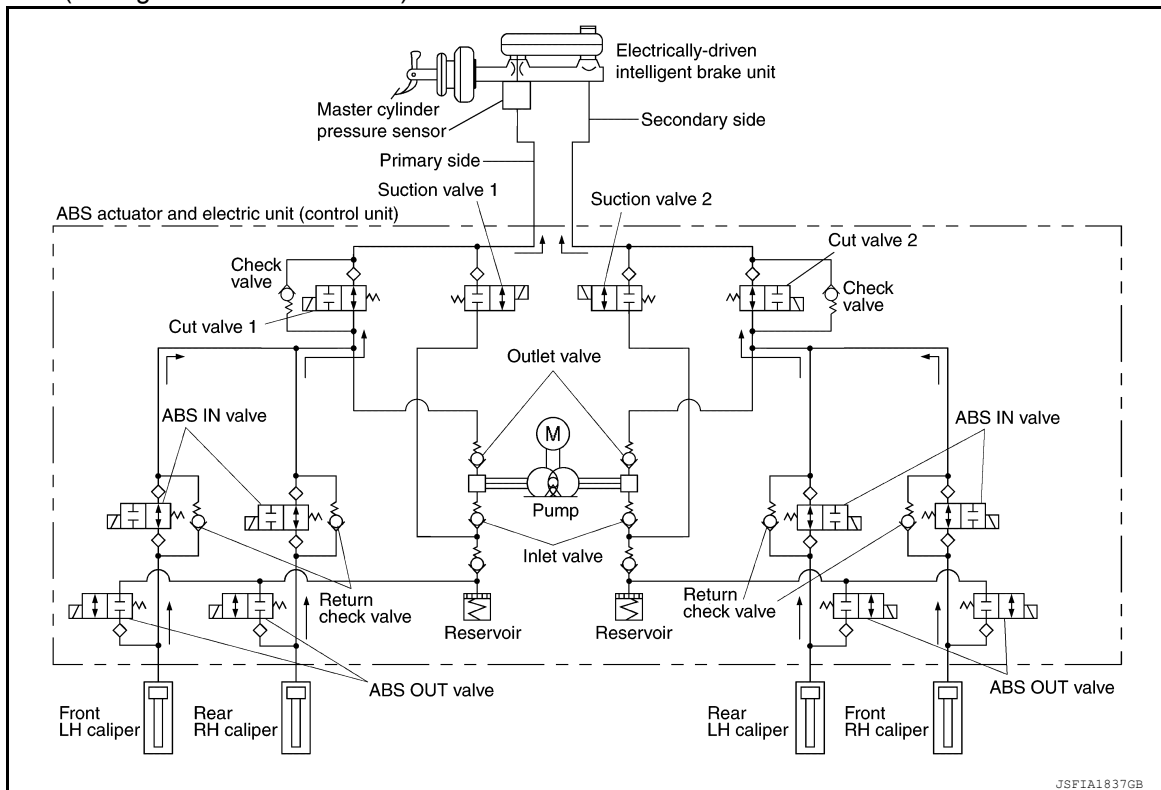
During pressure rear RH brake caliper holds

- 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 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 sensor	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)

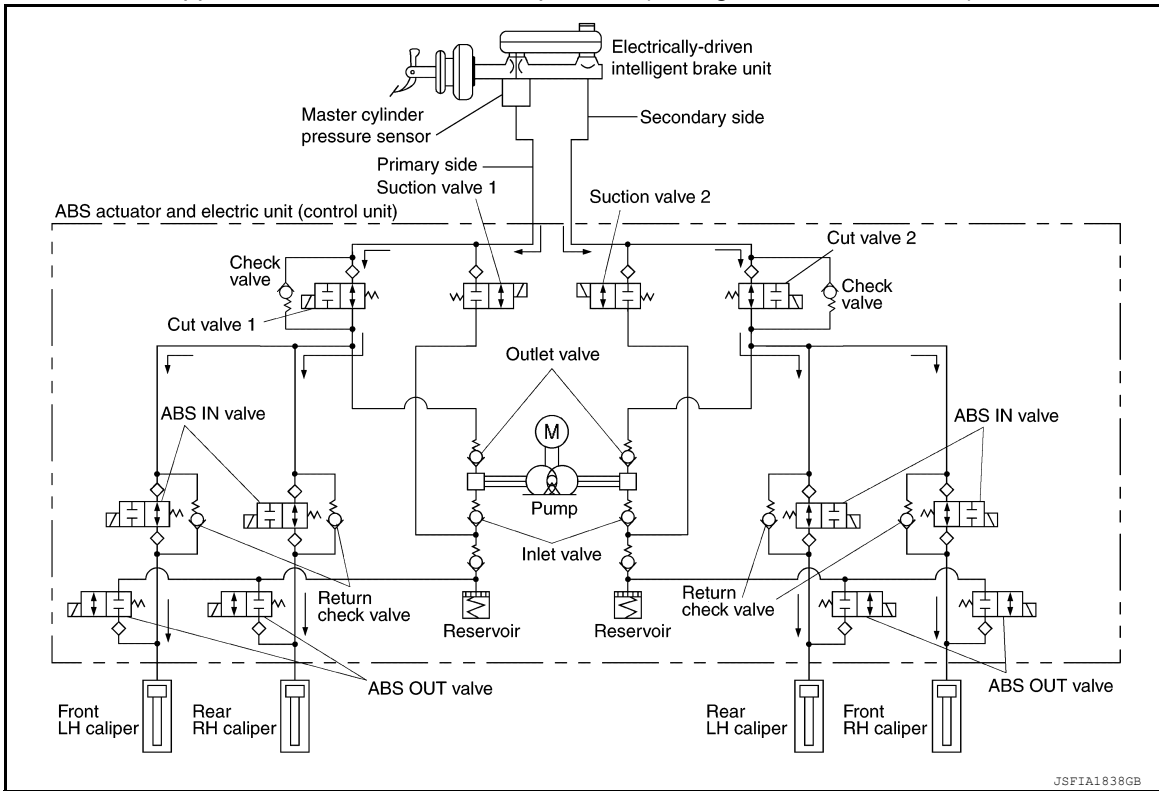
The control unit built in the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers, respectively, by operating each valve.

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

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

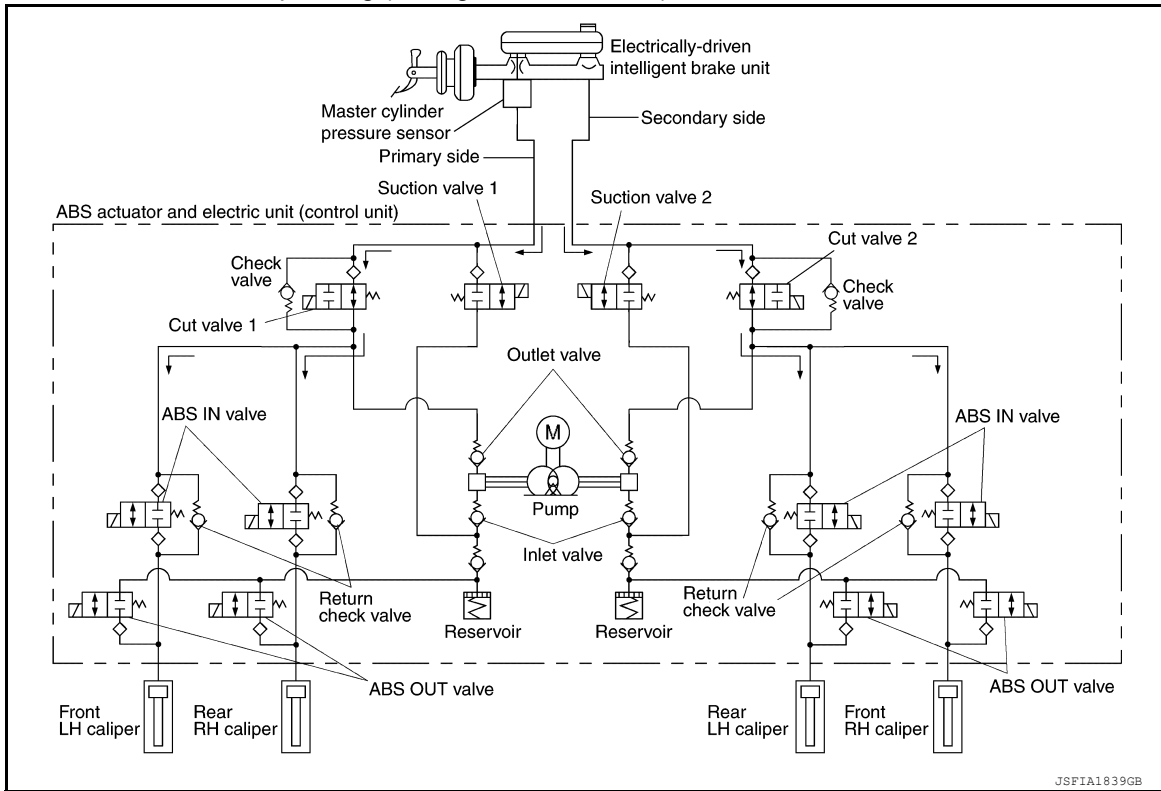
- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear LH brake caliper from the electrically-driven intelligent brake unit through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

# 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

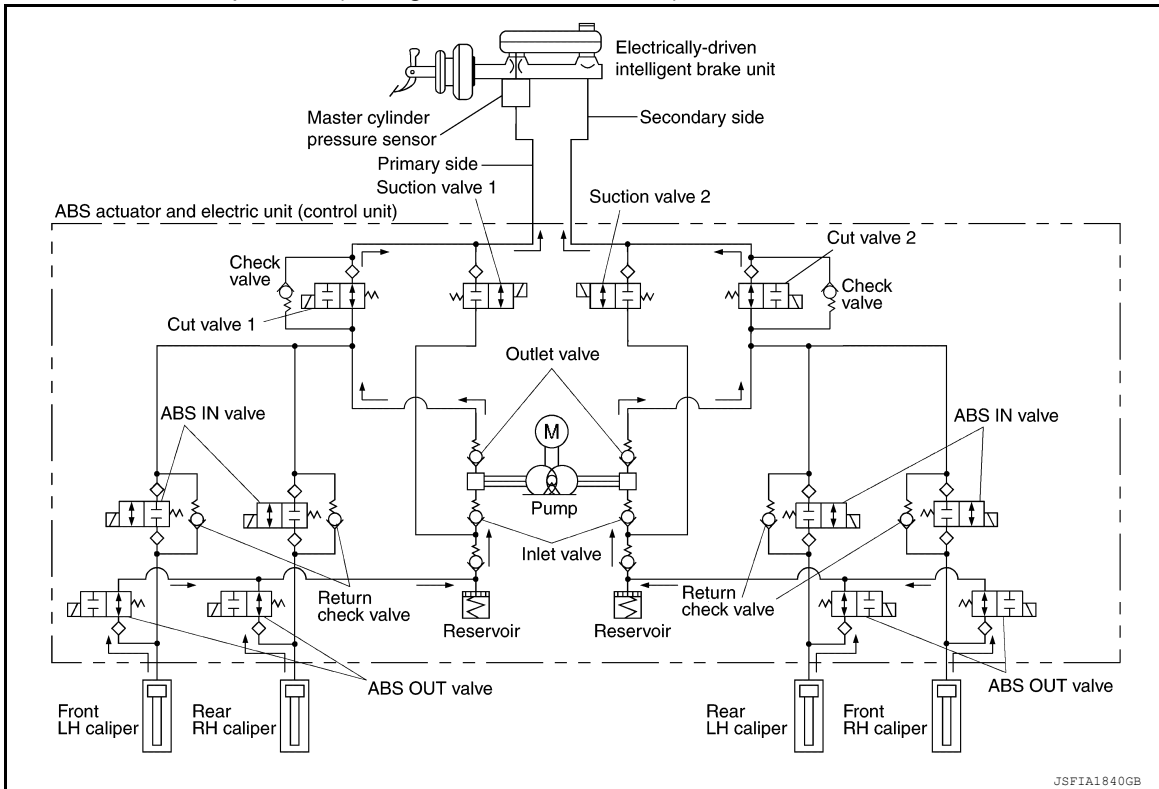
- Since the ABS IN valve and the ABS OUT valve are closed, the rear LH brake caliper, electrically-driven intelligent brake unit, and reservoir are blocked. This maintains fluid pressure applied on the rear LH brake caliper.

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

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

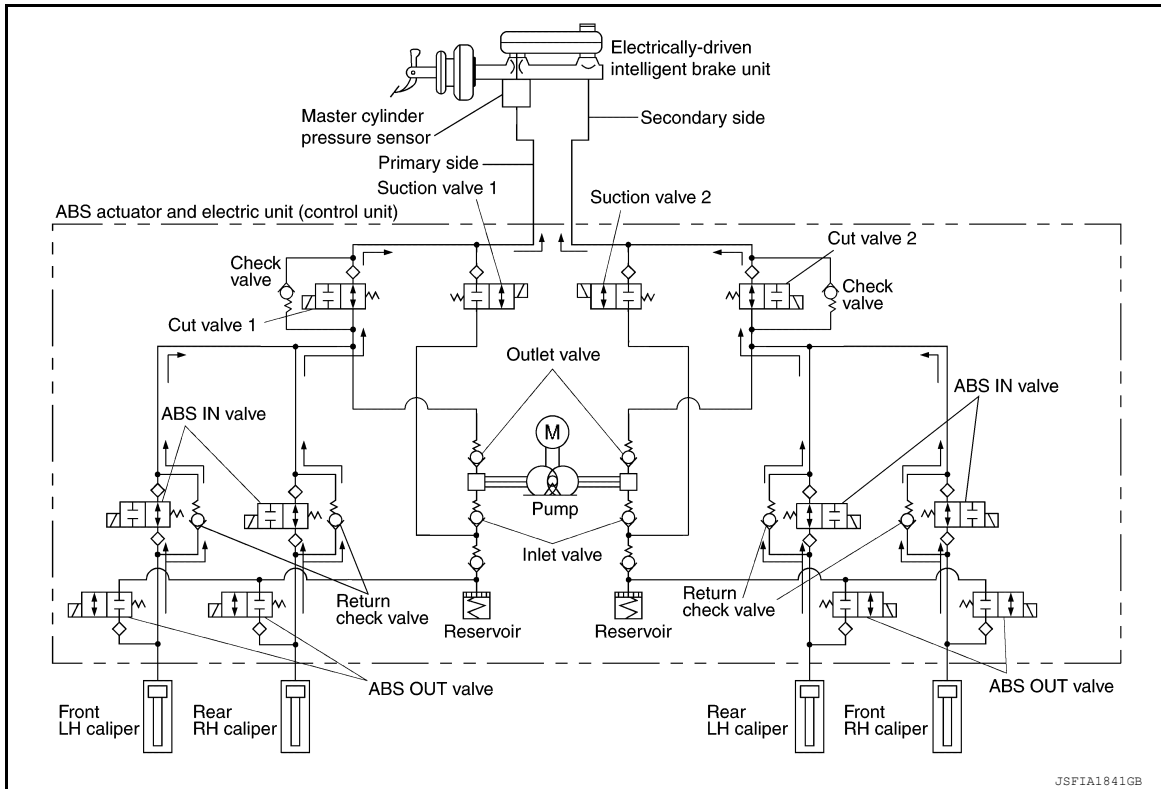
- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear LH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the electrically-driven intelligent brake unit by the pump.

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

### 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 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 sensor	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
When parking brake operates (parking brake switch ON)	OFF	ON	OFF
VDC function is malfunctioning	OFF	OFF	ON
TCS function is malfunctioning	OFF	OFF	ON
ABS function is malfunctioning	ON	OFF	ON
EBD function is malfunctioning	ON	ON	ON
Brake limited slip differential (BLSD) function is malfunctioning	OFF	OFF	ON
Brake assist function is malfunctioning	OFF	OFF	ON
Electrically-driven intelligent brake unit function is malfunctioning	ON	ON	ON
VDC function is operating	OFF	OFF	Blinking
TCS function is operating	OFF	OFF	Blinking
ABS function is operating	OFF	OFF	OFF
EBD function is operating	OFF	OFF	OFF
Brake limited slip differential (BLSD) function is operating	OFF	OFF	Blinking
Brake assist function is operating	OFF	OFF	OFF

### 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

# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

Condition (status)	VDC OFF indicator lamp
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

## Fail-safe

INFOID:000000010120031

### 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>

# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

DTC	Vehicle condition	
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>	A
		B
		C
		D
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>	E
		F
		G
		H
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>	I
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>	J
C1121		K
C1122		L
C1123		M
C1124		N
C1125		O
C1126		P
C1127		Q
C1140		R
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	T	
C1144	U	
C1145	V	
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>	W
C1155		X
		Y
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>	Z
C1165		AA
C1166		AB
C1167		AC
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>	AD
		AE
		AF
		AG
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>	AH

BRC

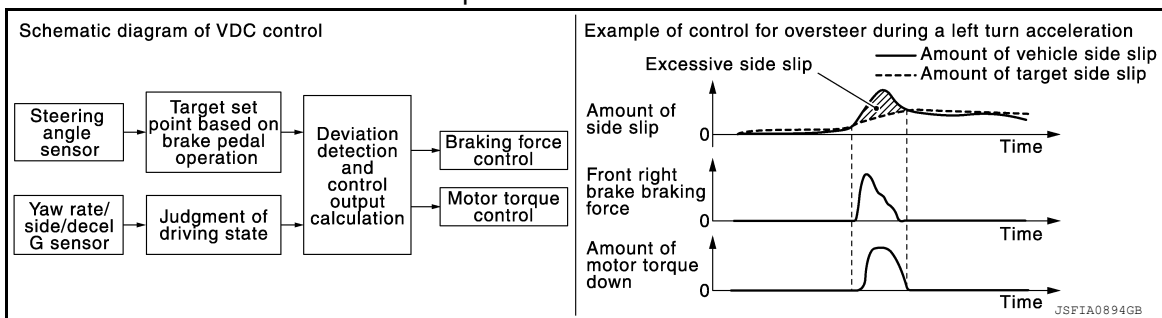
DTC	Vehicle condition
C118C	The following functions are suspended: <ul style="list-style-type: none"> <li>• VDC function</li> <li>• TCS function</li> <li>• Brake limited slip differential (BLSD) function</li> <li>• Brake assist function</li> </ul>
U1000	
U1010	
U110D	The following functions are suspended: <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:000000010120032

- 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-53. "Fail-safe"](#).

**NOTE:**

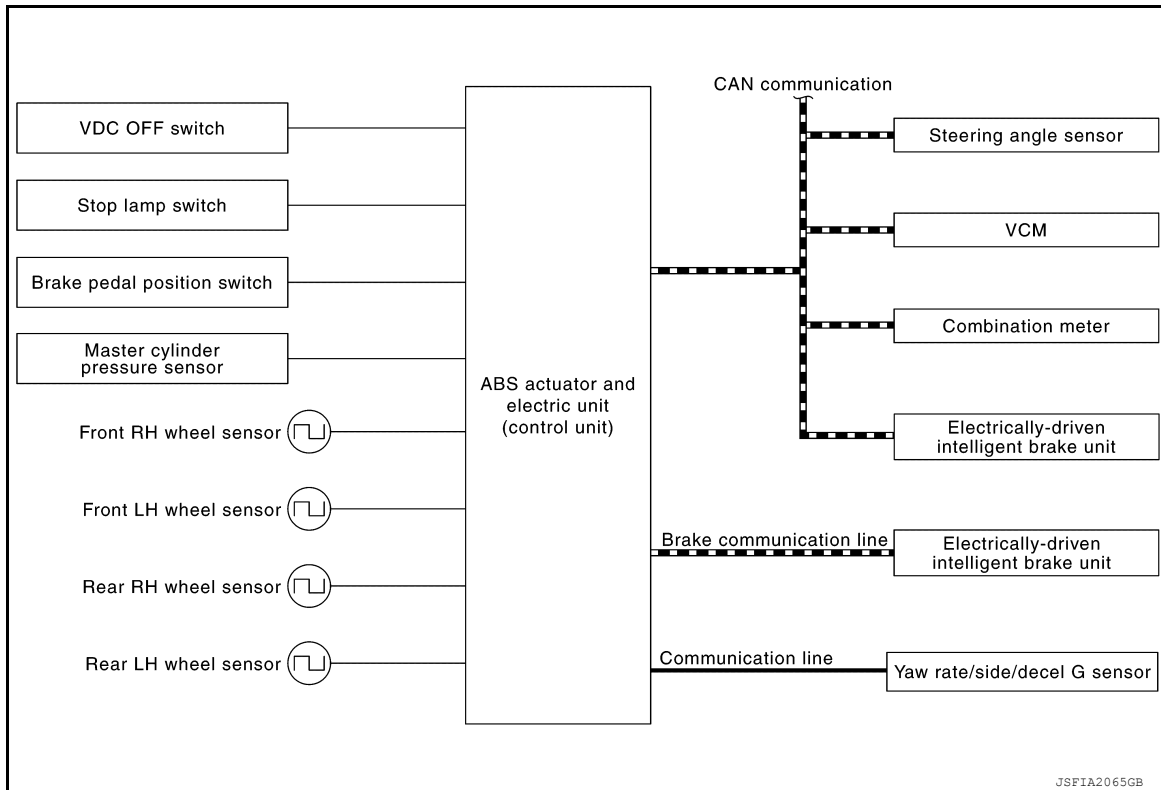
VDC has the characteristic as described here, This is not the device that helps reckless driving.

# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

## 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>• 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 CAN communication line*2: <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> <li>• Brake warning lamp request signal</li> <li>• Brake system warning lamp request signal</li> </ul>
Steering angle sensor	Mainly transmits the following signal 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>• VDC warning lamp signal</li> <li>• Brake warning lamp signal</li> <li>• Brake system warning lamp signal</li> <li>• VDC OFF indicator lamp signal</li> </ul>

# SYSTEM

[WITH VDC]

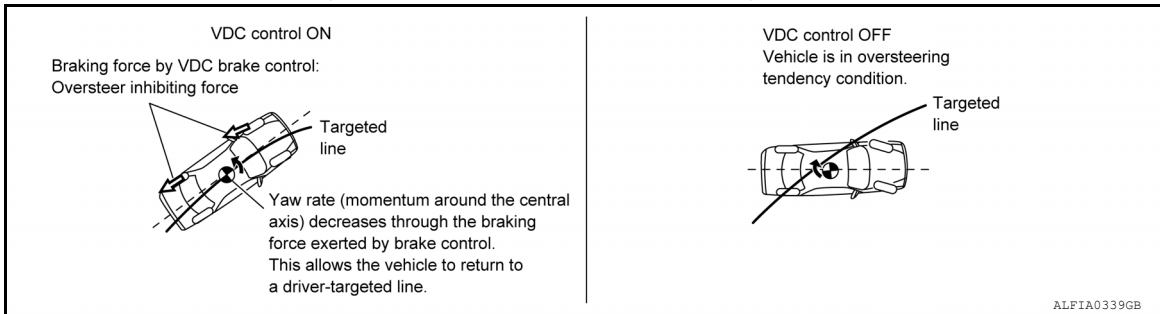
## < SYSTEM DESCRIPTION >

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

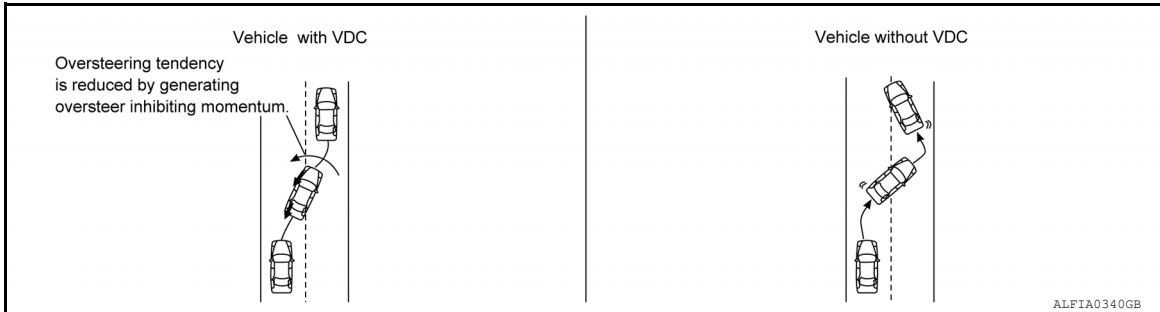
## OPERATION CHARACTERISTICS

### 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. Momentum directing towards the outer side of turn is generated. Oversteer is prevented.

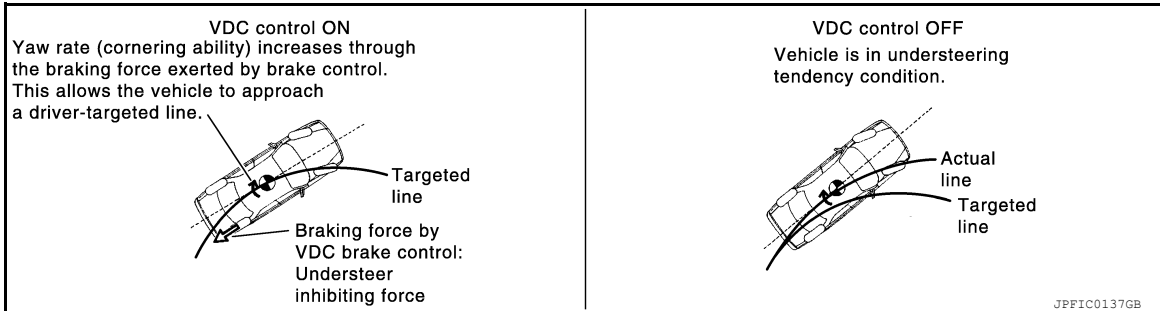


- Changing driving lane on a slippery road, when oversteer tendency is judged large, motor torque is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

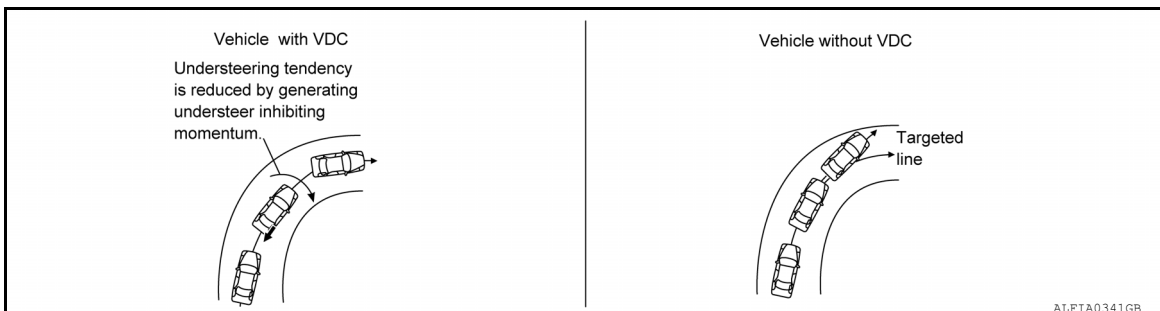


### VDC Function That Prevents Understeer Tendency

- During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the inner side of turn. Momentum 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.

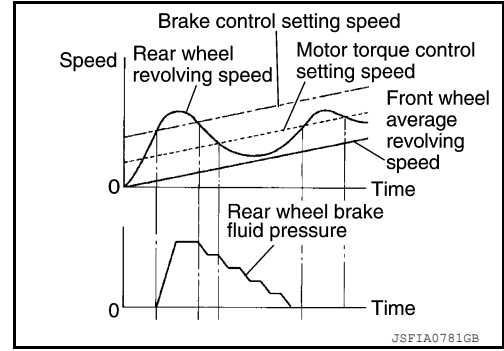


## TCS FUNCTION

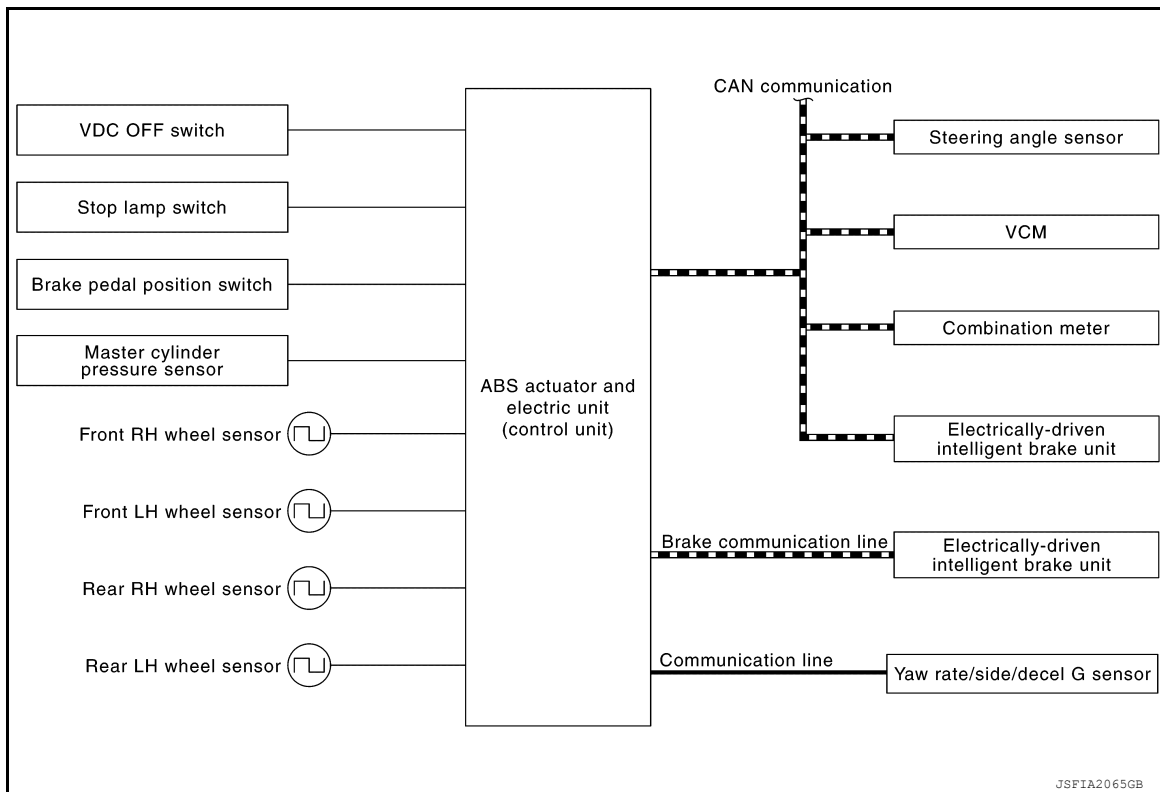
TCS FUNCTION : System Description

INFOID:000000010120033

- 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 (BLSL) function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, brake limited slip differential (BLSL) function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-53, "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>• 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 CAN communication line*2: <ul style="list-style-type: none"><li>• Electrically-driven intelligent brake control signal</li><li>• Brake warning lamp request signal</li><li>• Brake system warning lamp request signal</li></ul>
Steering angle sensor	Mainly transmits the following signal 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>• VDC warning lamp signal</li><li>• Brake warning lamp signal</li><li>• Brake system 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: CAN communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## ABS FUNCTION

### ABS FUNCTION : System Description

INFOID:000000010120034

- 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

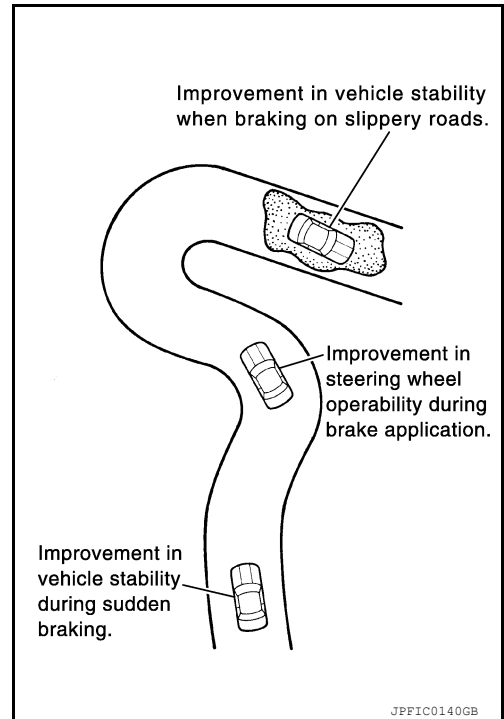
[WITH VDC]

## < SYSTEM DESCRIPTION >

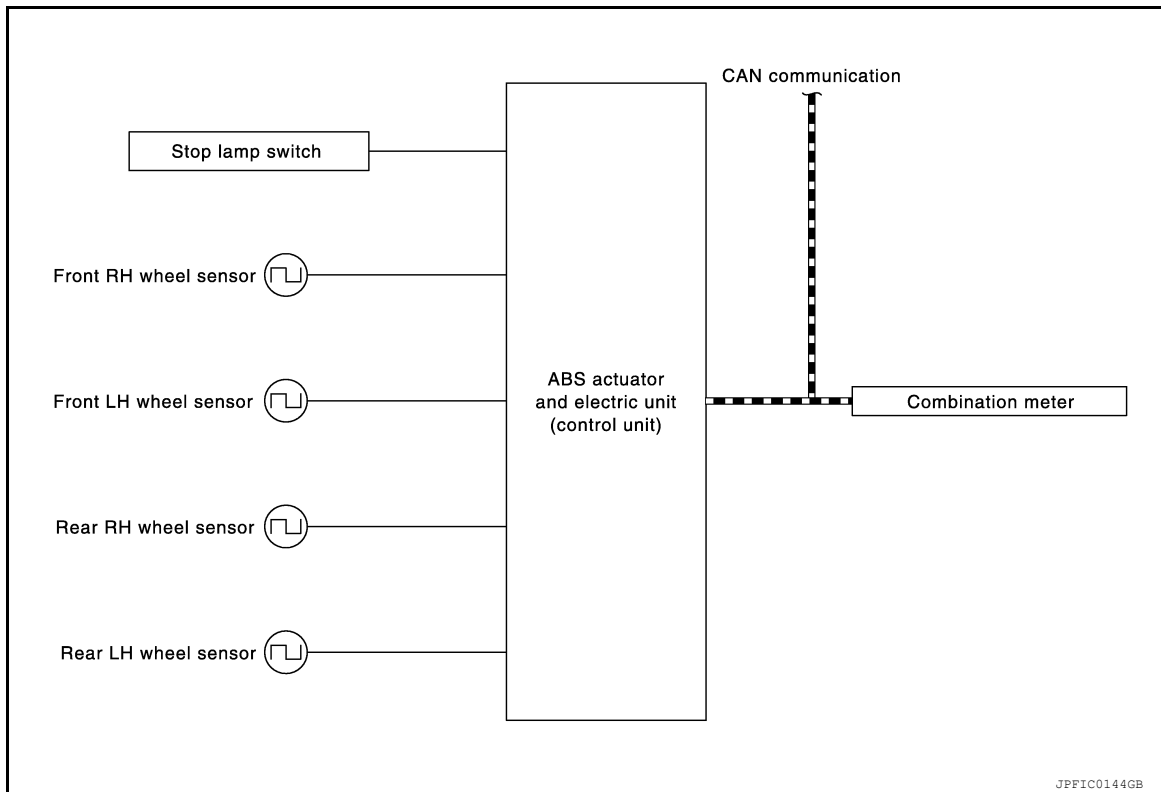
- The following effects are obtained by preventing wheel lock during braking:
  - Vehicle tail slip is prevented during braking when driving straight.
  - Understeer and oversteer tendencies are moderated during braking driving on a corner.
  - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function, 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-53](#), "[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.

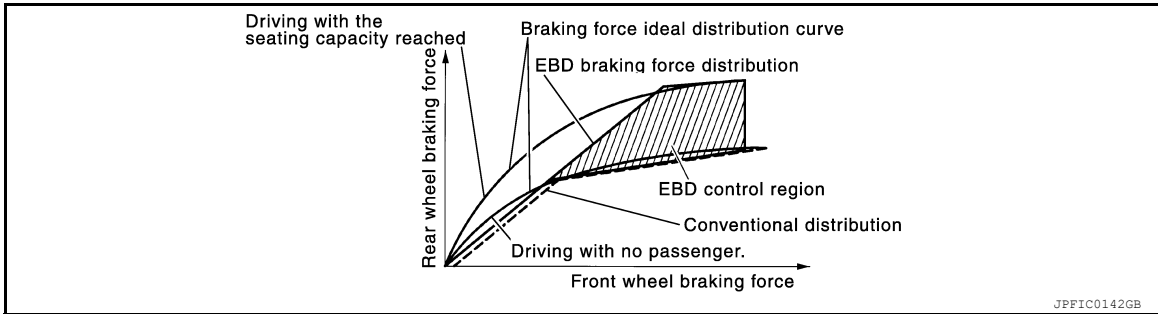
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> <li>• VDC warning lamp signal</li> <li>• ABS warning lamp signal</li> </ul>

EBD FUNCTION

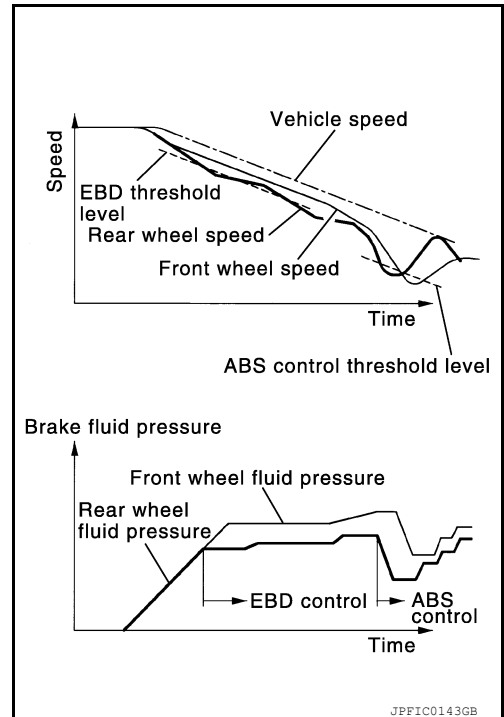
EBD FUNCTION : System Description

INFOID:000000010120035

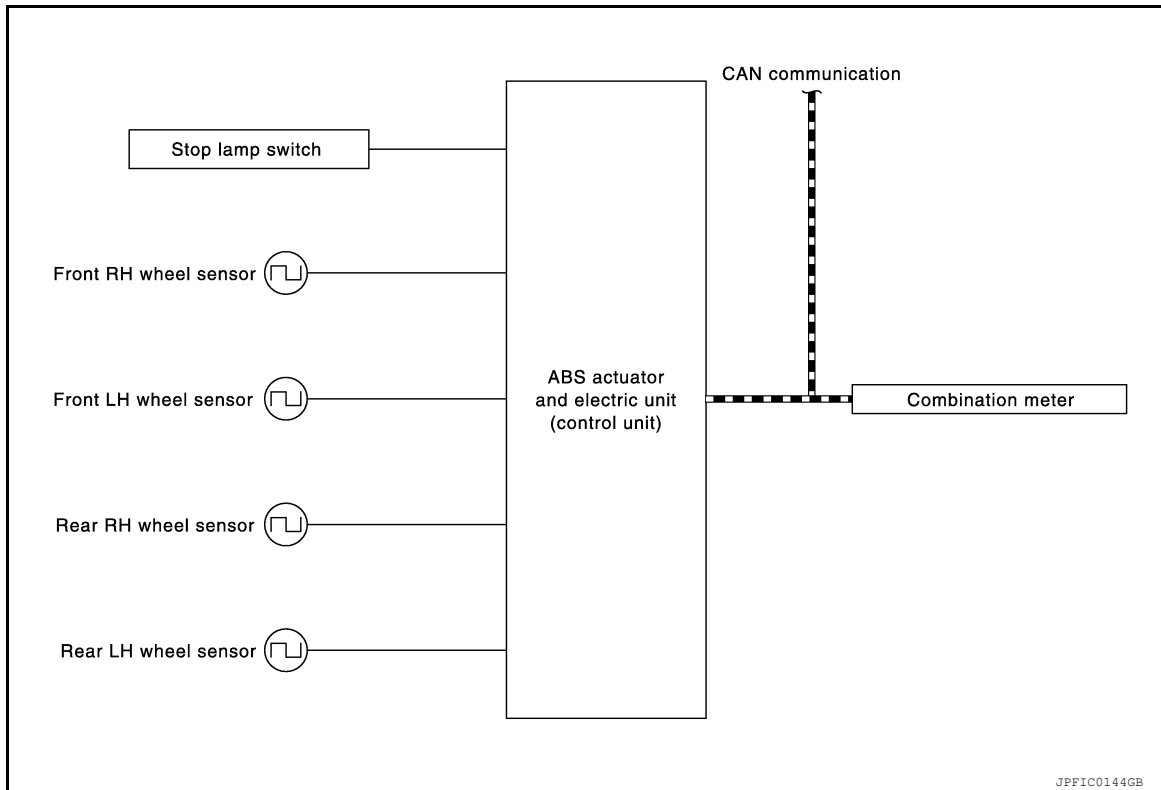
- By preventing rear wheel slip increase through rear wheel brake force (brake fluid pressure) control that is electronically controlled when slight skip on front and rear wheels are detected during braking, stability during braking is improved.
- EBD function is expanded and developed from conventional 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-53, "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	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> <li>• Brake warning lamp signal</li> </ul>

## BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

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

INFOID:0000000010120036

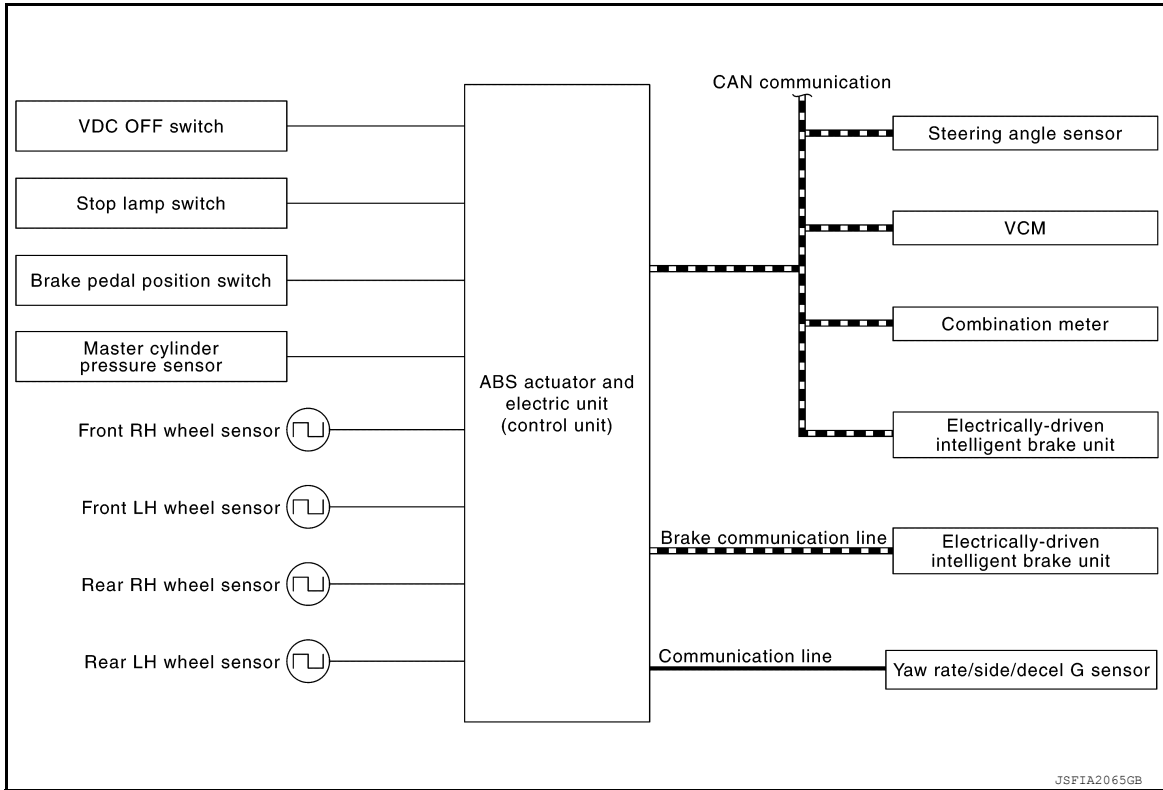
- LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved.
- Brake limited slip differential (BLSD) function operates 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-53, "Fail-safe"](#).

# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

## 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* <sup>1</sup> : <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>• 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 CAN communication line* <sup>2</sup> : <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> <li>• Brake warning lamp request signal</li> <li>• Brake system warning lamp request signal</li> </ul>
Steering angle sensor	Mainly transmits the following signal 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>• VDC warning lamp signal</li> <li>• Brake warning lamp signal</li> <li>• Brake system warning lamp signal</li> <li>• VDC OFF indicator lamp signal</li> </ul>

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

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

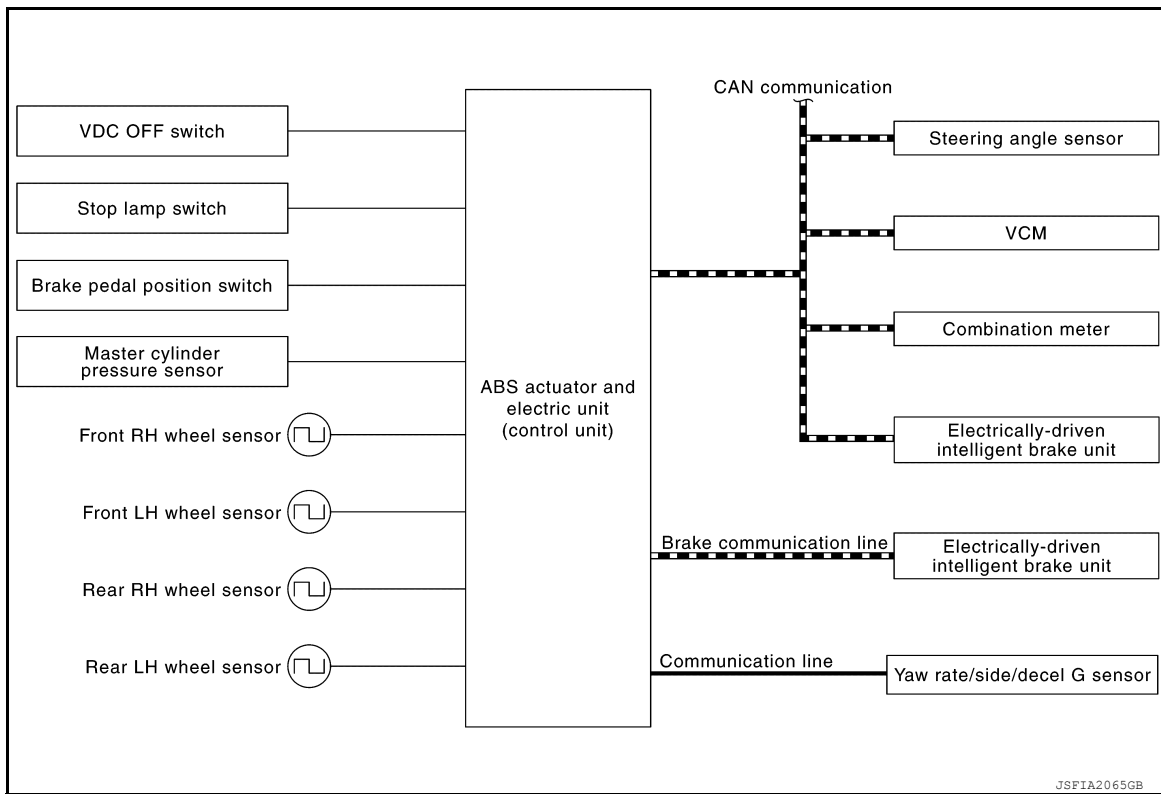
## BRAKE ASSIST FUNCTION

### BRAKE ASSIST FUNCTION : System Description

INFOID:000000010120037

- 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-53, "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>• VCM control signal</li> <li>• Shift position signal</li> </ul>

# SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

Component	Signal description
Electrically-driven intelligent brake	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication line*2: <ul style="list-style-type: none"> <li>• Electrically-driven intelligent brake control signal</li> <li>• Brake warning lamp request signal</li> <li>• Brake system warning lamp request signal</li> </ul>
Steering angle sensor	Mainly transmits the following signal 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>• VDC warning lamp signal</li> <li>• Brake warning lamp signal</li> <li>• Brake system 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: CAN communication line between electrically-driven intelligent brake unit and ABS actuator and electric unit (control unit)

## WARNING/INDICATOR/CHIME LIST




### WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp


INFOID:000000010120038

FOR U.S.A.

Name	Design	Layout/Function
ABS warning lamp	<b>ABS</b>	For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-39, "WARNING/INDICATOR/CHIME LIST : ABS Warning Lamp"</a> .
Brake warning lamp	<b>BRAKE</b>	For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-40, "WARNING/INDICATOR/CHIME LIST : Brake Warning Lamp"</a> .
VDC warning lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-43, "WARNING/INDICATOR/CHIME LIST : VDC Warning Lamp"</a> .
VDC OFF indicator lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-42, "WARNING/INDICATOR/CHIME LIST : VDC OFF Indicator Lamp"</a> .

FOR CANADA AND MEXICO

Name	Design	Layout/Function
ABS warning lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-39, "WARNING/INDICATOR/CHIME LIST : ABS Warning Lamp"</a> .
Brake warning lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-40, "WARNING/INDICATOR/CHIME LIST : Brake Warning Lamp"</a> .
VDC warning lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-43, "WARNING/INDICATOR/CHIME LIST : VDC Warning Lamp"</a> .

Name	Design	Layout/Function
VDC OFF indicator lamp		For layout: Refer to <a href="#">MWI-8, "METER SYSTEM : System Description"</a> . For function: Refer to <a href="#">BRC-42, "WARNING/INDICATOR/CHIME LIST : VDC OFF Indicator Lamp"</a> .

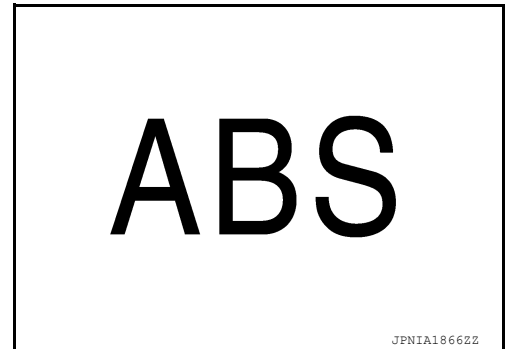
## WARNING/INDICATOR/CHIME LIST : ABS Warning Lamp

INFOID:000000010120039

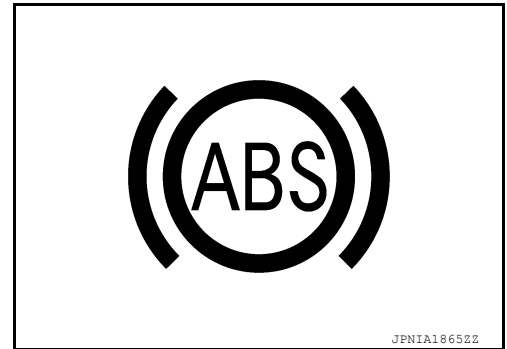
### DESIGN/PURPOSE

The ABS warning lamp warns the driver of a malfunction in the ABS function or EBD function of ABS actuator and electric unit (control unit).

- For U.S.A.



- For Canada and Mexico



### NOTE:

The ABS warning lamp may turn ON simultaneously with the brake warning lamp, VDC warning lamp. For details, refer to [BRC-16, "System Description"](#).

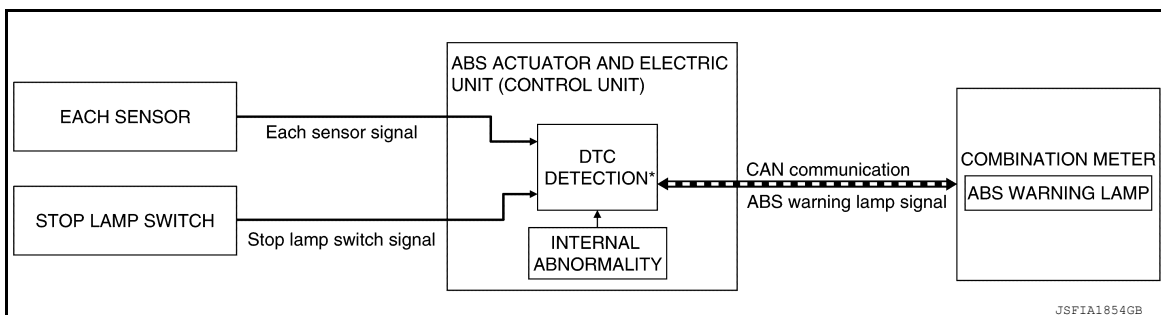
### BULB CHECK

The ABS warning lamp turns ON and stays ON for several seconds after turning ON the power switch.

### OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to [MWI-64, "Fail-Safe"](#).

### SYSTEM DIAGRAM



\*: For DTCs that the ABS warning lamp turns ON, refer to [BRC-56, "DTC Index"](#).

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

### SIGNAL PATH

- The ABS actuator and electric unit (control unit) transmits an ABS warning lamp signal to the combination meter via CAN communication when detecting a malfunction.
- The combination meter turns ON the ABS warning lamp when receiving an ABS warning lamp signal.
- For the relationship between warning lamp and DTC, refer to [BRC-56, "DTC Index"](#).

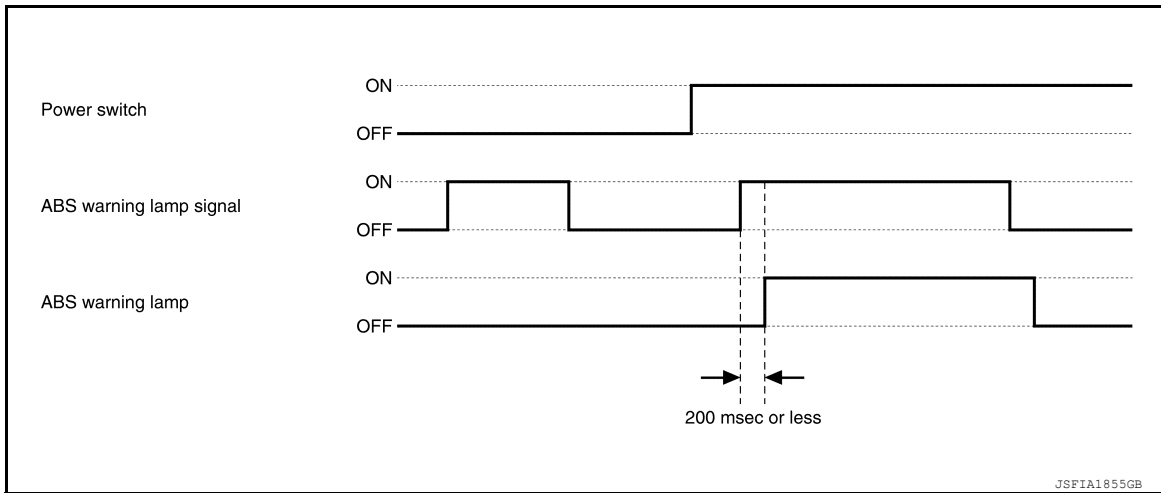
### LIGHTING CONDITION

- A malfunction is detected in the ABS function or EBD function of the ABS actuator and electric unit (control unit).
- For the relationship between warning lamp and DTC, refer to [BRC-56, "DTC Index"](#).

### SHUTOFF CONDITION

- When the condition listed below is satisfied while the power switch ON:
  - Erase DTC
  - Power switch OFF.

### TIMING CHART

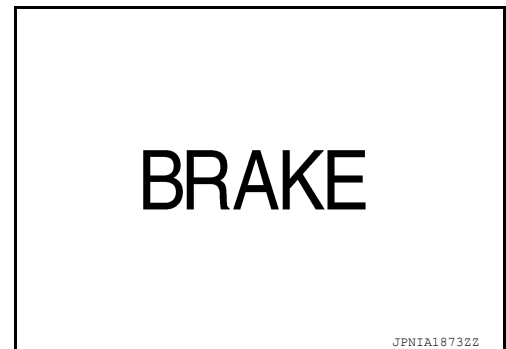


### WARNING/INDICATOR/CHIME LIST : Brake Warning Lamp

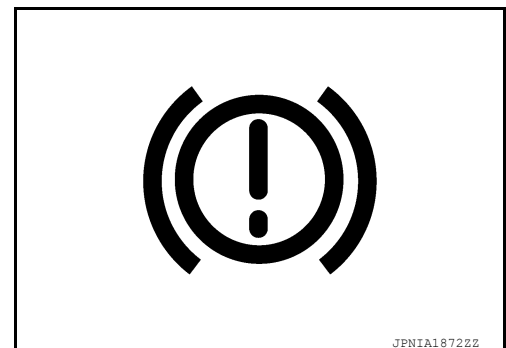
INFOID:000000010120040

### DESIGN/PURPOSE

- The brake warning lamp warns the driver of brake fluid shortages.
- For U.S.A.



- For Canada and Mexico





# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

- The brake warning lamp warns the driver that the parking brake is engaged.
- The brake warning lamp warns the driver of a malfunction in the ABS actuator and electric unit (control unit).
- The brake warning lamp warns the driver of a malfunction in the electrically-driven intelligent brake unit.

### NOTE:

The brake warning lamp may turn ON simultaneously with the ABS warning lamp, VDC warning lamp. For details, refer to [BRC-16. "System Description"](#) (ABS warning lamp, VDC warning lamp) and [BR-14. "System Description"](#) (brake system warning lamp).

### BULB CHECK

Several seconds after power switch is turned ON

### SYNCHRONIZATION WITH WARNING CHIME

YES

For warning chime, refer to [WCS-11. "PARKING BRAKE RELEASE WARNING CHIME : Parking Brake Release Warning Chime"](#).

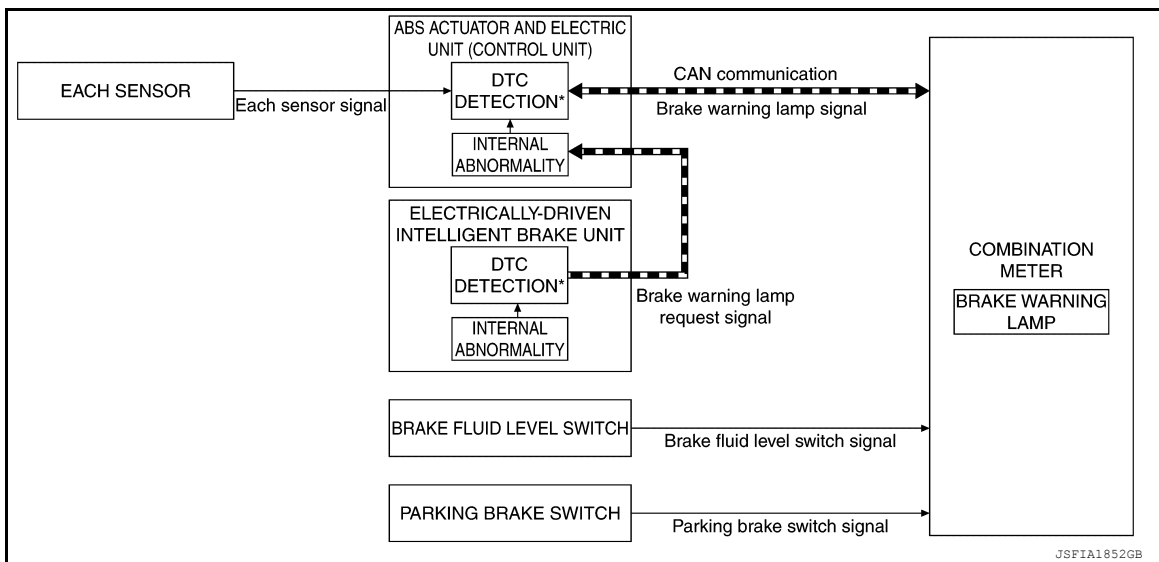
### MASTER WARNING LAMP WITH WARNING CHIME

Not applicable

### OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to [MWI-64. "Fail-Safe"](#).

### SYSTEM DIAGRAM



\*: For DTCs that the brake system warning lamp turns ON, refer to [BR-38. "DTC Index"](#) (electrically-driven intelligent brake unit) or [BRC-56. "DTC Index"](#) [ABS actuator and electric unit (control unit)].

### SIGNAL PATH

When Brake Fluid Is Insufficient:

The combination meter turns ON/OFF the brake warning lamp, according to the ON/OFF state of the brake fluid level switch.

When Operating The Parking Brake:

The combination meter turns ON/OFF the brake warning lamp, according to the ON/OFF state of the parking brake switch.

When The EBD Function Is In Abnormal State:

- The ABS actuator and electric unit (control unit) transmits a brake warning lamp signal to the combination meter via CAN communication when detecting a malfunction in the EBD function.
- The combination meter turns ON the brake warning lamp when receiving a brake warning lamp signal.
- For the relationship between warning lamp and DTC, refer to [BRC-56. "DTC Index"](#).

When The Electrically-driven Intelligent Brake Unit Is In Abnormal State:

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

- The electrically-driven intelligent brake unit transmits a brake warning lamp request signal to the ABS actuator and electric unit (control unit) via CAN communication when detecting a malfunction in the electrically-driven intelligent brake unit.
- The ABS actuator and electric unit (control unit) receiving a brake warning lamp request signal, and transmits a brake system warning lamp signal to the combination meter via CAN communication.
- The combination meter turns ON the brake system warning lamp when receiving a brake system warning lamp signal.
- For the relationship between warning lamp and DTC, refer to [BR-38, "DTC Index"](#).

## LIGHTING CONDITION

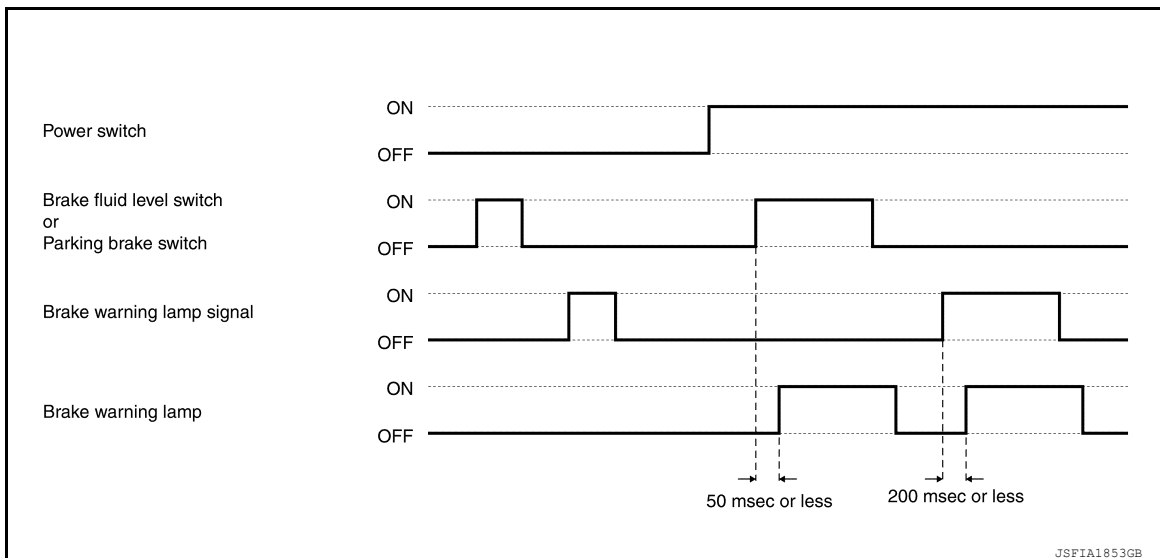
When any of the condition listed below is satisfied while the power switch ON:

- Brake fluid level switch ON.
- Parking switch ON.
- A malfunction is detected in the EBD function of the ABS actuator and electric unit (control unit).
- A malfunction is detected in the electrically-driven intelligent brake unit.
- For the relationship between warning lamp and DTC, refer to [BR-38, "DTC Index"](#) (electrically-driven intelligent brake unit) or [BRC-56, "DTC Index"](#) [ABS actuator and electric unit (control unit)].

## SHUTOFF CONDITION

- When the condition listed below is satisfied while the power switch ON:
  - Brake fluid level switch is OFF.
  - Parking brake switch is OFF.
  - Erase DTC
- Power switch OFF

## TIMING CHART



## WARNING/INDICATOR/CHIME LIST : VDC OFF Indicator Lamp

INFOID:000000010120041

## DESIGN/PURPOSE

The VDC OFF indicator lamp warns the driver that VDC function and TCS function are OFF.



## BULB CHECK

The VDC OFF indicator lamp turns ON and stays ON for several seconds after turning ON the power switch.

# SYSTEM

[WITH VDC]

< SYSTEM DESCRIPTION >

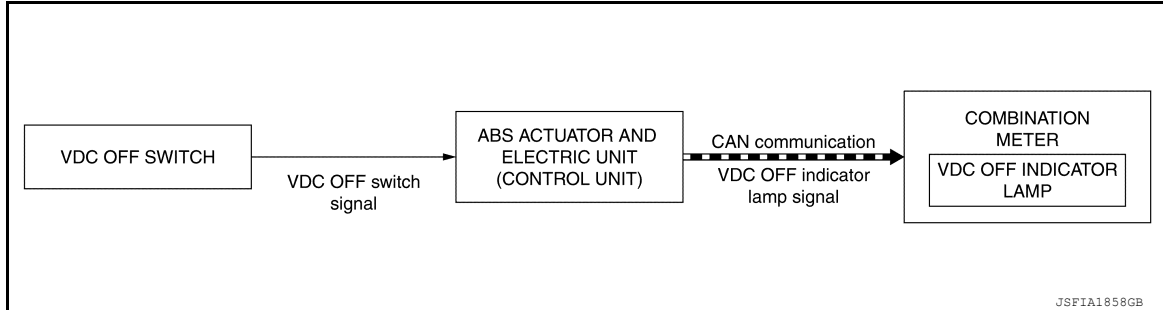
## SYNCHRONIZATION WITH MASTER WARNING LAMP

Not applicable

## OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to [BRC-56, "DTC Index"](#).

## SYSTEM DIAGRAM



## SIGNAL PATH

- The ABS actuator and electric unit (control unit) receives a VDC OFF switch signal from the VDC OFF switch.
- The ABS actuator and electric unit (control unit) transmits a VDC OFF indicator lamp signal to the combination meter via CAN communication according to the received VDC OFF switch signal.
- The combination meter turns ON the VDC OFF indicator lamp when receiving a VDC OFF indicator lamp signal.

## LIGHTING CONDITION

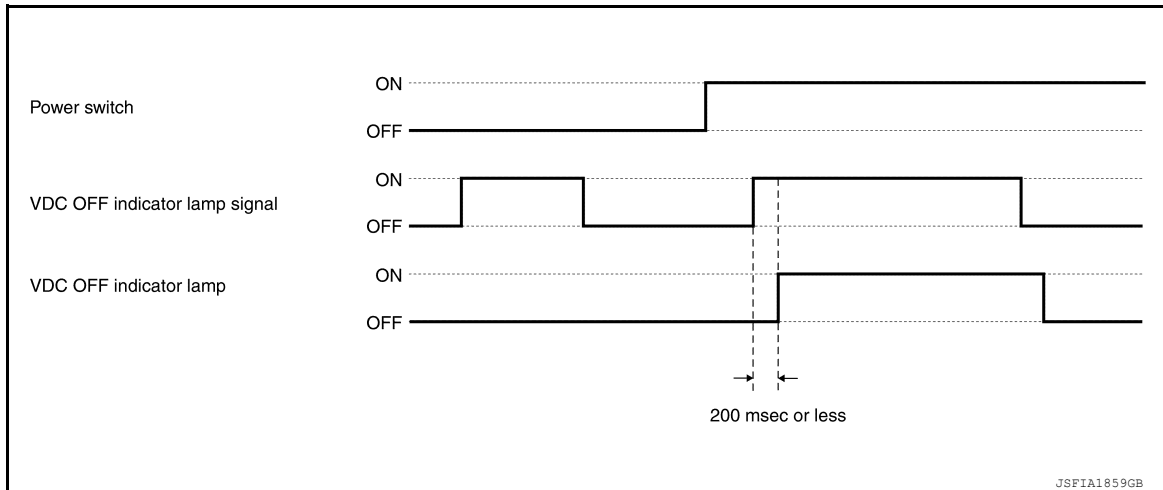
When all of the condition listed below are satisfied:

- Power switch ON
- VDC OFF switch ON (VDC function and TCS function non-operational status)

## SHUTOFF CONDITION

- When the condition listed below is satisfied while the power switch ON:
  - VDC OFF switch OFF (VDC function and TCS function standby status)
- Power switch OFF

## TIMING CHART



## WARNING/INDICATOR/CHIME LIST : VDC Warning Lamp

INFOID:000000010120042

## DESIGN/PURPOSE

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

- When VDC function, TCS function, or brake limited slip differential (BLSD) function is activated, the VDC warning lamp blinks to inform the driver of the activation of the function.
- When VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function, or brake assist function of the ABS actuator and electric unit (control unit) has a malfunction, the VDC warning lamp turns ON to warn the driver of the malfunction.

### NOTE:

The VDC warning lamp may turn ON when the brake warning lamp or ABS warning lamp turns ON. For details, refer to [BRC-16, "System Description"](#).



## BULB CHECK

The VDC warning lamp turns ON and stays ON for approximately one second after turning ON the power switch.

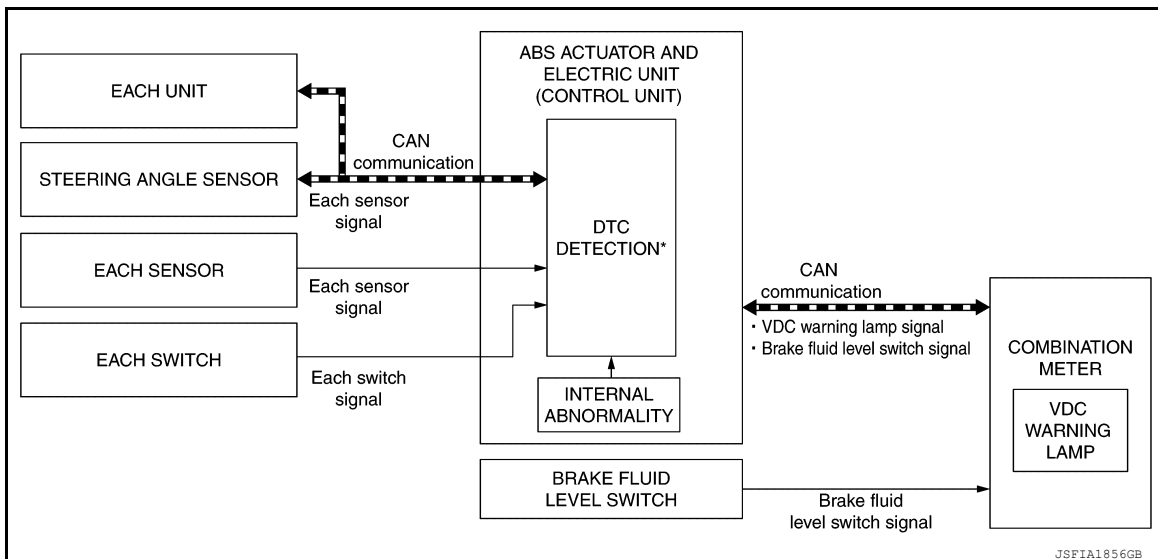
## SYNCHRONIZATION WITH MASTER WARNING LAMP

Not applicable

## OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to [MWI-64, "Fail-Safe"](#).

## SYSTEM DIAGRAM



\*: For DTCs that the VDC warning lamp turns ON, refer to [BRC-56, "DTC Index"](#).

## SIGNAL PATH

When Operating VDC Function, TCS Function, Brake Limited Slip Differential (BLSD) Function:

- The ABS actuator and electric unit (control unit) transmits a VDC warning lamp signal to the combination meter via CAN communication when operating in the VDC function, TCS function, or brake limited slip differential (BLSD) function.
- The combination meter blinks the VDC warning lamp when receiving a VDC warning lamp signal.

When VDC Function, TCS Function, Brake Limited Slip Differential (BLSD) Function, Brake Assist Function Are In Abnormal State:

- The ABS actuator and electric unit (control unit) transmits a VDC warning lamp signal to the combination meter via CAN communication when detecting a malfunction in the VDC function, TCS function, brake limited slip differential (BLSD) function, or brake assist function.
- The combination meter turns ON the VDC warning lamp when receiving a VDC warning lamp signal.
- For the relationship between warning lamp and DTC, refer to [BRC-56, "DTC Index"](#).

## LIGHTING CONDITION

## LIGHTING CONDITION

# SYSTEM

[WITH VDC]

## < SYSTEM DESCRIPTION >

- A malfunction is detected in the VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function, or brake assist function of the ABS actuator and electric unit (control unit).
- For the relationship between warning lamp and DTC, refer to [BRC-56. "DTC Index"](#).

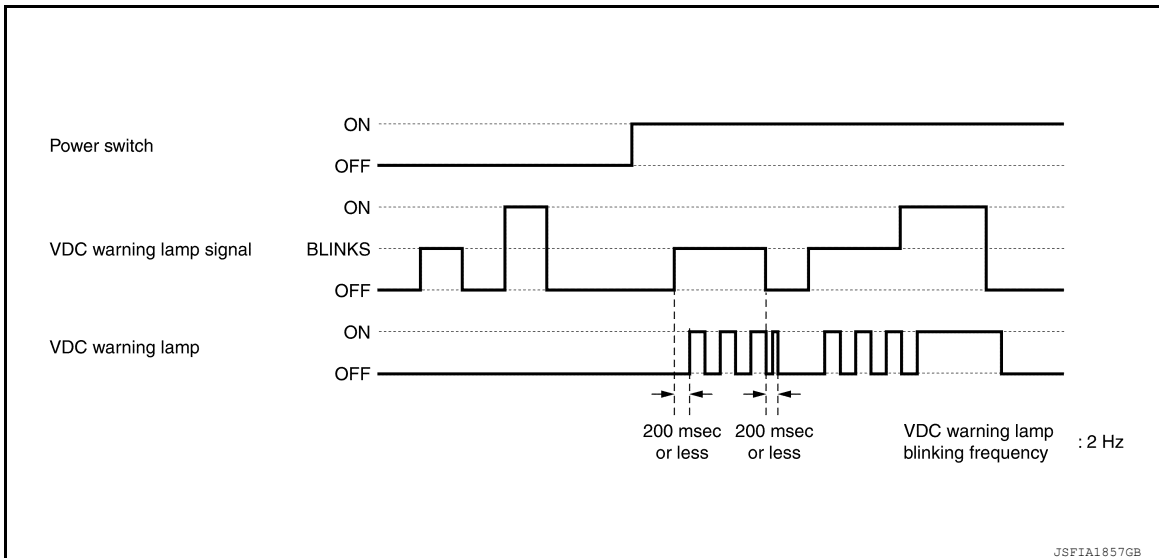
### BLINKING CONDITION

When VDC function, TCS function, or brake limited slip differential (BLSD) function is under operating conditions.

### SHUTOFF CONDITION

- When the condition listed below is satisfied while the power switch ON:
  - Erase DTC
  - When VDC function, TCS function, or brake limited slip differential (BLSD) function is not under operating conditions.
- Power switch OFF.

### TIMING CHART



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

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:000000010120043

### 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-56, "DTC Index"](#).

When "CRNT" is displayed on "Self Diagnostic Result"

- The system is presently malfunctioning.

When "PAST" is displayed on "Self Diagnostic 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

#### NOTE:

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

×: Applicable

Item (Unit)	Monitor 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.

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

< SYSTEM DESCRIPTION >

[WITH VDC]

Item (Unit)	Monitor item selection		Note	
	ECU INPUT SIGNALS	MAIN SIGNALS		
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.	A
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position	B
SIDE G-SENSOR (m/s <sup>2</sup> )	×		Side G detected by side G sensor is displayed.	C
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	D
DECEL G-SEN (G)	×	×	Decel G detected by decel G sensor is displayed.	E
STR ANGLE SIG (deg)	×		Steering angle detected by steering angle sensor is displayed.	E
PRESS SENSOR (bar)	×		Fluid pressure detected by master cylinder pressure sensor is displayed.	E
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.	E
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.	G
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.	G
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.	H
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.	H
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.	I
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.	I
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.	J
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.	J
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. *	K
STOP LAMP SW (On/Off)	×	×	Stop lamp switch operation status is displayed.	L
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. *	L
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.	M
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.	M
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. *	N
OFF SW (On/Off)	×	×	VDC OFF switch operation status is displayed.	O
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status is displayed. *	O
EBD SIGNAL (On/Off)			EBD operation status is displayed.	P
ABS SIGNAL (On/Off)			ABS operation status is displayed.	P

BRC

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

< SYSTEM DESCRIPTION >

[WITH VDC]

Item (Unit)	Monitor item selection		Note
	ECU INPUT SIGNALS	MAIN SIGNALS	
TCS SIGNAL (On/Off)			TCS operation status is displayed.
VDC SIGNAL (On/Off)			VDC operation status is displayed.
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.
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)			Brake pedal position 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 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:000000010120044

#### CONSULT DATA MONITOR STANDARD VALUE

##### NOTE:

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

Monitor item	Condition	Reference values in normal operation
FR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within ±10%)
FR RH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within ±10%)
RR LH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within ±10%)
RR RH SENSOR	Vehicle stopped	0.00 km/h (MPH)
	When driving straight ahead*1	Nearly matches the speedometer display (within ±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±2.5°
	When steering wheel is steered to RH by 90°	Approx. +90°
	When steering wheel is steered to LH 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

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Monitor item	Condition	Reference values in normal operation
FR LH OUT SOL *2	Active	On
	Not activated	Off
RR RH IN SOL *2	Active	On
	Not activated	Off
RR RH OUT SOL *2	Active	On
	Not activated	Off
RR LH IN SOL *2	Active	On
	Not activated	Off
RR LH OUT SOL *2	Active	On
	Not activated	Off
EBD WARN LAMP	When brake warning lamp is ON*3	On
	When brake warning lamp is OFF*3	Off
STOP LAMP SW	Brake pedal depressed	On
	Brake pedal not depressed	Off
ABS WARN LAMP	When ABS warning lamp is ON*3	On
	When ABS warning lamp is OFF*3	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*3	On
	When VDC OFF indicator lamp is OFF*3	Off
OFF SW	VDC OFF switch ON	On
	VDC OFF switch OFF	Off
SLIP/VDC LAMP	When VDC warning lamp is ON*3	On
	When VDC warning lamp is OFF*3	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

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Monitor item	Condition	Reference values in normal operation
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off
P POSI SIG	When selector lever is in the P position	On
	When selector lever is in the other position than P	Off
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:000000010120045

## 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	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>
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	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>
C1142	
C1143	
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	• VDC function	B
	• TCS function	
C1164	• ABS function	C
	• Brake limited slip differential (BLSD) function	
C1165	• Brake assist function	D
	• EBD function	
C1166	• Brake limited slip differential (BLSD) function	E
	• Brake assist function	
C1167	• VDC function	E
	• TCS function	
C1176	• Brake limited slip differential (BLSD) function	BRC
	• Brake assist function	
C118A	The following functions are suspended:	G
	• VDC function	
C118C	• TCS function	H
	• ABS function	
U1000	• EBD function	I
	• Brake limited slip differential (BLSD) function	
U1010	• Brake assist function	J
	• VDC function	
U110D	• TCS function	K
	• ABS function	
U110D	• EBD function	L
	• Brake limited slip differential (BLSD) function	
U110D	• Brake assist function	M
	• VDC function	

## DTC Inspection Priority Chart

INFOID:0000000010120046

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

Priority	Detected item (DTC)	
1	• U1000 CAN COMM CIRCUIT	N
	• U1010 CONTROL UNIT (CAN)	
	• U110D E-DRIVEN INTELLIGENT BRAKE COMM	
2	• C1110 CONTROLLER FAILURE	
3	• C1144 ST ANG SEN SIGNAL	O
	• C118A E-DRIVEN INTELLIGENT BRAKE SYSTEM	
	• C118C EV/HEV SYSTEM	
4	• C1109 BATTERY VOLTAGE [ABNORMAL]	P
	• C1111 PUMP MOTOR	
	• C1140 ACTUATOR RLY	

# 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:000000010120047

DTC	Display Item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Reference
C1101	RR RH SENSOR-1	ON	ON	OFF	<a href="#">BRC-73, "DTC Logic"</a>
C1102	RR LH SENSOR-1	ON	ON	OFF	
C1103	FR RH SENSOR-1	ON	ON	OFF	
C1104	FR LH SENSOR-1	ON	ON	OFF	
C1105	RR RH SENSOR-2	ON	ON	OFF	<a href="#">BRC-77, "DTC Logic"</a>
C1106	RR LH SENSOR-2	ON	ON	OFF	
C1107	FR RH SENSOR-2	ON	ON	OFF	
C1108	FR LH SENSOR-2	ON	ON	OFF	
C1109	BATTERY VOLTAGE [ABNORMAL]	ON	ON	ON	<a href="#">BRC-79, "DTC Logic"</a>
C1110	CONTROLLER FAILURE	ON	ON	ON	<a href="#">BRC-81, "DTC Logic"</a>
C1111	PUMP MOTOR	ON	ON	OFF	<a href="#">BRC-82, "DTC Logic"</a>
C1113	G-SENSOR	ON	OFF	OFF	<a href="#">BRC-85, "DTC Logic"</a>
C1115	ABS SENSOR [ABNORMAL SIGNAL]	ON	ON	ON	<a href="#">BRC-89, "DTC Logic"</a>
C1116	STOP LAMP SW	ON	OFF	OFF	<a href="#">BRC-96, "DTC Logic"</a>
C1120	FR LH IN ABS SOL	ON	ON	ON	<a href="#">BRC-101, "DTC Logic"</a>
C1121	FR LH OUT ABS SOL	ON	ON	ON	<a href="#">BRC-103, "DTC Logic"</a>
C1122	FR RH IN ABS SOL	ON	ON	ON	<a href="#">BRC-101, "DTC Logic"</a>
C1123	FR RH OUT ABS SOL	ON	ON	ON	<a href="#">BRC-103, "DTC Logic"</a>
C1124	RR LH IN ABS SOL	ON	ON	ON	<a href="#">BRC-101, "DTC Logic"</a>
C1125	RR LH OUT ABS SOL	ON	ON	ON	<a href="#">BRC-103, "DTC Logic"</a>



# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

DTC	Display Item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Reference
C1126	RR RH IN ABS SOL	ON	ON	ON	<a href="#">BRC-101, "DTC Logic"</a>
C1127	RR RH OUT ABS SOL	ON	ON	ON	<a href="#">BRC-103, "DTC Logic"</a>
C1140	ACTUATOR RLY	ON	ON	ON	<a href="#">BRC-105, "DTC Logic"</a>
C1142	PRESS SEN CIRCUIT	ON	OFF	OFF	<a href="#">BRC-107, "DTC Logic"</a>
C1143	ST ANG SEN CIRCUIT	ON	OFF	OFF	<a href="#">BRC-110, "DTC Logic"</a>
C1144	ST ANG SEN SIGNAL	ON	OFF	OFF	<a href="#">BRC-113, "DTC Logic"</a>
C1145	YAW RATE SENSOR	ON	OFF	OFF	<a href="#">BRC-85, "DTC Logic"</a>
C1146	SIDE G-SEN CIRCUIT	ON	OFF	OFF	
C1155	BR FLUID LEVEL LOW	ON	OFF	OFF	<a href="#">BRC-115, "DTC Logic"</a>
C1164	CV 1	ON	ON	ON	<a href="#">BRC-119, "DTC Logic"</a>
C1165	CV 2	ON	ON	ON	
C1166	SV 1	ON	ON	ON	<a href="#">BRC-121, "DTC Logic"</a>
C1167	SV 2	ON	ON	ON	
C1176	STOP LAMP SW2	ON	OFF	OFF	<a href="#">BRC-123, "DTC Logic"</a>
C118A	E-DRIVEN INTELLIGENT BRAKE SYSTEM	ON	ON	ON	<a href="#">BRC-128, "DTC Logic"</a>
C118C	EV/HEV SYSTEM	ON	OFF	OFF	<a href="#">BRC-130, "DTC Logic"</a>
U1000	CAN COMM CIRCUIT	ON	OFF	OFF	<a href="#">BRC-132, "DTC Logic"</a>
U1010	CONTROL UNIT (CAN)	ON	OFF	OFF	<a href="#">BRC-133, "DTC Logic"</a>
U110D	E-DRIVEN INTELLIGENT BRAKE COMM	ON	ON	ON	<a href="#">BRC-134, "DTC Logic"</a>

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# BRAKE CONTROL SYSTEM

[WITH VDC]

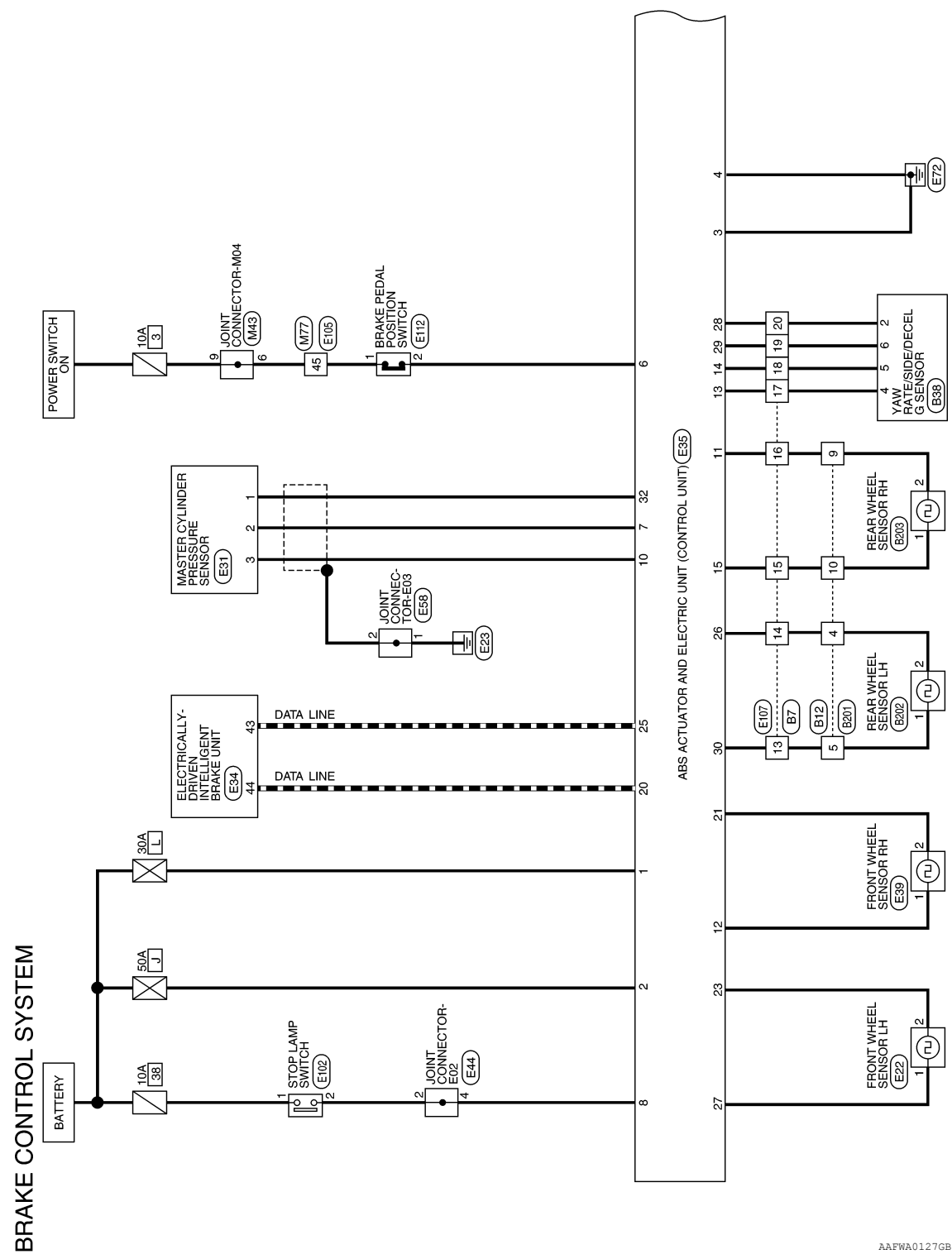
< WIRING DIAGRAM >

## WIRING DIAGRAM

### BRAKE CONTROL SYSTEM

Wiring Diagram

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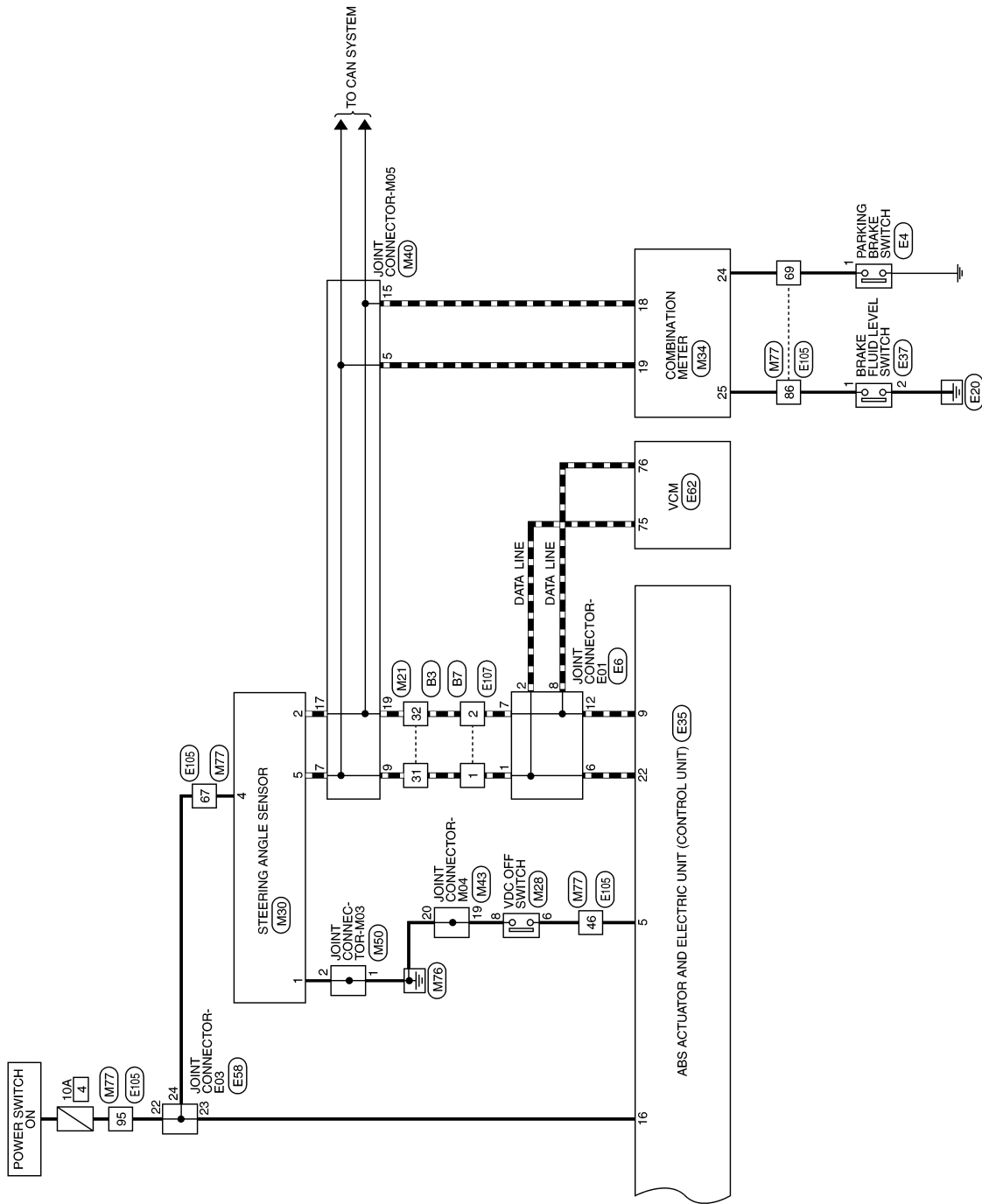


AAFWA0127GB

# BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]



AAFWA0128GB

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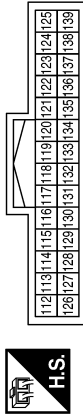
# BRAKE CONTROL SYSTEM

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[WITH VDC]

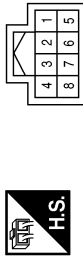
## BRAKE CONTROL SYSTEM CONNECTORS

Connector No.	M21
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
31	L	-
32	P	-

Connector No.	M28
Connector Name	VDC OFF SWITCH
Connector Color	BLACK



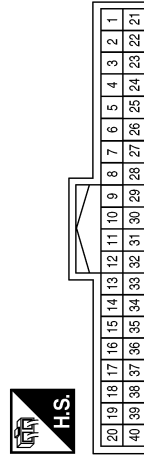
Terminal No.	Color of Wire	Signal Name
6	R	-
8	B	-

Connector No.	M30
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE



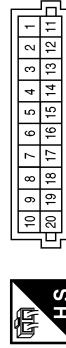
Terminal No.	Color of Wire	Signal Name
1	B	-
2	P	-
4	R	-
5	L	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Color	WHITE



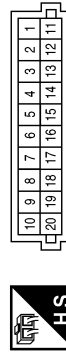
Terminal No.	Color of Wire	Signal Name
18	P	-
19	L	-
24	BG	-
25	B	-

Connector No.	M40
Connector Name	JOINT CONNECTOR-M05
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
5	L	-
7	L	-
9	L	-
15	P	-
17	P	-
19	P	-

Connector No.	M43
Connector Name	JOINT CONNECTOR-M04
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
6	Y	-
9	W	-
19	B	-
20	B	-

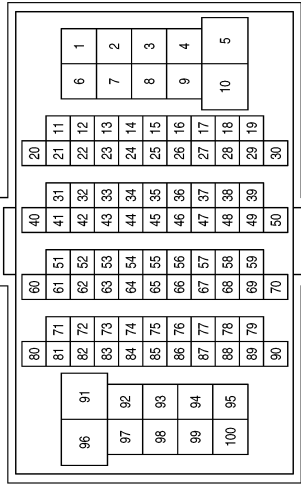
# BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

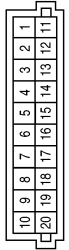
[WITH VDC]

Terminal No.	Color of Wire	Signal Name
45	Y	-
46	R	-
67	R	-
69	BG	-
86	B	-
95	L	-

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	M50
Connector Name	JOINT CONNECTOR-M03
Connector Color	PINK



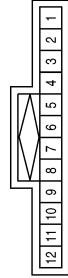
Terminal No.	Color of Wire	Signal Name
1	B	-
2	B	-

Connector No.	E22
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	R	-

Connector No.	E6
Connector Name	JOINT CONNECTOR-E01
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
6	L	-
7	P	-
8	P	-
12	P	-

Connector No.	E4
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	-

AAPIA0234GB

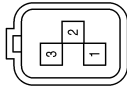
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# BRAKE CONTROL SYSTEM

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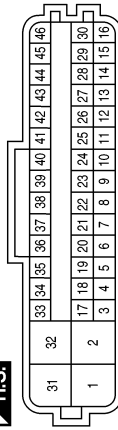
[WITH VDC]

Connector No.	E31
Connector Name	MASTER CYLINDER PRESSURE SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L/O	-
2	L/Y	-
3	W/L	-

Connector No.	E34
Connector Name	ELECTRICALLY DRIVEN INTELLIGENT BRAKE UNIT
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
43	W	CAN-L
44	L	CAN-H

Connector No.	E35
Connector Name	ABS ACTUATOR AND ELECTRONIC UNIT (CONTROL UNIT)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	G	MOTOR BATTERY
2	R	SOL BATTERY
3	B	GND
4	B	GND
5	P	VDC OFF SW
6	O	BLS (BNC)

Terminal No.	Color of Wire	Signal Name
7	L/Y	PRESS-SEN SIGNAL
8	SB	BLS (BNO)
9	P	CAN-L
10	W/L	PRESS-SEN VCC
11	BR	RR-RH SENSOR VB
12	W	FR-RH SENSOR
13	G	COMBINE VCC
14	B	COMBINE S (+)
15	LG	RR-RH SENSOR
16	V	IGN SW
17	-	-
18	-	-
19	-	-
20	L	CAN-H
21	B	FR-RH SENSOR VB

Terminal No.	Color of Wire	Signal Name
22	L	CAN-H
23	R	FR-LH SENSOR VB
24	-	-
25	W	CAN-L
26	B	RR-LH SENSOR VB
27	Y	FR-LH SENSOR
28	R	COMBINE GND
29	Y	COMBINE S (-)
30	G	RR-LH SENSOR
31	-	-
32	L/O	PRESS-SEN GND

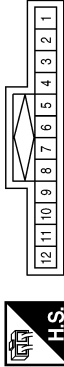
AAFIA0235GB

# BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

Connector No.	E44
Connector Name	JOINT CONNECTOR-E02
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
2	SB	-
4	SB	-

Connector No.	E39
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W	-
2	B	-

Connector No.	E37
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Color	GRAY



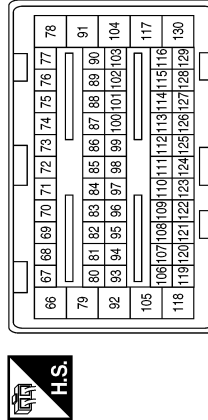
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	B/W	-

Connector No.	E102
Connector Name	STOP LAMP SWITCH
Connector Color	WHITE



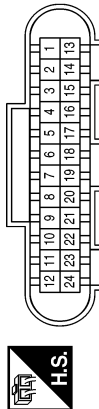
Terminal No.	Color of Wire	Signal Name
1	W	-
2	SB	-

Connector No.	E62
Connector Name	VCM
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
75	L	-
76	P	-

Connector No.	E58
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	SHIELD	-

AAPIA0236GB

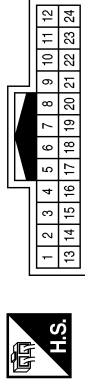
A  
B  
C  
D  
E  
BRC  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

# BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

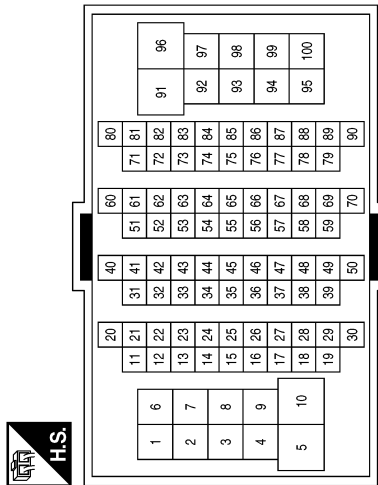
Connector No.	E107
Connector Name	WIRE TO WIRE
Connector Color	WHITE



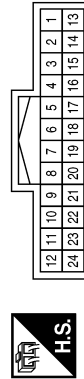
Terminal No.	Color of Wire	Signal Name
1	L	-
2	P	-
13	G	-
14	B	-
15	LG	-
16	BR	-
17	G	-
18	B	-
19	Y	-
20	R	-

Terminal No.	Color of Wire	Signal Name
45	G	-
46	P	-
67	V	-
69	B	-
86	BR	-
95	V	-

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Color	WHITE

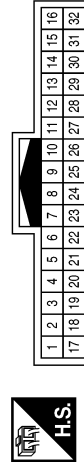


Connector No.	B7
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	P	-

Connector No.	B3
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
31	L	-
32	P	-

Connector No.	E112
Connector Name	BRAKE PEDAL POSITION SWITCH
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	G	-
2	O	-

AAPFA0237GB



# BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

Connector No.	B201
Connector Name	WIRE TO WIRE
Connector Color	BLACK



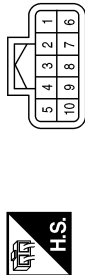
Terminal No.	Color of Wire	Signal Name
4	B	-
5	GR	-
9	BR	-
10	LG	-

Connector No.	B38
Connector Name	YAW RATE/SIDE/DECEL G SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
2	R	-
4	G	-
5	B	-
6	Y	-

Connector No.	B12
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
4	B	-
5	G	-
9	BR	-
10	LG	-

Connector No.	B203
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	BR	-

Connector No.	B202
Connector Name	REAR WHEEL SENSOR LH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	GR	-
2	B	-

AAPIA0238GB

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

## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

#### Work Flow

INFOID:0000000010120049

#### DETAILED FLOW

#### 1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [BRC-67, "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".**

&gt;&gt; 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-53, "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.**

&gt;&gt; GO TO 3.

#### 3. PERFORM SELF DIAGNOSTIC RESULT

Ⓟ 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 Diagnostic Result".

Is any DTC detected?

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

NO &gt;&gt; GO TO 6.

#### 4. RECHECK SYMPTOM

Ⓟ With CONSULT

1. Erase "Self Diagnostic 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.**

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-55, "DTC Inspection Priority Chart"](#) [ABS actuator and electric unit (control unit)].

Is any DTC detected?

YES &gt;&gt; GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-53, "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” of “ABS”.
- CAUTION:**
- Turn the power switch OFF → ON → OFF after erase “Self Diagnostic 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-53](#).  
"Intermittent Incident".

## 7. FINAL CHECK

☑ With CONSULT

1. Check the reference value of “ABS”.
2. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> Inspection End.

## Diagnostic Work Sheet

INFOID:000000010120050

### 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 conditions	<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:000000010120051

When replaced the ABS actuator and electric unit (control unit), Perform steering angle sensor neutral position. Refer to [BRC-70, "Work Procedure"](#).

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

# ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

### Description

INFOID:000000010120052

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:000000010120053

#### 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±2.5°**

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. Refer to [ST-33, "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. Refer to [ST-16, "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±2.5°**

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.
  - 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.

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

BRC

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

[WITH VDC]

< BASIC INSPECTION >

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 DIAGNOSTIC MEMORY

---

Ⓜ With CONSULT

1. Erase "Self Diagnostic 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 Diagnostic Result".



# C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## DTC/CIRCUIT DIAGNOSIS

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

#### DTC Logic

INFOID:000000010435994

#### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1101	RR RH SENSOR-1	<ul style="list-style-type: none"><li>When power supply voltage of rear wheel sensor RH is low.</li><li>When an open or shorted circuit is detected in rear wheel sensor RH circuit.</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></ul>
C1102	RR LH SENSOR-1	<ul style="list-style-type: none"><li>When power supply voltage of rear wheel sensor LH is low.</li><li>When an open or shorted circuit is detected in rear wheel sensor LH circuit.</li></ul>	
C1103	FR RH SENSOR-1	<ul style="list-style-type: none"><li>When power supply voltage of front wheel sensor RH is low.</li><li>When an open or shorted circuit is detected in front wheel sensor RH circuit.</li></ul>	
C1104	FR LH SENSOR-1	<ul style="list-style-type: none"><li>When power supply voltage of front wheel sensor LH is low.</li><li>When an open or shorted circuit is detected in front wheel sensor LH circuit.</li></ul>	

#### DTC CONFIRMATION PROCEDURE

##### 1. CHECK SELF DIAGNOSTIC RESULT

ⓐ With CONSULT.

- Start engine and drive vehicle at approximately 21 km/h (13 MPH) or more for approximately 5 minutes.
- Perform "Self Diagnostic Result".

Is DTC C1101, C1102, C1103 or C1104 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-73. "Diagnosis Procedure"](#).  
NO >> Inspection End.

#### Diagnosis Procedure

INFOID:000000010435995

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

##### 1. CONFIRM DTC

ⓐ With CONSULT

- Perform "Self Diagnostic Result" of "ABS" and record all active DTCs.
- Clear all DTCs.
- Perform DTC confirmation procedure. Refer to [BRC-73. "DTC Logic"](#).

Does DTC C1101, C1102, C1103 or C1104 reset?

- YES >> GO TO 2.  
NO >> Refer to [GI-53. "Intermittent Incident"](#).

##### 2. INSPECT WHEEL SENSOR

Inspect the suspect wheel sensor for damage or deformation.

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair or replace as necessary.

##### 3. HARNESS AND CONNECTOR INSPECTION

# C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

1. Disconnect ABS actuator and electric unit (control unit) connector E35 and wheel sensor connector of suspect wheel.
2. Check harness, connectors and terminals for corrosion, deformation, disconnection, looseness or damage.

### Is the inspection result normal?

- YES >> GO TO 4.  
 NO >> Repair or replace as necessary.

## 4. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741-A) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.

### **NOTE:**

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal.

### **NOTE:**

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

### Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 5.  
 NO >> Replace the wheel sensor. Refer to [BRC-158, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-159, "REAR WHEEL SENSOR : Removal and Installation"](#).

## 5. CHECK WIRING HARNESS FOR SHORT TO VOLTAGE

1. Turn power switch ON.
2. Check voltage between wheel sensor harness connector terminals of suspect wheel and ground.

Wheel Sensor			Ground	Voltage
Wheel	Connector	Terminal		
Front LH	E22	1	—	0V
		2		
Front RH	E39	1		
		2		
Rear LH	B202	1		
		2		
Rear RH	B203	1		
		2		

### Is the inspection result normal?

- YES >> GO TO 6.  
 NO >> Repair the circuit.

## 6. CHECK WIRING HARNESS FOR SHORT TO GROUND

1. Turn power switch OFF.
2. Check continuity between wheel sensor harness connector terminals of suspect wheel and ground.

Wheel Sensor			Ground	Continuity
Wheel	Connector	Terminal		

# C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Front LH	E22	1	—	No	A									
		2												
Front RH	E39	1				—	No	B						
		2												
Rear LH	C202	1							—	No	C			
		2												
Rear RH	C203	1										—	No	D
		2												

**Is the inspection result normal?**

YES >> GO TO 7.

NO >> Repair the circuit.

## 7. CHECK WIRING HARNESS FOR SHORT BETWEEN CIRCUITS

Check continuity between wheel sensor harness connector terminals of suspect wheel.

Wheel Sensor		(+)	(-)	Continuity
Wheel	Connector	Terminal	Terminal	
Front LH	E22	1	2	No
Front RH	E39			
Rear LH	C202			
Rear RH	C203			

**Is the inspection result normal?**

YES >> GO TO 8.

NO >> Repair the circuit.

## 8. CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E35 and harness connector of suspect wheel sensor.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E35	27	E22	1	Yes
		23		2	
Front RH		12	E39	1	
		21		2	
Rear LH		30	B202	1	
		26		2	
Rear RH		15	B203	1	
		11		2	

**Is the inspection result normal?**

YES >> GO TO 9.

NO >> Repair the circuit.

## 9. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT

1. Turn power switch ON.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E35 terminal and ground.

# C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E35	6	—	Power switch ON	Battery voltage
			Power switch OFF	0V

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check the following:

- 10A fuse No. 3 located in fuse block
- Harness between ABS actuator and electric unit (control unit) and fuse block

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

1. Turn power switch OFF.
2. Check continuity between ABS actuator and electric unit (control unit) connector E35 terminals and ground.

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace malfunctioning components.

## 11. CHECK WHEEL SENSOR INPUT VOLTAGE

1. Connect ABS actuator and electric unit (control unit) connector E35.
2. Turn power switch ON.
3. Check voltage between suspect wheel sensor harness connector terminals.

Wheel Sensor		(+)	(-)	Voltage (Approx.)
Wheel	Connector	Terminal	Terminal	
Front LH	E22	1	2	Battery voltage
Front RH	E39			
Rear LH	B202			
Rear RH	B203			

Is the inspection result normal?

YES >> Replace wheel sensor. Refer to [BRC-158, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-159, "REAR WHEEL SENSOR : Removal and Installation"](#). Then, GO TO 12.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

## 12. CONFIRM REPAIR

Ⓟ With CONSULT

1. Clear all DTCs.
2. Perform DTC confirmation procedure. Refer to [BRC-73, "DTC Logic"](#).

Does DTC C1101, C1102, C1103 or C1104 reset?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "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:000000010435996

### DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	<ul style="list-style-type: none"><li>When distance between rear wheel sensor RH and rear wheel sensor RH rotor is large.</li><li>When installation of rear wheel sensor RH or rear wheel sensor RH rotor is not normal.</li></ul>	<ul style="list-style-type: none"><li>Wheel sensor</li><li>ABS actuator and electric unit (control unit)</li><li>Sensor rotor</li></ul>
C1106	RR LH SENSOR-2	<ul style="list-style-type: none"><li>When distance between rear wheel sensor LH and rear wheel sensor LH rotor is large.</li><li>When installation of rear wheel sensor LH or rear wheel sensor LH rotor is not normal.</li></ul>	
C1107	FR RH SENSOR-2	<ul style="list-style-type: none"><li>When distance between front wheel sensor RH and front wheel sensor RH rotor is large.</li><li>When installation of front wheel sensor RH or front wheel sensor RH rotor is not normal.</li></ul>	
C1108	FR LH SENSOR-2	<ul style="list-style-type: none"><li>When distance between front wheel sensor LH and front wheel sensor LH rotor is large.</li><li>When installation of front wheel sensor LH or front wheel sensor LH rotor is not normal.</li></ul>	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULT

 With CONSULT.

- Start engine and drive vehicle at approximately 21 km/h (13 MPH) or more for approximately 5 minutes.
- Perform self-diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-77, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010435997

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 1. CONFIRM DTC

 With CONSULT

- Perform "Self Diagnostic Result" of "ABS" and record all active DTCs.
- Clear all DTCs.
- Perform DTC confirmation procedure. Refer to [BRC-73, "DTC Logic"](#).

Does DTC C1105, C1106, C1107 or C1108 reset?

- YES >> GO TO 2.  
NO >> Refer to [GI-53, "Intermittent Incident"](#).

#### 2. CHECK TIRE PRESSURE AND TIRE WEAR

Check tires for excessive wear and proper inflation. Refer to [WT-43, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair or replace as necessary.

#### 3. CHECK WHEEL SENSOR

Check wheel sensor for the following:

- Proper installation

## C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH VDC]

### < DTC/CIRCUIT DIAGNOSIS >

---

- Physical damage
- Contamination

#### Is the inspection result normal?

- YES >> GO TO 4.  
NO >> Repair or replace as necessary.

### 4.CHECK SENSOR ROTOR

---

Check sensor rotor for the following:

- Contamination
- Physical damage (missing teeth, cracks, etc.)
- Foreign material
- Looseness

#### Is the inspection result normal?

- YES >> Replace the wheel sensor. Refer to [BRC-158, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-159, "REAR WHEEL SENSOR : Removal and Installation"](#). Then, GO TO 5.  
NO >> Repair or replace as necessary.

### 5.CONFIRM REPAIR

---

Ⓟ With CONSULT

1. Clear all DTCs.
2. Perform DTC confirmation procedure. Refer to [BRC-73, "DTC Logic"](#).

#### Does DTC C1105, C1106, C1107 or C1108 reset?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).  
NO >> Inspection End.

# C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1109 POWER AND GROUND SYSTEM

### DTC Logic

INFOID:000000010120058

### 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></li><li>Power switch ON power supply voltage: <math>16\text{ V} \leq</math></li><li>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 Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES >> Proceed to [BRC-79, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120059

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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 DIAGNOSTIC

Ⓜ 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 Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

# C1109 POWER AND GROUND SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Inspection End.

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

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-26, "Wiring Diagram—On Power Supply—"](#).

NO >> Repair or replace error-detected parts.

## 5. 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-162, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

## 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 ground.

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

Is the inspection result normal?

YES >> GO TO 6.

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:000000010120060

### 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 Diagnostic Result" of "ABS".

Is DTC "C1110" detected?

YES >> Proceed to [BRC-81. "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120061

#### 1. CHECK SELF DIAGNOSTIC RESULTS

Replace ABS actuator and electric unit (control unit) even if other display than "C1110" is displayed in "Self-Diagnosis" of "ABS".

>> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1111 ABS MOTOR, MOTOR RELAY SYSTEM

### DTC Logic

INFOID:000000010120062

#### 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 Diagnostic Result" of "ABS".

Is DTC "C1111" detected?

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

#### Diagnosis Procedure

INFOID:000000010120063

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

##### 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 DIAGNOSTIC

Ⓜ 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.

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

### • Set the vehicle to READY.

- Repeat step 4 two or more times.
- Perform "Self Diagnostic Result" of "ABS".

### Is DTC "C1111" detected?

- YES >> GO TO 3.  
NO >> Inspection End.

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

- Turn the power switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 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	Battery voltage

- Turn the power switch ON.  
**CAUTION:**  
**Never set the vehicle to READY.**
- 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	Battery voltage

### Is the inspection result normal?

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

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

- Turn the power switch OFF.
- Check the 30A fusible link (#L).
- 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-15, "Wiring Diagram — Battery Power Supply —"](#).  
NO >> Repair or replace error-detected parts. GO TO 5.

## 5. ERASE SELF DIAGNOSTIC RESULT (1)

### Ⓜ With CONSULT

- Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Stop the vehicle.
- Erase "Self Diagnostic Result" of "ABS".
- 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

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

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

Is the inspection result normal?

YES >> GO TO 8.

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

## 7.ERASE SELF DIAGNOSTIC 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 Diagnostic Result" of "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-162. "Removal and Installation"](#).

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

## 9.ERASE SELF DIAGNOSTIC 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 Diagnostic Result" of "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.

# 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:000000010120064

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G-SENSOR	When a malfunction is detected in decel G signal.	• Harness or connector • Yaw rate/side/decel G sensor • ABS actuator and electric unit (control unit)
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 Diagnostic Result" of "ABS".

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

YES >> Proceed to [BRC-85, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120065

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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-137, "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.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 3.

## 3.PERFORM SELF DIAGNOSTIC

Ⓟ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 Diagnostic Result" of "ABS".

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

YES >> GO TO 4.

NO >> Inspection End.

## 4.CHECK YAW RATE/SIDE/DECCEL 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/deccl G sensor harness connector.

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

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

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

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

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

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

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

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

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

Check the continuity between each terminals of yaw rate/side/deccl 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	No
	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)

Ⓜ 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.**

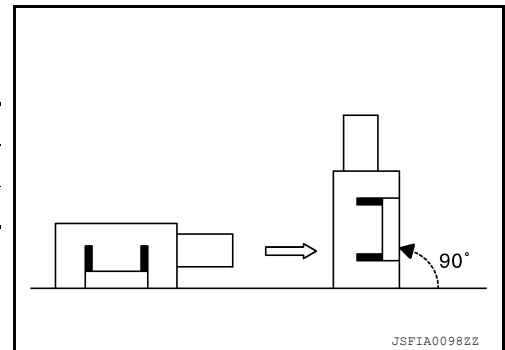
4. Select "ABS", "Data Monitor" and "DECEL G-SEN" in order.
5. Move yaw rate/side/decel G sensor as shown in the figure to check the output of before and after moving the sensor.

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-164](#). "Removal and Installation".



## 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-162, "Removal and Installation"](#).
- NO >> Replace yaw rate/side/decel G sensor. Refer to [BRC-164, "Removal and Installation"](#).



# C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1115 WHEEL SENSOR

### DTC Logic

INFOID:000000010120066

### 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.

>> 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 Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

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

### Diagnosis Procedure

INFOID:000000010120067

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

**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-137, "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-51, "Tire Air Pressure"](#).

Is the inspection result normal?

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

# C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## 3. CHECK DATA MONITOR (1)

Ⓜ With CONSULT

1. Erase "Self Diagnostic 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.**

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 DIAGNOSTIC (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:**

• **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 Diagnostic Result" of "ABS".

Is DTC "C1115" 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-158, "FRONT WHEEL SENSOR : Exploded View"](#).**

• **Rear: Refer to [BRC-159, "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-158, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-159, "REAR WHEEL SENSOR : Removal and Installation"](#).

2. Erase "Self Diagnostic Result" of "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".

# C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## 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 DIAGNOSTIC (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 Diagnostic Result" of "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 Diagnostic 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.**

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 DIAGNOSTIC (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 Diagnostic Result" of "ABS".

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# C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1115" 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 Diagnostic Result" of "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 DIAGNOSTIC (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 Diagnostic Result" of "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  Yes
	21	E39	Front RH wheel	
	26	B202	Rear LH wheel	
	11	B203	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  Yes
	12	E39	Front RH wheel	
	30	B202	Rear LH wheel	
	15	B203	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	No
	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

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "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 DIAGNOSTIC (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.

&lt; DTC/CIRCUIT DIAGNOSIS &gt;

**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 Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 17.  
NO >> Inspection End.

**17**.REPLACE WHEEL SENSOR (2)

ⓂWith CONSULT

- Replace wheel sensor.
  - Front: Refer to [BRC-158, "FRONT WHEEL SENSOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-159, "REAR WHEEL SENSOR : Removal and Installation"](#).
- Erase "Self Diagnostic Result" of "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?

- YES >> GO TO 18.  
NO >> GO TO 19.

**18**.PERFORM SELF DIAGNOSTIC (6)

Ⓜ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 Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 19.  
NO >> Inspection End.

**19**.REPLACE SENSOR ROTOR

ⓂWith CONSULT

- Replace sensor rotor.
  - Front: Refer to [BRC-161, "FRONT SENSOR ROTOR : Removal and Installation"](#).
  - Rear: Refer to [BRC-161, "REAR SENSOR ROTOR : Removal and Installation"](#).
- Erase "Self Diagnostic Result" of "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.
- 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.

# C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

- Set the vehicle to READY.

8. Repeat step 7 two or more times.

9. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

NO >> Inspection End.

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# C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1116 STOP LAMP SWITCH

### DTC Logic

INFOID:000000010120068

### 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 Diagnostic Result" of "ABS".

Is DTC "C1116" detected?

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

### Diagnosis Procedure

INFOID:000000010120069

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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?



# C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

## 2.PERFORM SELF DIAGNOSIS

ⓂWith CONSULT

1. Erase "Self Diagnostic 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.**

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 Diagnostic Result" of "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. GO TO 4.
- LED headlamp: Refer to [EXL-101, "Diagnosis Procedure"](#).
  - Halogen headlamp: Refer to [EXL-238, "Diagnosis Procedure"](#).

## 4.CHECK DATA MONITOR (1)

ⓂWith CONSULT

1. Erase "Self Diagnostic 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.**

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-51, "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-51, "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-490, "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 7.  
NO >> Adjust stop lamp switch clearance. Refer to [BR-490, "Inspection and Adjustment"](#). GO TO 6.

## 6.CHECK DATA MONITOR (2)

ⓂWith CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the power switch OFF → ON → OFF.

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# C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

**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-51. "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-51. "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-100. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace stop lamp switch. Refer to [BR-500. "Removal and Installation"](#). GO TO 8.

## 8. CHECK DATA MONITOR (3)

Ⓟ With CONSULT

1. Erase "Self Diagnostic 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.**
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-51. "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-51. "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 Diagnostic Result" of "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:**

# C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

**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-51, "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-51, "Reference Value"](#).

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	Battery voltage
			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	Battery voltage
			Brake pedal not depressed	0 V

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "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	Yes

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	No

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "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.

# C1116 STOP LAMP SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

2. Erase "Self Diagnostic Result" of "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.

**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-51, "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-51, "Reference Value"](#).

### Is the inspection result normal?

YES >> Inspection End.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

## Component Inspection

INFOID:0000000010120070

### 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 Terminal	Condition	Continuity
1 - 2	When stop lamp switch is released (When brake pedal is depressed)	Yes
	When stop lamp switch is pressed (When brake pedal is released)	No

### Is the inspection result normal?

YES >> Inspection End.

NO >> Replace stop lamp switch. Refer to [BR-500, "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:000000010120071

### 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 Diagnostic Result" of "ABS".

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

YES >> Proceed to [BRC-101, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120072

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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 Diagnostic Result" of "ABS".

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

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

- YES >> GO TO 3.
- NO >> Inspection End.

## 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	Battery voltage

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	Battery voltage

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-15, "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	Yes
	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-162, "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:000000010120073

### 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 Diagnostic Result" of "ABS".

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

- YES >> Proceed to [BRC-103. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120074

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

#### 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 Diagnostic Result" of "ABS".

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

- YES >> GO TO 3.
- NO >> Inspection End.

## 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	Battery voltage

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	Battery voltage

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-15, "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	Yes.
	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-162, "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:000000010120075

### 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 Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES >> Proceed to [BRC-105, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120076

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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 Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> Inspection End.

# C1140 ACTUATOR RELAY SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## 3. CHECK ACTUATOR 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	2	Ground	Battery voltage

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	Battery voltage

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-15, "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	Yes
	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-162, "Removal and Installation"](#).  
NO >> Repair or replace error-detected parts.

# C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1142 PRESS SENSOR

### DTC Logic

INFOID:000000010120077

### DTC DETECTION LOGIC

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

Is DTC "C1142" detected?

YES >> Proceed to [BRC-107. "Diagnosis Procedure"](#).

NO >> Inspection End

### Diagnosis Procedure

INFOID:000000010120078

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

#### 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 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 DIAGNOSTIC (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 Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

# C1142 PRESS SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 3.  
NO >> Inspection End.

## 3. CHECK MASTER CYLINDER PRESSURE SENSOR CIRCUIT

1. Turn the power switch OFF
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect master cylinder pressure sensor harness connector.
4. Check the continuity between master cylinder pressure sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

ABS actuator and electric unit (control unit)		Master cylinder pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
E35	10	E31	1	No
	10		2	No
	10		3	Yes
	7		1	No
	7		2	Yes
	7		3	No
	32		1	Yes
	32		2	No
	32		3	No

Is the inspection result normal?

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

## 4. CHECK MASTER CYLINDER PRESSURE SENSOR 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 sensor harness connector terminals.

Master cylinder pressure sensor		Voltage (Approx.)
Connector	Terminal	
E31	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-162, "Removal and Installation"](#).

## 5. CHECK DATA MONITOR

Ⓜ With CONSULT

1. Turn the power switch OFF.
2. Connect master cylinder pressure sensor harness connector.
3. "ABS", "Data Monitor" and "PRESS SENSOR" according to this order.
4. Check that the indication changes with the depth of pedal depression. Refer to [BRC-51, "Reference Value"](#).

Is the inspection result normal?

- YES >> GO TO 6.  
NO >> GO TO 7.

## 6. PERFORM SELF DIAGNOSTIC (2)

Ⓜ With CONSULT

1. Turn the power switch OFF → ON.

# C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

**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 Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).

NO >> Inspection End.

## 7. CHECK MASTER CYLINDER PRESSURE SENSOR

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

Master cylinder pressure sensor	Harness connector	
	Connector	Terminal
1	E31	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 sensor harness connectors changes with the depth of pedal depression.

**CAUTION:**

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

Master cylinder pressure sensor		Voltage (Approx.)
Connector	Terminal	
E31	1 – 2	0.5 – 4.5 V

Is the inspection result normal?

YES >> Replace ABS actuator end electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).

NO >> Replace master cylinder pressure sensor. Refer to [BR-510. "Removal and installation"](#).

# C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1143 STEERING ANGLE SENSOR

### DTC Logic

INFOID:000000010120079

#### 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

 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 Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES >> Proceed to [BRC-110. "Diagnosis Procedure"](#).

NO >> Inspection End.

#### Diagnosis Procedure

INFOID:000000010120080

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

##### 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 DIAGNOSTIC

 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 Diagnostic Result" of "ABS".

# C1143 STEERING ANGLE SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1143" detected?

- YES >> GO TO 3.
- NO >> Inspection End.

## 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	Battery voltage

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-15, "Wiring Diagram — Battery 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	Yes

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-67, "Diagnosis Procedure"](#).

Is the inspection result normal?

## C1143 STEERING ANGLE SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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YES >> GO TO 8.

NO >> Repair or replace error-detected parts. Refer to [LAN-27, "Precautions for Harness Repair"](#).

### 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-51, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

NO >> Replace steering angle sensor. Refer to [BRC-165, "Removal and Installation"](#).



# C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

### DTC Logic

INFOID:000000010120081

### 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 Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES >> Proceed to [BRC-113. "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120082

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

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-70. "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 Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> Inspection End.

#### 3. CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the power switch OFF.

## C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

2. Check the steering angle sensor system. Refer to [BRC-110. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

# C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## C1155 BRAKE FLUID LEVEL SWITCH

### DTC Logic

INFOID:000000010120083

### 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

Ⓜ 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 Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> Proceed to [BRC-115. "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120084

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

#### 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 DIAGNOSTIC (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 Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

# C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Inspection End.

## 3. CHECK BRAKE FLUID LEVEL

1. Turn the power switch OFF.
2. Check the brake fluid level. Refer to [BR-493, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Refill brake fluid. Refer to [BR-493, "Refilling"](#). GO TO 4.

## 4. PERFORM SELF DIAGNOSTIC (2)

Ⓟ With CONSULT

1. Erase "Self Diagnostic 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 Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> Inspection End.

## 5. CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluid level switch. Refer to [BRC-118, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace electrically-driven intelligent brake unit. Refer to [BR-510, "Removal and installation"](#). GO TO 6.

## 6. PERFORM SELF DIAGNOSTIC (3)

Ⓟ With CONSULT

1. Erase "Self Diagnostic 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.**
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 Diagnostic Result" of "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.

# C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

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

### 8. PERFORM SELF DIAGNOSTIC (4)

Ⓜ With CONSULT

1. Erase "Self Diagnostic 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.**

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 Diagnostic Result" of "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	Yes

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E37	1	Ground	No

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	Yes

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-49, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

NO >> Repair or replace combination meter. Refer to [MWI-102, "Removal and Installation"](#).

# C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## Component Inspection

INFOID:000000010120085

### 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.

Brake fluid level switch	Condition	Continuity
Terminal		
1 – 2	When brake fluid level in reservoir tank is within the specified level.	No
	When brake fluid level in reservoir tank is less than the specified level.	Yes

#### Is the inspection result normal?

- YES >> Inspection End.  
NO >> Replace electrically-driven intelligent brake unit. Refer to [BR-510. "Removal and installation"](#).

C1164, C1165 CV SYSTEM

DTC Logic

INFOID:000000010120086

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.

>> 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 Diagnostic Result" of "ABS".

Is DTC "C1164" or "C1165" detected?

YES >> Proceed to [BRC-119. "Diagnosis Procedure"](#).

NO >> Inspection End.

Diagnosis Procedure

INFOID:000000010120087

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

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 DIAGNOSTIC (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 Diagnostic Result" of "ABS".

Is any "C1164" or "C1165" detected?

YES >> GO TO 3.

# C1164, C1165 CV SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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.
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	Battery voltage

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	Battery voltage

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-15. "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	Yes
	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-162. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.



C1166, C1167 SV SYSTEM

DTC Logic

INFOID:000000010120088

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.

>> 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 Diagnostic Result" of "ABS".

Is DTC "C1166" or "C1167" detected?

YES >> Proceed to [BRC-121, "Diagnosis Procedure"](#).

NO >> Inspection End.

Diagnosis Procedure

INFOID:000000010120089

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

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 DIAGNOSTIC (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 Diagnostic Result" of "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.
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	Battery voltage

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	Battery voltage

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-15. "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	Yes
	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-162. "Removal and Installation"](#).  
 NO >> Repair or replace error-detected parts.

# C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C1176 STOP LAMP SW2

### DTC Logic

INFOID:000000010120090

### DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1176	STOP LAMP SW2	When brake pedal position switch signal is not input when brake pedal operates.	<ul style="list-style-type: none"><li>• Harness or connector</li><li>• Brake pedal position 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 Diagnostic Result" of "ABS".

Is DTC "C1176" detected?

- YES >> Proceed to [BRC-123. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120091

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

**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. PERFORM SELF DIAGNOSTIC

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

## Ⓢ With CONSULT

1. Erase "Self Diagnostic 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.**
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 Diagnostic Result" of "ABS".

Is DTC "C1176" detected?

- YES >> GO TO 3.  
NO >> Inspection End.

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

## Ⓢ With CONSULT

1. Erase "Self Diagnostic 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.**
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-51, "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-51, "Reference Value"](#).

Is the inspection result normal?

- YES >> Inspection End.  
NO >> GO TO 4.

**4.CHECK BRAKE PEDAL POSITION SWITCH CLEARANCE**

1. Turn the power switch OFF.
2. Check the brake pedal position switch clearance. Refer to [BR-490, "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 6.  
NO >> Adjust brake pedal position switch clearance. Refer to [BR-490, "Inspection and Adjustment"](#). GO TO 5.

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

## Ⓢ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the power switch OFF, and wait 10 seconds or more.
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-51, "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-51, "Reference Value"](#).

Is the inspection result normal?

- YES >> Inspection End.  
NO >> GO TO 6.

# C1176 STOP LAMP SW2

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## 6. CHECK BRAKE PEDAL POSITION SWITCH

Check the brake pedal position switch. Refer to [BRC-127, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace brake pedal position switch. Refer to [BR-500, "Removal and Installation"](#). GO TO 7.

## 7. CHECK DATA MONITOR (3)

Ⓜ With CONSULT

1. Erase "Self Diagnostic 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.**

3. Turn the power switch ON.

**CAUTION:**

**Never set the vehicle to READY.**

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-51, "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-51, "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 brake pedal position switch harness connector.

6. Check the brake pedal position switch harness connector for disconnection or looseness.

7. Check the brake pedal position 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 (4)

Ⓜ With CONSULT

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

2. Connect brake pedal position switch harness connector.

3. Erase "Self Diagnostic Result" of "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 SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-51, "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-51, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 10.

## 10. CHECK BRAKE PEDAL POSITION SWITCH CIRCUIT (1)

1. Turn the power switch OFF.

# C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E35	6	Ground	Brake pedal depressed	0 V
			Brake pedal not depressed	Battery voltage

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

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

## 11. CHECK BRAKE PEDAL POSITION SWITCH CIRCUIT (2)

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

ABS actuator and electric unit (control unit)		brake pedal position switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	6	E112	2	Yes

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	6	Ground	No

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

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

## 12. CHECK DATA MONITOR (5)

Ⓟ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Erase "Self Diagnostic Result" of "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.  
**CAUTION:**  
**Stop the vehicle.**
5. 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-51, "Reference Value"](#).

# C1176 STOP LAMP SW2

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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-51, "Reference Value"](#).

Is the inspection result normal?

- YES >> Inspection End.  
NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

## Component Inspection

INFOID:000000010120092

### 1. CHECK BRAKE PEDAL POSITION SWITCH

1. Turn the power switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch harness connector terminals.

Brake pedal position switch Terminal	Condition	Continuity
1 - 2	When brake pedal position switch is release. (When brake pedal is slightly depressed.)	No
	When brake pedal position switch is pressed. (When brake pedal is fully released.)	Yes

Is the inspection result normal?

- YES >> Inspection End.  
NO >> Replace brake pedal position switch. Refer to [BR-500, "Removal and Installation"](#).

# C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

### DTC Logic

INFOID:000000010120093

#### 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 Diagnostic Result" of "ABS".

Is DTC "C118A" detected?

YES >> Proceed to [BRC-128. "Diagnosis Procedure"](#).

NO >> Inspection End.

#### Diagnosis Procedure

INFOID:000000010120094

##### 1. CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM (1)

Ⓟ With CONSULT

Perform "Self Diagnostic Result" of "BRAKE".

Is any DTC detected?

YES >> Check the DTC. Refer to [BR-38. "DTC Index"](#).

NO >> GO TO 2.

##### 2. CHECK CONNECTOR

1. Turn the power switch OFF to exit CONSULT.

2. Close all doors (including back door), check that the room lamp is OFF, get out of the vehicle, and wait for 3 minutes or more with all doors closed.

**CAUTION:**

**Never operate the vehicle and CONSULT while waiting.**

3. Disconnect 12V battery cable from negative terminal. Refer to [BRC-5. "Precaution for Removing 12V Battery"](#).

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 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 3.

##### 3. CHECK SELF DIAGNOSTIC (1)



# C118A ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

④ 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:**

- 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 Diagnostic Result" of "ABS".

Is DTC "C118A" detected?

- YES >> GO TO 4.  
NO >> Inspection End.

## 4. CHECK CAN COMMUNICATION

Check the CAN communication line. Refer to [LAN-17. "Trouble Diagnosis Flow Chart"](#).

>> GO TO 5.

## 5. CHECK SELF DIAGNOSTIC (2)

④ With CONSULT

1. Turn the power switch OFF.
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 3 two or more times.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C118A" detected?

- YES >> GO TO 6.  
NO >> Inspection End.

## 6. CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM (2)

④ With CONSULT

Perform "Self Diagnosis Result" of "BRAKE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BR-38. "DTC Index"](#).  
NO >> GO TO 7.

## 7. CHECK SELF DIAGNOSIS (3)

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 Diagnostic Result" of "ABS".

Is DTC "C118A" detected?

- YES >> GO TO 4.  
NO >> Inspection End.

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## C118C EV SYSTEM

## DTC Logic

INFOID:000000010120095

## 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.

>> 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 Diagnostic Result" of "ABS".

Is DTC "C118C" detected?


YES >> Proceed to [BRC-130, "Diagnosis Procedure"](#).

NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000010120096

## 1. CHECK VCM SYSTEM

 With CONSULT

Perform "Self Diagnostic Result" of "EV/HEV". Refer to [EVC-72, "CONSULT Function"](#).

Is any DTC detected?

YES >> Check the DTC. Refer to [EVC-102, "DTC Index"](#).


NO >> GO TO 2.

## 2. CHECK CAN COMMUNICATION

Check the CAN communication line. Refer to [LAN-17, "Trouble Diagnosis Flow Chart"](#).

>> GO TO 3.

## 3. CHECK SELF DIAGNOSTIC

 With CONSULT

1. Erase "Self Diagnostic Result" of "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 Diagnostic Result" of "ABS".

Is DTC "C118C" or "U1000" detected?

YES ("C118C")>>GO TO 1.

# C118C EV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

YES ("U1000")>>Refer to [LAN-17. "Trouble Diagnosis Flow Chart"](#).

NO >> Inspection End.

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# U1000 CAN COMM CIRCUIT

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

## U1000 CAN COMM CIRCUIT

### Description

INFOID:000000010120097

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:000000010120098

### 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

### 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 Diagnostic Result" of "ABS".

Is DTC "U1000" detected?

YES >> Proceed to [BRC-132, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120099

Proceed to [LAN-17, "Trouble Diagnosis Flow Chart"](#).

# U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## U1010 CONTROL UNIT (CAN)

### Description

INFOID:000000010120100

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:000000010120101

### 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)

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### 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 Diagnostic Result" of "ABS".

Is DTC "U1010" detected?

YES >> Proceed to [BRC-133, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120102

#### 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-162, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

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# U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

### Description

INFOID:000000010120103

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:000000010120104

### DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	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>

\*: CAN 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

 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 Diagnostic Result" of "ABS".

Is DTC "U110D" detected?

YES >> Proceed to diagnosis procedure. Refer to [BRC-134, "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000010120105

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 1. CHECK CONNECTOR

1. Turn the power switch OFF.

2. Close all doors (including back door), check that the room lamp is OFF, get out of the vehicle, and wait for 3 minutes or more with all doors closed.

3. Disconnect 12V battery cable from negative terminal. Refer to [BRC-5, "Precaution for Removing 12V Battery"](#)

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?

# U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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.

ABS actuator and electric unit (control unit)		Electrically-driven intelligent brake unit		Continuity
Connector	Terminal	Connector	Terminal	
E35	20	E34	44	Yes
	25		43	Yes

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	No
	25		

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 DIAGNOSTIC (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. 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 Diagnostic Result" of "ABS".

Is DTC "C118A", "U1000" or "U110D" detected?

YES ("C118A")>>Refer to [BRC-128, "Diagnosis Procedure"](#).

YES ("U1000")>>Refer to [BRC-132, "Diagnosis Procedure"](#).

YES ("U110D")>>GO TO 4.

NO >> Inspection End.

## 4. CHECK ELECTRICALLY-DRIVEN INTELLIGENT BRAKE SYSTEM

Ⓜ With CONSULT

Perform "Self Diagnostic Result" of "BRAKE".

Is any DTC detected?

YES >> Check the DTC. Refer to [BR-38, "DTC Index"](#).

NO >> GO TO 5.

## 5. PERFORM SELF DIAGNOSTIC (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 Diagnostic Result" of "ABS".

Is DTC "U110D" detected?

## U110D ELECTRICALLY-DRIVEN INTELLIGENT BRAKE COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- 
- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).
- NO >> Inspection End.



# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## POWER SUPPLY AND GROUND CIRCUIT

### Diagnosis Procedure

INFOID:000000010120106

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

#### 1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SWITCH ON 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	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	Battery voltage

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 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-26. "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	Battery voltage

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.

# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E35	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 5.
- 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-15, "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	Battery voltage

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	Battery voltage

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-26, "Wiring Diagram—On 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.

# POWER SUPPLY AND GROUND CIRCUIT

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	3	Ground	Yes
	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.

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair or replace error-detected parts.

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**BRC**

# VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## VDC OFF SWITCH

### Component Function Check

INFOID:000000010120107

#### 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-140, "Diagnosis Procedure"](#).

#### Diagnosis Procedure

INFOID:000000010120108

Regarding Wiring Diagram information. Refer to [BRC-58, "Wiring Diagram"](#).

#### 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	6	Yes

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	No

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	8	Ground	Yes

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-141, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace VDC OFF switch. Refer to [BRC-166, "Removal and Installation"](#).

#### 4. CHECK VDC OFF SWITCH SIGNAL

Ⓟ With CONSULT

# VDC OFF SWITCH

[WITH VDC]

## < DTC/CIRCUIT DIAGNOSIS >

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.

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-162. "Removal and Installation"](#).  
NO >> Repair or replace error-detected parts.

## Component Inspection

INFOID:0000000010120109

## 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		
8 - 9	When VDC OFF switch is pressed	Yes
	When VDC OFF switch is not pressed	No

### Is the inspection result normal?

- YES >> Inspection End  
NO >> Replace VDC OFF switch. Refer to [BRC-166. "Removal and Installation"](#).

# PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## PARKING BRAKE SWITCH

### Component Function Check

INFOID:000000010120110

#### 1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to [BRC-142. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000010120111

Regarding Wiring Diagram information. Refer to [BRC-58. "Wiring Diagram"](#).

#### 1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E4	1	M34	24	Yes

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

Parking brake switch		—	Continuity
Connector	Terminal		
E4	1	Ground	No

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2.CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to [BRC-142. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to [PB-15. "Removal and Installation"](#).

#### 3.CHECK COMBINATION METER

Check combination meter. Refer to [MWI-49. "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

YES >> Check each pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

NO >> Repair or replace combination meter. Refer to [MWI-102. "Removal and Installation"](#).

### Component Inspection

INFOID:000000010120112

#### 1.CHECK PARKING BRAKE SWITCH

1. Turn the power switch OFF.
2. Remove parking brake switch. Refer to [PB-15. "Removal and Installation"](#).

# PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

3. Check continuity between parking brake switch connector terminal.

Parking brake switch Terminal	—	Condition	Continuity
1	Ground	When the parking brake switch is operated.	Yes
		When the parking brake switch is not operated.	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace parking brake switch. Refer to [PB-15. "Removal and Installation"](#).

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**BRC**

## ABS WARNING LAMP

### Component Function Check

INFOID:000000010120113

#### 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-144, "Diagnosis Procedure"](#).

#### Diagnosis Procedure

INFOID:000000010120114

#### 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-137, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

#### 2. PERFORM SELF DIAGNOSTIC

Ⓟ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56, "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-49, "CONSULT Function \(METER/M&A\)"](#).
- NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).



## BRAKE WARNING LAMP

## Component Function Check

INFOID:0000000010120115

**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-145, "Diagnosis Procedure"](#).

**2.**CHECK BRAKE WARNING LAMP FUNCTION (2)

Check that brake warning lamp in combination meter turns ON/OFF when parking brake is operated.

**NOTE:**

Brake warning lamp turns ON when parking brake is operated (when parking brake switch is ON).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check parking brake switch system. Refer to [BRC-142, "Diagnosis Procedure"](#).

**3.**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-115, "Diagnosis Procedure"](#).

## Diagnosis Procedure

INFOID:0000000010120116

**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-137, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

**2.**PERFORM SELF DIAGNOSTIC

 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 Diagnostic Result" of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-56, "DTC Index"](#).

NO >> GO TO 3.

**3.**CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-49, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

## BRAKE WARNING LAMP

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

---

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).
- NO >> Repair or replace combination meter. Refer to [MWI-102. "Removal and Installation"](#).

# VDC WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

## VDC WARNING LAMP

### Component Function Check

INFOID:0000000010120117

#### 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-147, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:0000000010120118

#### 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-137, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

#### 2. PERFORM SELF DIAGNOSTIC

Ⓜ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-56, "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-49, "CONSULT Function \(METER/M&A\)"](#).

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162, "Removal and Installation"](#).

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## VDC OFF INDICATOR LAMP

## Component Function Check

INFOID:000000010120119

**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-148, "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-140, "Diagnosis Procedure"](#).

## Diagnosis Procedure

INFOID:000000010120120

**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-137, "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-162, "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-49, "CONSULT Function \(METER/M&A\)"](#).

NO >> Check the VDC OFF switch system. Refer to [BRC-140, "Diagnosis Procedure"](#).

# EXCESSIVE OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## SYMPTOM DIAGNOSIS

### EXCESSIVE OPERATION FREQUENCY

#### Description

INFOID:0000000010120121

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:0000000010120122

#### 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-7. "Inspection"](#).
- Rear axle: Refer to [RAX-6. "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-158. "FRONT WHEEL SENSOR : Removal and Installation"](#).
- Rear wheel sensor: Refer to [BRC-159. "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-161. "FRONT SENSOR ROTOR : Removal and Installation"](#).
- Rear sensor rotor: Refer to [BRC-161. "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 DIAGNOSTIC

Ⓜ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56, "DTC Index"](#).
- NO >> Inspection End.

# UNEXPECTED BRAKE PEDAL REACTION

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## UNEXPECTED BRAKE PEDAL REACTION

### Description

INFOID:000000010120123

A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed.

### Diagnosis Procedure

INFOID:000000010120124

#### 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-7, "Inspection"](#).
- Rear axle: Refer to [RAX-6, "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-496, "DISC ROTOR : Inspection and Adjustment"](#).
- Rear: Refer to [BR-498, "DISC ROTOR : Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Refinish disc rotor.
  - Front: Refer to [BR-496, "DISC ROTOR : Inspection and Adjustment"](#).
  - Rear: Refer to [BR-498, "DISC ROTOR : Inspection and Adjustment"](#).

#### 3.CHECK BRAKE FLUID LEAKAGE

Check the brake fluid leakage.

- Front: Refer to [BR-506, "FRONT : Inspection"](#).
- Rear: Refer to [BR-509, "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-490, "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Adjust each item of brake pedal. Refer to [BR-490, "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.

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# THE BRAKING DISTANCE IS LONG

[WITH VDC]

< SYMPTOM DIAGNOSIS >

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## THE BRAKING DISTANCE IS LONG

### Description

INFOID:000000010120125

Brake stopping distance is long when ABS function is operated.

### Diagnosis Procedure

INFOID:000000010120126

#### **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.



# DOES NOT OPERATE

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## DOES NOT OPERATE

### Description

INFOID:000000010120127

VDC function, TCS function, ABS function, EBD function, brake limited slip differential (BLSD) function and brake assist function does not operate.

### Diagnosis Procedure

INFOID:000000010120128

#### 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 DIAGNOSTIC

Ⓜ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56, "DTC Index"](#).
- NO >> Inspection End.

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# BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

### Description

INFOID:000000010120129

- 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:000000010120130

#### 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-490, "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 DIAGNOSTIC

Ⓜ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56, "DTC Index"](#).
- NO >> Inspection End.

# VEHICLE JERKS DURING

[WITH VDC]

< SYMPTOM DIAGNOSIS >

## VEHICLE JERKS DURING

### Description

INFOID:000000010120131

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:000000010120132

#### 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 DIAGNOSTIC (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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56. "DTC Index"](#).
- NO >> GO TO 3.

#### 3. CHECK CONNECTOR

Ⓜ 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 DIAGNOSTIC (2)

Ⓜ 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 Diagnostic Result" of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-56. "DTC Index"](#).
- NO >> GO TO 5.

#### 5. CHECK VCM SYSTEM

Ⓜ With CONSULT

Perform "Self Diagnostic Result" of "EV/HEV".

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-162. "Removal and Installation"](#).

# THE DRIVING WHEELS SKID GREATLY ON ACCELERATION

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## THE DRIVING WHEELS SKID GREATLY ON ACCELERATION

### System Description

INFOID:000000010120133

The driving wheels skid greatly on acceleration.

### Diagnosis Procedure

INFOID:000000010120134

#### 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.

- LED headlamp: Refer to [EXL-101, "Diagnosis Procedure"](#).
- Halogen headlamp: Refer to [EXL-238, "Diagnosis Procedure"](#).

#### 2. PERFORM SELF DIAGNOSTIC

 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 Diagnostic Result" of "ABS".

##### Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-56, "DTC Index"](#).

NO >> Normal

# NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[WITH VDC]

## NORMAL OPERATING CONDITION

### Description

INFOID:000000010120135

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 "Self Diagnostic Result" of "ABS" 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).	<p><b>CAUTION:</b></p> <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.)

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# WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

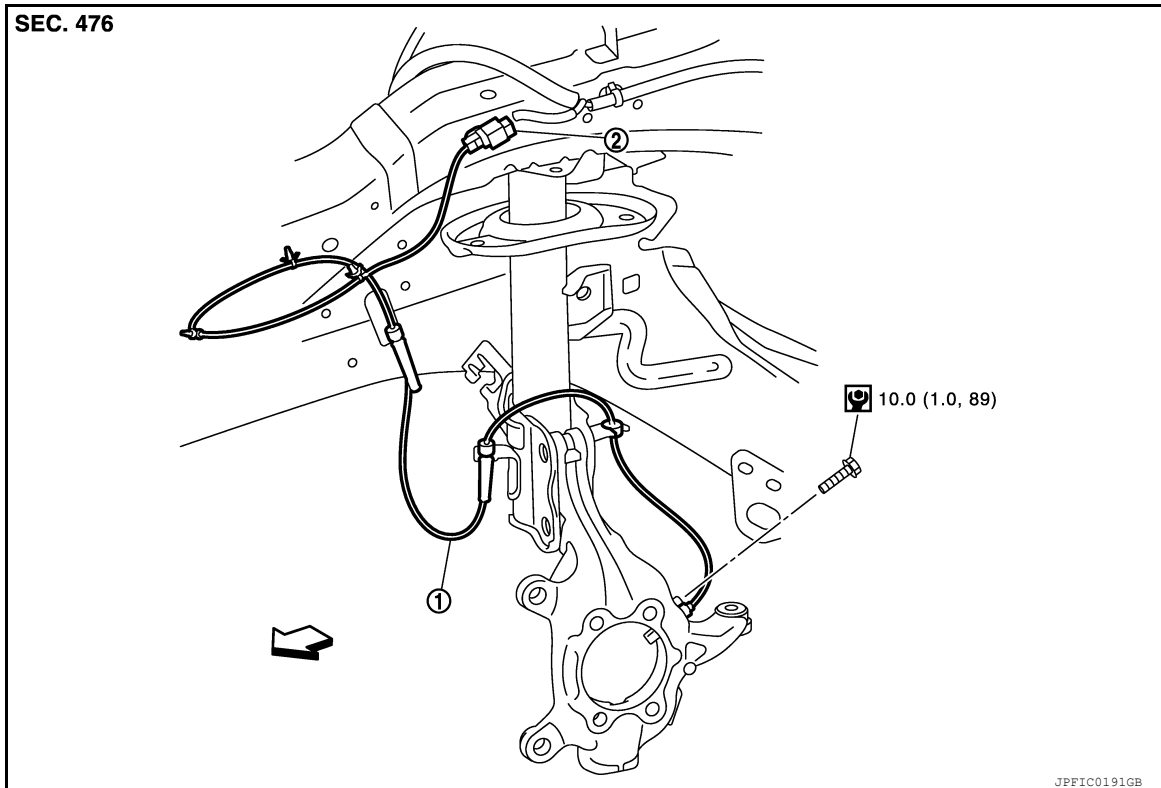
## REMOVAL AND INSTALLATION

### WHEEL SENSOR

### FRONT WHEEL SENSOR

### FRONT WHEEL SENSOR : Exploded View

INFOID:0000000010120136



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:0000000010120137

#### REMOVAL

1. Remove front wheel and tire using power tool. Refer to [WT-45, "Removal and Installation"](#).
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

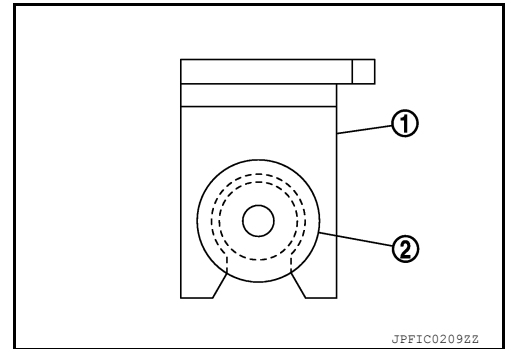
< REMOVAL AND INSTALLATION >

[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:**

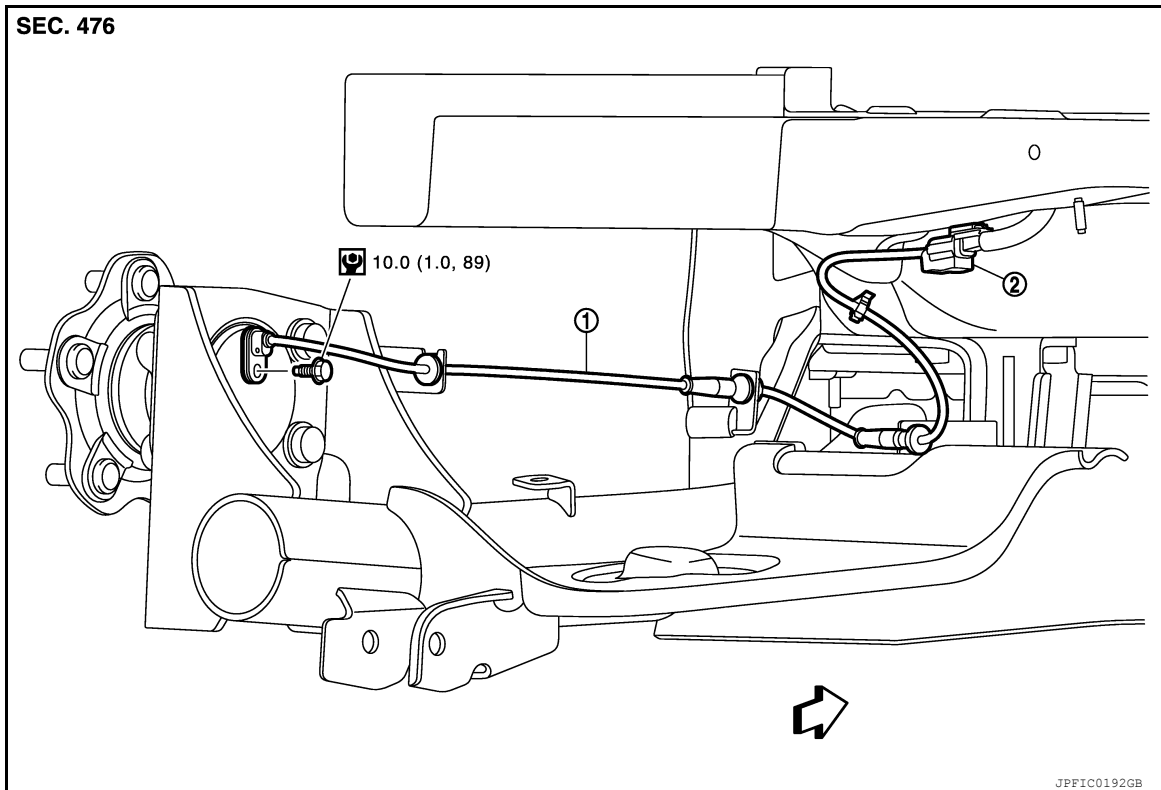
**Check that the identification line of the front wheel sensor is faced vehicle front.**



## REAR WHEEL SENSOR

### REAR WHEEL SENSOR : Exploded View

INFOID:000000010120138



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:000000010120139

#### REMOVAL

1. Remove rear wheel sensor from wheel hub and bearing assembly.

**CAUTION:**

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# 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.

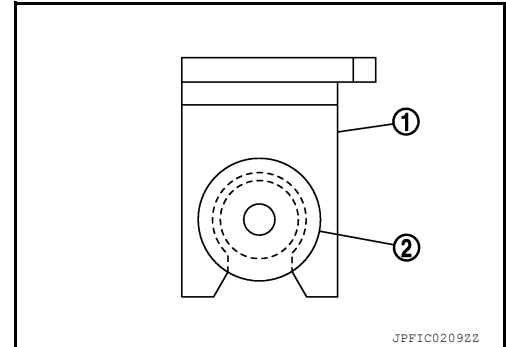
**CAUTION:**

To prevent damage to the parts, never twist and never pull rear wheel sensor harness, when removing.

## INSTALLATION

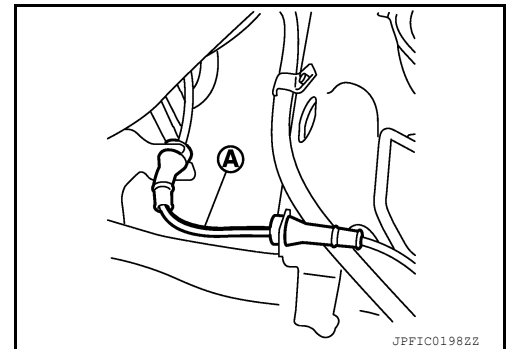
Note the following, and install in the reverse order of the removal.

- 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.



**CAUTION:**

Check that the identification line ㉞ of the rear wheel sensor is faced upward.





# SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

## SENSOR ROTOR

### FRONT SENSOR ROTOR

#### FRONT SENSOR ROTOR : Removal and Installation

INFOID:000000010120140

##### REMOVAL

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

##### INSTALLATION

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

### REAR SENSOR ROTOR

#### REAR SENSOR ROTOR : Removal and Installation

INFOID:000000010120141

##### REMOVAL

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

##### INSTALLATION

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

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**BRC**

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

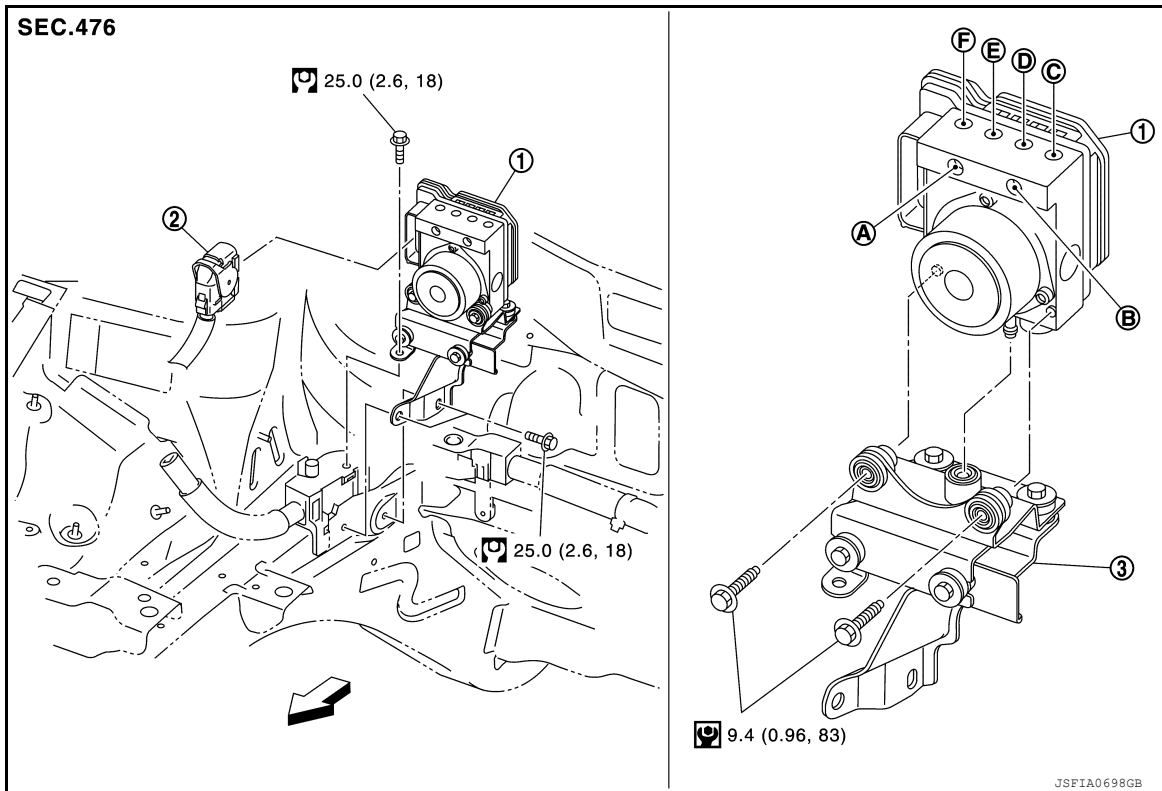
< REMOVAL AND INSTALLATION >

[WITH VDC]

## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000010120142



- |  |   |                       |
|--|---|-----------------------|
| ① ABS actuator and electric unit (control unit)                | ② ABS actuator and electric unit (control unit) harness connector | ③ Bracket             |
| Ⓐ To electrically-driven intelligent brake unit secondary side | Ⓑ To electrically-driven intelligent brake unit primary side      | Ⓒ To front LH caliper |
| Ⓓ To rear RH caliper   | Ⓔ To rear LH caliper  | Ⓕ To front RH caliper |

←: Vehicle front

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

### Removal and Installation

INFOID:000000010120143

#### REMOVAL

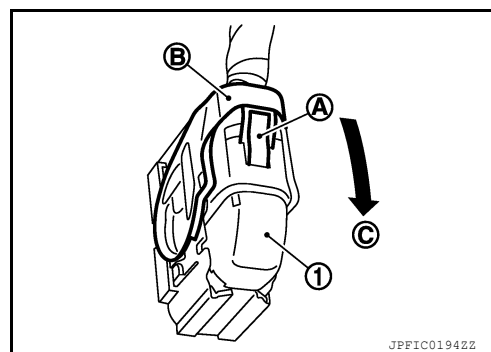
1. Turn the power switch OFF.
2. Disconnect 12V battery cable from negative terminal. Refer to [BRC-5, "Precaution for Removing 12V Battery"](#).
3. Drain brake fluid. Refer to [BR-493, "Draining"](#).

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[WITH VDC]

## < REMOVAL AND INSTALLATION >

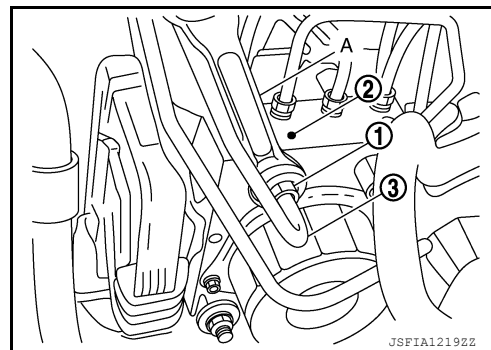
4. Disconnect ABS actuator and electric unit (control unit) harness connector ①, follow the procedure described below.
  - a. Push the pawl ④.
  - b. Move the lever ⑤ in the direction ⑥ until locked.
  - c. Disconnect ABS actuator and electric unit (control unit) harness connector.



5. Loosen flare nut ① of brake tube ③ using a flare nut wrench (A), and then remove brake tube from ABS actuator and electric unit (control unit) ②. Refer to [BR-503, "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.

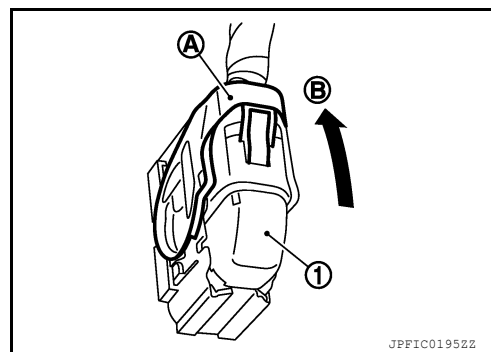


7. Remove bracket and bushing from ABS actuator and electric unit (control unit).

## 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-503, "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-494, "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 ④ in the direction ⑤ to secure the locking.
  - Perform steering angle sensor neutral position adjustment when ABS actuator and electric unit (control unit) is replaced. Refer to [BRC-70, "Work Procedure"](#).



# YAW RATE/SIDE/DECEL G SENSOR

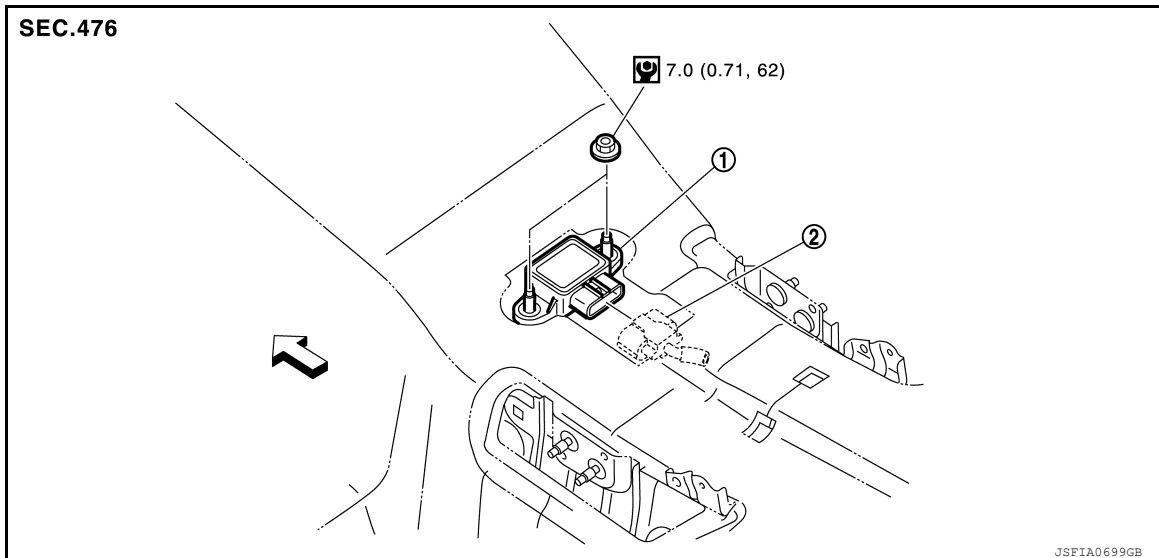
< REMOVAL AND INSTALLATION >

[WITH VDC]

## YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:000000010120144



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:000000010120145

### 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-17, "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

[WITH VDC]

< REMOVAL AND INSTALLATION >

## STEERING ANGLE SENSOR

### Removal and Installation

INFOID:000000010120146

#### REMOVAL

1. Remove spiral cable assembly. Refer to [SR-23, "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-70, "Work Procedure"](#).

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

**BRC**

# VDC OFF SWITCH

< REMOVAL AND INSTALLATION >

[WITH VDC]

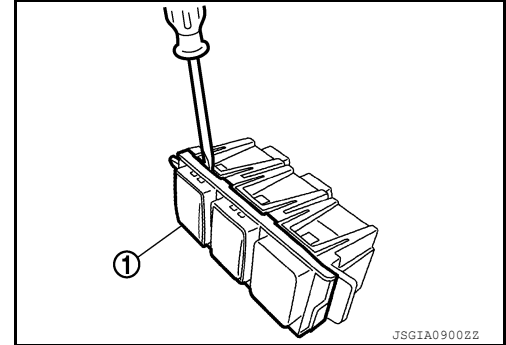
## VDC OFF SWITCH

### Removal and Installation

INFOID:000000010120147

#### REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-17, "Removal and Installation"](#).
2. Remove switch panel. Refer to [IP-17, "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.