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SECTION **BRC**

BRAKE CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000012273548

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

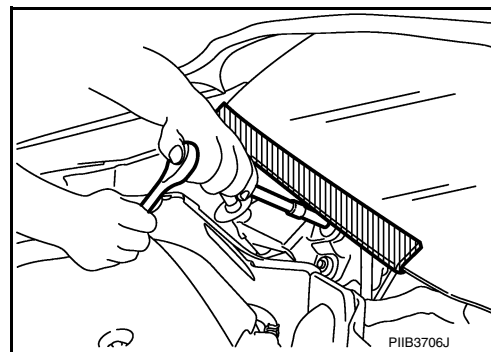
WARNING:

- 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 Procedure without Cowl Top Cover

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



Precaution for Brake System

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WARNING:

Clean any dust from the front brake and rear brake using a vacuum dust collector. Do not blow by compressed air.

- Brake fluid use refer to [MA-16. "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) [MA-17. "FOR MEXICO : Fluids and Lubricants"](#) (Mexico).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.

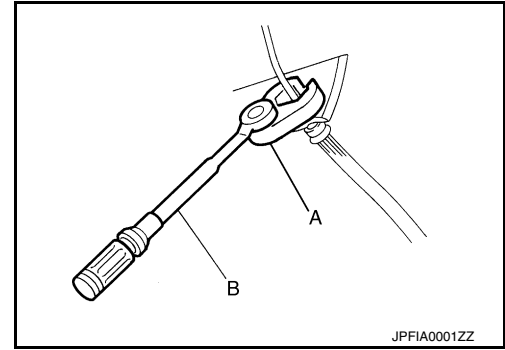
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PRECAUTIONS

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[WITHOUT ICC]

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



Precaution for Brake Control System

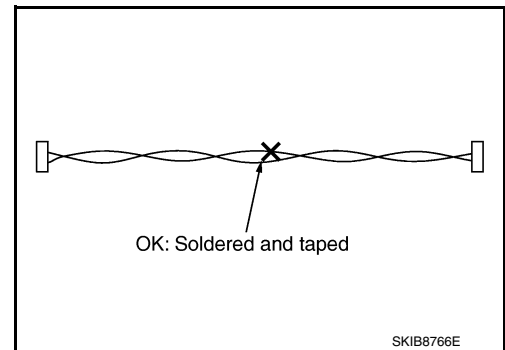
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- Just after starting vehicle after ignition switch is ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level and oil leaks.
- If tire size and type are used in an improper combination or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension-related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

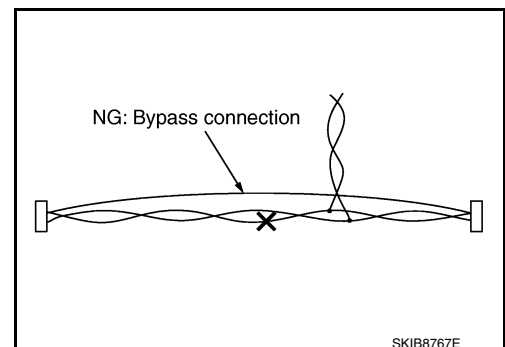
Precaution for Harness Repair

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



- Do not bypass the repair point with wire. (If it is bypassed, the turn-out point cannot be separated and the twisted wire characteristics are lost.)



PREPARATION

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PREPARATION

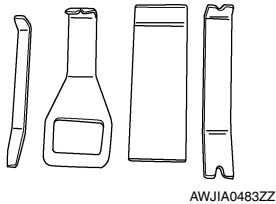
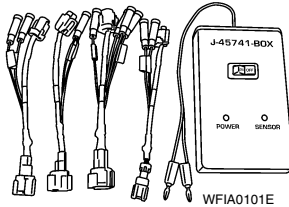
PREPARATION

Special Service Tool

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

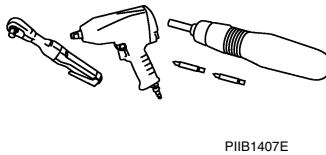
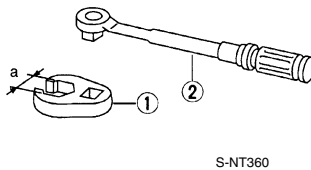
Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors
— (J-46534) Trim Tool Set	Removing trim components



Commercial Service Tools

INFOID:0000000012273554

Tool name	Description
1. Flare nut crowfoot 2. Torque wrench	Tightening brake tube flare nuts a: 10 mm (0.39 in)/12 mm (0.47 in)
Power tool	Loosening nuts, screws and bolts



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COMPONENT PARTS

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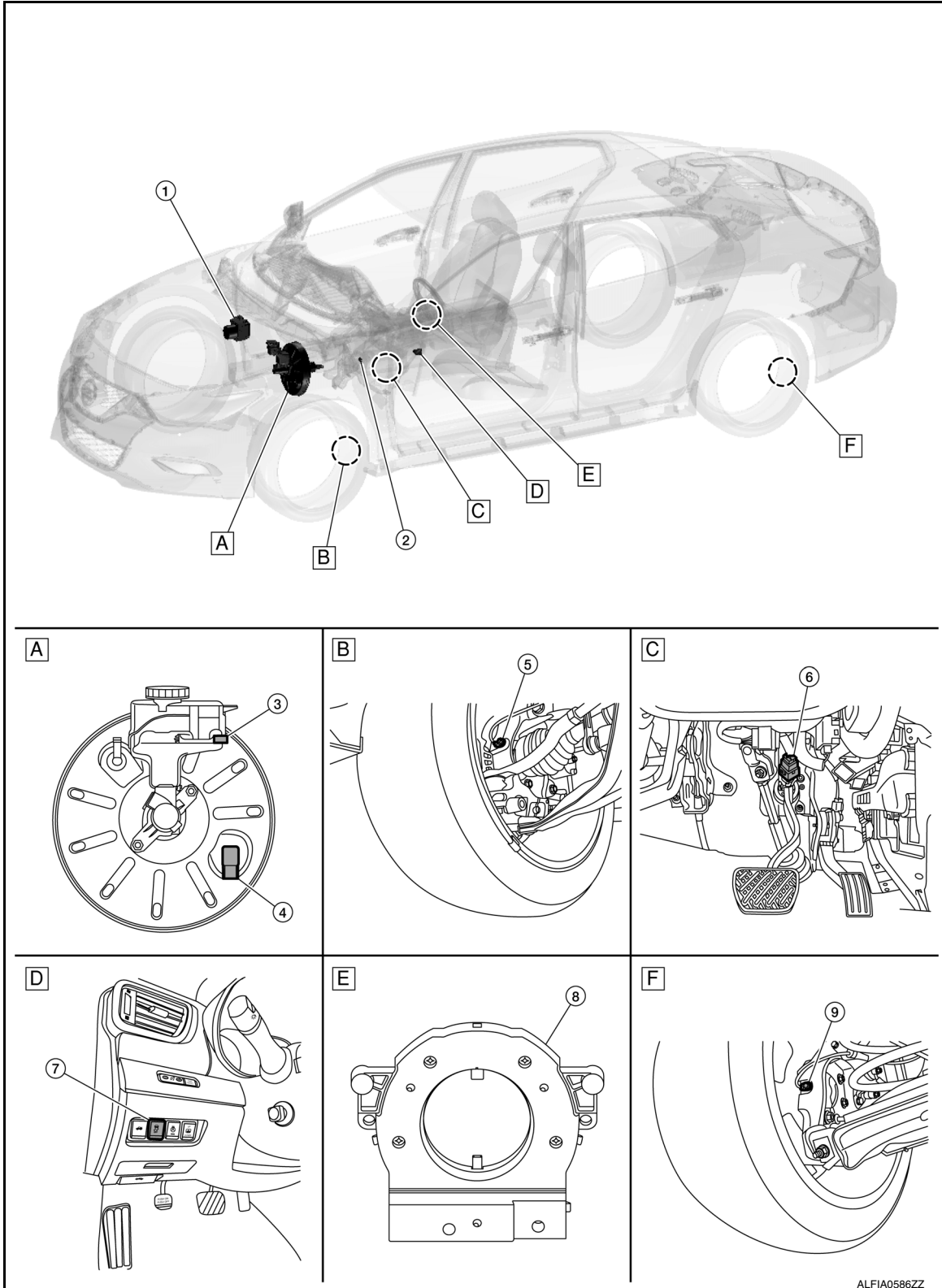
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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COMPONENT PARTS

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- | | | |
|---|--|-------------------------|
| A. View with brake booster assembly removed | B. Left front wheel area | C. Brake pedal area |
| D. Left side of instrument panel | E. View of steering angle sensor removed | F. Left rear wheel area |

No.	Component parts	Function
1.	ABS actuator and electric unit (control unit)	BRC-12, "ABS Actuator and Electric Unit (Control Unit)"
2.	Parking brake switch	BRC-13, "Parking Brake Switch"
3.	Brake fluid level switch	BRC-13, "Brake Fluid Level Switch"
4.	Vacuum sensor	BRC-13, "Vacuum Sensor"
5.	Front LH wheel sensor	BRC-11, "Wheel Sensor and Sensor Rotor"
6.	Stop lamp switch	BRC-12, "Stop Lamp Switch"
7.	VDC OFF switch	BRC-13, "VDC OFF Switch"
8.	Steering angle sensor	BRC-13, "Steering Angle Sensor"
9.	Rear LH wheel sensor	BRC-11, "Wheel Sensor and Sensor Rotor"

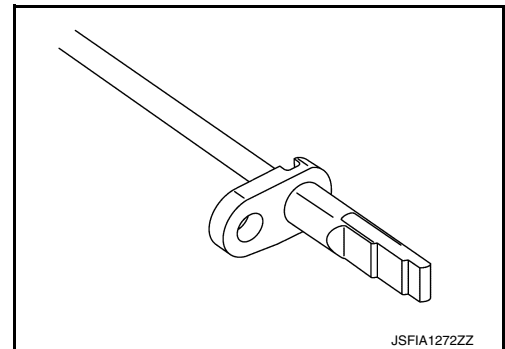
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Wheel Sensor and Sensor Rotor

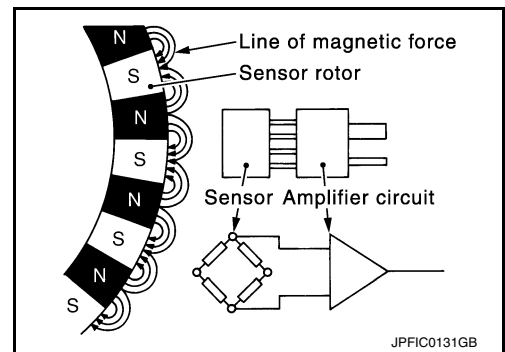
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NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated into the wheel hub assembly.
- Wheel sensor of rear wheel is installed on rear final drive.
- Sensor rotor of rear wheel is installed on drive shaft (rear final drive side).
- Never measure resistance and voltage value using a tester because sensor is an active sensor.



- 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.



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COMPONENT PARTS

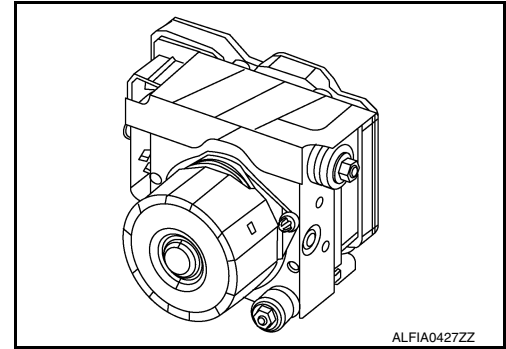
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[WITHOUT ICC]

ABS Actuator and Electric Unit (Control Unit)

INFOID:000000012273557

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



ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure, engine and transmission 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

Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.

Motor

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

Motor Relay

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

Actuator Relay

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

ABS IN Valve and ABS OUT Valve

Increases, holds or decreases the fluid pressure of each caliper according to signals from ABS actuator and electric unit (control unit).

Pressure Sensor

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

Cut Valve 1 (Primary Line) and Cut Valve 2 (Secondary Line)

Shuts off the ordinary brake line from master cylinder when VDC function, TCS function and brake assist function are activated.

Yaw Rate/Side/Decel G Sensor

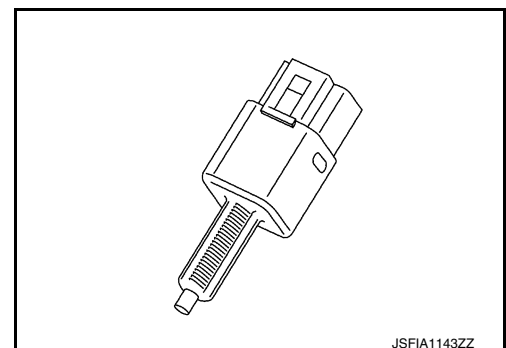
Calculates the following information that affects the vehicle and transmits a signal to ABS actuator and electric unit (control unit). [Yaw rate/side/decel G sensor is integrated into the ABS actuator and electric unit (control unit).]

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

Stop Lamp Switch

INFOID:000000012273558

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



COMPONENT PARTS

< SYSTEM DESCRIPTION >

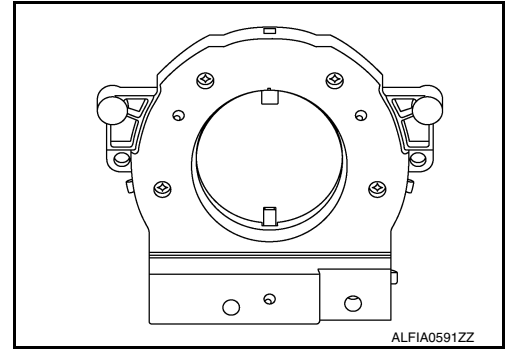
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Steering Angle Sensor

INFOID:0000000112273559

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

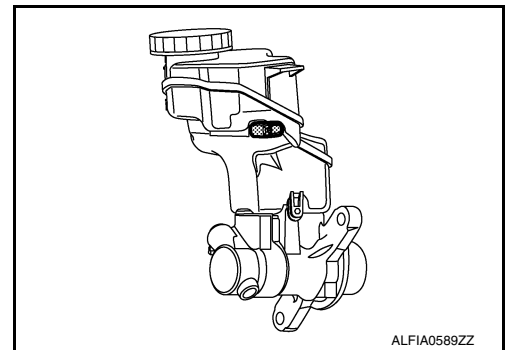
- Steering angle sensor malfunction signal
- Steering wheel rotation amount
- Steering wheel rotation angular velocity
- Steering wheel rotation direction



Brake Fluid Level Switch

INFOID:0000000112273560

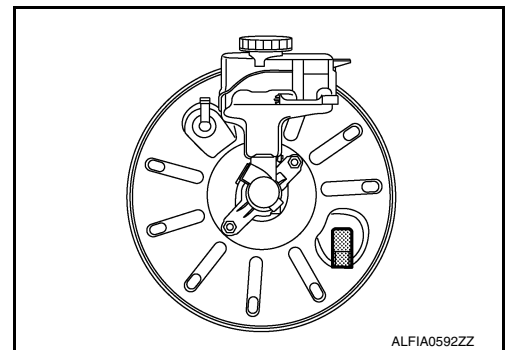
Detects the brake fluid level in reservoir tank and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication when brake fluid level is the specified level or less.



Vacuum Sensor

INFOID:0000000112273561

Detects the vacuum in brake booster and transmits converted electric signal to ABS actuator and electric unit (control unit).



Parking Brake Switch

INFOID:0000000112273562

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

VDC OFF Switch

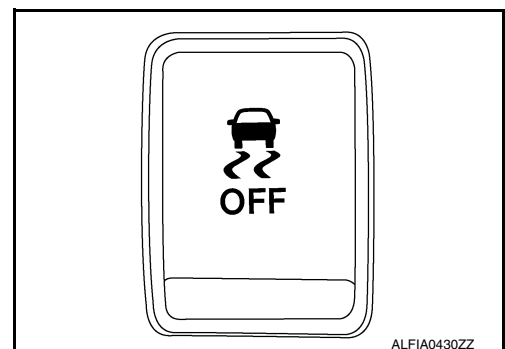
INFOID:0000000112273563

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

NOTE:

ABS function and EBD function operate.

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



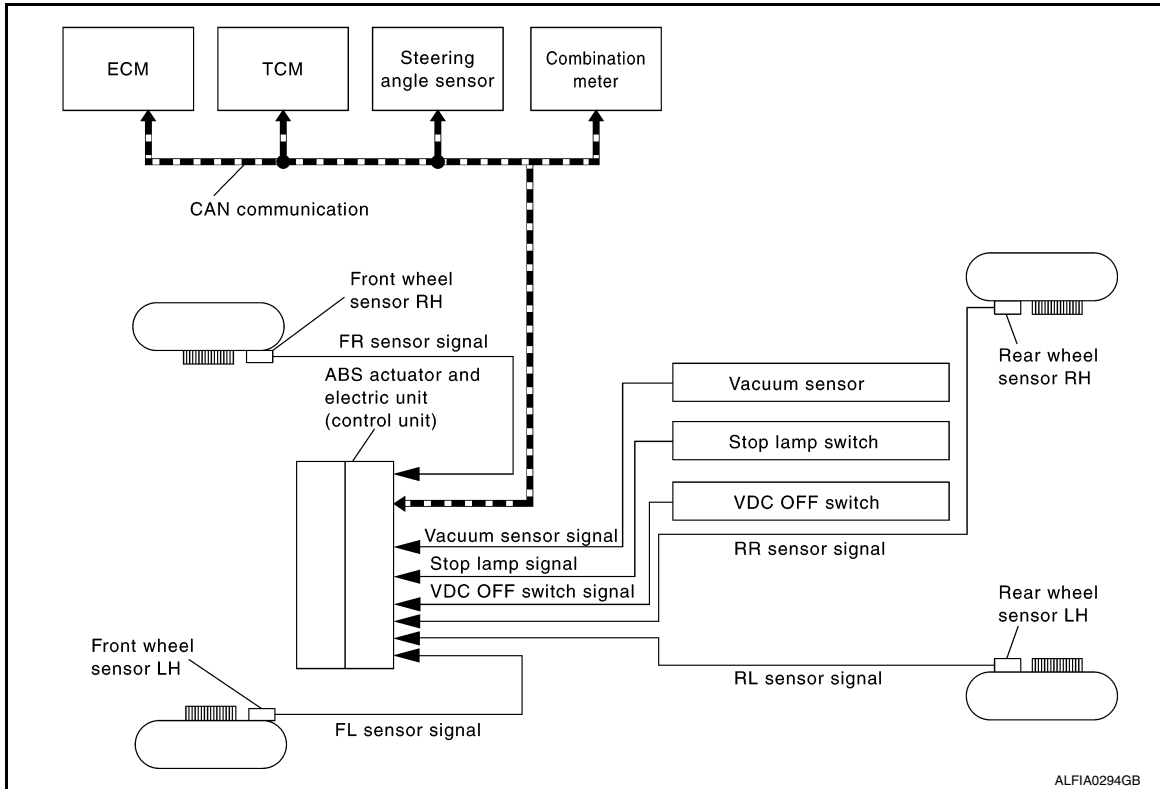
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SYSTEM

System Description

INFOID:000000012273564

SYSTEM DIAGRAM



- 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, TCS, ABS, EBD and brake assist functions.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

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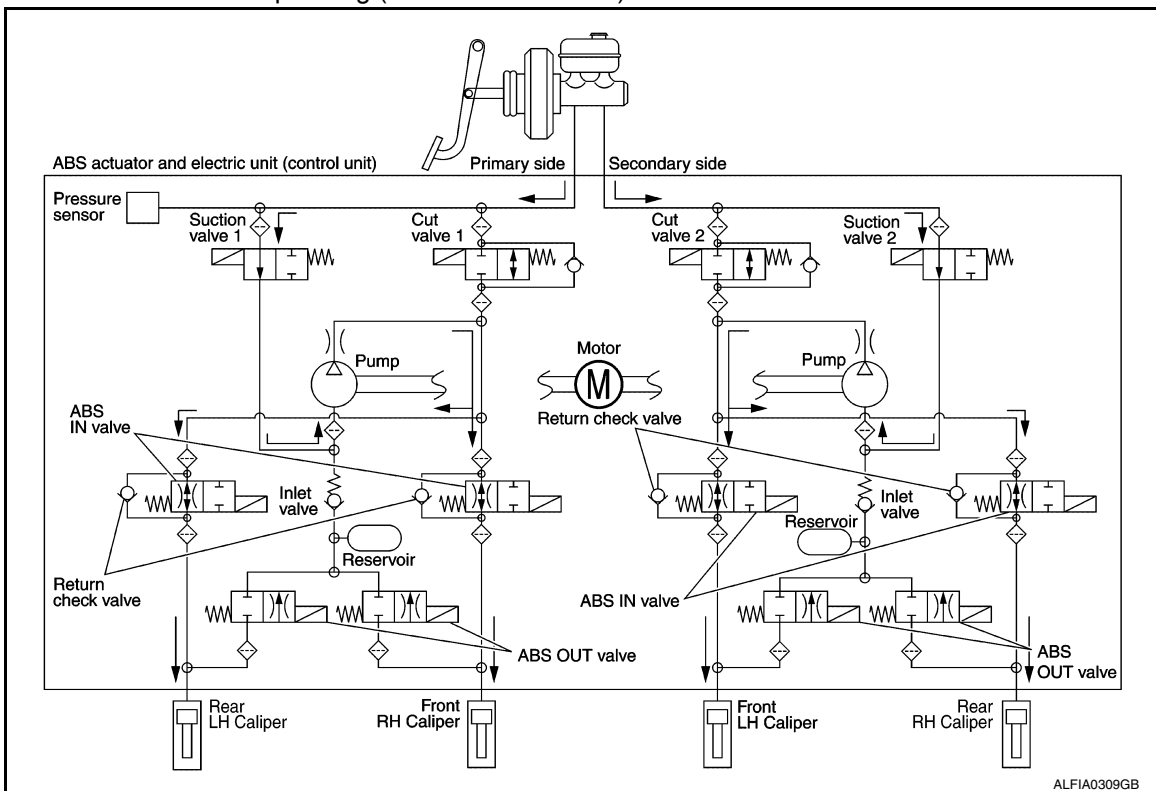
[WITHOUT ICC]

Component	Signal description
Steering angle sensor	Transmits the steering angle sensor signal to ABS actuator and electric unit (control unit) via CAN communication.
ECM	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Target throttle position signal
TCM	Transmits the current gear position signal to ABS actuator and electric unit (control unit) via CAN communication.
Chassis control module	Transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control
Combination meter	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • ABS warning lamp signal • Brake warning lamp signal • VDC OFF indicator lamp signal • Slip indicator lamp signal

VALVE OPERATION (VDC AND TCS FUNCTIONS)

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

VDC and TCS Functions are Operating (Pressure Increases)



Name	Not activated	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)

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

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

Front RH brake caliper

- Brake fluid is conveyed to the pump from the master cylinder through suction valve 1 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.

Front LH brake caliper

- Brake fluid is conveyed to the pump from the master cylinder through suction valve 2 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.

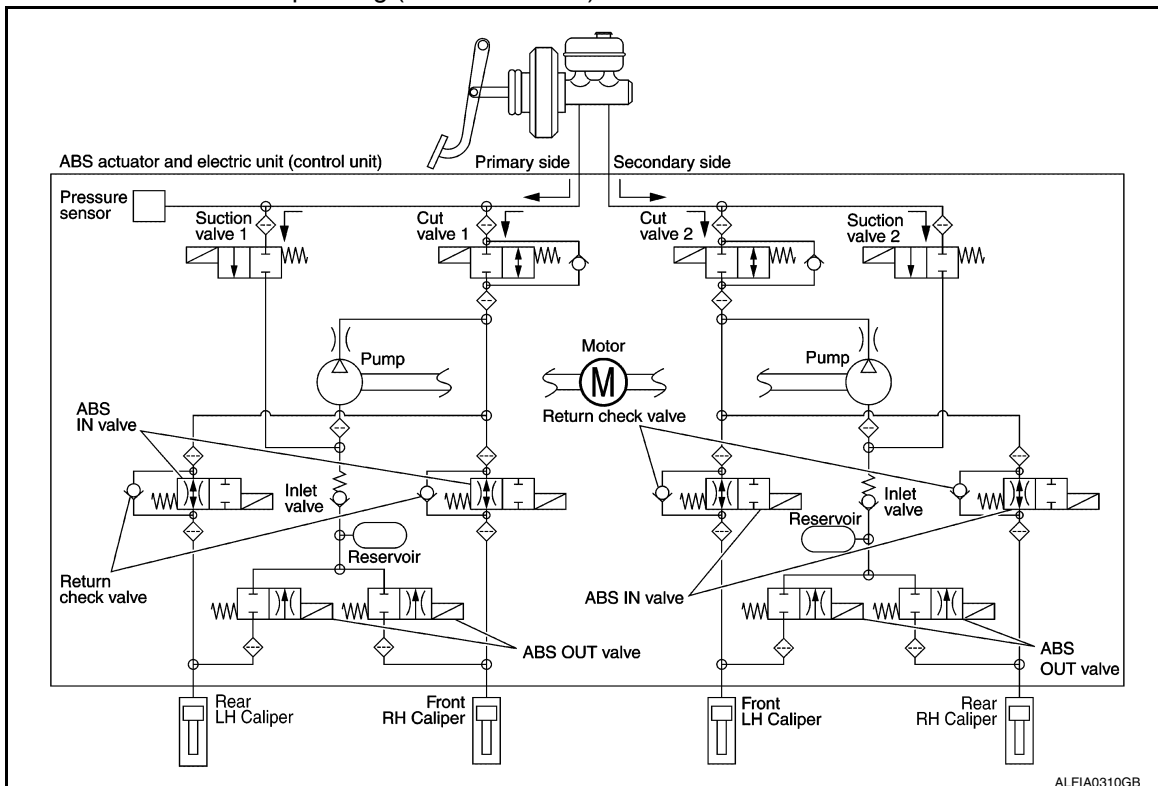
Rear RH brake caliper

- Brake fluid is conveyed to the pump from the master cylinder through suction valve 2 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.

Rear LH brake caliper

- Brake fluid is conveyed to the pump from the master cylinder through suction valve 1 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.

VDC and TCS Functions Start Operating (Pressure Holds)



SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Name	Not activated	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)
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

Front RH brake caliper

- Since the cut valve 1 and the suction valve 1 are closed, the front RH brake caliper, master cylinder, 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.

Front LH brake caliper

- Since the cut valve 2 and the suction valve 2 are closed, the front LH brake caliper, master cylinder, 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.

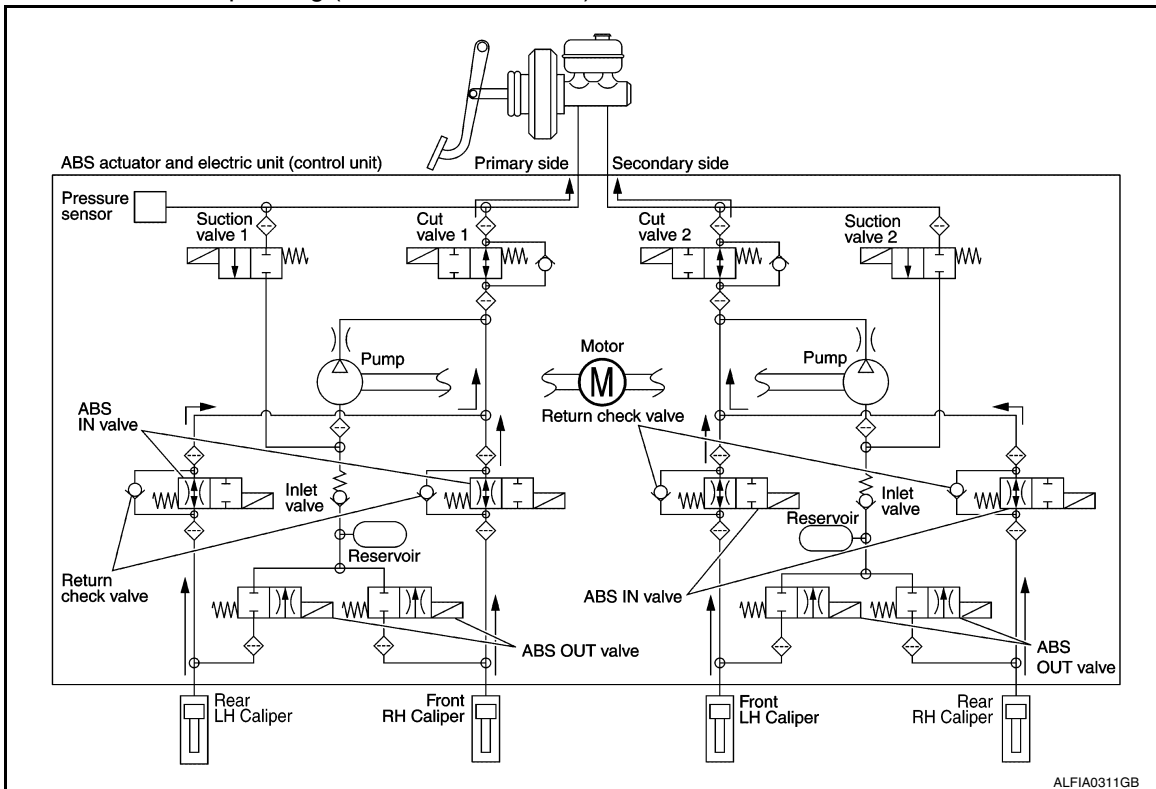
Rear RH brake caliper

- Since the cut valve 2 and the suction valve 2 are closed, the rear RH brake caliper, master cylinder, 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.

Rear LH brake caliper

- Since the cut valve 1 and the suction valve 1 are closed, the rear LH brake caliper, master cylinder, 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.

VDC and TCS Functions Operating (Pressure Decreases)



SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Name	Not activated	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 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

Front RH brake caliper

- Since the suction valve 1 and the ABS OUT valve are closed and the cut valve 1 and the ABS IN valve are open, the fluid pressure applied on the front RH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 1. The pressurization for the right caliper is controlled separately from the left caliper.

Front LH brake caliper

- Since the suction valve 2 and the ABS OUT valve are closed and the cut valve 2 and the ABS IN valve are open, the fluid pressure applied on the front LH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 2. The pressurization for the left caliper is controlled separately from the right caliper.

Rear RH brake caliper

- Since the suction valve 2 and the ABS OUT valve are closed and the cut valve 2 and the ABS IN valve are open, the fluid pressure applied on the rear RH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 2. The pressurization for the right caliper is controlled separately from the left caliper.

Rear LH brake caliper

- Since the suction valve 1 and the ABS OUT valve are closed and the cut valve 1 and the ABS IN valve are open, the fluid pressure applied on the rear LH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 1. The pressurization for the right caliper is controlled separately from the left caliper.

Component Parts and Function

Component	Function
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Activates the pump according to signals from ABS actuator and electric unit (control unit).
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Return check valve	Returns the brake fluid from brake caliper to master cylinder 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.
Pressure sensor	Detects the brake fluid pressure and transmits signal to ABS actuator and electric unit (control unit).

VALVE OPERATION (ABS AND EBD FUNCTIONS)

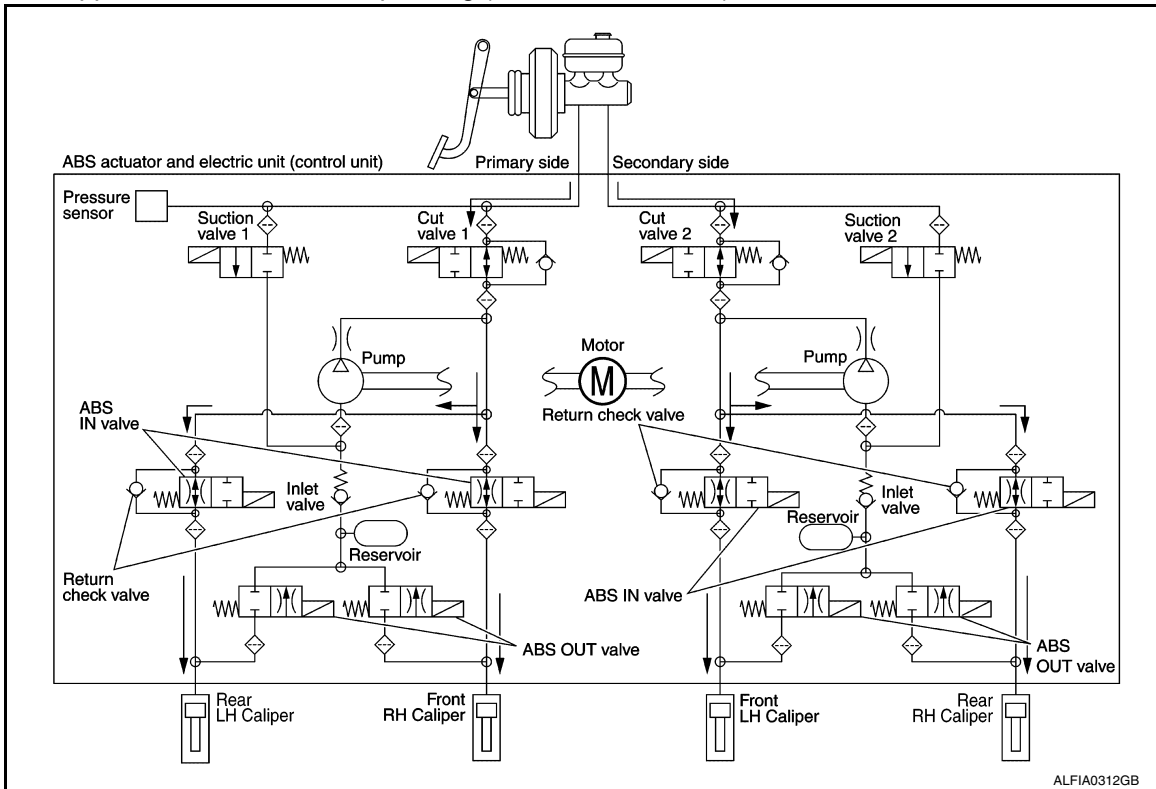
The control unit built into the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers by operating each valve.

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Brake Pedal Applied or ABS Function Operating (Pressure Increases)



Name	Not activated	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

Front RH brake caliper

- When the cut valve 1 and the ABS IN valve opens, brake fluid is supplied to the front RH brake caliper from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

Front LH brake caliper

- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the front LH brake caliper from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

Rear RH brake caliper

- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear RH brake caliper from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

Rear LH brake caliper

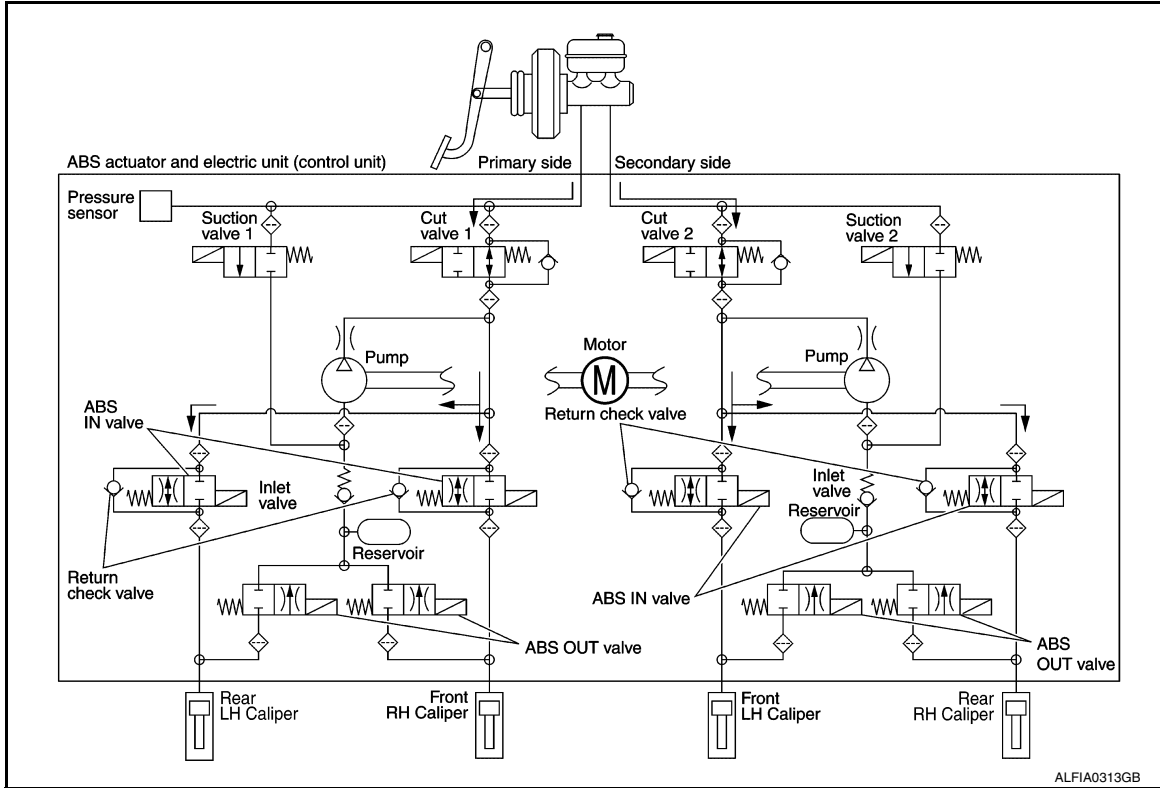
- When the cut valve 1 and the ABS IN valve opens, brake fluid is supplied to the rear LH brake caliper from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

ABS Function Starts Operating (Pressure Holds)



Name	Not activated	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

Front RH brake caliper

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

Front LH brake caliper

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

Rear RH brake caliper

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

Rear LH brake caliper

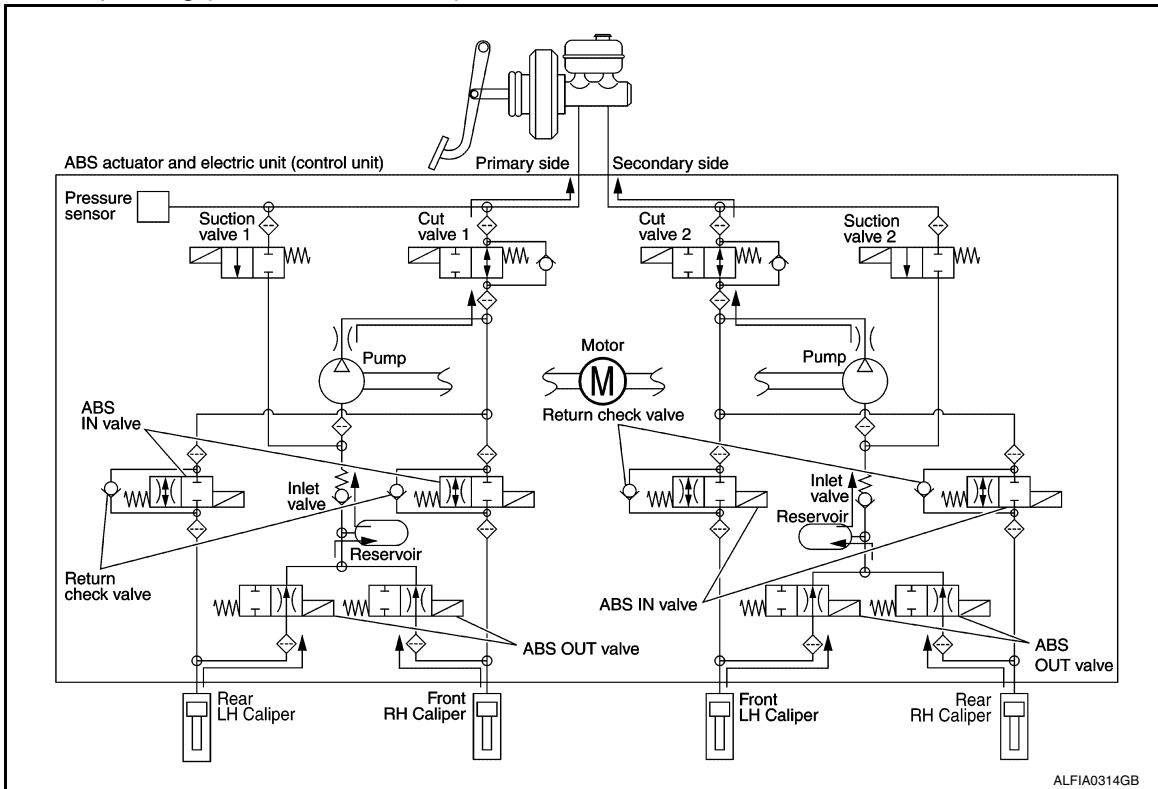
- Since the ABS IN valve and the ABS OUT valve are closed, the rear LH brake caliper, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear LH brake caliper.

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

ABS Function Operating (Pressure Decreases)



Name	Not activated	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

Front RH brake caliper

- 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 master cylinder by the pump.

Front LH brake caliper

- 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 master cylinder by the pump.

Rear RH brake caliper

- 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 master cylinder by the pump.

Rear LH brake caliper

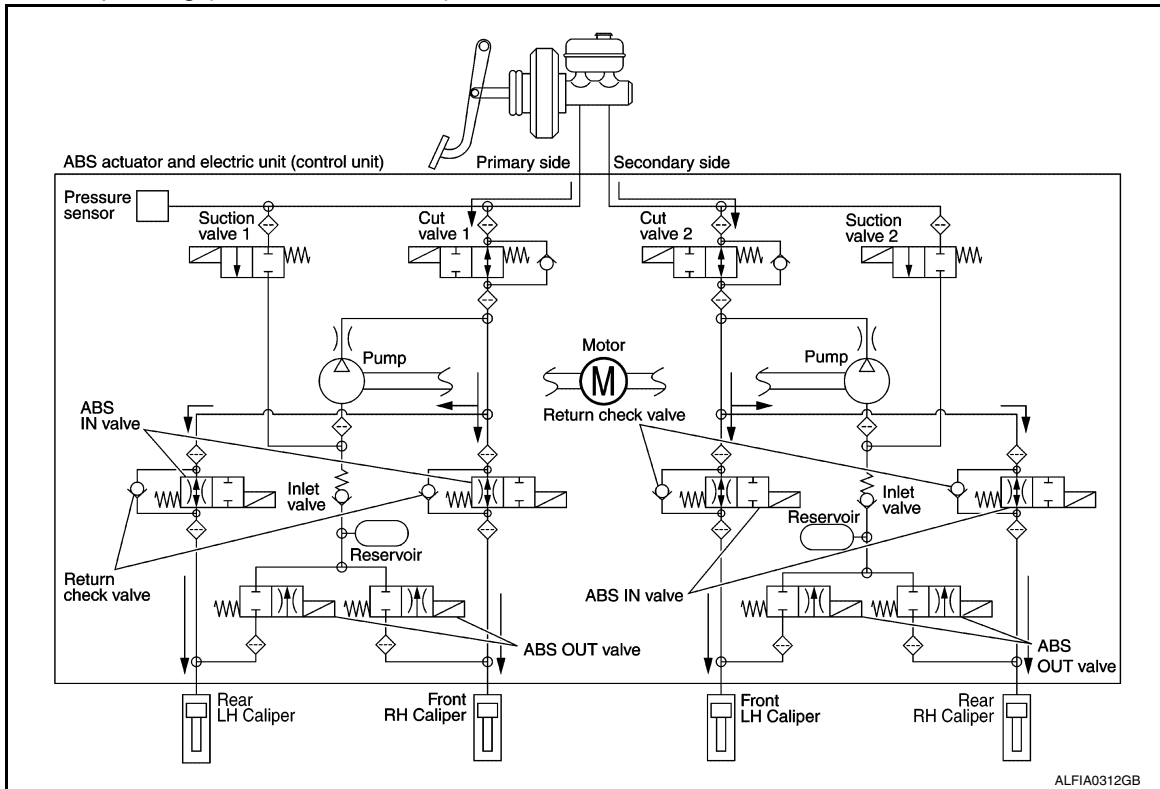
- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear LH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the master cylinder by the pump.

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

ABS Function Operating (Pressure Increases)



Name	Not activated	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

Front RH brake caliper

- Brake fluid is supplied to the front RH brake caliper from the master cylinder through the cut valve 1 and the ABS IN valve. Since the suction valve 1 and the ABS OUT valve are closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

Front LH brake caliper

- Brake fluid is supplied to the front LH brake caliper from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve are closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

Rear RH brake caliper

- Brake fluid is supplied to the rear RH brake caliper from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve are closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the rear RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

Rear LH brake caliper

- Brake fluid is supplied to the rear LH brake caliper from the master cylinder through the cut valve 1 and the ABS IN valve. Since the suction valve 1 and the ABS OUT valve are closed, the fluid does not flow into the

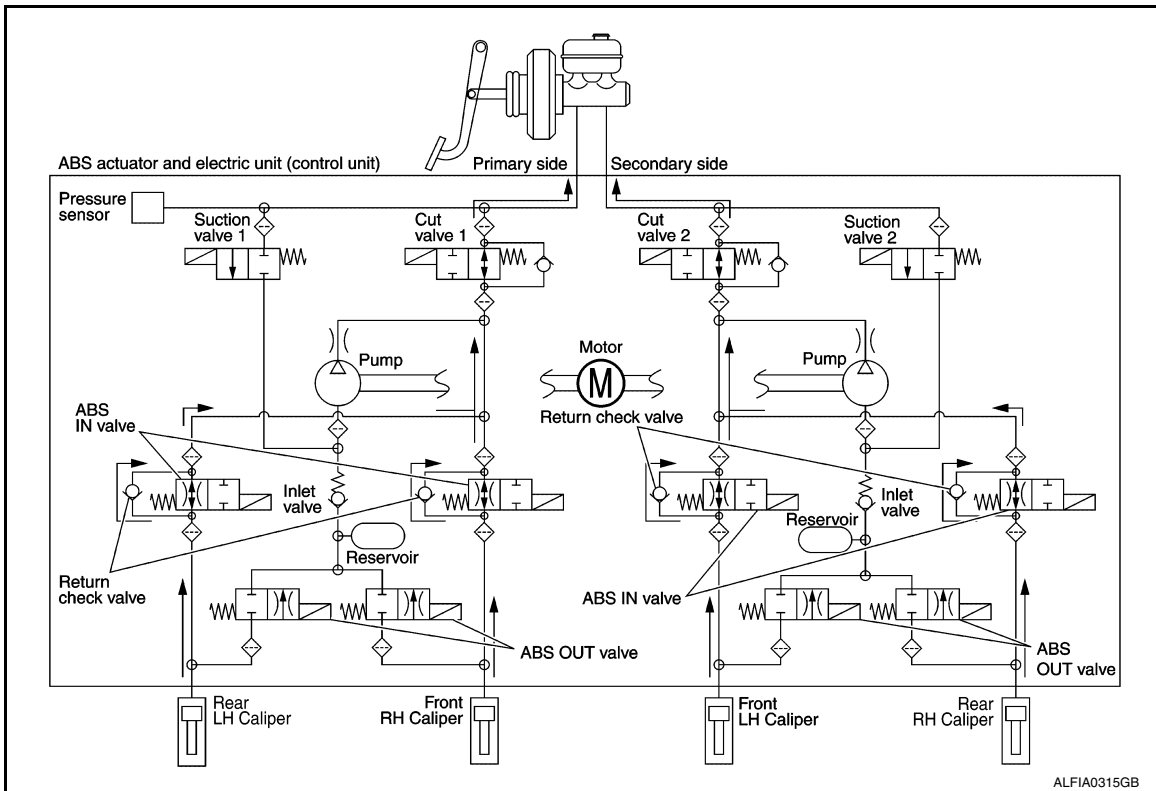
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reservoir. The amount of brake fluid supplied to the rear LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

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

Front RH brake caliper

- Brake fluid is supplied to the front RH brake caliper through the return check valve of the ABS IN valve and the cut valve 1 and returns to the master cylinder.

Front LH brake caliper

- Brake fluid is supplied to the front LH brake caliper through the return check valve of the ABS IN valve and the cut valve 2 and returns to the master cylinder.

Rear RH brake caliper

- Brake fluid is supplied to the rear RH brake caliper through the return check valve of the ABS IN valve and the cut valve 2 and returns to the master cylinder.

Rear LH brake caliper

- Brake fluid is supplied to the rear LH brake caliper through the return check valve of the ABS IN valve and the cut valve 1 and returns to the master cylinder.

Component Parts and Function

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Component	Function
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Activates the pump according to signals from ABS actuator and electric unit (control unit).
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Return check valve	Returns the brake fluid from brake caliper to master cylinder 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.
Pressure sensor	Detects the brake fluid pressure and transmits signal to ABS actuator and electric unit (control unit).

CONDITIONS FOR INDICATOR LAMP ILLUMINATION

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

Condition (status)	VDC OFF indicator lamp	Slip indicator lamp
Ignition switch OFF	OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON	ON
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF	OFF
When VDC OFF switch is ON (VDC function and TCS function are OFF.)	ON	OFF
VDC function is malfunctioning.	OFF	ON
TCS function is malfunctioning.	OFF	ON

CONDITIONS FOR WARNING LAMP ILLUMINATION

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

Condition (status)	ABS warning lamp	Brake warning lamp
Ignition switch OFF	OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON	ON
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF	OFF
After engine starts	OFF	OFF
When parking brake operates (parking brake switch ON)	OFF	ON
When brake fluid is less than the specified level (brake fluid level switch ON)	OFF	ON
When vacuum sensor is malfunctioning	OFF	ON
VDC function is malfunctioning.	OFF	OFF
TCS function is malfunctioning.	OFF	OFF
ABS function is malfunctioning.	ON	OFF
EBD function is malfunctioning.	ON	ON
VDC function is operating.	OFF	OFF

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Condition (status)	ABS warning lamp	Brake warning lamp
TCS function is operating.	OFF	OFF
Brake assist	OFF	OFF

Fail-safe

INFOID:000000012273565

VDC AND TCS FUNCTIONS

VDC warning lamp in combination meter turns ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC and TCS functions. However, ABS and EBD functions operate normally.

ABS FUNCTION

ABS warning lamp and SLIP indicator 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, TCS and ABS functions. However, EBD function operates normally.

EBD FUNCTION

ABS warning lamp, brake warning lamp and SLIP indicator 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, TCS, ABS and EBD functions.

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	The following functions are suspended: • VDC • ABS • EBD (only when both rear wheels are malfunctioning) • Brake assist function • Active trace control function
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	<ul style="list-style-type: none"> • When a short circuit is detected in rear RH wheel sensor circuit. • When power supply voltage of rear RH wheel sensor is in following state: - Rear RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ rear RH wheel sensor power supply voltage • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 	
C1106	<ul style="list-style-type: none"> • When a short circuit is detected in rear LH wheel sensor circuit. • When power supply voltage of rear LH wheel sensor is in following state: - Rear LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ rear LH wheel sensor power supply voltage • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 	
C1107	<ul style="list-style-type: none"> • When a short circuit is detected in front RH wheel sensor circuit. • When power supply voltage of front RH wheel sensor is in following state: - Front RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ front RH wheel sensor power supply voltage • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 	
C1108	<ul style="list-style-type: none"> • When a short circuit is detected in front LH wheel sensor circuit. • When power supply voltage of front LH wheel sensor is in following state: - Front LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ front LH wheel sensor power supply voltage • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 	

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

DTC	Malfunction detected condition	Fail-safe condition
C1109	<ul style="list-style-type: none"> • When ignition power supply voltage is in following state: - Ignition power supply voltage: $10\text{ V} \geq$ ignition power supply voltage. - Ignition power supply voltage: $16\text{ V} \leq$ ignition power supply voltage. 	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • ABS • EBD • Brake assist function • Active trace control function
C1110	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	
C1111	When a malfunction is detected in motor or motor relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • ABS • Brake assist function • Active trace control function
C1113	When a malfunction is detected in longitudinal G signal.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • Brake assist function • Active trace control function
C1115	When difference in wheel speed between any wheel and others is detected when the vehicle is driven because of installation of tires other than as specified.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • ABS • EBD • Brake assist function • Active trace control function
C1116	When stop lamp switch signal is not inputted when brake pedal operates.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • Brake assist function • Active trace control function
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • ABS • EBD • Brake assist function • Active trace control function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • Active trace control function
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC • TCS • ABS • EBD • Brake assist function • Active trace control function

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

DTC	Malfunction detected condition	Fail-safe condition	
C1142	When a malfunction is detected in VDC pressure sensor.		A
C1143	When a malfunction is detected in steering angle sensor.	The following functions are suspended: • VDC • TCS • Brake assist function • Active trace control function	B
C1144	When neutral position adjustment of steering angle sensor is not complete.		
C1145	When a malfunction is detected in yaw rate signal or signal line of yaw rate/side/decel G sensor is open or shorted.		
C1146	When a malfunction is detected in side G signal or signal line of yaw rate/side/decel G sensor is open or shorted.		C
C1153	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little.)	The following functions are suspended: • VDC • TCS • ABS • Brake assist function • Active trace control function	D
C1154	When an open or short is detected between the ABS actuator and electrical unit (control unit) and TCM		E
C1155	When brake fluid level low signal is detected.	The following functions are suspended: • VDC • TCS • Brake assist function • Active trace control function	BRC
C1160	When calibration of yaw rate/side/decel G sensor is not complete.		
C1164	When a malfunction is detected in cut valve 1.		
C1165	When a malfunction is detected in cut valve 2.		
C1166	When a malfunction is detected in suction valve 1.		
C1167	When a malfunction is detected in suction valve 2.		G
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended: • VDC • TCS • ABS • Brake assist function • Active trace control function	H
C1197	When a malfunction is detected in vacuum sensor.		I
C1198	<ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. 	Electrical vacuum assistance of brake booster is suspended.	J
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	—	K
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.	L
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	The following functions are suspended: • VDC • TCS • Active trace control function	M

VDC FUNCTION

N

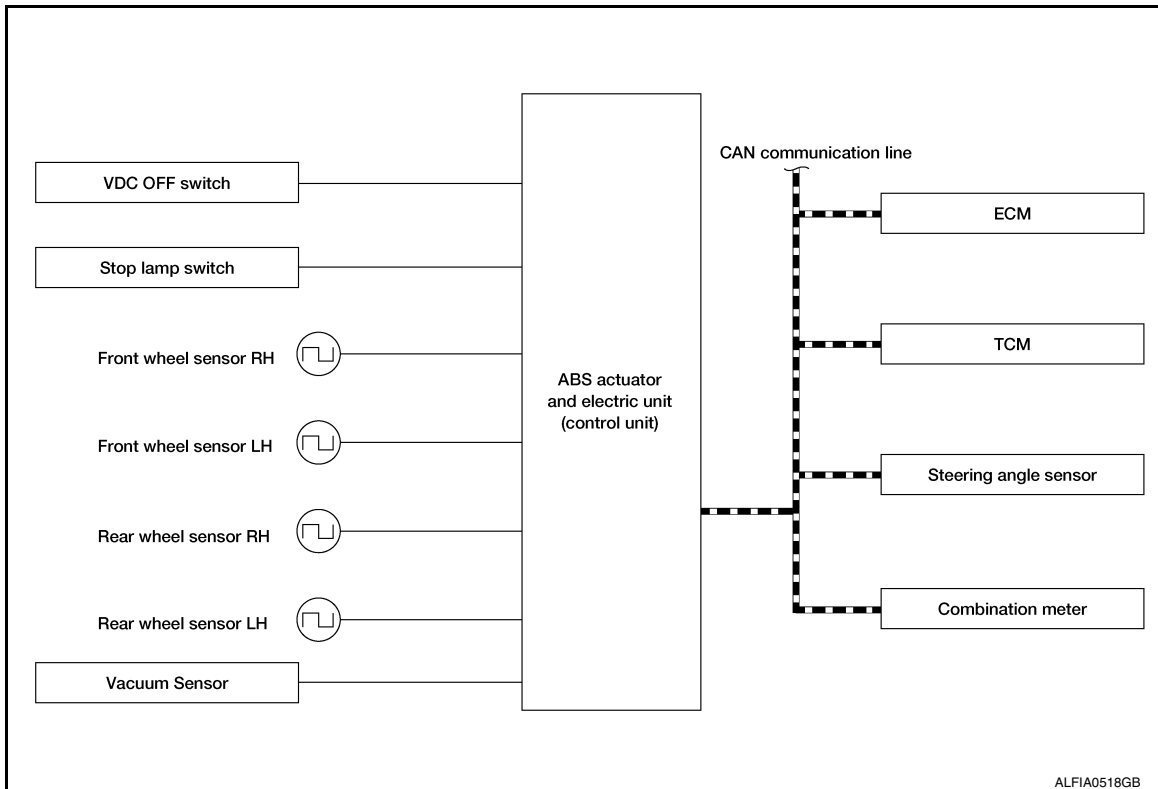
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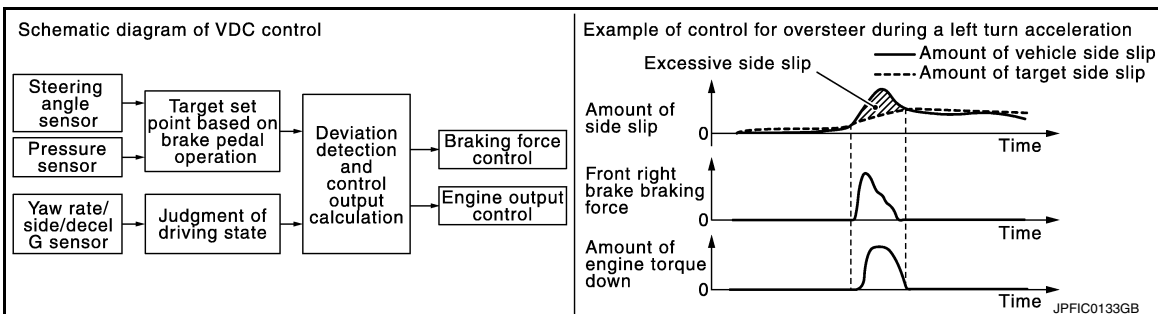
VDC FUNCTION : System Description

INFOID:000000012273566

SYSTEM DIAGRAM



- Side slip or tail slip may occur while driving on a slippery road or intending urgent evasive driving. VDC function detects side slip status using each sensor when side slip or tail slip is about to occur and improves vehicle stability by brake control and engine output control during driving.
- In addition to ABS function, EBD function and TCS function, target side slip amount is calculated according to steering operation amount from steering angle sensor and brake operation amount from brake pressure 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 wheels and engine output control.



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount.
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function, brake assist function and brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-49, "Fail-Safe"](#).

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

INPUT SIGNAL AND OUTPUT SIGNAL

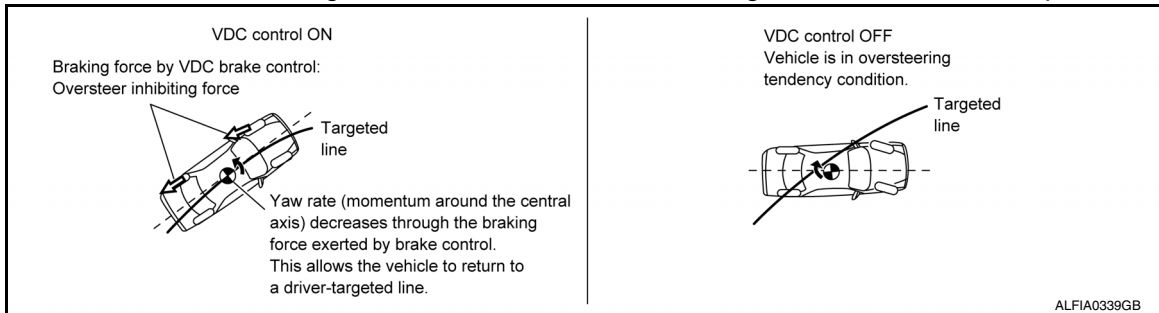
Major signal transmission between each unit via communication lines is shown in the following table:

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Engine torque request signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal • Steering angle sensor malfunction signal

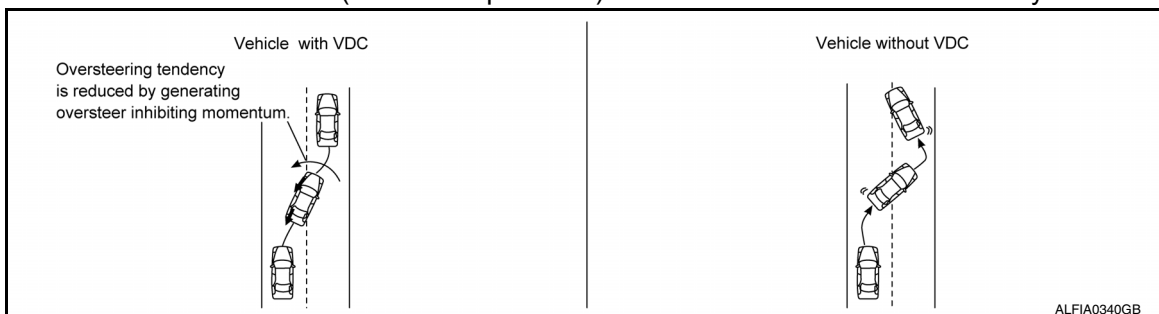
OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

- During 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.



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



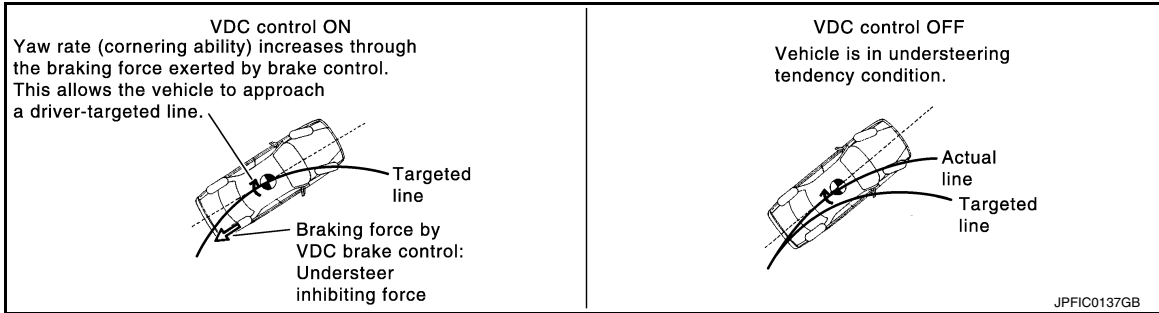
VDC Function That Prevents Understeer Tendency

SYSTEM

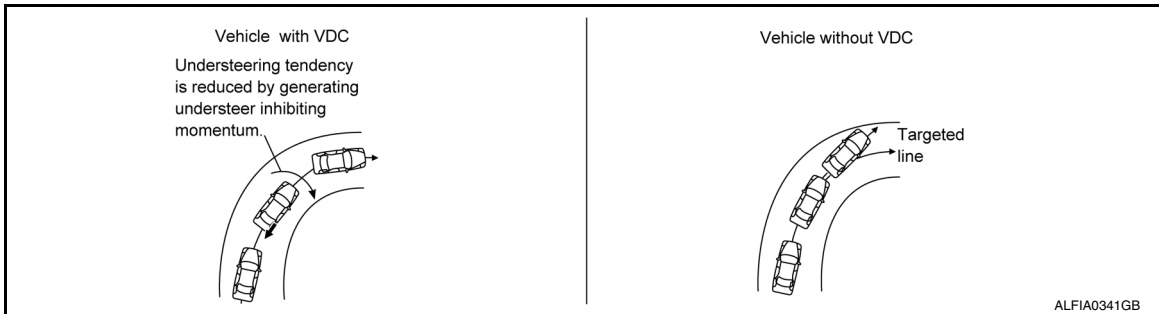
< SYSTEM DESCRIPTION >

[WITHOUT ICC]

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



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

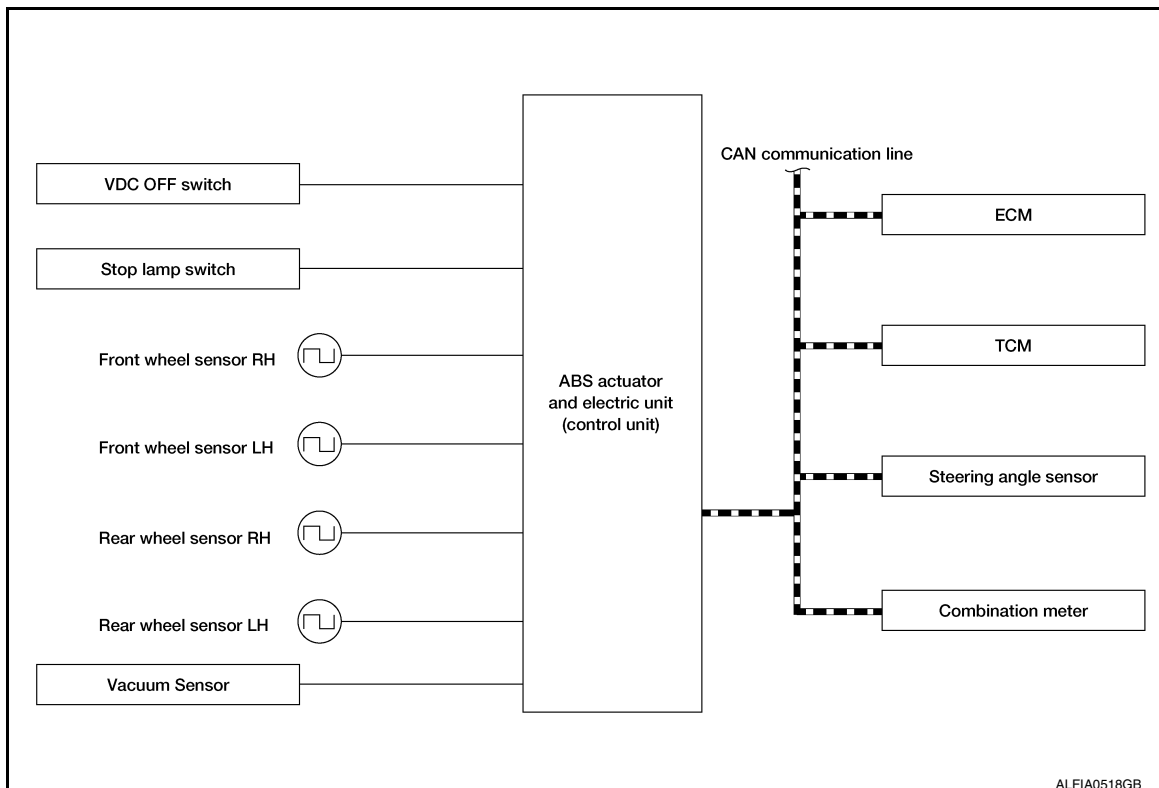


TCS FUNCTION

TCS FUNCTION : System Description

INFOID:000000012273567

SYSTEM DIAGRAM

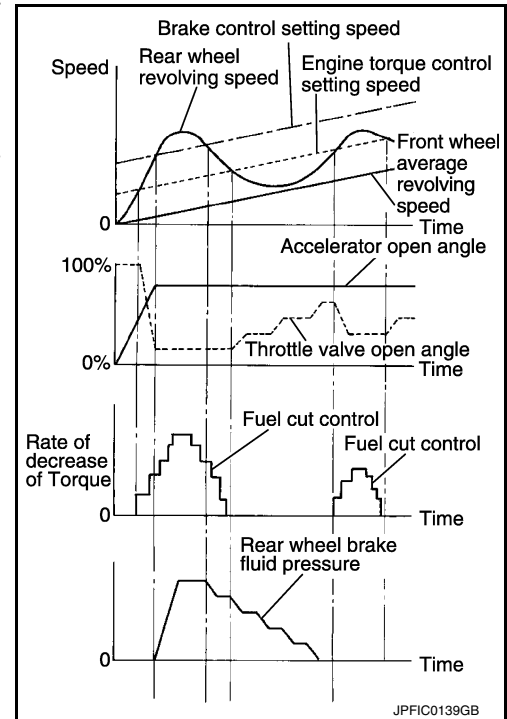


SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

- Wheel spin status of drive wheel is detected by wheel sensor of four wheels. Engine output and transmission shift status are 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) performs brake force control of LH and RH drive wheels (applies brake force by increasing brake fluid pressure of drive wheel) and decreases engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-49, "Fail-Safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

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

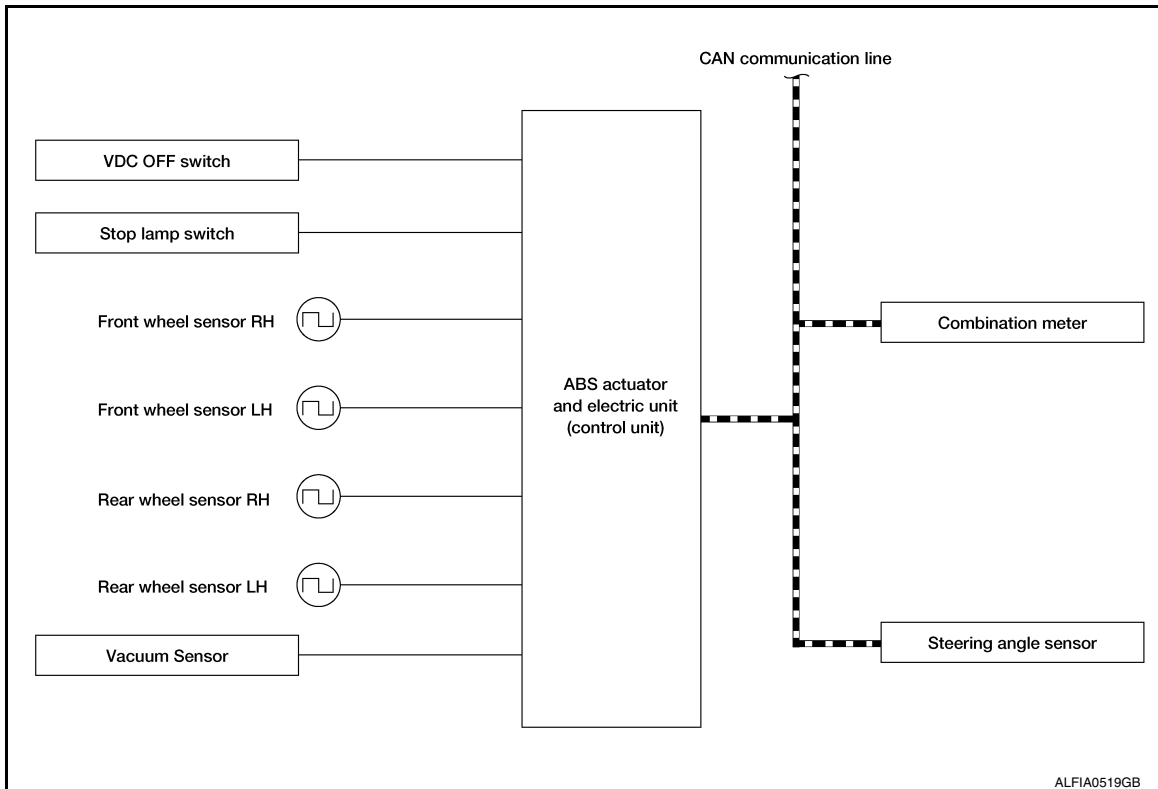
Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Engine torque request signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal • Steering angle sensor malfunction signal

ABS FUNCTION

ABS FUNCTION : System Description

INFOID:000000012273568

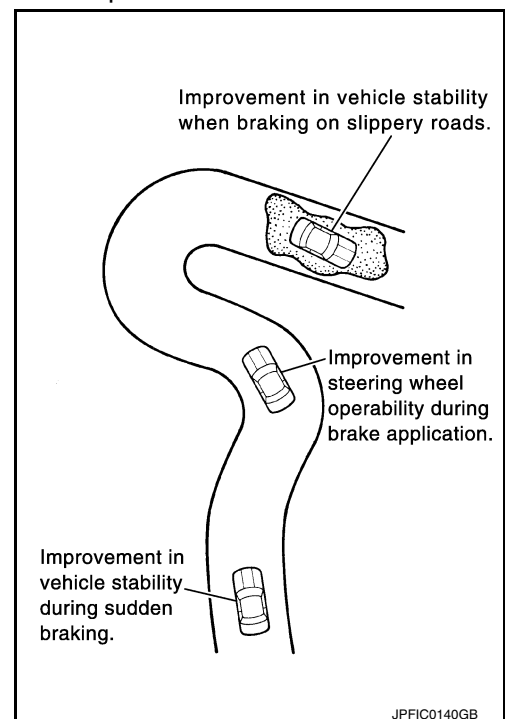
SYSTEM DIAGRAM



- 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 calculate wheel speed and pseudo-vehicle speed and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- 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 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 and ABS function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake assist function. However, EBD function is operated normally. Refer to [BRC-49, "Fail-Safe"](#).

NOTE:

- ABS has the characteristics as described here. This is not a 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 MPH) or less, but differs subject to road conditions].
- Self-diagnosis is performed immediately after engine starts and when vehicle is initially driven [vehicle speed approx. 15 km/h (9 MPH)]. Motor sounds are generated during self-diagnosis. In addition, brake pedal may be feel heavy when depressing brake pedal lightly. These symptoms are not malfunctions.



INPUT SIGNAL AND OUTPUT SIGNAL

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

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

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

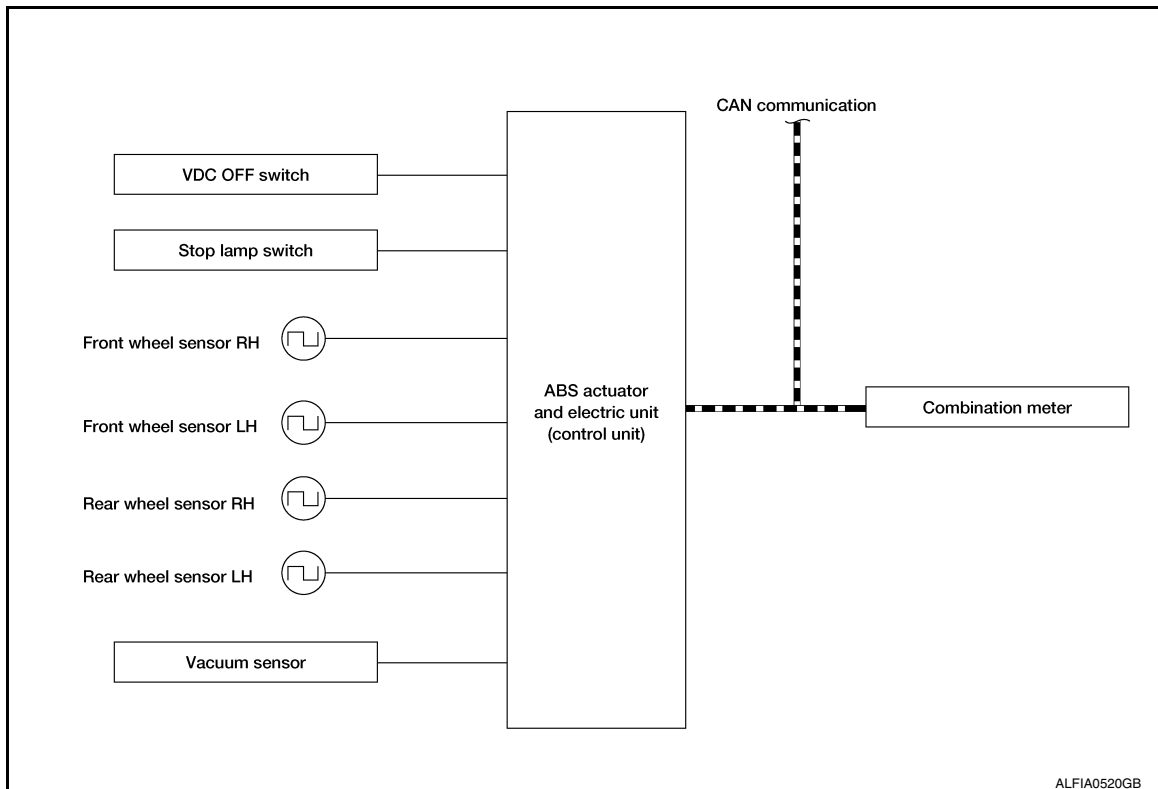
EBD FUNCTION

EBD FUNCTION : System Description

INFOID:000000012273569

BRC

SYSTEM DIAGRAM



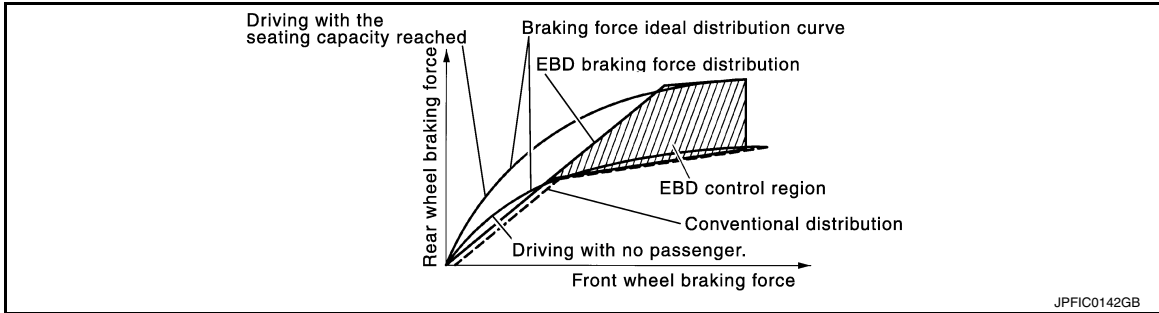
- By preventing rear wheel slip increase through rear wheel brake force (brake fluid pressure) control that is electronically controlled when slight slip of front and rear wheels is detected during braking, stability during braking is improved.

SYSTEM

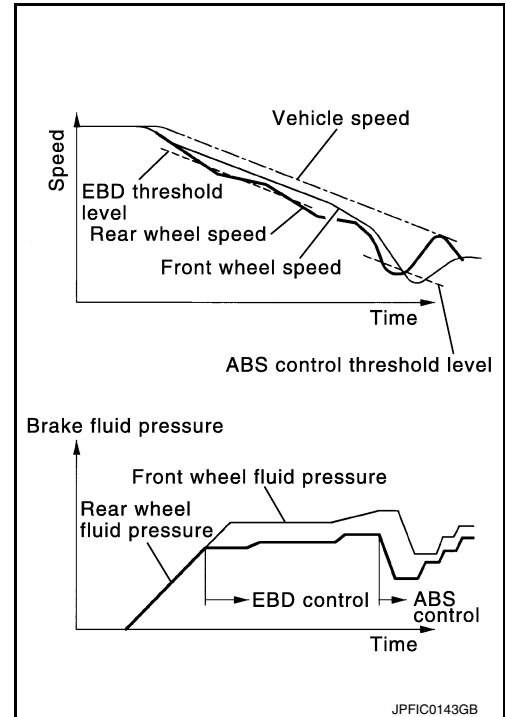
< SYSTEM DESCRIPTION >

[WITHOUT ICC]

- 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 of front and rear wheels with 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 of front wheel and rear wheel are nearly equalized. ABS control is applied when slip of each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and brake assist function. Refer to [BRC-49. "Fail-Safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

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

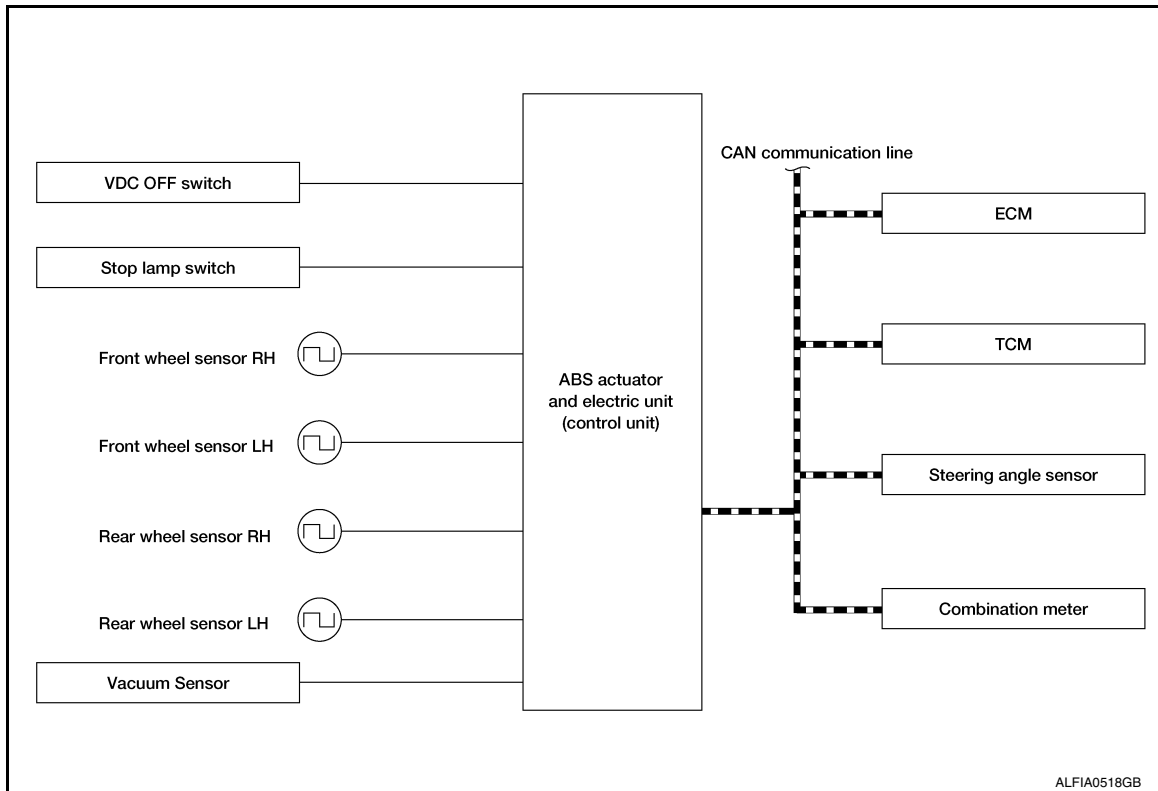
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> VDC warning lamp signal ABS warning lamp signal Brake warning lamp signal

BRAKE ASSIST FUNCTION

BRAKE ASSIST FUNCTION : System Description

INFOID:000000012273570

SYSTEM DIAGRAM



- 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 and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-49, "Fail-Safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
ECM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Engine torque request signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

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">• Brake fluid level switch signal• Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• VDC warning lamp signal• VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Steering angle sensor signal• Steering angle sensor malfunction signal

ACTIVE TRACE CONTROL FUNCTION

ACTIVE TRACE CONTROL FUNCTION : System Description

INFOID:0000000012379188

- Active trace control function controls the braking utilizing the ABS actuator and electric unit (control unit), depending on cornering condition calculated from driver's steering input and plural sensors.
- Active trace control function is aimed to enhance traceability at corners and smooth the vehicle movement to provide confident driving.
- When the drive mode select switch is set to the "SPORT" mode, the amount of brake control provided by active trace control is reduced.
- For "NORMAL" mode, the active trace control can be selected ON or OFF. Refer to [BRC-36, "ACTIVE TRACE CONTROL FUNCTION : System Description"](#).
- When the VDC OFF switch is used to turn OFF the VDC system, the active trace control system is also turned OFF.
- When the active trace control is operated, active trace control graphics are shown on the information display of combination meter. These are shown only when "Chassis control" is selected on the information display. Refer to [DAS-183, "System Description"](#).
- When the active trace control is not functioning properly, the master warning lamp illuminates. Warning message "Chassis control" will also appear on information display.

NOTE:

- The active trace control may not be effective depending on the driving condition. Always drive carefully and attentively.
- Brake pedal may vibrate and brake pedal feel may change during active trace control operation. Also operation noise may be noticeable during operation. These are not abnormal conditions.
- When the active trace control is selected OFF, some functions will be kept ON to assist driver (For example, avoidance condition).

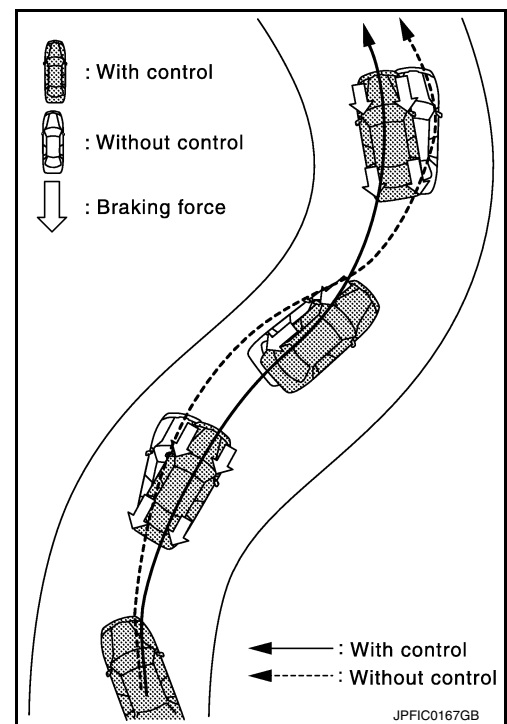
OPERATION CHARACTERISTICS

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

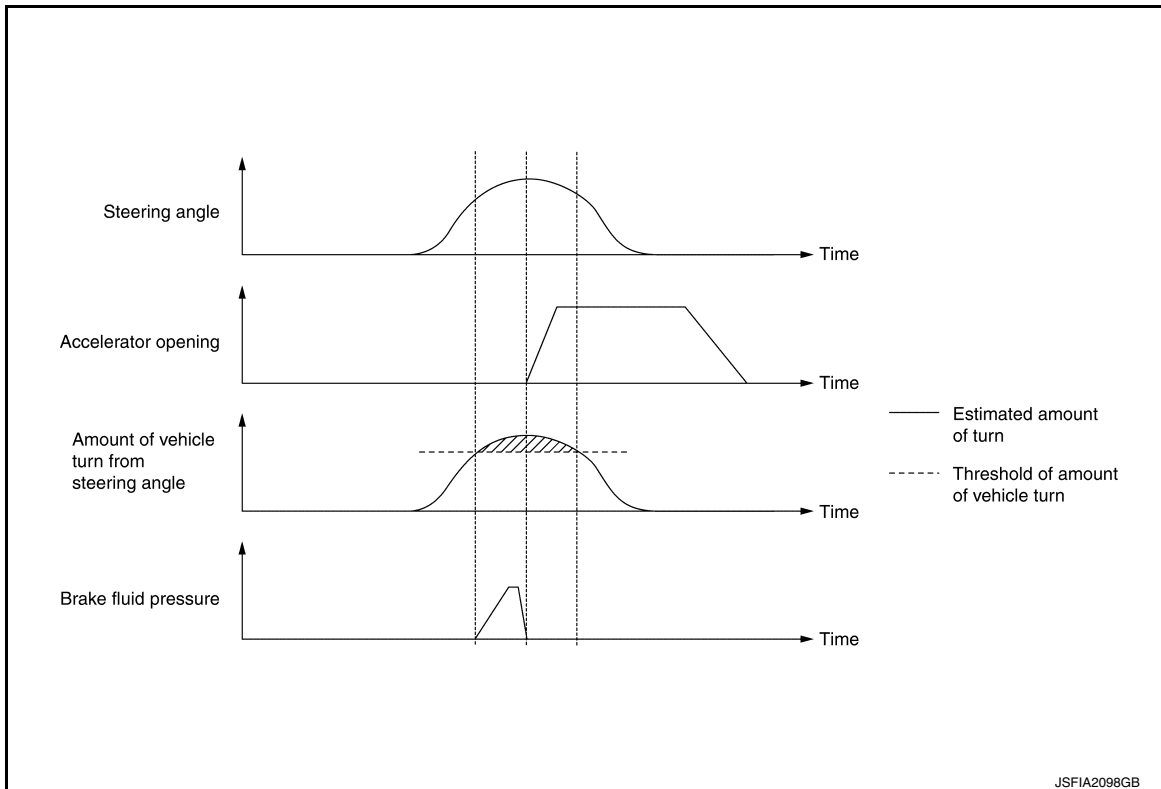
Active trace control helps enhance the transition from braking into and then accelerating out of corners. Active trace control utilizes the vehicle's electrically-driven intelligent brake system to help improve cornering feel by automatically applying brakes. Furthermore, active trace control will apply selective braking to help create increased steering response in S-turns. For example, if driving through an S-turn that starts with steering to the right, the right-side brakes are engaged to create a yaw momentum and help turn the vehicle.



A
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BRC

- Brake control amount is controlled according to steering operation status by the driver and vehicle cornering status.



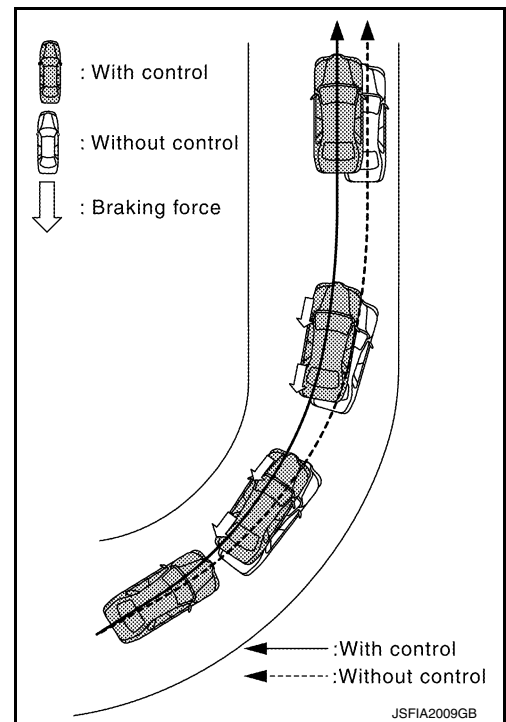
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SYSTEM

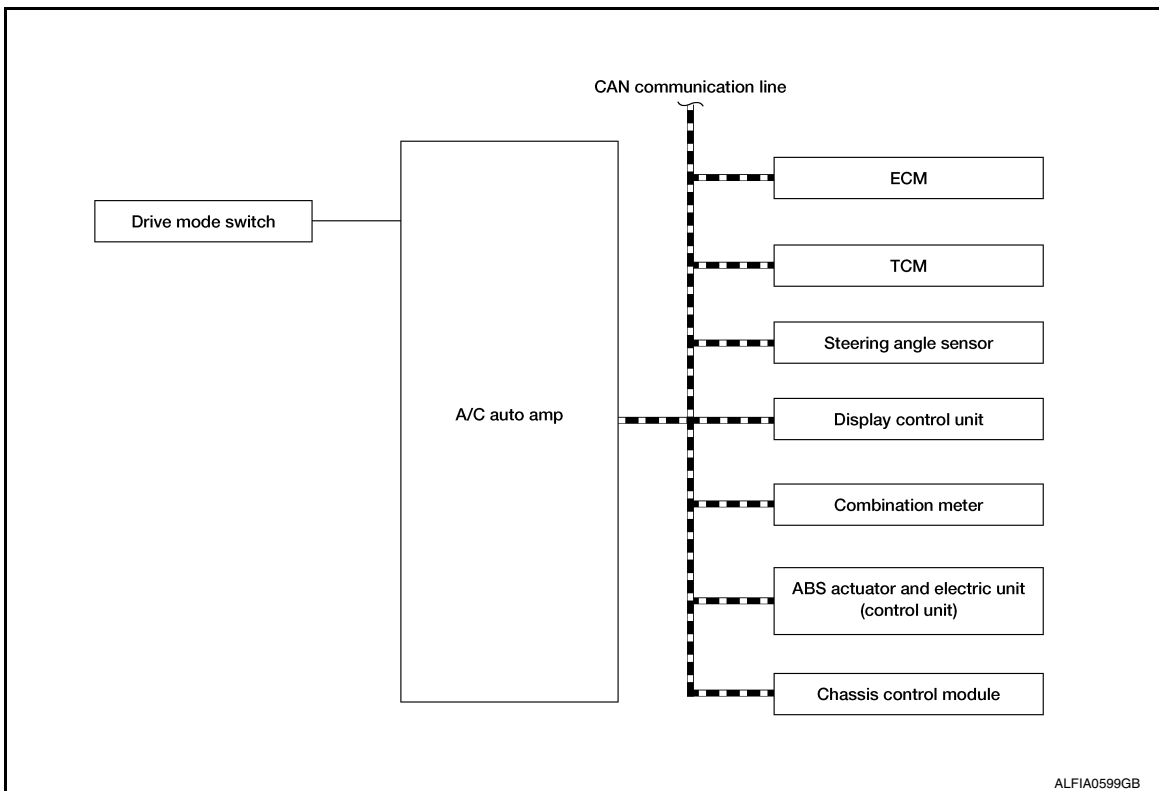
< SYSTEM DESCRIPTION >

- During cornering, the brake control system limits changes in steering angle by controlling the inner ring brakes according to accelerator pedal operation and allows smooth movement of the vehicle to achieve stable cornering.

[WITHOUT ICC]



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 >

[WITHOUT ICC]

Component	Signal description	
ECM	Mainly transmits the following signals to chassis control module via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine torque signal • Engine speed signal 	A
TCM	Mainly transmits the following signal to chassis control module via CAN communication: <ul style="list-style-type: none"> • Current gear position signal 	B
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to chassis control module via CAN communication: <ul style="list-style-type: none"> • Front LH wheel speed signal • Front RH wheel speed signal • Rear LH wheel speed signal • Rear RH wheel speed signal • ABS operation signal • TCS operation signal • VDC operation signal • Stop lamp switch signal • Vehicle speed signal (ABS) • Yaw rate signal • Side G signal • Decel G signal • VDC OFF switch signal • Brake fluid pressure signal • Steering angle sensor signal 	C
	Mainly receives the following signal from chassis control module via CAN communication: <ul style="list-style-type: none"> • Active trace control signal 	D
Steering angle sensor	Mainly transmits the following signal to chassis control module via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal 	E
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active Trace Control signal • Drive mode signal 	F
Display control unit	Mainly transmits the following signal to chassis control module via CAN communication line: <ul style="list-style-type: none"> • System selection signal 	G
Combination meter	Mainly receives the following signals from chassis control module via CAN communication: <ul style="list-style-type: none"> • Chassis control malfunction signal • Active trace control display signal 	H
Drive mode select switch	Mainly transmits the following signal to chassis control module: <ul style="list-style-type: none"> • Drive mode signal 	I

BRC

WARNING/INDICATOR/CHIME LIST

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



INFOID:0000000012273572

Name	Design	Layout/Function
ABS warning lamp	ABS	For function: Refer to BRC-151. "Component Function Check" .
Brake warning lamp	BRAKE	For function: Refer to BRC-152. "Component Function Check" .

SYSTEM

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Name	Design	Layout/Function
VDC OFF indicator lamp		For function: Refer to BRC-155, "Component Function Check" .
VDC warning lamp		For function: Refer to BRC-154, "Component Function Check" .

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

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

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

CONSULT Function

INFOID:0000000012273573

APPLICATION ITEMS

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

Mode	Function description
ECU Identification	Part 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.
Re/programming, Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing ABS actuator and electric unit (control unit).

*: 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-52, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

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

Freeze Frame Data (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT.

Item name	Display item
IGN counter (0 - 39)	<p>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none">• When "0" is displayed: It indicates that the system is presently malfunctioning.• When except "0" is displayed: It indicates that system malfunction in the past was detected, but the system is presently normal. <p>NOTE: Each time ignition switch is turned OFF to ON, number increases from 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number does not increase and "39" is displayed until self-diagnosis is erased.</p>

ACTIVE TEST

The active test is used to determine and identify details of a malfunction, based on self-diagnosis test results 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 approximately 10 seconds after operation starts.
- When performing active test again after "TEST IS STOPPED" is displayed, select "BACK".

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

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

- ABS warning lamp, brake warning lamp and VDC 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:

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 approximately 2 seconds.

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

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

Test item	Display item	Display		
		Up	ACT UP	ACT KEEP
FR RH SOL (ACT)	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	On*	On*
FR LH SOL (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	On*	On*
RR RH SOL (ACT)	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	On*	On*
RR LH SOL (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	On*	On*

*: Immediately after being selected, status is “On”. Status changes to “Off” after approx. 10 seconds.

ABS MOTOR

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

Test item	Display item	Display	
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY ^(Note)	On	On

NOTE:

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

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Display occasionally changes On/Off for a moment after ignition switch is turned ON. This operation is for checking purposes and is not a malfunction.

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
	INPUT SIGNALS	MAIN SIGNALS	
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.
DECEL G-SEN (m/s ²)	×	×	Decel G detected by decel G sensor is displayed.
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. (Note 1)
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. (Note 1)
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. (Note 1)
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status is displayed. (Note 1)
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR	×	×	Current gear position judged from current gear position signal is displayed.

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

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Item (Unit)	Monitor item selection		Note
	INPUT SIGNALS	MAIN SIGNALS	
ENGINE SPEED (tr/min)	×	×	Engine speed status is displayed.
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.
P POSI SIG (On/Off)			P range signal input status judged from P range signal is displayed.
CV1 (On/Off)			Cut valve 1 (On/Off) status is displayed
CV2 (On/Off)			Cut valve 2 (On/Off) status is displayed
ACCEL POS SIG (%)	×		Displays the accelerator pedal position
SIDE G-SENSOR (m/s ²)	×		Side G detected by side G sensor is displayed.
STR ANGLE SIG	×		Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×		Brake fluid pressure detected by pressure sensor is displayed.
EBD SIGNAL (On/Off)			EBD operation status is displayed.
ABS SIGNAL (On/Off)			ABS operation status is displayed.
TCS SIGNAL (On/Off)			TCS operation status is displayed.
VDC SIGNAL (On/Off)			VDC operation status is displayed.
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.
CRANKING SIG (On/Off)			Cranking status is displayed.
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communication is displayed.

Note 1: Refer to [MWI-9, "METER SYSTEM : System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

WORK SUPPORT

Conditions	Description
ST ANGLE SENSOR ADJUSTMENT	Perform neutral position adjustment of steering angle sensor.
DECEL G SEN CALIBRATION	Perform decel G sensor calibration.

CONFIGURATION

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

< SYSTEM DESCRIPTION >

[WITHOUT ICC]

Configuration includes the following functions.

Function	Description
Read/Write Configuration	Before replacing ECU Allows the reading of vehicle specification (TYPE ID) written in the ABS actuator and electrical unit (control unit) to store the specification in CONSULT.
	After replacing ECU Allows the writing of vehicle information (TYPE ID) stored in the CONSULT into the ABS actuator and electrical unit (control unit).
Manual Configuration	Allows the writing of vehicle specification (TYPE ID) stored in the ABS actuator and electrical unit (control unit) by hand.

CAUTION:
Use “Manual Configuration” “TYPE ID” of ABS actuator and electric unit (control unit) cannot be read.

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BRC

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000012273574

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
FR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
RR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
RR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
DECEL G-SEN	Longitudinal acceleration detected by decel G sensor	Approx. 0 G	Vehicle stopped
		-1.7 to 1.7 G	Vehicle running
FR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

Monitor item	Display content	Data monitor		
		Condition	Reference value in normal operation	
RR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On	A
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	B
RR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On	C
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	D
RR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On	E
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	BRC
RR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On	G
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	H
EBD WARN LAMP	EBD warning lamp (Note 2)	When EBD warning lamp is ON	On	I
		When EBD warning lamp is OFF	Off	
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	On	J
		When brake pedal is not depressed	Off	
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	On	K
		When the motor relay and motor are not operating	Off	
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On	L
		When the actuator relay is not operating	Off	
ABS WARN LAMP	ABS warning lamp (Note 2)	When ABS warning lamp is ON	On	M
		When ABS warning lamp is OFF	Off	
OFF LAMP	VDC OFF indicator lamp (Note 2)	When VDC OFF indicator lamp is ON	On	N
		When VDC OFF indicator lamp is OFF	Off	
SLIP/VDC LAMP	SLIP indicator lamp (Note 2)	When SLIP indicator lamp is ON	On	O
		When SLIP indicator lamp is OFF	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Manual mode gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	P
ENGINE SPEED	With engine running	With engine stopped	0 RPM	
		Engine running	Almost in accordance with tachometer display	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G sensor	Vehicle stopped	Approx. 0 d/s
		Vehicle turning	-75 to 75 d/s
R POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = R position	On
		CVT shift position = other than R position	Off
N POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = N position	On
		CVT shift position = other than N position	Off
CV1	Cut valve 1 signal	When cut valve 1 is open or closed	On
			Off
CV2	Cut valve 2 signal	When cut valve 2 is open or closed	On
			Off
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON).	0 %
		Depress accelerator pedal (ignition switch is ON).	0 - 100 %
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s ²
		Vehicle turning right	Negative value (m/s ²)
		Vehicle turning left	Positive value (m/s ²)
STR ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead	Approx. 0°
		Steering wheel turned	-720 to 720°
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar
EBD SIGNAL	EBD operation	EBD is active.	On
		EBD is inactive.	Off
ABS SIGNAL	ABS operation	ABS is active.	On
		ABS is inactive.	Off
TCS SIGNAL	TCS operation	TCS is active.	On
		TCS is inactive.	Off
VDC SIGNAL	VDC operation	VDC is active.	On
		VDC is inactive.	Off
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe.	On
		EBD is normal.	Off
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe.	On
		ABS is normal.	Off
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe.	On
		TCS is normal.	Off
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe.	On
		VDC is normal.	Off
CRANKING SIG	Crank operation	Crank is active.	On
		Crank is inactive.	Off

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FLUID LEV SW	Brake fluid level switch	When brake fluid level switch is ON	On
		When brake fluid level switch is OFF	Off

Note 1: Confirm tire pressure is normal.

Note 2: On and off timing for warning lamps and indicator lamps:

- Refer to [BRC-28. "VDC FUNCTION : System Description"](#).
- Refer to [BRC-30. "TCS FUNCTION : System Description"](#).
- Refer to [BRC-32. "ABS FUNCTION : System Description"](#).
- Refer to [BRC-33. "EBD FUNCTION : System Description"](#).

Fail-Safe

INFOID:000000012273575

VDC FUNCTION, TCS FUNCTION and BRAKE ASSIST FUNCTION

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

NOTE:

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

EBD FUNCTION

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

DTC	Fail-safe condition
C1101	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both rear wheels are malfunctioning) • Brake assist function • Active trace control function
C1102	
C1103	
C1104	
C1105	
C1106	
C1107	
C1108	
C1109	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1111	
C1113	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

DTC	Fail-safe condition
C1115	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1116	
C1120	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1121	
C1122	
C1123	
C1124	
C1125	
C1126	
C1127	
C1130	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function
C1140	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1142	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Brake assist function • Active trace control function
C1143	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function
C1144	
C1145	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1146	
C1153	
C1154	
C1155	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Brake assist function • Active trace control function
C1160	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1164	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1165	
C1166	
C1167	
C1167	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

DTC	Fail-safe condition	
C1170	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function 	A
C1197	Electrical vacuum assistance of brake booster is suspended.	B
C1198		C
C1199		D
C119A		E
U1000	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function 	E

DTC Inspection Priority Chart

INFOID:000000012273576

BRC

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

Priority	Detected item (DTC)	
1	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT • U1002 SYSTEM COMM (CAN) 	G
2	<ul style="list-style-type: none"> • C1110 CONTROLLER FAILURE • C1153 EMERGENCY BRAKE • C1170 VARIANT CODING 	H
3	<ul style="list-style-type: none"> • C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL 	I
4	<ul style="list-style-type: none"> • C1109 BATTERY VOLTAGE [ABNOMAL] • C1110 CONTROLLER FAILURE • C1111 PUMP MOTOR • C1140 ACTUATOR RLY 	J

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

Priority	Detected item (DTC)
5	<ul style="list-style-type: none"> • C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1113 G SENSOR • C1115 ABS SENSOR [ABNORMAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1153 EMERGENCY BRAKE • C1154 PNP POS SIG • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1166 SV 1 • C1167 SV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT
6	<ul style="list-style-type: none"> • C1155 BR FLUID LEVEL LOW

DTC Index

INFOID:000000012273577

DTC	Display item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to:
C1101	RR RH SENSOR-1	ON	ON	OFF	BRC-71. "Diagnosis Procedure"
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	BRC-76. "Diagnosis Procedure"
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 [ABNOMAL]	ON	ON	ON	BRC-82. "Diagnosis Procedure"
C1110	CONTROLLER FAILURE	ON	ON	ON	BRC-85. "Diagnosis Procedure"
C1111	PUMP MOTOR	ON	ON	ON	BRC-86. "Diagnosis Procedure"
C1113	G SENSOR	ON	ON	OFF	BRC-90. "Diagnosis Procedure"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	ON	ON	OFF	BRC-91. "Diagnosis Procedure"
C1116	STOP LAMP SW	ON	ON	OFF	BRC-99. "Diagnosis Procedure"
C1120	FR LH IN ABS SOL	ON	ON	ON	BRC-102. "Diagnosis Procedure"

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ICC]

DTC	Display item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to:
C1121	FR LH OUT ABS SOL	ON	ON	ON	BRC-104, "Diagnosis Procedure"
C1122	FR RH IN ABS SOL	ON	ON	ON	BRC-102, "Diagnosis Procedure"
C1123	FR RH OUT ABS SOL	ON	ON	ON	BRC-104, "Diagnosis Procedure"
C1124	RR LH IN ABS SOL	ON	ON	ON	BRC-102, "Diagnosis Procedure"
C1125	RR LH OUT ABS SOL	ON	ON	ON	BRC-104, "Diagnosis Procedure"
C1126	RR RH IN ABS SOL	ON	ON	ON	BRC-102, "Diagnosis Procedure"
C1127	RR RH OUT ABS SOL	ON	ON	ON	BRC-104, "Diagnosis Procedure"
C1130	ENGINE SIGNAL 1	ON	OFF	OFF	BRC-106, "Diagnosis Procedure"
C1140	ACTUATOR RLY	ON	ON	ON	BRC-108, "Diagnosis Procedure"
C1142	PRESS SEN CIRCUIT	ON	OFF	OFF	BRC-110, "Diagnosis Procedure"
C1143	ST ANG SEN CIRCUIT	ON	OFF	OFF	BRC-113, "Diagnosis Procedure"
C1144	ST ANG SEN SIGNAL	ON	OFF	OFF	BRC-117, "Diagnosis Procedure"
C1145	YAW RATE SENSOR	ON	ON	OFF	BRC-90, "Diagnosis Procedure"
C1146	SIDE G SEN CIRCUIT	ON	ON	OFF	
C1153	EMERGENCY BRAKE	ON	ON	ON	BRC-85, "Diagnosis Procedure"
C1154	PNP POS SIG	ON	ON	OFF	BRC-119, "Diagnosis Procedure"
C1155	BR FLUID LEVEL LOW	ON	OFF	OFF	BRC-121, "Diagnosis Procedure"
C1160	DECEL G SEN SET	ON	ON	OFF	BRC-125, "Diagnosis Procedure"
C1164	CV 1	ON	ON	ON	BRC-127, "Diagnosis Procedure"
C1165	CV 2	ON	ON	ON	
C1166	SV 1	ON	ON	ON	BRC-129, "Diagnosis Procedure"
C1167	SV 2	ON	ON	ON	
C1170	VARIANT CODING	ON	ON	OFF	BRC-131, "Diagnosis Procedure"
C1197	VACUUM SENSOR	OFF	OFF	ON	BRC-133, "Diagnosis Procedure"
C1198	VACUUM SEN CIR	OFF	OFF	ON	BRC-136, "Diagnosis Procedure"
C1199	BRAKE BOOSTER	OFF	OFF	ON	BRC-138, "Diagnosis Procedure"
C119A	VACUUM SEN VOLT	OFF	OFF	ON	BRC-141, "Diagnosis Procedure"
U1000	CAN COMM CIRCUIT	ON	OFF	OFF	BRC-144, "Diagnosis Procedure"

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

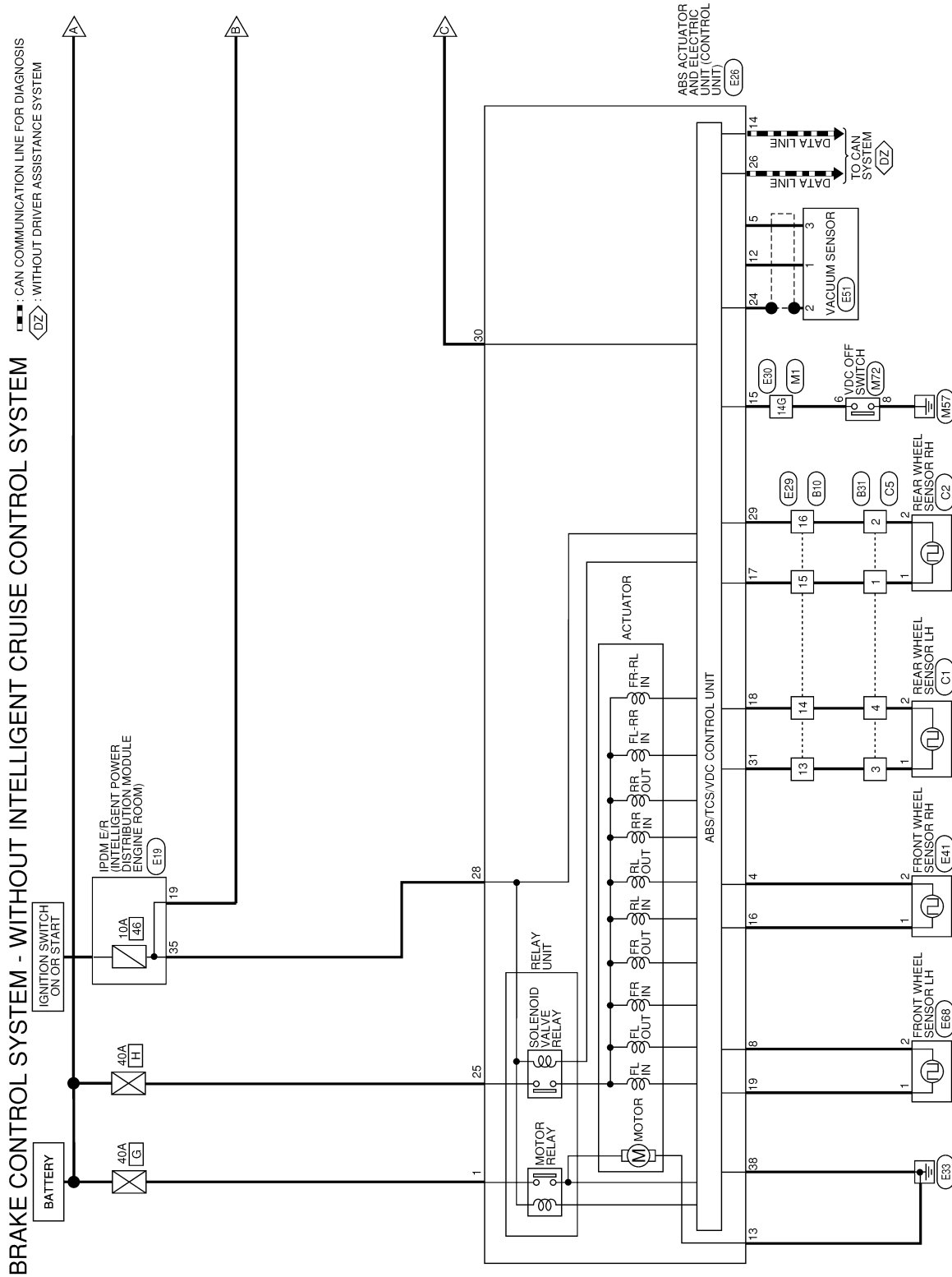
[WITHOUT ICC]

WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000012273578

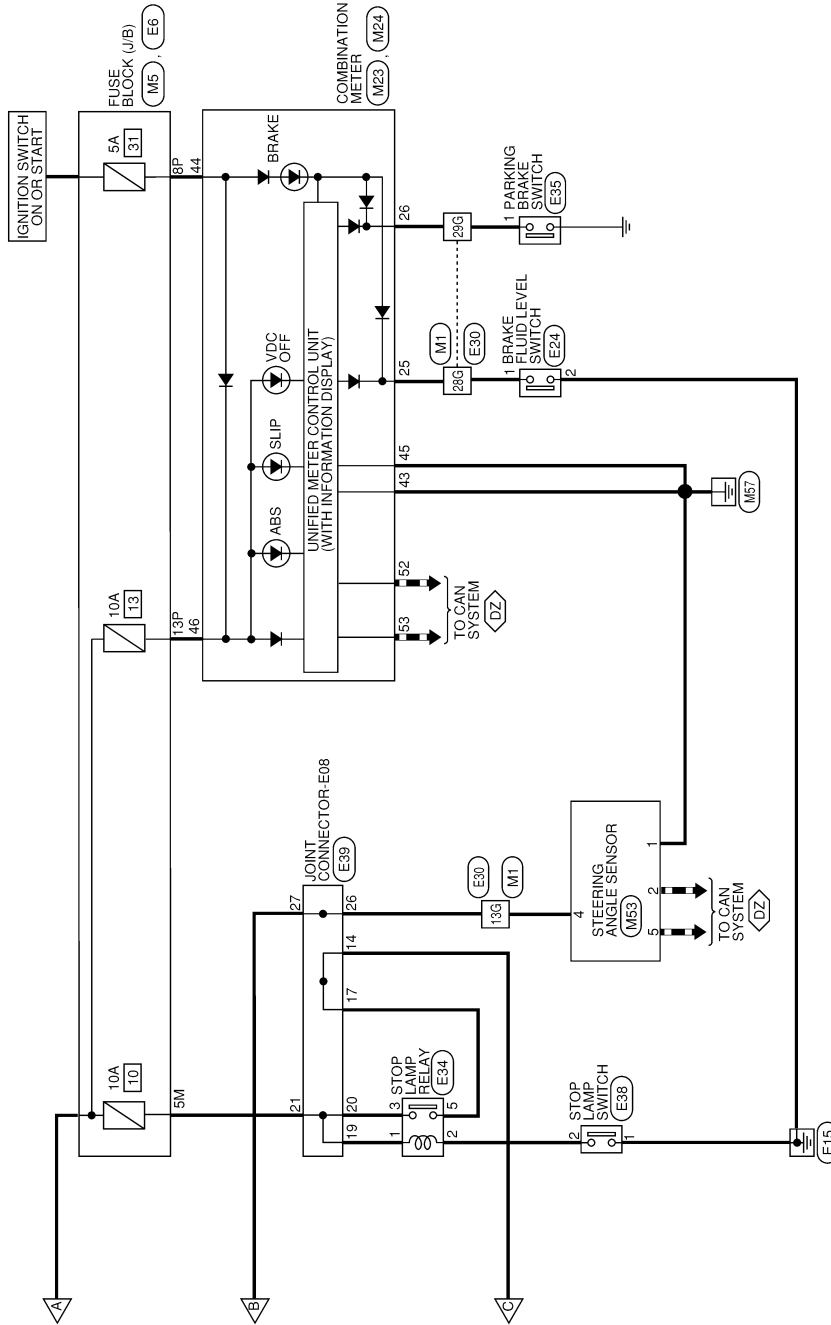


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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITHOUT ICC]



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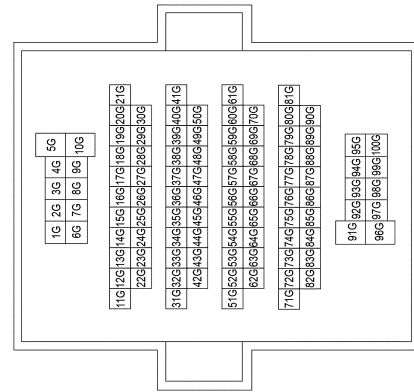
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITHOUT ICC]

BRAKE CONTROL SYSTEM CONNECTORS - WITHOUT INTELLIGENT CRUISE CONTROL SYSTEM

Connector No.	M1
Connector Name	WIRES TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



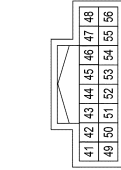
Terminal No.	Color of Wire	Signal Name
13G	G	-
14G	LG	-
28G	BR	-
29G	V	-

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



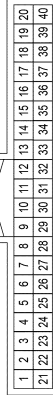
Terminal No.	Color of Wire	Signal Name
8P	BR	-
13P	G	-

Connector No.	M23
Connector Name	COMBINATION METER
Connector Type	TH16FW-NH
Connector Color	WHITE



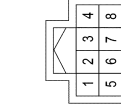
Terminal No.	Color of Wire	Signal Name
43	B	GND1
44	BR	POWER (IGN)
45	B	GND2
46	G	POWER (BAT)
52	P	CAN-L
53	L	CAN-H

Connector No.	M24
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH
Connector Color	WHITE



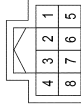
Terminal No.	Color of Wire	Signal Name
25	BR	BRAKE OIL SW
26	V	PKB SW

Connector No.	M53
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FV-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND
2	P	CAN-L
3	-	-
4	G	IGN
5	L	CAN-H
6	-	-
7	-	-
8	-	-

Connector No.	M72
Connector Name	VDC OFF SWITCH
Connector Type	TH08FB-NH
Connector Color	BLACK



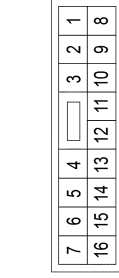
Terminal No.	Color of Wire	Signal Name
6	LG	-
8	B	-

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

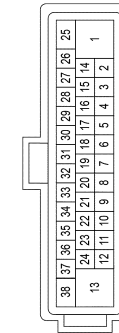
[WITHOUT ICC]

38	B	GND ECU
Connector No.	E29	
Connector Name	WIRE TO WIRE	
Connector Type	NS16FW-CS	
Connector Color	WHITE	



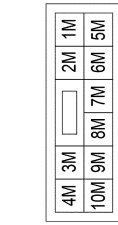
Terminal No.	Color of Wire	Signal Name
13	BR	-
14	LG	-
15	L	-
16	Y	-

Connector No.	E26	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT INTELLIGENT CRUISE CONTROL SYSTEM)
Connector Name	BE234FB-BHY2-BJZ2-LH	
Connector Type	BE234FB-BHY2-BJZ2-LH	
Connector Color	BLACK	



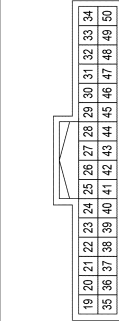
Terminal No.	Color of Wire	Signal Name
1	W	UB MR
2	-	-
3	-	-
4	V	WSS FR
5	B	UBV EXT
6	-	-
7	-	-
8	Y	WSS FL
9	-	-
10	-	-
11	-	-
12	W	VAC
13	B	GND MR
14	P	CAN-L
15	V	VDC OFF
16	SB	WSP FR
17	L	WSP RR
18	LG	WSS RL
19	BR	WSP FL
20	-	-
21	-	-
22	-	-
23	-	-
24	SHIELD	GND EXT
25	R	UB VR
26	L	CAN-H
27	-	-
28	LG	WAU
29	Y	WSS RR
30	W	BLS
31	BR	WSP RL
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-

Connector No.	E6	FUSE BLOCK (J/B)
Connector Name	NS10FW-CS	
Connector Type	NS10FW-CS	
Connector Color	WHITE	



Terminal No.	Color of Wire	Signal Name
5M	P	-

Connector No.	E19	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Name	TH32FW-NH	
Connector Type	TH32FW-NH	
Connector Color	WHITE	



Terminal No.	Color of Wire	Signal Name
19	BR	SUB ECU
35	LG	ABS ECU

Connector No.	E24	BRAKE FLUID LEVEL SWITCH
Connector Name	YV02FGY	
Connector Type	YV02FGY	
Connector Color	GRAY	



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

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITHOUT ICC]

21	P	-
26	BR	-
27	BR	-

Connector No.	E41
Connector Name	FRONT WHEEL SENSOR RH
Connector Type	RK02MGY
Connector Color	GRAY



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

Connector No.	E51
Connector Name	VACUUM SENSOR
Connector Type	RH03FB
Connector Color	BLACK



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

Connector No.	E35
Connector Name	PARKING BRAKE SWITCH
Connector Type	P01FB-A
Connector Color	BLACK



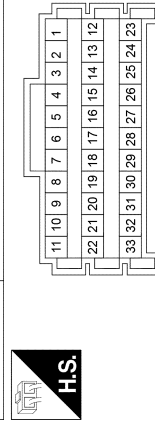
Terminal No.	Color of Wire	Signal Name
1	L	-

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC
Connector Color	WHITE



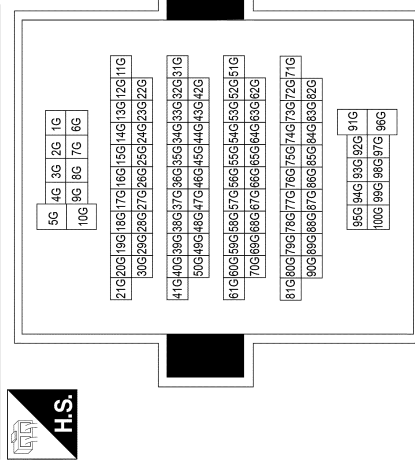
Terminal No.	Color of Wire	Signal Name
1	B	-
2	R	-

Connector No.	E39
Connector Name	JOINT CONNECTOR-E08
Connector Type	BJ30FW
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
14	W	-
17	W	-
19	P	-
20	P	-

Connector No.	E30
Connector Name	WIPE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13G	BR	-
14G	V	-
28G	BG	-
29G	L	-

Connector No.	E34
Connector Name	STOP LAMP RELAY
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	R	-
3	P	-
5	W	-

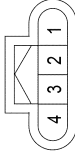
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BRAKE CONTROL SYSTEM

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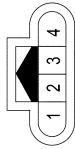
[WITHOUT ICC]

Connector No.	B31
Connector Name	WIRE TO WIRE
Connector Type	RH04FB
Connector Color	BLACK



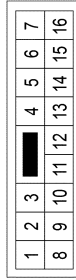
Terminal No.	Color of Wire	Signal Name
1	L	-
2	Y	-
3	BR	-
4	LG	-

Connector No.	C5
Connector Name	WIRE TO WIRE
Connector Type	RH04MB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	LG	-
3	SB	-
4	BR	-

Connector No.	B10
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13	BR	-
14	LG	-
15	L	-
16	Y	-

Connector No.	E68
Connector Name	FRONT WHEEL SENSOR LH
Connector Type	RK02MGY
Connector Color	GRAY



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

Connector No.	C1
Connector Name	REAR WHEEL SENSOR LH
Connector Type	RH02FB
Connector Color	BLACK



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

Connector No.	C2
Connector Name	REAR WHEEL SENSOR RH
Connector Type	RH02FB
Connector Color	BLACK



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

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000012323195

DETAILED FLOW

1. INTERVIEW THE CUSTOMER

Clarify customer concerns before inspection. First of all, perform an interview utilizing [BRC-61, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her concerns carefully. Check symptoms by driving vehicle with customer if necessary.

CAUTION:

Customers are not professional. Never guess easily like "maybe the customer means that..." or "maybe the customer mentions this symptom".

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained in the interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-49, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM THE SELF-DIAGNOSIS

Ⓢ CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

2. Select "Self Diagnostic Result" mode of "ABS".

Is DTC detected?

YES >> Record or print Self Diagnostic Results and Freeze Frame Data (FFD). GO TO 4.

NO >> GO TO 6.

4. RECHECK THE SYMPTOM

Ⓢ CONSULT

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

CAUTION:

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

3. Perform DTC confirmation procedures for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-51, "DTC Inspection Priority Chart"](#).

Is DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-41, "Intermittent Incident"](#).

5. REPAIR OR REPLACE MALFUNCTIONING COMPONENT

1. Repair or replace malfunctioning components.
2. Reconnect component or connector after repairing or replacing it.
3. When DTC is detected, erase "Self Diagnostic Result" mode of "ABS".

CAUTION:

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITHOUT ICC]

- Turn the ignition switch OFF → ON → OFF after erasing Self Diagnostic Result.
- Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

>> GO TO 7.

6. IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Identify malfunctioning system based on symptom diagnosis and perform inspection.

Can the malfunctioning system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-41, "Intermittent Incident"](#).

7. FINAL CHECK

CONSULT

1. Select "Data Monitor" mode of "ABS".
2. Check the reference values. Refer to [BRC-46, "Reference Value"](#).
3. Recheck the symptom and check that the symptom is not reproduced in the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> Inspection End.

Diagnostic Work Sheet

INFOID:000000012323196

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		Engine/traction Motor		Mileage	km (Mile)
Symptom		<input type="checkbox"/> Does not operate () function			
		<input type="checkbox"/> Warning lamp turns ON.			
		ABS or BRAKE or <input type="checkbox"/> <input type="checkbox"/> OFF			
		<input type="checkbox"/> Other ()			
		<input type="checkbox"/> Noise (Location:)		<input type="checkbox"/> Vibration (Location:)	
<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"/> Ordinary road <input type="checkbox"/> Highway <input type="checkbox"/> Mountainous road (uphill or downhill) <input type="checkbox"/> Rough road			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITHOUT ICC]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine/traction Motor		Mileage	km (Mile)
Operating condition, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine/traction motor starts <input type="checkbox"/> During idling <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"/> Immediately before stop [Vehicle speed: Approx. km/h (MPH)] <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> When steering wheel is steered (to right or to left)			
Other conditions	VDC OFF switch operation	<input type="checkbox"/> Yes <input type="checkbox"/> No			
	Use of other functions (ex. ICC)	<input type="checkbox"/> Yes <input type="checkbox"/> No ()			
	Presence of non-genuine parts installation	<input type="checkbox"/> Yes <input type="checkbox"/> No ()			
Memo					

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

< BASIC INSPECTION >

[WITHOUT ICC]

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

Description

INFOID:000000012273581

- When replacing the ABS actuator and electric unit (control unit), perform configuration of the ABS actuator and electric unit (control unit). Refer to [BRC-68, "Work Procedure"](#).
- When replacing the ABS actuator and electric unit (control unit), adjust the neutral position of steering angle sensor. Refer to [BRC-64, "Work Procedure"](#).
- When replacing the ABS actuator and electric unit (control unit), perform calibration of the decel G sensor. Refer to [BRC-66, "Work Procedure"](#).

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ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITHOUT ICC]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000012273582

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

×: Required –: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	—
Replacing suspension components	×
Changing tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	×

Work Procedure

INFOID:000000012273583

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

1. On the CONSULT screen, touch "Work support" and "ST ANGLE SENSOR ADJUSTMENT" in order.
2. Touch "Start".

CAUTION:

Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, touch "End".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position then stop.
2. Select "Data Monitor" mode. Then make sure "STR ANGLE SIG" is within $0 \pm 3.5^\circ$.

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4. ERASE THE SELF DIAGNOSTIC RESULT MEMORY

Erase the "Self Diagnostic Result" memory of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to [BRC-41, "CONSULT Function"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITHOUT ICC]

- ECM: Refer to [EC-73. "CONSULT Function"](#).

Are the memories erased?

YES >> Inspection End.

NO >> Check the items indicated by the "Self Diagnostic Result".

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CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[WITHOUT ICC]

CALIBRATION OF DECEL G SENSOR

Description

INFOID:000000012273584

CAUTION:

Always perform the decel G sensor calibration before driving when the following operation is performed.

NOTE:

Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

×: Required —: Not required

Procedure	Decel G sensor calibration
Removing/installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	×
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:000000012273585

DECEL G SENSOR CALIBRATION

CAUTION:

Always use CONSULT for the decel G sensor calibration. (It cannot be adjusted other than with CONSULT.)

NOTE:

Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

1. CHECK THE VEHICLE STATUS

1. Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.
2. Stop the engine.
3. Turn the ignition switch OFF.

Is the vehicle stopped in the straight-ahead position on a level surface?

YES >> GO TO 2.

NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.

2. PERFORM DECEL G SENSOR CALIBRATION

CAUTION:

- Never allow passenger or load on the vehicle.
- Never apply vibration to the vehicle body when opening or closing door during calibration.

CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start engine.

2. Select "ABS", "Work Support" and "DECEL G SEN CALIBRATION" in this order.
3. Select "Start".
4. After approx. 10 seconds, select "End".
5. Turn ignition switch OFF and then turn it ON again.

CAUTION:

Be sure to perform the operation above.

>> GO TO 3.

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[WITHOUT ICC]

3. CHECK DATA MONITOR

CONSULT

1. Drive the vehicle. Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.
2. Select "ABS", "Data Monitor", "ECU INPUT SIGNALS" and "DECEL G SENSOR" in this order. Check that the signal is within the specified value.

DECEL G SENSOR : Approx. ± 0.01 G

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 1.

4. ERASE SELF DIAGNOSTIC RESULT MEMORY

CONSULT

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

Are the memories erased?

YES >> Inspection End.

NO >> Check the items indicated by the "Self Diagnostic Result".

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BRC

CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< BASIC INSPECTION >

[WITHOUT ICC]

CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

Work Procedure

INFOID:000000012323197

NOTE:

- After configuration, turn the ignition switch from OFF to ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately two seconds.
- If an error occurs during configuration, start over from the beginning.

1.CHECK TYPE ID (1)

CONSULT

1. Select "ECU Identification" mode of "ABS".
2. Write down "ECU PART NUMBER" displayed on the CONSULT screen. This is the ABS actuator and electric unit (control unit) "Type ID".

Is "Type ID" displayed?

- YES-1 >> When replacing ABS actuator and electric unit (control unit): GO TO 3.
- YES-2 >> When re-configuring existing ABS actuator and electric unit (control unit): GO TO 4.
- NO >> GO TO 2.

2.CHECK TYPE ID (2)

1. Use FAST (service parts catalog) to search ABS actuator and electric unit (control unit) of the applicable vehicle and find "Type ID".
2. Write down "Type ID".

- >> • When replacing ABS actuator and electric unit (control unit): GO TO 3.
- When re-configuring existing ABS actuator and electric unit (control unit): GO TO 4.

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

Replace ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

CAUTION:

Do not perform the following work items at this time. These items must be performed after configuration is complete.

- **Air bleeding**
- **Adjustment of steering angle sensor neutral position**
- **Calibration of decel G sensor**

>> GO TO 4.

4.WRITE CONFIGURATION

CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" found using CONSULT "ECU Identification" or FAST (service parts catalog) to write the "Type ID" into the ABS actuator and electric unit (control unit).

>> GO TO 5.

5.VERIFY TYPE ID

Compare the "Type ID" written into the ABS actuator and electric unit (control unit) with the one found using CONSULT "ECU Identification" or FAST (service parts catalog) to confirm they match.

Do Type IDs match?

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

6.CHECK VDC WARNING LAMP

1. Turn the ignition switch OFF.
2. Turn the ignition switch ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately two seconds.

CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< BASIC INSPECTION >

[WITHOUT ICC]

NOTE:

Do not start the engine.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Select "Self Diagnostic Result" mode of "ABS". Refer to [BRC-41, "CONSULT Function"](#).

7. PERFORM SUPPLEMENTARY WORK

1. Perform air bleeding. Refer to [BR-15, "Bleeding Brake System"](#).
2. Perform adjustment of steering angle sensor neutral position. Refer to [BRC-64, "Work Procedure"](#).
3. Perform calibration of decel G sensor. Refer to [BRC-66, "Work Procedure"](#).
4. Perform "Self Diagnostic Result" of all systems.
5. Erase "Self Diagnostic Result".

>> Work End.

A
B
C
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BRC

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:000000012323198

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1101	RR RH SENSOR-1 (Rear RH wheel sensor-1)	When an open circuit is detected in rear RH wheel sensor circuit.
C1102	RR LH SENSOR-1 (Rear LH wheel sensor-1)	When an open circuit is detected in rear LH wheel sensor circuit.
C1103	FR RH SENSOR-1 (Front RH wheel sensor-1)	When an open circuit is detected in front RH wheel sensor circuit.
C1104	FR LH SENSOR-1 (Front LH wheel sensor-1)	When an open circuit is detected in front LH wheel sensor circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is "PAST" or "CRNT". If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Wheel sensor• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Vehicle was not driven after previous repair.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "CRNT": Proceed to [BRC-71. "Diagnosis Procedure"](#).

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

YES-2 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323199

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL SENSOR

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. REPLACE WHEEL SENSOR (1)

CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase "Self Diagnostic Result" mode of "ABS".
3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness or connector and securely lock the connector, GO TO 4.

4. PERFORM SELF-DIAGNOSIS (1)

CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

5. Stop the vehicle.
6. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
7. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
8. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 5.
NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Repair / replace harness, connector, or terminal, GO TO 7.

7.PERFORM SELF-DIAGNOSIS (2)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
7. Stop the vehicle.
8. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
9. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
10. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 8.
NO >> Inspection End.

8.CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity while turning steering wheel left and right or while moving center harness in wheel housing.)

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E68	Front LH wheel	1 Yes
	16	E41	Front RH wheel	
	31	C1	Rear LH wheel	
	17	C2	Rear RH wheel	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E68	Front LH wheel	2 Yes
	4	E41	Front RH wheel	
	18	C1	Rear LH wheel	
	29	C2	Rear RH wheel	

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace harness or connector GO TO 9.

9. PERFORM SELF DIAGNOSTIC RESULT (3)

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 10.

NO >> Inspection End.

10. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect ABS actuator and electric unit (control unit) harness connector.
2. Disconnect wheel sensor harness connector.
3. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
4. Turn the ABS active wheel sensor tester power switch ON.

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.

5. 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.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

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 >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

Ⓟ CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:000000012323200

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Vehicle was not driven after previous repair.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Start the engine.
- Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- Stop the vehicle.
- Turn the ignition switch OFF.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "CRNT": Proceed to [BRC-76, "Diagnosis Procedure"](#).

YES-2 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323201

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.

- Front: Refer to [FSU-6, "Inspection"](#).
- Rear: Refer to [RSU-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the wheel hub assembly GO TO 2.

- Front: Refer to [BRC-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
- Rear: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK TIRE

1. Turn the ignition switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-73, "Tire"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust air pressure or replace tire GO TO 4.

4. CHECK DATA MONITOR (1)

CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 5.

NO >> GO TO 6.

5.PERFORM SELF-DIAGNOSIS (1)

CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 6.

NO >> Inspection End.

6.CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

3. Remove dust and foreign matter adhered to the wheel sensor and 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-164, "FRONT WHEEL SENSOR : Exploded View"](#).

• Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Exploded View"](#).

>> GO TO 7.

7.CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 9.

8.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

2. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.

3. Turn the ABS active wheel sensor tester power switch ON.

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.

4. 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 12.

NO >> GO TO 9.

9.REPLACE WHEEL SENSOR (1)

CONSULT

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

1. Replace the wheel sensor.
 - Front: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
NOTE:
Set the "Data Monitor" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning 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 20.

10. PERFORM SELF-DIAGNOSIS (2)

Ⓟ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 11.

NO >> Inspection End.

11. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair / replace harness or connector and securely lock the connector GO TO 12.

12. CHECK DATA MONITOR (2)

Ⓟ CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
NOTE:
Set the "Data Monitor" recording speed to "10 msec".
5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%. respectively?

- YES >> GO TO 13.
- NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (3)

Ⓜ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 14.
- NO >> Inspection End.

14.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 17.
- NO >> Repair / replace harness, connector, or terminal GO TO 15.

15.CHECK DATA MONITOR (3)

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "Data Monitor" mode of "ABS", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
NOTE:
Set the "Data Monitor" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%. respectively?

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

16.PERFORM SELF-DIAGNOSIS (4)

Ⓜ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 17.

NO >> Inspection End.

17. CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E26	19	Ground	No
	16		
	31		
	17		

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair / replace harness or connector GO TO 18.

18. CHECK DATA MONITOR (4)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

19. PERFORM SELF-DIAGNOSIS (5)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

20. REPLACE SENSOR ROTOR

CONSULT

1. Replace the sensor rotor.

- Front: Refer to [BRC-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).

- Rear: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

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

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.

5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.

7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:000000012323202

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	When ignition power supply voltage is in following state: <ul style="list-style-type: none">• Ignition power supply voltage: $10\text{ V} \geq$ ignition power supply voltage.• Ignition power supply voltage: $16\text{ V} \leq$ ignition power supply voltage.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• IPDM E/R• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1109" detected?

YES-1 >> "C1109" is displayed as "CRNT": Proceed to [BRC-82, "Diagnosis Procedure"](#).

YES-2 >> "C1109" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323203

1. CHECK CONNECTOR

1. Turn the ignition 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 / replace harness or connector and securely lock the connector GO TO 2.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

2.PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

1. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Description

INFOID:000000012323204

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1110	CONTROLLER FAILURE (Controller failure)	When there is an internal malfunction in the ABS actuator and electric unit (control unit).
C1153	EMERGENCY BRAKE (Emergency brake)	When ABS actuator and electric unit (control unit) is malfunctioning (pressure increase is too much or too little).

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

DTC	PAST DTC	CRNT DTC
C1110	<ul style="list-style-type: none">The vehicle travels near high-voltage electrical power lines.Motor that is built-in the ABS actuator and electric unit (control unit) operates temporarily without a break.Harness or connectorABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery	<ul style="list-style-type: none">ABS actuator and electric unit (control unit)Harness or connectorABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery
C1153	<ul style="list-style-type: none">The vehicle travels near high-voltage electrical power lines.ABS operates for a long time (e.g., travel under a tire hydroplaning condition).	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1110" or "C1153" detected?

YES-1 >> "C1110" or "C1153" is displayed as "CRNT": Proceed to [BRC-85, "Diagnosis Procedure"](#).

YES-2 >> "C1110" or "C1153" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Diagnosis Procedure

INFOID:000000012323205

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Ⓜ CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

Is neutral position adjustment of steering angle sensor finished?

YES >> GO TO 2.

NO >> Check the steering angle sensor system. Refer to [BRC-113, "Diagnosis Procedure"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

Select "Self Diagnostic Result" mode of "ABS".

NOTE:

Replace the ABS actuator and electric unit (control unit) even if other DTCs are displayed along with "C1110" or "C1153" in "Self Diagnostic Result" mode of "ABS".

Is DTC "C1110" or "C1153" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End. (Although motor that is built-in the ABS actuator and electric unit (control unit) operates temporarily without a break, this is not a malfunction. Erase "Self Diagnostic Result" mode of "ABS".)

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:000000012323206

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1111	PUMP MOTOR (Pump motor and motor relay)	When a malfunction is detected in motor or motor relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1111" detected?

YES-1 >> "C1111" is displayed as "CRNT": Proceed to [BRC-86, "Diagnosis Procedure"](#).

YES-2 >> "C1111" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323207

1. CHECK CONNECTOR

1. Turn the ignition 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 / replace harness or connector and securely lock the connector, GO TO 2.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

2. PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Start the engine.
3. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
4. Stop the vehicle.
5. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
6. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
7. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1111" detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness, connector, or fuse, GO TO 4.

4. ERASE SELF-DIAGNOSIS RESULT (1)

Ⓜ CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" mode of "ABS".
5. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

5. CHECK TERMINAL

1. Turn the ignition 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 the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).
NO >> Repair / replace harness or connector, GO TO 6.

6. ERASE SELF-DIAGNOSIS RESULT (2)

Ⓜ CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" of "ABS".

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

5. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

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

DTC Description

INFOID:0000000012323208

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1113	G-SENSOR (Decel G sensor circuit)	When a malfunction is detected in the longitudinal G sensor internal to the ABS actuator and electric unit (control unit).
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	When a malfunction is detected in the yaw rate sensor internal to the ABS actuator and electric unit (control unit).
C1146	SIDE G-SEN CIRCUIT (Side G sensor circuit)	When a malfunction is detected in side G sensor internal to the ABS actuator and electric unit (control unit).

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

DTC	PAST DTC	CRNT DTC
C1113	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Change in vehicle posture (e.g. different tire sizes on front and rear, overload) 	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) Change in vehicle posture (e.g. different tire sizes on front and rear, overload)
C1145	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	ABS actuator and electric unit (control unit)
C1146	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1113", "C1145", or "C1146" is displayed as "CRNT": Proceed to [BRC-90, "Diagnosis Procedure"](#).

YES-2 >> "C1113", "C1145", or "C1146" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

INFOID:000000012323209

Diagnosis Procedure

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness, connector, fuse, or fusible link.

2. CHECK CONNECTOR

1. Turn the ignition 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 / replace harness or connector, securely lock the connector, and GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Select "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1115 WHEEL SENSOR

DTC Description

INFOID:0000000012323210

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1115	ABS SENSOR [ABNORMAL SIGNAL] (Wheel sensor [abnormal signal])	When difference in wheel speed between any wheel and others is detected when the vehicle is driven because of installation of other tires than as specified.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Tire size

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES-1 >> "C1115" is displayed as "CRNT": Proceed to [BRC-91, "Diagnosis Procedure"](#).

YES-2 >> "C1115" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012323211

CAUTION:

Never check between wheel sensor harness connector terminals.

C1115 WHEEL SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to [WT-73, "Tire"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Adjust air pressure or replace tire, GO TO 2.

2. CHECK DATA MONITOR (1)

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 3.

NO >> GO TO 4.

3. PERFORM SELF-DIAGNOSIS (1)

CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> GO TO 4.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

3. Remove dust and foreign matter adhered to the wheel sensor and 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-164, "FRONT WHEEL SENSOR : Exploded View"](#).

• Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Exploded View"](#).

>> GO TO 6.

6. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 8.

7. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect ABS actuator and electric unit (control unit) harness connector.
2. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
3. Turn the ABS active wheel sensor tester power switch ON.

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.

4. 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 11.

NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 9.

NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.

NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

C1115 WHEEL SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1115" detected?

- YES >> GO TO 10.
- NO >> Inspection End.

10. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 12.
- NO >> Repair / replace harness or connector and securely lock the connector, GO TO 11.

11. CHECK DATA MONITOR (2)

Ⓟ CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

- YES >> GO TO 12.
- NO >> GO TO 13.

12. PERFORM SELF-DIAGNOSIS (3)

Ⓟ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 13.
- NO >> Inspection End.

13. CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 16.
- NO >> Repair / replace harness, connector, or terminal, GO TO 14.

14. CHECK DATA MONITOR (3)

Ⓟ CONSULT

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

C1115 WHEEL SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
 - NOTE:**
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
 - NOTE:**
Set the "Data Monitor" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
 - NOTE:**
Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

- YES >> GO TO 15.
NO >> GO TO 16.

15. PERFORM SELF-DIAGNOSIS (4)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
 - NOTE:**
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
 - NOTE:**
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 16.
NO >> Inspection End.

16. CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity while turning steering wheel left and right or while moving center harness in wheel housing.)

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E68	(Front LH wheel)	1 Yes
	16	E41	(Front RH wheel)	
	31	C1	(Rear LH wheel)	
	17	C2	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E68	(Front LH wheel)	2 Yes
	4	E41	(Front RH wheel)	
	18	C1	(Rear LH wheel)	
	29	C2	(Rear RH wheel)	

C1115 WHEEL SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E26	19	Ground	No
	16		
	31		
	17		

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair / replace harness or connector, and GO TO 17.

17. CHECK DATA MONITOR (4)

Ⓟ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning 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 >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

18. PERFORM SELF-DIAGNOSIS (5)

Ⓟ CONSULT

1. Stop the vehicle.
 2. Turn the ignition switch OFF.
- #### NOTE:
- Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

19. REPLACE SENSOR ROTOR

Ⓟ CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" mode of "ABS".

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.

5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.

7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

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C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1116 STOP LAMP SWITCH

DTC Description

INFOID:000000012323212

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1116	STOP LAMP SW (Stop lamp switch)	When stop lamp switch signal is not inputted when brake pedal operates.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Stop lamp switch signal circuit	<ul style="list-style-type: none">• Harness or connector• Stop lamp relay• Stop lamp switch• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

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

NOTE:

Stop the vehicle.

3. Wait 1 minute or more.

NOTE:

Never depress brake pedal.

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

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

Is DTC "C1116" detected?

YES-1 >> "C1116" is displayed as "CRNT": Proceed to [BRC-99, "Diagnosis Procedure"](#).

YES-2 >> "C1116" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

INFOID:000000012323213

Diagnosis Procedure

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 THE CUSTOMER

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

Is there such a history?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Depress the brake pedal several times.

5. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

6. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

7. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

Does the stop lamps turn ON?

YES >> GO TO 5.

NO >> Check the stop lamp system. Refer to [BRC-54. "Wiring Diagram"](#). GO TO 4.

4. CHECK DATA MONITOR (1)

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "Data Monitor" mode of "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 5.

5. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.

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

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

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C1116 STOP LAMP SWITCH

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp relay harness connector.
6. Check the stop lamp relay harness connector for disconnection or looseness.
7. Check the stop lamp relay pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, or terminal. GO TO 6.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, fuse, or fusible link.

7. CHECK DATA MONITOR (2)

CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "Data Monitor" mode of "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 8.

8. CHECK STOP LAMP RELAY CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E26	30	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

4. Turn the ignition 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			
E26	30	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness or connector, and GO TO 9.

9. CHECK STOP LAMP RELAY CIRCUIT (2)

1. Turn the ignition switch OFF.

C1116 STOP LAMP SWITCH

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect stop lamp relay harness connector.
3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp relay harness connector.

ABS actuator and electric unit (control unit)		Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	
E26	30	E34	5	Yes

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E54	30	Ground	No

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness or connector. GO TO 10.

10. CHECK DATA MONITOR (3)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
NOTE:
Stop the vehicle.
6. Select "Data Monitor" mode of "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

Component Inspection

INFOID:000000012323214

1. CHECK STOP LAMP SWITCH

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

Stop lamp switch	Condition	Continuity
Terminals		
2 - 1	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 the stop lamp switch. Refer to [BR-20, "Exploded View"](#).

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:000000012323215

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1120	FR LH IN ABS SOL (Front LH ABS IN solenoid valve)	When a malfunction is detected in front LH ABS IN valve.
C1122	FR RH IN ABS SOL (Front RH ABS IN solenoid valve)	When a malfunction is detected in front RH ABS IN valve.
C1124	RR LH IN ABS SOL (Rear LH ABS IN solenoid valve)	When a malfunction is detected in rear LH ABS IN valve.
C1126	RR RH IN ABS SOL (Rear RH ABS IN solenoid valve)	When a malfunction is detected in rear RH ABS IN valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "CRNT": Proceed to [BRC-102, "Diagnosis Procedure"](#).

YES-2 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323216

1. CHECK CONNECTOR

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

1. Turn the ignition 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 / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.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 the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:000000012323217

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1121	FR LH OUT ABS SOL (Front LH ABS OUT solenoid valve)	When a malfunction is detected in front LH ABS OUT valve.
C1123	FR RH OUT ABS SOL (Front RH ABS OUT solenoid valve)	When a malfunction is detected in front RH ABS OUT valve.
C1125	RR LH OUT ABS SOL (Rear LH ABS OUT solenoid valve)	When a malfunction is detected in rear LH ABS OUT valve.
C1127	RR RH OUT ABS SOL (Rear RH ABS OUT solenoid valve)	When a malfunction is detected in rear RH ABS OUT valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "CRNT": Proceed to [BRC-104, "Diagnosis Procedure"](#).

YES-2 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323218

1. CHECK CONNECTOR

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

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

A

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness or connector and securely lock the connector. GO TO 2.

B

2.PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

C

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

D

3. Select "Self Diagnostic Result" mode of "ABS".

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

E

YES >> GO TO 3.

NO >> Inspection End.

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

BRC

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

G

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

H

4.CHECK TERMINAL

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

I

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

J

NO >> Repair / replace harness, connector, or terminal.

K

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C1130 ENGINE SIGNAL

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Description

INFOID:000000012323219

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1130	ENGINE SIGNAL 1 (Engine system signal)	When a malfunction is detected in ECM system.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line	<ul style="list-style-type: none">• Harness or connector• ECM• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1130" detected?

YES-1 >> "C1130" is displayed as "CRNT": Proceed to [BRC-106, "Diagnosis Procedure"](#).

YES-2 >> "C1130" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323220

1. CHECK ENGINE SYSTEM

CONSULT

Select "Self Diagnostic Result" mode of "ENGINE".

Is DTC detected?

YES >> Check the DTC. Refer to [EC-107, "DTC Index"](#) (VQ35DE).

NO >> GO TO 2.

C1130 ENGINE SIGNAL

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal, securely lock the connector, and GO TO 4.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

CONSULT

1. Connect ECM harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1130" or "U1000" detected?

YES ("C1130")>> GO TO 1.

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

NO >> Inspection End.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:0000000012323221

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1140	ACTUATOR RLY (Actuator relay)	When a malfunction is detected in actuator relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1140" detected?

YES-1 >> "C1140" is displayed as "CRNT": Proceed to [BRC-108, "Diagnosis Procedure"](#).

YES-2 >> "C1140" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012323222

1.CHECK CONNECTOR

1. Turn the ignition 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 harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "DTC Description"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.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 the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1142 PRESS SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1142 PRESS SENSOR

DTC Description

INFOID:00000001232323

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1142	PRESS SEN CIRCUIT (Pressure sensor circuit)	When a malfunction is detected in pressure sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Air inclusion in the brake piping• Stop lamp switch system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Stop lamp switch system• ABS actuator and electric unit (control unit)• Brake system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Air inclusion in the brake piping

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1142" detected?

YES-1 >> "C1142" is displayed as "CRNT": Proceed to [BRC-110, "Diagnosis Procedure"](#).

YES-2 >> "C1142" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:00000001232324

1. STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to [BRC-99, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2. CHECK BRAKE FLUID LEAKAGE

C1142 PRESS SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

Check for brake fluid leakage. Refer to [BR-14, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping. Refer to [BR-22, "FRONT : Exploded View"](#) or [BR-28, "REAR : Removal and Installation"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to [BR-25, "FRONT : Removal and Installation"](#).

- Rear: Refer to [BR-28, "REAR : Removal and Installation"](#).

4.CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to [BR-12, "Inspection"](#).

- Brake pedal assembly: Refer to [BR-20, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust the brake pedal height or replace brake pedal assembly.

- Adjust the brake pedal: Refer to [BR-12, "Adjustment"](#).

- Replace the brake pedal: Refer to [BR-20, "Removal and Installation"](#).

5.CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to [BR-7, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to [BR-30, "Removal and Installation"](#).

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to [BR-32, "Removal and installation"](#).

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

8.CHECK FRONT DISC BRAKE

Check the front disc brake caliper. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace front disc brake caliper. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

9.CHECK REAR DISC BRAKE

Check the rear disc brake. Refer to [BR-46, "DISC BRAKE ROTOR : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace rear disc brake. Refer to [BR-46, "DISC BRAKE ROTOR : Removal and Installation"](#).

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

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C1142 PRESS SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness, connector, fuse, or fusible link.

11. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Ⓟ CONSULT

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

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Start the engine and drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1142" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:000000012323225

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1143	ST ANG SEN CIRCUIT (Steering angle sensor circuit)	When a malfunction is detected in steering angle sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • CAN communication line • Incomplete neutral position adjustment of steering angle sensor • Improper installation of steering angle sensor 	<ul style="list-style-type: none"> • Harness or connector • Steering angle sensor • ABS actuator and electric unit (control unit) • IPDM E/R • CAN communication line • Wheel alignment • Incomplete neutral position adjustment of steering angle sensor • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": Proceed to [BRC-113, "Diagnosis Procedure"](#).

YES-2 >> "C1143" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323226

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": GO TO 3.

YES-2 >> "C1143" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" mode of "ABS")

NO >> Inspection End.

3.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector and securely lock the connector. GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES >> GO TO 5.

NO >> Inspection End.

5.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Turn the ignition 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		
M53	4	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between steering angle sensor harness connector and ground.

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M53	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

6. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 46 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

Steering angle sensor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M53	4	E19	19	Yes

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M53	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

7. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M53	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness or connector.

8. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, fuse, or fusible link.

9. CHECK TERMINAL

1. Check the steering angle sensor pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness, connector, or terminal.

10. CHECK CAN COMMUNICATION LINE

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector.

11. CHECK DATA MONITOR

 CONSULT

1. Select "Data Monitor" mode of "ABS" and check "STR ANGLE SIG".

C1143 STEERING ANGLE SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

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-46, "Reference Value"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).
- NO >> Replace the steering angle sensor. Refer to [BRC-370, "Removal and Installation"](#).

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:000000012323227

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1144	ST ANG SEN SIGNAL (Steering angle sensor not complete)	When neutral position adjustment of steering angle sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

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

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1144" detected?

YES-1 >> "C1144" is displayed as "CRNT": Proceed to [BRC-117, "Diagnosis Procedure"](#).

YES-2 >> "C1144" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323228

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

>> GO TO 2.

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

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the ignition switch OFF.
2. Check the steering angle sensor system. Refer to [BRC-113, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal.

4. CHECK DATA MONITOR

CONSULT

1. Select "Data Monitor" mode of "ABS" and check "STR ANGLE SIG".
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-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-370, "Removal and Installation"](#).

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1154 TRANSMISSION RANGE SWITCH

DTC Description

INFOID:000000012323229

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1154	PNP POSI SIG (PNP position signal)	When a malfunction is detected in TCM system.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Transmission range switch	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• TCM• Transmission range switch

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1154" detected?

YES-1 >> "C1154" is displayed as "CRNT": Proceed to [BRC-119, "Diagnosis Procedure"](#).

YES-2 >> "C1154" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323230

CAUTION:

"C1154" may be detected when going up a slope, being towed with ignition switch ON and the shift selector in a position other than R position. This is not a shift position error. The system returns to normal once the vehicle is stopped, parked on level ground and the engine is started.

1. CHECK CVT SYSTEM

CONSULT

Select "Self Diagnostic Result" mode of "TRANSMISSION".

Is DTC detected?

YES >> Check the DTC. Refer to [TM-58, "DTC Index"](#) (RE0F10H).

NO >> GO TO 2.

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

2. PERFORM SELF-DIAGNOSIS

CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.
6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1154" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).
- NO >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair / replace harness, connector, or terminal.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:000000012323231

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	<ul style="list-style-type: none">When brake fluid level low signal is detected.When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">Harness or connectorBrake fluid level is low.	<ul style="list-style-type: none">Harness or connectorABS actuator and electric unit (control unit)Brake fluid level switchCombination meterBrake fluid level is low.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES-1 >> "C1155" is displayed as "CRNT": Proceed to [BRC-121, "Diagnosis Procedure"](#).

YES-2 >> "C1155" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323232

1. CHECK BRAKE FLUID LEVEL

- Turn the ignition switch OFF.
- Check the brake fluid level. Refer to [BR-14, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refill brake fluid. Refer to [BR-14, "Drain and Refill"](#). GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

CONSULT

- Erase "Self Diagnostic Result" mode of "ABS".

C1155 BRAKE FLUID LEVEL SWITCH

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the combination meter harness connector for disconnection or looseness.
3. Check the brake fluid level switch harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector. GO TO 4.

4. PERFORM SELF-DIAGNOSIS (2)

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode 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 [BR-30, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to [BR-30, "Exploded View"](#). GO TO 6.

6. PERFORM SELF-DIAGNOSIS (3)

Ⓟ CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> Inspection End.

7. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect brake fluid level switch harness connector.
3. Check the brake fluid level switch harness connector for disconnection or looseness.
4. Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
5. Disconnect combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

6. Check the combination meter harness connector for disconnection or looseness.
7. Check the combination meter pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 9.
 NO >> Repair / replace harness, connector, or terminal GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
 Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
NOTE:
 Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

- YES >> GO TO 9.
 NO >> Inspection End.

9.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

1. Turn the ignition 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	
E24	1	M24	25	Yes

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E24	1	Ground	No

Is the inspection result normal?

- YES >> GO TO 10.
 NO >> Repair / replace harness or connector GO TO 10.

10.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E24	2	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 11.
 NO >> Repair / replace harness or connector GO TO 11.

11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-20, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

NO >> Repair or replace combination meter. Refer to [MWI-68. "Removal and Installation"](#).

Component Inspection

INFOID:000000012323233

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition 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
Terminals		
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 the reservoir tank. Refer to [BR-30. "Exploded View"](#).

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Description

INFOID:0000000012323234

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1160	DECEL G SEN SET (Decel G sensor set)	When calibration of yaw rate/side/decel G sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Incomplete calibration of decel G sensor • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1160" detected?

YES-1 >> "C1160" is displayed as "CRNT": Proceed to [BRC-125. "Diagnosis Procedure"](#).

YES-2 >> "C1160" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012323235

1. CALIBRATION OF DECEL G SENSOR

Perform calibration of decel G sensor. Refer to [BRC-66. "Description"](#).

>> GO TO 2.

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

CONSULT

1. Turn the ignition switch OFF.

NOTE:

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1160" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

NO >> Inspection End.

C1164, C1165 CV SYSTEM

DTC Description

INFOID:000000012323236

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION?

 CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed as "CRNT": Proceed to [BRC-127, "Diagnosis Procedure"](#).

YES-2 >> "C1164" or "C1165" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323237

1. CHECK CONNECTOR

1. Turn the ignition 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.

C1164, C1165 CV SYSTEM

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair / replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

Select "Self Diagnostic Result" mode of "ABS" again.

Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1166, C1167 SV SYSTEM

DTC Description

INFOID:000000012323238

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1166	SV 1 (Suction valve 1)	When a malfunction is detected in suction valve 1.
C1167	SV 2 (Suction valve 2)	When a malfunction is detected in suction valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1166" or "C1167" detected?

YES-1 >> "C1166" or "C1167" is displayed as "CRNT": Proceed to [BRC-129, "Diagnosis Procedure"](#).

YES-2 >> "C1166" or "C1167" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323239

1. CHECK CONNECTOR

1. Turn the ignition 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.

C1166, C1167 SV SYSTEM

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair / replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

Select "Self Diagnostic Result" mode of "ABS" again.

Is DTC "C1166" or "C1167" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1170 VARIANT CODING

DTC Description

INFOID:000000012323240

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
—	<ul style="list-style-type: none">• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) is not configured.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1170" detected?

YES-1 >> "C1170" is displayed as "CRNT": Proceed to [BRC-131, "Diagnosis Procedure"](#).

YES-2 >> "C1170" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323241

1. CONFIGURATION OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform configuration of ABS actuator and electric unit (control unit). Refer to [BRC-68, "Work Procedure"](#).

CAUTION:

Never replace the ABS actuator and electric unit (control unit).

>> GO TO 2.

2. CHECK SELF-DIAGNOSIS RESULTS

CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC's are displayed along with "C1170" in "Self Diagnostic Result" mode of "ABS".

C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1197 VACUUM SENSOR

DTC Description

INFOID:0000000012323242

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • Vacuum piping • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
- Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1197" detected?

- YES-1 >> "C1197" is displayed as "CRNT": Proceed to [BRC-133, "Diagnosis Procedure"](#).
- YES-2 >> "C1197" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")
- NO-1 >> To check malfunction symptom before repair: Refer to [Gl-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012323243

1. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK BRAKE BOOSTER

- Turn the ignition switch OFF.

C1197 VACUUM SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to [BR-32, "Removal and installation"](#).

3. CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

4. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E26	12	Yes
	2		24	
	3		5	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-32, "Removal and installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1197" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

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C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1198 VACUUM SENSOR

DTC Description

INFOID:000000012323244

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	<ul style="list-style-type: none">• When an open circuit is detected in vacuum sensor circuit.• When a short circuit is detected in vacuum sensor circuit.• When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1198" detected?

- YES-1 >> "CRNT" is displayed: Proceed to [BRC-136, "Diagnosis Procedure"](#).
YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323245

1. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK TERMINAL

C1198 VACUUM SENSOR

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal.

3. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E26	12	Yes
	2		24	
	3		5	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BRC-168, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1198" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C1199 BRAKE BOOSTER

DTC Description

INFOID:000000012323246

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mm Hg) when engine is running.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1199" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-138, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323247

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK BRAKE BOOSTER

C1199 BRAKE BOOSTER

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Replace the brake booster. Refer to [BR-32, "Removal and installation"](#).

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace the vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

4.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 5.
 NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E26	12	Yes
	2		24	
	3		5	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

- YES >> GO TO 6.
 NO >> Repair / replace harness or connector.

6.REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-32, "Removal and installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1199" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

C119A VACUUM SENSOR

DTC Description

INFOID:000000012323248

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in power supply voltage of vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C119A" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-141, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#)

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323249

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the vacuum sensor harness connector for disconnection or looseness.
3. 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 / replace harness or connector. GO TO 2.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

2. CHECK VACUUM SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E51	3	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E51	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	3	E26	5	Yes

4. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	3	Ground	No

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair / replace harness or connector.

4. CHECK VACUUM SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	2	Ground	No

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness or connector.

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

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-82. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

1. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.

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 the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012323250

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• CAN communication line	CAN communication system malfunction

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-144, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012323251

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

POWER SUPPLY AND GROUND CIRCUIT

BCM

BCM : Diagnosis Procedure

INFOID:000000012385889

Regarding Wiring Diagram information, refer to [BCS-56. "Wiring Diagram"](#).

1. CHECK FUSE AND FUSIBLE LINK

Check if the following BCM fuses or fusible link are blown.

Signal name	Fuse and fusible link No.
Fusible link battery power	I (40A)
BCM battery fuse	1 (10A)

Is the fuse or fusible link blown?

- YES >> Replace the blown fuse or fusible link after repairing the affected circuit.
NO >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector M17.
3. Check voltage between BCM harness connector M17 and ground.

Terminals		Voltage (Approx.)
(+)	(-)	
BCM		Battery voltage
Connector	Terminal	
M17	135	
	142	

Is the measurement normal?

- YES >> GO TO 3.
NO >> Repair or replace harness.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector M17 and ground.

BCM		Ground	Continuity
Connector	Terminal		
M17	138		Yes
	132		

Is the inspection result normal?

- YES >> Inspection End.
NO >> Repair or replace harness.

BCM : Special Repair Requirement

INFOID:000000012385890

1. REQUIRED WORK WHEN REPLACING BCM

Initialize control unit. Refer to [BCS-63. "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT \(BCM\) : Work Procedure"](#).

>> Work End.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) : Diagnosis Procedure

INFOID:000000012385891

Regarding Wiring Diagram information, refer to [PCS-23. "Wiring Diagram"](#).

1. CHECK FUSES AND FUSIBLE LINK

Check that the following IPDM E/R fusible links are not blown.

Signal name	Fuses and fusible link No.
Battery power supply	E (80A)
	B (100A)
	A (250A), C (80A)

Is the fusible link blown?

YES >> Replace the blown fusible link after repairing the affected circuit.

NO >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connectors E16 and E17.
3. Check voltage between IPDM E/R harness connector and ground.

Terminals		Voltage (V) (Approx.)
(+)	(-)	
IPDM E/R		Battery voltage
Connector	Terminal	
E16	1	
	2	
E17	3	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness or connector.

3. CHECK GROUND CIRCUIT

1. Disconnect connectors.
2. Check continuity between IPDM E/R harness connectors and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E18	7		Yes
E19	41		

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair or replace harness or connector.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000112273643

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Proceed to [BRC-147, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000112273644

1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E35	1	M24	26	Yes

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

Parking brake switch		—	Continuity
Connector	Terminal		
E35	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 [PB-5, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Replace the parking brake switch. Refer to [PB-11, "Removal and Installation"](#).

3.CHECK PARKING BRAKE SWITCH SIGNAL

CONSULT

1. Select "Data Monitor" mode of "ICC/ADAS"
2. Select "PKB SW".
3. Check that the function operates normally according to the following conditions:

Condition	Data Monitor
Operate parking brake	On
Release parking brake	Off

Is the inspection result normal?

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

4.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-20, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

PARKING BRAKE SWITCH

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 5.

NO >> Repair or replace combination meter. Refer to [MWI-68, "Removal and Installation"](#).

5.CHECK TERMINAL

1. Check the combination meter pin terminals for damage or loose connection with harness connector.
2. Check the parking brake switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000012273645

1.CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.
2. Disconnect parking brake switch harness connector.
3. Check the continuity between parking brake switch terminal and ground.

Parking brake switch Terminal	—	Condition	Continuity
1	Ground	When parking brake switch is pressed	Yes
		When parking brake switch is released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the parking brake switch. Refer to [PB-11, "Removal and Installation"](#).

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

VDC OFF SWITCH

Component Function Check

INFOID:0000000112273646

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 [BRC-149, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000112273647

1.CHECK VDC OFF SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect VDC OFF switch harness connector.
4. Check 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	
E26	15	M72	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		
E26	15	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		
M72	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-150, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Replace the VDC OFF switch. Refer to [BRC-170, "Removal and Installation"](#).

4.CHECK VDC OFF SWITCH SIGNAL

CONSULT

1. Select "Data Monitor" mode of "CHASSIS CONTROL".
2. Select "VDC OFF SWITCH".
3. Check that the function operates normally according to the following conditions:

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

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

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

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000012273648

1.CHECK VDC OFF SWITCH

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

VDC OFF switch Terminals	Condition	Continuity
6 – 8	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 the VDC OFF switch. Refer to [BRC-170. "Removal and Installation"](#).

ABS WARNING LAMP

[WITHOUT ICC]

< DTC/CIRCUIT DIAGNOSIS >

ABS WARNING LAMP

Component Function Check

INFOID:0000000012273649

1. CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to [BRC-151, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012273650

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-82, "DTC Description"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.

3. Select "Self Diagnostic Result" mode for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK ABS WARNING LAMP SIGNAL

CONSULT

1. Select "ABS", "Data Monitor" and "ABS WARN LAMP" in this order.

2. Turn the ignition switch OFF.

3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

BRAKE WARNING LAMP

Component Function Check

INFOID:000000012273651

1. CHECK BRAKE WARNING LAMP FUNCTION

Check that brake warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [BRC-152. "Diagnosis Procedure"](#).

2. CHECK BRAKE WARNING LAMP FUNCTION

Check that brake warning lamp 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 the parking brake switch system. Refer to [BRC-147. "Diagnosis Procedure"](#).

3. CHECK BRAKE WARNING LAMP FUNCTION

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 within 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 [BR-30. "Exploded View"](#).

Diagnosis Procedure

INFOID:000000012273652

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-82. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF DIAGNOSTIC RESULT

 CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

• **Start the engine.**

2. Repeat step 1 two or more times.

3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52. "DTC Index"](#).

NO >> GO TO 3.

3. CHECK BRAKE WARNING LAMP SIGNAL

 CONSULT

1. Select "ABS", "Data Monitor" and "EBD WARN LAMP" in this order.

2. Turn the ignition switch OFF.

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).
NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

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< DTC/CIRCUIT DIAGNOSIS >

VDC WARNING LAMP

Component Function Check

INFOID:000000012273653

1.CHECK VDC WARNING LAMP FUNCTION

Check that VDC warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Proceed to [BRC-154, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273654

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-82, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

2.PERFORM THE SELF DIAGNOSTIC RESULT

④ CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.
 3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
 NO >> GO TO 3.

3.CHECK VDC WARNING LAMP SIGNAL

④ CONSULT

1. Select "ABS", "Data Monitor" and "SLIP/VDC LAMP" in this order.
 2. Turn the ignition switch OFF.
 3. Check that "Data Monitor" displays "On" for approximately 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).
 NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ICC]

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:000000012273655

1. CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [BRC-155, "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-149, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273656

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-82, "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

Ⓜ CONSULT

1. Select "ABS", "Data Monitor" and "OFF LAMP" in this order.
2. Turn the ignition switch OFF.
3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

3. CHECK VDC OFF INDICATOR LAMP SIGNAL

Ⓜ CONSULT

1. Select "ABS", "Data Monitor" and "OFF LAMP" in this order.
2. Check that "Data Monitor" displays "On" or "Off" each time VDC OFF switch is operated.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).

NO >> Check the VDC OFF switch system. Refer to [BRC-149, "Diagnosis Procedure"](#).

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BRC

SYMPTOM DIAGNOSIS

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:0000000012273657

VDC function, TCS function, ABS function, EBD function or brake assist function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:0000000012273658

1. CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.
Refer to [FAX-6, "Inspection"](#) (front) or [RAX-5, "Inspection"](#) (rear).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK WHEEL SENSOR

Check wheel sensor.

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair installation or replace wheel sensor.

- Front wheel sensor: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
- Rear wheel sensor: Refer to [BRC-165, "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-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
- Rear sensor rotor: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

5. CHECK THAT WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approximately 1 second after key switch is turned ON and stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 6.

6. PERFORM THE SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

EXCESSIVE OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Set the vehicle to READY/Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
NO >> Inspection End.

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BRC

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:000000012273659

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

Diagnosis Procedure

INFOID:000000012273660

1.CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.
Refer to [FAX-6. "Inspection"](#) (front) or [RAX-5. "Inspection"](#) (rear).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK DISC ROTOR

Check disc rotor runout.

- Front: Refer to [BR-16. "DISC BRAKE ROTOR : Inspection"](#).
- Rear: Refer to [BR-18. "DISC BRAKE ROTOR : Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check for fluid leakage.

Refer to [BR-14. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK BRAKE PEDAL

Check each item of brake pedal. Refer to [BR-12. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust each item of brake pedal. Refer to [BR-12. "Adjustment"](#).

5.CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check each component of brake system.

6.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Check each component of brake system.

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

THE BRAKING DISTANCE IS LONG

Description

INFOID:000000012273661

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:000000012273662

CAUTION:

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

1.CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check each component of brake system.

2.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Check each component of brake system.

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DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

DOES NOT OPERATE

Description

INFOID:000000012273663

VDC function, TCS function, ABS function, EBD function or brake assist function does not operate.

Diagnosis Procedure

INFOID:000000012273664

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. However, TCS function will operate when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

1. CHECK ABS WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF approximately 1 second after key switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

- YES >> Inspection End.
NO >> GO TO 2.

2. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
NO >> Inspection End.

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:000000012273665

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

CAUTION:

Vibration may be felt when 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 speeds
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]

Diagnosis Procedure

INFOID:000000012273666

1. SYMPTOM CHECK (1)

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Check brake pedal. Refer to [BR-12. "Adjustment"](#).

2. SYMPTOM CHECK (2)

Check that motor sound from ABS actuator and electric unit (control unit) occurs when the engine starts.

Does the operation sound occur?

YES >> GO TO 3.

NO >> Perform "Self Diagnostic Result" mode of "ABS".

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 RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.

3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52. "DTC Index"](#).

NO >> Inspection End.

VEHICLE JERKS DURING

Description

INFOID:000000012273667

The vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake assist function operates.

Diagnosis Procedure

INFOID:000000012273668

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake assist function operates.

Is the inspection result normal?

- YES >> Inspection End.
NO >> GO TO 2.

2.PERFORM THE SELF DIAGNOSTIC RESULT

Ⓟ CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
NO >> GO TO 3.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check 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 THE SELF DIAGNOSTIC RESULT

Ⓟ CONSULT

1. Connect harness connector.
2. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

3. Repeat step 2 two or more times.
4. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
NO >> GO TO 5.

5.PERFORM THE SELF DIAGNOSTIC RESULT

Ⓟ CONSULT

Select "Self Diagnostic Result" mode of "ENGINE" and "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC.
NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[WITHOUT ICC]

NORMAL OPERATING CONDITION

Description

INFOID:000000012273669

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 or brake assist function operates.	This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD 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 a slippery road, 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 assist function or brake force distribution function is operated.	
Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction, because it is caused by operation check of ABS actuator and electric unit (control unit).
Acceleration may feel 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.	
ABS warning lamp and VDC OFF indicator lamp may turn ON when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.
VDC warning lamp may turn ON and VDC function, TCS function, brake assist function, and brake force distribution function may not normally operate when driving on a special road that 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).	
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 normal. (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 >

[WITHOUT ICC]

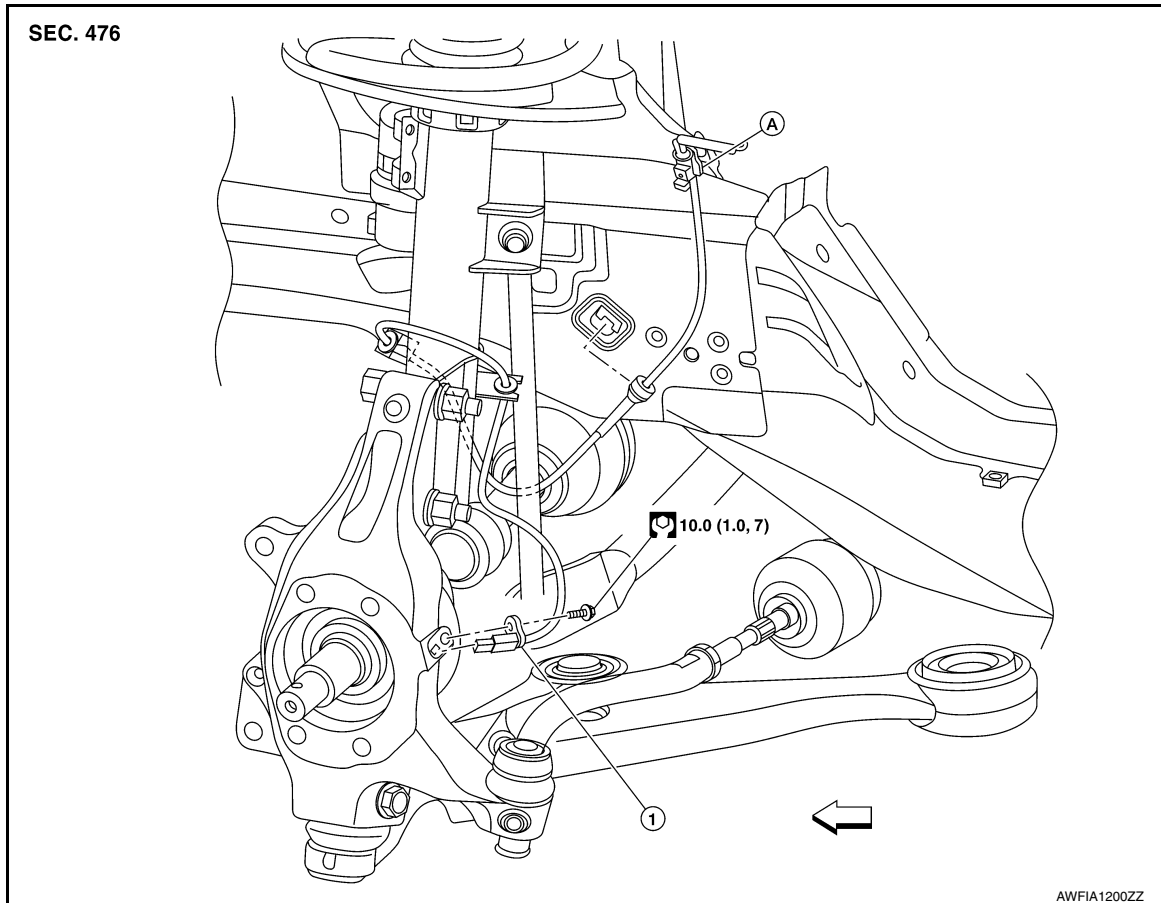
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:0000000012273670



1. Front wheel sensor

A. Front wheel sensor harness connector

⇐ Front

FRONT WHEEL SENSOR : Removal and Installation

INFOID:0000000012273671

CAUTION:

Do not damage front wheel sensor or sensor rotor.

REMOVAL

1. Remove front wheels and tires using power tools. Refer to [WT-67, "Removal and Installation"](#).
2. Partially remove fender protector to gain access to front wheel sensor harness connector. Refer to [EXT-28, "Exploded View"](#).
3. Disconnect harness connector from front wheel sensor.
4. Remove front wheel sensor from strut bracket and body brackets.
5. Remove front wheel sensor bolt and remove front wheel sensor.

CAUTION:

Pull out front wheel sensor being careful to turn it as little as possible. Do not pull on front wheel sensor harness.

INSTALLATION

Installation is in the reverse order of removal.

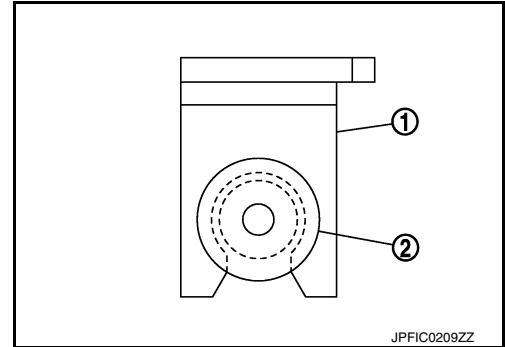
CAUTION:

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

- Before installing, make sure there is no foreign material, such as iron fragments, adhered to pick-up part of front wheel sensor.
- When installing, make sure there is no foreign material, such as iron fragments, on and in hole in knuckle for front wheel sensor. Make sure no foreign material has been caught in sensor rotor. Remove any foreign material and clean the mount.
- Do not 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.

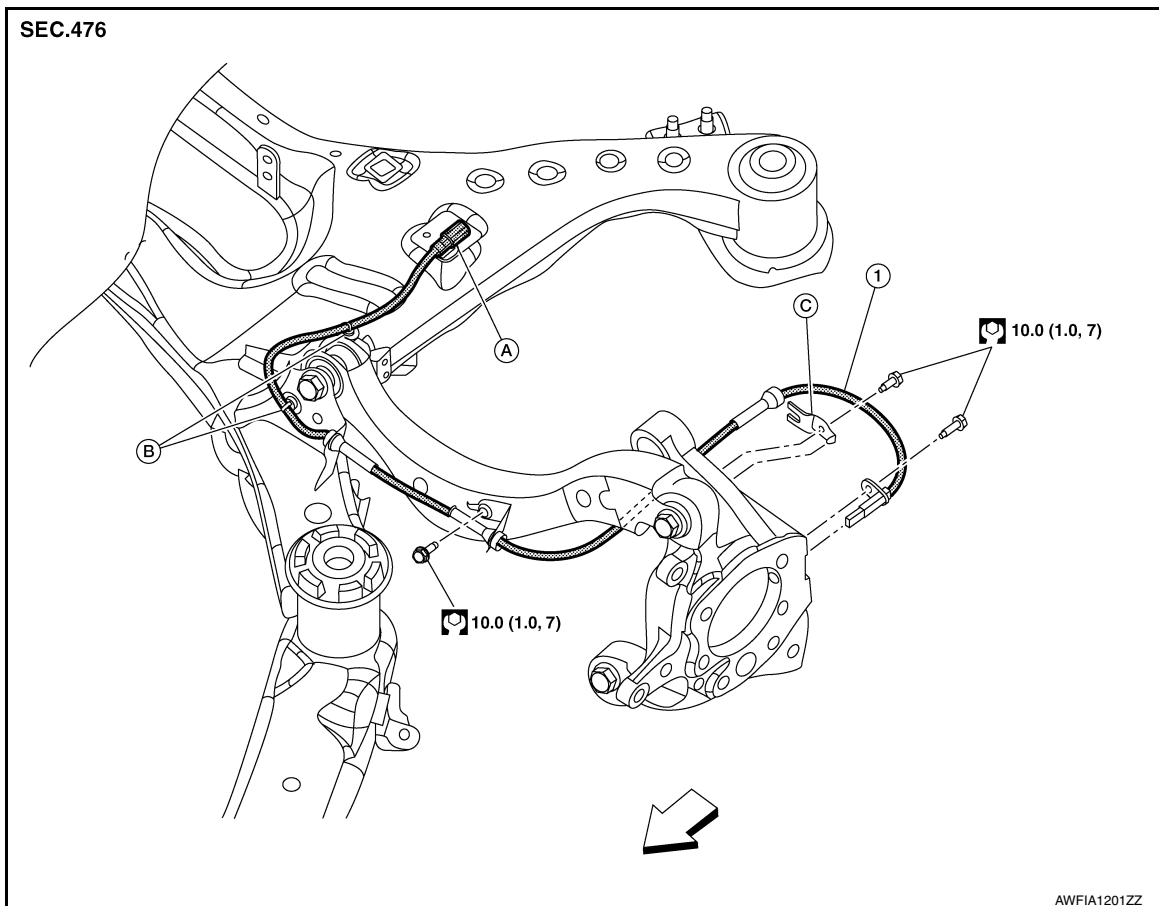


REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000012273672

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|------------------------------|--|---------|
| 1. Rear wheel sensor | A. Rear wheel sensor harness connector | B. Clip |
| C. Rear wheel sensor bracket | ← Front | |

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000012273673

CAUTION:
Do not damage rear wheel sensor or sensor rotor.

REMOVAL

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WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

1. Remove rear wheels and tires using power tools. Refer to [WT-67. "Removal and Installation"](#).
2. Disconnect harness connector from rear wheel sensor.
3. Remove rear wheel sensor from rear wheel sensor brackets and clips.
4. Remove rear wheel sensor bolt and remove rear wheel sensor.

CAUTION:

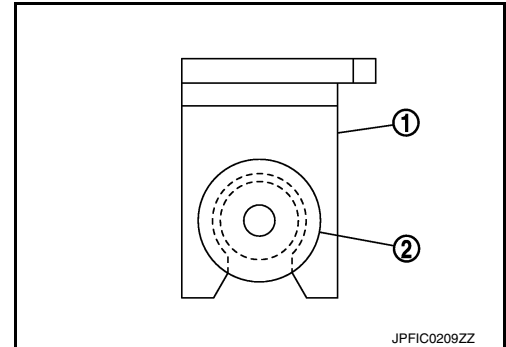
Pull out rear wheel sensor being careful to turn it as little as possible. Do not pull on rear wheel sensor harness.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Before installing, make sure there is no foreign material, such as iron fragments, adhered to pick-up part of rear wheel sensor.
- When installing, make sure there is no foreign material, such as iron fragments, on and in hole in knuckle for rear wheel sensor. Make sure no foreign material has been caught in sensor rotor. Remove any foreign material and clean mount.
- Do not 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.



SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor INFOID:0000000012273674

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [FAX-8. "Removal and Installation"](#).

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor INFOID:0000000012273675

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [RAX-6. "Removal and Installation"](#).

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

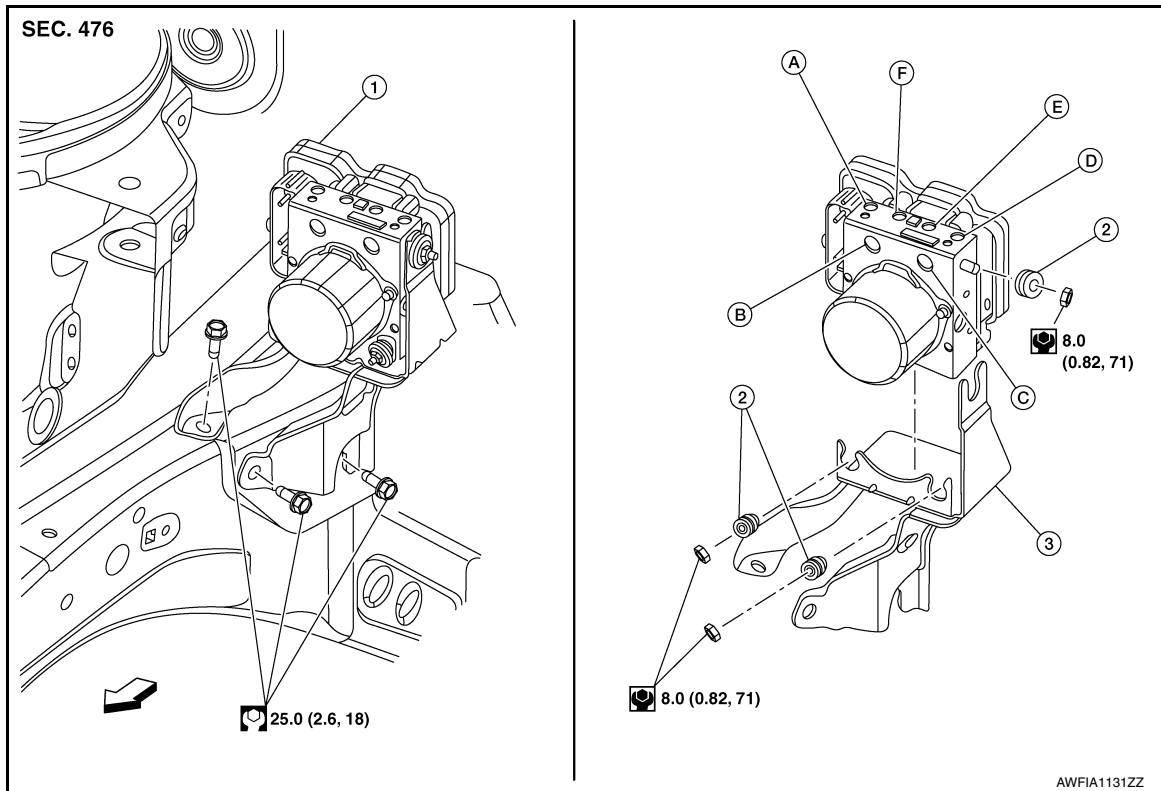
< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000012273676



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|--|--|--------------------------------------|
| 1. ABS actuator and electric unit (control unit) | 2. Bushings | 3. Bracket |
| A. To rear RH brake caliper | B. From master cylinder secondary side | C. From master cylinder primary side |
| D. To rear LH brake caliper | E. To front RH brake caliper | F. To front LH brake caliper |
| ⇐ Front | | |

Removal and Installation

INFOID:000000012273677

REMOVAL

CAUTION:

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.
- Do not remove actuator by holding harness.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

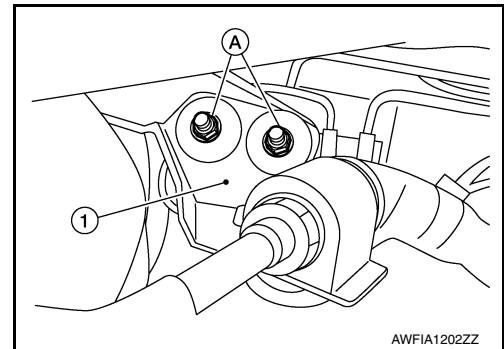
1. Disconnect battery negative terminal. Refer to [PG-105, "Exploded View"](#).
2. Remove cowl top and cowl top extension. Refer to [EXT-25, "Removal and Installation"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

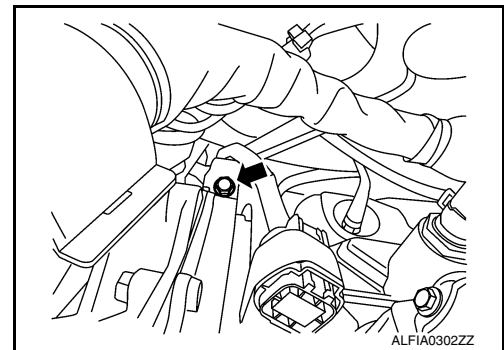
< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

3. Remove nuts (A) and power steering line hold down bracket (1).



4. Disconnect harness connector from ABS actuator and electric unit (control unit) and position aside.
5. Loosen brake tube flare nuts using a suitable tool, then remove brake tubes from ABS actuator and electric unit (control unit) and position aside. Refer to [BR-22, "FRONT : Exploded View"](#).
6. Remove harness bracket bolt.



7. Remove ABS actuator and electric unit (control unit) and bracket as an assembly.
8. If necessary, remove bracket from ABS actuator and electric unit (control unit).

INSTALLATION

CAUTION:

When replacing ABS actuator and electric unit (control unit), calibration of ABS actuator and electric unit (control unit) is required. Refer to [BRC-68, "Work Procedure"](#).

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to [BR-15, "Bleeding Brake System"](#).
- Adjust neutral position of steering angle sensor. Refer to [BRC-64, "Description"](#).
- Perform calibration of decel G sensor. Refer to [BRC-66, "Description"](#).

CAUTION:

- **To install, use flare nut crowfoot and torque wrench.**
- **Replace ABS actuator if it has been dropped or sustained an impact.**
- **Do not install actuator by holding harness.**
- **After installing harness connector in ABS actuator and electric unit (control unit), make sure connector is securely locked.**

VDC OFF SWITCH

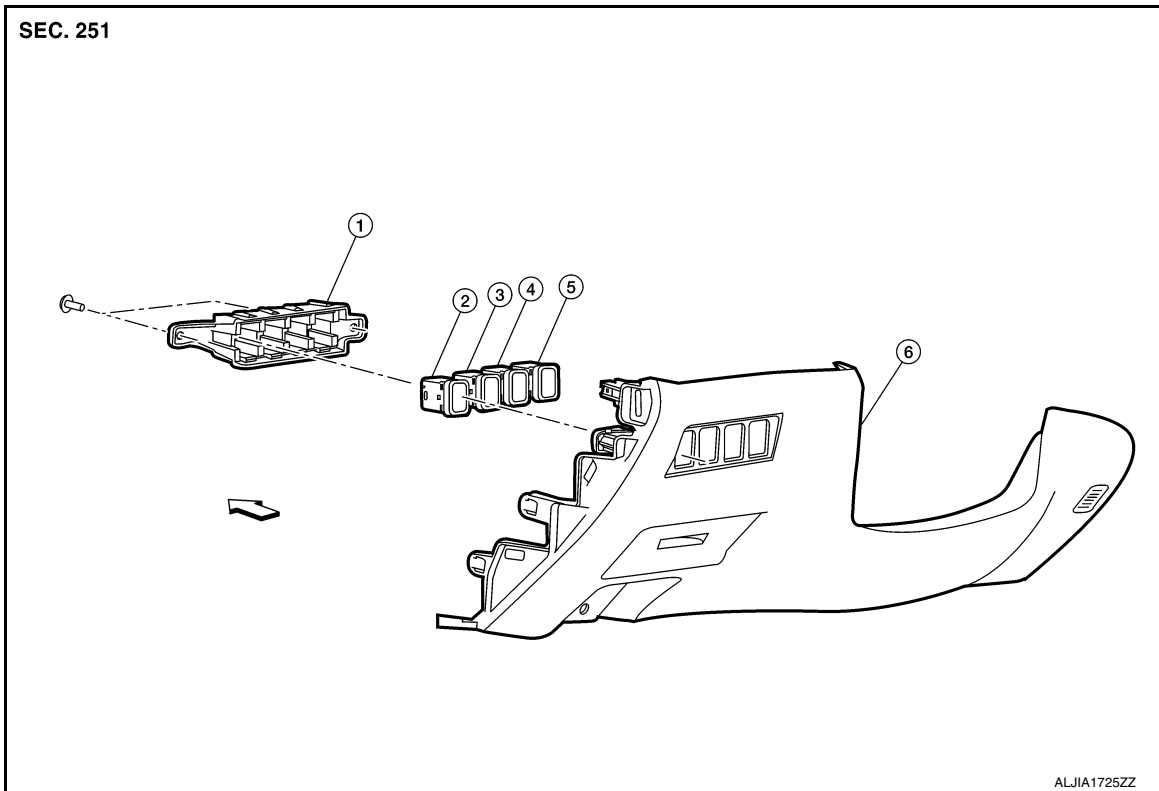
< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

VDC OFF SWITCH

Exploded View

INFOID:000000012273678



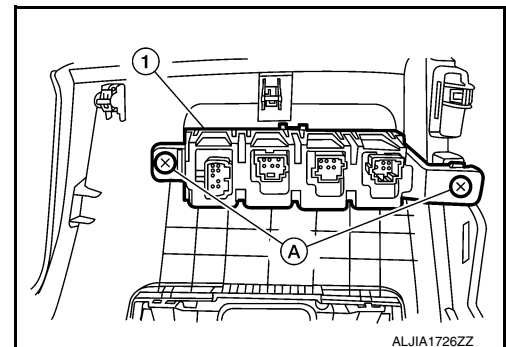
- | | | |
|---|------------------------------|-------------------|
| 1. Switch carrier
Heated steering wheel switch (if
4. equipped) | 2. Trunk lid opener switch | 3. VDC OFF switch |
| 5. Rear sunshade switch (if equipped) | 6. Instrument lower panel LH | |
- ⇐ Front

Removal and Installation

INFOID:000000012273679

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-23. "Removal and Installation"](#).
2. Remove screws (A), then remove switch carrier (1) from instrument lower panel LH.




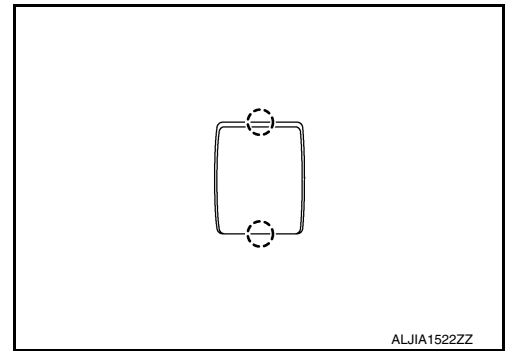
VDC OFF SWITCH

< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

3. Using suitable tool, release pawls and remove VDC OFF switch.

 : Pawl



INSTALLATION

Installation is in the reverse order of removal.

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STEERING ANGLE SENSOR

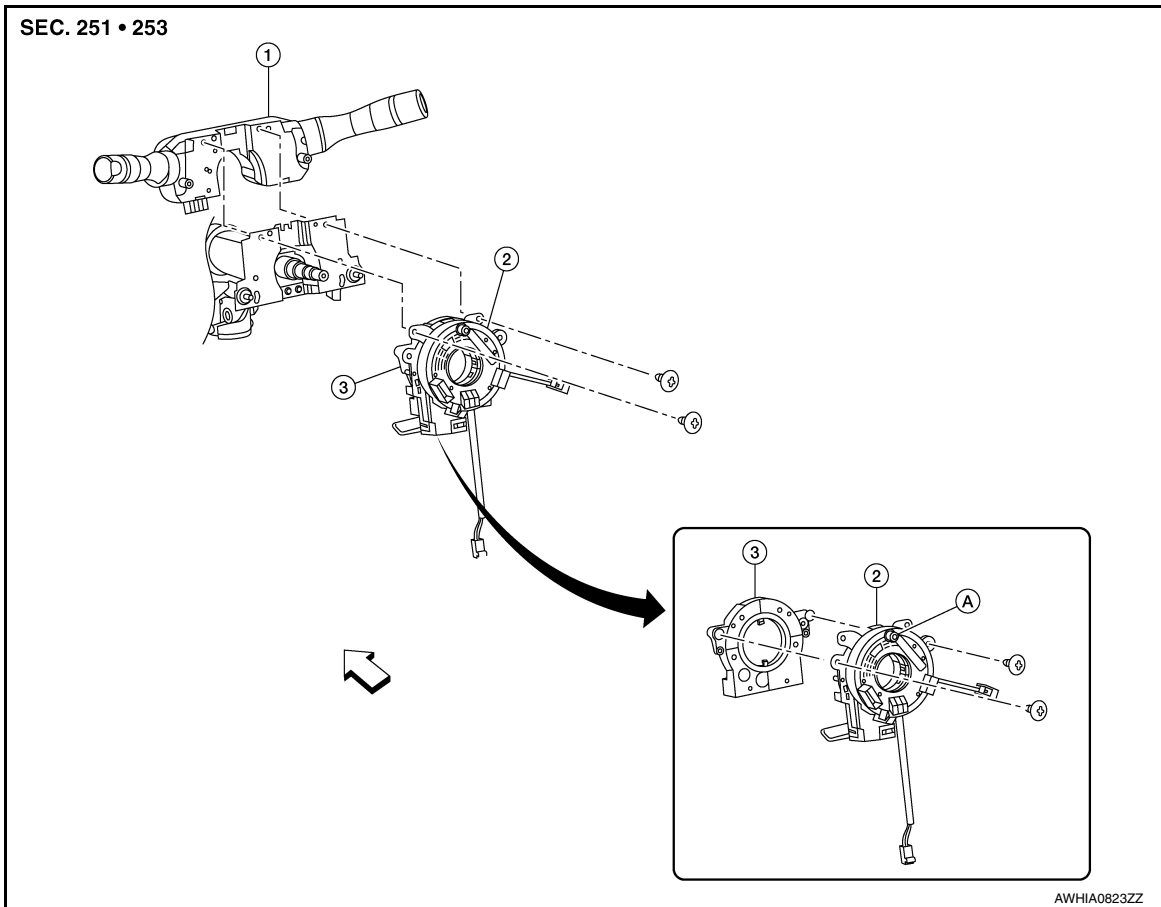
< REMOVAL AND INSTALLATION >

[WITHOUT ICC]

STEERING ANGLE SENSOR

Exploded View

INFOID:000000012273680



1. Combination switch

2. Spiral cable

3. Steering angle sensor

A. Locating pin

⇐ Front

Removal and Installation

INFOID:000000012273681

To remove and install steering angle sensor, remove and install spiral cable. Refer to [SR-16, "Removal and Installation"](#).

PRECAUTION

PRECAUTIONS

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

INFOID:0000000112273682

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

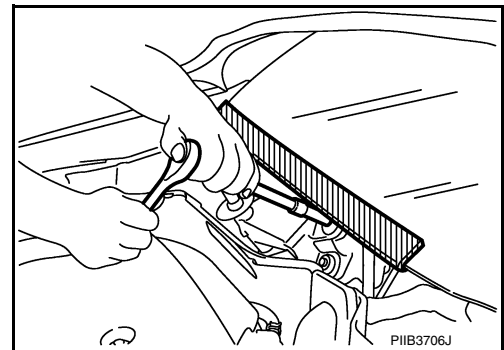
WARNING:

- 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 Procedure without Cowl Top Cover

INFOID:0000000112273683

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



Precaution for Brake System

INFOID:0000000112273684

WARNING:

Clean any dust from the front brake and rear brake using a vacuum dust collector. Do not blow by compressed air.

- Brake fluid use refer to [MA-16. "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) [MA-13. "FOR MEXICO : Periodic Maintenance"](#) (Mexico).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.

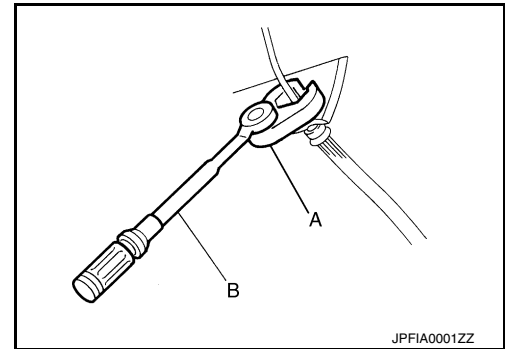
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PRECAUTIONS

[WITH ICC]

< PRECAUTION >

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



Precaution for Brake Control System

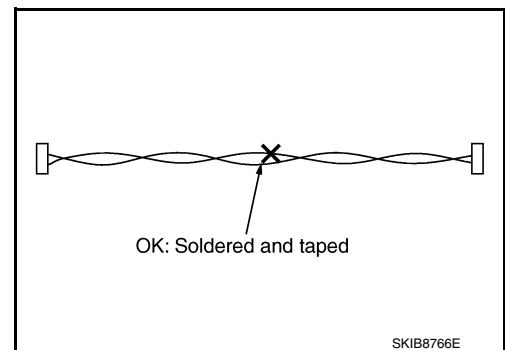
INFOID:000000012273685

- Just after starting vehicle after ignition switch is ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level and oil leaks.
- If tire size and type are used in an improper combination or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension-related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

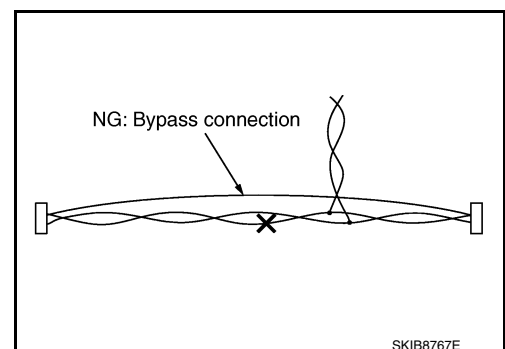
Precaution for Harness Repair

INFOID:000000012273686

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



- Do not bypass the repair point with wire. (If it is bypassed, the turn-out point cannot be separated and the twisted wire characteristics are lost.)



PRECAUTIONS

< PRECAUTION >

[WITH ICC]

Precautions for FEB System Service

INFOID:000000012273687

CAUTION:

- Never use the ICC sensor removed from vehicle. Never disassemble or remodel.
- Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after radar alignment if necessary.
- Never change FEB system state ON/OFF without the consent of the customer.
- Turn the FEB system OFF in conditions similar to driving, such as free rollers or a chassis dynamometer.

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PREPARATION

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PREPARATION

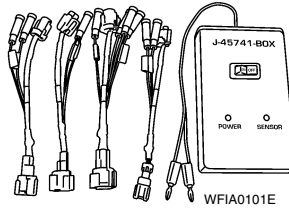
PREPARATION

Special Service Tool

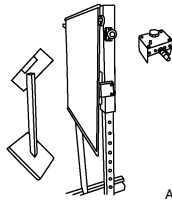
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The actual shape of the tools may differ from those illustrated here.

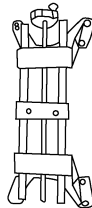
Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors
— (1-20-2851-1) ICC Alignment Kit	Adjusting ICC sensor
— (1-20-2722-1-IF) Wheel Adaptor	Adjusting ICC sensor
— (J-46534) Trim Tool Set	Removing trim components



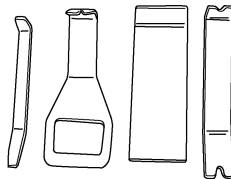
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Commercial Service Tools

INFOID:000000012273689

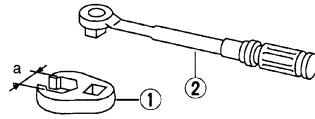
Tool name	Description
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PREPARATION

[WITH ICC]

< PREPARATION >

- 1. Flare nut crowfoot
- 2. Torque wrench



S-NT360

Tightening brake tube flare nuts
a: 10 mm (0.39 in)/12 mm (0.47 in)

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Power tool



PIIB1407E

Loosening nuts, screws and bolts

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

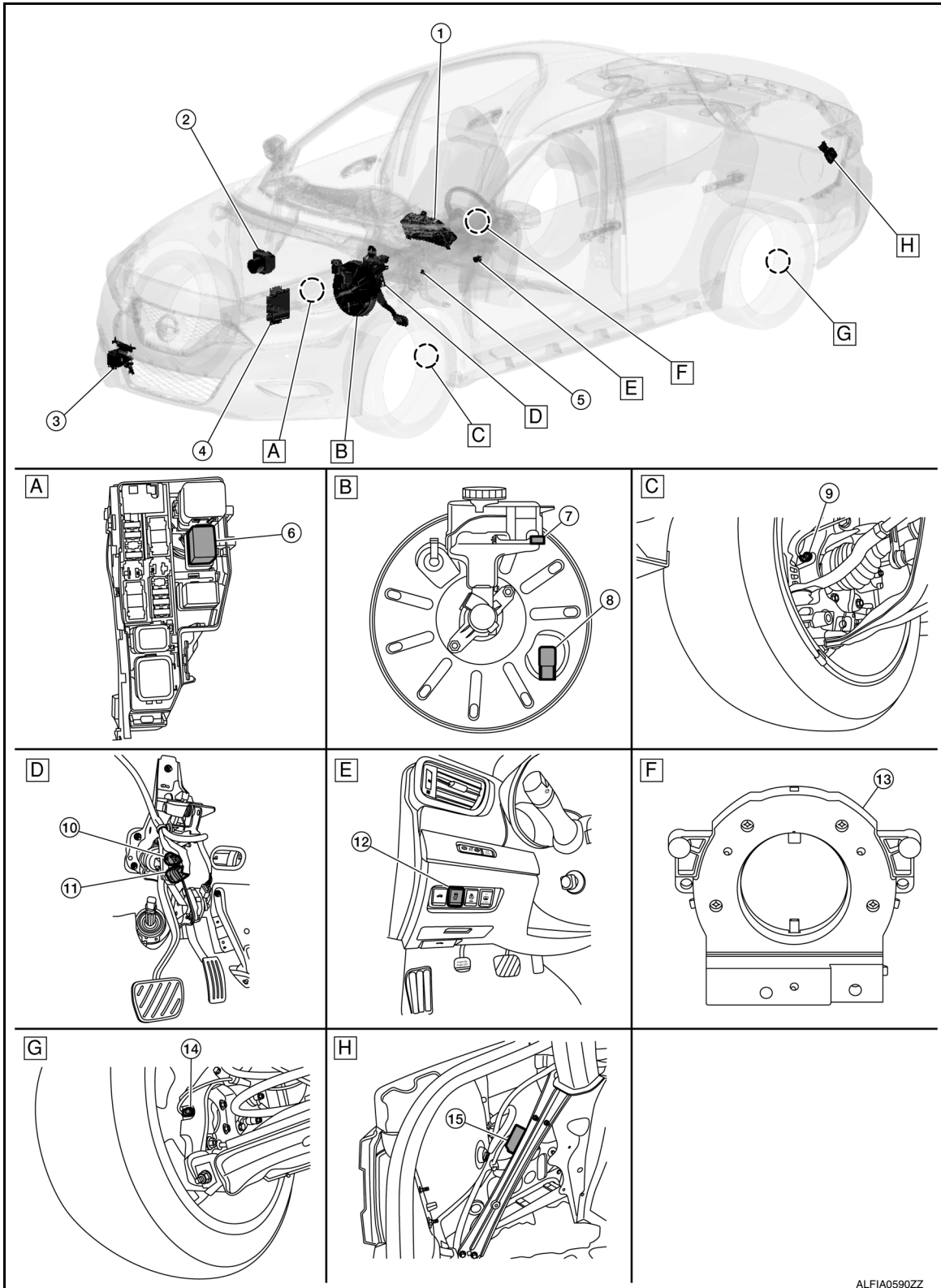
[WITH ICC]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000012273690



COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH ICC]

- | | | |
|-------------------------|---|--|
| A. Engine room (LH) | B. View with brake booster assembly removed | C. Left front wheel area |
| D. Brake pedal area | E. Left side of instrument panel | F. View of steering angle sensor removed |
| G. Left rear wheel area | H. Left side of luggage compartment | |

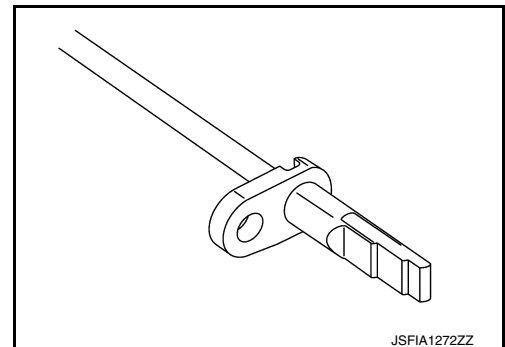
No.	Component	Description
1.	Combination meter	<ul style="list-style-type: none"> Performs the following operations using the signals received from the ADAS control unit via the CAN communication: <ul style="list-style-type: none"> Displays the FEB system operation status using the meter display signal Illuminates the FEB warning lamp using the FEB warning lamp signal Refer to MWI-5, "METER SYSTEM : Component Parts Location" for detailed installation location.
2.	ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) transmits the vehicle speed signal (wheel speed), stop lamp signal and VDC/TCS/ABS system operation condition to ADAS control unit via CAN communication. ABS actuator and electric unit (control unit) controls the brake, based on a brake fluid pressure control signal received from ADAS control unit via CAN communication. Refer to BRC-168, "Exploded View" for detailed installation location.
3.	ICC sensor	Refer to BRC-182, "ICC Sensor" .
4.	TCM	<ul style="list-style-type: none"> TCM transmits the signal related to CVT control to ADAS control unit via CAN communication. Refer to TM-14, "CVT CONTROL SYSTEM : TCM" for detailed installation location.
5.	Parking brake switch	Refer to BRC-181, "Parking Brake Switch" .
6.	Steering angle sensor	Refer to BRC-181, "Steering Angle Sensor" .
7.	Brake pedal position switch	Refer to BRC-182, "Brake Pedal Position Switch / Stop Lamp Switch" .
8.	Stop lamp switch	
9.	Brake fluid level switch	Refer to BRC-181, "Brake Fluid Level Switch" .
10.	Vacuum sensor	Refer to BRC-181, "Vacuum Sensor" .
11.	ICC brake hold relay	Refer to BRC-183, "ICC Brake Hold Relay" .
12.	Front LH wheel sensor	Refer to BRC-179, "Wheel Sensor and Sensor Rotor" .
13.	VDC OFF switch	Refer to BRC-182, "VDC OFF Switch" .
14.	Rear LH wheel sensor	Refer to BRC-179, "Wheel Sensor and Sensor Rotor" .
15.	ADAS control unit (view with center console removed)	<ul style="list-style-type: none"> Refer to BRC-182, "ADAS Control Unit". Refer to DAS-9, "Component Parts Location" for detailed installation location.

Wheel Sensor and Sensor Rotor

INFOID:000000012273691

NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated into the wheel hub assembly.
- Wheel sensor of rear wheel is installed on rear final drive.
- Sensor rotor of rear wheel is installed on drive shaft (rear final drive side).
- Never measure resistance and voltage value using a tester because sensor is an active sensor.

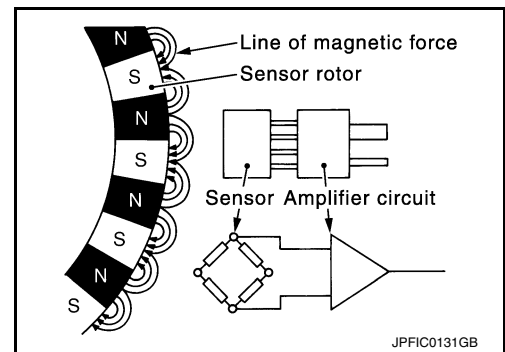


COMPONENT PARTS

[WITH ICC]

< SYSTEM DESCRIPTION >

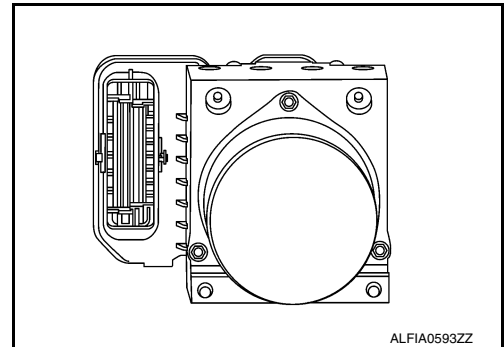
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field changes. Magnetic field change is converted to current signals (rectangular wave) and is transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed.



ABS Actuator and Electric Unit (Control Unit)

INFOID:000000012273692

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



ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure, engine and transmission 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

Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.

Motor

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

Motor Relay

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

Actuator Relay

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

ABS IN Valve and ABS OUT Valve

Increases, holds or decreases the fluid pressure of each caliper according to signals from ABS actuator and electric unit (control unit).

Pressure Sensor

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

Cut Valve 1 (Primary Line) Cut Valve 2 (Secondary Line)

Shuts off the ordinary brake line from master cylinder when VDC function, TCS function and brake assist function are activated.

Yaw Rate/Side/Decel G Sensor

Calculates the following information that affects the vehicle and transmits a signal to ABS actuator and electric unit (control unit). [Yaw rate/side/decels G sensor is integrated into the ABS actuator and electric unit (control unit).]

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

COMPONENT PARTS

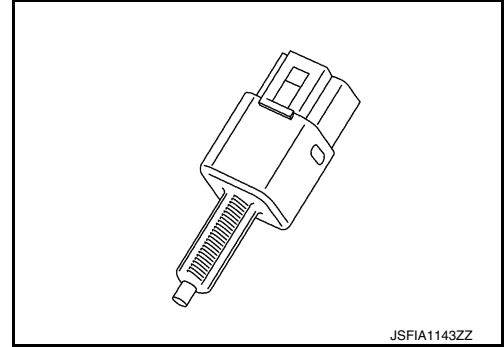
< SYSTEM DESCRIPTION >

[WITH ICC]

Stop Lamp Switch

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

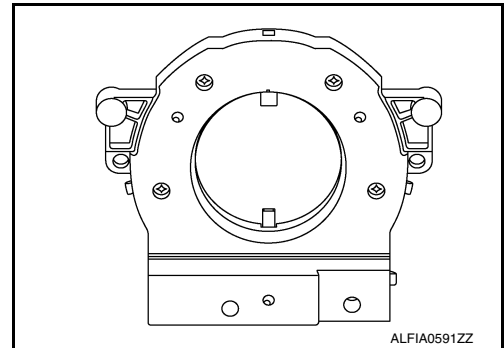


Steering Angle Sensor

INFOID:000000012273694

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

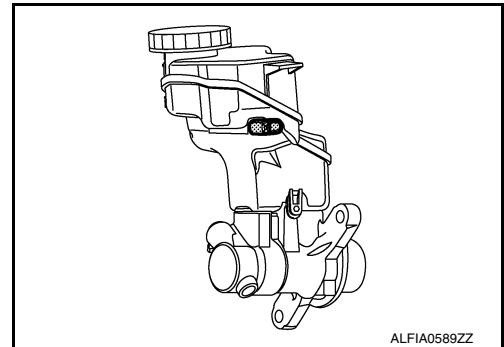
- Steering angle sensor malfunction signal
- Steering wheel rotation amount
- Steering wheel rotation angular velocity
- Steering wheel rotation direction



Brake Fluid Level Switch

INFOID:000000012273695

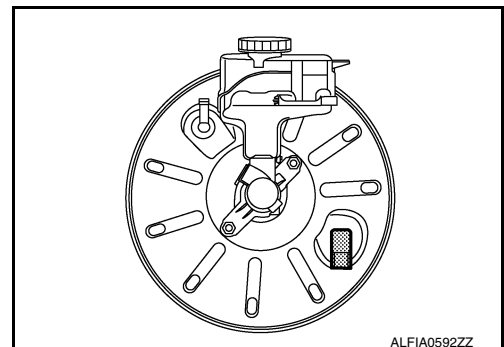
Detects the brake fluid level in reservoir tank and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication when brake fluid level is the specified level or less.



Vacuum Sensor

INFOID:000000012273696

Detects the vacuum in brake booster and transmits converted electric signal to ABS actuator and electric unit (control unit).



Parking Brake Switch

INFOID:000000012273697

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

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COMPONENT PARTS

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VDC OFF Switch

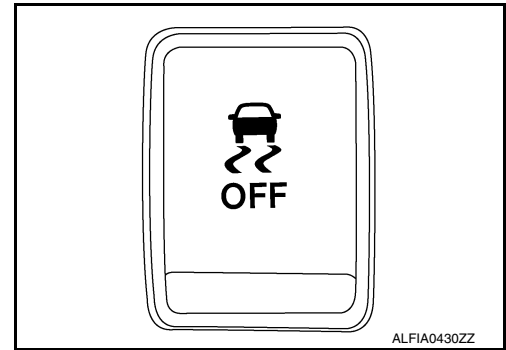
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- This is an integrated switch with switches for other functions.
- Non-operational status or standby status of the following functions can be selected using VDC OFF switch. VDC OFF indicator lamp indicates the operation status of function (ON: Non-operational status, OFF: Standby status).
 - Vehicle Dynamic Control function
 - Traction Control System function
 - Forward Emergency Braking function
 - Active trace control function

NOTE:

ABS function EBD function operate.

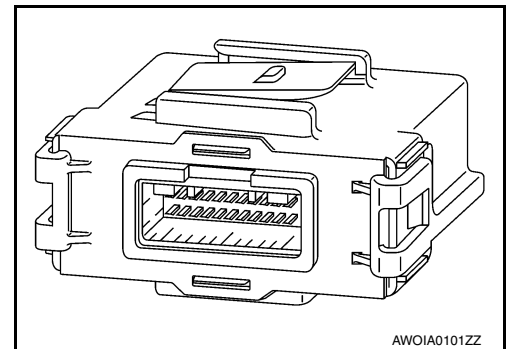
- VDC OFF indicator lamp turns OFF (standby status) when the engine is started again after it is stopped once while VDC OFF indicator lamp is ON (non-operational status).



ADAS Control Unit

INFOID:0000000112273699

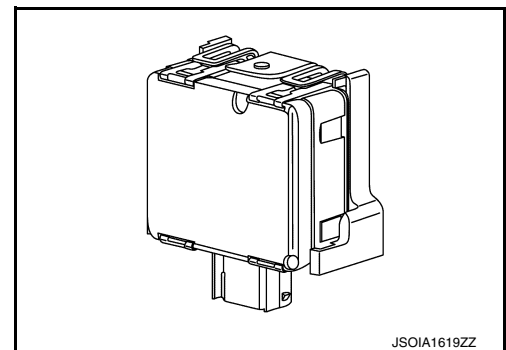
- ADAS control unit is at the front of center console.
- Communicates with each control unit via CAN communication/ITS communication/chassis control communication.
- ADAS control unit includes gateway function, and necessary system control signals are transmitted to each control unit between CAN communication and ITS communication by the ADAS control unit.
- ADAS control unit controls each system, based on ITS communication signal, CAN communication signal, and chassis control communication signal from each control unit.



ICC Sensor

INFOID:0000000112273700

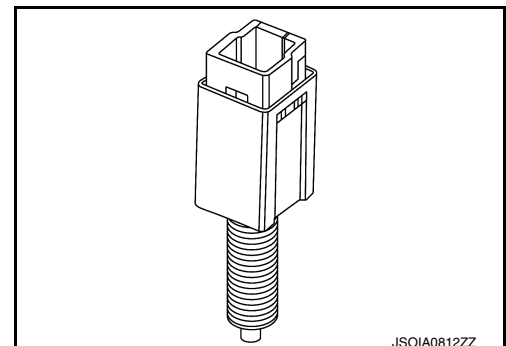
- ICC sensor is installed on the front of the vehicle and detects a vehicle ahead using millimeter waves.
- ICC sensor detects radar reflected from a vehicle ahead by irradiating radar forward and calculates a distance from the vehicle ahead and its relative speed, based on the detected signal.
- ICC sensor transmits information for ICC from the vehicle to ADAS control unit via ITS communication.



Brake Pedal Position Switch / Stop Lamp Switch

INFOID:0000000112273701

- Brake pedal position switch is installed at the upper part of the brake pedal and detects a brake operation performed by the driver.



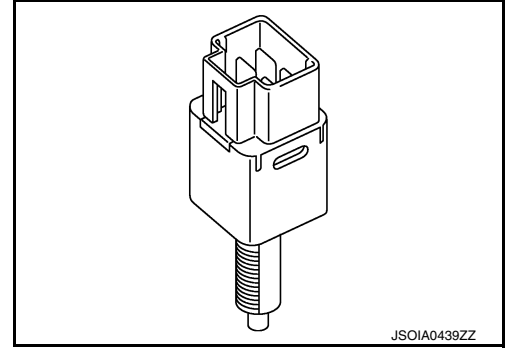
- Brake pedal position switch is turned OFF when depressing the brake pedal.

COMPONENT PARTS

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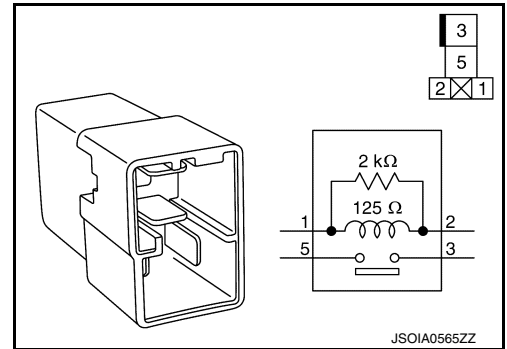
- Brake pedal position switch signal is inputted to ECM. Brake pedal position switch signal is transmitted from ECM to ADAS control unit via CAN communication.
- Stop lamp switch is installed at the upper part of the brake pedal and detects a brake operation performed by the driver.
- Stop lamp switch is turned ON when depressing the brake pedal.
- Stop lamp switch signal is inputted to ECM and ABS actuator and electric unit (control unit). Stop lamp switch signals are transmitted from ECM and ABS actuator and electric unit (control unit) to ADAS control unit via CAN communication.



INFOID:0000000112273702

ICC Brake Hold Relay

- ICC brake hold relay is installed in the engine room (right side).
- When the brake is activated by the system, the ICC brake hold relay turns ON the stop lamp by bypassing the circuit of the stop lamp according to a signal transmitted from the ADAS control unit.



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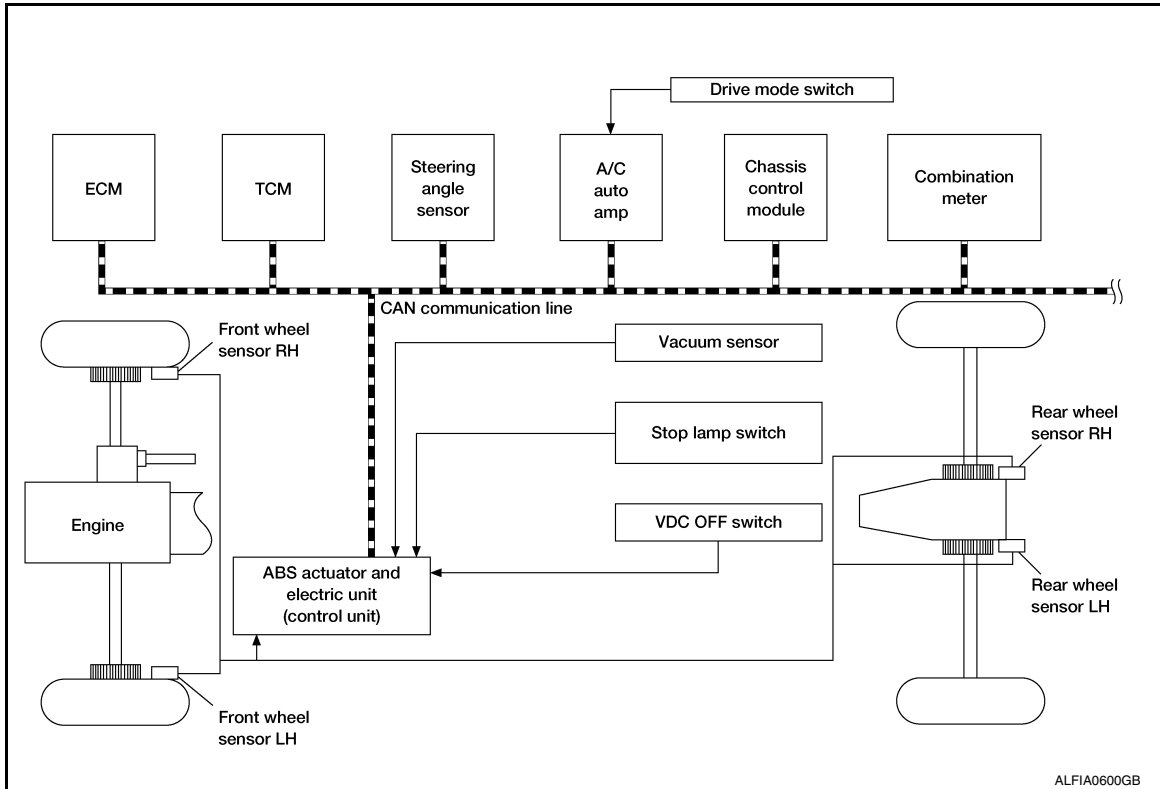
SYSTEM

System Description

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- The system switches fluid pressure of each brake caliper to increase, hold or 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 assist function and Forward Emergency Braking function.
- Fail-safe function is available for each function and is activated by each function when a 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
ECM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal <p>Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Engine torque request signal
TCM	<p>Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	<p>Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Active trace control signal

SYSTEM

[WITH ICC]

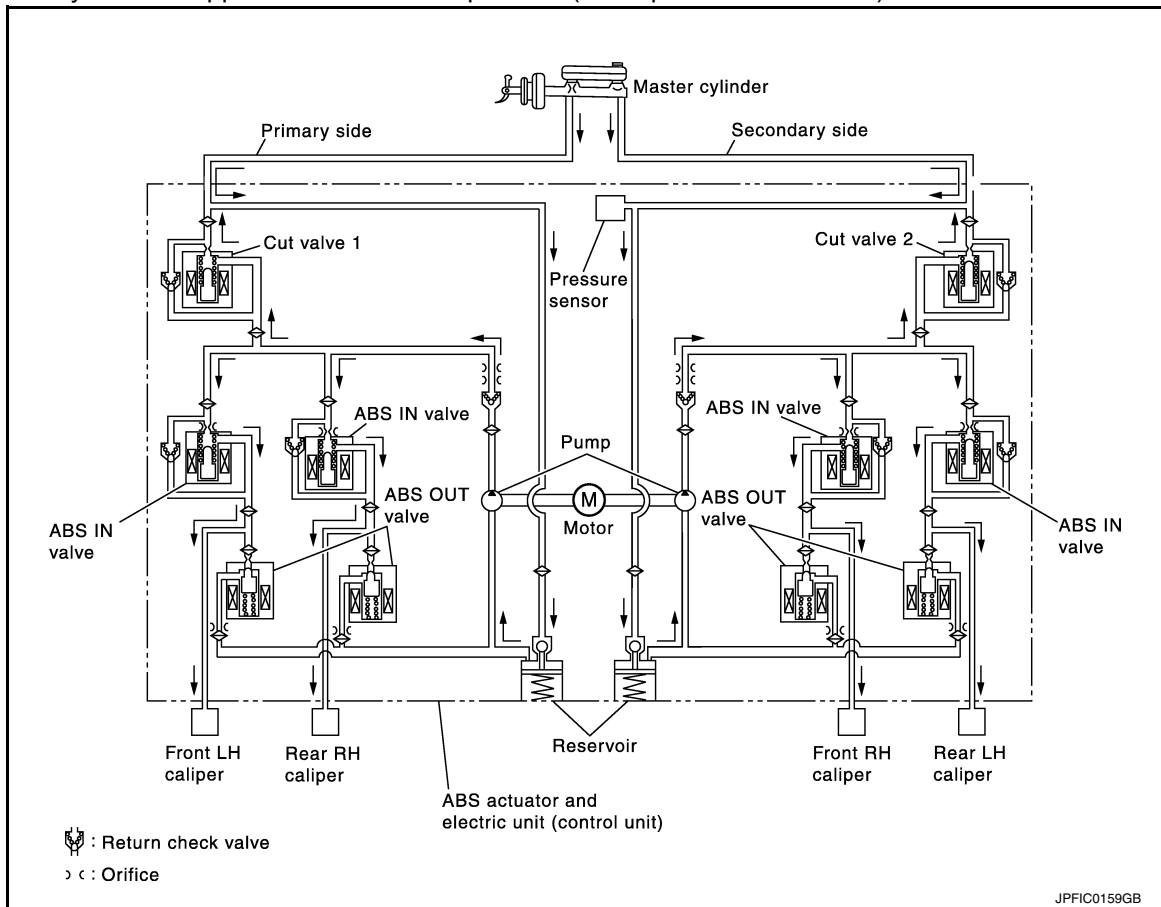
< SYSTEM DESCRIPTION >

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"> • Brake fluid level switch signal • Parking brake switch signal
	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal • Steering angle sensor malfunction signal

VALVE OPERATION (ABS AND EBD)

Each valve is operated and fluid pressure of brake caliper is controlled.

When ordinary brake is applied and ABS is in operation (when pressure increases)



Name	Not activated	When 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).
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 caliper (fluid pressure)	—	Pressure increases

When front RH wheel caliper pressure increases

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, pressurized brake fluid is supplied to front RH wheel caliper through ABS IN valve.

When front LH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, pressurized brake fluid is supplied to front LH wheel caliper through ABS IN valve.

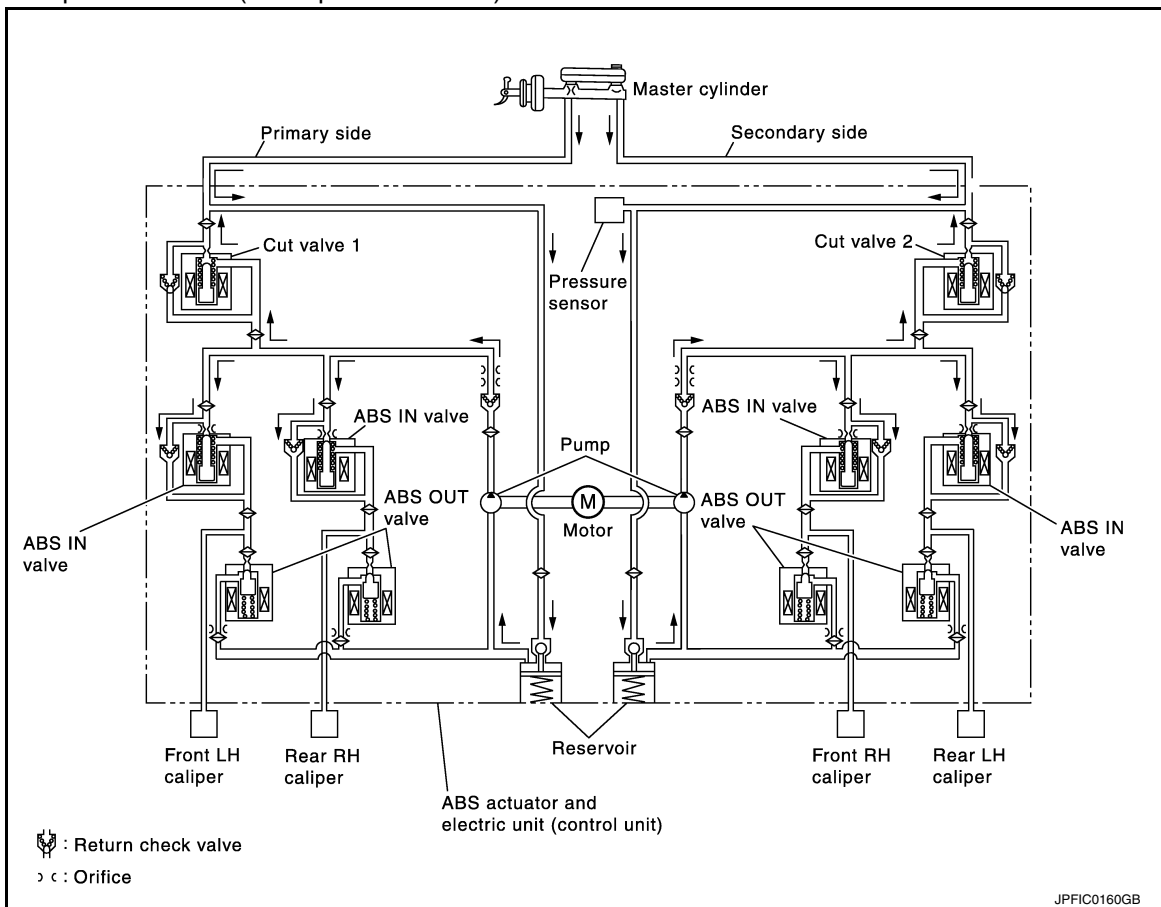
When rear RH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, pressurized brake fluid is supplied to rear RH wheel caliper through ABS IN valve.

When rear LH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, pressurized brake fluid is supplied to rear LH wheel caliper through ABS IN valve.

When ABS operation starts (when pressure holds)



Name	Not activated	When 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).
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 caliper (fluid pressure)	—	Pressure holds

When front RH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

When front LH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

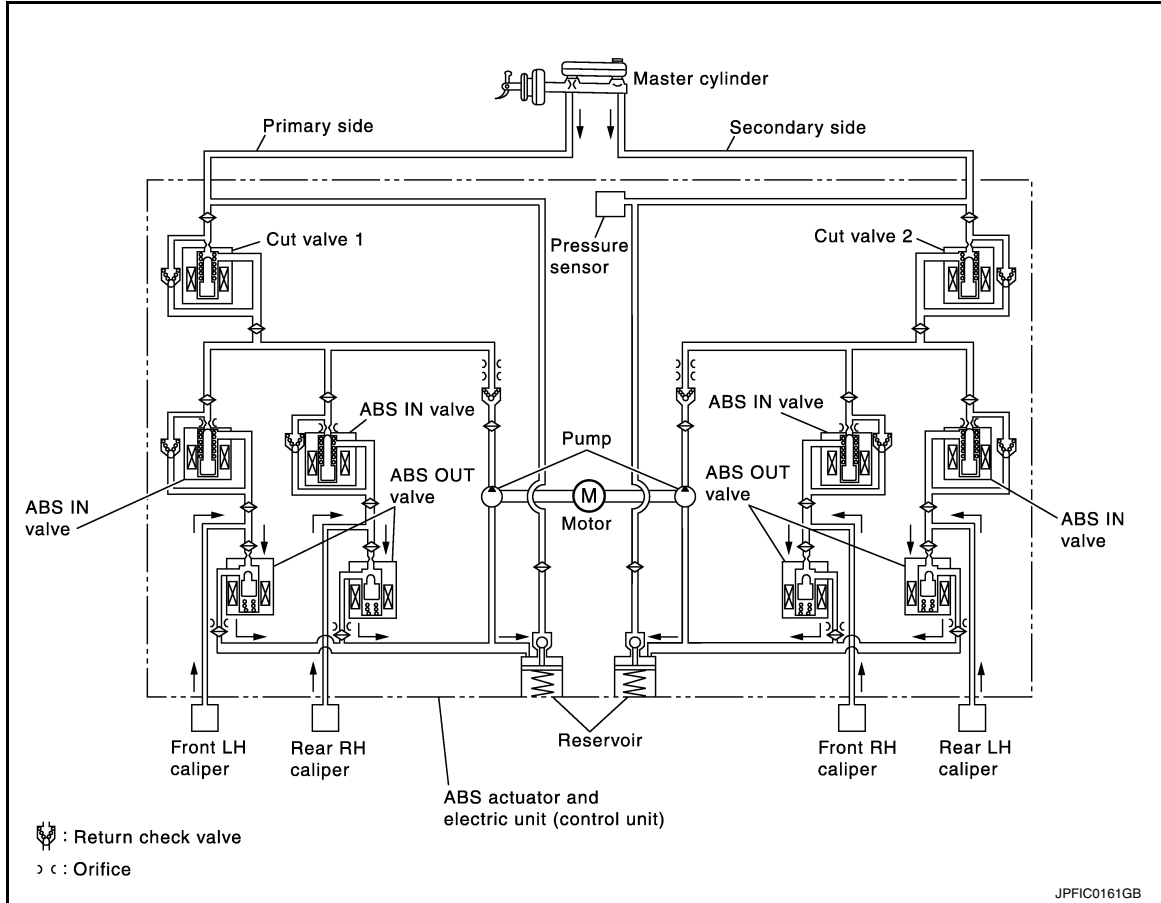
When rear RH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

When rear LH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

ABS is in operation (when pressure decreases)



Name	Not activated	When 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).
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 caliper (fluid pressure)	—	Pressure decreases

When front RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

Component Parts and Function

SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

Component	Function
Reservoir	Temporarily reserves the brake fluid drained from brake caliper so that pressure efficiently decreases when decreasing pressure of brake caliper.
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to signals from control unit.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Return check valve	Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released.
Cut valve 1 Cut valve 2	Performs the duty control of fluid pressure increased by pump according to signals from control unit.
Pressure sensor	Detects the brake pedal operation amount.

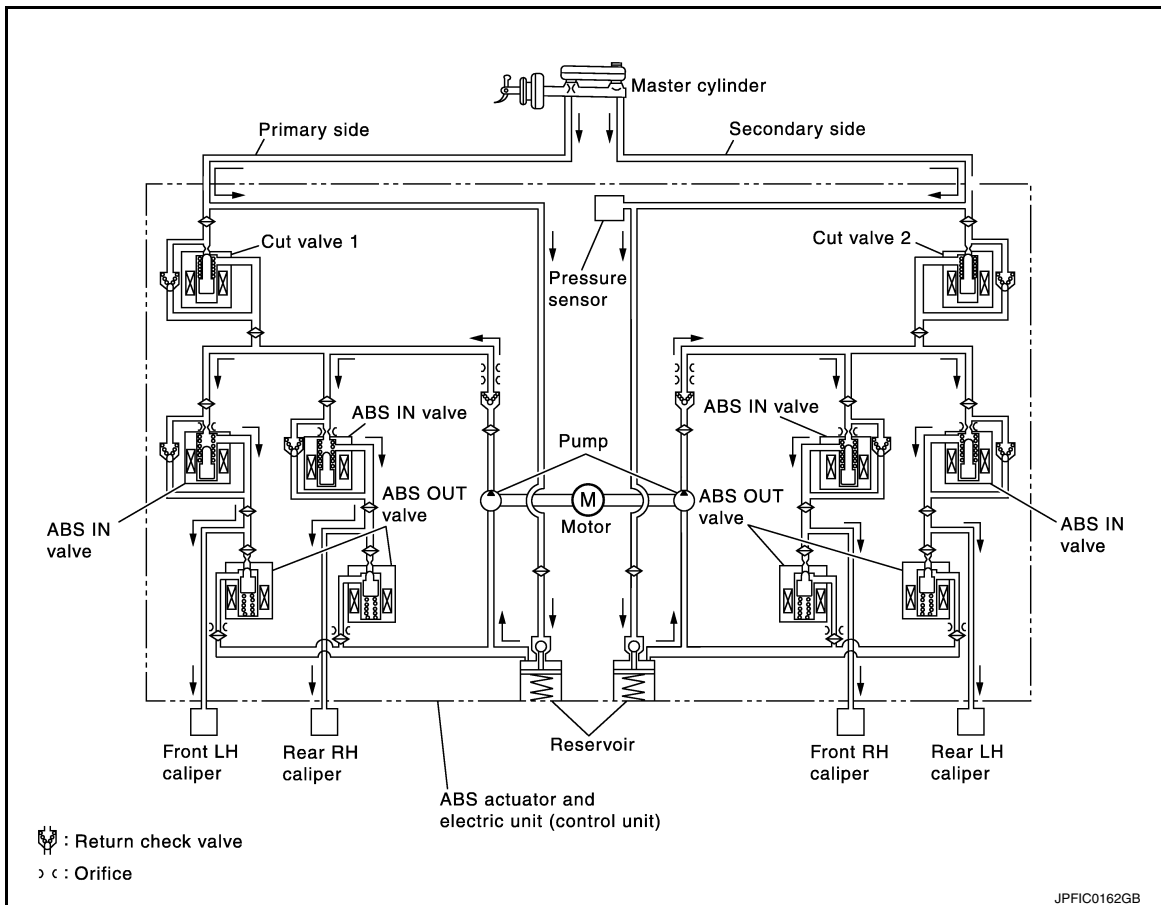
VALVE OPERATION (OTHER THAN ABS AND EBD)

Each valve is operated and fluid pressure of brake caliper is controlled.

NOTE:

There is no operation to hold and increase pressure for functions other than ABS and EBD.

When pressure increases



SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

Name	Not activated	When pressure increases
Cut valve 1	Power supply is not supplied (open)	Wheel other than the one that the pressure is to be increased: Power supply is not supplied (open) Only wheel that the pressure is to be increased: Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Wheel other than the one that the pressure is to be increased: Power supply is not supplied (open) Only wheel that the pressure is to be increased: Power supply is supplied (close)
ABS IN valve	Power supply is not supplied (open)	Wheel other than the one that the pressure is to be increased: Power supply is supplied (close) Only wheel that the pressure is to be increased: Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each caliper (fluid pressure)	—	Pressure increases

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When front RH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front RH wheel caliper through ABS IN valve. For other wheels, ABS IN valve is closed and brake fluid is not supplied to caliper.

When front LH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front LH wheel caliper through ABS IN valve. For other wheels, ABS IN valve is closed and brake fluid is not supplied to caliper.

When rear RH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to rear RH wheel caliper through ABS IN valve. For other wheels, ABS IN valve is closed and brake fluid is not supplied to caliper.

When rear LH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to rear LH wheel caliper through ABS IN valve. For other wheels, ABS IN valve is closed and brake fluid is not supplied to caliper.

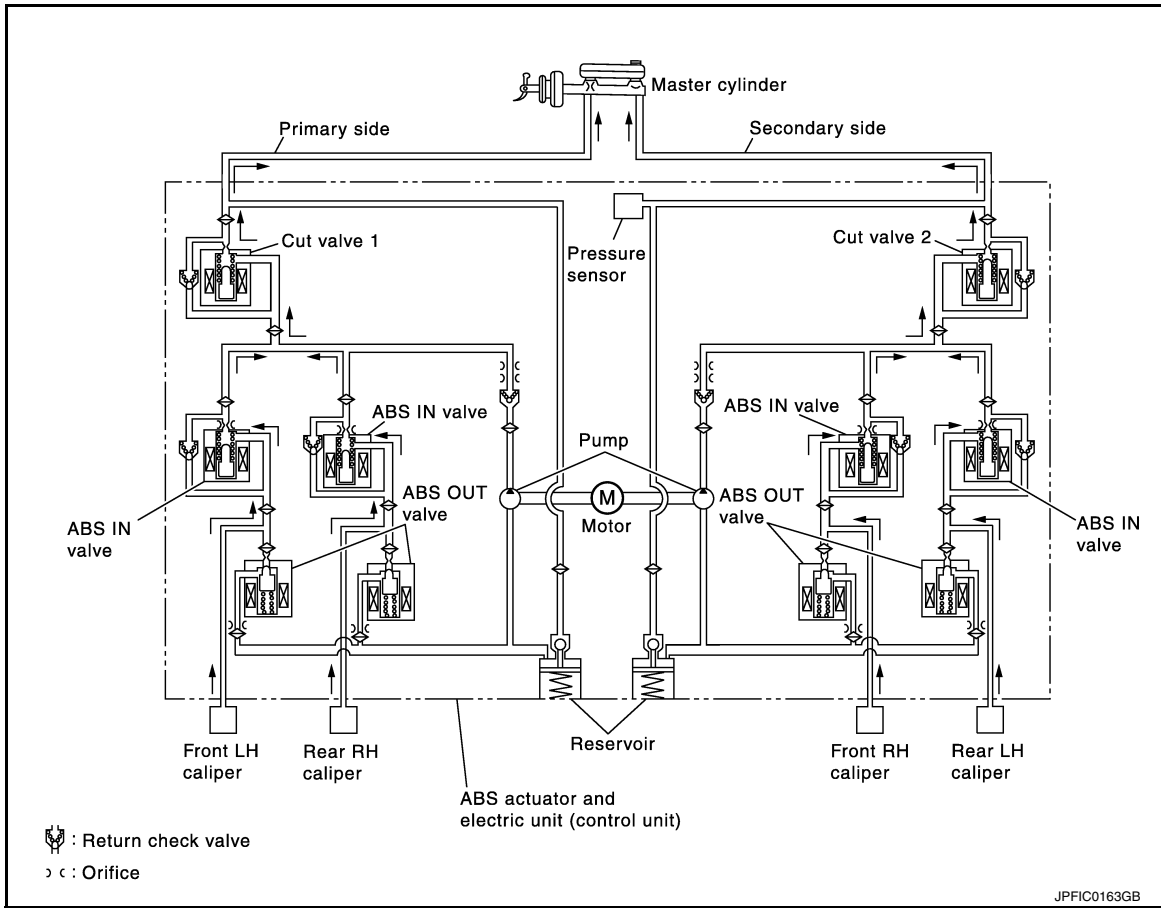
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Released



Name	Not activated	When 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)
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 supplied (open)
Each caliper (fluid pressure)	—	Pressure decreases

When front RH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

Component Parts and Function

Component	Function
Reservoir	Temporarily reserves the brake fluid drained from brake caliper so that pressure efficiently decreases when decreasing pressure of brake caliper.
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to signals from control unit.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

Component	Function
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Return check valve	Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released.
Cut valve 1 Cut valve 2	Performs the duty control of fluid pressure increased by pump according to signals from control unit.
Pressure sensor	Detects the brake pedal operation amount.

CONDITION TO TURN ON THE WARNING LAMP

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

Condition (status)	ABS warning lamp	Brake warning lamp	FEB warning lamp	VDC warning lamp
Ignition switch OFF	OFF	OFF	OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON	ON	ON	ON
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF	OFF	OFF	OFF
After engine starts	OFF	OFF	OFF	OFF
When brake fluid is less than the specified level (brake fluid level switch ON)	OFF	ON	OFF	OFF
When parking brake operates (parking brake switch ON)	OFF	ON	OFF	OFF
VDC function is malfunctioning.	OFF	OFF	OFF	ON
TCS function is malfunctioning.	OFF	OFF	OFF	ON
ABS function is malfunctioning.	ON	OFF	OFF	ON
EBD function is malfunctioning.	ON	ON	OFF	ON
FEB function is malfunctioning.	OFF	OFF	ON	OFF
Brake assist function is malfunctioning.	OFF	OFF	OFF	ON
Brake force distribution function is malfunctioning.	OFF	OFF	OFF	ON
When brake booster vacuum decreases	OFF	ON	OFF	OFF
When vacuum sensor is malfunctioning	OFF	ON	OFF	OFF
VDC function is operating.	OFF	OFF	OFF	Blinking
TCS function is operating.	OFF	OFF	OFF	Blinking
ABS function is operating.	OFF	OFF	OFF	OFF
EBD function is operating.	OFF	OFF	OFF	OFF
FEB function in operating.	OFF	OFF	Blinking	OFF
Brake assist function is operating.	OFF	OFF	OFF	OFF

CONDITION TO TURN ON THE INDICATOR LAMP

VDC OFF indicator lamp

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

Condition (status)	VDC OFF indicator lamp
Ignition switch OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON
Approx. 2 second after ignition switch is turned ON (when the system is in normal operation).	OFF
When VDC OFF switch is ON (VDC function, TCS function and active trace control function are OFF.)	ON

SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

Fail-Safe

INFOID:000000012273705

VDC FUNCTION, TCS FUNCTION AND BRAKE ASSIST FUNCTION

VDC warning lamp in combination meter turns ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS 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 and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS 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 ignition switch turns ON and when vehicle initially starts.

EBD FUNCTION

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

DTC	Fail-safe condition
C1101	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both rear wheels are malfunctioning) • Brake assist function • Active trace control function
C1102	
C1103	
C1104	
C1105	
C1106	
C1107	
C1108	
C1109	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1111	
C1113	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1115	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1116	

SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

DTC	Fail-safe condition	
C1120	The following functions are suspended: • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function	A
C1121		
C1122		B
C1123		
C1124		
C1125		C
C1126		
C1127		D
C1130	The following functions are suspended: • VDC function • TCS function • Active trace control function	E
C1140	The following functions are suspended: • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function	G
C1142	The following functions are suspended: • VDC function • TCS function • Brake assist function • Active trace control function	H
C1143	The following functions are suspended: • VDC function • TCS function • Active trace control function	I
C1144		
C1145	The following functions are suspended: • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function	J
C1146		K
C1155	The following functions are suspended: • VDC function • TCS function • Brake assist function • Active trace control function	L
C1160	The following functions are suspended: • VDC function • TCS function • ABS function • Brake assist function • Active trace control function	N
C1164	The following functions are suspended: • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function	O
C1165		P

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SYSTEM

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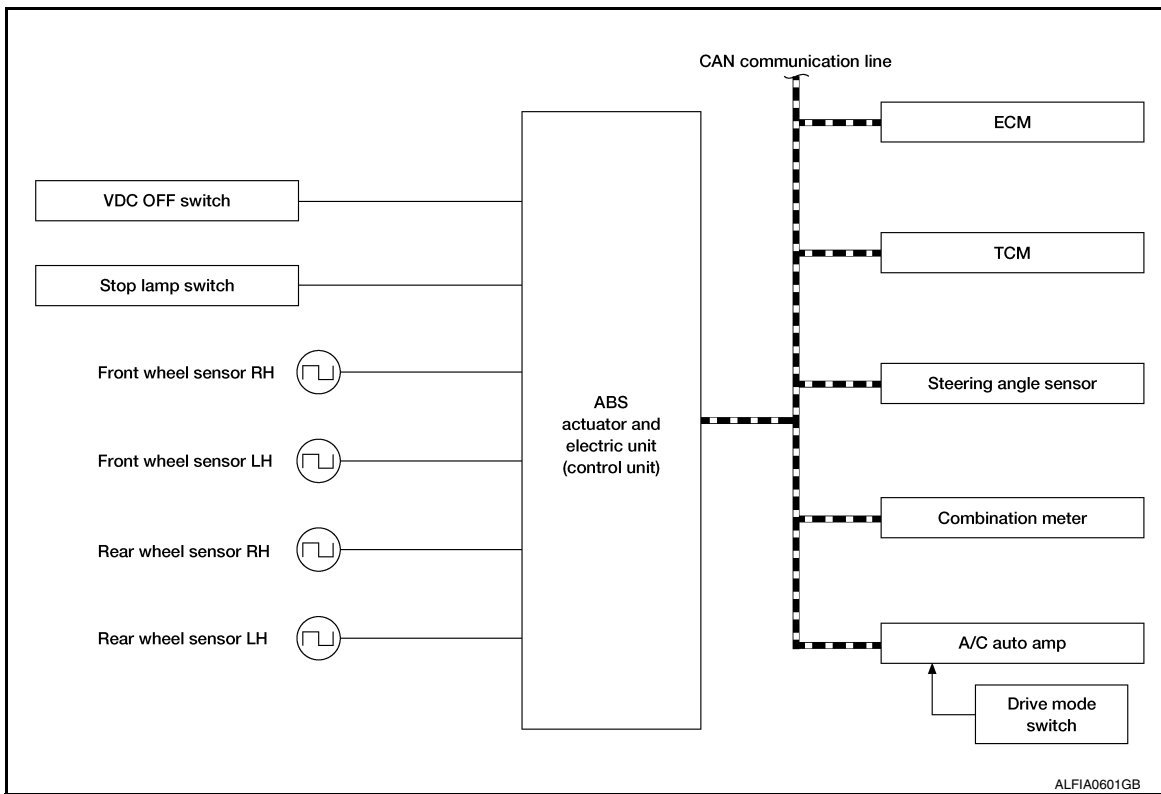
DTC	Fail-safe condition
C1170	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1197	Electrical vacuum assistance of brake booster is suspended.
C1198	
C1199	—
C119A	Electrical vacuum assistance of brake booster is suspended.
U1000	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function

VDC FUNCTION

VDC FUNCTION : System Description

INFOID:0000000012273706

SYSTEM DIAGRAM



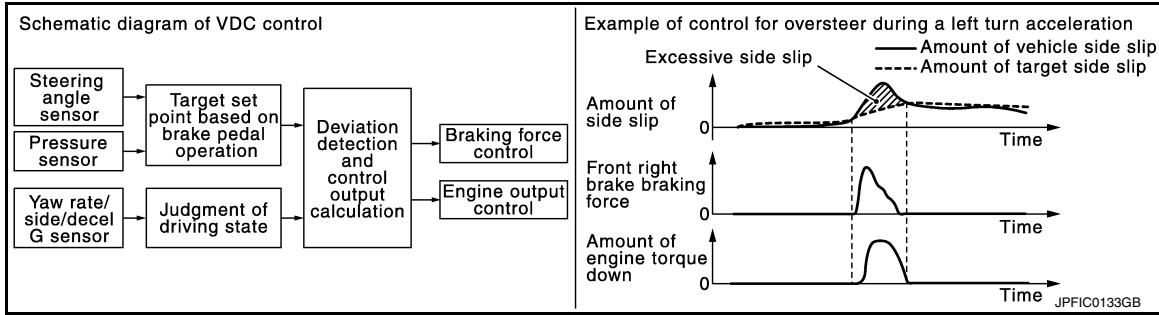
- Side slip or tail slip may occur while driving on a slippery road or intending urgent evasive driving. VDC function detects side slip status using each sensor when side slip or tail slip is about to occur and improves vehicle stability by brake control and engine output control during driving.
- In addition to ABS function, EBD function and TCS function, target side slip amount is calculated according to steering operation amount from steering angle sensor and brake operation amount from brake pressure 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 over-

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

steer) are judged and vehicle stability is improved by brake force control on all wheels and engine output control.



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount.
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function, brake assist function and brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-49. "Fail-Safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Engine torque request signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal • Steering angle sensor malfunction signal

OPERATION CHARACTERISTICS

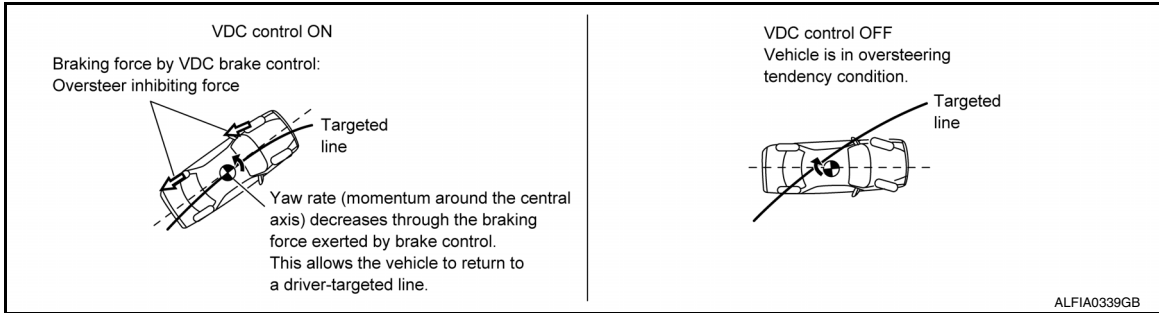
VDC Function That Prevents Oversteer Tendency

SYSTEM

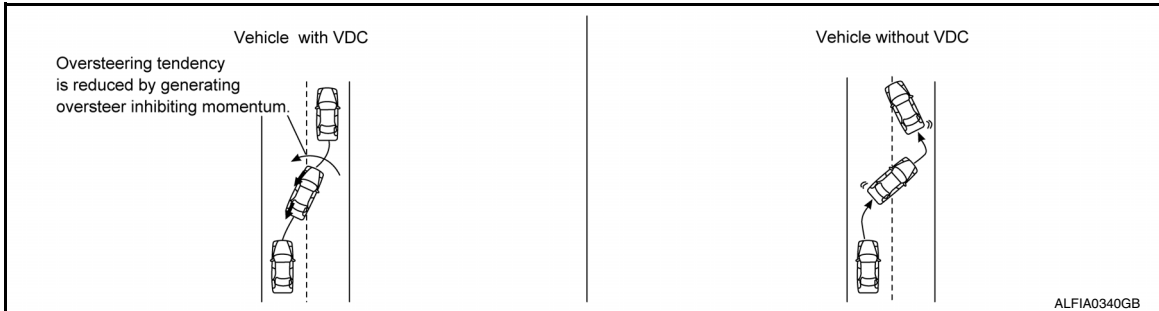
< SYSTEM DESCRIPTION >

[WITH ICC]

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

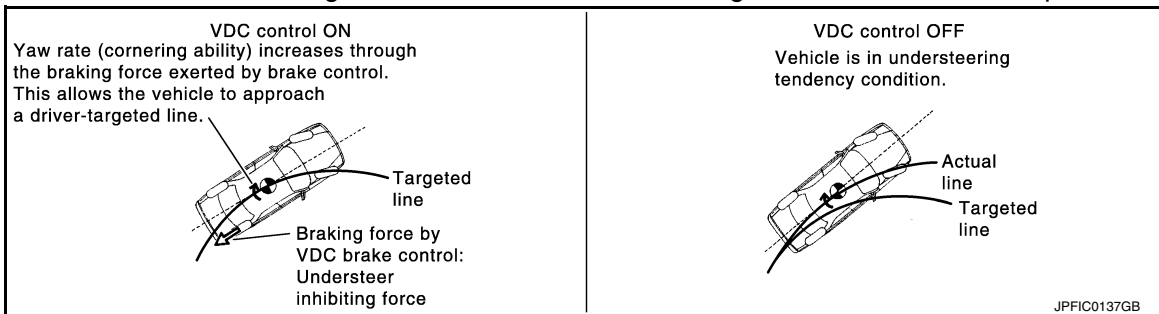


- When changing driving lane on a slippery road when oversteer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of four wheels. Oversteer tendency decreases.

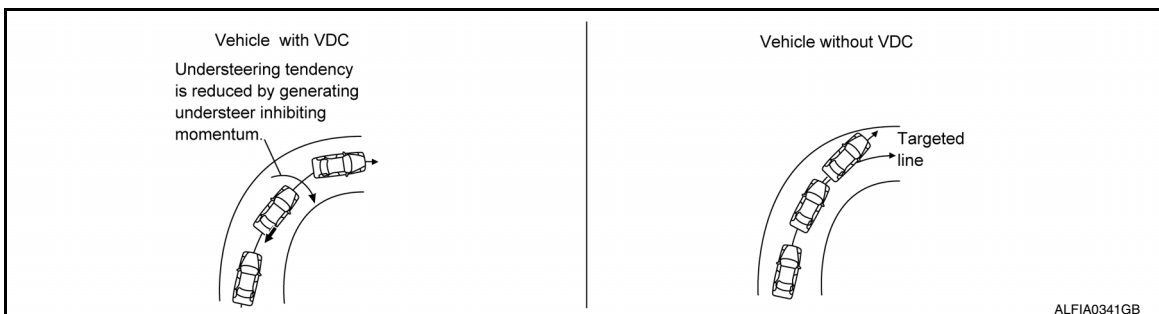


VDC Function That Prevents Understeer Tendency

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



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

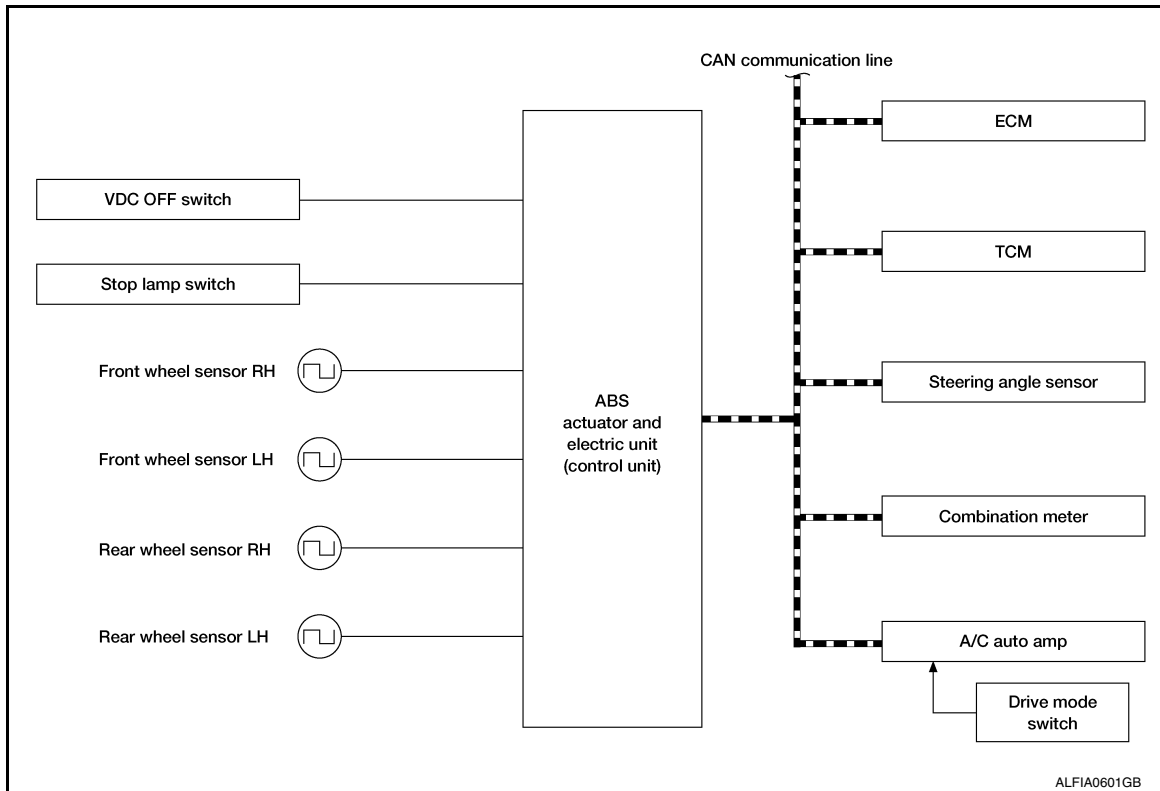


TCS FUNCTION

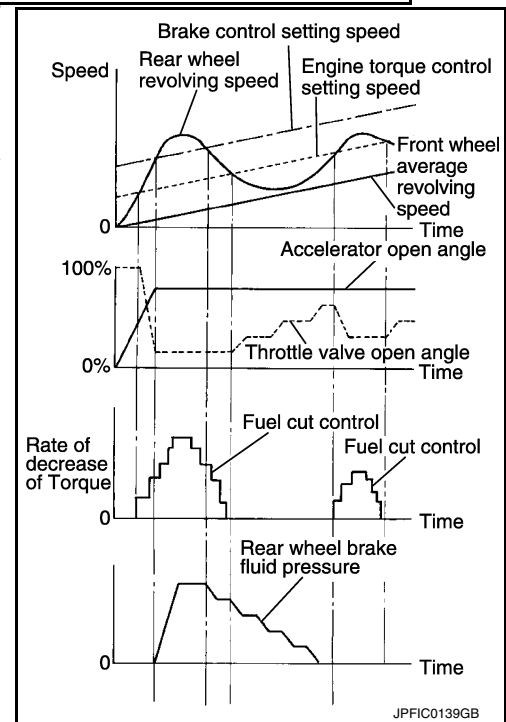
TCS FUNCTION : System Description

INFOID:0000000112273707

SYSTEM DIAGRAM



- Wheel spin status of drive wheel is detected by wheel sensor of four wheels. Engine output and transmission shift status are 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) performs brake force control of LH and RH drive wheels (applies brake force by increasing brake fluid pressure of drive wheel) and decreases engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-49, "Fail-Safe"](#).



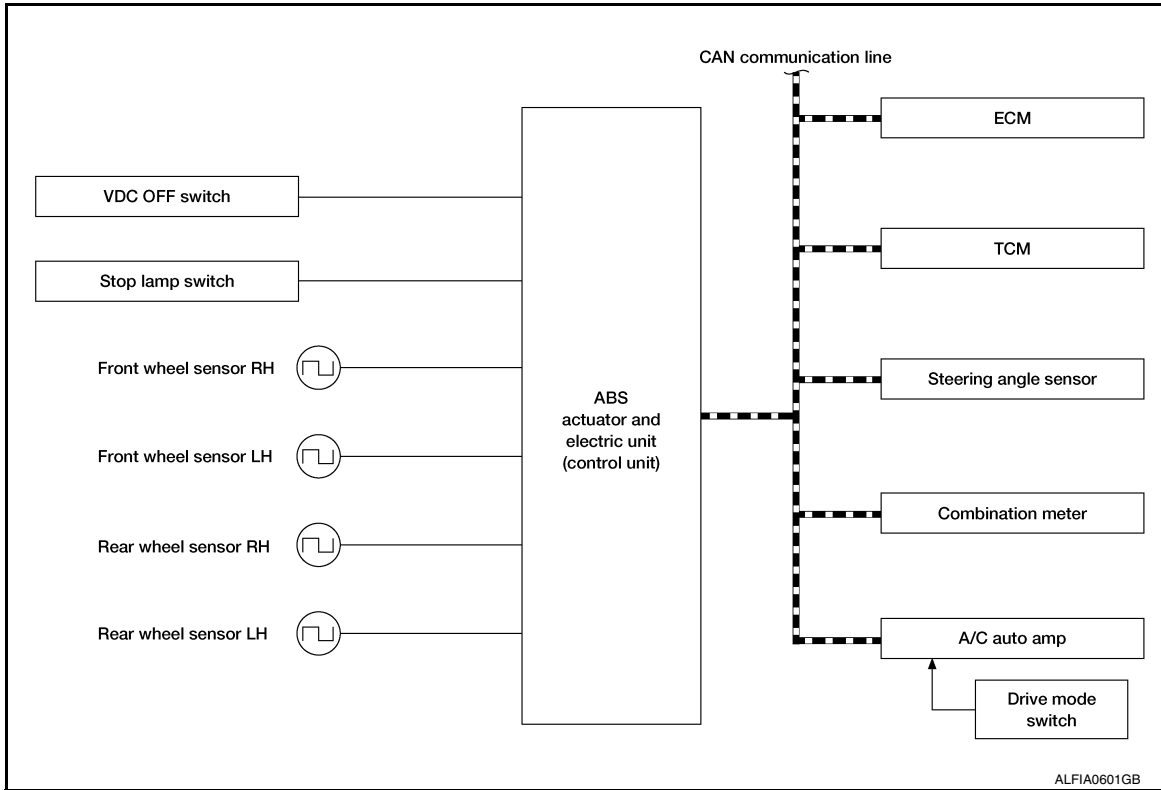
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SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

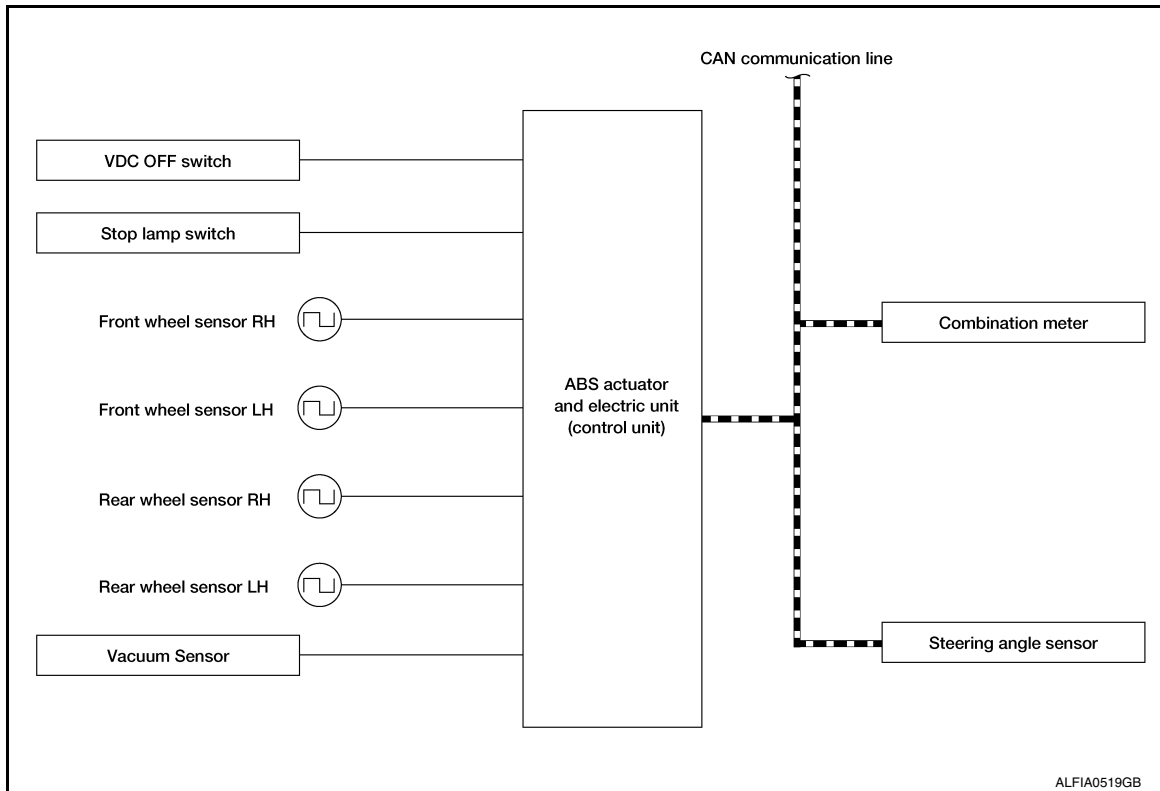
Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Engine torque request signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal • Steering angle sensor malfunction signal

ABS FUNCTION

ABS FUNCTION : System Description

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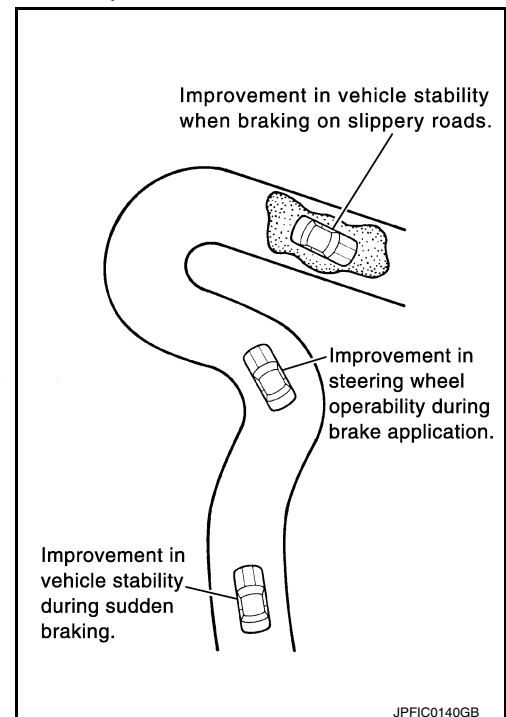
SYSTEM DIAGRAM



- 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 calculate wheel speed and pseudo-vehicle speed and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- 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 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 and ABS function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake assist function. However, EBD function is operated normally. Refer to [BRC-224, "Fail-Safe"](#).

NOTE:

- ABS has the characteristics as described here. This is not a 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 MPH) or less, but differs subject to road conditions].
- Self-diagnosis is performed immediately after engine starts and when vehicle is initially driven [vehicle speed of approx. 15 km/h (9 MPH)]. Motor sounds are generated during self-diagnosis. In addition, brake pedal may be feel heavy when depressing brake pedal lightly. These symptoms are not malfunctions.



INPUT SIGNAL AND OUTPUT SIGNAL

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SYSTEM

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< SYSTEM DESCRIPTION >

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

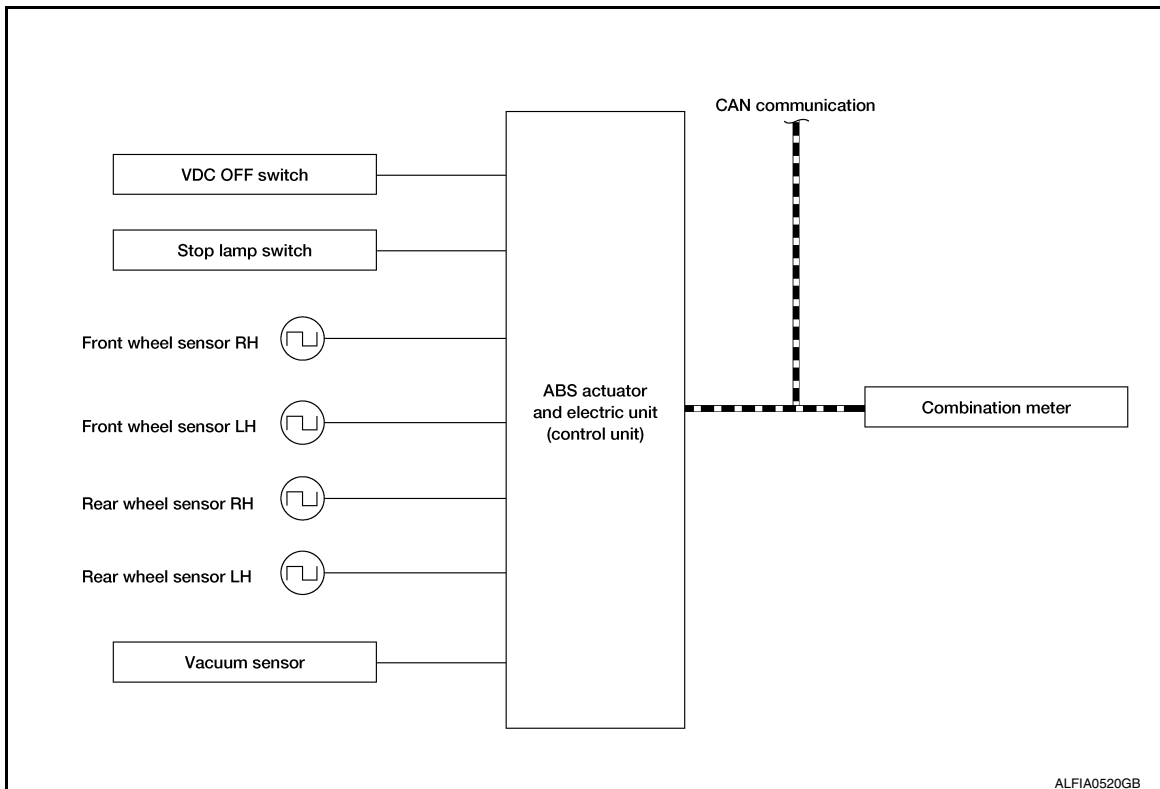
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from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

EBD FUNCTION

EBD FUNCTION : System Description

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SYSTEM DIAGRAM



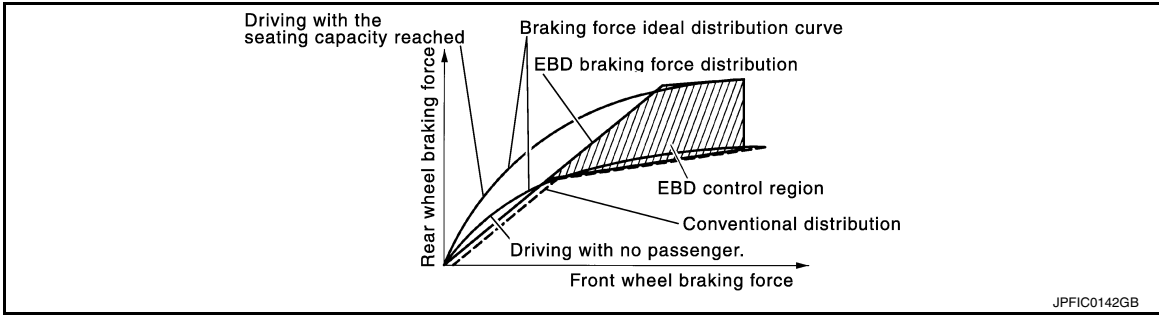
- By preventing rear wheel slip increase through rear wheel brake force (brake fluid pressure) control that is electronically controlled when slight slip on front and rear wheels is detected during braking, stability during braking is improved.

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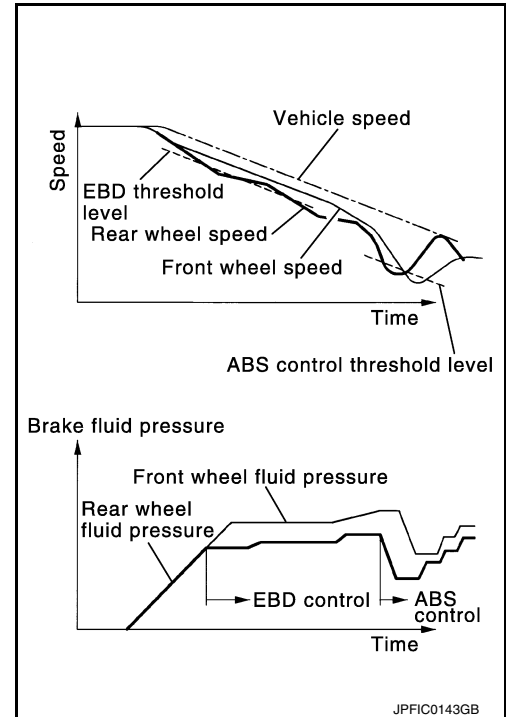
[WITH ICC]

< SYSTEM DESCRIPTION >

- 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 of front and rear wheels with 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 of front wheel and rear wheel are nearly equalized. ABS control is applied when slip of each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and brake assist function. Refer to [BRC-224, "Fail-Safe"](#).



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"> • VDC warning lamp signal • ABS warning lamp signal • Brake warning lamp signal

BRAKE ASSIST (WITHOUT PREVIEW FUNCTION)

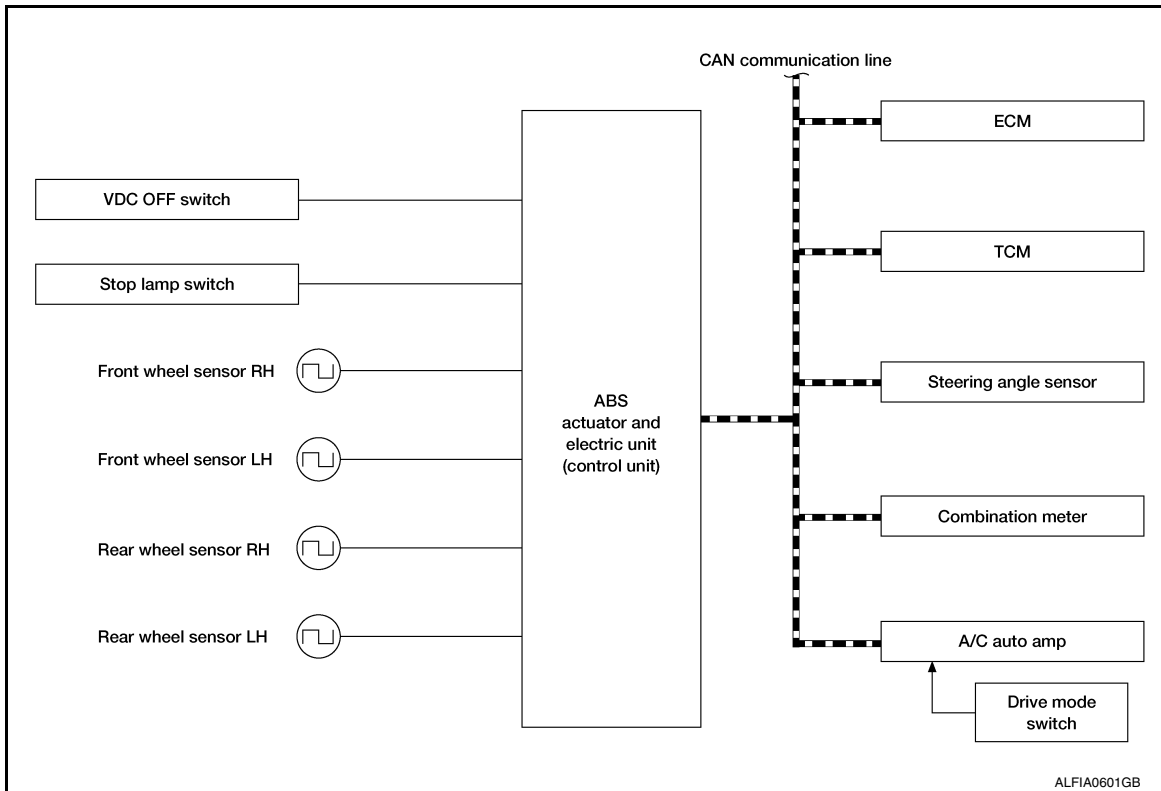
SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

BRAKE ASSIST (WITHOUT PREVIEW FUNCTION) : System Description INFOID:000000012273710

SYSTEM DIAGRAM



- 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 and brake assist function. The vehicle status becomes the same as models without VDC function, TCS function and brake assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-224, "Fail-Safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
ECM	<p>Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal • Engine torque signal <p>Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Engine torque request signal
TCM	<p>Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Current gear position signal
Chassis control module	<p>Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:</p> <ul style="list-style-type: none"> • Active trace control signal

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

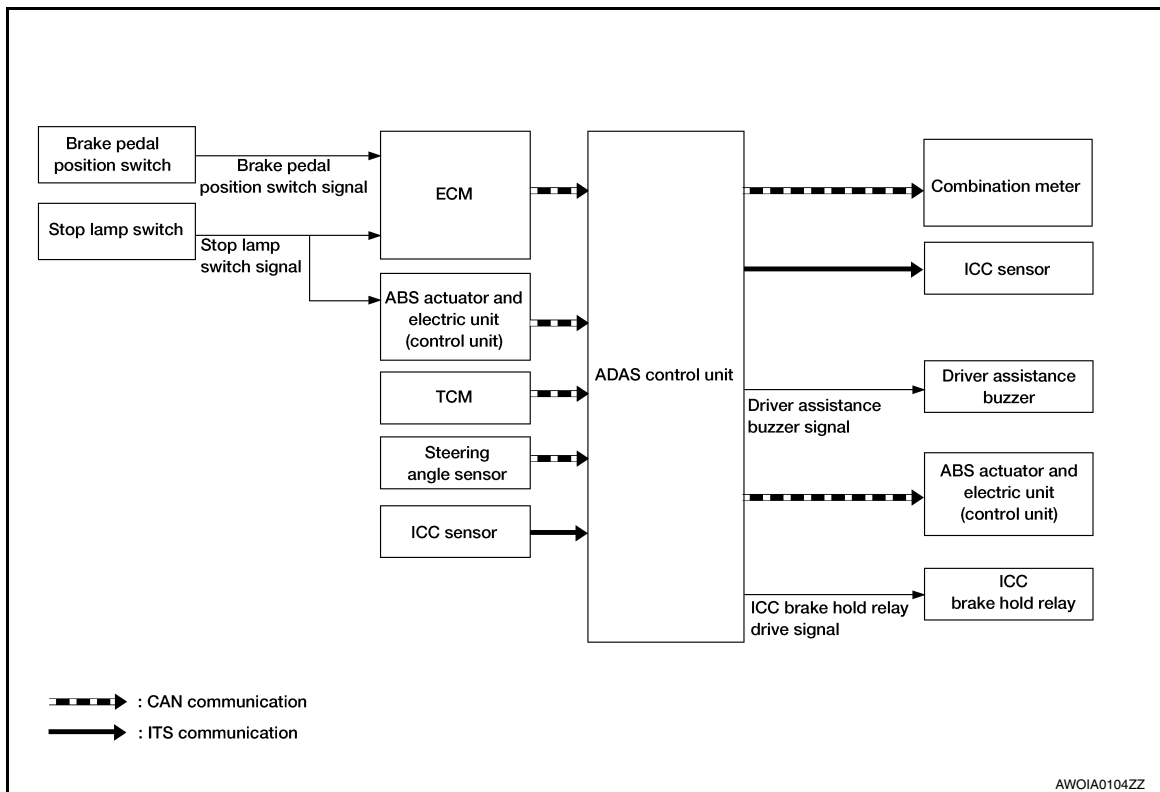
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from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

BRAKE ASSIST (WITH PREVIEW FUNCTION)

BRAKE ASSIST (WITH PREVIEW FUNCTION) : System Description-Forward Emergency Braking

INFOID:000000012273712

SYSTEM DIAGRAM



ADAS CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

Transmit unit	Signal name	Description	
ECM	CAN communication	Closed throttle position signal	Receives idle position state (ON/OFF)
	CAN communication	Accelerator pedal position signal	Receives accelerator pedal position (angle)
	CAN communication	Engine speed signal	Receives engine speed
	CAN communication	Stop lamp switch signal	Receives an operational state of the brake pedal
	CAN communication	Brake pedal position switch signal	Receives an operational state of the brake pedal

SYSTEM

< SYSTEM DESCRIPTION >

[WITH ICC]

Transmit unit	Signal name		Description
TCM	CAN communication	Input speed signal	Receives the number of revolutions of input shaft
		Current gear position signal	Receives a current gear position
		Shift position signal	Receives a selector lever position
		Output shaft revolution signal	Receives the number of revolutions of output shaft
ABS actuator and electric unit (control unit)	CAN communication	ABS malfunction signal	Receives a malfunction state of ABS
		ABS operation signal	Receives an operational state of ABS
		ABS warning lamp signal	Receives an ON/OFF state of ABS warning lamp
		TCS malfunction signal	Receives a malfunction state of TCS
		TCS operation signal	Receives an operational state of TCS
		VDC OFF switch signal	Receives an ON/OFF state of VDC
		VDC malfunction signal	Receives a malfunction state of VDC
		VDC operation signal	Receives an operational state of VDC
		Vehicle speed signal (ABS)	Receives wheel speeds of four wheels
		Yaw rate signal	Receives yaw rate acting on the vehicle
Steering angle sensor	CAN communication	Stop lamp switch signal	Receives an operational state of the brake pedal
		Steering angle sensor malfunction signal	Receives a malfunction state of steering angle sensor
		Steering angle sensor signal	Receives the number of revolutions turning direction of the steering wheel
Steering angle sensor	CAN communication	Steering angle speed signal	Receives the turning angle speed of the steering wheel
		Steering angle speed signal	Receives the turning angle speed of the steering wheel
ICC sensor	ITS communication	ICC sensor signal	Receives detection results, such as the presence or absence of a leading vehicle and distance from the vehicle

Output Signal Item

Reception unit	Signal name		Description
ABS actuator and electric unit (control unit)	CAN communication	Brake fluid pressure control signal	Transmits a brake fluid pressure control signal to activate the brake
Combination meter	CAN communication	Meter display signal	Vehicle ahead detection indicator signal
			FEB/PFCW system display signal
			FEB warning signal
ICC sensor	ITS communication	Vehicle speed signal	Transmits a vehicle speed calculated by the ADAS control unit
		Steering angle sensor signal	Transmits a steering angle sensor signal received from the steering angle sensor
ICC brake hold relay	ICC brake hold relay drive signal		Activates the brake hold relay and turns ON the stop lamp

DESCRIPTION

- Forward Emergency Braking (FEB) system can assist the driver when there is a forward collision with the vehicle ahead in the traveling lane.
- FEB system operates at speeds above approximately 5 km/h (3 mph).

FUNCTION DESCRIPTION

- The FEB system uses the ICC sensor to measure the distance to the vehicle ahead in the traveling lane.
- If there is a risk of collision, FEB issues a visual and audible warning signal to the combination meter via CAN communication.

SYSTEM

[WITH ICC]

< SYSTEM DESCRIPTION >

- If the driver does not take action, FEB system applies braking command to ABS actuator and electric unit (control unit).
- If the risk of a collision becomes imminent, FEB system applies braking command to ABS actuator and electric unit (control unit) via CAN communication.

Operation Condition

- FEB is ON.
- Vehicle speed: approximately 5 km/h (3 mph) and above.
- There is a possibility of a collision with the vehicle ahead.

CAUTION:

It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times. As there is a performance limit, it may not provide a warning or brake in certain conditions.

BRAKE ASSIST (WITH PREVIEW FUNCTION) : Fail-safe (ICC RADAR) INFOID:000000012273713

If a malfunction occurs in each system, ADAS control unit cancels each control, sounds a beep, and turns ON the warning or indicator lamp.

System	Buzzer	Warning lamp/Warning display	Description
Intelligent Cruise Control (ICC)	High-pitched tone	ICC system warning	Cancel
Conventional (fixed speed) cruise control mode	High-pitched tone	ICC system warning	Cancel
Forward Emergency Braking (FEB)	High-pitched tone	FEB warning lamp (Yellow)	Cancel
Predictive Forward Collision Warning (PFCW)	High-pitched tone	FEB warning lamp (Yellow)	Cancel
Blind Spot Warning (BSW)	Low-pitched tone	BSW system warning (Orange)	Cancel

ACTIVE TRACE CONTROL FUNCTION

ACTIVE TRACE CONTROL FUNCTION : System Description INFOID:000000012376021

- Active trace control function controls braking utilizing the ABS actuator and electric unit (control unit), depending on cornering condition calculated from driver's steering input and plural sensors.
- Active trace control function is aimed to enhance traceability at corners and smooth the vehicle movement to provide confident driving.
- When the drive mode select switch is set to the "SPORT" mode, the amount of brake control provided by active trace control is reduced.
- For "NORMAL" mode, the active trace control can be selected ON or OFF. Refer to [BRC-205, "ACTIVE TRACE CONTROL FUNCTION : System Description"](#).
- When the VDC OFF switch is used to turn OFF the VDC system, the active trace control system is also turned OFF.
- When the active trace control is operated, active trace control graphics are shown on the information display of combination meter. These are shown only when "Chassis control" is selected on the information display. Refer to [DAS-183, "System Description"](#).
- When the active trace control is not functioning properly, the master warning lamp illuminates. Warning message "Chassis control" will also appear on information display.

NOTE:

- The active trace control may not be effective depending on the driving conditions. Always driving carefully and attentively.
- Brake pedal may vibrate and brake pedal feel may change during active trace control operation. Also operation noise may be noticeable during operation. These are not abnormal conditions.
- When the active trace control is selected OFF, some functions will be kept ON to assist driver (for example, avoidance condition).

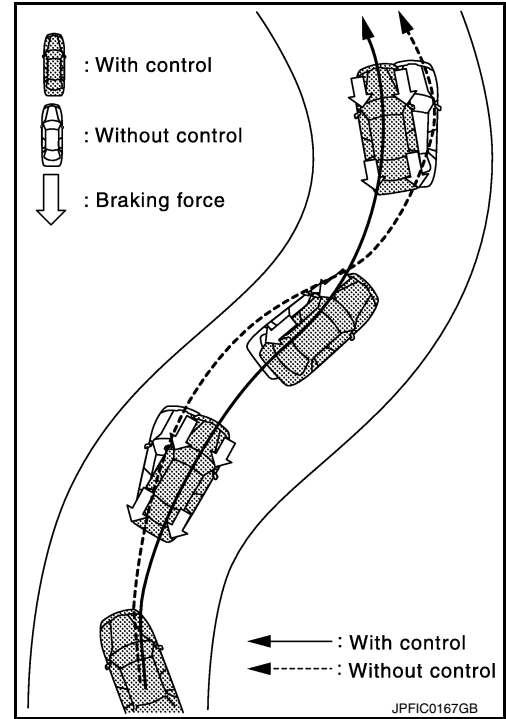
SYSTEM

[WITH ICC]

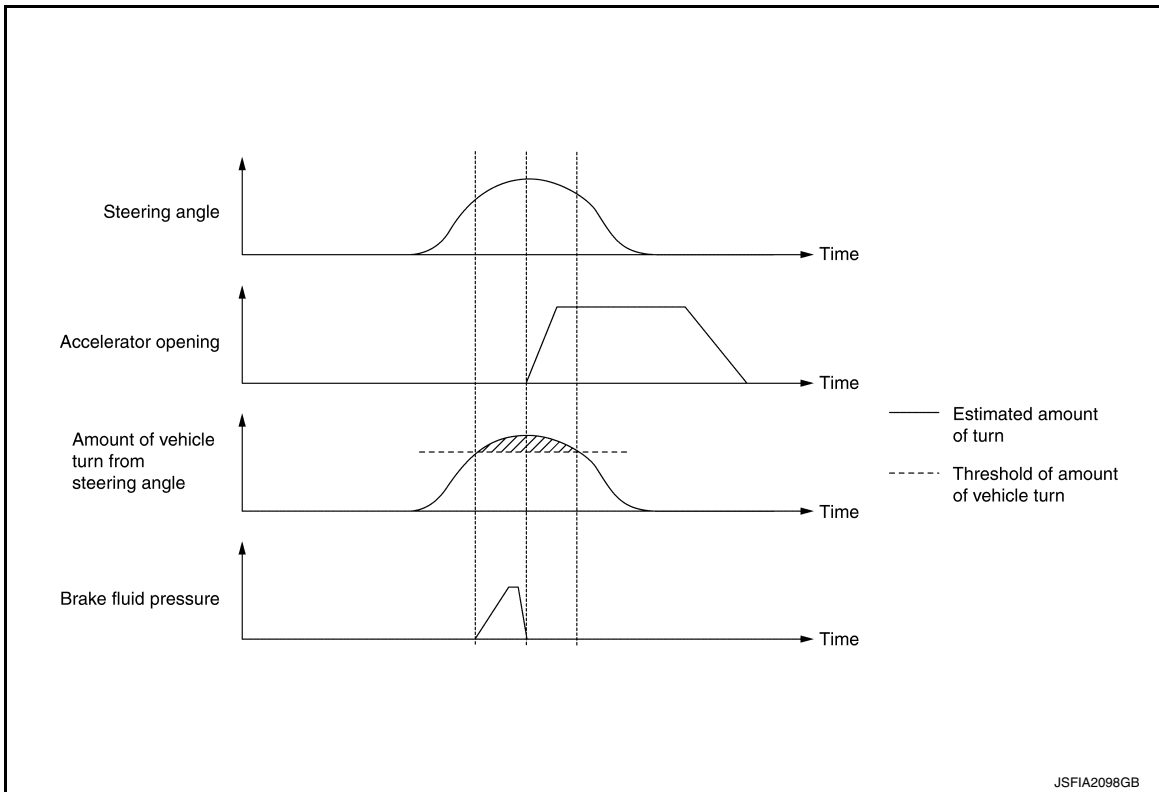
< SYSTEM DESCRIPTION >

OPERATION CHARACTERISTICS

Active trace control helps enhance the transition from braking into and then accelerating out of corners. Active trace control utilizes the vehicle's electrically-driven intelligent brake system to help improve cornering feel by automatically applying brakes. Furthermore, Active trace control will apply selective braking to help create increased steering response in S-turns. For example, if driving through an S-turn that starts with steering to the right, the right-side brakes are engaged to create a yaw momentum and help turn the vehicle.



- Brake control amount is controlled according to steering operation status by the driver and vehicle cornering status.

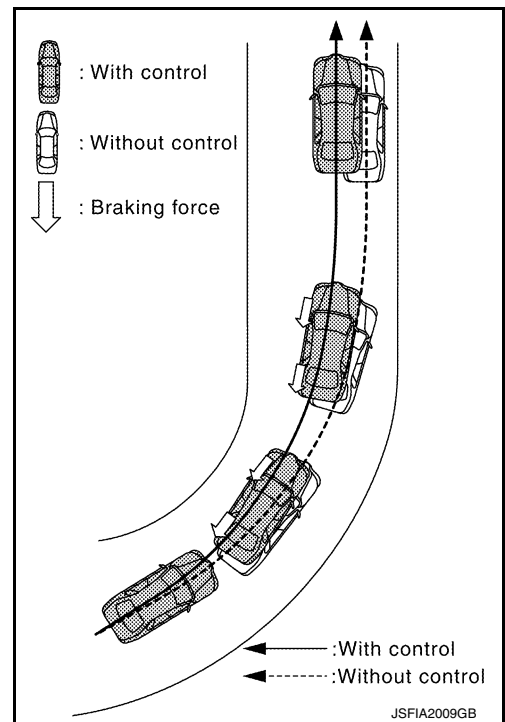


SYSTEM

[WITH ICC]

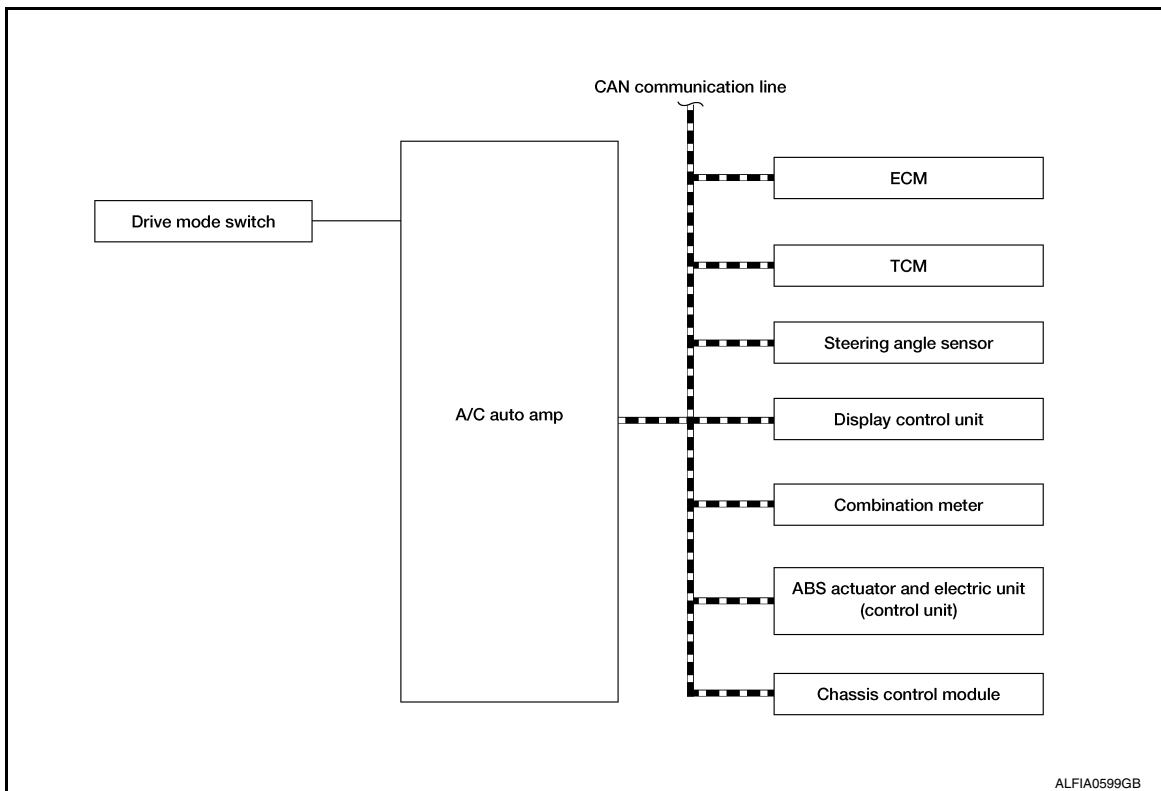
< SYSTEM DESCRIPTION >

- During cornering, the brake control system limits changes in steering angle by controlling the inner ring brakes according to accelerator pedal operation and allows smooth movement of the vehicle to achieve stable cornering.



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SYSTEM DIAGRAM



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INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >


[WITH ICC]

Component	Signal description
ECM	Mainly transmits the following signals to chassis control module via CAN communication: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine torque signal • Engine speed signal
TCM	Mainly transmits the following signal to chassis control module via CAN communication: <ul style="list-style-type: none"> • Current gear position signal
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to chassis control module via CAN communication: <ul style="list-style-type: none"> • Front LH wheel speed signal • Front RH wheel speed signal • Rear LH wheel speed signal • Rear RH wheel speed signal • ABS operation signal • TCS operation signal • VDC operation signal • Stop lamp switch signal • Vehicle speed signal (ABS) • Yaw rate signal • Side G signal • Decel G signal • VDC OFF switch signal • Brake fluid pressure signal • Steering angle sensor signal Mainly receives the following signal from chassis control module via CAN communication: <ul style="list-style-type: none"> • Active trace control signal
Steering angle sensor	Mainly transmits the following signal to chassis control module via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Active trace control signal • Drive mode signal
Display control unit	Mainly transmits the following signal to chassis control module via CAN communication line: <ul style="list-style-type: none"> • System selection signal
Combination meter	Mainly receives the following signals from chassis control module via CAN communication: <ul style="list-style-type: none"> • Chassis control malfunction signal • Active trace control display signal
Drive mode select switch	Mainly transmits the following signal to chassis control module: <ul style="list-style-type: none"> • Drive mode signal

WARNING/INDICATOR/CHIME LIST

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

INFOID:0000000012273714

Name	Design	Function
FEB warning lamp	 <p style="text-align: center; font-size: x-small;">ALFIA0508ZZ</p>	<ul style="list-style-type: none"> • For layout, refer to MWI-6, "METER SYSTEM : Design".

OPERATION

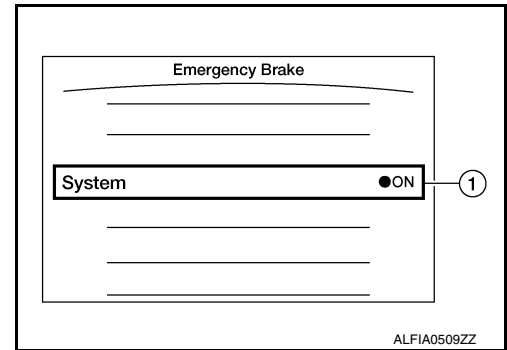
< SYSTEM DESCRIPTION >

[WITH ICC]

OPERATION

Switch Name and Function

INFOID:000000012273715



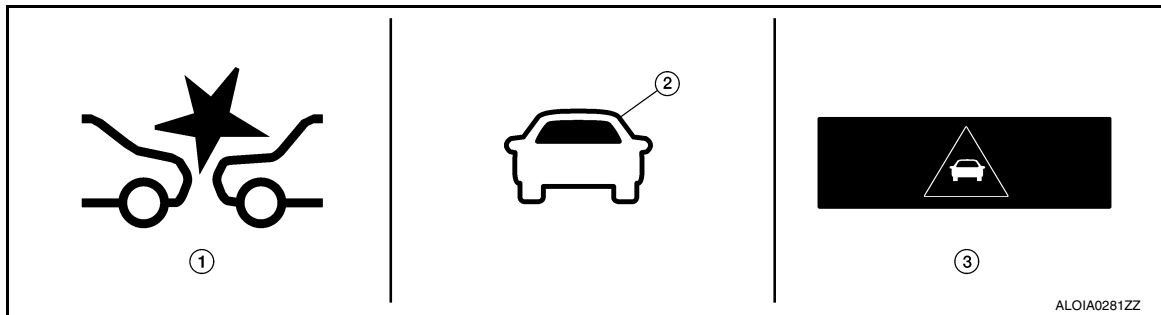
No.	Switch name	Description
1.	FEB system setting screen (Integral switch settings screen)	The setting of FEB/PFCW system can be switched between ON and OFF.

BRC

Menu Displayed by Pressing Each Switch

INFOID:000000012273716

SYSTEM DISPLAY



No.	Switch name	Description
1.	FEB warning lamp	<ul style="list-style-type: none"> FEB warning lamp indicates that an abnormal condition is present in FEB system. When the FEB system turns OFF, the FEB warning lamp will illuminate.
2.	Vehicle ahead detection indicator	<ul style="list-style-type: none"> Indicates whether it detects a vehicle ahead Blinks when approaching vehicle ahead
3.	FEB warning	Displays immediately before the harder brake operates

DISPLAY AND WARNING


Warning Display

System status	Condition	Display on combination meter	FEB warning lamp	Buzzer
FEB/PFCW OFF	—	—	OFF	—



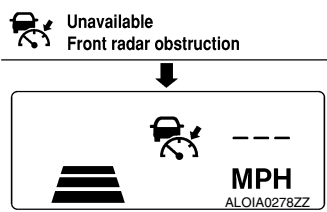
OPERATION

< SYSTEM DESCRIPTION >

[WITH ICC]

System status	Condition	Display on combination meter	FEB warning lamp	Buzzer
FEB/PFCW ON	System ON	 <small>ALFIA0531ZZ</small>	ON	—
FEB/PFCW system malfunction	The FEB/PFCW system is automatically canceled. NOTE: The system operates if the ignition switch is turned OFF⇒ON after the condition improves	Malfuction See Owner's Manual	ON	Beep

Warning Operation

Condition	Action	Display on combination meter	FEB warning lamp	Chime
There is a possibility of a collision with the vehicle ahead.	<ul style="list-style-type: none"> Accelerator pedal actuation Operates brake (Partial) 	 <small>ALFIA0532ZZ</small>	FLASHING	Beep
An obstacle ahead is avoided due to the system applying braking.	Operates brake (Emergency)	 <small>JSOIA0957ZZ</small>	ON	Continuous beeps
Dirt around the ICC sensor	The FEB system is automatically canceled. NOTE: The system operates if the ignition switch is turned OFF⇒ON after the condition improves.	 <small>ALQIA0278ZZ</small>	ON	—

HANDLING PRECAUTION

[WITH ICC]

< SYSTEM DESCRIPTION >

HANDLING PRECAUTION

Description

INFOID:000000012273717

PRECAUTIONS FOR FORWARD EMERGENCY BRAKING

- The forward emergency braking system is a supplemental aid to the driver. It is not a replacement for the driver's attention to traffic conditions or responsibility to drive safely. It cannot prevent accidents due to carelessness or dangerous driving techniques.
- The forward emergency braking system does not function in all driving, traffic, weather and road conditions.
- The automatic braking will cease under the following conditions:
 - When the steering wheel is turned as far as necessary to avoid a collision.
 - When the accelerator pedal is depressed.
 - When there is no longer a vehicle detected ahead.
- If the forward emergency braking system has stopped the vehicle, the vehicle will remain at a standstill for approximately 2 seconds before the brakes are released.
- The system will not detect the following objects:
 - Pedestrians, animals, or obstacles in the roadway
 - Oncoming vehicles in the same lane
 - Crossing vehicles
- The radar sensor has some performance limitations. For stationary vehicles, the forward emergency braking system can function at speeds of up to approximately 80 km/h (50 MPH).
- The radar sensor may not detect a vehicle ahead in the following conditions:
 - Dirt, ice, snow or other material covering the radar sensor.
 - Interference by other radar sources.
 - Snow or road spray from traveling vehicles.
 - If the vehicle ahead is narrow (e.g. motorcycle)
 - When driving on a steep downhill slope or roads with sharp curves.
- In some road or traffic conditions, the forward emergency braking system may unexpectedly apply partial braking. When acceleration is necessary, continue to depress the accelerator pedal to override the system.
- Braking distances increase on slippery surfaces.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.

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

< SYSTEM DESCRIPTION >

[WITH ICC]

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

CONSULT Function

INFOID:0000000012273718

APPLICATION ITEMS

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

Mode	Function description
ECU Identification	Part 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.
Re/programming, Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing ABS actuator and electric unit (control unit).

*: 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-52, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

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

Freeze frame data (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT.

Item name	Display item
IGN counter (0 - 39)	<p>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none">• When "0" is displayed: It indicates that the system is presently malfunctioning.• When except "0" is displayed: It indicates that system malfunction in the past was detected, but the system is presently normal. <p>NOTE: Each time ignition switch is turned OFF to ON, number increases from 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number does not increase and "39" is displayed until self-diagnosis is erased.</p>

ACTIVE TEST

The active test is used to determine and identify details of a malfunction, based on self-diagnosis test results 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 approximately 10 seconds after operation starts.
- When performing active test again after "TEST IS STOPPED" is displayed, select "BACK".

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

< SYSTEM DESCRIPTION >

[WITH ICC]

- ABS warning lamp, brake warning lamp and VDC 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:

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 approximately 2 seconds.

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

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

Test item	Display item	Display		
		Up	ACT UP	ACT KEEP
FR RH SOL (ACT)	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
	CV1	Off	Off	Off
	CV2	Off	On*	On*
FR LH SOL (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	Off	Off
RR RH SOL (ACT)	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
	CV1	Off	On*	On*
	CV2	Off	Off	Off
RR LH SOL (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
	CV1	Off	Off	Off
	CV2	Off	On*	On*

*: Immediately after being selected, status is "On". Status changes to "Off" after approx. 10 seconds.

ABS MOTOR

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

Test item	Display item	Display	
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY ^(Note)	On	On

NOTE:

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

< SYSTEM DESCRIPTION >

[WITH ICC]

Display occasionally changes On/Off for a moment after ignition switch is turned ON. This operation is for checking purposes and is not a malfunction.

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
	INPUT SIGNALS	MAIN SIGNALS	
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.
DECEL G-SEN (m/s ²)	×	×	Decel G detected by decel G sensor is displayed.
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. (Note 1)
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. (Note 1)
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. (Note 1)
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status is displayed. (Note 1)
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR	×	×	Current gear position judged from current gear position signal is displayed.

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

< SYSTEM DESCRIPTION >

[WITH ICC]

Item (Unit)	Monitor item selection		Note	
	INPUT SIGNALS	MAIN SIGNALS		
ENGINE SPEED (tr/min)	×	×	Engine speed status is displayed.	A
SLCT LVR POSI	×	×	Current gear position judged from current gear position signal is displayed.	B
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.	C
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.	D
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.	D
CV1 (On/Off)			Cut valve 1 (On/Off) status is displayed.	E
CV2 (On/Off)			Cut valve 2 (On/Off) status is displayed.	E
ACCEL POS SIG (%)	×		Displays the accelerator pedal position	BRC
SIDE G-SENSOR (m/s ²)	×		Side G detected by side G sensor is displayed.	G
STR ANGLE SIG	×		Steering angle detected by steering angle sensor is displayed.	H
PRESS SENSOR (bar)	×		Brake fluid pressure detected by pressure sensor is displayed.	H
EBD SIGNAL (On/Off)			EBD operation status is displayed.	I
ABS SIGNAL (On/Off)			ABS operation status is displayed.	I
TCS SIGNAL (On/Off)			TCS operation status is displayed.	J
VDC SIGNAL (On/Off)			VDC operation status is displayed.	K
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	K
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.	L
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.	M
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.	M
CRANKING SIG (On/Off)			Cranking status is displayed.	N
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communication is displayed.	O

Note 1: Refer to [BRC-208, "WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

WORK SUPPORT

Conditions	Description
ST ANGLE SENSOR ADJUSTMENT	Perform neutral position adjustment of steering angle sensor.
DECEL G SEN CALIBRATION	Perform decel G sensor calibration.

CONFIGURATION

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

< SYSTEM DESCRIPTION >

[WITH ICC]

Configuration includes the following functions:

Function		Description
Read/Write Configuration	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in the ABS actuator and electric unit (control unit) to store the specification in CONSULT.
	After replacing ECU	Allows the writing of vehicle information (Type ID) stored in CONSULT into the ABS actuator and electric unit (control unit).
Manual Configuration		Allows the writing of vehicle information (Type ID) into the ABS actuator and electric unit (control unit) by hand.

CAUTION:

Use "Manual Configuration" "TYPE ID"

DIAGNOSIS SYSTEM (ICC SENSOR)

[WITH ICC]

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (ICC SENSOR)

CONSULT Function (LASER/RADAR)

INFOID:000000012273719

CAUTION:

After disconnecting the CONSULT vehicle interface (VI) from the data link connector, the ignition must be cycled OFF → ON (for at least 5 seconds) → OFF. If this step is not performed, the BCM may not go to "sleep mode", potentially causing a discharged battery and a no-start condition.

APPLICATION ITEMS

CONSULT performs the following functions via CAN communication with ADAS control unit and the communication with ICC sensor.

Diagnosis mode	Description
Self Diagnostic Result	Displays malfunctioning system memorized in ICC sensor
Data Monitor	Displays real-time input/output data of ICC sensor
Work support	It can monitor the adjustment direction indication in order to perform the radar adjustment operation smoothly.
ECU Identification	Displays ICC sensor part number
CAN Diag Support Monitor	The results of transmit/receive diagnosis of ITS communication can be read.

SELF DIAGNOSTIC RESULT

Refer to [BRC-227, "DTC Index"](#).

DATA MONITOR

Monitored item [Unit]	Description
VHCL SPEED SE [km/h] or [mph]	Vehicle speed judged from a vehicle speed signal read by the ICC sensor via ITS communication is displayed [ADAS control unit receives a vehicle speed signal from ABS actuator and electric unit (control unit) via CAN communication and transmits the calculated vehicle speed to ICC sensor via ITS communication].
YAW RATE [deg/s]	Indicates yaw rate read from ADAS control unit through ITS communication [ADAS control unit receives yaw rate signal from ABS actuator and electric unit (control unit) via CAN communication and transmits yaw rate calculated by the ADAS control unit]. Yaw rate judged from a yaw rate signal read by ICC sensor via ITS communication is displayed [ADAS control unit receives a yaw rate signal from ABS actuator and electric unit (control unit) via CAN communication and transmits the calculated yaw rate to ICC sensor via ITS communication].
PWR SUP MONI [V]	Indicates ignition voltage inputted by ICC sensor
DISTANCE [m]	Indicates the distance from the vehicle ahead
RELATIVE SPD [m/s]	Indicates the relative speed of the vehicle ahead
RADAR OFFSET [m]	NOTE: The item is indicated, but not used.
RADAR HEIGHT [m]	NOTE: The item is indicated, but not used.
STEERING ANGLE [deg]	The steering angle is displayed.
STRG ANGLE SPEED [deg/s]	The steering angle speed is displayed.
L/R ADJUST [deg]	Indicates a horizontal correction value of the radar
U/D ADJUST [deg]	Indicates a vertical correction value of the radar

DIAGNOSIS SYSTEM (ICC SENSOR)

[WITH ICC]

< SYSTEM DESCRIPTION >

Monitored item [Unit]	Description
FCW SYSTEM ON	NOTE: The item is indicated, but not used.
FCW SELECT	NOTE: The item is indicated, but not used.
PFCW SELECT	NOTE: The item is indicated, but not used.
FEB SW	NOTE: The item is indicated, but not used.
FEB SELECT	Indicates [ON/OFF] state of the PFCW system.
MAIN SW	Indicates [ON/OFF] status as judged from ICC steering switch.
ICC/ASCD MODE	NOTE: The item is indicated, but not used.
SET/COAST SW	Indicates [ON/OFF] status as judged from ICC steering switch.
CANCEL SW	Indicates [ON/OFF] status as judged from ICC steering switch.
RESUME/ACC SW	Indicates [ON/OFF] status as judged from ICC steering switch.
DISTANCE SW	Indicates [ON/OFF] status as judged from ICC steering switch.
BRAKE SW	Indicates [ON/OFF] status as judged from brake pedal position switch signal [ECM transmits brake pedal position switch signal through CAN communication].
STOP LAMP SW	Indicates [ON/OFF] status as judged from stop lamp switch signal [ABS actuator and electric unit (control unit) transmits stop lamp switch signal through CAN communication].
IDLE SW	Indicates [ON/OFF] status of idle switch read from ICC sensor through CAN communication (ECM transmits ON/OFF status through CAN communication).
CRUISE LAMP	Indicates [ON/OFF] status of MAIN switch indicator output.
OWN VHCL	NOTE: The item is indicated, but not used.
VHCL AHEAD	Indicates [ON/OFF] status of vehicle ahead detection indicator output.
SET DISTANCE	Indicates set distance memorized in ADAS control unit.
SET VHCL SPD [km/h] or [mph]	NOTE: The item is indicated, but not used.
THRTL SENSOR [%]	Indicates throttle position read from ICC sensor through CAN communication (ECM transmits accelerator pedal position signal through CAN communication).
VEHICLE AHEAD DETECT	Indicates [ON/OFF] status of vehicle ahead detection indicator output.
STATIC OBSTACLE DETECT	Indicates [ON/OFF] status of static obstacle detection.
BUZZER O/P	[ON/OFF] Indicates [On/Off] status of warning chime output.
FUNC ITEM (FCW)	NOTE: The item is indicated, but not used.
FUNC ITEM (PFCW)	Indicates system status
FUNC ITEM (FEB)	Indicates system status
FUNC ITEM (ICC)	Indicates system status
PRESS_ORDER [bar]	Indicates status as judged from brake fluid pressure signal [ABS actuator and electric unit (control unit) transmits brake fluid pressure signal through CAN communication].
D RANGE SW	Indicates [ON/OFF] status as judged from D position switch signal (TCM transmits shift position signal through CAN communication).
NP RANGE SW	Indicates [ON/OFF] status as judged from N/P position switch signal (TCM transmits shift position signal through CAN communication).
PKB SW	Parking brake switch status [ON/OFF] judged from the parking brake switch signal that ADAS control unit read via CAN communication is displayed (combination meter transmits the parking brake switch signal via CAN communication)

DIAGNOSIS SYSTEM (ICC SENSOR)

< SYSTEM DESCRIPTION >

[WITH ICC]

Monitored item [Unit]	Description
VHCL SPD AT	NOTE: The item is indicated, but not used.
Shift position	Indicates shift position read from ADAS control unit though CAN communication (TCM transmits shift position signal through CAN communication).
Turn signal	NOTE: The item is indicated, but not used.
SYSTEM CANCEL MESSAGE	Indicates [ON/OFF] status of system cancel display output.
DISP VHCL SPD [km/h] or [mph]	NOTE: The item is indicated, but not used.
VHCL SPD UNIT	Indicates vehicle speed unit read from ICC sensor through CAN communication (combination meter transmits vehicle speed signal through CAN communication).
ADAS AVAILABLE COND	NOTE: The item is indicated, but not used.
ICC SET STATUS	NOTE: The item is indicated, but not used.
ICC MALF	NOTE: The item is indicated, but not used.
ADAS MALF	Indicates [ON/OFF] status of ADAS malfunction.
STOP LAMP RELAY ON	Indicates [ON/OFF] status of stop lamp relay fixed on.
STOP LAMP RELAY OFF	Indicates [ON/OFF] status of stop lamp relay fixed off.
ICC CANCEL	
ACCEL COM VALUE 1 [m/s ²]	Indicates accel command calculated from set speed and information of ahead vehicle.
ICC STATUS	Indicates ICC status.
ACCEL COM VALUE 2	NOTE: The item is indicated, but not used.

WORK SUPPORT

Work support items	Description
MILLIWAVE RADAR ADJUST	Outputs millimeter waves, calculates the displacement in radar direction, and indicates an adjustment direction
CAUSE OF AUTO-CANCEL	Displays causes of automatic cancellation that occurred during Intelligent Cruise Control system operation.

ICC Sensor Adjustment

Refer to [BRC-256](#). "Description".

ECU IDENTIFICATION

ICC sensor part number is displayed.

CAUSE OF AUTO CANCEL

Work support items	Description
OPERATING ABS	ABS function was operated.
OPERATING TCS	TCS function was operated.
OPERATING VDC	VDC function was operated.
ECM CIRCUIT	ECM did not permit ICC operation.
OP SW VOLT CIRC	The ICC steering switch input voltage is not within standard range.
OP SW DOUBLE TOUCH	The ICC steering switches were pressed at the same time.

DIAGNOSIS SYSTEM (ICC SENSOR)

[WITH ICC]

< SYSTEM DESCRIPTION >

Work support items	Description
VHCL SPD DOWN	Vehicle speed is lower than the speed as follows: <ul style="list-style-type: none">• Vehicle to vehicle control mode is 24 km/h (15 MPH).• Conventional (fixed speed) cruise control mode is 32 km/h (20 MPH).
WHL SPD ELEC NOISE	Wheel speed sensor signal caught electromagnetic noise.
VDC/TCS OFF SW	VDC OFF switch was pressed.
VHCL SPD UNMATCH	Wheel speeds became different from A/T vehicle speed.
TIRE SLIP	Wheel slipped.
IGN LOW VOLT	Decrease in ICC sensor ignition voltage.
PARKING BRAKE ON	The parking brake is operating.
WHEEL SPD UNMATCH	The wheel speeds of all four wheels are out of the specified values.
INCHING LOST	A vehicle ahead is not detected during the following driving when the vehicle speed is approximately 24 km/h (15MPH) or less.
CAN COMM ERROR	ICC sensor received an abnormal signal with CAN communication.
ABS/TCS/VDC CIRC	An abnormal condition occurs in VDC/TCS/ABS system.
ECD CIRCUIT	An abnormal condition occurs in ECD system.
ASCD VHCL SPD DTAC	Vehicle speed is detached from the set vehicle speed.
ASCD DOUBLE COMD	Cancel switch and operation switch are detected simultaneously.
FEB OPERATED	FEB is activated.
VHL AHAD LOST (CLSE RANGE)	A vehicle ahead lost close range.
NO RECORD	—

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000012273720

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
FR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
RR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
RR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h, mph]
		Vehicle running (Note 1)	Nearly matches the speed meter display (± 10% or less)
DECEL G-SEN	Longitudinal acceleration detected by decel G sensor	Approx. 0 G	Vehicle stopped
		-1.7 to 1.7 G	Vehicle running
FR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
RR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("Active Test" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
EBD WARN LAMP	EBD warning lamp (Note 2)	When EBD warning lamp is ON	On
		When EBD warning lamp is OFF	Off
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	On
		When brake pedal is not depressed	Off
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	On
		When the motor relay and motor are not operating	Off
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On
		When the actuator relay is not operating	Off
ABS WARN LAMP	ABS warning lamp (Note 2)	When ABS warning lamp is ON	On
		When ABS warning lamp is OFF	Off
OFF LAMP	VDC OFF indicator lamp (Note 2)	When VDC OFF indicator lamp is ON	On
		When VDC OFF indicator lamp is OFF	Off
SLIP/VDC LAMP	SLIP indicator lamp (Note 2)	When SLIP indicator lamp is ON	On
		When SLIP indicator lamp is OFF	Off
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Manual mode gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
ENGINE SPEED	With engine running	With engine stopped	0 RPM
		Engine running	Almost in accordance with tachometer display

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G sensor	Vehicle stopped	Approx. 0 d/s
		Vehicle turning	-75 to 75 d/s
R POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = R position	On
		CVT shift position = other than R position	Off
N POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = N position	On
		CVT shift position = other than N position	Off
CV1	Cut valve 1 signal	When cut valve 1 is open or closed	On
			Off
CV2	Cut valve 2 signal	When cut valve 2 is open or closed	On
			Off
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Depress accelerator pedal (ignition switch is ON).	0 - 100 %
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s ²
		Vehicle turning right	Negative value (m/s ²)
		Vehicle turning left	Positive value (m/s ²)
STR ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead	Approx. 0°
		Steering wheel turned	-720 to 720°
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar
EBD SIGNAL	EBD operation	EBD is active.	On
		EBD is inactive.	Off
ABS SIGNAL	ABS operation	ABS is active.	On
		ABS is inactive.	Off
TCS SIGNAL	TCS operation	TCS is active.	On
		TCS is inactive.	Off
VDC SIGNAL	VDC operation	VDC is active.	On
		VDC is inactive.	Off
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe.	On
		EBD is normal.	Off
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe.	On
		ABS is normal.	Off
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe.	On
		TCS is normal.	Off
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe.	On
		VDC is normal.	Off
CRANKING SIG	Crank operation	Crank is active.	On
		Crank is inactive.	Off

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FLUID LEV SW	Brake fluid level switch	When brake fluid level switch is ON	On
		When brake fluid level switch is OFF	Off

Note 1: Confirm tire pressure is normal.

Note 2: For on and off timing for warning lamps and indicator lamps.

- Refer to [BRC-28. "VDC FUNCTION : System Description"](#).
- Refer to [BRC-30. "TCS FUNCTION : System Description"](#).
- Refer to [BRC-32. "ABS FUNCTION : System Description"](#).
- Refer to [BRC-33. "EBD FUNCTION : System Description"](#).

Fail-Safe

INFOID:000000012273721

VDC FUNCTION, TCS FUNCTION AND BRAKE ASSIST FUNCTION

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

NOTE:

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

EBD FUNCTION

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

DTC	Fail-safe condition
C1101	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both rear wheels are malfunctioning) • Brake assist function • Active trace control function
C1102	
C1103	
C1104	
C1105	
C1106	
C1107	
C1108	
C1109	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function
C1110	
C1111	
C1112	
C1113	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

DTC	Fail-safe condition	
C1115	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function 	A
C1116		B
C1120	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function 	C
C1121		
C1122		
C1123		D
C1124		
C1125		
C1126		E
C1127		
C1130	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function 	BRC
C1140	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function 	G
C1142	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Brake assist function • Active trace control function 	H
C1143	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function 	I
C1144		J
C1145	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function 	K
C1146		
C1153		L
C1154		M
C1155	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Brake assist function • Active trace control function 	N
C1160	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function 	O
C1164	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • Brake assist function • Active trace control function 	P
C1165		
C1166		
C1167		

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

DTC	Fail-safe condition
C1170	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • Brake assist function • Active trace control function
C1197	Electrical vacuum assistance of brake booster is suspended.
C1198	
C1199	
C119A	
U1000	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • Active trace control function

DTC Inspection Priority Chart

INFOID:000000012273722

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

Priority	Detected item (DTC)
1	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT
2	<ul style="list-style-type: none"> • C1170 VARIANT CODING
3	<ul style="list-style-type: none"> • C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	<ul style="list-style-type: none"> • C1109 BATTERY VOLTAGE [ABNORMAL] • C1110 CONTROLLER FAILURE • C1140 ACTUATOR RLY
5	<ul style="list-style-type: none"> • C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1113 G SENSOR • C1115 ABS SENSOR [ABNORMAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT
6	<ul style="list-style-type: none"> • C1155 BR FLUID LEVEL LOW

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

DTC Index

INFOID:000000012273723

DTC	Display item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to:
C1101	RR RH SENSOR-1	ON	ON	OFF	BRC-265, "Diagnosis Procedure"
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	BRC-270, "Diagnosis Procedure"
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 [ABNOMAL]	ON	ON	ON	BRC-276, "Diagnosis Procedure"
C1110	CONTROLLER FAILURE	ON	ON	ON	BRC-279, "Diagnosis Procedure"
C1111	PUMP MOTOR	ON	ON	ON	BRC-280, "Diagnosis Procedure"
C1113	G SENSOR	ON	ON	OFF	BRC-284, "Diagnosis Procedure"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	ON	ON	OFF	BRC-285, "Diagnosis Procedure"
C1116	STOP LAMP SW	ON	ON	OFF	BRC-293, "Diagnosis Procedure"
C1120	FR LH IN ABS SOL	ON	ON	ON	BRC-296, "Diagnosis Procedure"
C1121	FR LH OUT ABS SOL	ON	ON	ON	BRC-298, "Diagnosis Procedure"
C1122	FR RH IN ABS SOL	ON	ON	ON	BRC-296, "Diagnosis Procedure"
C1123	FR RH OUT ABS SOL	ON	ON	ON	BRC-298, "Diagnosis Procedure"
C1124	RR LH IN ABS SOL	ON	ON	ON	BRC-296, "Diagnosis Procedure"
C1125	RR LH OUT ABS SOL	ON	ON	ON	BRC-298, "Diagnosis Procedure"
C1126	RR RH IN ABS SOL	ON	ON	ON	BRC-296, "Diagnosis Procedure"
C1127	RR RH OUT ABS SOL	ON	ON	ON	BRC-298, "Diagnosis Procedure"
C1130	ENGINE SIGNAL 1	ON	OFF	OFF	BRC-300, "Diagnosis Procedure"
C1140	ACTUATOR RLY	ON	ON	ON	BRC-302, "Diagnosis Procedure"
C1142	PRESS SEN CIRCUIT	ON	OFF	OFF	BRC-304, "Diagnosis Procedure"
C1143	ST ANG SEN CIRCUIT	ON	OFF	OFF	BRC-307, "Diagnosis Procedure"
C1144	ST ANG SEN SIGNAL	ON	OFF	OFF	BRC-311, "Diagnosis Procedure"
C1145	YAW RATE SENSOR	ON	ON	OFF	BRC-284, "Diagnosis Procedure"
C1146	SIDE G SEN CIRCUIT	ON	ON	OFF	

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[WITH ICC]

< ECU DIAGNOSIS INFORMATION >

DTC	Display item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to:
C1153	EMERGENCY BRAKE	ON	ON	ON	BRC-279, "Diagnosis Procedure"
C1154	PNP POS SIG	ON	ON	OFF	BRC-313, "Diagnosis Procedure"
C1155	BR FLUID LEVEL LOW	ON	OFF	OFF	BRC-318, "Component Inspection"
C1160	DECEL G SEN SET	ON	ON	OFF	BRC-319, "Diagnosis Procedure"
C1164	CV 1	ON	ON	ON	BRC-321, "Diagnosis Procedure"
C1165	CV 2	ON	ON	ON	
C1166	SV 1	ON	ON	ON	BRC-323, "Diagnosis Procedure"
C1167	SV 2	ON	ON	ON	
C1170	VARIANT CODING	ON	ON	OFF	BRC-325, "Diagnosis Procedure"
C1197	VACUUM SENSOR	OFF	OFF	ON	BRC-327, "Diagnosis Procedure"
C1198	VACUUM SEN CIR	OFF	OFF	ON	BRC-330, "Diagnosis Procedure"
C1199	BRAKE BOOSTER	OFF	OFF	ON	BRC-332, "Diagnosis Procedure"
C119A	VACUUM SEN VOLT	OFF	OFF	ON	BRC-335, "Diagnosis Procedure"
U1000	CAN COMM CIRCUIT	ON	OFF	OFF	BRC-338, "Diagnosis Procedure"

ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

ADAS CONTROL UNIT

Reference Value

INFOID:000000012385895

VALUES ON THE DIAGNOSIS TOOL

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		Value/Status
MAIN SW	Ignition switch ON	When MAIN (ON/OFF) switch is pressed.	On
		When MAIN (ON/OFF) switch is not pressed.	Off
SET/COAST SW	Ignition switch ON	When SET/COAST switch is pressed.	On
		When SET/COAST switch is not pressed.	Off
CANCEL SW	Ignition switch ON	When CANCEL switch is pressed.	On
		When CANCEL switch is not pressed.	Off
RESUME/ACC SW	Ignition switch ON	When RESUME/ACCELERATE switch is pressed.	On
		When RESUME/ACCELERATE switch is not pressed.	Off
DISTANCE SW	Ignition switch ON	When DISTANCE switch is pressed.	On
		When DISTANCE switch is not pressed.	Off
CRUISE OPE	Drive the vehicle and activate the ICC system	When ICC system is controlling.	On
		When ICC system is not controlling.	Off
BRAKE SW	Ignition switch ON	When brake or clutch pedal is depressed.	Off
		When brake or clutch pedal is not depressed.	On
STOP LAMP SW	Ignition switch ON	When brake pedal is depressed.	On
		When brake pedal is not depressed.	Off
IDLE SW	Engine running	Idling	On
		Except idling (depress accelerator pedal)	Off
SET DISTANCE	<ul style="list-style-type: none"> • Start the engine and turn the ICC system ON • Press the DISTANCE switch to change the ICC system 	When set to "long"	Long
		When set to "middle"	Mid
		When set to "short"	Short
CRUISE LAMP	Start the engine and press MAIN switch	ICC system ON (MAIN switch indicator ON).	On
		ICC system OFF (MAIN switch indicator OFF).	Off
OWN VHCL	NOTE: The item is indicated, but not monitored		Off
VHCL AHEAD	Drive the vehicle and activate the ICC system	When a vehicle ahead is detected (vehicle ahead detection indicator ON).	On
		When a vehicle ahead is not detected (vehicle ahead detection indicator OFF).	Off
ICC WARNING	Start the engine and press MAIN switch	When ICC system is malfunctioning (ICC system malfunction ON).	On
		When ICC system is normal (ICC system malfunction OFF).	Off
VHCL SPEED SE	While driving		Displays the vehicle speed calculated by ADAS control unit

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ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Condition		Value/Status
SET VHCL SPD	While driving	When vehicle speed is set.	Displays the set vehicle speed
BUZZER O/P	Engine running	When the buzzer of the following system operates: • ICC system • PFCW system • FEB system	On
		When the buzzer of the following system does not operate: • ICC system • PFCW system • FEB system	Off
THRTL SENSOR	NOTE: The item is indicated, but not monitored.		0.0
ENGINE RPM	Engine running		Equivalent to tachometer reading
WIPER SW	Ignition switch ON	Wiper not operating.	Off
		Wiper LO operation.	Low
		Wiper HI operation.	High
YAW RATE	NOTE: The item is indicated, but not monitored.		0.0
BA WARNING	Engine running	FEB OFF indicator lamp ON. • When FEB system is malfunctioning. • When FEB system is turned to OFF.	On
		FEB OFF indicator lamp OFF. • When FEB system is normal. • When FEB system is turned to ON.	Off
STP LMP DRIVE	Drive the vehicle and activate the ICC system	When ICC brake hold relay is activated.	On
		When ICC brake hold relay is not activated.	Off
D POSITION SW	Engine running	When the shift selector is in "D" position or manual mode.	On
		When the shift selector is in any position other than "D" or manual mode.	Off
NP RANGE SW	Engine running	When the shift selector is in "N" or "P" position.	On
		When the shift selector is in any position other than "N" or "P".	Off
PKB SW	Ignition switch ON	When the parking brake is applied.	On
		When the parking brake is released.	Off
PWR SUP MONI	Engine running		Power supply voltage value of ADAS control unit
VHCL SPD AT	While driving		Value of CVT vehicle speed sensor signal
THRTL OPENING	Engine running	Depress accelerator pedal.	Displays the throttle position
GEAR	While driving		Displays the gear position
CLUTCH SW SIG	Ignition switch ON	When clutch or brake pedal is depressed.	On
		When clutch or brake pedal is not depressed.	Off

ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Condition		Value/Status
NP SW SIG	Ignition switch ON	When the shift selector is in neutral position.	On
		When the shift selector is in any position other than neutral.	Off
MODE SIG	Start the engine and press MAIN switch	When ICC system is deactivated.	Off
		When ICC system is activated.	ICC
SET DISP IND	Press SET/COAST switch	SET switch indicator ON.	On
		SET switch indicator OFF.	Off
DISTANCE	Drive the vehicle and activate the ICC system	When a vehicle ahead is detected.	Displays the distance from the preceding vehicle
		When a vehicle ahead is not detected.	0.0
RELATIVE SPD	Drive the vehicle and activate the ICC system	When a vehicle ahead is detected.	Displays the relative speed.
		When a vehicle ahead is not detected.	0.0
ON ROOT GUIDE	NOTE: The item is indicated, but not monitored.		Off
FCW SYSTEM ON	Ignition switch ON	When the PFCW system is ON.	On
		When the PFCW system is OFF.	Off
Shift position	<ul style="list-style-type: none"> • Engine running • While driving 		Displays the shift selector position
Turn signal	Turn signal lamps OFF.		Off
	Turn signal lamp LH blinking.		LH
	Turn signal lamp RH blinking.		RH
	Turn signal lamp LH and RH blinking.		LH&RH
SIDE G	While driving	Vehicle turning right.	Negative value
		Vehicle turning left.	Positive value
FUNC ITEM	Ignition switch ON		FUNC3
FUNC ITEM (FCW)	Engine running		On
FUNC ITEM (BSW)	Engine running		On
FUNC ITEM (NV-ICC)	NOTE: The item is indicated, but not monitored		Off
FCW SELECT	Ignition switch ON	"Forward Emergency Braking" set when the integral switch is ON.	On
		"Forward Emergency Braking" set when the integral switch is OFF.	Off
BSW SELECT	Ignition switch ON	"Blind Spot Warning" set when the integral switch is ON.	On
		"Blind Spot Warning" set when the integral switch is OFF.	Off
NAVI ICC SELECT	NOTE: The item is indicated, but not monitored.		Off
SYS SELECTABILITY	Ignition switch ON	Items set with the integral switch can be switched normally.	On
		Items set with the integral switch cannot be switched normally.	Off
BSW WARN LMP	Engine running	When the BSW system is malfunctioning.	On
		When the BSW system is normal.	Off

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ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Monitor item	Condition		Value/Status
BSW SYSTEM ON	Ignition switch ON	When the BSW system is ON.	On
		When the BSW system is OFF.	Off
FCW SYSTEM ON	Engine running	When the FEB/PFCW system is ON.	On
		When the FEB/PFCW system is OFF.	Off
BATTERY CIRCUIT OFF	NOTE: The item is indicated, but not used.		Off
SYSTEM CANCEL MESSAGE	Engine running	System cancel display ON.	On
		System cancel display OFF.	Off
BSW ON INDICATOR	Engine running	BSW system display ON.	On
		BSW system display OFF.	Off
SIDE RADAR BLOCK COND	Engine running	Front bumper or side radar is dirty.	On
		Front bumper and side radar are clean.	Off
BSW IND BRIGHTNESS	Ignition switch ON	BSW system OFF.	Nothing
		Blind Spot Warning indicator brightness bright.	Bright
		Blind Spot Warning indicator brightness normal.	Normal
		Blind Spot Warning indicator brightness dark.	Dark
SL MAIN SW	Engine running	When speed limiter MAIN switch is pressed.	On
		When speed limiter MAIN switch is not pressed.	Off
FUNC ITEM (FEB)	Engine running		On
FEB SELECT	Ignition switch ON	"Forward Emergency Braking" set when the integral switch is ON.	On
		"Forward Emergency Braking" set when the integral switch is OFF.	Off
FEB SW	Engine running	FEB system ON.	On
		FEB system OFF.	Off
SL TARGET VEHICLE SPEED	While driving	When vehicle speed is set.	Displays the set vehicle speed
SL SET LAMP	<ul style="list-style-type: none"> • Drive the vehicle and activate the speed limiter • Press speed limiter MAIN switch 	Speed limiter SET indicator ON.	On
		Speed limiter SET indicator OFF.	Off
SL LIMIT LAMP	<ul style="list-style-type: none"> • Drive the vehicle and activate the speed limiter • Press speed limiter MAIN switch 	Speed limiter system ON.	On
		Speed limiter system OFF.	Off
ASCDCANCEL (LOW SPEED)	Drive the vehicle and activate the ASCD	ASCDCanceled by low vehicle speed.	On
		Other than above.	Off
ASCDCANCEL (SPEED DIFF)	Drive the vehicle and activate the ASCD	ASCDCanceled by difference between set speed and vehicle speed.	On
		Other than above.	Off
KICK DOWN	Drive the vehicle and activate the speed limiter	When accelerator pedal is fully depressed.	On
		Other than above.	Off

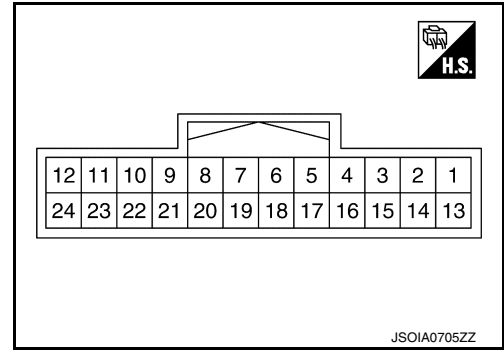
ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

TERMINAL LAYOUT

PHYSICAL VALUES



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Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
1 (B)	Ground	Ground	Input	—		0 V
2 (L)		ITS communication high	—	—		—
3 (BG)		Ignition power supply	Input	Ignition switch ON		Battery voltage
5 (Y)		ITS communication low	—	—		—
9 (L)		CAN high	—	—		—
10 (P)		CAN low	—	—		—
14 (W)		ICC brake hold relay drive signal	Output	Ignition switch ON	—	

Fail-safe (ADAS Control Unit)

INFOID:000000012385896

If a malfunction occurs in each system, ADAS control unit cancels each control, sounds a beep, and turns ON the warning or indicator lamp.

System	Buzzer	Warning lamp/Warning display	Description
Intelligent Cruise Control (ICC)	High-pitched tone	ICC system warning	Cancel
Forward Emergency Braking (FEB)	High-pitched tone	FEB warning lamp (Yellow)	Cancel
Predictive Forward Collision Warning (PFCW)	High-pitched tone	FEB warning lamp (Yellow)	Cancel
Blind Spot Warning (BSW)	Low-pitched tone	BSW system warning	Cancel
Rear Cross Traffic Alert (RCTA)	—	BSW system warning	Cancel

DTC Inspection Priority Chart

INFOID:000000012385897

If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Priority	Detected items (DTC)
1	<ul style="list-style-type: none"> • U1507: LOST COMM (SIDE RDR R) • U1508: LOST COMM (SIDE RDR L)
2	<ul style="list-style-type: none"> • U1000: CAN COMM CIRCUIT • U1321: CONFIGURATION
3	<ul style="list-style-type: none"> • C1A17: ICC SENSOR MALF • C1B53: SIDE RDR R MALF • C1B54: SIDE RDR L MALF
4	<ul style="list-style-type: none"> • C1A01: POWER SUPPLY CIR • C1A02: POWER SUPPLY CIR 2 • C1A13: STOP LAMP RLY FIX • C1A14: ECM CIRCUIT • C1A34: COMMAND ERROR • U0121: VDC CAN CIR 2 • U0235: ICC SENSOR CAN CIRC 1 • U0401: ECM CAN CIR 1 • U0402: TCM CAN CIR 1 • U0415: VDC CAN CIR 1 • U0433: ICC SENSOR CAN CIRC 2 • U1503: SIDE RDR L CAN CIR 2 • U1504: SIDE RDR L CAN CIR 1 • U1505: SIDE RDR R CAN CIR 2 • U1506: SIDE RDR R CAN CIR 1
5	<ul style="list-style-type: none"> • C1A03: VHCL SPEED SE CIRC
6	<ul style="list-style-type: none"> • C1A00: CONTROL UNIT

DTC Index

INFOID:000000012385898

Systems for fail-safe

- A: Intelligent Cruise Control (ICC)
- B: Forward Emergency Braking (FEB)
- C: Predictive Forward Collision Warning (PFCW)
- D: Blind Spot Warning (BSW)
- E: Rear Cross Traffic Alert (RCTA)

DTC	CONSULT display	Fail-safe System	Reference
CONSULT			
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—
U1507	LOST COMM (SIDE RDR R)	D, E	DAS-76
U1508	LOST COMM (SIDE RDR L)	D, E	DAS-77
U1000 ^{NOTE}	CAN COMM CIRCUIT	A, B, C, D, E	DAS-65
U1321	CONFIGURATION	A, B, C, D, E	DAS-67
C1A17	ICC SENSOR MALF	A, B, C	DAS-51
C1B53	SIDE RDR R MALF	D, E	DAS-53
C1B54	SIDE RDR L MALF	D, E	DAS-54
C1A01	POWER SUPPLY CIR	A, B, C, D, E	DAS-40
C1A02	POWER SUPPLY CIR 2	A, B, C, D, E	DAS-40
C1A13	STOP LAMP RLY FIX	A, B, C	DAS-43
C1A14	ECM CIRCUIT	A, B, C	DAS-49
C1A34	COMMAND ERROR	A, B, C	DAS-52
U0121	VDC CAN CIR 2	A, B, C, D, E	DAS-55

ADAS CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[WITH ICC]

Systems for fail-safe

- A: Intelligent Cruise Control (ICC)
- B: Forward Emergency Braking (FEB)
- C: Predictive Forward Collision Warning (PFCW)
- D: Blind Spot Warning (BSW)
- E: Rear Cross Traffic Alert (RCTA)

DTC	CONSULT display	Fail-safe System	Reference
U0235	ICC SENSOR CAN CIRC 1	A, C, D, E	DAS-57
U0401	ECM CAN CIR 1	A, B, C, D, E	DAS-58
U0402	TCM CAN CIR 1	A, B, C, D, E	DAS-60
U0415	VDC CAN CIR 1	A, B, C, D, E	DAS-62
U0433	ICC SENSOR CAN CIRC 2	A, B, C	DAS-64
U1503	SIDE RDR L CAN CIR 2	D, E	DAS-68
U1504	SIDE RDR L CAN CIR 1	D, E	DAS-70
U1505	SIDE RDR R CAN CIR 2	D, E	DAS-72
U1506	SIDE RDR R CAN CIR 1	D, E	DAS-74
C1A03	VHCL SPEED SE CIRC	D, E	DAS-41
C1A00	CONTROL UNIT	A, B, C, D, E	DAS-39

NOTE:

With the detection of "U1000" some systems do not perform the fail-safe operation.
 A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ADAS control unit becomes inoperable.

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BRAKE CONTROL SYSTEM

[WITH ICC]

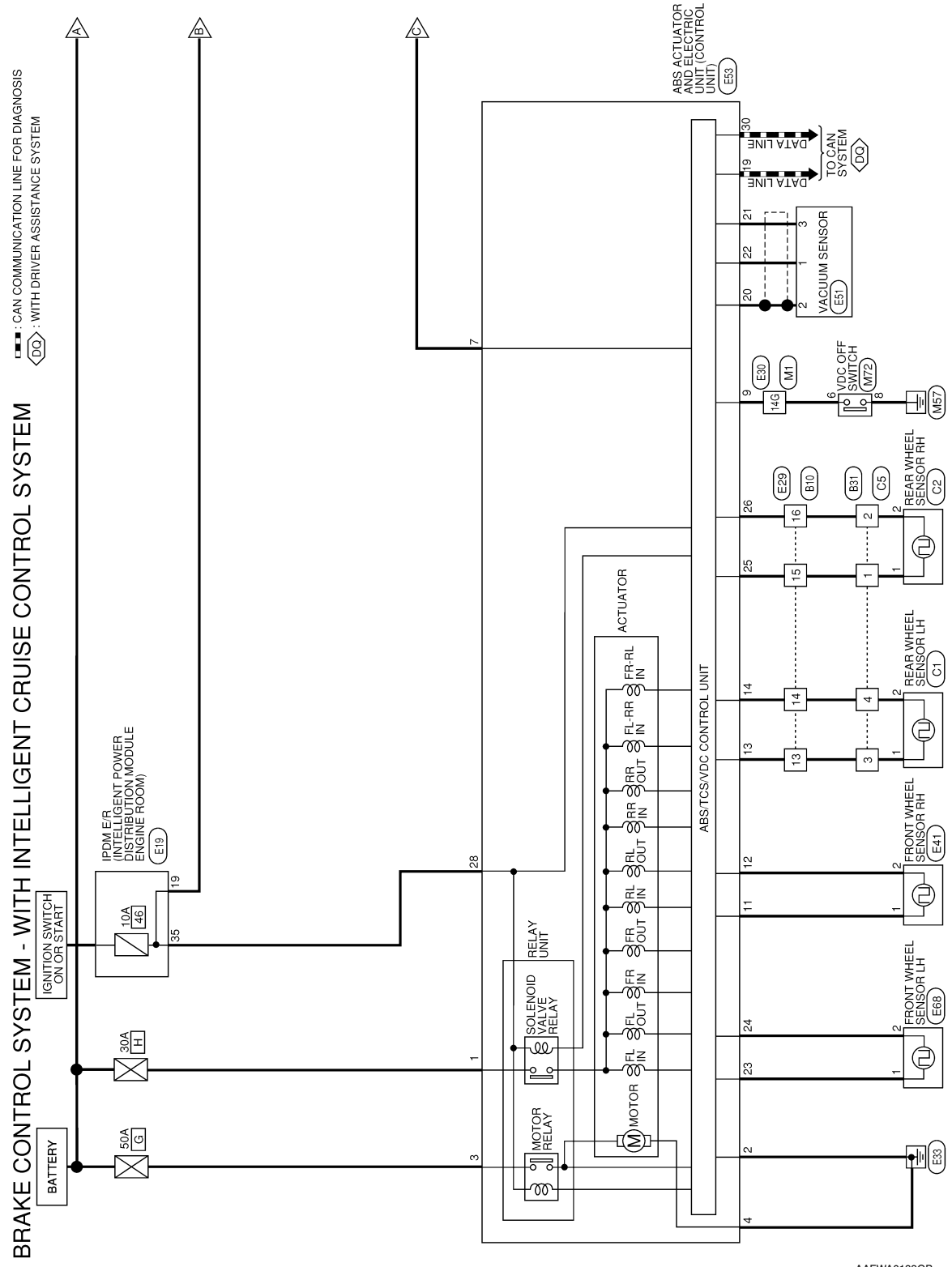
< WIRING DIAGRAM >

WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

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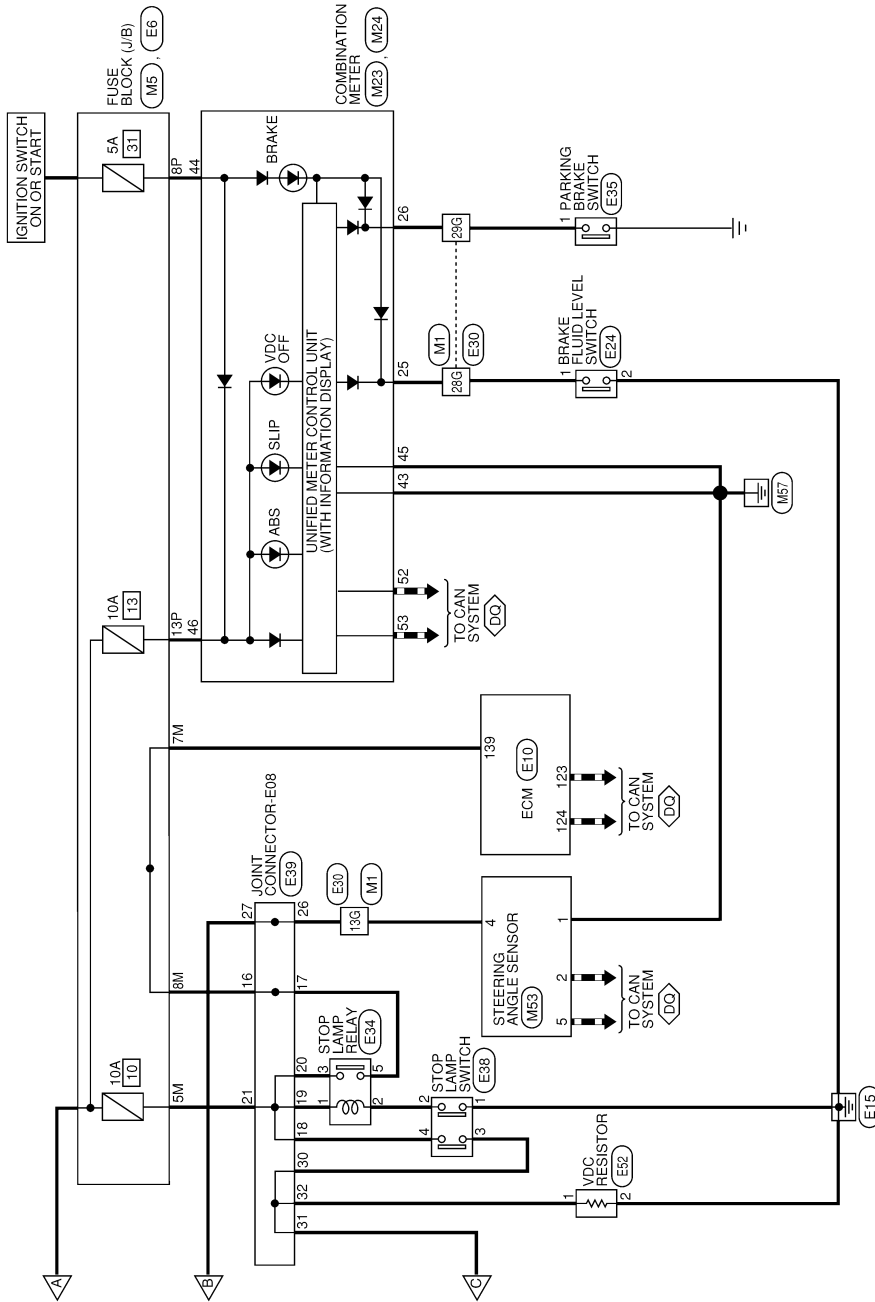


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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH ICC]



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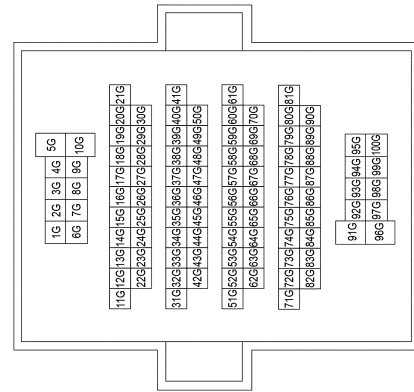
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH ICC]

BRAKE CONTROL SYSTEM CONNECTORS - WITH INTELLIGENT CRUISE CONTROL SYSTEM

Connector No.	M1
Connector Name	WIRES TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



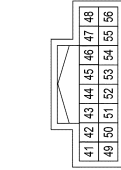
Terminal No.	Color of Wire	Signal Name
13G	G	-
14G	LG	-
28G	BR	-
29G	V	-

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



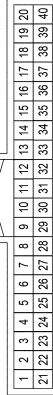
Terminal No.	Color of Wire	Signal Name
8P	BR	-
13P	G	-

Connector No.	M23
Connector Name	COMBINATION METER
Connector Type	TH16FW-NH
Connector Color	WHITE



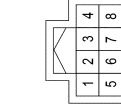
Terminal No.	Color of Wire	Signal Name
43	B	GND1
44	BR	POWER (IGN)
45	B	GND2
46	G	POWER (BAT)
52	P	CAN-L
53	L	CAN-H

Connector No.	M24
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH
Connector Color	WHITE



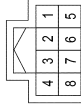
Terminal No.	Color of Wire	Signal Name
25	BR	BRAKE OIL SW
26	V	PKB SW

Connector No.	M53
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FV-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND
2	P	CAN-L
3	-	-
4	G	IGN
5	L	CAN-H
6	-	-
7	-	-
8	-	-

Connector No.	M72
Connector Name	VDC OFF SWITCH
Connector Type	TH08FB-NH
Connector Color	BLACK



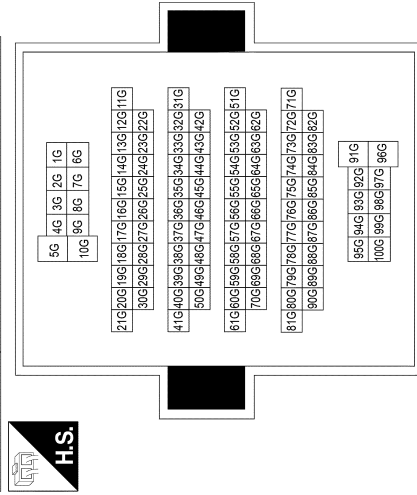
Terminal No.	Color of Wire	Signal Name
6	LG	-
8	B	-

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

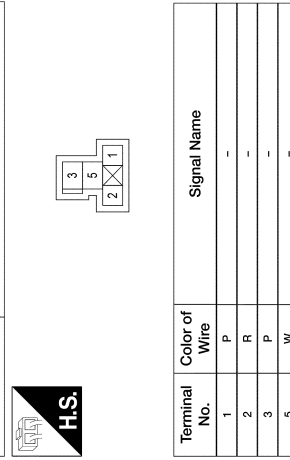
[WITH ICC]

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Type	TH80MM-CS16-TM4
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13G	BR	-
14G	V	-
28G	BG	-
29G	L	-

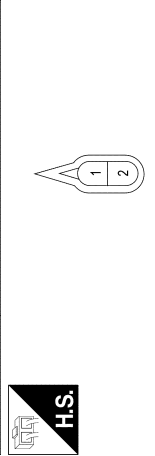
Connector No.	E34
Connector Name	STOP LAMP RELAY
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	R	-
3	P	-
5	W	-

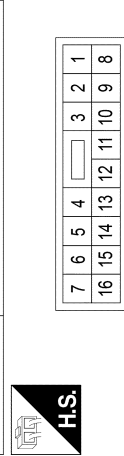
19	BR	SUB ECU
35	LG	ABS ECU

Connector No.	E24
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Type	YU02FGY
Connector Color	GRAY



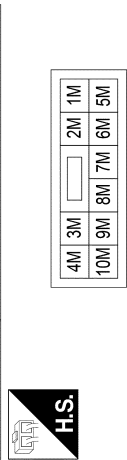
Terminal No.	Color of Wire	Signal Name
1	BG	-
2	GR	-

Connector No.	E29
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS
Connector Color	WHITE



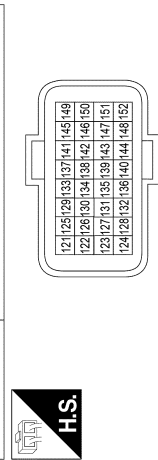
Terminal No.	Color of Wire	Signal Name
13	BR	-
14	LG	-
15	L	-
16	Y	-

Connector No.	E6
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE



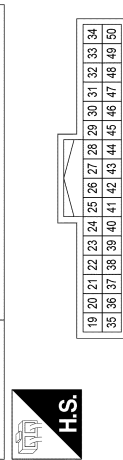
Terminal No.	Color of Wire	Signal Name
5M	P	-
7M	GR	-
8M	W	-

Connector No.	E10
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
123	P	CAN-L
124	L	CAN-H
139	GR	STOP LAMP SWITCH

Connector No.	E19
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH32FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
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BRAKE CONTROL SYSTEM

[WITH ICC]

< WIRING DIAGRAM >

Connector No.	E52
Connector Name	VDC RESISTOR
Connector Type	M02FBR-LC
Connector Color	BROWN



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

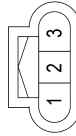
18	P	-
19	P	-
20	P	-
21	P	-
26	BR	-
27	BR	-
30	LG	-
31	LG	-
32	LG	-

Connector No.	E41
Connector Name	FRONT WHEEL SENSOR RH
Connector Type	RK02MGY
Connector Color	GRAY



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

Connector No.	E51
Connector Name	VACUUM SENSOR
Connector Type	RH03FB
Connector Color	BLACK



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

Connector No.	E35
Connector Name	PARKING BRAKE SWITCH
Connector Type	P01FB-A
Connector Color	BLACK



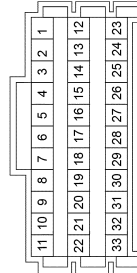
Terminal No.	Color of Wire	Signal Name
1	L	-

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	-
2	R	-
3	LG	-
4	P	-

Connector No.	E39
Connector Name	JOINT CONNECTOR-E08
Connector Type	BJ30FW
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16	W	-
17	W	-

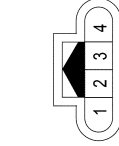
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BRAKE CONTROL SYSTEM

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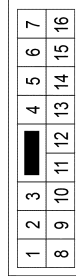
[WITH ICC]

2	LG	-
Connector No.	C5	
Connector Name	WIRE TO WIRE	
Connector Type	RH04MB	
Connector Color	BLACK	



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	LG	-
3	SB	-
4	BR	-

Connector No.	B10	
Connector Name	WIRE TO WIRE	
Connector Type	NS16MM-CS	
Connector Color	WHITE	



Terminal No.	Color of Wire	Signal Name
13	BR	-
14	LG	-
15	L	-
16	Y	-

38	-	-
Connector No.	E68	
Connector Name	FRONT WHEEL SENSOR LH	
Connector Type	RK02MGY	
Connector Color	GRAY	



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

Connector No.	C1	
Connector Name	REAR WHEEL SENSOR LH	
Connector Type	RH02FB	
Connector Color	BLACK	



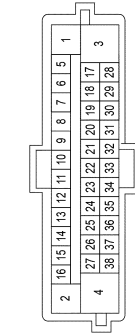
Terminal No.	Color of Wire	Signal Name
1	SB	-
2	BR	-

Connector No.	C2	
Connector Name	REAR WHEEL SENSOR RH	
Connector Type	RH02FB	
Connector Color	BLACK	



Terminal No.	Color of Wire	Signal Name
1	Y	-

Connector No.	E53	
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITH INTELLIGENT CRUISE CONTROL SYSTEM)	
Connector Type	SAZ34FB-HS2-SJZ2-UH	
Connector Color	BLACK	



Terminal No.	Color of Wire	Signal Name
1	R	UB VR
2	B	GND ECU
3	W	UB MR
4	B	GND MR
5	-	-
6	-	-
7	LG	BLS
8	-	-
9	V	VDC OFF
10	-	-
11	SB	WSP FR
12	V	WSS FR
13	BR	WSP RL
14	LG	WSS RL
15	-	-
16	-	-
17	-	-
18	-	-
19	L	CAN-H
20	SHIELD	GND EXT
21	B	USV EXT
22	W	WAC
23	BR	WSP FL
24	Y	WSS FL
25	L	WSP RR
26	Y	WSS RR
27	-	-
28	LG	WALU
29	-	-
30	P	CAN-L
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-

AAFIA0415GB

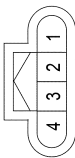
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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH ICC]

Connector No.	B31
Connector Name	WIRE TO WIRE
Connector Type	RH04FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	Y	-
3	BR	-
4	LG	-

AAFIA0416GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000012323331

DETAILED FLOW

1. INTERVIEW THE CUSTOMER

Clarify customer's concerns before inspection. First of all, perform an interview utilizing [BRC-244, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her concerns carefully. Check symptoms by driving vehicle with customer if necessary.

CAUTION:

Customers are not professional. Never guess easily like "maybe the customer means that..." or "maybe the customer mentions this symptom".

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained in the interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-224, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM THE SELF-DIAGNOSIS

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

2. Select "Self Diagnostic Result" mode of "ABS".

Is DTC detected?

- YES >> Record or print Self Diagnostic Results and Freeze Frame Data (FFD). GO TO 4.
 NO >> GO TO 6.

4. RECHECK THE SYMPTOM

CONSULT

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

CAUTION:

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

3. Perform DTC confirmation procedure for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-226, "DTC Inspection Priority Chart"](#).

Is DTC detected?

- YES >> GO TO 5.
 NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-41, "Intermittent Incident"](#).

5. REPAIR OR REPLACE MALFUNCTIONING COMPONENT

1. Repair or replace malfunctioning components.
2. Reconnect component or connector after repairing or replacing it.
3. When DTC is detected, erase "Self Diagnostic Result" mode of "ABS".

CAUTION:

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BRC

DIAGNOSIS AND REPAIR WORK FLOW

[WITH ICC]

< BASIC INSPECTION >

- Turn the ignition switch OFF → ON → OFF after erasing Self Diagnostic Result.
- Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

>> GO TO 7.

6. IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Identify malfunctioning system based on symptom diagnosis and perform inspection.

Can the malfunctioning system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-41](#), "[Intermittent Incident](#)".

7. FINAL CHECK

CONSULT

1. Select "Data Monitor" mode of "ABS".
2. Check the reference values. Refer to [BRC-221](#), "[Reference Value](#)".
3. Recheck the symptom and check that the symptom is not reproduced in the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> Inspection End.



Diagnostic Work Sheet

INFOID:00000001232332

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		Engine/trac-tion Motor		Mileage	km (Mile)
Symptom		<input type="checkbox"/> Does not operate () function			
		<input type="checkbox"/> Warning lamp turns ON.			
		ABS <input type="checkbox"/> or <input type="checkbox"/> (ABS) BRAKE <input type="checkbox"/> or <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> OFF <input type="checkbox"/>			
		<input type="checkbox"/> Other ()			
		<input type="checkbox"/> Noise (Location:)		<input type="checkbox"/> Vibration (Location:)	
First occurrence		<input type="checkbox"/> Recently <input type="checkbox"/> Other ()			
Frequency of occurrence		<input type="checkbox"/> Always <input type="checkbox"/> Under certain conditions of <input type="checkbox"/> Sometimes (time(s)/day)			
Climate con-ditions		<input type="checkbox"/> Irrelevant			
		Weather <input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <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"/> Ordinary road <input type="checkbox"/> Highway <input type="checkbox"/> Mountainous road (uphill or downhill) <input type="checkbox"/> Rough road			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH ICC]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration		A	
		Vehicle type		VIN		B	
Storage date		Engine/traction Motor		Mileage	km (Mile)		
Operating condition, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine/traction motor starts <input type="checkbox"/> During idling <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"/> Immediately before stop [Vehicle speed: Approx. km/h (MPH)] <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> When steering wheel is steered (to right or to left)				C	
Other conditions	VDC OFF switch operation	<input type="checkbox"/> Yes <input type="checkbox"/> No				E	
	Use of other functions (e.g. ICC)	<input type="checkbox"/> Yes <input type="checkbox"/> No ()					
	Presence of non-genuine parts installation	<input type="checkbox"/> Yes <input type="checkbox"/> No ()				BRC	
Memo							G

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

< BASIC INSPECTION >

[WITH ICC]

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

Description

INFOID:000000012273730

- When replacing the ABS actuator and electric unit (control unit), perform configuration of the ABS actuator and electric unit (control unit). Refer to [BRC-252, "Work Procedure"](#).
- When replacing the ABS actuator and electric unit (control unit), adjust the neutral position of steering angle sensor. Refer to [BRC-248, "Work Procedure"](#).
- When replacing the ABS actuator and electric unit (control unit), perform calibration of the decel G sensor. Refer to [BRC-250, "Work Procedure"](#).

ADDITIONAL SERVICE WHEN REPLACING ICC SENSOR

< BASIC INSPECTION >

[WITH ICC]

ADDITIONAL SERVICE WHEN REPLACING ICC SENSOR

Description

INFOID:0000000012273731

- Always perform the radar alignment aiming adjustment after removing and installing or replacing the ICC sensor.

CAUTION:

The system does not operate normally unless the ICC sensor is aligned properly.

- Perform the ICC system action test to check that the ICC system operates normally.

Work Procedure

INFOID:0000000012273732

1. RADAR ALIGNMENT ADJUSTMENT

Adjust the radar alignment. Refer to [BRC-256, "Description"](#).

>> GO TO 2.

2. ICC SYSTEM ACTION TEST

1. Perform the ICC system action test. Refer to [CCS-66, "Description"](#).
2. Check that the ICC system operates normally.

>> Inspection End.

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ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH ICC]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000012273733

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

×: Required –: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	—
Replacing suspension components	×
Changing tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	×

Work Procedure

INFOID:000000012273734

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

CONSULT

1. Select "Work support" and "ST ANGLE SENSOR ADJUSTMENT" in order.
2. Select "Start".

CAUTION:

Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, select "End".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position then stop.
2. Select "Data Monitor". Then make sure "STR ANGLE SIG" is within $0 \pm 3.5^\circ$.

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4. ERASE THE SELF DIAGNOSTIC RESULT MEMORY

Erase the "Self Diagnostic Result" memory of the ABS actuator and electric unit (control unit) and ECM.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

[WITH ICC]

< BASIC INSPECTION >

- ABS actuator and electric unit (control unit): Refer to [BRC-41, "CONSULT Function"](#).
- ECM: Refer to [EC-73, "CONSULT Function"](#).

Are the memories erased?

YES >> Inspection End.

NO >> Check the items indicated by the "Self Diagnostic Result".

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CALIBRATION OF DECEL G SENSOR

[WITH ICC]

< BASIC INSPECTION >

CALIBRATION OF DECEL G SENSOR

Description

INFOID:000000012273735

CAUTION:

Always perform the decel G sensor calibration before driving when the following operation is performed.

NOTE:

Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

×: Required —: Not required

Procedure	Decel G sensor calibration
Removing/installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	×
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:000000012273736

Decel G sensor calibration

CAUTION:

Always use CONSULT for the decel G sensor calibration. (It cannot be adjusted other than with CONSULT.)

NOTE:

Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

1. CHECK THE VEHICLE STATUS

1. Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.
2. Stop the engine.
3. Turn the ignition switch OFF.

Is the vehicle stopped in the straight-ahead position on a level surface?

YES >> GO TO 2.

NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.

2. PERFORM DECEL G SENSOR CALIBRATION

CAUTION:

- Never allow passenger or load on the vehicle.
- Never apply vibration to the vehicle body when opening or closing door during calibration.

CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start engine.

2. Select "ABS", "Work Support" and "DECEL G SEN CALIBRATION" in this order.
3. Select "Start".
4. After approx. 10 seconds, select "End".
5. Turn ignition switch OFF and then turn it ON again.

CAUTION:

Be sure to perform the operation above.

>> GO TO 3.

CALIBRATION OF DECEL G SENSOR

[WITH ICC]

< BASIC INSPECTION >

3. CHECK DATA MONITOR

CONSULT

1. Drive the vehicle. Steer the steering wheel to the straight-ahead position. Stop the vehicle on a level surface.
2. Select “ABS”, “Data Monitor”, “ECU INPUT SIGNALS” and “DECEL G SENSOR” in this order. Check that the signal is within the specified value.

DECEL G SENSOR : Approx. \pm 0.01 G

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 1.

4. ERASE SELF DIAGNOSTIC RESULT MEMORY

CONSULT

Erase “Self Diagnostic Result” mode of “ABS”.

Are the memories erased?

YES >> Inspection End.

NO >> Check the items indicated by the “Self Diagnostic Result”.

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CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

< BASIC INSPECTION >

[WITH ICC]

CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

Work Procedure

INFOID:000000012323333

NOTE:

- After configuration, turn the ignition switch from OFF to ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately 2 seconds.
- If an error occurs during configuration, start over from the beginning.

1. CHECK TYPE ID (1)

CONSULT

1. Select "ECU Identification" mode of "ABS".
2. Write down "ECU PART NUMBER" displayed on the CONSULT screen. This is the ABS actuator and electric unit (control unit) "Type ID".

Is "Type ID" displayed?

- YES-1 >> When replacing ABS actuator and electric unit (control unit): GO TO 3.
- YES-2 >> When re-configuring existing ABS actuator and electric unit (control unit): GO TO 4.
- NO >> GO TO 2.

2. CHECK TYPE ID (2)

1. Use FAST (service parts catalog) to search ABS actuator and electric unit (control unit) of the applicable vehicle and find "Type ID".
2. Write down "Type ID".

- >> • When replacing ABS actuator and electric unit (control unit): GO TO 3.
- When re-configuring existing ABS actuator and electric unit (control unit): GO TO 4.

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

Replace ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

CAUTION:

Do not perform the following work items at this time. These items must be performed after configuration is complete.

- **Air bleeding**
- **Adjustment of steering angle sensor neutral position**
- **Calibration of decel G sensor**

>> GO TO 4.

4. WRITE CONFIGURATION

CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" found using CONSULT "ECU Identification" or FAST (service parts catalog) to write the "Type ID" into the ABS actuator and electric unit (control unit).

>> GO TO 5.

5. VERIFY TYPE ID

Compare the "Type ID" written into the ABS actuator and electric unit (control unit) with the one found using CONSULT "ECU Identification" or FAST (service parts catalog) to confirm they match.

Do Type IDs match?

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

6. CHECK VDC WARNING LAMP

1. Turn the ignition switch OFF.
2. Turn the ignition switch ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately 2 seconds.

CONFIGURATION [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

[WITH ICC]

< BASIC INSPECTION >

NOTE:

Do not start the engine.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Select "Self Diagnostic Result" mode of "ABS". Refer to [BRC-212. "CONSULT Function"](#).

7. PERFORM SUPPLEMENTARY WORK

1. Perform air bleeding. Refer to [BR-15. "Bleeding Brake System"](#).
2. Perform adjustment of steering angle sensor neutral position. Refer to [BRC-248. "Work Procedure"](#).
3. Perform calibration of decel G sensor. Refer to [BRC-250. "Work Procedure"](#).
4. Perform "Self Diagnostic Result" of all systems.
5. Erase "Self Diagnostic Result".

>> Work End.

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ICC SENSOR INITIAL VERTICAL ALIGNMENT

< BASIC INSPECTION >

[WITH ICC]

ICC SENSOR INITIAL VERTICAL ALIGNMENT

Description

INFOID:000000012273738

WARNING:

Radio waves could adversely affect electric medical equipment. Those who use a pacemaker should contact the electric medical equipment manufacturer for the possible influences before use.

OUTLINE OF ICC SENSOR INITIAL ALIGNMENT PROCEDURE

- Always perform the ICC sensor initial vertical alignment after removing and installing or replacing the ICC sensor.

CAUTION:

The system does not operate normally unless the ICC sensor is aligned properly.

1. For required tools, refer to [BRC-254, "Required Tools"](#).
2. For preparation, refer to [BRC-254, "Preparation"](#).
3. For ICC sensor initial vertical alignment, refer to [BRC-255, "ICC Sensor Initial Vertical Alignment"](#).

CAUTIONARY POINT FOR DISTANCE SENSOR ALIGNMENT PROCEDURE

CAUTION:

- For Distance sensor alignment procedure, choose a level location with a few feet of working space in front and surrounding the vehicle.
- Vehicle must be stationary and unoccupied during the whole alignment procedure.
- Never enter the vehicle during ICC sensor alignment.
- For proper system operation and adjustment, all vehicle wheels must be the original factory size.

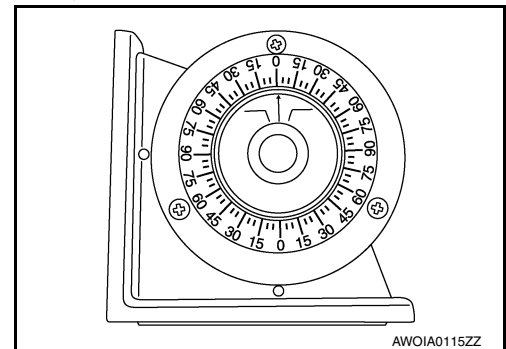
The ICC sensor requires alignment whenever the ICC sensor is removed and reinstalled and whenever front end structural repairs are performed. ICC sensor alignment consists of performing the mechanical vertical alignment (ICC sensor initial vertical alignment) described in the following procedure, followed by the electronic horizontal alignment (ICC sensor alignment) that is performed using CONSULT and the appropriate special service tools.

Required Tools

INFOID:000000012273739

The following tool is necessary to perform the ICC sensor initial vertical alignment:

- Small level or angle meter.



Preparation

INFOID:000000012273740

1. PREPARATION FOR ICC SENSOR INITIAL VERTICAL ALIGNMENT PROCEDURE

1. Verify correct vehicle suspension height. Refer to [WT-73, "Tire"](#).
2. Repair or replace any damaged body components.
3. Verify proper tire inflation pressures. Refer to [FSU-24, "Wheelarch Height \(Unladen*1\)"](#).
4. Remove any accumulations of mud, snow or ice from the vehicle underbody.
5. Verify that there is no load in the vehicle (cargo or passenger).
6. Place the vehicle on a known level horizontal surface such as a wheel or frame alignment rack to achieve satisfactory sensor vertical alignment results.

ICC SENSOR INITIAL VERTICAL ALIGNMENT

< BASIC INSPECTION >

[WITH ICC]

>> Refer to [BRC-255. "ICC Sensor Initial Vertical Alignment"](#).

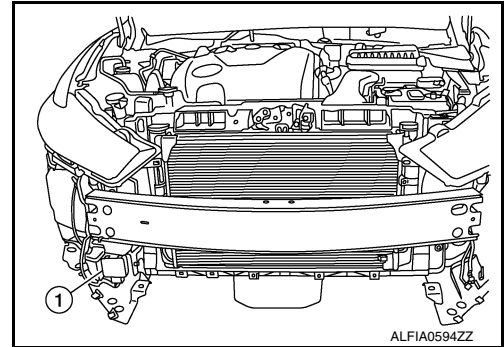
ICC Sensor Initial Vertical Alignment

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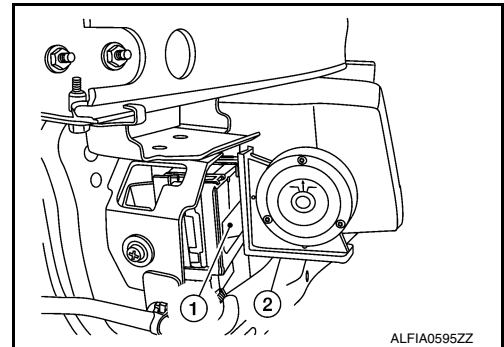
NOTE:

The ICC sensor initial vertical alignment procedure must be performed anytime the ICC sensor is removed and reinstalled.

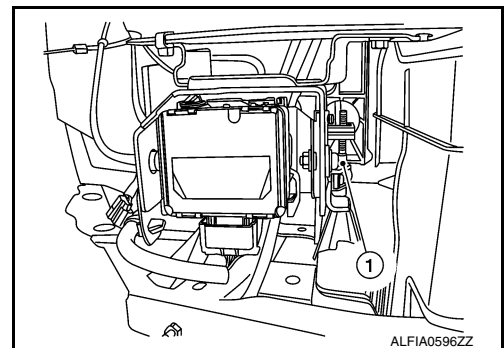
1. The ICC sensor (1) is located near the right front headlamp behind the front bumper fascia.



2. Place the small level or angle meter (2) against the face of the ICC sensor (1).



3. Turn the ICC sensor adjustment screw (1) to level the sensor.



4. Ensure the ICC sensor electrical connector located on the bottom of the sensor is connected.
5. Perform the ICC sensor alignment procedure. Refer to [BRC-256. "Description"](#).

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ICC SENSOR ALIGNMENT

Description

INFOID:000000012273742

WARNING:

Radio waves could adversely affect electric medical equipment. Those who use a pacemaker should contact the electric medical equipment manufacturer for the possible influences before use.

OUTLINE OF ICC SENSOR ALIGNMENT PROCEDURE

- A 4-wheel vehicle alignment must be performed before proceeding with ICC sensor alignment procedure.
- Always perform the ICC sensor alignment after removing and installing or replacing the ICC sensor.
- If the ICC sensor was removed and installed or replaced, first perform ICC Sensor Initial Vertical Alignment, refer to [BRC-254, "Description"](#).

CAUTION:

The system does not operate normally unless the ICC sensor is aligned properly.

1. For required tools, refer to [BRC-256, "Required Tools"](#).
2. For preparation, refer to [BRC-257, "Preparation"](#).
3. For vehicle set up, refer to [BRC-258, "Vehicle Set Up"](#).
4. For setting the ICC target board, refer to [BRC-260, "Setting The ICC Target Board"](#).
5. For ICC sensor adjustment, refer to [BRC-261, "ICC Sensor Adjustment"](#).

CAUTIONARY POINT FOR ICC SENSOR ALIGNMENT PROCEDURE

CAUTION:

- For ICC sensor alignment procedure, choose a level location with a few feet of working space in front and surrounding the vehicle.
- Vehicle must be stationary and unoccupied during the whole alignment procedure.
- Any slight vibration during the alignment procedure can cause the test to fail. If this happens, you will have to restart the alignment process.
- The ignition switch must be in the ON position.
- The battery voltage must not fall below 12 volts during the whole alignment procedure. Failure to maintain adequate battery voltage will cause the test to fail. If this happens, you will have to restart the alignment process.
- The ICC target board must be set in front of the vehicle facing the sensor.
- Adjust the ICC sensor alignment with CONSULT. (The ICC sensor alignment procedure cannot be adjusted without CONSULT.)
- Never enter the vehicle during ICC sensor alignment.
- Never block the area between the ICC sensor and the ICC target board at any time during the alignment process.
- Never break the laser beam between the laser assembly and front ICC target board or rear reflector at any time during alignment.
- Accurate steering wheel setting is crucial. Once set, do not disturb the steering wheel for the remainder of the alignment procedure.
- To avoid physical damage, the ICC sensor adjustment screw must not be forced to either clockwise or counter-clockwise limit. For proper adjustment procedure, follow the directions of the CONSULT exactly as instructed.
- For proper system operation and adjustment, all vehicle wheels must be of the same size.

Required Tools

INFOID:000000012273743

- ICC alignment kit 1-20-2721-1-IF in addition to one of the following:
 - a) Hunter self-centering wheel adapter (Hunter wheel alignment tool)
 - b) Special Service Tool kit 1-20-2722-1-IF (kit SCA W/Tire Clamp-ICC Aiming)

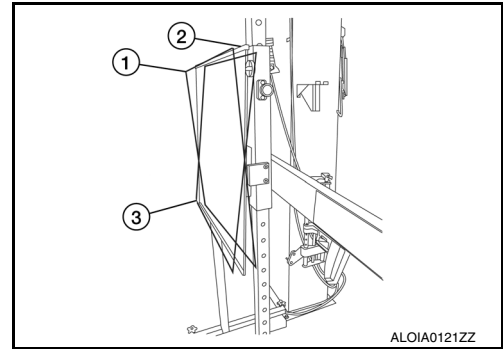
The following ICC alignment kit 1-20-2721-1-IF is necessary to perform the ICC sensor alignment:

ICC SENSOR ALIGNMENT

[WITH ICC]

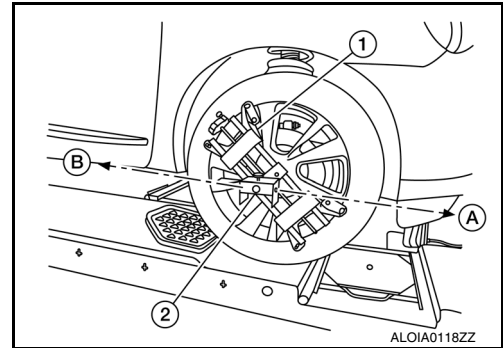
< BASIC INSPECTION >

- ICC target board:
 - Position 1: with top tilted 2° toward vehicle (1).
 - Position 2: vertical (2).
 - Position 3: with top tilted 2° away from vehicle (3).

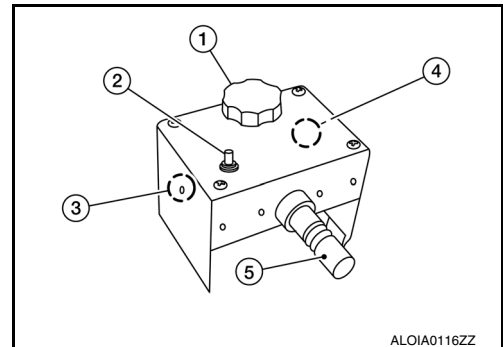


- Hunter self-centering wheel adapter (1) [shown with laser assembly (2) installed] (Hunter alignment rack head may be substituted).

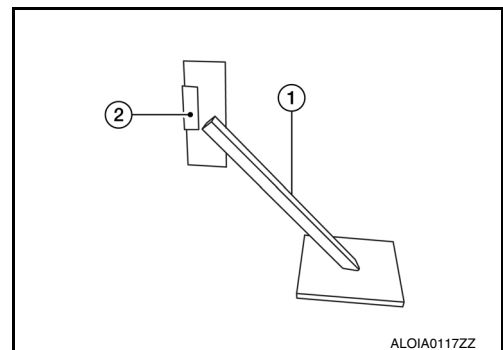
NOTE:
Retailers that are not equipped with a Hunter self-centering wheel adapter will require the following kit:
Part No. 1-20-2722-1-IF (kit SCA with Tire Clamp-ICC Aiming).
When the power switch is turned ON, the front laser (A) will be emitted toward the front ICC target board, and the rear laser signal (B) will be emitted toward the rear of the vehicle.



- Laser assembly (with bi-directional laser beam) as shown in the illustration.
 - Tightening knob (1)
 - Power ON/OFF button (2)
 - Front laser beam opening (3)
 - Rear laser beam opening (4)
 - Attaching shaft (5)



- Stationary target as shown in the illustration.
 - Stationary target (1)
 - Laser signal reception plate (2)



- Distance chain (not shown).

Preparation

INFOID:000000012273744

1. ADVANCE PREPARATION FOR ICC SENSOR ALIGNMENT PROCEDURE

1. Adjust all tire pressure to the specified value.
2. Empty the vehicle. (Remove any luggage from the passenger compartment, luggage room, etc.)
3. Shift the selector lever to "P" position, and release the parking brake.
4. Fully fill the fuel tank, and then check that the coolant and oils are filled to correct level.
5. Clean off the front of the ICC sensor.

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ICC SENSOR ALIGNMENT

< BASIC INSPECTION >

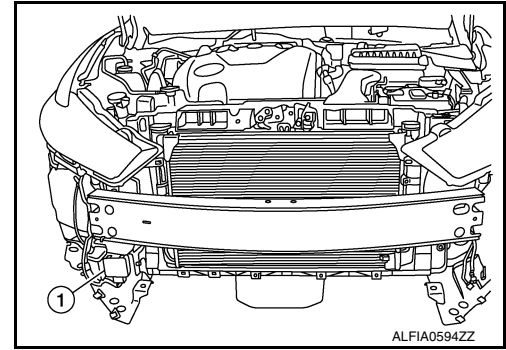
[WITH ICC]

NOTE:

The ICC sensor is located behind the fascia and it is not exposed to the elements. Therefore, it should not require any cleaning.

1 : ICC sensor

>> Refer to [BRC-258. "Vehicle Set Up"](#).



INFOID:000000012273745

Vehicle Set Up

DESCRIPTION

Accurate adjustment of the ICC sensor alignment requires that the ICC target board, wheel adapter, laser assembly, and stationary target be properly positioned.

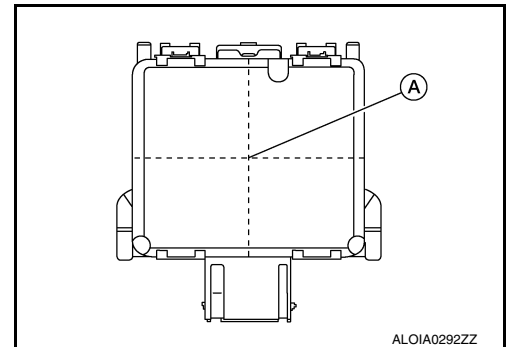
CAUTION:

If the ICC sensor alignment is adjusted with the ICC target board, wheel adapter, laser assembly, or stationary target in the incorrect position, the ICC system will not function properly or the alignment procedure may not be completed successfully.

1. PREPOSITION TARGET BOARD

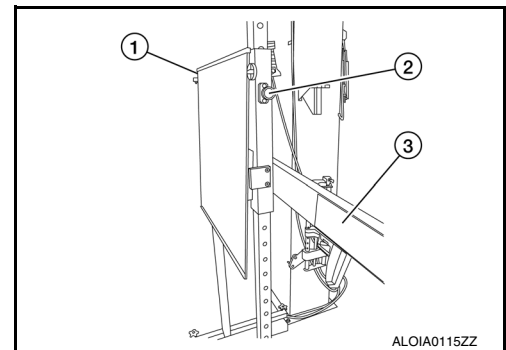
NOTE:

- The center of the sensor wave axis (A) is located at the center of the front lens.



- Initial ICC target board setting must be in the center position.

1. Position the ICC target board in front facing the right front side of the vehicle:
 - Using the full length of the supplied chain for distance, place the marked center of the ICC target board (1) 1200 mm (47.2 in.) \pm 625 mm (24.6 in) away facing the ICC sensor.
 - Adjust the height of the ICC target board using the adjustable nut (2) to achieve the proper height. The up/down tolerance is \pm 80 mm (3.15 in).
 - Adjust the ICC target board lateral position aligning the marked center of the board horizontally with the center of the ICC sensor front lens. The right/left tolerance is \pm 80 mm (3.15 in).
2. Extend the machined arm of the ICC target board exposing the reflective surface (3) to the right front side of the vehicle.

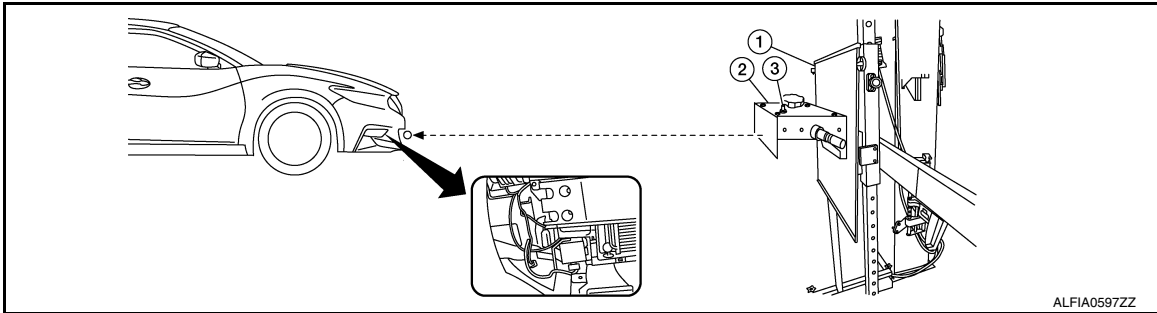


ICC SENSOR ALIGNMENT

[WITH ICC]

< BASIC INSPECTION >

- Place one side of the laser assembly (2) flush against the center of the ICC target board (1) to assist in the positioning.



- Turn the laser assembly ON (3) allowing the laser beam to emit through the opening of the laser assembly toward the center of the ICC sensor.
- Move the ICC target board (1) as necessary so that center of ICC target board aligns with center of ICC sensor.
- Turn the laser assembly OFF when done.

Are you using Hunter alignment equipment?

- YES >> Refer to Hunter's equipment instructions for complete vehicle set up and ICC target board setting. Then, refer to [BRC-261, "ICC Sensor Adjustment"](#).
- NO >> GO TO 2.

2. INSTALLING LASER ASSEMBLY

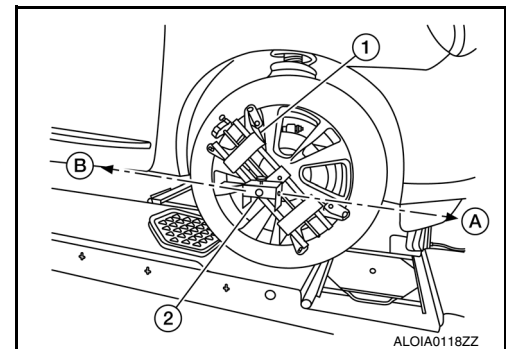
NOTE:

- Ensure the steering wheel is positioned in the center straight-forward position.
 - Ensure all four vehicle wheels do not have any physical damage.
- Install the wheel adapter (1) on the right front wheel.
 - Mount the laser assembly (2) to the wheel adapter (1) as shown in the figure.

NOTE:

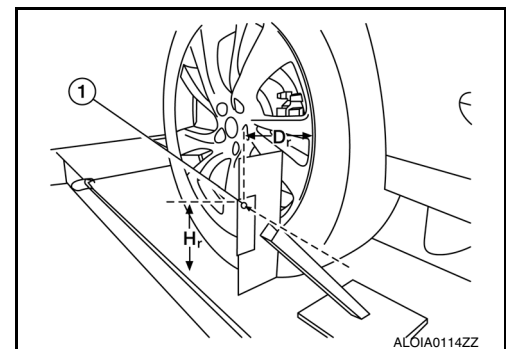
When the power switch is turned ON, the front laser signal (A) will be emitted toward the front ICC target board, and the rear laser signal (B) will be emitted toward the rear of the vehicle.

>> GO TO 3.



3. SETTING UP STATIONARY TARGET

- Place the stationary target next to the right rear tire as shown in the figure.
- Turn the laser assembly ON allowing the laser beam to be emitted through the front and rear laser assembly openings.
- Measure and record the distance (D_r) between the edge of the right rear wheel and the laser beam (1) on the stationary target (horizontal line).
- Measure and record the height (H_r) between the laser beam (1) on the stationary target and ground level (vertical line).



ICC SENSOR ALIGNMENT

[WITH ICC]

< BASIC INSPECTION >

5. Measure and record the distance (D_f) between the edge of the right front wheel and the laser beam signal/opening (1) on the laser assembly (horizontal line).
6. Measure and record the height (H_f) between the laser beam signal/opening (1) on the laser assembly and ground level (vertical line).

NOTE:

- Horizontal adjustment [front distance (D_f) and rear distance (D_r)] is accomplished by slowly turning the steering wheel until the two distances are the same.
- Vertical adjustment [front height (H_f) and rear height (H_r)] is accomplished by rotating the laser assembly around its axis until the two heights are the same.
- Directional arrows (A) and (B) are shown to illustrate the direction of the laser assembly beams.

7. Adjust laser beam as necessary until the two distances match and the two heights match.

NOTE:

You will have to verify both horizontal and vertical adjustments anytime one adjustment is made.

>> Refer to [BRC-260. "Setting The ICC Target Board"](#).

Setting The ICC Target Board

INFOID:000000012273746

DESCRIPTION

Accurate adjustment of the ICC sensor alignment requires that the ICC target board be accurately positioned.

CAUTION:

If the ICC sensor alignment is adjusted with the ICC target board in the incorrect position, the ICC system will not function properly or the alignment procedure may not be completed successfully.

1. ICC TARGET BOARD FINAL SETTING

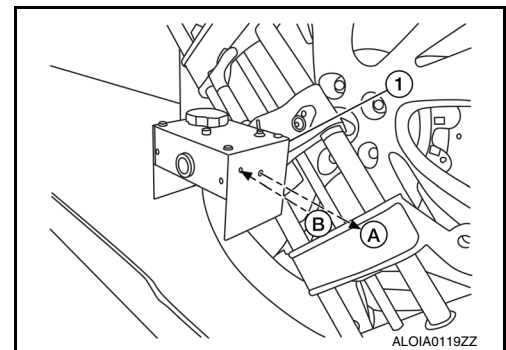
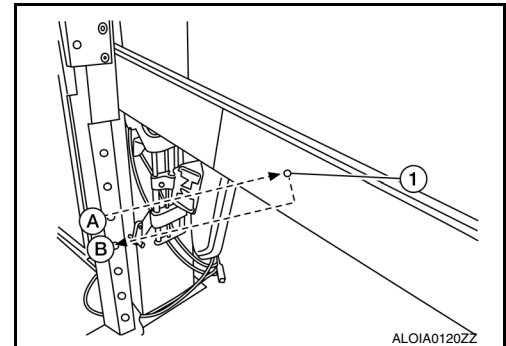
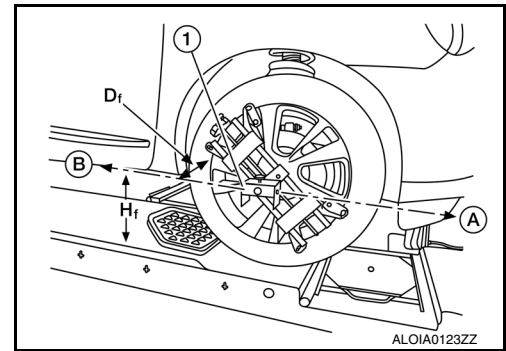
1. With the ICC target board arm extended, the laser beam (1) emitted by the laser assembly (A) will be reflected back (B) toward the laser assembly.

NOTE:

When adjusted properly, reflected laser beam (B) must align with emitted laser beam (A) and the two laser beams will be seen as one.

2. Rotate the ICC target board to achieve the necessary horizontal adjustment.
3. Adjust the ICC target board leveling screws to achieve the necessary vertical adjustment.

4. The figure shown illustrates the laser beam (A) emitted by the laser assembly (1) and its reflection (B) off the ICC target board arm.



>> GO TO 2.

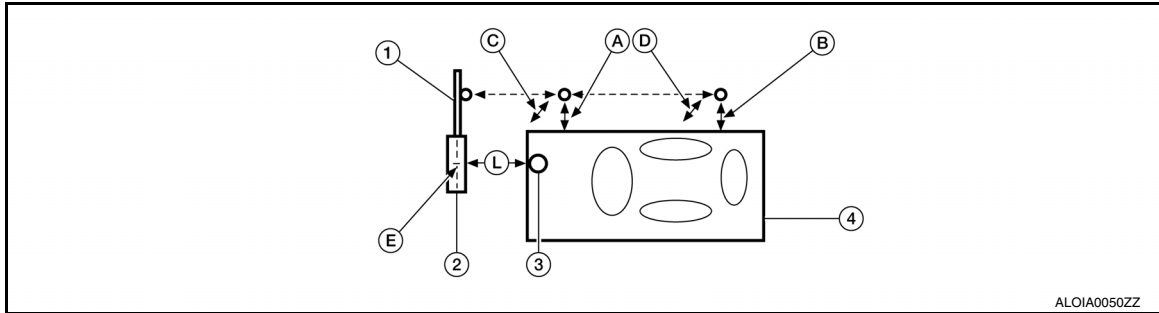
2. CHECK THE POSITION OF THE ICC TARGET BOARD

ICC SENSOR ALIGNMENT

[WITH ICC]

< BASIC INSPECTION >

Do not place anything other than the ICC target board in the space shown in front of the vehicle (view from top).



- | | | |
|---|--|---|
| 1. ICC target board arm | 2. ICC target board | 3. ICC sensor |
| 4. Vehicle | A. Distance between front wheel and laser beam (D_f) | B. Distance between rear wheel and laser beam (D_r) |
| C. Height between front laser beam and ground (H_f) | D. Height between rear laser beam and ground (H_r) | E. ICC target board center position (Position 2) |
| L. 1 - 1.5 m (39.3 - 59 in.) | | |

>> Refer to [BRC-261, "ICC Sensor Adjustment"](#).

ICC Sensor Adjustment

INFOID:000000012273747

DESCRIPTION

- Adjust the ICC sensor alignment in a vertical direction with CONSULT as per the following.
- The ICC sensor alignment in the horizontal direction is performed automatically and cannot be adjusted manually.

CAUTION:

- **Never look directly into or block the ICC sensor source (between the front fascia and ICC target board) during the ICC sensor alignment procedure.**
- **Perform all necessary work for ICC sensor alignment procedure until the adjustment completes as shown in the procedure. If the procedure is started but not completed, the ICC system is rendered inoperable.**

1. SET CONSULT TO THE ICC SENSOR ALIGNMENT MODE

1. Place ignition switch in the ON position.
2. Connect CONSULT and select "LASER/RADAR" then "Work Support".
3. Select "RADAR Alignment".
4. Select "Start" after the "RADAR Alignment" screen is displayed.

NOTE:

If the adjustment screen does not appear or an error appears within approximately 10 seconds after "RADAR Alignment" is selected, the following causes are possible:

- The ICC target board is not installed in the correct position.
- Adequate space is not secured around the ICC target board.
- The ICC sensor alignment procedure exceeds its proper installation range:
 - Deformation of vehicle body
 - Deformation of unit
 - Deformation of bracket
- The area is not suitable for the adjustment work.
- Right front side of fascia (ICC sensor view) is not clean.
- The ICC system warning lamp illuminates.
- Battery voltage is low.
- The extended arm and mirror are not stationary.

>> GO TO 2.

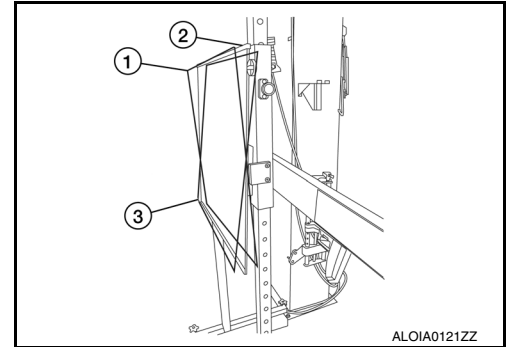
2. ICC SENSOR ALIGNMENT

ICC SENSOR ALIGNMENT

[WITH ICC]

< BASIC INSPECTION >

1. Once the ICC sensor alignment procedure is started, you will be prompted by CONSULT for the next instruction.
2. Follow all the instructions exactly as requested by CONSULT which will include the following:
 - Adjust ICC target board to position 1 (top tilted toward vehicle).
 - Adjust ICC target board to position 2 (vertical position).
 - Adjust ICC target board to position 3 (top tilted away from vehicle)



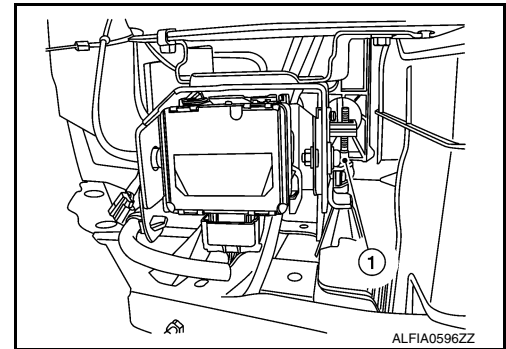
3. You will be prompted with specific instructions to perform physical adjustment to the sensor which may include turning the adjustment screw (1) for a certain number of turns in increments of 0.25 in either direction.

NOTE:

CONSULT is not live and will not automatically update while turning the tool.

CAUTION:

Be careful not to cover the right front side of the fascia (ICC sensor view) with a hand or any other body part during adjustment.



>> GO TO 3.

3. ICC SENSOR ALIGNMENT CONFIRMATION

1. When the "U/D CORRECT" value is executed and the "ADJ VALUE" has been performed, select "End".
2. When "COMPLETED THE VERTICAL AIMING OF LASER BEAM" display appears, select "End".
CAUTION:
Always check that the value of "U/D CORRECT" remains accurate (within specification) when the ICC sensor is left alone for at least 2 seconds.
3. Check that "ADJUSTING AUTOMATIC HORIZONTAL LASER BEAM AIMING" is displayed and wait for a short period of time (Maximum: Approx. 10 seconds).
4. Check that "Normally Completed" is displayed, and select "End" to end "RADAR Alignment".
CAUTION:
Once "RADAR Alignment" is started with CONSULT, always continue the work until the ICC sensor alignment is completed successfully. If the job is stopped midway, the ICC sensor alignment is not completed and the ICC system is rendered inoperative.
5. Confirm proper ICC sensor alignment by following CONSULT steps until it shows "ADJ VALUE" to be 0.00 turn.

>> Alignment End.

ACTION TEST

< BASIC INSPECTION >

[WITH ICC]

ACTION TEST

Description

INFOID:000000012273748

- Perform action test to verify the customer's concern.
- Perform action test and check the system operation after system diagnosis.

Inspection Procedure

INFOID:000000012273749

1.CHECK FEB SYSTEM SETTING

1. Start the engine.
2. Check that the FEB system setting can be enabled/disabled on the vehicle information display.
3. Turn the ignition switch OFF and wait for 30 seconds or more.
4. Check that the previous setting is saved when the engine starts again.

>> GO TO 2.

2.CHECK FEB SYSTEM

1. Enable the setting of the FEB system on the vehicle information display.
2. Check that FEB warning lamp is OFF.

>> Inspection End.

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:000000012378474

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1101	RR RH SENSOR-1 (Rear RH wheel sensor-1)	When an open circuit is detected in rear RH wheel sensor circuit.
C1102	RR LH SENSOR-1 (Rear LH wheel sensor-1)	When an open circuit is detected in rear LH wheel sensor circuit.
C1103	FR RH SENSOR-1 (Front RH wheel sensor-1)	When an open circuit is detected in front RH wheel sensor circuit.
C1104	FR LH SENSOR-1 (Front LH wheel sensor-1)	When an open circuit is detected in front LH wheel sensor circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is "PAST" or "CRNT". If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Wheel sensor• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Vehicle was not driven after previous repair.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "CRNT": Proceed to [BRC-265. "Diagnosis Procedure"](#).

C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

YES-2 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378475

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL SENSOR

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. REPLACE WHEEL SENSOR (1)

CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-362, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-363, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase "Self Diagnostic Result" mode of "ABS".
3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness or connector securely lock the connector. GO TO 4.

4. PERFORM SELF-DIAGNOSIS (1)

CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

5. Stop the vehicle.
6. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
7. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
8. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 5.
NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276](#), "Diagnosis Procedure".

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Repair / replace harness, connector, or terminal. GO TO 7.

7.PERFORM SELF-DIAGNOSIS (2)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
7. Stop the vehicle.
8. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
9. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
10. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 8.
NO >> Inspection End.

8.CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity while turning steering wheel left and right or while moving center harness in wheel housing.)

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E53	23	E68	Front LH wheel	1
	11	E41	Front RH wheel	
	13	C1	Rear LH wheel	
	25	C2	Rear RH wheel	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E53	24	E68	Front LH wheel	2
	12	E41	Front RH wheel	
	14	C1	Rear LH wheel	
	26	C2	Rear RH wheel	

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness or connector, and GO TO 9.

9. PERFORM SELF DIAGNOSTIC RESULT (3)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 10.

NO >> Inspection End.

10. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect ABS actuator and electric unit (control unit) harness connector.
2. Disconnect wheel sensor harness connector.
3. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
4. Turn the ABS active wheel sensor tester power switch ON.

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.

5. 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.

C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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 >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

Ⓟ CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-362, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-363, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:000000012378476

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Vehicle was not driven after previous repair.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Start the engine.
- Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- Stop the vehicle.
- Turn the ignition switch OFF.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "CRNT": Proceed to [BRC-270, "Diagnosis Procedure"](#).

YES-2 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012378477

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.

- Front: Refer to [FSU-6, "Inspection"](#).
- Rear: Refer to [RSU-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the wheel hub assembly. GO TO 2.

- Front: Refer to [BRC-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
- Rear: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK TIRE

1. Turn the ignition switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-73, "Tire"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust air pressure or replace tire. GO TO 4.

4. CHECK DATA MONITOR (1)

 CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Select "Data Monitor" mode of "ABS", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. is the difference within 5%. respectively?

YES >> GO TO 5.

NO >> GO TO 6.

5.PERFORM SELF-DIAGNOSIS (1)

CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 6.

NO >> Inspection End.

6.CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

3. Remove dust and foreign matter adhered to the wheel sensor and 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-164, "FRONT WHEEL SENSOR : Exploded View"](#).

• Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Exploded View"](#).

>> GO TO 7.

7.CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 9.

8.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

2. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.

3. Turn the ABS active wheel sensor tester power switch ON.

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.

4. 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 12.

NO >> GO TO 9.

9.REPLACE WHEEL SENSOR (1)

CONSULT

C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Replace the wheel sensor.
 - Front: Refer to [BRC-164, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning 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 20.

10. PERFORM SELF-DIAGNOSIS (2)

Ⓟ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.

NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 11.

NO >> Inspection End.

11. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 12.

12. CHECK DATA MONITOR (2)

Ⓟ CONSULT

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

NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:
Set the "Data Monitor" recording speed to "10 msec".
5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5% respectively?

- YES >> GO TO 13.
NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (3)

Ⓜ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

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

- YES >> GO TO 14.
NO >> Inspection End.

14.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 17.
NO >> Repair / replace harness, connector, or terminal. GO TO 15.

15.CHECK DATA MONITOR (3)

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
NOTE:
Set the "Data Monitor" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5% respectively?

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

16.PERFORM SELF-DIAGNOSIS (4)

Ⓜ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 17.

NO >> Inspection End.

17. CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E53	23	Ground	No
	11		
	13		
	25		

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair / replace harness or connector. GO TO 18.

18. CHECK DATA MONITOR (4)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

19. PERFORM SELF-DIAGNOSIS (5)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

20. REPLACE SENSOR ROTOR

Ⓜ CONSULT

1. Replace the sensor rotor.

- Front: Refer to [BRC-365, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).

- Rear: Refer to [BRC-365, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

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

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.

5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.

7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:000000012378478

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	When ignition power supply voltage is in following state: <ul style="list-style-type: none">• Ignition power supply voltage: $10\text{ V} \geq$ ignition power supply voltage• Ignition power supply voltage: $16\text{ V} \leq$ ignition power supply voltage

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• IPDM E/R• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1109" detected?

YES-1 >> "C1109" is displayed as "CRNT": Proceed to [BRC-276, "Diagnosis Procedure"](#).

YES-2 >> "C1109" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378479

1. CHECK CONNECTOR

1. Turn the ignition 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 harness or connector and securely lock the connector. GO TO 2.

C1109 POWER AND GROUND SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

1. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Description

INFOID:000000012378480

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1110	CONTROLLER FAILURE (Controller failure)	When there is an internal malfunction in the ABS actuator and electric unit (control unit).
C1153	EMERGENCY BRAKE (Emergency brake)	When ABS actuator and electric unit (control unit) is malfunctioning (pressure increase is too much or too little).

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

DTC	PAST DTC	CRNT DTC
C1110	<ul style="list-style-type: none">The vehicle travels near high-voltage electrical power lines.Motor that is built into the ABS actuator and electric unit (control unit) operates temporarily without a break.Harness or connectorABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery	<ul style="list-style-type: none">ABS actuator and electric unit (control unit)Harness or connectorABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery
C1153	<ul style="list-style-type: none">The vehicle travels near high-voltage electrical power lines.ABS operates for a long time (e.g., travel under a tire hydroplaning condition).	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1110" or "C1153" detected?

YES-1 >> "C1110" or "C1153" is displayed as "CRNT": Proceed to [BRC-279, "Diagnosis Procedure"](#).

YES-2 >> "C1110" or "C1153" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

Diagnosis Procedure

INFOID:000000012378481

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Ⓜ CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

Was neutral position adjustment of steering angle sensor finished?

YES >> GO TO 2.

NO >> Check the steering angle sensor system. Refer to [BRC-307, "Diagnosis Procedure"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

Select "Self Diagnostic Result" mode of "ABS".

NOTE:

Replace the ABS actuator and electric unit (control unit) even if other DTCs are displayed along with "C1110" or "C1153" in "Self Diagnostic Result" mode of "ABS".

Is DTC "C1110" or "C1153" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End. (Although motor that is built into the ABS actuator and electric unit (control unit) operates temporarily without a break, this is not a malfunction. Erase "Self Diagnostic Result" mode of "ABS".)

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:000000012378482

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1111	PUMP MOTOR (Pump motor and motor relay)	When a malfunction is detected in motor or motor relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1111" detected?

YES-1 >> "C1111" is displayed as "CRNT": Proceed to [BRC-280, "Diagnosis Procedure"](#).

YES-2 >> "C1111" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378483

1. CHECK CONNECTOR

1. Turn the ignition 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 harness or connector, securely lock the connector. GO TO 2.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

2. PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Start the engine.
3. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
4. Stop the vehicle.
5. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
6. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
7. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1111" detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness, connector, or fuse. GO TO 4.

4. ERASE SELF-DIAGNOSIS RESULT (1)

Ⓜ CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" mode of "ABS".
5. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

5. CHECK TERMINAL

1. Turn the ignition 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 the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).
NO >> Repair / replace harness or connector, and GO TO 6.

6. ERASE SELF-DIAGNOSIS RESULT (2)

Ⓜ CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" mode of "ABS".

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

5. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

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

DTC Description

INFOID:000000012378484

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1113	G-SENSOR (Decel G sensor circuit)	When a malfunction is detected in the longitudinal G sensor internal to the ABS actuator and electric unit (control unit).
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	When a malfunction is detected in the yaw rate sensor internal to the ABS actuator and electric unit (control unit).
C1146	SIDE G-SEN CIRCUIT (Side G sensor circuit)	When a malfunction is detected in side G sensor internal to the ABS actuator and electric unit (control unit).

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

DTC	PAST DTC	CRNT DTC
C1113	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Change in vehicle posture (e.g., different tire sizes on front and rear, overload) 	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) Change in vehicle posture (e.g., different tire sizes on front and rear, overload)
C1145	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	ABS actuator and electric unit (control unit)
C1146	<ul style="list-style-type: none"> ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1113", "C1145", or "C1146" is displayed as "CRNT": Proceed to [BRC-284, "Diagnosis Procedure"](#).

YES-2 >> "C1113", "C1145", or "C1146" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

Diagnosis Procedure

INFOID:000000012378485

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness, connector, fuse, or fusible link.

2. CHECK CONNECTOR

1. Turn the ignition 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 / replace harness or connector and securely lock the connector. GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1115 WHEEL SENSOR

DTC Description

INFOID:000000012378486

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1115	ABS SENSOR [ABNORMAL SIGNAL] (Wheel sensor [abnormal signal])	When difference in wheel speed between any wheel and others is detected when the vehicle is driven because of installation of tires other than as specified.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Wheel sensor• Sensor rotor• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Wheel sensor• Sensor rotor• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Tire size

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES-1 >> "C1115" is displayed as "CRNT": Proceed to [BRC-285, "Diagnosis Procedure"](#).

YES-2 >> "C1115" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378487

CAUTION:

Never check between wheel sensor harness connector terminals.

C1115 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to [WT-73, "Tire"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Adjust air pressure or replace tire. GO TO 2.

2. CHECK DATA MONITOR (1)

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 3.

NO >> GO TO 4.

3. PERFORM SELF-DIAGNOSIS (1)

CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> GO TO 4.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

3. Remove dust and foreign matter adhered to the wheel sensor and 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-164, "FRONT WHEEL SENSOR : Exploded View"](#).

• Rear: Refer to [BRC-165, "REAR WHEEL SENSOR : Exploded View"](#).

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

>> GO TO 6.

6. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 8.

7. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect ABS actuator and electric unit (control unit) harness connector.
2. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
3. Turn the ABS active wheel sensor tester power switch ON.

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.

4. 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 11.

NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-362, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-363, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

YES >> GO TO 9.

NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

C1115 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1115" detected?

- YES >> GO TO 10.
NO >> Inspection End.

10.CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 12.
NO >> Repair / replace harness or connector and securely lock the connector. GO TO 11.

11.CHECK DATA MONITOR (2)

Ⓜ CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

5. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

- YES >> GO TO 12.
NO >> GO TO 13.

12.PERFORM SELF-DIAGNOSIS (3)

Ⓜ CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 13.
NO >> Inspection End.

13.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 16.
NO >> Repair / replace harness, connector, or terminal. GO TO 14.

14.CHECK DATA MONITOR (3)

Ⓜ CONSULT

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

C1115 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
 - NOTE:**
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
 - NOTE:**
Set the "Data Monitor" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
 - NOTE:**
Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. Is the difference within 5%, respectively?

- YES >> GO TO 15.
NO >> GO TO 16.

15.PERFORM SELF-DIAGNOSIS (4)

CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
 - NOTE:**
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
 - NOTE:**
Wait at least 10 seconds after starting the engine.
4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 16.
NO >> Inspection End.

16.CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity while turning steering wheel left and right or while moving center harness in wheel housing.)

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E53	23	E68	(Front LH wheel)	1 Yes
	11	E41	(Front RH wheel)	
	13	C1	(Rear LH wheel)	
	25	C2	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E53	24	E68	(Front LH wheel)	2 Yes
	12	E41	(Front RH wheel)	
	14	C1	(Rear LH wheel)	
	26	C2	(Rear RH wheel)	

C1115 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E53	23	Ground	No
	11		
	13		
	25		

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair / replace harness or connector. GO TO 17.

17. CHECK DATA MONITOR (4)

Ⓟ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "Data Monitor" mode of "ABS" and check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "Data Monitor" recording speed to "10 msec".

7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the malfunctioning 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 >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

18. PERFORM SELF-DIAGNOSIS (5)

Ⓟ CONSULT

1. Stop the vehicle.
 2. Turn the ignition switch OFF.
- #### NOTE:
- Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

19. REPLACE SENSOR ROTOR

Ⓟ CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-167, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-167, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" mode of "ABS"

C1115 WHEEL SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Inspection End.

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C1116 STOP LAMP SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Description

INFOID:000000012378488

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1116	STOP LAMP SW (Stop lamp switch)	When stop lamp switch signal is not inputted when brake pedal operates.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Stop lamp switch signal circuit	<ul style="list-style-type: none">• Harness or connector• Stop lamp relay• Stop lamp switch• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

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

NOTE:

Stop the vehicle.

3. Wait 1 minute or more.

NOTE:

Never depress brake pedal.

4. Depress brake pedal 100 mm (3.94 in) or more, and maintain that position for a minimum of 1 minute or more.
5. Release brake pedal, and wait 1 minute or more.
6. Repeat steps 4 through 5 ten or more times.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1116" detected?

- YES-1 >> "C1116" is displayed as "CRNT": Proceed to [BRC-293, "Diagnosis Procedure"](#).
YES-2 >> "C1116" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

C1116 STOP LAMP SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000012378489

Diagnosis Procedure

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 were simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Depress the brake pedal several times.

5. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

6. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

7. Select "Self Diagnostic Result" mode 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 lamps turns ON.

Does the stop lamp turn ON?

YES >> GO TO 5.

NO >> Check the stop lamp system. Refer to [BRC-54. "Wiring Diagram"](#). GO TO 4.

4. CHECK DATA MONITOR (1)

CONSULT

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

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "Data Monitor" mode of "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 5.

5. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.

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

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

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C1116 STOP LAMP SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp relay harness connector.
6. Check the stop lamp relay harness connector for disconnection or looseness.
7. Check the stop lamp relay pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, or terminal. GO TO 6.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, fuse, or fusible link.

7. CHECK DATA MONITOR (2)

CONSULT

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

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "Data Monitor" mode of "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 8.

8. CHECK STOP LAMP SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E53	7	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness or connector. GO TO 9.

9. CHECK STOP LAMP SWITCH CIRCUIT (2)

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

ABS actuator and electric unit (control unit)		Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	
E53	7	E38	3	Yes

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

C1116 STOP LAMP SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E53	7	Ground	No

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness or connector. GO TO 10.

10. CHECK DATA MONITOR (3)

CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.

NOTE:

Stop the vehicle.

6. Select "Data Monitor" of mode "ABS" and check "STOP LAMP SW". Check that "Data Monitor" displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

Component Inspection

INFOID:0000000012378490

1. CHECK STOP LAMP SWITCH

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

Stop lamp switch	Condition	Continuity
Terminals		
3 – 4	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 the stop lamp switch. Refer to [BR-20, "Exploded View"](#).

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:000000012378491

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1120	FR LH IN ABS SOL (Front LH ABS IN solenoid valve)	When a malfunction is detected in front LH ABS IN valve.
C1122	FR RH IN ABS SOL (Front RH ABS IN solenoid valve)	When a malfunction is detected in front RH ABS IN valve.
C1124	RR LH IN ABS SOL (Rear LH ABS IN solenoid valve)	When a malfunction is detected in rear LH ABS IN valve.
C1126	RR RH IN ABS SOL (Rear RH ABS IN solenoid valve)	When a malfunction is detected in rear RH ABS IN valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "CRNT": Proceed to [BRC-296, "Diagnosis Procedure"](#).

YES-2 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378492

1. CHECK CONNECTOR

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition 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 / replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.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 the ABS actuator and electric unit (control unit). Refer to [BRC-168](#), "[Removal and Installation](#)".

NO >> Repair / replace harness, connector, or terminal.

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C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:000000012378493

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1121	FR LH OUT ABS SOL (Front LH ABS OUT solenoid valve)	When a malfunction is detected in front LH ABS OUT valve.
C1123	FR RH OUT ABS SOL (Front RH ABS OUT solenoid valve)	When a malfunction is detected in front RH ABS OUT valve.
C1125	RR LH OUT ABS SOL (Rear LH ABS OUT solenoid valve)	When a malfunction is detected in rear LH ABS OUT valve.
C1127	RR RH OUT ABS SOL (Rear RH ABS OUT solenoid valve)	When a malfunction is detected in rear RH ABS OUT valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "CRNT": Proceed to [BRC-298, "Diagnosis Procedure"](#).

YES-2 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378494

1. CHECK CONNECTOR

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition 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 / replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.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 the ABS actuator and electric unit (control unit). Refer to [BRC-168](#), "[Removal and Installation](#)".

NO >> Repair / replace harness, connector, or terminal.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1130 ENGINE SIGNAL

DTC Description

INFOID:000000012378495

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1130	ENGINE SIGNAL 1 (Engine system signal)	When a malfunction is detected in ECM system.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line	<ul style="list-style-type: none">• Harness or connector• ECM• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1130" detected?

YES-1 >> "C1130" is displayed as "CRNT": Proceed to [BRC-300, "Diagnosis Procedure"](#).

YES-2 >> "C1130" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378496

1. CHECK ENGINE SYSTEM

CONSULT

Select "Self Diagnostic Result" mode of "ENGINE".

Is DTC detected?

YES >> Check the DTC. Refer to [EC-107, "DTC Index"](#) (VQ35DE).

NO >> GO TO 2.

C1130 ENGINE SIGNAL

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal and securely lock the connector. GO TO 4.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

CONSULT

1. Connect ECM harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1130" or "U1000" detected?

YES ("C1130")>> GO TO 1.

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

NO >> Inspection End.

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C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:000000012378497

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1140	ACTUATOR RLY (Actuator relay)	When a malfunction is detected in actuator relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1140" detected?

YES-1 >> "C1140" is displayed as "CRNT": Proceed to [BRC-302, "Diagnosis Procedure"](#).

YES-2 >> "C1140" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378498

1. CHECK CONNECTOR

1. Turn the ignition 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 harness or connector and securely lock the connector. GO TO 2.

2. PERFORM SELF-DIAGNOSIS

Ⓟ CONSULT

C1140 ACTUATOR RELAY SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> Inspection Ed.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276. "DTC Description"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.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 the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1142 PRESS SENSOR

DTC Description

INFOID:000000012378499

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1142	PRESS SEN CIRCUIT (Pressure sensor circuit)	When a malfunction is detected in pressure sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Air inclusion in the brake piping• Stop lamp switch system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Stop lamp switch system• ABS actuator and electric unit (control unit)• Brake system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Air inclusion in the brake piping

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1142" detected?

YES-1 >> "C1142" is displayed as "CRNT": Proceed to [BRC-304, "Diagnosis Procedure"](#).

YES-2 >> "C1142" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378500

1. STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to [BRC-293, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2. CHECK BRAKE FLUID LEAKAGE

C1142 PRESS SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

Check the brake fluid leakage. Refer to [BR-14, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping. Refer to [BR-22, "FRONT : Exploded View"](#) or [BR-28, "REAR : Removal and Installation"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to [BR-25, "FRONT : Removal and Installation"](#).

- Rear: Refer to [BR-28, "REAR : Removal and Installation"](#).

4.CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to [BR-12, "Inspection"](#).

- Brake pedal assembly: Refer to [BR-20, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust the brake pedal height or replace brake pedal assembly.

- Adjust the brake pedal height: Refer to [BR-12, "Adjustment"](#).

- Replace the brake pedal assembly: Refer to [BR-20, "Removal and Installation"](#).

5.CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to [BR-7, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to [BR-30, "Removal and Installation"](#).

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to [BR-32, "Removal and installation"](#).

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

8.CHECK FRONT DISC BRAKE

Check the front disc brake caliper. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace front disc brake caliper. Refer to [BR-39, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

9.CHECK REAR DISC BRAKE

Check the rear disc brake. Refer to [BR-46, "DISC BRAKE ROTOR : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace rear disc brake. Refer to [BR-46, "DISC BRAKE ROTOR : Removal and Installation"](#).

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

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C1142 PRESS SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness, connector, fuse, or fusible link.

11. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Ⓟ CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Start the engine and drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.
6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1142" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:000000012378501

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1143	ST ANG SEN CIRCUIT (Steering angle sensor circuit)	When a malfunction is detected in steering angle sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line• Incomplete neutral position adjustment of steering angle sensor• Improper installation of steering angle sensor	<ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• IPDM E/R• CAN communication line• Wheel alignment• Incomplete neutral position adjustment of steering angle sensor• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": Proceed to [BRC-307, "Diagnosis Procedure"](#).

YES-2 >> "C1143" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378502

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

C1143 STEERING ANGLE SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": GO TO 3.

YES-2 >> "C1143" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" of "ABS".)

NO >> Inspection End.

3.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector and securely lock the connector. GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

Ⓟ CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1143" detected?

YES >> GO TO 5.

NO >> Inspection End.

5.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Turn the ignition 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		
M53	4	Ground	0 V

4. Turn the ignition switch ON.

NOTE:

Start the engine.

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

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M53	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

C1143 STEERING ANGLE SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 49 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

Steering angle sensor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M53	4	E19	19	Yes

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M53	4	Ground	No

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair / replace harness, connector, or fuse.

7. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M53	1	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Repair / replace harness or connector.

8. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair / replace harness, connector, fuse, or fusible link.

9. CHECK TERMINAL

1. Check the steering angle sensor pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 10.
NO >> Repair / replace harness, connector, or terminal.

10. CHECK CAN COMMUNICATION LINE

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

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair / replace harness or connector.

11. CHECK DATA MONITOR

Ⓜ CONSULT

1. Select "Data Monitor" mode of "ABS" and check "STR ANGLE SIG".

C1143 STEERING ANGLE SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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-46, "Reference Value"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).
- NO >> Replace the steering angle sensor. Refer to [BRC-172, "Removal and Installation"](#).

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:000000012378503

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1144	ST ANG SEN SIGNAL (Steering angle sensor not complete)	When neutral position adjustment of steering angle sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

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

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1144" detected?

YES-1 >> "C1144" is displayed as "CRNT": Proceed to [BRC-311, "Diagnosis Procedure"](#).

YES-2 >> "C1144" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378504

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-64, "Description"](#).

>> GO TO 2.

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

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> Inspection End.

3.CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the ignition switch OFF.

2. Check the steering angle sensor system. Refer to [BRC-307, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal.

4.CHECK DATA MONITOR

④ CONSULT

1. Select "Data Monitor" mode of "ABS" and check "STR ANGLE SIG".

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-46, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-172, "Removal and Installation"](#).

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1154 TRANSMISSION RANGE SWITCH

DTC Description

INFOID:000000012378505

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1154	PNP POSI SIG (PNP position signal)	When a malfunction is detected in TCM system.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Transmission range switch	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• TCM• Transmission range switch

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1154" detected?

YES-1 >> "C1154" is displayed as "CRNT": Proceed to [BRC-313, "Diagnosis Procedure"](#).

YES-2 >> "C1154" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378506

CAUTION:

"C1154" may be detected when going up a slope, being towed with ignition switch ON and the shift selector in a position other than R position. This is not a shift position error. The system returns to normal once the vehicle is stopped, parked on level ground and the engine is started.

1. CHECK CVT SYSTEM

CONSULT

Select "Self Diagnostic Result" mode of "TRANSMISSION".

Is DTC detected?

YES >> Check the DTC. Refer to [TM-58, "DTC Index"](#) (RE0F10H).

NO >> GO TO 2.

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

2. PERFORM SELF-DIAGNOSIS

CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.
6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1154" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).
- NO >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair / replace harness, connector, or terminal.

C1155 BRAKE FLUID LEVEL SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:000000012378507

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	<ul style="list-style-type: none"> When brake fluid level low signal is detected. When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Brake fluid level is low. 	<ul style="list-style-type: none"> Harness or connector ABS actuator and electric unit (control unit) Brake fluid level switch Combination meter Brake fluid level is low.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES-1 >> "C1155" is displayed as "CRNT": Proceed to [BRC-315, "Diagnosis Procedure"](#).

YES-2 >> "C1155" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378508

1. CHECK BRAKE FLUID LEVEL

- Turn the ignition switch OFF.
- Check the brake fluid level. Refer to [BR-14, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refill brake fluid. Refer to [BR-14, "Drain and Refill"](#). GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

CONSULT

- Erase "Self Diagnostic Result" of mode "ABS".

C1155 BRAKE FLUID LEVEL SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> Inspection End.

3.CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the combination meter harness connector for disconnection or looseness.
- Check the brake fluid level switch harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector. GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

Ⓟ CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode 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 [BR-30, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to [BR-30, "Exploded View"](#). GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

Ⓟ CONSULT

- Erase "Self Diagnostic Result" mode of "ABS"

- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> Inspection End.

7.CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector.
- Check the brake fluid level switch harness connector for disconnection or looseness.
- Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- Disconnect combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

6. Check the combination meter harness connector for disconnection or looseness.
7. Check the combination meter pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, or terminal. GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

CONSULT

1. Erase "Self Diagnostic Result" mode of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 9.

NO >> Inspection End.

9.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

1. Turn the ignition 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	
E24	1	M24	25	Yes

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E24	1	Ground	No

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness or connector. GO TO 10.

10.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E24	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector. GO TO 11.

11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-20, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

C1155 BRAKE FLUID LEVEL SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace combination meter. Refer to [MWI-68. "Removal and Installation"](#).

Component Inspection

INFOID:000000012378509

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition 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
Terminals		
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 the reservoir tank. Refer to [BR-30. "Exploded View"](#).

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Description

INFOID:000000012378510

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1160	DECEL G SEN SET (Decel G sensor set)	When calibration of yaw rate/side/decel G sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Incomplete calibration of decel G sensor • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1160" detected?

YES-1 >> "C1160" is displayed as "CRNT": Proceed to [BRC-319. "Diagnosis Procedure"](#).

YES-2 >> "C1160" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378511

1. CALIBRATION OF DECEL G SENSOR

Perform calibration of decel G sensor. Refer to [BRC-66. "Description"](#).

>> GO TO 2.

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

CONSULT

1. Turn the ignition switch OFF.

NOTE:

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" mode of "ABS".

Is DTC "C1160" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

NO >> Inspection End.

C1164, C1165 CV SYSTEM

DTC Description

INFOID:000000012378512

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION?

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed as "CRNT": Proceed to [BRC-321, "Diagnosis Procedure"](#).

YES-2 >> "C1164" or "C1165" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378513

1. CHECK CONNECTOR

1. Turn the ignition 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.

C1164, C1165 CV SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Ⓜ CONSULT

Select "Self Diagnostic Result" mode of "ABS" again.

Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1166, C1167 SV SYSTEM

DTC Description

INFOID:000000012378514

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1166	SV 1 (Suction valve 1)	When a malfunction is detected in suction valve 1.
C1167	SV 2 (Suction valve 2)	When a malfunction is detected in suction valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1166" or "C1167" detected?

YES-1 >> "C1166" or "C1167" is displayed as "CRNT": Proceed to [BRC-323, "Diagnosis Procedure"](#).

YES-2 >> "C1166" or "C1167" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [Gl-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378515

1. CHECK CONNECTOR

1. Turn the ignition 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.

C1166, C1167 SV SYSTEM

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace harness or connector and securely lock the connector. GO TO 2.

2.PERFORM SELF-DIAGNOSIS

CONSULT

Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1166" or "C1167" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1170 VARIANT CODING

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1170 VARIANT CODING

DTC Description

INFOID:000000012378516

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
—	<ul style="list-style-type: none"> • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) is not configured.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1170" detected?

YES-1 >> "C1170" is displayed as "CRNT": Proceed to [BRC-325, "Diagnosis Procedure"](#).

YES-2 >> "C1170" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378517

1. CONFIGURATION OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform configuration of ABS actuator and electric unit (control unit). Refer to [BRC-68, "Work Procedure"](#).

CAUTION:

Never replace the ABS actuator and electric unit (control unit).

>> GO TO 2.

2. CHECK SELF DIAGNOSTIC RESULTS

CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC's are displayed along with "C1170" in "Self Diagnostic Result" mode of "ABS".

C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1197 VACUUM SENSOR

DTC Description

INFOID:000000012378518

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • Vacuum piping • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

- Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
- Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
- Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1197" detected?

- YES-1 >> "C1197" is displayed as "CRNT": Proceed to [BRC-327, "Diagnosis Procedure"](#).
- YES-2 >> "C1197" is displayed as "PAST": Inspection End. (Erase "Self Diagnostic Result" mode of "ABS".)
- NO-1 >> To check malfunction symptom before repair: Refer to [Gl-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378519

1. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK BRAKE BOOSTER

- Turn the ignition switch OFF.

C1197 VACUUM SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to [BR-32, "Removal and installation"](#).

3. CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

4. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E53	22	Yes
	2		20	
	3		21	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-32, "Removal and installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1197" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

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C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C1198 VACUUM SENSOR

DTC Description

INFOID:000000012378520

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	<ul style="list-style-type: none">• When an open circuit is detected in vacuum sensor circuit.• When a short circuit is detected in vacuum sensor circuit.• When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1198" detected?

- YES-1 >> "CRNT" is displayed: Proceed to [BRC-330, "Diagnosis Procedure"](#).
YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378521

1. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK TERMINAL

C1198 VACUUM SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal.

3. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E53	22	Yes
	2		20	
	3		21	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BRC-168, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1198" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C1199 BRAKE BOOSTER

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

C1199 BRAKE BOOSTER

DTC Description

INFOID:000000012378522

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mm Hg) while engine running.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1199" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-332, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378523

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector. GO TO 2.

2. CHECK BRAKE BOOSTER

C1199 BRAKE BOOSTER

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Replace the brake booster. Refer to [BR-32, "Removal and installation"](#).

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-34, "Exploded View"](#).

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace the vacuum piping. Refer to [BR-35, "Removal and Installation"](#).

4.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. 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 >> GO TO 5.
 NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	1	E53	22	Yes
	2		20	
	3		21	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	1	Ground	No
	2		
	3		

Is the inspection result normal?

- YES >> GO TO 6.
 NO >> Repair / replace harness or connector.

6.REPLACE VACUUM SENSOR

Ⓜ CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-32, "Removal and installation"](#).

3. Erase "Self Diagnostic Result" mode of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

C1199 BRAKE BOOSTER

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C1199" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

NO >> Inspection End.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

C119A VACUUM SENSOR

DTC Description

INFOID:000000012378524

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in power supply voltage of vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "C119A" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-335, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" mode of "ABS")

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#)

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378525

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the vacuum sensor harness connector for disconnection or looseness.
3. 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 / replace harness or connector. GO TO 2.

C119A VACUUM SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK VACUUM SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E51	3	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E51	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E51	3	E53	21	Yes

4. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	3	Ground	No

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair / replace harness or connector.

4. CHECK VACUUM SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E51	2	Ground	No

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness or connector.

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

C119A VACUUM SENSOR

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-276. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

1. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.

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 the ABS actuator and electric unit (control unit). Refer to [BRC-168. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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U1000 CAN COMM CIRCUIT

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012378526

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• CAN communication line	CAN communication system malfunction

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Select "Self Diagnostic Result" mode of "ABS".

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-338, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End. (Erase "Self Diagnostic Result" of "ABS".)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012378527

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000012385899

Regarding Wiring Diagram information, refer to [PCS-23, "Wiring Diagram"](#).

1. CHECK FUSES AND FUSIBLE LINK

Check that the following IPDM E/R fusible links are not blown.

Signal name	Fuses and fusible link No.
Battery power supply	E (80A)
	B (100A)
	A (250A), C (80A)

Is the fusible link blown?

- YES >> Replace the blown fusible link after repairing the affected circuit.
NO >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connectors E16 and E17.
3. Check voltage between IPDM E/R harness connector and ground.

Terminals		Voltage (V) (Approx.)
(+)	(-)	
IPDM E/R		Battery voltage
Connector	Terminal	
E16	1	
	2	
E17	3	

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3. CHECK GROUND CIRCUIT

1. Disconnect connectors.
2. Check continuity between IPDM E/R harness connectors and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E18	7		Yes
E19	41		

Is the inspection result normal?

- YES >> Inspection End.
NO >> Repair or replace harness or connector.

PARKING BRAKE SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

PARKING BRAKE SWITCH

Component Function Check

INFOID:000000012273800

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Proceed to [BRC-340, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273801

1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E35	1	M24	26	Yes

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

Parking brake switch		—	Continuity
Connector	Terminal		
E35	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 [BR-12, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Replace the parking brake switch. Refer to [PB-11, "Removal and Installation"](#).

3.CHECK PARKING BRAKE SWITCH SIGNAL

CONSULT

1. Select "Data Monitor" mode of "ICC/ADAS".
2. Select "PKB SW".
3. Check that the function operates normally according to the following conditions:

Condition	Data Monitor
Operate parking brake.	On
Release parking brake.	Off

Is the inspection result normal?

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

4.CHECK COMBINATION METER

Check the combination meter. Refer to [WCS-11, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

PARKING BRAKE SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 5.

NO >> Repair or replace combination meter. Refer to [MWI-68, "Removal and Installation"](#).

5.CHECK TERMINAL

1. Check the combination meter pin terminals for damage or loose connection with harness connector.
2. Check the parking brake switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000012273802

1.CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.
2. Disconnect parking brake switch harness connector.
3. Check the continuity between parking brake switch terminal and ground.

Parking brake switch Terminal	—	Condition	Continuity
1	Ground	When parking brake switch is pressed	Yes
		When parking brake switch is released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the parking brake switch. Refer to [BR-20, "Exploded View"](#).

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

VDC OFF SWITCH

Component Function Check

INFOID:000000012273803

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 [BRC-342, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273804

1.CHECK VDC OFF SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect VDC OFF switch harness connector.
4. Check 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	
E53	9	M72	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		
E53	9	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		
M72	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-343, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Replace the VDC OFF switch. Refer to [BRC-368, "Removal and Installation"](#).

4.CHECK VDC OFF SWITCH SIGNAL

CONSULT

1. Select "Data Monitor" mode of "CHASSIS CONTROL".
2. Select "VDC OFF SWITCH".
3. Check that the function operates normally according to the following conditions:

VDC OFF SWITCH

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000012273805

1.CHECK VDC OFF SWITCH

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

VDC OFF switch Terminals	Condition	Continuity
6 – 8	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 the VDC OFF switch. Refer to [BRC-170, "Removal and Installation"](#).

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ABS WARNING LAMP

Component Function Check

INFOID:000000012273806

1. CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to [BRC-344, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273807

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-344, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- **Be sure to wait 10 seconds after turning ignition switch OFF or ON.**
- **Start the engine.**

2. Repeat step 1 two or more times.

3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK ABS WARNING LAMP SIGNAL

CONSULT

1. Select "ABS", "Data Monitor" and "ABS WARN LAMP" in this order.

2. Turn the ignition switch OFF.

3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

BRAKE WARNING LAMP

Component Function Check

INFOID:0000000012273808

1. CHECK BRAKE WARNING LAMP FUNCTION

Check that brake warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [BRC-345. "Diagnosis Procedure"](#).

2. CHECK BRAKE WARNING LAMP FUNCTION

Check that brake warning lamp 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 the parking brake switch system. Refer to [BRC-340. "Diagnosis Procedure"](#).

3. CHECK BRAKE WARNING LAMP FUNCTION

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 within 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 [BR-30. "Exploded View"](#).

Diagnosis Procedure

INFOID:0000000012273809

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-276. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF DIAGNOSTIC RESULT

 CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

• **Start the engine.**

2. Repeat step 1 two or more times.

3. Perform "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52. "DTC Index"](#).

NO >> GO TO 3.

3. CHECK BRAKE WARNING LAMP SIGNAL

 CONSULT

1. Select "ABS", "Data Monitor" and "EBD WARN LAMP" in this order.

2. Turn the ignition switch OFF.

BRAKE WARNING LAMP

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-68. "Removal and Installation"](#).
- NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366. "Removal and Installation"](#).

< DTC/CIRCUIT DIAGNOSIS >

VDC WARNING LAMP

Component Function Check

INFOID:000000012273810

1. CHECK VDC WARNING LAMP FUNCTION

Check that VDC warning lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:**Never start the engine.**

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to [BRC-347, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273811

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-276, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.

3. Perform "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK VDC WARNING LAMP SIGNAL

CONSULT

1. Select "ABS", "Data Monitor" and "SLIP/VDC LAMP" in this order.

2. Turn the ignition switch OFF.

3. Check that "Data Monitor" displays "On" for approximately 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:**Never start the engine.**

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

VDC OFF INDICATOR LAMP

[WITH ICC]

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:000000012273812

1. CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp in combination meter turns ON for 1 second after ignition switch is turned ON.

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [BRC-348, "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-342, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012273813

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-276, "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

ⓐ CONSULT

1. Select "ABS", "Data Monitor" and "OFF LAMP" in this order.
2. Turn the ignition switch OFF.
3. Check that "Data Monitor" displays "On" for 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-168, "Removal and Installation"](#).

3. CHECK VDC OFF INDICATOR LAMP SIGNAL

ⓐ CONSULT

1. Select "ABS", "Data Monitor" and "OFF LAMP" in this order.
2. Check that "Data Monitor" displays "On" or "Off" each time VDC OFF switch is operated.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).

NO >> Check the VDC OFF switch system. Refer to [BRC-342, "Diagnosis Procedure"](#).

FORWARD EMERGENCY BRAKING

< DTC/CIRCUIT DIAGNOSIS >

[WITH ICC]

FORWARD EMERGENCY BRAKING

Diagnosis Procedure

INFOID:000000012273814

1. FORWARD EMERGENCY BRAKING DIAGNOSIS

- The system will be canceled automatically with a beep sound and FEB warning lamp on the combination meter will illuminate when the system will not operate properly.
- When the FEB warning lamp continues to illuminate even if the FEB system is turned on after the engine restarts, perform the trouble diagnosis.

>> Go to ICC. Refer to [CCS-54. "Work Flow"](#).

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DRIVER ASSISTANCE SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[WITH ICC]

SYMPTOM DIAGNOSIS

DRIVER ASSISTANCE SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000012273815

Before performing diagnosis, check that it is not a symptom caused by normal operation. Refer to [BRC-203, "BRAKE ASSIST \(WITH PREVIEW FUNCTION\) : System Description-Forward Emergency Braking"](#).

Symptom	Confirmation item	Inspection item/Reference page
FEB system display does not illuminate.	All of system display does not illuminate.	System settings cannot be turned ON/OFF. Refer to BRC-351, "Diagnosis Procedure" .
	Other information display is not illuminated.	Combination meter Refer to MWI-29, "DTC Index" .
FEB warning lamp does not illuminate.	All of system display does not illuminate.	System settings cannot be turned ON/OFF. Refer to BRC-351, "Diagnosis Procedure" .
	Other information display is not illuminated.	Combination meter Refer to MWI-29, "DTC Index" .
FEB warning buzzer is not sounding (Warning display is functioning normally).	—	Chime does not sound. Refer to WCS-5, "WARNING CHIME SYSTEM : System Description" .

SYSTEM SETTINGS CANNOT BE TURNED ON/OFF ON THE INTEGRAL SWITCH

< SYMPTOM DIAGNOSIS >

[WITH ICC]

SYSTEM SETTINGS CANNOT BE TURNED ON/OFF ON THE INTEGRAL SWITCH

Symptom Table

INFOID:000000012273816

CAUTION:

Perform the "Self Diagnostic Result" with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

Symptom		Inspection item/Reference page
FEB system does not turn ON/OFF.	FEB warning lamp is not turned ON↔OFF when operating integral switch.	BRC-351. "Diagnosis Procedure"

Description

INFOID:000000012273817

FEB system does not turn ON/OFF.

- FEB warning lamp does not illuminate even if the integral switch is operated when FEB warning lamp is not illuminated.
- FEB warning lamp does not turn off even if the integral switch is operated when FEB warning lamp is illuminated.

NOTE:

The system ON/OFF condition will be memorized even if the ignition switch turns OFF.

Diagnosis Procedure

INFOID:000000012273818

1.PERFORM SELF DIAGNOSTIC RESULT (LASER/RADAR)

- Perform "Self Diagnostic Result" mode of "ICC/ADAS" with CONSULT.
- Check if the DTC is detected in "Self Diagnostic Result" mode of "ICC/ADAS" with CONSULT. Refer to [CCS-46. "DTC Index"](#).

Is any DTC detected?

- YES >> GO TO 9.
NO >> GO TO 2.

2.STEERING SWITCH INSPECTION

- Start the engine.
- Check that "FEB SELECT" operates normally in "Data Monitor" mode of "LASER/RADAR" with CONSULT.

Is inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 3.

3.CHECK STEERING SWITCH RESISTANCE

Check resistance between the following steering switch terminals:

Steering switches		Condition	Resistance (Ω) (Approx.)	
Terminals	Signal name			
17	19	Display	Depress ▷ switch.	2023
		Back	Depress ◁ switch.	723
16	19	Enter	Depress OK switch.	2023
		Menu Up	Depress △ switch.	121
		Menu Down	Depress ▽ switch.	321

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace steering wheel switch. Refer to [AV-184. "Removal and Installation"](#).

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SYSTEM SETTINGS CANNOT BE TURNED ON/OFF ON THE INTEGRAL SWITCH

< SYMPTOM DIAGNOSIS >

[WITH ICC]

4. CHECK SPIRAL CABLE

Check continuity between the following spiral cable terminals:

Spiral cable		Continuity
Terminals		
16	9	Yes
17	8	
19	11	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace spiral cable. Refer to [SR-16, "Removal and Installation"](#).

5. CHECK STEERING SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter harness connector M24 and spiral cable harness connector M30.
3. Check continuity between combination meter harness connector M24 and spiral cable harness connector M30.

Combination meter		Spiral cable		Continuity
Connector	Terminal	Connector	Terminal	
M24	21	M30	11	Yes
	22		9	
	23		8	

4. Check continuity between combination meter harness connector M24 and ground.

Combination meter		Ground	Continuity
Connector	Terminal		
M24	21	Ground	No
	22		
	23		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness or connector.

6. PERFORM THE SELF DIAGNOSTIC RESULT (METER/M&A)

1. Perform "Self Diagnostic Result" mode of "METER/M&A" with CONSULT.
2. Check if the DTC is detected in "Self Diagnostic Result" mode of "METER/M&A" with CONSULT. Refer to [MWI-29, "DTC Index"](#).

Is any DTC detected?

YES >> GO TO 9.

NO >> GO TO 7.

7. FEB WARNING LAMP

1. Select the active test item "METER LAMP" of "ICC/ADAS".
2. Check if the FEB warning lamp illuminates when the test item is operated.

Is inspection result normal?

YES >> Refer to [CCS-54, "Work Flow"](#).

NO >> GO TO 8.

8. CHECK DATA MONITOR OF COMBINATION METER

Check that "BA W/L" operates normally in "Data Monitor mode of "METER/M&A".

Is inspection result normal?

SYSTEM SETTINGS CANNOT BE TURNED ON/OFF ON THE INTEGRAL SWITCH

< SYMPTOM DIAGNOSIS >

[WITH ICC]

YES >> Replace the combination meter. Refer to [MWI-68, "Removal and Installation"](#).

NO >> Replace the ICC sensor. Refer to [CCS-136, "Removal and Installation"](#).

A

9.REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace malfunctioning parts.

B

>> GO TO 10.

10.CHECK FEB SYSTEM

Check that FEB warning lamp turns ON⇔OFF when operating steering switch.

C

>> Inspection End.

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EXCESSIVE OPERATION FREQUENCY

[WITH ICC]

< SYMPTOM DIAGNOSIS >

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:000000012273819

VDC function, TCS function, ABS function, EBD function or brake assist function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:000000012273820

1. CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

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

- Refer to [FSU-6, "Inspection"](#) (front) or [RSU-5, "Inspection"](#) (rear).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK WHEEL SENSOR

Check wheel sensor.

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair installation or replace wheel sensor.

- Front wheel sensor: Refer to [BRC-362, "FRONT WHEEL SENSOR : Removal and Installation"](#).
- Rear wheel sensor: Refer to [BRC-363, "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-365, "FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor"](#).
- Rear sensor rotor: Refer to [BRC-365, "REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor"](#).

5. CHECK THAT WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approximately 1 second after key switch is turned ON and stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 6.

6. PERFORM THE SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

EXCESSIVE OPERATION FREQUENCY

[WITH ICC]

< SYMPTOM DIAGNOSIS >

- Set the vehicle to READY/Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-227, "DTC Index"](#).
NO >> Inspection End.

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UNEXPECTED BRAKE PEDAL REACTION

[WITH ICC]

< SYMPTOM DIAGNOSIS >

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:0000000012273821

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

Diagnosis Procedure

INFOID:0000000012273822

1.CHECK FRONT AND REAR AXLE

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

- Refer to [FSU-6. "Inspection"](#) (front) or [RSU-5. "Inspection"](#) (rear).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK DISC ROTOR

Check disc rotor runout.

- Front: Refer to [BR-16. "DISC BRAKE ROTOR : Inspection"](#).
- Rear: Refer to [BR-18. "DISC BRAKE ROTOR : Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage.

Refer to [BR-14. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK BRAKE PEDAL

Check each item of brake pedal. Refer to [BR-12. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust each item of brake pedal. Refer to [BR-12. "Adjustment"](#).

5.CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check each component 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 connector after checking.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check each component of brake system.

THE BRAKING DISTANCE IS LONG

[WITH ICC]

< SYMPTOM DIAGNOSIS >

THE BRAKING DISTANCE IS LONG

Description

INFOID:000000012273823

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:000000012273824

CAUTION:

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

1.CHECK BRAKE FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check each component of brake system.

2.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Check each component of brake system.

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DOES NOT OPERATE

[WITH ICC]

< SYMPTOM DIAGNOSIS >

DOES NOT OPERATE

Description

INFOID:000000012273825

VDC function, TCS function, ABS function, EBD function or brake assist function does not operate.

Diagnosis Procedure

INFOID:000000012273826

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. However, TCS function and brake limited slip differential (BLSD) function operate when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

1. CHECK ABS WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF approximately 1 second after key switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

- YES >> Inspection End.
NO >> GO TO 2.

2. PERFORM SELF DIAGNOSTIC RESULT

Ⓜ CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-227. "DTC Index"](#).
NO >> Inspection End.

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[WITH ICC]

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:000000012273827

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

CAUTION:

Vibration may be felt when 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 speeds
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]

Diagnosis Procedure

INFOID:000000012273828

1. SYMPTOM CHECK (1)

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Check brake pedal. Refer to [BR-12. "Adjustment"](#).

2. SYMPTOM CHECK (2)

Check that motor sound from ABS actuator and electric unit (control unit) occurs when the engine starts.

Does the operation sound occur?

YES >> GO TO 3.

NO >> Select "Self Diagnostic Result" mode of "ABS" with CONSULT.

3. SYMPTOM CHECK (3)

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

Does the symptom occur?

YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).

NO >> GO TO 4.

4. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.

3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-227. "DTC Index"](#).

NO >> Inspection End.

VEHICLE JERKS DURING

Description

INFOID:000000012273829

The vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake assist function operates.

Diagnosis Procedure

INFOID:000000012273830

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function, brake assist function operates.

Is the inspection result normal?

- YES >> Inspection End.
NO >> GO TO 2.

2.PERFORM THE SELF DIAGNOSTIC RESULT

CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

2. Repeat step 1 two or more times.
3. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-227, "DTC Index"](#).
NO >> GO TO 3.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check 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 THE SELF DIAGNOSTIC RESULT

CONSULT

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

CAUTION:

- Be sure to wait 10 seconds after turning ignition switch OFF or ON.
- Start the engine.

3. Repeat step 2 two or more times.
4. Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-227, "DTC Index"](#).
NO >> GO TO 5.

5.PERFORM THE SELF DIAGNOSTIC RESULT

CONSULT

Select "Self Diagnostic Result" mode of "ENGINE" and "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC.
NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-366, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[WITH ICC]

NORMAL OPERATING CONDITION

Description

INFOID:000000012273831

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 or brake assist function operates.	This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD 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 a slippery road, 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 assist function or brake force distribution function is operated.	
Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction, because it is caused by operation check of ABS actuator and electric unit (control unit).
Acceleration may feel 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.	
ABS warning lamp and VDC OFF indicator lamp may turn ON when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" "Self Diagnostic Result" memory with CONSULT.
VDC warning lamp may turn ON and VDC function, TCS function, brake assist function, and brake force distribution function may not normally operate when driving on a special road that 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).	
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 normal. (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 ICC]

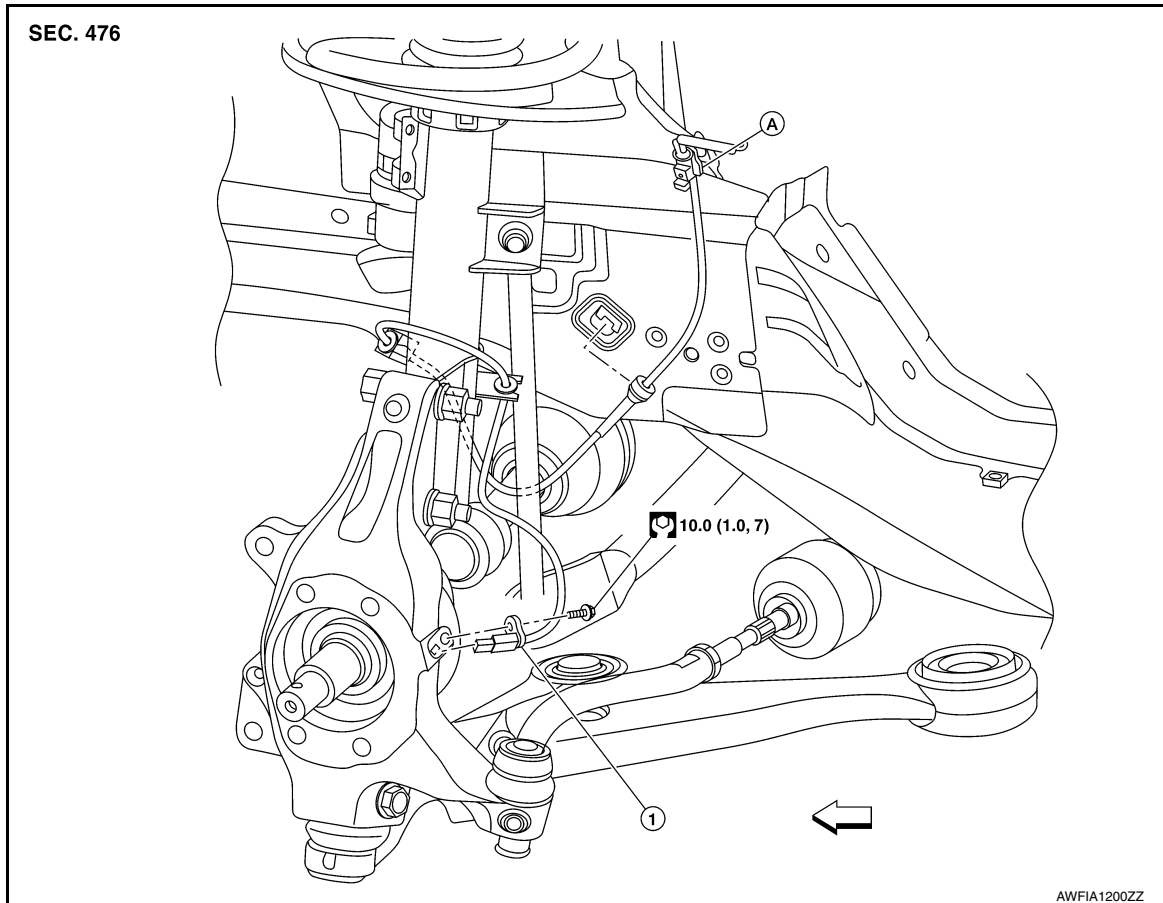
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000012273832



1. Front wheel sensor

A. Front wheel sensor harness connector

⇐ Front

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000012385883

CAUTION:

Do not damage front wheel sensor or sensor rotor.

REMOVAL

1. Remove front wheels and tires using power tools. Refer to [WT-67, "Removal and Installation"](#).
2. Partially remove fender protector to gain access to front wheel sensor harness connector. Refer to [EXT-28, "Exploded View"](#).
3. Disconnect harness connector from front wheel sensor.
4. Remove front wheel sensor from strut bracket and body brackets.
5. Remove front wheel sensor bolt and remove front wheel sensor.

CAUTION:

Pull out front wheel sensor being careful to turn it as little as possible. Do not pull on front wheel sensor harness.

INSTALLATION

Installation is in the reverse order of removal.

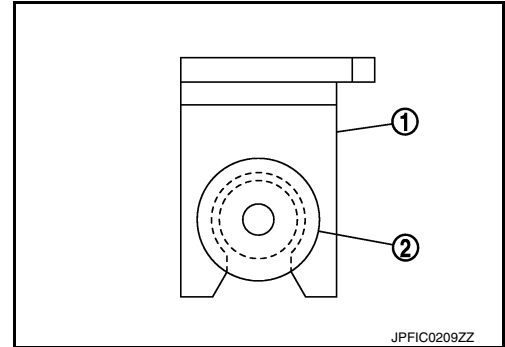
CAUTION:

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH ICC]

- Before installing, make sure there is no foreign material, such as iron fragments, adhered to pick-up part of front wheel sensor.
- When installing, make sure there is no foreign material, such as iron fragments, on and in hole in knuckle for front wheel sensor. Make sure no foreign material has been caught in sensor rotor. Remove any foreign material and clean the mount.
- Do not 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.

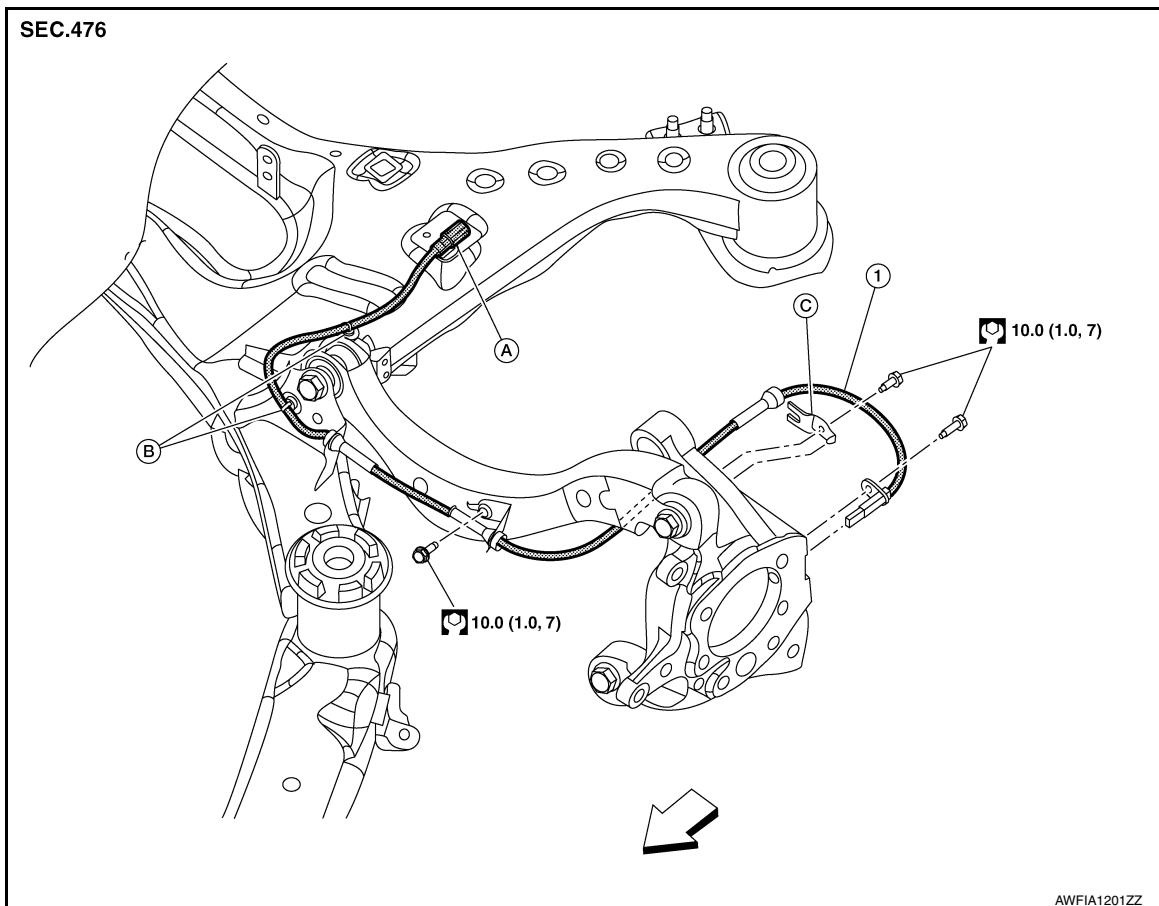


REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000012273834

BRC



- 1. Rear wheel sensor
- A. Rear wheel sensor harness connector
- B. Clip
- C. Rear wheel sensor bracket
- ← Front

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000012385884

CAUTION:
Do not damage rear wheel sensor or sensor rotor.

REMOVAL

WHEEL SENSOR

[WITH ICC]

< REMOVAL AND INSTALLATION >

1. Remove rear wheels and tires using power tools. Refer to [WT-67. "Removal and Installation"](#).
2. Disconnect harness connector from rear wheel sensor.
3. Remove rear wheel sensor from rear wheel sensor brackets and clips.
4. Remove rear wheel sensor bolt and remove rear wheel sensor.

CAUTION:

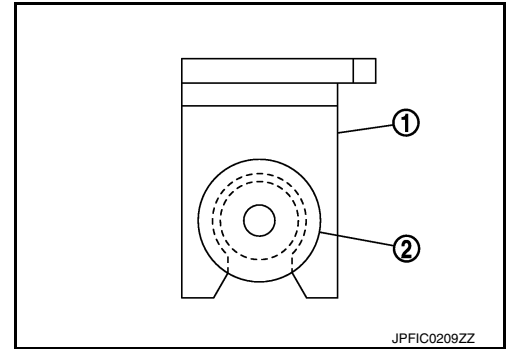
Pull out rear wheel sensor being careful to turn it as little as possible. Do not pull on rear wheel sensor harness.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Before installing, make sure there is no foreign material, such as iron fragments, adhered to pick-up part of rear wheel sensor.
- When installing, make sure there is no foreign material, such as iron fragments, on and in hole in knuckle for rear wheel sensor. Make sure no foreign material has been caught in sensor rotor. Remove any foreign material and clean mount.
- Do not 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.



SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[WITH ICC]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation - Front Sensor Rotor INFOID:0000000012273836

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [FAX-8. "Removal and Installation"](#).

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation - Rear Sensor Rotor INFOID:0000000012273837

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [RAX-6. "Removal and Installation"](#).

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

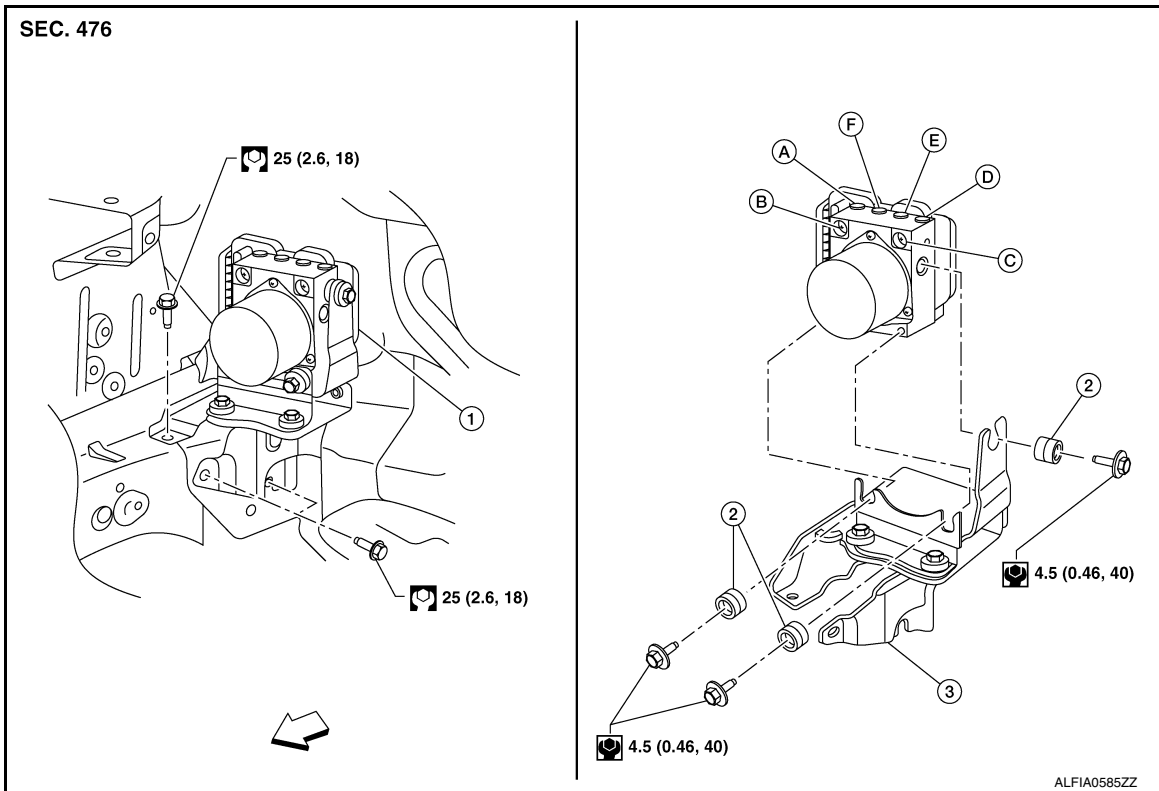
< REMOVAL AND INSTALLATION >

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000012273838



- | | | |
|--|--|--------------------------------------|
| 1. ABS actuator and electric unit (control unit) | 2. Bushings | 3. Bracket |
| A. To front RH brake caliper | B. From master cylinder secondary side | C. From master cylinder primary side |
| D. To front LH brake caliper | E. To rear RH brake caliper | F. To rear LH brake caliper |
- ⇐ Front

Removal and Installation

INFOID:000000012273839

REMOVAL

CAUTION:

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.
- Do not remove actuator by holding harness.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

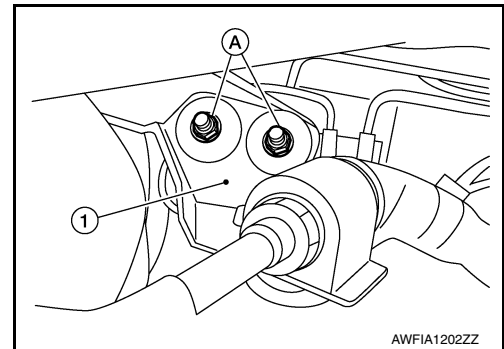
1. Disconnect battery negative terminal. Refer to [PG-105, "Exploded View"](#).
2. Remove cowl top and cowl top extension. Refer to [EXT-25, "Removal and Installation"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

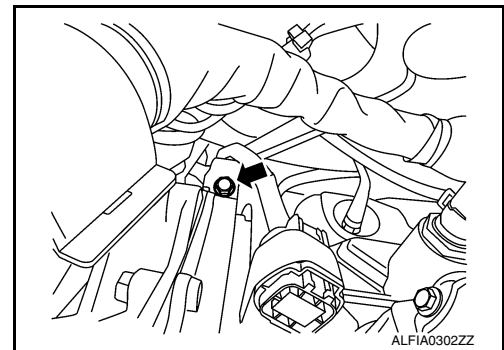
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< REMOVAL AND INSTALLATION >

3. Remove nuts (A) and power steering line hold down bracket (1).



4. Disconnect harness connector from ABS actuator and electric unit (control unit) and position aside.
5. Loosen brake tube flare nuts using a suitable tool, then remove brake tubes from ABS actuator and electric unit (control unit) and position aside. Refer to [BR-22, "FRONT : Exploded View"](#).
6. Remove harness bracket bolt.



7. Remove ABS actuator and electric unit (control unit) and bracket as an assembly.
8. If necessary, remove bracket from ABS actuator and electric unit (control unit).

INSTALLATION

CAUTION:

When replacing ABS actuator and electric unit (control unit), calibration of ABS actuator and electric unit (control unit) is required. Refer to [BRC-68, "Work Procedure"](#).

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to [BR-15, "Bleeding Brake System"](#).
- Adjust neutral position of steering angle sensor. Refer to [BRC-64, "Description"](#).
- Perform calibration of decel G sensor. Refer to [BRC-66, "Description"](#).

CAUTION:

- To install, use flare nut crowfoot and torque wrench.
- Replace ABS actuator if it has been dropped or sustained an impact.
- Do not install actuator by holding harness.
- After installing harness connector in ABS actuator and electric unit (control unit), make sure connector is securely locked.

VDC OFF SWITCH

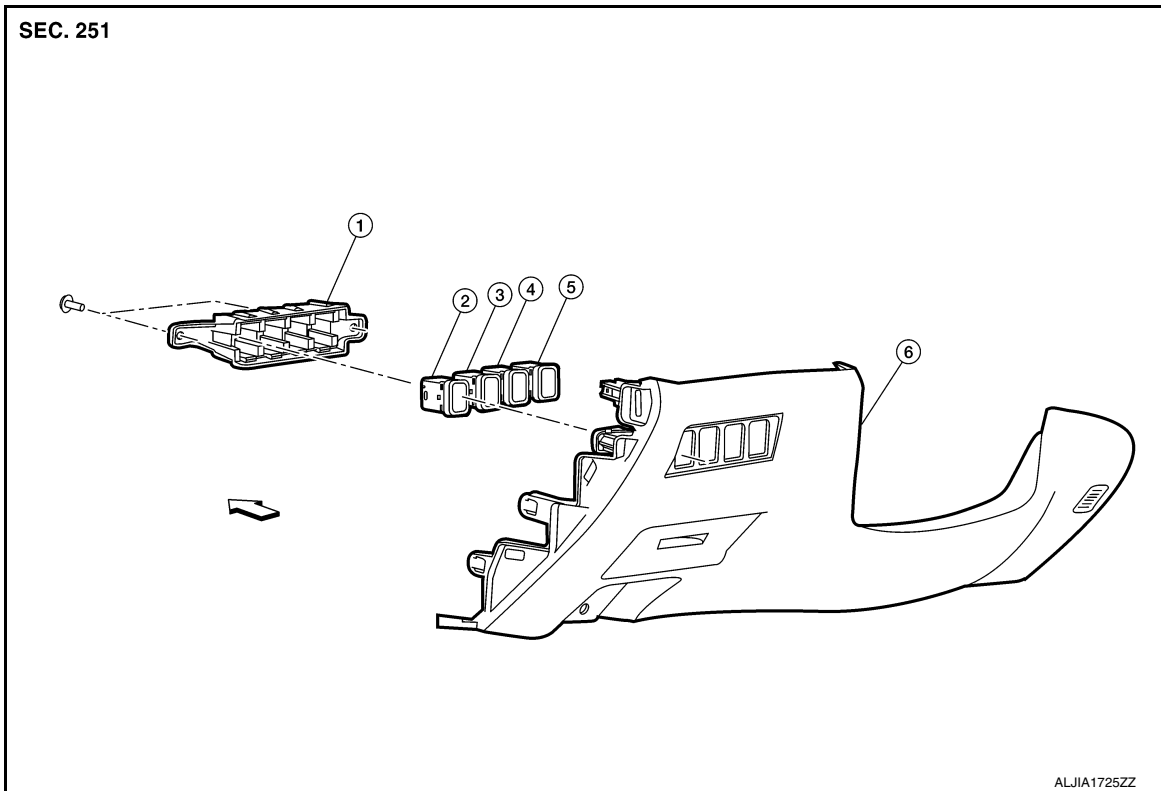
< REMOVAL AND INSTALLATION >

[WITH ICC]

VDC OFF SWITCH

Exploded View

INFOID:000000012273840



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|---------------------------------|---------------------------------------|------------------------------|
| 1. Switch carrier | 2. Trunk lid opener switch | 3. VDC OFF switch |
| 4. Heated steering wheel switch | 5. Rear sunshade switch (if equipped) | 6. Instrument lower panel LH |

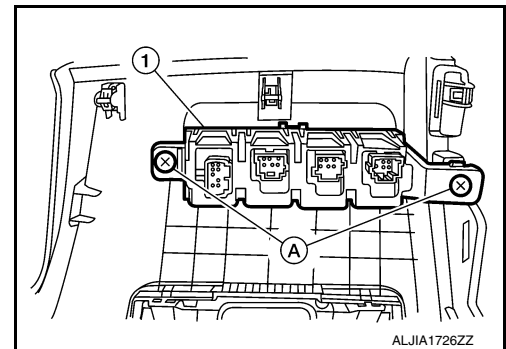
⇐ Front

Removal and Installation

INFOID:000000012273841

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-23. "Removal and Installation"](#).
2. Remove screws (A), then remove switch carrier (1) from instrument lower panel LH.




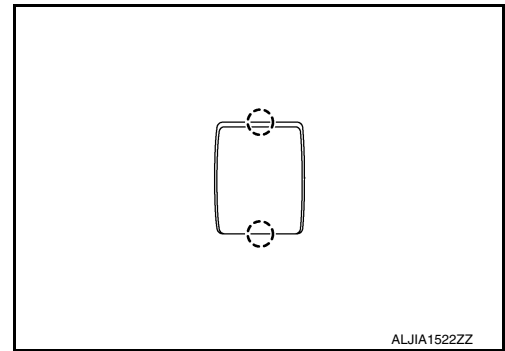
VDC OFF SWITCH

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< REMOVAL AND INSTALLATION >

3. Using suitable tool, release pawls and remove VDC OFF switch.

 : Pawl



INSTALLATION

Installation is in the reverse order of removal.

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STEERING ANGLE SENSOR

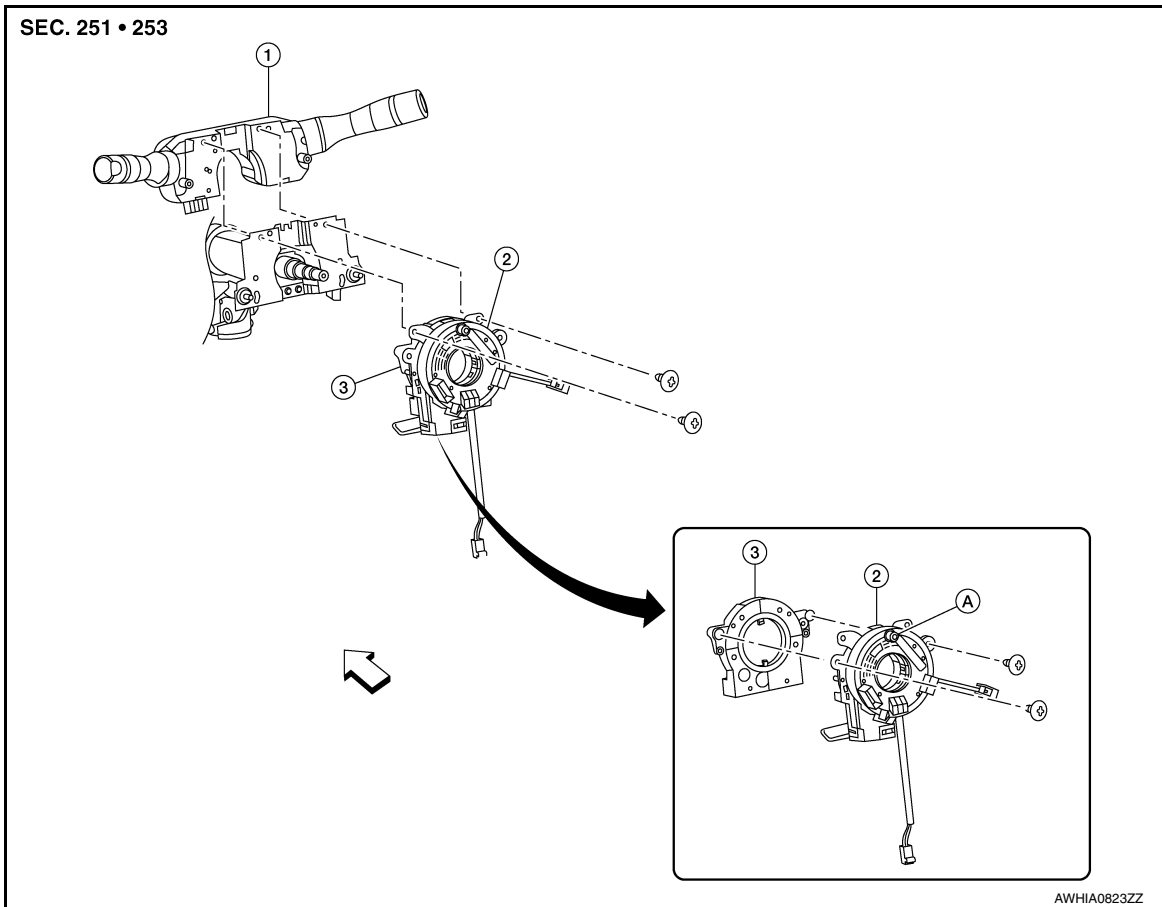
< REMOVAL AND INSTALLATION >

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STEERING ANGLE SENSOR

Exploded View

INFOID:000000012273842



1. Combination switch

2. Spiral cable

3. Steering angle sensor

A. Locating pin

⇐ Front

Removal and Installation

INFOID:000000012273843

To remove and install steering angle sensor, remove and install spiral cable. Refer to [SR-16, "Removal and Installation"](#).