

BRC

SECTION

BRAKE CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000012430820

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.

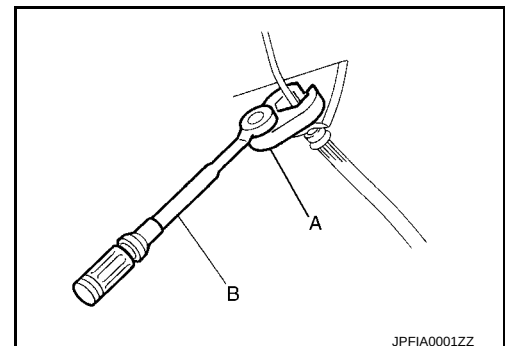
Precaution for Brake System

INFOID:000000012430821

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-11, "Fluids and Lubricants"](#).
- 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.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crow-foot (A) and torque wrench (B).
- 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.



PRECAUTIONS

< PRECAUTION >

[VDC/TCS/ABS]

Precaution for Brake Control System

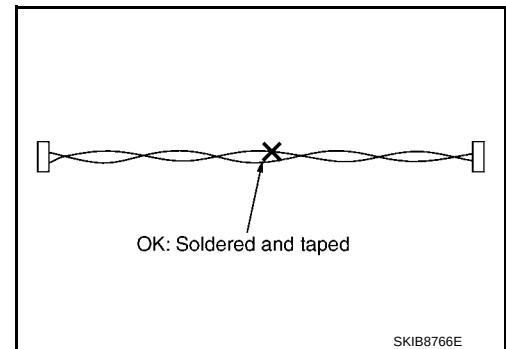
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- Just after starting vehicle after ignition switch is ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary 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.

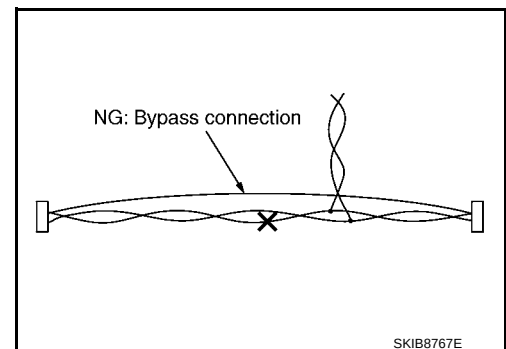
Precaution for Harness Repair

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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

< PREPARATION >

[VDC/TCS/ABS]

PREPARATION

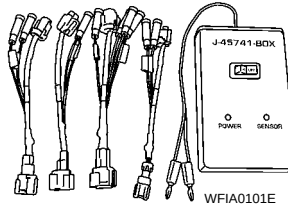
PREPARATION

Special Service Tool

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

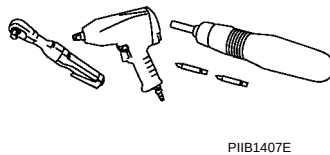
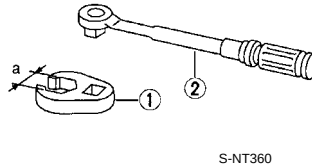
Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors



Commercial Service Tool

INFOID:000000012430825

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



COMPONENT PARTS

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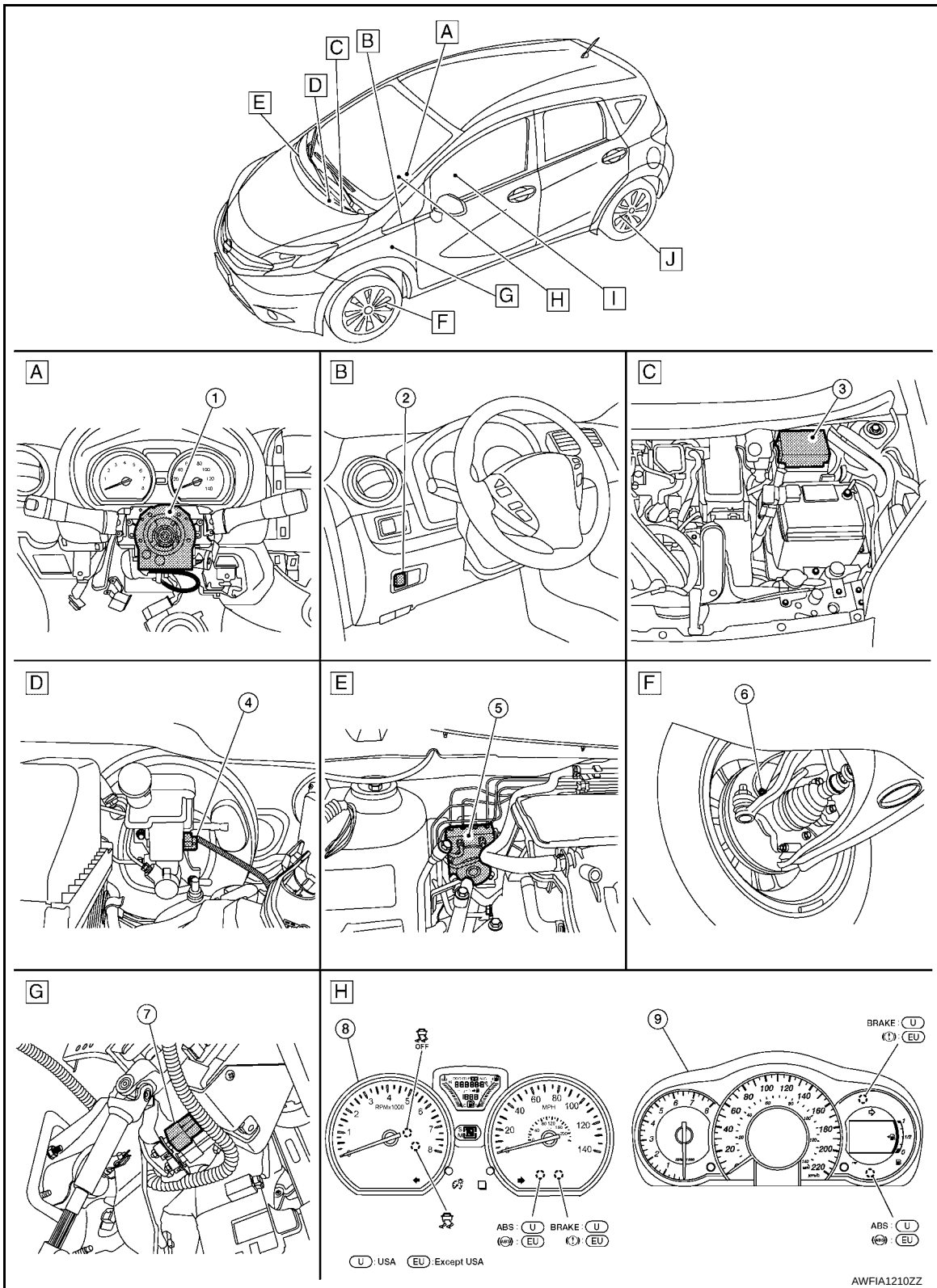
[VDC/TCS/ABS]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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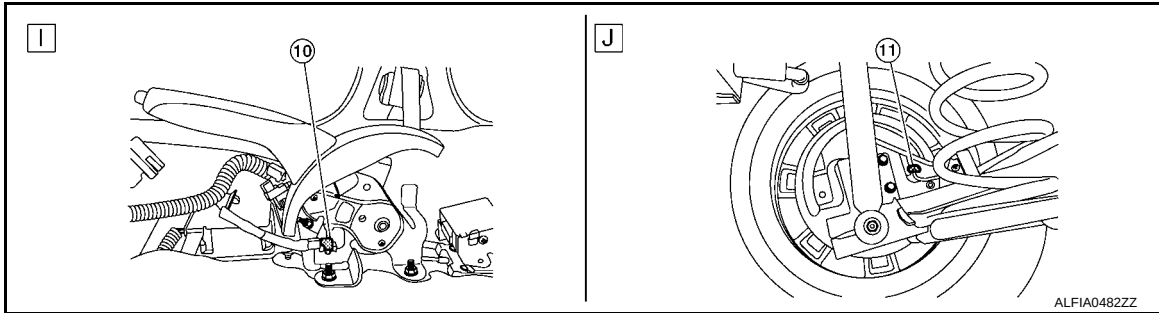
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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]



- A. View with steering wheel and spiral cable removed
 B. Left side of instrument panel
 C. Left side of engine compartment
 D. Left side of engine compartment
 E. Right side of engine compartment
 F. Left front wheel assembly
 G. Near brake pedal area
 H. Left side of instrument panel
 I. Center of front seats (view with center console removed)
 J. Left rear wheel assembly

Component Description

INFOID:0000000012430827

	Component	Reference/Function
1	Steering angle sensor	BRC-9, "Steering Angle Sensor"
2	VDC OFF switch	BRC-10, "VDC OFF Switch"
3	IPDM E/R	PCS-4, "Component Parts Location"
4	Brake fluid level switch	BRC-10, "Brake Fluid Level Switch"
5	ABS actuator and electric unit (control unit)	BRC-8, "ABS Actuator and Electric Unit (Control Unit)"
6	Front wheel sensor	BRC-9, "Wheel Sensor and Sensor Rotor"
7	Stop lamp switch	BRC-9, "Stop Lamp Switch"
8	Combination meter (type A)	MWI-9, "METER SYSTEM : Combination Meter"
9	Combination meter (type B)	MWI-9, "METER SYSTEM : Combination Meter"
10	Parking brake switch	BRC-10, "Parking Brake Switch"
11.	Rear wheel sensor	BRC-9, "Wheel Sensor and Sensor Rotor"

ABS Actuator and Electric Unit (Control Unit)

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

ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure is 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 (Main Relay)

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

ABS IN Valve

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

ABS OUT Valve

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

Cut Valve 1, Cut Valve 2

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

Suction Valve 1, Suction Valve 2

Supplies the brake fluid from master cylinder to the pump, when VDC function and TCS function are activated.

Return Check Valve

Returns the brake fluid from brake caliper and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released.

Reservoir

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

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) via communication lines:

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

Pressure Sensor

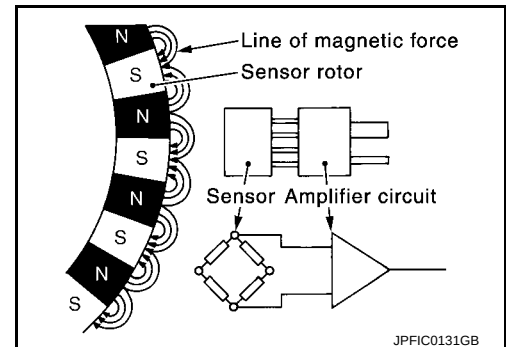
Detects the brake fluid pressure and transmits signal to ABS actuator and electric unit (control unit).

Wheel Sensor and Sensor Rotor

INFOID:0000000012430829

NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated in wheel hub assembly.
- Wheel sensor of rear wheel is installed on back plate of rear brake.
- Sensor rotor of rear wheel is installed on rear brake drum.
- Never measure resistance and voltage value using a tester because sensor is active sensor.
- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field changes. Magnetic field change is converted to current signals (rectangular wave) and is transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed.



Stop Lamp Switch

INFOID:0000000012430830

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

Steering Angle Sensor

INFOID:0000000012430831

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

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

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VDC OFF Switch

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

Brake Fluid Level Switch

INFOID:0000000012430833

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.

Parking Brake Switch

INFOID:0000000012430834

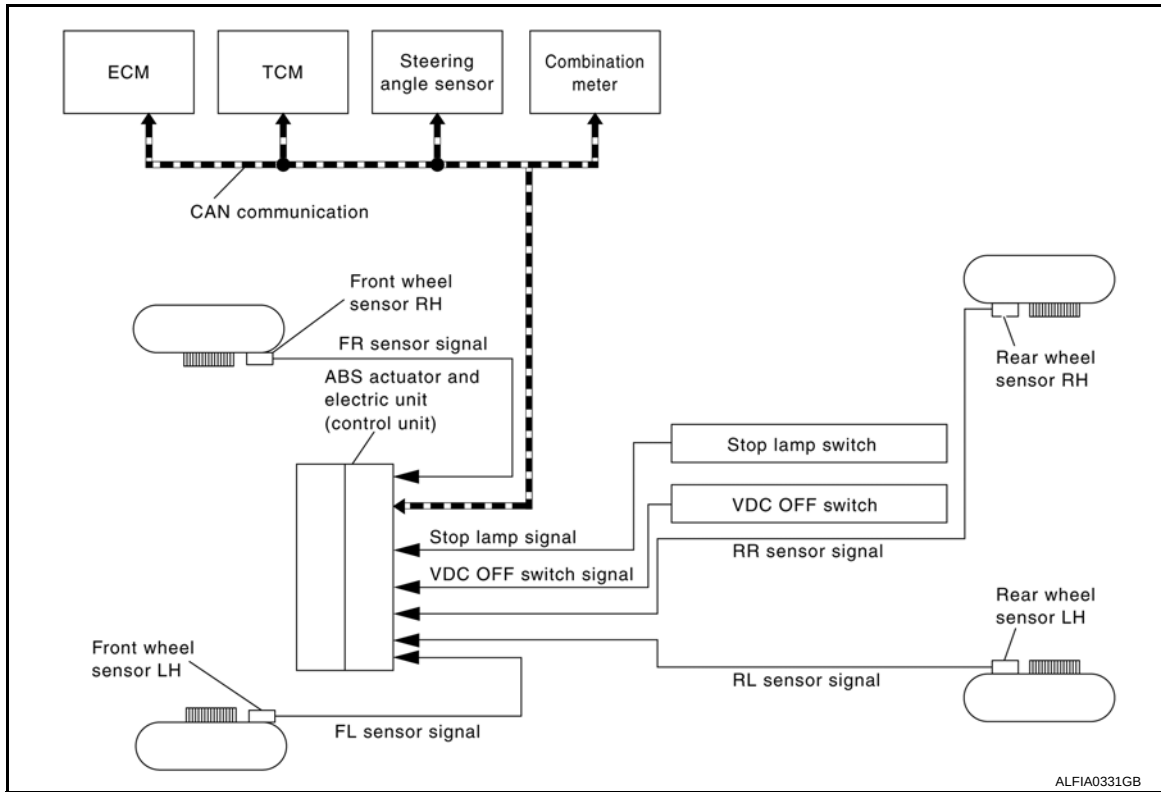
Detects the operation status of parking brake switch and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication.

SYSTEM

VDC/TCS/ABS

VDC/TCS/ABS : System Diagram

INFOID:0000000012430835



VDC/TCS/ABS : System Description

INFOID:0000000012430836

- The system switches fluid pressure of each brake caliper and each wheel cylinder 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 and EBD 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

< SYSTEM DESCRIPTION >

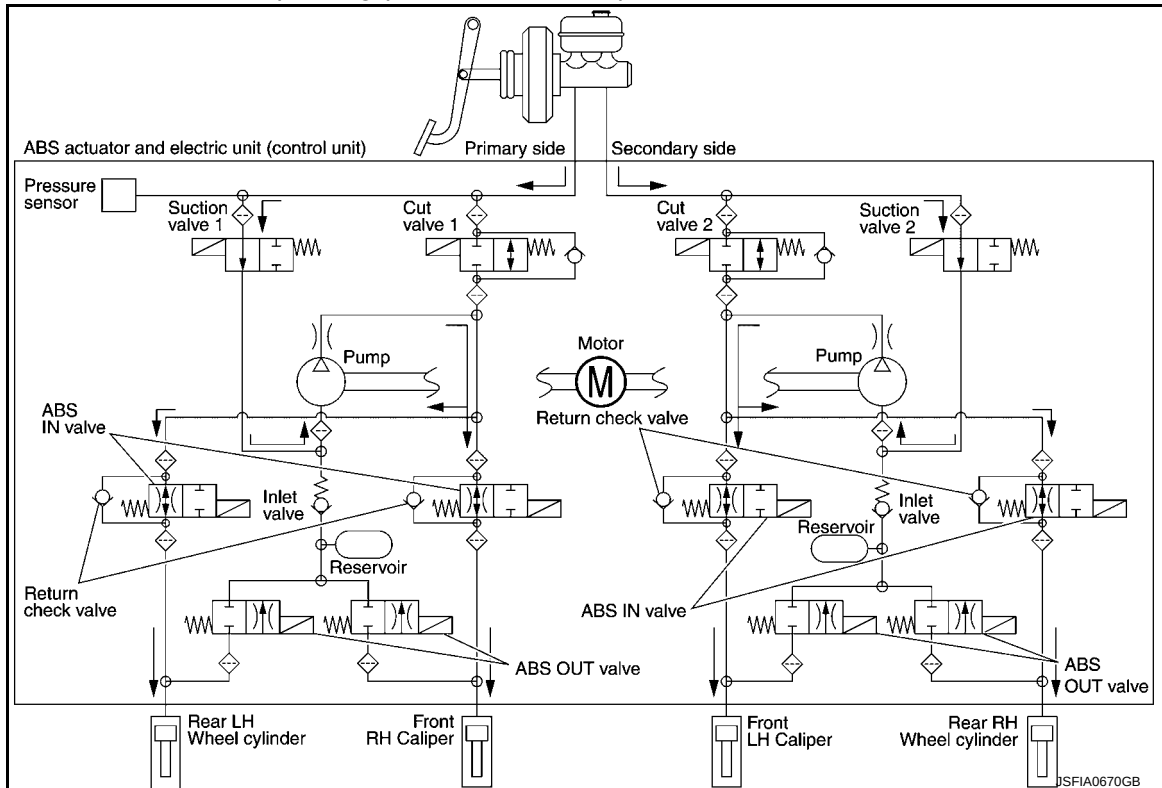
[VDC/TCS/ABS]

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: • 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.
Combination meter	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: • Brake fluid level switch signal • Parking brake switch signal Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: • 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 in 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)
Suction valve 2	Power supply is not supplied (close)	Power supply is supplied (open)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Name	Not activated	Pressure increases
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (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.

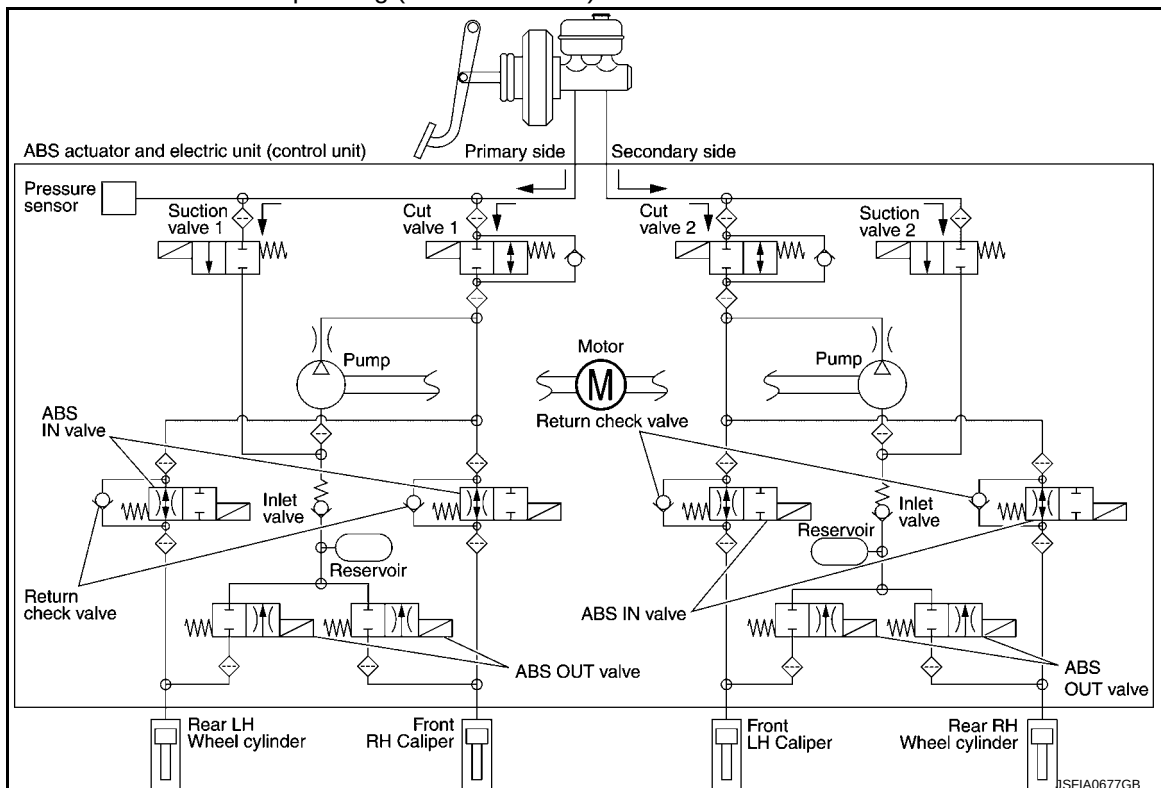
Rear RH wheel cylinder

- 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 wheel cylinder through the ABS IN valve. For the left wheel cylinder, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the left wheel cylinder is controlled separately from the right wheel cylinder.

Rear LH wheel cylinder

- 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 wheel cylinder through the ABS IN valve. For the right wheel cylinder, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right wheel cylinder is controlled separately from the left wheel cylinder.

VDC and TCS Functions Start Operating (Pressure Holds)



SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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 and wheel cylinder (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.

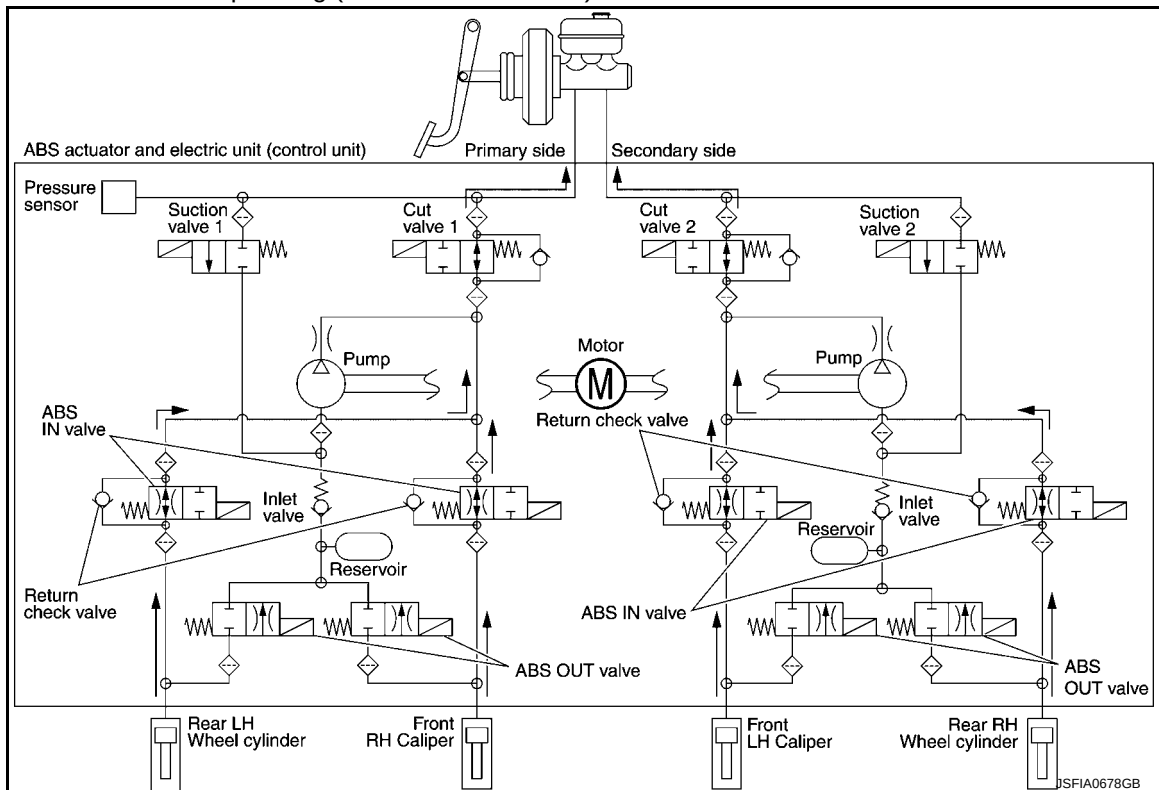
Rear RH wheel cylinder

- Since the cut valve 2 and the suction valve 2 are closed, the rear RH wheel cylinder, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear RH wheel cylinder. The pressurization for the left wheel cylinder is controlled separately from the right wheel cylinder.

Rear LH wheel cylinder

- Since the cut valve 1 and the suction valve 1 are closed, the rear LH wheel cylinder, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear LH wheel cylinder. The pressurization for the right wheel cylinder is controlled separately from the left wheel cylinder.

VDC and TCS Functions Operating (Pressure Decreases)



SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Name	Not activated	During pressure decreases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (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 wheel cylinder

- 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 wheel cylinder 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 wheel cylinder is controlled separately from the left wheel cylinder.

Rear LH wheel cylinder

- 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 wheel cylinder 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 left wheel cylinder is controlled separately from the right wheel cylinder.

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

VALVE OPERATION (ABS AND EBD FUNCTIONS)

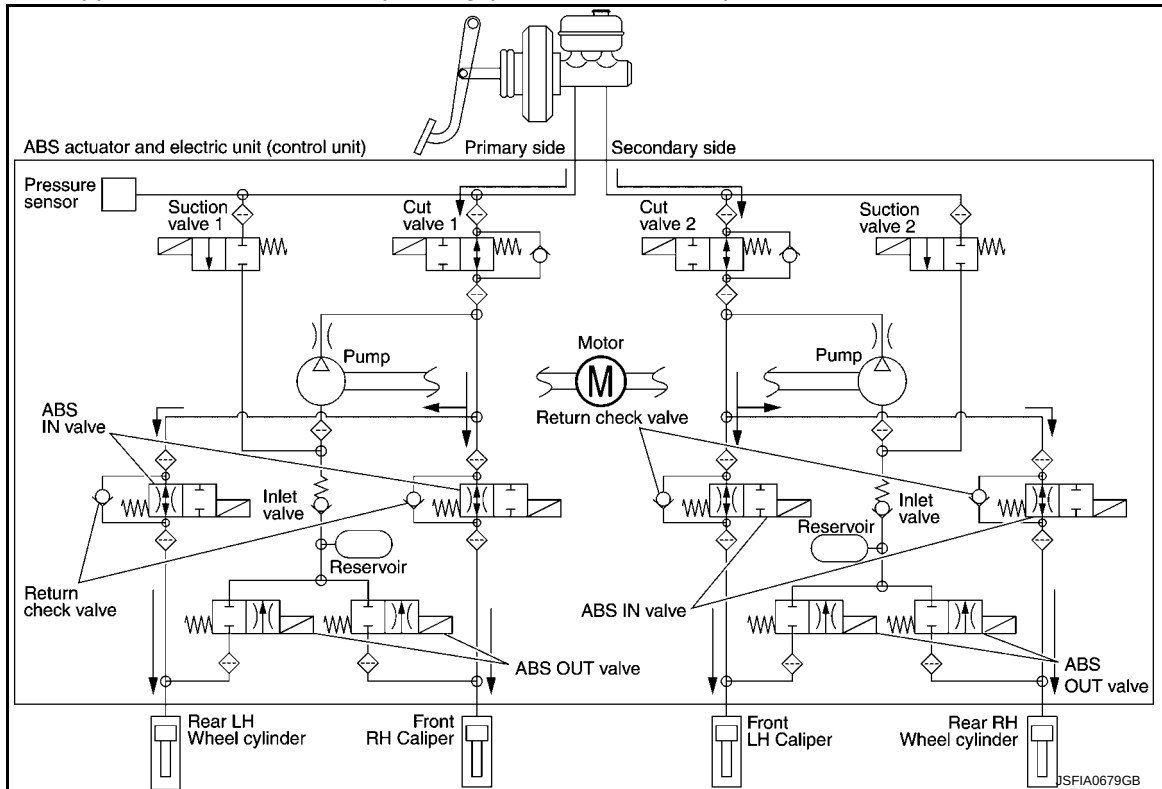
The control unit built into the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers by operating each valve.

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Brake Pedal Applied or ABS Function Operating (Pressure Increases)



Name	Not activated	During pressure increases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (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.

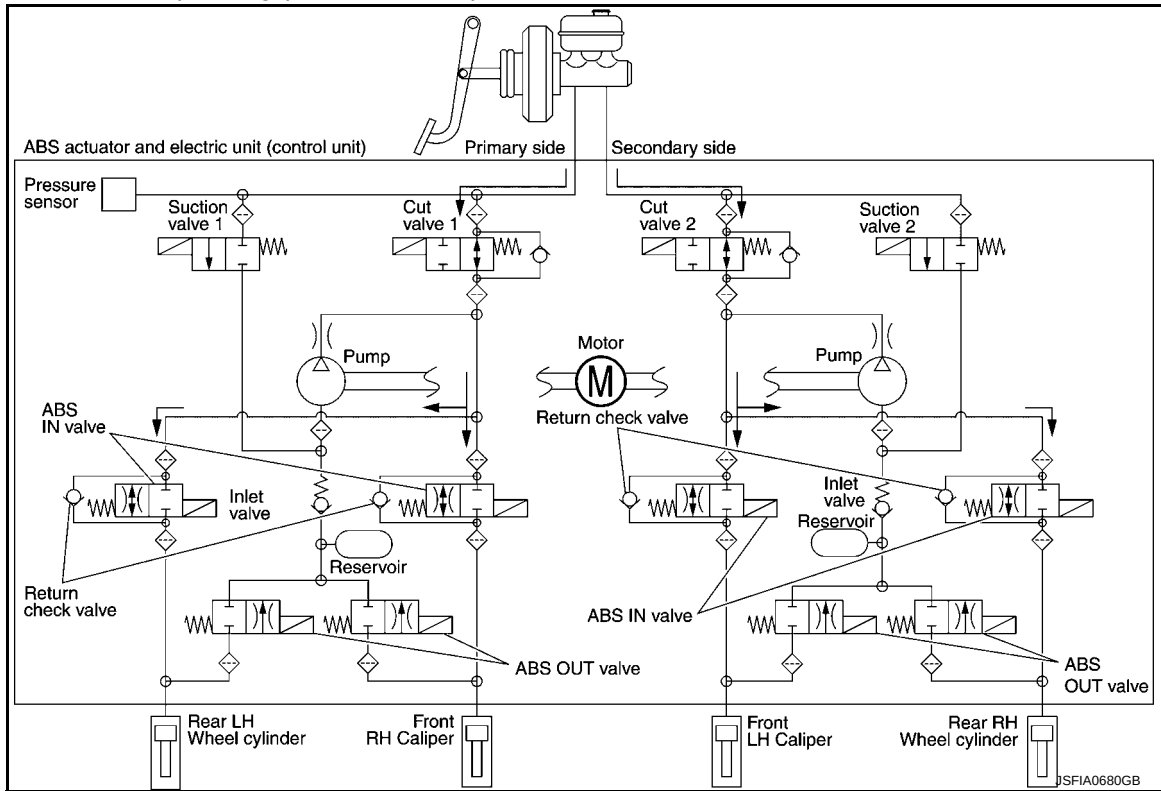
Rear RH wheel cylinder

- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear RH wheel cylinder 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 wheel cylinder

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

ABS Function Starts Operating (Pressure Holds)



Name	Not activated	During pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (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.

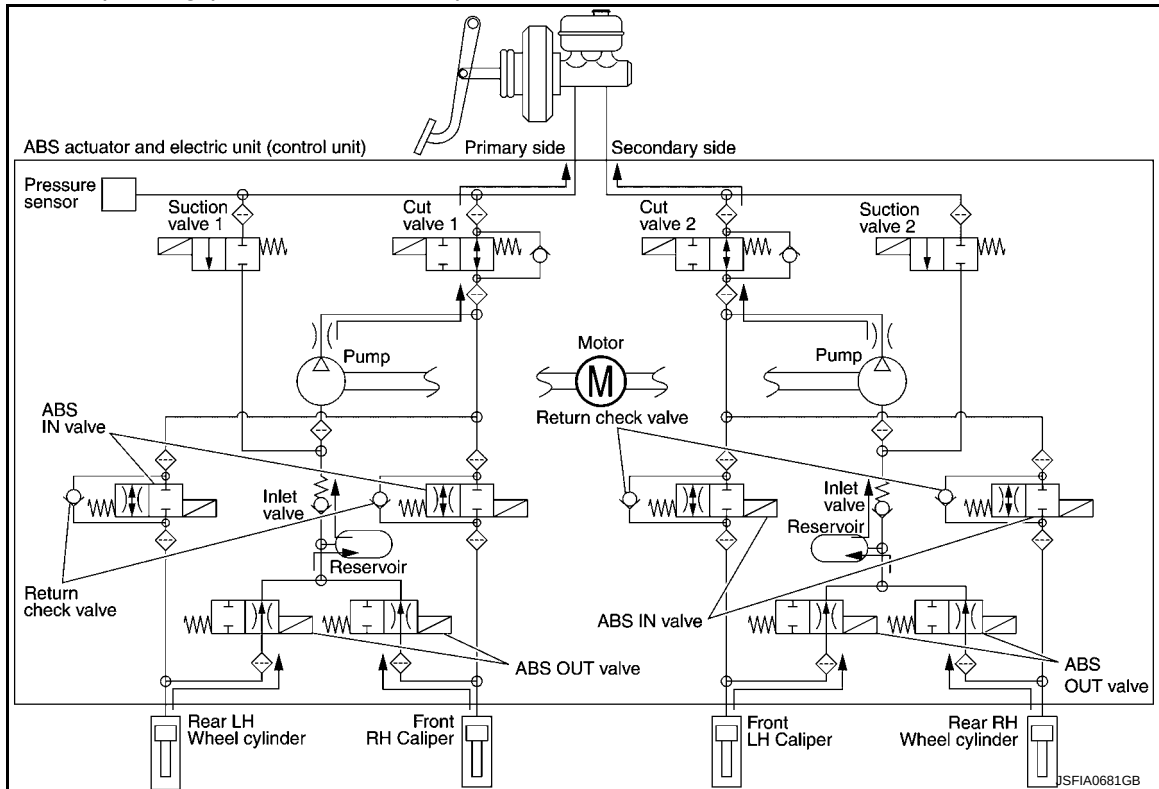
Rear RH wheel cylinder

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

Rear LH wheel cylinder

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

ABS Function Operating (Pressure Decreases)



Name	Not activated	During pressure decreases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is supplied (open)
Each brake caliper and each wheel cylinder (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.

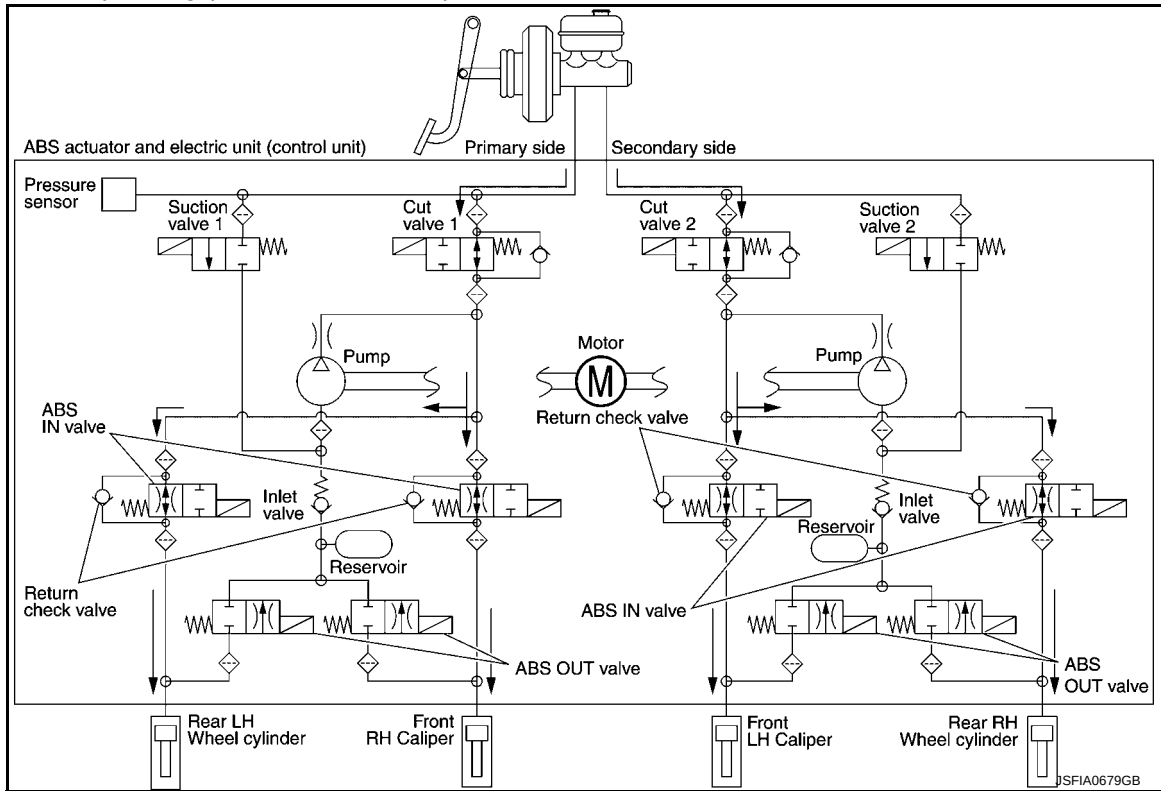
Rear RH wheel cylinder

- Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear RH wheel cylinder 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 wheel cylinder

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

ABS Function Operating (Pressure Increases)



Name	Not activated	During pressure increases
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (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 is 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 is 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 wheel cylinder

- Brake fluid is supplied to the rear RH wheel cylinder from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the rear RH wheel cylinder 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 wheel cylinder

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

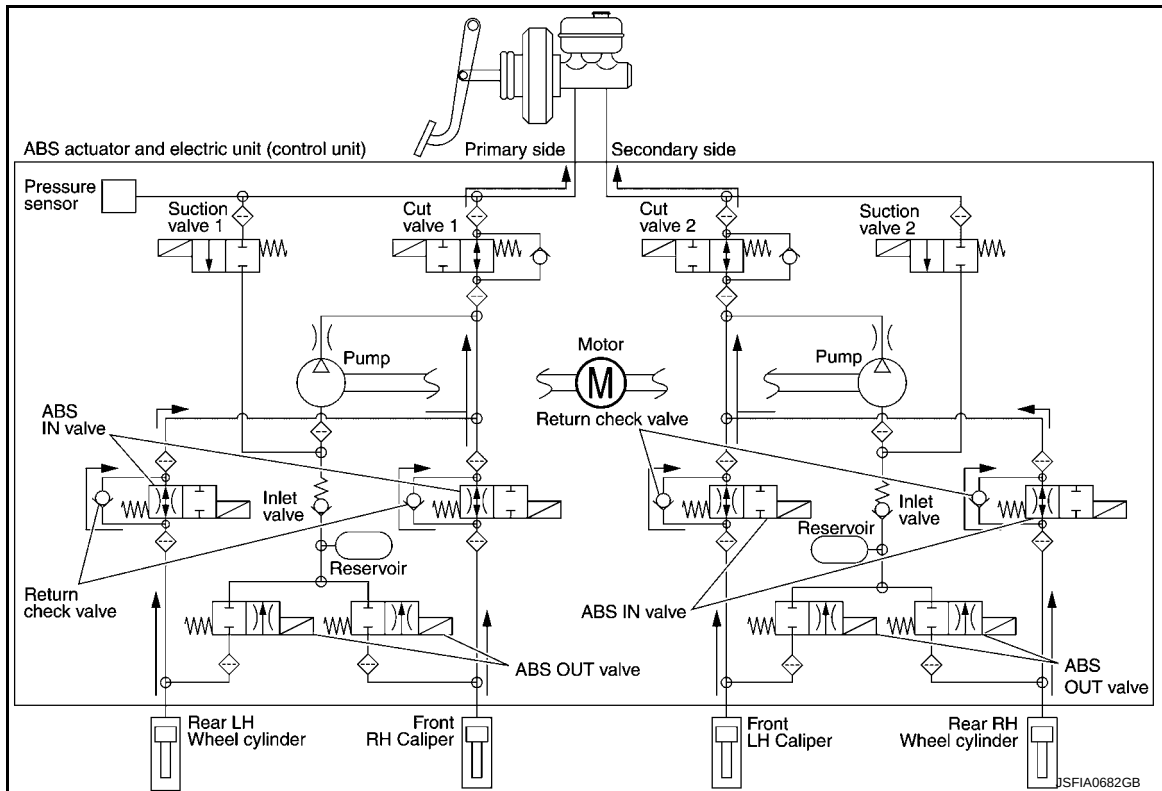
SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

reservoir. The amount of brake fluid supplied to the rear LH wheel cylinder 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 and each wheel cylinder (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 wheel cylinder

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

Rear LH wheel cylinder

- Brake fluid is supplied to the rear LH wheel cylinder 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

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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 and wheel cylinder 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 and wheel cylinder.
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. 1 second 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. 1 second 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
VDC function is malfunctioning	OFF	OFF
TCS function is malfunctioning	OFF	OFF
ABS function is malfunctioning	ON	OFF
EBD function is malfunctioning	ON	ON
Brake limited slip differential (BLSD) function is malfunctioning	OFF	OFF

SYSTEM

< SYSTEM DESCRIPTION >

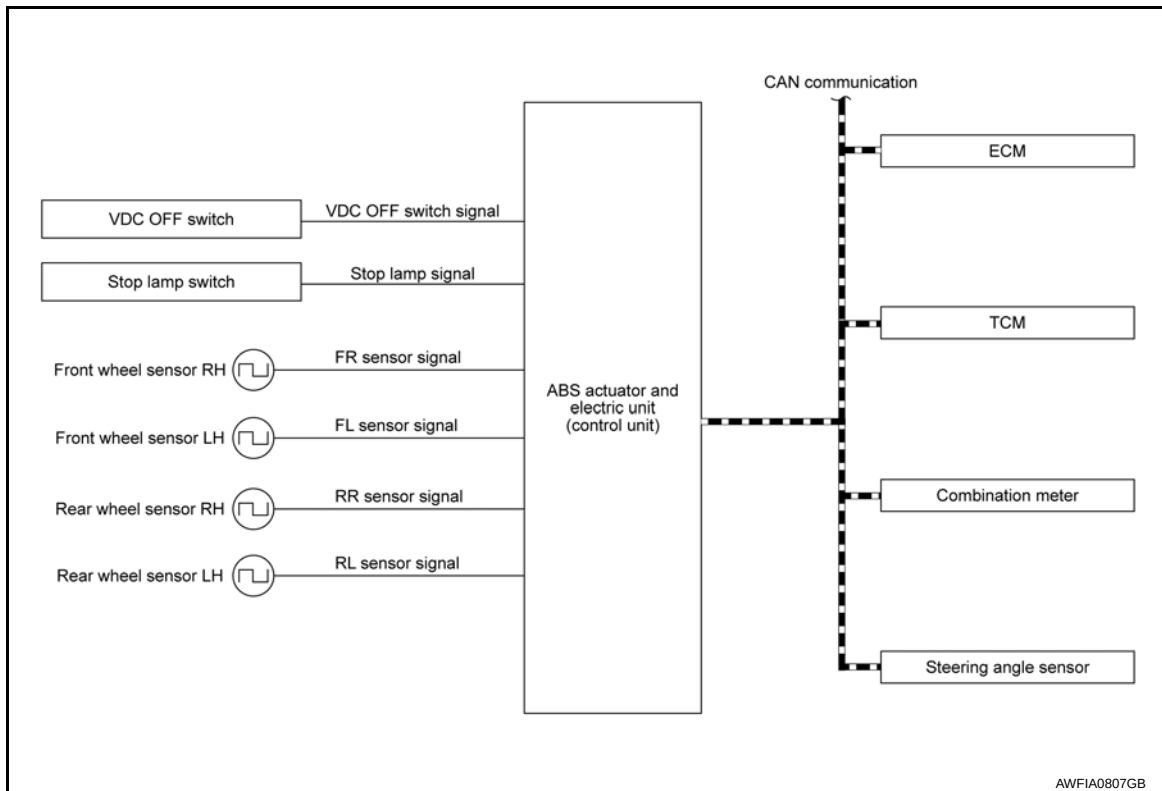
[VDC/TCS/ABS]

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

VDC/TCS/ABS : VDC Function

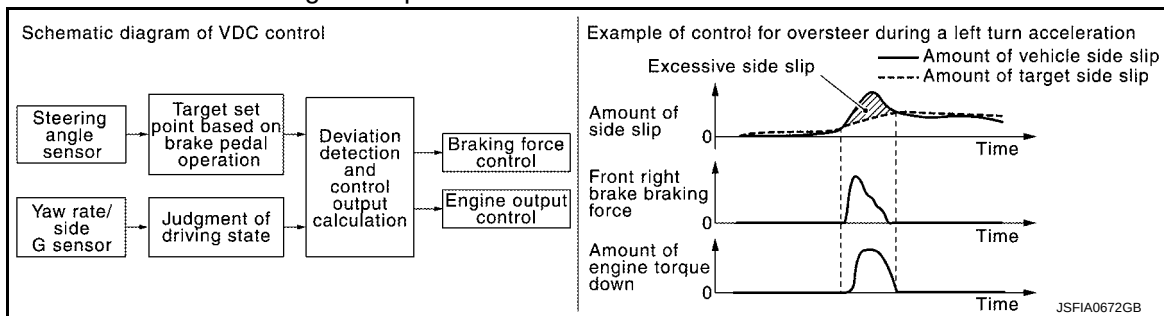
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SYSTEM DIAGRAM



SYSTEM DESCRIPTION

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



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

- Brake force control function at braking hard detects driver's brake operations with the pressure sensor, judges a brake booster's maximum brake power function by using information from the vacuum sensor, and enhances more powerful braking force by controlling brakes of four wheels.
- 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.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function and TCS function. However, ABS function and EBD function operate normally. Refer to [BRC-39, "Fail-safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

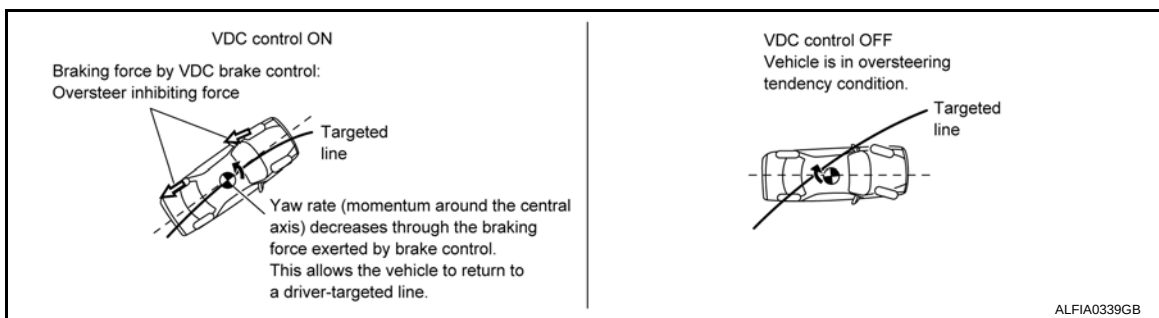
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
ECM	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: • Acceleration 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.
Steering angle sensor	Transmits the steering angle sensor signal to ABS actuator and electric unit (control unit) via CAN communication.
Combination meter	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: • Brake fluid level switch signal • parking brake switch signal Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: • VDC OFF indicator lamp signal • SLIP indicator lamp signal

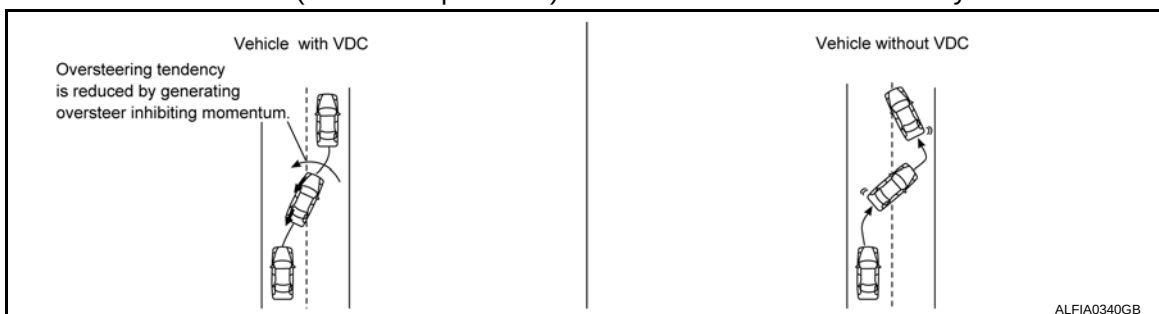
OPERATION CHARACTERISTICS

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 is generated directing the vehicle toward the outer side of the turn. Oversteer is prevented.



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



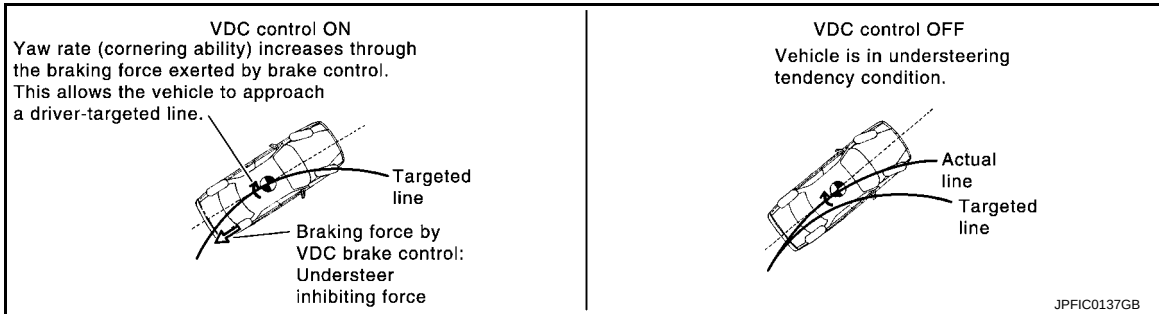
SYSTEM

< SYSTEM DESCRIPTION >

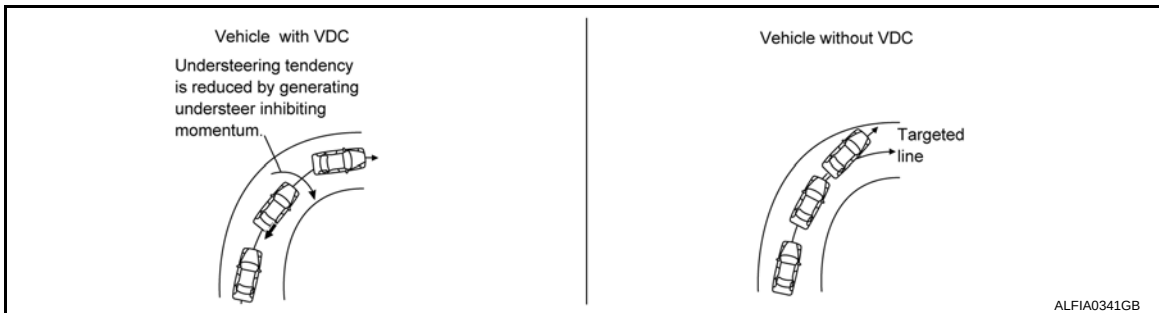
[VDC/TCS/ABS]

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 is generated directing the vehicle toward the inner side of the turn. Understeer is prevented.



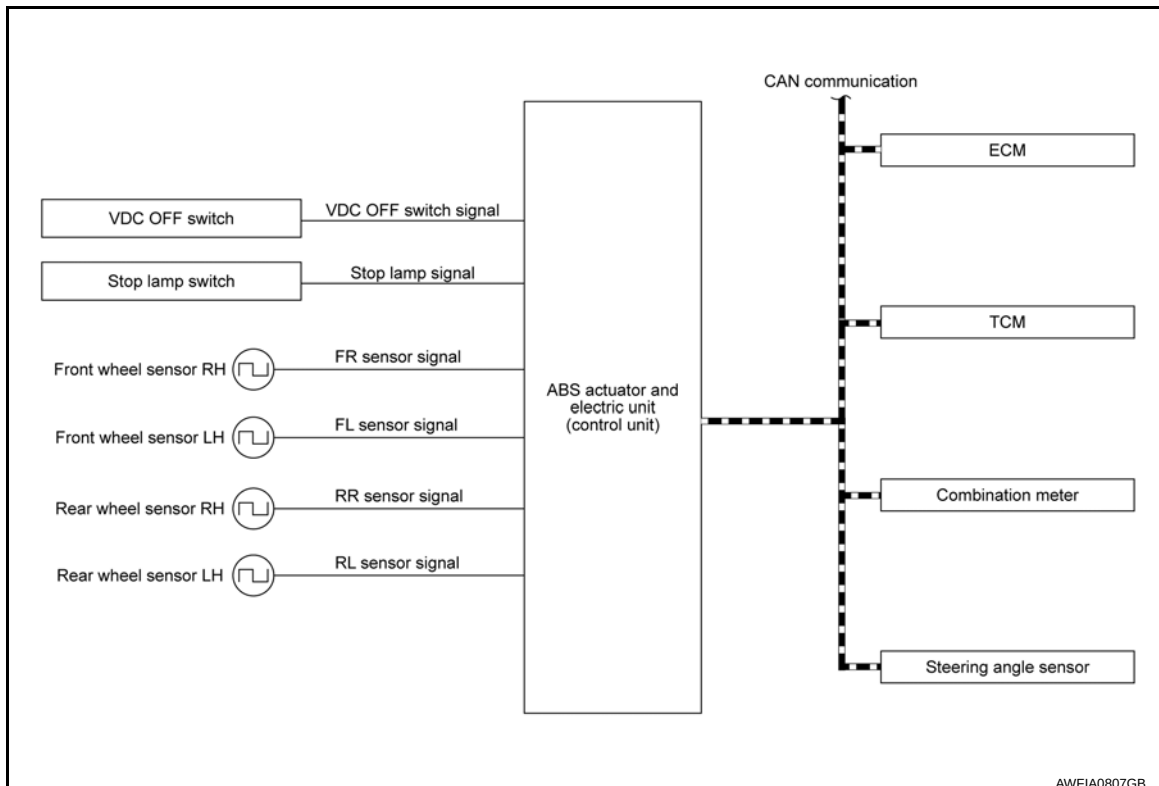
- Applying brakes during cornering on a slippery road, when there may be a tendency to understeer, engine output is controlled as well as brake force (brake fluid pressure) of 4 wheels. Understeer tendency decreases.



VDC/TCS/ABS : TCS Function

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SYSTEM DIAGRAM



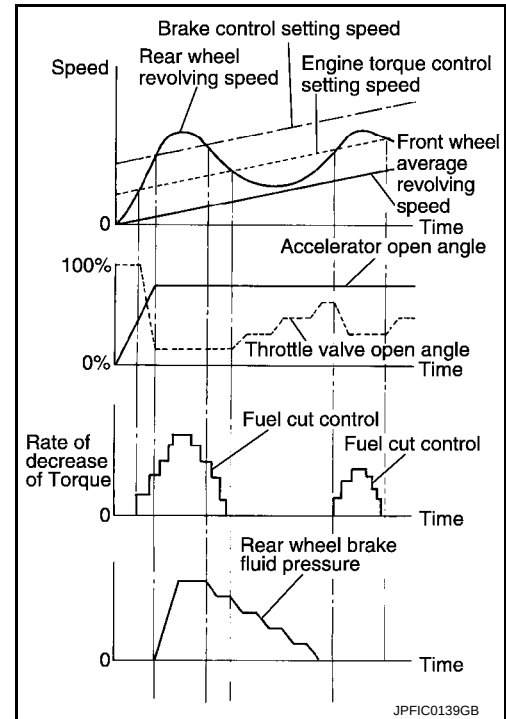
SYSTEM DESCRIPTION

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- SLIP indicator 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.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function and TCS function. However, ABS function and EBD function operate normally. Refer to [BRC-39, "Fail-safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

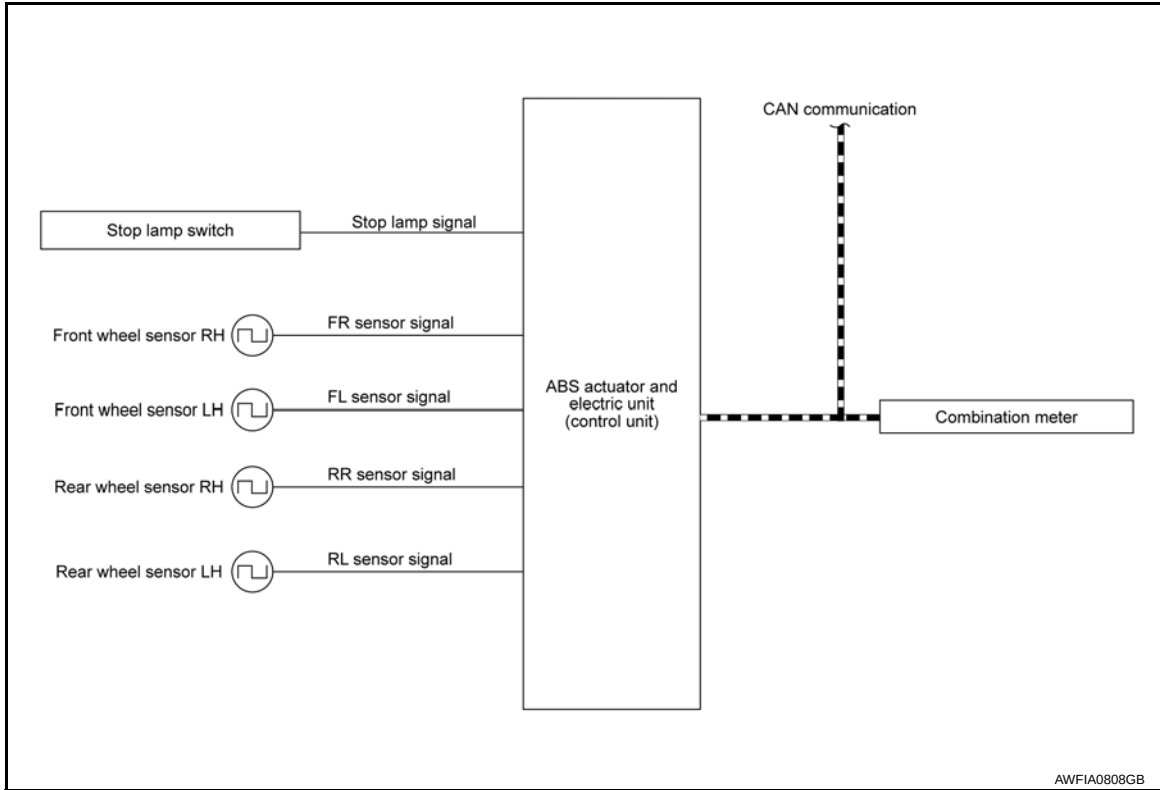
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
ECM	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: • 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.
Steering angle sensor	Transmits the steering angle sensor signal to ABS actuator and electric unit (control unit) via CAN communication.
Combination meter	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: • Brake fluid level switch signal • Parking brake switch signal Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: • VDC OFF indicator lamp signal • SLIP indicator lamp signal

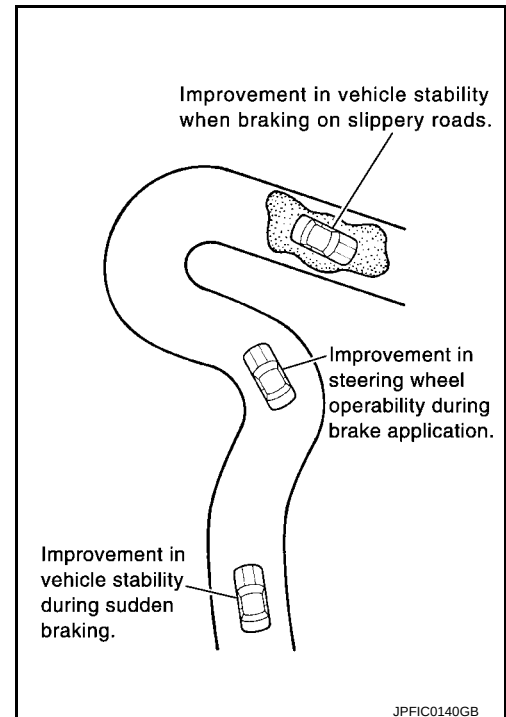
VDC/TCS/ABS : ABS Function

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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 transmit 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 while cornering.
 - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function and ABS function. However, EBD function operates normally. Refer to [BRC-28, "VDC/TCS/ABS : Fail-safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

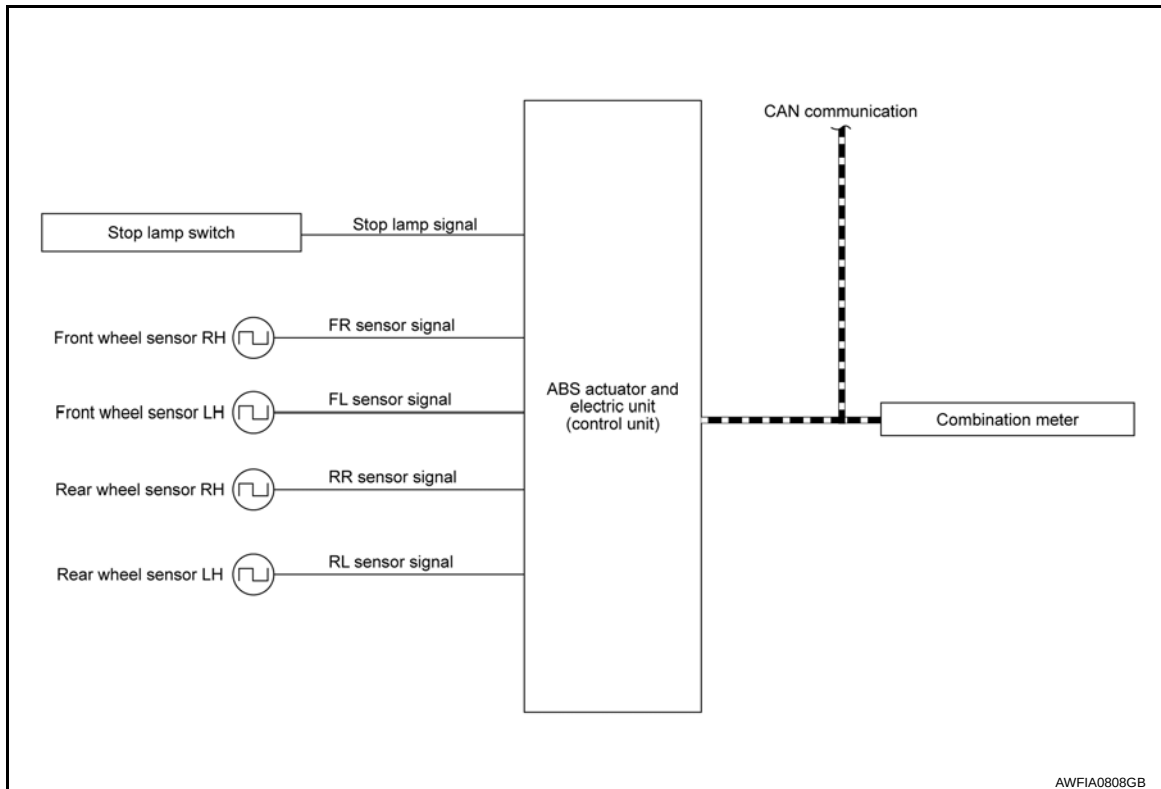
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Combination meter	Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: • VDC warning lamp signal • ABS warning lamp signal

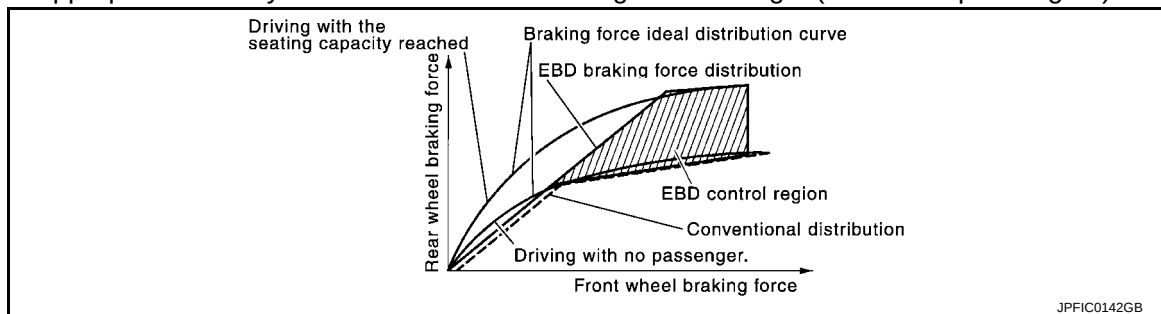
VDC/TCS/ABS : EBD Function

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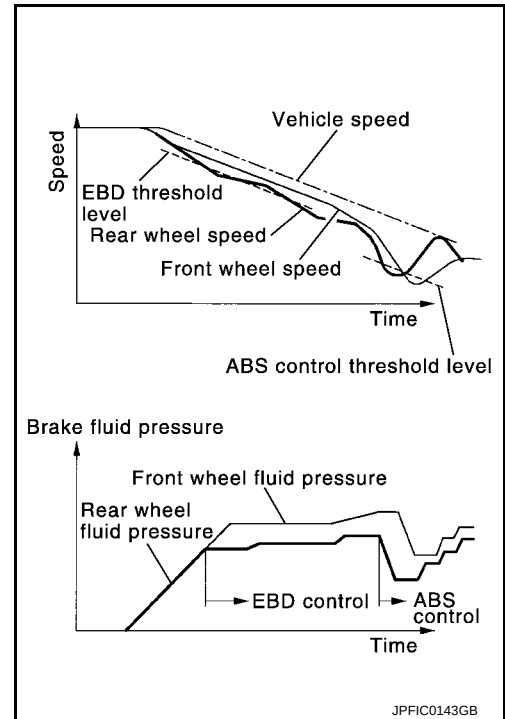
SYSTEM DIAGRAM



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



- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function and EBD function. Refer to [BRC-28. "VDC/TCS/ABS : 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	Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: • ABS warning lamp signal • Brake warning lamp signal • SLIP indicator lamp signal

VDC/TCS/ABS : Fail-safe

INFOID:0000000012430841

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 functions operate 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.

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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)
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	- 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	- 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	- 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	- 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.	
C1109	- 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.	
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: • VDC • TCS • ABS
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 specified.	The following functions are suspended: • VDC • TCS • ABS • EBD
C1116	When stop lamp switch signal is not input when brake pedal operates.	The following functions are suspended: • VDC • TCS

A

B

C

D

E

BRC

G

H

I

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M

N

O

P

SYSTEM

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

DTC	Malfunction detected condition	Fail-safe condition
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended: • VDC • TCS • ABS • EBD
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: • VDC • TCS
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: • VDC • TCS • ABS • EBD
C1142	When a malfunction is detected in VDC pressure sensor.	The following functions are suspended: • VDC • TCS
C1143	When a malfunction is detected in steering angle sensor.	
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.	
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
C1155	When brake fluid level low signal is detected.	The following functions are suspended: • VDC • TCS
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: • VDC • TCS • ABS • EBD
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.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended: • VDC • TCS • ABS
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	The following functions are suspended: • VDC • TCS
U1002	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.	
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit)	

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

CONSULT Function (ABS)

INFOID:0000000012430842

APPLICATION ITEMS

CONSULT can display each diagnostic item using the following direct diagnostic modes.

Direct Diagnostic Mode	Description
ECU Identification	The ABS actuator and electric unit (control unit) part number is displayed.
Self Diagnostic Result	The ABS actuator and electric unit (control unit) self diagnostic results are displayed.
Data Monitor	The ABS actuator and electric unit (control unit) input/output data is displayed in real time.
Active Test	The ABS actuator and electric unit (control unit) activates outputs to test components.
Work support	The settings for ABS actuator and electric unit (control unit) functions can be changed.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number is displayed.

SELF DIAGNOSTIC RESULT

Operation Procedure

1. Before performing the "Self Diagnostic Result", start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How To Erase Self Diagnostic Result

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

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

Display Item List

Refer to [BRC-43, "DTC Index"](#).

DATA MONITOR

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR (km/h, mph)	×	×	×	Wheel speed (km/h, mph) calculated by front wheel sensor LH signal is displayed.
FR RH SENSOR (km/h, mph)	×	×	×	Wheel speed (km/h, mph) calculated by front wheel sensor RH signal is displayed.
RR LH SENSOR (km/h, mph)	×	×	×	Wheel speed (km/h, mph) calculated by rear wheel sensor LH signal is displayed.
RR RH SENSOR (km/h, mph)	×	×	×	Wheel speed (km/h, mph) calculated by rear wheel sensor RH signal is displayed.

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR RH IN SOL (On/Off)	—	×	×	Front RH IN ABS solenoid (On/Off) status is displayed.
FR RH OUT SOL (On/Off)	—	×	×	Front RH OUT ABS solenoid (On/Off) status is displayed.
FR LH IN SOL (On/Off)	—	×	×	Front LH IN ABS solenoid (On/Off) status is displayed.
FR LH OUT SOL (On/Off)	—	×	×	Front LH OUT ABS solenoid (On/Off) status is displayed.
RR RH IN SOL (On/Off)	—	×	×	Rear RH IN ABS solenoid (On/Off) status is displayed.
RR RH OUT SOL (On/Off)	—	×	×	Rear RH OUT ABS solenoid (On/Off) status is displayed.
RR LH IN SOL (On/Off)	—	×	×	Rear LH IN ABS solenoid (On/Off) status is displayed.
RR LH OUT SOL (On/Off)	—	×	×	Rear LH OUT ABS solenoid (On/Off) status is displayed.
EBD WARN LAMP (On/Off)	—	—	×	Brake warning lamp (On/Off) status is displayed.
STOP LAMP SW (On/Off)	×	×	×	Stop lamp switch (On/Off) status is displayed.
MOTOR RELAY (On/Off)	—	×	×	ABS motor relay signal (On/Off) status is displayed.
ACTUATOR RLY (On/Off)	—	×	×	ABS actuator relay signal (On/Off) status is displayed.
ABS WARN LAMP (On/Off)	—	×	×	ABS warning lamp (On/Off) status is displayed.
OFF LAMP (On/Off)	—	×	×	VDC OFF Lamp (On/Off) status is displayed.
OFF SW	×	×	×	VDC OFF Switch (On/Off) position is displayed
SLIP/VDC LAMP (On/Off)	—	×	×	SLIP indicator lamp (On/Off) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage (V) supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position (1, 2, 3, 4, 5) judged by transmission range switch signal is displayed.
SLCT LVR POSI	×	×	×	Current gear position judged from current gear position signal is displayed.
ENGINE SPEED	×	×	×	Engine speed judged by CAN communication signal is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate (d/s) detected by yaw rate sensor is displayed.
R POSI SIG (On/Off)	—	—	×	Reverse shift position (On/Off) judged by transmission range switch signal.
N POSI SIG (On/Off)	—	—	×	Neutral position (On/Off) judged by transmission range switch signal.
P POSI SIG (On/Off)	—	—	×	Park position (On/Off) judged by transmission range switch signal.
CV1 (On/Off)	—	—	×	Cut valve 1(On/Off) status is displayed.
CV2 (On/Off)	—	—	×	Cut valve 2 (On/Off) status is displayed.

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SV1 (On/Off)	—	—	×	Suction valve 1(On/Off) status is displayed.
SV2 (On/Off)	—	—	×	Suction valve 2 (On/Off) status is displayed.
ACCEL POS SIG (%)	×	—	×	Throttle valve open/close status judged by CAN communication signal is displayed.
SIDE G-SENSOR (m/s ²)	×	—	×	Transverse acceleration detected by side G-sensor is displayed.
STR ANGLE SIG (deg)	×	—	×	Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×	—	×	Brake pressure detected by pressure sensor is displayed.
EBD SIGNAL (On/Off)	—	—	×	EBD operation (On/Off) status is displayed.
ABS SIGNAL (On/Off)	—	—	×	ABS operation (On/Off) status is displayed.
TCS SIGNAL (On/Off)	—	—	×	TCS operation (On/Off) status is displayed.
VDC SIGNAL (On/Off)	—	—	×	VDC operation (On/Off) status is displayed.
EBD FAIL SIG (On/Off)	—	—	×	EBD fail signal (On/Off) status is displayed.
ABS FAIL SIG (On/Off)	—	—	×	ABS fail signal (On/Off) status is displayed.
TCS FAIL SIG (On/Off)	—	—	×	TCS fail signal (On/Off) status is displayed.
VDC FAIL SIG (On/Off)	—	—	×	VDC fail signal (On/Off) status is displayed.
CRANKING SIG (On/Off)	—	—	×	The input state of the key SW START position signal is displayed.
FLUID LEV SW (On/Off)	×	—	×	Brake fluid level switch (On/Off) status is displayed.

×: Applicable

—: Not applicable

ACTIVE TEST MODE

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be performed with the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp or brake warning lamp on.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn on during active test.

NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal.
- "TEST IS STOPPED" is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" is displayed, to perform test again, touch BACK.

Test Item

ABS SOLENOID VALVE

- Select "Up", "Keep" and "Down". Then use screen monitor to check that solenoid valve operates as shown in the table below.

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

Test item	Display item	Display (Note)		
		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*

*: On for 1 to 2 seconds after the select, and then Off.

NOTE:

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

ABS SOLENOID VALVE (ACT)

- Select "Up", "ACT UP" and "ACT KEEP". Then use screen monitor to check that solenoid valve operates as shown in the table below.

Test item	Display item	Display (Note)		
		Up	ACT UP	ACT KEEP
FR RH ABS SOLENOID (ACT)	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	CV2	Off	On*	Off
	SV1	Off	On	On
	SV2	Off	On	Off
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	CV2	Off	On*	Off
	SV1	Off	On	On
	SV2	Off	On	Off
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	CV2	Off	On*	Off
	SV1	Off	On	On
	SV2	Off	On	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
	CV1	Off	On	On
	CV2	Off	On*	Off
	SV1	Off	On	On
	SV2	Off	On	Off

*: On for 1 to 2 seconds after the select, and then Off.

NOTE:

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

ABS MOTOR

- Select "On" and "Off". Make sure motor relay and actuator relay operates as shown in table below.

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

NOTE:

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

WORK SUPPORT

Conditions	Description
ST ANGLE SENSOR ADJUSTMENT	Steering angle sensor neutral position adjustment can be performed. Refer to BRC-55, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement" .

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000012430843

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	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
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
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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
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
OFF SW	VDC OFF switch	When VDC OFF switch is in ON	On
		When VDC OFF switch is in 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
SLCT LVR POSI	Selector lever position.	Vehicle stopped	N/P
ENGINE SPEED	With engine running	When engine running	RPM
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	When vehicle stop	Approx. 0 d/s
		When 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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
N POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = N position	On
		CVT shift position = other than N position	Off
P POSI SIG	Transmission range switch signal ON/OFF condition	CVT shift position = P position	On
		CVT shift position = other than P position	Off
CV1	ABS actuator cut valve 1	When the cut valve is active	On
		When the cut valve is inactive	Off
CV2	ABS actuator cut valve 2	When the cut valve is active	On
		When the cut valve is inactive	Off
SV1	ABS actuator suction valve	When the suction valve is active	On
		When the suction valve is inactive	Off
SV2	ABS actuator suction valve 2	When the suction valve is active	On
		When the suction valve is inactive	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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

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

Note 1: Confirm tire pressure is normal.

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

- Refer to [BRC-22, "VDC/TCS/ABS : VDC Function"](#).
- Refer to [BRC-24, "VDC/TCS/ABS : TCS Function"](#).
- Refer to [BRC-26, "VDC/TCS/ABS : ABS Function"](#).
- Refer to [BRC-27, "VDC/TCS/ABS : EBD Function"](#).

Fail-safe

INFOID:0000000012430844

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 functions operate 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.

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

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)
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	• 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	• 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	• 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	• 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.	
C1109	• 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: • VDC • TCS • ABS • EBD
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: • VDC • TCS • ABS
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 specified.	The following functions are suspended: • VDC • TCS • ABS • EBD
C1116	When stop lamp switch signal is not input when brake pedal operates.	The following functions are suspended: • VDC • TCS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

DTC	Malfunction detected condition	Fail-safe condition
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended: • VDC • TCS • ABS • EBD
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: • VDC • TCS
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: • VDC • TCS • ABS • EBD
C1142	When a malfunction is detected in VDC pressure sensor.	The following functions are suspended: • VDC • TCS
C1143	When a malfunction is detected in steering angle sensor.	
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.	The following functions are suspended: • VDC • TCS • ABS
C1153	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little.)	
C1154	Transmission range switch signal or communication line between the ABS actuator and electric unit (control unit) and TCM is open or shorted.	The following functions are suspended: • VDC • TCS • ABS
C1155	When brake fluid level low signal is detected.	The following functions are suspended: • VDC • TCS
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: • VDC • TCS • ABS • EBD
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.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended: • VDC • TCS • ABS

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

DTC	Malfunction detected condition	Fail-safe condition
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	The following functions are suspended: • VDC • TCS
U1002	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.	
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit)	

DTC Inspection Priority Chart

INFOID:000000012430845

When multiple DTCs are displayed simultaneously, check each one using the following priority list.

Priority	Detected item (DTC)
1	• U1000 CAN COMM CIRCUIT • U1002 SYSTEM COMM(CAN) • U1010 CAN CONTROLLER CIRCUIT
2	• C1110 CONTROLLER FAILURE • C1153 EMERGENCY BRAKE • C1170 VARIANT CODING
3	• C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	• C1109 BATTERY VOLTAGE [ABNORMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY
5	• 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 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • 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 • C1154 PNP POSI SIG • C1164 CV1 • C1165 CV2 • C1166 SV1 • C1167 SV2
6	• C1155 BR FLUID LEVEL LOW

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

DTC Index

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DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-58, "DTC Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-63, "DTC Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-70, "DTC Description"
C1110	CONTROLLER FAILURE	BRC-72, "DTC Description"
C1111	PUMP MOTOR	BRC-74, "DTC Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-77, "DTC Description"
C1116	STOP LAMP SW	BRC-84, "DTC Description"
C1120	FR LH IN ABS SOL	BRC-88, "DTC Description"
C1121	FR LH OUT ABS SOL	BRC-90, "DTC Description"
C1122	FR RH IN ABS SOL	BRC-88, "DTC Description"
C1123	FR RH OUT ABS SOL	BRC-90, "DTC Description"
C1124	RR LH IN ABS SOL	BRC-88, "DTC Description"
C1125	RR LH OUT ABS SOL	BRC-90, "DTC Description"
C1126	RR RH IN ABS SOL	BRC-88, "DTC Description"
C1127	RR RH OUT ABS SOL	BRC-90, "DTC Description"
C1130	ENGINE SIGNAL 1	BRC-92, "DTC Description"
C1140	ACTUATOR RLY	BRC-94, "DTC Description"
C1142	PRESS SEN CIRCUIT	BRC-96, "DTC Description"
C1143	ST ANG SEN CIRCUIT	BRC-99, "DTC Description"
C1144	ST ANG SEN SIGNAL	BRC-103, "DTC Description"
C1145	YAW RATE SENSOR	BRC-105, "DTC Description"
C1146	SIDE G-SEN CIRCUIT	
C1153	EMERGENCY BRAKE	BRC-72, "DTC Description"
C1154	PNP POSI SIG	BRC-106, "DTC Description"
C1155	BR FLUID LEVEL LOW	BRC-108, "DTC Description"
C1164	CV 1	BRC-112, "DTC Description"
C1165	CV 2	
C1166	SV 1	BRC-114, "DTC Description"
C1167	SV 2	
C1170	VARIANT CODING	BRC-116, "DTC Description"
U1000	CAN COMM CIRCUIT	BRC-117, "DTC Description"
U1002	SYSTEM COMM (CAN)	BRC-118, "DTC Description"
U1010	CONTROL UNIT (CAN)	BRC-120, "DTC Description"

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WIRING DIAGRAM

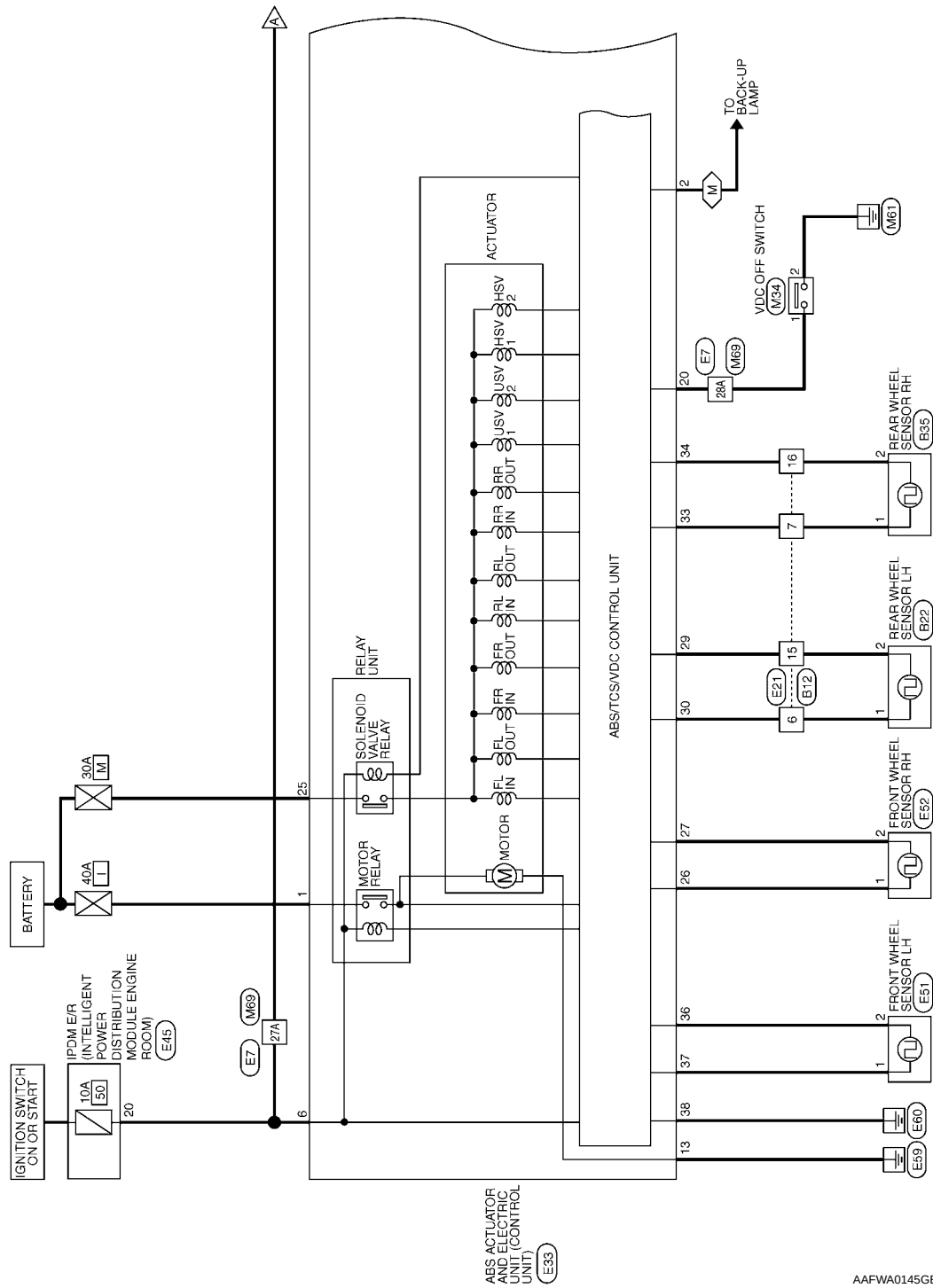
BRAKE CONTROL SYSTEM

Wiring Diagram

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BRAKE CONTROL SYSTEM

M : WITH M/T

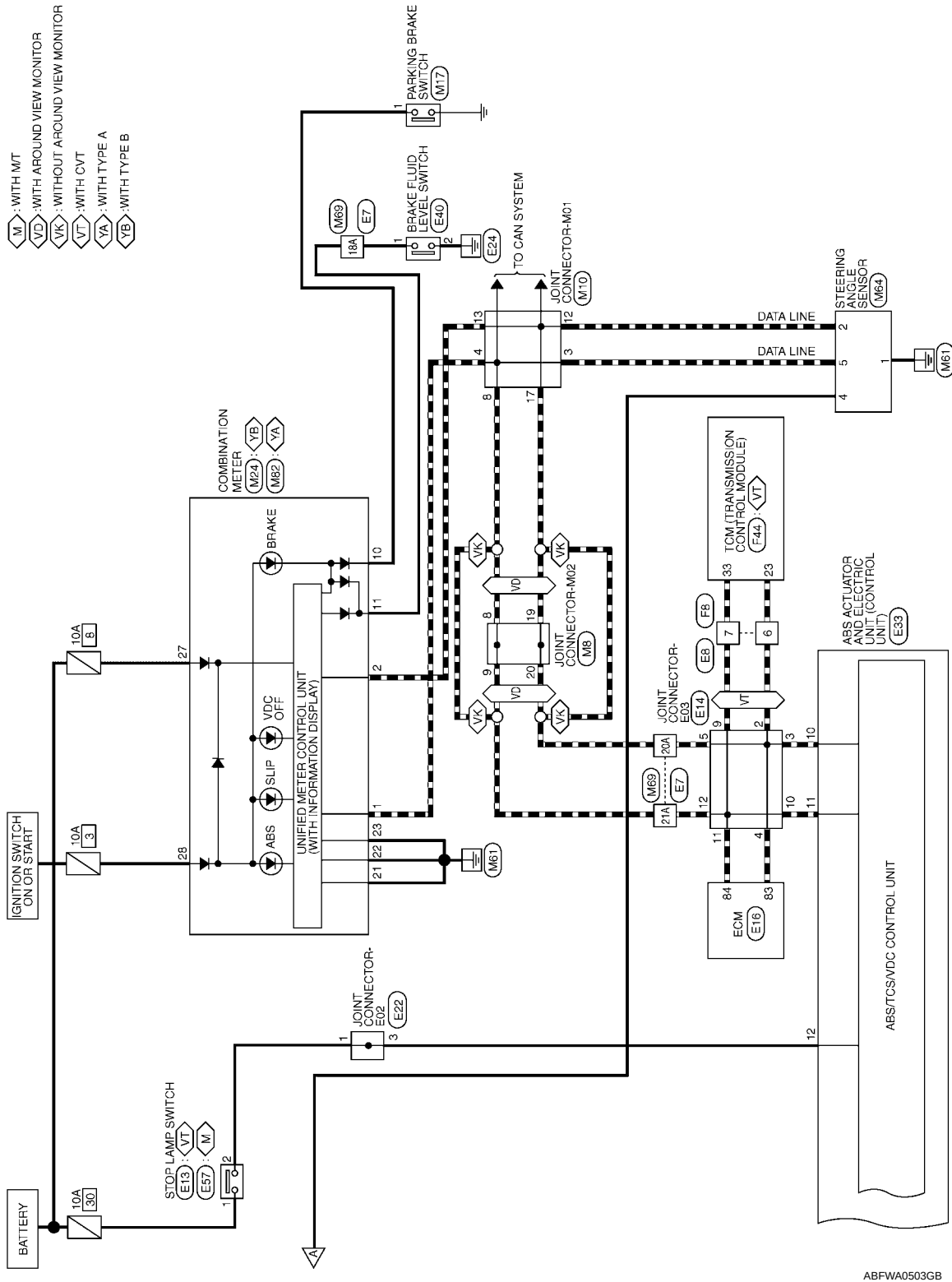


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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[VDC/TCS/ABS]



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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[VDC/TCS/ABS]

BRAKE CONTROL SYSTEM CONNECTORS

Connector No.	M8
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
8	L	-
9	L	-
19	P	-
20	P	-

Connector No.	M10
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



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Terminal No.	Color of Wire	Signal Name
3	L	-
4	L	-
8	L	-
12	P	-
13	P	-
17	P	-

Connector No.	M17
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK



1

Connector No.	M24
Connector Name	COMBINATION METER (WITH TYPE B)
Connector Color	WHITE



20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name
1	SB	-

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
10	SB	PKB SW
11	BR	BRAKE OIL SW
21	B	GND (ILL)
22	B	GND (POWER)
23	B	GND (CIRCUIT)
27	R/W	BAT
28	GR	IGN

Connector No.	M34
Connector Name	VDC OFF SWITCH
Connector Color	GRAY



6	5	4	3	2	1
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Terminal No.	Color of Wire	Signal Name
1	SB	-
2	B	-

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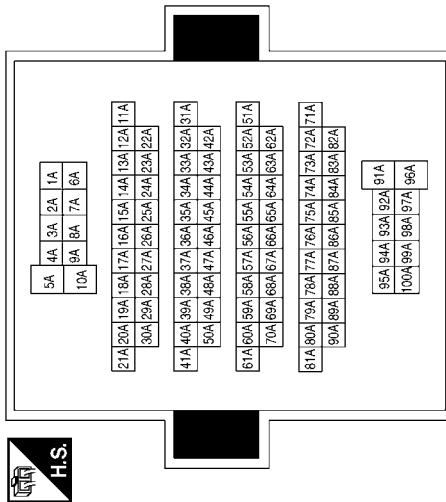
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

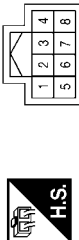
[VDC/TCS/ABS]

Terminal No.	Color of Wire	Signal Name
18A	BR	-
20A	P	-
21A	L	-
27A	GR	-
28A	SB	-

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



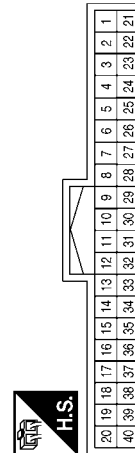
Connector No.	M64
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE



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

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
10	SB	PKB SW
11	BR	BRAKE OIL SW
21	B	GND (ILLUMINATION)
22	B	GND (POWER)
23	B	GND (CIRCUIT)
27	R/W	BAT
28	GR	IGN

Connector No.	M82
Connector Name	COMBINATION METER (WITH TYPE A)
Connector Color	WHITE



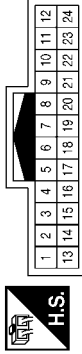
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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[VDC/TCS/ABS]

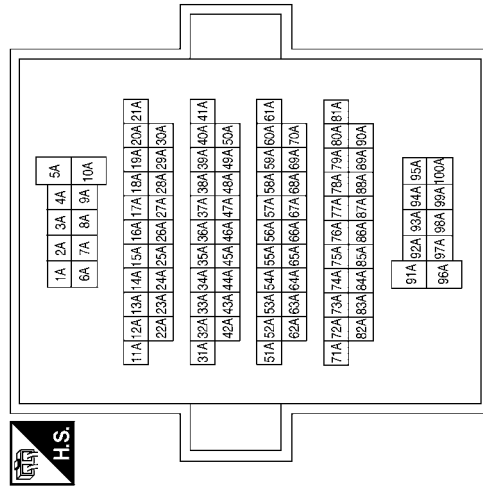
Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
6	P	-
7	L	-

Terminal No.	Color of Wire	Signal Name
18A	LG	-
20A	P	-
21A	L	-
27A	BR	-
28A	R	-

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	L	-
10	L	-
11	L	-
12	L	-

Connector No.	E14
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
2	P	-
3	P	-
4	P	-
5	P	-

Connector No.	E13
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE



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

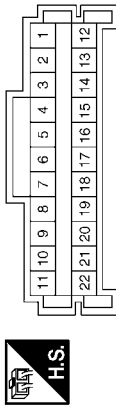
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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

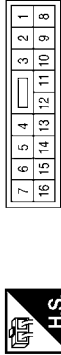
[VDC/TCS/ABS]

Connector No.	E22
Connector Name	JOINT CONNECTOR-E02
Connector Color	WHITE



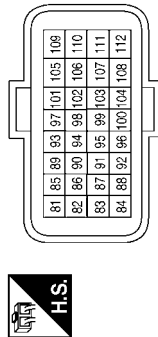
Terminal No.	Color of Wire	Signal Name
1	LG	-
3	LG	-

Connector No.	E21
Connector Name	WIRE TO WIRE
Connector Color	GRAY



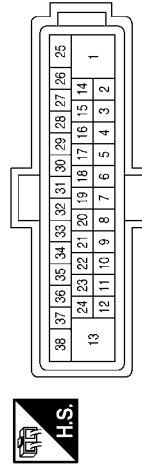
Terminal No.	Color of Wire	Signal Name
6	B	-
7	SB	-
15	W	-
16	V	-

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
83	P	CAN-H
84	L	CAN-L

Connector No.	E33
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	MOTOR SUPPLY
2	SB	SHIFT R (WITH MANUAL TRANSMISSION)
3	-	-
4	-	-
5	-	-
6	BR	IGN

Terminal No.	Color of Wire	Signal Name
24	-	-
25	W	VALVE/ECU SUPPLY
26	LG	WSS FR SIG (-)
27	Y	WSS FR PWR (+)
28	-	-
29	W	WSS RL PWR (+)
30	B	WSS RL SIG (-)
31	-	-
32	-	-
33	SB	WSS RR SIG (-)
34	V	WSS RR PWR (+)
35	-	-
36	R	WSS FL PWR (+)
37	G	WSS FL SIG (-)
38	B	GND (SOL)

Terminal No.	Color of Wire	Signal Name
7	-	-
8	-	-
9	-	-
10	P	CAN-L
11	L	CAN-H
12	LG	BLS
13	B	GND (MTR)
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	-	-
20	R	VDC OFF SW
21	-	-
22	-	-
23	-	-

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[VDC/TCS/ABS]

Connector No.	E40
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Color	BLACK



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

Connector No.	E45
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



21	20	19	18	17
28	27	26	25	24
23	22	21	20	19

Terminal No.	Color of Wire	Signal Name
20	BR	ABS ECU

Connector No.	E51
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	BLACK



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

Connector No.	E52
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK



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

Connector No.	E57
Connector Name	STOP LAMP SWITCH (WITH M/T)
Connector Color	BLACK



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

Connector No.	F8
Connector Name	WIRE TO WIRE
Connector Color	WHITE



12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
6	P/L	-
7	L/G	-

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[VDC/TCS/ABS]

Connector No.	B22
Connector Name	REAR WHEEL SENSOR LH
Connector Color	GRAY



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

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



1	2	3	4		5	6	7	
8	9	10	11	12	13	14	15	16

Terminal No.	Color of Wire	Signal Name
6	V	-
7	SB	-
15	W	-
16	BG	-

Connector No.	F44
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	BLACK



31	32	33	34	35	36	37	38	39	40	47	48
21	22	23	24	25	26	27	28	29	30	45	46
11	12	13	14	15	16	17	18	19	20	43	44
1	2	3	4	5	6	7	8	9	10	41	42

Terminal No.	Color of Wire	Signal Name
23	P/L	CAN-L
33	L/G	CAN-H

Connector No.	B35
Connector Name	REAR WHEEL SENSOR RH
Connector Color	BLACK



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

ABFIA1096GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000012430848

DETAILED FLOW

1. INTERVIEW THE CUSTOMER

Clarify customer concerns before inspection. First of all, perform an interview utilizing [BRC-53, "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-39, "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

 With CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

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

2. Perform "Self Diagnostic Result" 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

 With CONSULT

1. Erase "Self Diagnostic Result" 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-42, "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-42, "Intermittent Incident"](#).

5. REPAIR OR REPLACE MALFUNCTIONING COMPONENT

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

CAUTION:

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

- 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-42, "Intermittent Incident"](#).

7. FINAL CHECK

 With CONSULT

1. Select "DATA MONITOR" of "ABS"
2. Check the reference values. Refer to [BRC-36, "Reference Value"](#).
3. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> Inspection End.

Diagnostic Work Sheet

INFOID:000000012430849

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		☐ Does not operate () function			
		☐ Warning lamp turns ON.			
		ABS  BRAKE    OFF			
		☐ Other ()			
		☐ Noise (Location:) ☐ Vibration (Location:)			
		☐ Other ()			
First occurrence		☐ Recently ☐ Other ()			
Frequency of occurrence		☐ Always ☐ Under a certain conditions of ☐ Sometimes (time(s)/day)			
Climate conditions		☐ Irrelevant			
	Weather	☐ Fine ☐ Cloud ☐ Rain ☐ Snow ☐ Others ()			
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Temperature [Approx. °C (°F)]			
	Relative humidity	☐ High ☐ Moderate ☐ Low			
Road conditions		☐ Ordinary road ☐ Highway ☐ Mountainous road (uphill or downhill) ☐ Rough road			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

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.		☐ Irrelevant ☐ When engine/traction motor starts ☐ During idling ☐ During driving ☐ During acceleration ☐ At constant speed driving ☐ During deceleration ☐ Immediately before stop [Vehicle speed: Approx. km/h (MPH)] ☐ During cornering (right curve or left curve) ☐ When steering wheel is steered (to right or to left)			
		VDC OFF switch operation ☐ Yes ☐ No			
		Use of other functions (ex. ICC) ☐ Yes ☐ No ()			
		Presence of non-genuine parts installation ☐ Yes ☐ No ()			

Memo

cardiagn.com

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000012545169

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:

- Neutral position adjustment for the steering angle sensor
- Calibration of the decel G sensor (if equipped)

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000012545170

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to [BRC-55. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#), GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR (IF EQUIPPED)

Perform calibration of the decel G sensor.

>> Refer to [BRC-56. "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000012545171

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	×
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

INFOID:0000000012545172

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.

< BASIC INSPECTION >

>> 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". Then make sure "STR ANGLE SIG" is within $0 \pm 2.5^\circ$.

Is the steering angle within the specified range?

YES >> GO TO 4

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to [BRC-31, "CONSULT Function \(ABS\)"](#).
- ECM: Refer to [EC-60, "CONSULT Function"](#).

Are the memories erased?

YES >> Inspection End

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

CALIBRATION OF DECEL G SENSOR**CALIBRATION OF DECEL G SENSOR : Description**

INFOID:0000000012545173

Refer to the table below to determine if calibration of the decel G sensor is required.

x: Required —: Not required

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	x
Removing/Installing steering components	—
Replacing steering components	—
Removing/Installing suspension components	—
Replacing suspension components	—
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	—
Removing/Installing yaw rate/side/decel G sensor	x
Replacing yaw rate/side/decel G sensor	x

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:0000000012545174

CALIBRATION OF DECEL G SENSOR (IF EQUIPPED)**CAUTION:**

To calibrate the decel G sensor, make sure to use CONSULT
(Calibration cannot be done without CONSULT)

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[VDC/TCS/ABS]

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

2.PERFORM CALIBRATION OF DECEL G SENSOR

1. On the CONSULT screen, touch "WORK SUPPORT" and "DECEL G-SEN CALIBRATION" in order.
2. Touch "START".
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". Then make sure "DECEL G SEN" is within $\pm 0.08G$.

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4.ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to [BRC-31. "CONSULT Function \(ABS\)".](#)
- ECM: Refer to [EC-60. "CONSULT Function".](#)

Are the memories erased?

YES >> Inspection End

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

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:000000012430854

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

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

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

YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "CRNT": Proceed to [BRC-59. "Diagnosis Procedure"](#).

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430855

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)

 With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-140, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-141, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Erase "Self Diagnostic Result" 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. Perform "Self Diagnostic Result" 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 / replace harness or connector, securely lock the connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (1)

 With 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. 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

[VDC/TCS/ABS]

< 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. Perform "Self Diagnostic Result" 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-121, "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, and GO TO 7.

7. PERFORM SELF-DIAGNOSIS (2)

 With CONSULT

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

[VDC/TCS/ABS]

- 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	
E33	36	E51	(Front LH wheel)	2
	27	E52	(Front RH wheel)	
	29	B22	(Rear LH wheel)	
	34	B35	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E33	37	E51	(Front LH wheel)	1
	26	E52	(Front RH wheel)	
	30	B22	(Rear LH wheel)	
	33	B35	(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-DIAGNOSIS (3)

 With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- Erase "Self Diagnostic Result" 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.
- 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.

- Stop the vehicle.
- 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.

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

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

YES >> GO TO 10.

NO >> Inspection End.

10.CHECK WHEEL SENSOR OUTPUT SIGNAL

- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Disconnect wheel sensor harness connector.
- Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
- 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.

- 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 >

[VDC/TCS/ABS]

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-144, "Removal and Installation"](#).

NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

Ⓔ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-140, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-141, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" 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. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:0000000012430856

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	- 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)	- 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)	- 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)	- 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
- Harness or connector - Wheel sensor - Sensor rotor - Tire size - ABS actuator and electric unit (control unit) power supply system - Fuse - Fusible link - Battery	- 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

With 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 >

[VDC/TCS/ABS]

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

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

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "CRNT": Proceed to [BRC-64, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430857

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 [FAX-7, "Inspection"](#).
- Rear: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

- Front: Refer to [FAX-9, "Removal and Installation"](#).
- Rear: Refer to [RAX-6, "Removal and Installation"](#).

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-121, "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-54, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 6.

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

4. CHECK DATA MONITOR (1)

 With 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" 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:

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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)

ⓘ With 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 start the engine.

4. Perform "Self Diagnostic Result" 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-140, "FRONT WHEEL SENSOR : Exploded View"](#).
- Rear: Refer to [BRC-141, "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)

ⓘ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-140, "FRONT WHEEL SENSOR : Removal and Installation"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- Rear: Refer to [BRC-141, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" 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" 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 10.

NO >> GO TO 20.

10. PERFORM SELF-DIAGNOSIS (2)

 With 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 start the engine.
4. Perform "Self Diagnostic Result" 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)

 With 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" 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:
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?

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

13.PERFORM SELF-DIAGNOSIS (3)

④With 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 start the engine.

4. Perform "Self Diagnostic Result" 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, and GO TO 15.

15.CHECK DATA MONITOR (3)

④With CONSULT

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

④With 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 start the engine.

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/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		
E33	36	Ground	No
	27		
	29		
	34		

Is the inspection result normal?

YES >> GO TO 18.

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

18. CHECK DATA MONITOR (4)

④ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the 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" 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 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

19. PERFORM SELF-DIAGNOSIS (5)

④ With 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 start the engine.

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

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Inspection End.

20. REPLACE SENSOR ROTOR

With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-143. "FRONT SENSOR ROTOR : Removal and Installation".](#)
 - Rear: Refer to [BRC-143. "REAR SENSOR ROTOR : Removal and Installation".](#)

2. Erase "Self Diagnostic Result" 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 start the engine.

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

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144. "Removal and Installation".](#)

NO >> Inspection End.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:0000000012430858

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: - 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
- Harness or connector - ABS actuator and electric unit (control unit) power supply system - Fuse - Fusible link - Battery - Charge system	- 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

 With 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. Drive the vehicle at 20 km/h (12 MPH) or more for approx. 2 minutes.

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

Is DTC "C1109" detected?

YES-1 >> "C1109" is displayed as "CRNT": Proceed to [BRC-70, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430859

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.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Repair / replace harness or connector, securely lock the connector, and 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. Drive the vehicle at 20 km/h (12 MPH) or more for approx. 2 minutes.
4. Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

DTC Description

INFOID:0000000012430860

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	• The vehicle travels near high-voltage electrical power lines. • Motor built-in the ABS actuator and electric unit (control unit) operates temporarily without a break. • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Incomplete neutral position adjustment of steering angle-sensor • ABS actuator and electric unit (control unit) • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery
C1153	• 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

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

Is DTC "C1110" or "C1153" detected?

YES-1 >> "C1110" or "C1153" is displayed as "CRNT": Proceed to [BRC-73, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Diagnosis Procedure

INFOID:000000012430861

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

 With CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-55, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

Was neutral position adjustment of steering angle sensor finished?

YES >> GO TO 2.

NO >> Check the steering angle sensor system. Refer to [BRC-99, "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-121, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

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

3. PERFORM SELF-DIAGNOSIS

 With CONSULT

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

Is DTC "C1110" or "C1153" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

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

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:0000000012430862

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

With 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 start the engine.

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

Is DTC "C1111" detected?

YES-1 >> "C1111" is displayed as "CRNT": Proceed to [BRC-74, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430863

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, securely lock the connector, and GO TO 2.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

2.PERFORM SELF-DIAGNOSIS

④With 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. Perform "Self Diagnostic Result" 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-121, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

4.ERASE SELF-DIAGNOSIS RESULT (1)

④With 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".
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-144, "Removal and Installation"](#).
NO >> Repair / replace harness or connector, and GO TO 6.

6.ERASE SELF-DIAGNOSIS RESULT (2)

④With 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".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

NOTE:

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

>> Inspection End.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1115 WHEEL SENSOR

DTC Description

INFOID:000000012430864

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 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
• Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

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

Is DTC "C1115" detected?

YES-1 >> "C1115" is displayed as "CRNT": Proceed to [BRC-77, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430865

CAUTION:

Never check between wheel sensor harness connector terminals.

< DTC/CIRCUIT DIAGNOSIS >

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to [WT-54, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 4.

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

2. CHECK DATA MONITOR (1)

 With 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" 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:

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)

 With 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. Perform "Self Diagnostic Result" 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-121, "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-140, "FRONT WHEEL SENSOR : Exploded View"](#).

• Rear: Refer to [BRC-141, "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)

 With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-140, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-141, "REAR WHEEL SENSOR : Removal and Installation"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" 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" 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 9.

NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

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

< 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, securely lock the connector, and GO TO 11.

11.CHECK DATA MONITOR (2) With 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" 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:

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) With 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. Perform "Self Diagnostic Result" 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, and GO TO 14.

14.CHECK DATA MONITOR (3) With CONSULT

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

C1115 WHEEL SENSOR

[VDC/TCS/ABS]

< DTC/CIRCUIT DIAGNOSIS >

2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" 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" 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 15.
NO >> GO TO 16.

15.PERFORM SELF-DIAGNOSIS (4)

Ⓜ With 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. Perform "Self Diagnostic Result" 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	
E33	36	E51	(Front LH wheel)	2 Yes
	27	E52	(Front RH wheel)	
	29	B22	(Rear LH wheel)	
	34	B35	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E33	37	E51	(Front LH wheel)	1 Yes
	26	E52	(Front RH wheel)	
	30	B22	(Rear LH wheel)	
	33	B35	(Rear RH wheel)	

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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		
E33	36	Ground	No
	27		
	29		
	34		

Is the inspection result normal?

YES >> GO TO 17.

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

17. CHECK DATA MONITOR (4)

⑧ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" 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" 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 18.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

18. PERFORM SELF-DIAGNOSIS (5)

⑧ With 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. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Inspection End.

19. REPLACE SENSOR ROTOR

⑧ With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-143, "FRONT SENSOR ROTOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-143, "REAR SENSOR ROTOR : Removal and Installation"](#).
2. Erase "Self Diagnostic Result" of "ABS"

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/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. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Inspection End.

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C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1116 STOP LAMP SWITCH

DTC Description

INFOID:000000012430866

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 input when brake pedal operates. - When stop lamp switch signal is input when brake pedal is not operated.

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
- Harness or connector - Stop lamp switch signal circuit	- Harness or connector - 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

With CONSULT

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

NOTE:

Stop the vehicle.

- Wait 1 minute or more.

NOTE:

Never depress brake pedal.

- Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.
- Release brake pedal, and wait 1 minute or more.
- Repeat step 4 to 5 ten or more times.
- 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.

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

Is DTC "C1116" detected?

YES-1 >> "C1116" is displayed as "CRNT": Proceed to [BRC-85. "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-42. "Intermittent Incident"](#).

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

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Diagnosis Procedure

INFOID:000000012430867

NOTE:

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

1. INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

 With 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.

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

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamps turn ON.

Do the stop lamps turn ON?

YES >> GO TO 5.

NO >> Check the stop lamp system. Refer to [EXL-63. "Wiring Diagram"](#). GO TO 4.

4. CHECK DATA MONITOR (1)

 With 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.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-36. "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.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, or terminal, and 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-121, "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)

 With 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.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-36, "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			
E33	12	Ground	Brake pedal depressed	10 – 16 V
			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			
E33	12	Ground	Brake pedal depressed	10 – 16 V
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

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

9. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E33	12	E13 (WITH CVT)	2	Yes
		E57 (WITH M/T)		

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	12	Ground	No

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

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

10.CHECK DATA MONITOR (3)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the 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 "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-36, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

Component Inspection

INFOID:0000000012430868

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
Terminal		
1 – 2	When stop lamp switch is released (When brake pedal is depressed)	Yes
	When stop lamp switch is pressed (When brake pedal is released)	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the stop lamp switch. Refer to [BR-20, "Removal and Installation"](#).

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:000000012430869

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

⑧ With 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. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "CRNT": Proceed to [BRC-88. "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430870

1. CHECK CONNECTOR

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

 With 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. Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:000000012430871

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

⑧ With 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. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "CRNT": Proceed to [BRC-90. "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430872

1. CHECK CONNECTOR

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

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. Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

C1130 ENGINE SIGNAL

DTC Description

INFOID:000000012430873

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • CAN communication line	• 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

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

Is DTC "C1130" detected?

YES-1 >> "C1130" is displayed as "CRNT": Proceed to [BRC-92, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430874

1. CHECK ENGINE SYSTEM

 With CONSULT

Perform "Self Diagnostic Result" of "ENGINE".

Is DTC detected?

YES >> Check the DTC. Refer to [EC-87, "DTC Index"](#).

NO >> GO TO 2.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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-121, "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)

 With CONSULT

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

Is DTC "C1130" or "U1000" detected?

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

YES ("U1000") >> Refer to [LAN-16, "Trouble Diagnosis Flow Chart"](#).

NO >> Inspection End.

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:0000000012430875

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

Ⓑ With 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. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES-1 >> "C1140" is displayed as "CRNT": Proceed to [BRC-94, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430876

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, securely lock the connector, and GO TO 2.

2. PERFORM SELF-DIAGNOSIS

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

 With 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. Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1142 PRESS SENSOR

DTC Description

INFOID:0000000012430877

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
• 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	• 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

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

Is DTC "C1142" detected?

YES-1 >> "C1142" is displayed as "CRNT": Proceed to [BRC-96, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430878

1. STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to [BRC-85, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2. CHECK BRAKE FLUID LEAKAGE

< DTC/CIRCUIT DIAGNOSIS >

Check the brake fluid leakage. Refer to [BR-12, "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-12, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to [BR-23, "FRONT : Removal and Installation"](#).

- Rear: Refer to [BR-26, "REAR : Removal and Installation"](#).

4.CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to [BR-9, "Inspection and Adjustment"](#).

- 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-9, "Inspection and 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-14, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to [BR-28, "Removal and Installation"](#).

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to [BR-15, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to [BR-31, "Removal and installation"](#).

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

8.CHECK FRONT DISC BRAKE

Check the front disc brake caliper. Refer to [BR-36, "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-37, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

9.CHECK REAR BRAKE

Check the rear brake. Refer to [BR-41, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace rear brake. Refer to [BR-41, "Removal and Installation"](#).

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

C1142 PRESS SENSOR

[VDC/TCS/ABS]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-121, "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)

 With CONSULT

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

Is DTC "C1142" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "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 >

[VDC/TCS/ABS]

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:0000000012430879

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
• 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	• 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

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

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": Proceed to [BRC-99, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430880

1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

With CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-55, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

 With 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. Perform "Self Diagnostic Result" 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, securely lock the connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

 With 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. Perform "Self Diagnostic Result" 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		
M64	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		
M64	4	Ground	Battery voltage

Is the inspection result normal?

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

6.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 50 (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	
M64	4	E45	20	Yes

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M64	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		
M64	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-121, "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-16, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair / replace harness or connector.

11.CHECK DATA MONITOR

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

 With CONSULT

1. Select "DATA MONITOR" of "ABS", 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-36, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-147, "Removal and Installation"](#).

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:000000012430881

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	• 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

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

Is DTC "C1144" detected?

YES-1 >> "C1144" is displayed as "CRNT": Proceed to [BRC-103. "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430882

1.AJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-55. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2.

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

With CONSULT

1. Turn the ignition switch OFF.

NOTE:

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- 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" 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-99. "Diagnosis Procedure"](#).

Is the inspection result normal?

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

4.CHECK DATA MONITOR

 With CONSULT

1. Select "DATA MONITOR" of "ABS", 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-36. "Reference Value"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144. "Removal and Installation"](#).
NO >> Replace the steering angle sensor. Refer to [BRC-147. "Removal and Installation"](#).

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Description

INFOID:0000000012430883

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	When a malfunction is detected in yaw rate signal.
C1146	SIDE G SEN CIRCUIT (Side G sensor circuit)	When a malfunction is detected in side/decel G signal.

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	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

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

Is DTC "C1145" or "C1146" detected?

YES-1 >> "C1145" or "C1146" is displayed as "CRNT": Proceed to [BRC-105, "Diagnosis Procedure"](#).

YES-2 >> "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-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430884

1. CHECK SELF-DIAGNOSIS RESULTS

Replace the ABS actuator and electric unit (control unit) even if other DTCs are displayed along with "C1145" or "C1146" in "Self Diagnostic Result" of "ABS".

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1154 TRANSMISSION RANGE SWITCH

DTC Description

INFOID:000000012430885

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
• Harness or connector • Transmission range switch	• 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

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

Is DTC "C1154" detected?

YES-1 >> "C1154" is displayed as "CRNT": Proceed to [BRC-106, "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430886

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

 With CONSULT

Perform "Self Diagnostic Result" of "TRANSMISSION".

Is DTC detected?

YES >> Check the DTC. Refer to [TM-110, "DTC Index"](#).

NO >> GO TO 2.

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

2.PERFORM SELF-DIAGNOSIS

④ With CONSULT

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

Is DTC "C1154" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "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 >

[VDC/TCS/ABS]

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:000000012430887

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	- 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
- Harness or connector - Brake fluid level is low	- 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

With 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.

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

Is DTC "C1155" detected?

YES-1 >> "C1155" is displayed as "CRNT": Proceed to [BRC-108. "Diagnosis Procedure"](#).

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

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430888

1. CHECK BRAKE FLUID LEVEL

- Turn the ignition switch OFF.
- Check the brake fluid level. Refer to [BR-12. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refill brake fluid. Refer to [BR-12. "Refilling"](#). GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

With CONSULT

- Erase "Self Diagnostic Result" of "ABS"

C1155 BRAKE FLUID LEVEL SWITCH

[VDC/TCS/ABS]

< 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.

- Perform "Self Diagnostic Result" 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, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

With 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.

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

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> Inspection End.

5.CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluid level switch. Refer to [BR-28, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to [BR-28, "Exploded View"](#). GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

With CONSULT

- Erase "Self Diagnostic Result" 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.

- Perform "Self Diagnostic Result" 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

[VDC/TCS/ABS]

< 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, and GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

With 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.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" 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	
E40	1	M24 (TYPE B)	11	Yes
		M82 (TYPE A)		

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E40	1	Ground	No

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness or connector, and 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		
E40	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector, and GO TO 11.

11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-18, "CONSULT Function \(METER/M&A\)"](#) (TYPE A) or [MWI-71, "CONSULT Function \(METER/M&A\)"](#) (TYPE B).

Is the inspection result normal?

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).
- NO >> Repair or replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

Component Inspection

INFOID:0000000012430889

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Replace the reservoir tank. Refer to [BR-28, "Exploded View"](#).

BRC

C1164, C1165 CV SYSTEM

DTC Description

INFOID:0000000012430890

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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

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

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed as "CRNT": Proceed to [BRC-112. "Diagnosis Procedure"](#).

YES-2 >> "C1164" or "C1165" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430891

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

2.PERFORM SELF-DIAGNOSIS

 With CONSULT

Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

C1166, C1167 SV SYSTEM

DTC Description

INFOID:000000012430892

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
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• 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 With 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. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1166" or "C1167" detected?

YES-1 >> "C1166" or "C1167" is displayed as "CRNT": Proceed to [BRC-114, "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 [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430893

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

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

2.PERFORM SELF-DIAGNOSIS

 With CONSULT

Perform "Self Diagnostic Result" 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-121, "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-144, "Removal and Installation"](#).

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

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C1170 VARIANT CODING

DTC Description

INFOID:0000000012430894

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
—	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

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

Is DTC "C1170" detected?

YES-1 >> "C1170" is displayed as "CRNT": Proceed to [BRC-116, "Diagnosis Procedure"](#).

YES-2 >> "C1170" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430895

1. CHECK SELF-DIAGNOSIS RESULTS

 With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC are displayed along with "C1170" in "Self Diagnostic Result" of "ABS".

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000012430896

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
• 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

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

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-117, "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-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:0000000012430897

Proceed to [LAN-16, "Trouble Diagnosis Flow Chart"](#).

U1002 SYSTEM COMM (CAN)

DTC Description

INFOID:000000012430898

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1002	SYSTEM COMM (CAN) (CAN system communication)	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.

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
- CAN communication line - Harness or connector	- CAN communication line - ABS actuator and electric unit (control unit) - 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. DTC REPRODUCTION PROCEDURE

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

Is DTC "U1002" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-118, "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-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430899

CAUTION:

- Never apply 7.0 V or more to the measurement terminal.
- Use a tester with open terminal voltage of 7.0 V or less.
- Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.

1. CHECK CAN DIAGNOSIS SUPPORT MONITOR

With CONSULT

1. Perform "CAN Diagnosis Support Monitor" of "ABS".
2. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit).

Check the result of "PAST"?

U1002 SYSTEM COMM (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

All items are "OK">>Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

"TRANSMIT DIAG" is other than "OK">>GO TO 2.

A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3.

2.CHECK TRANSMITTING SIDE UNIT

Check the ABS actuator and electric unit (control unit) harness connector terminals No. 14 and 26 for damage or loose connection.

Is the inspection result normal?

YES >> Erase "Self Diagnostic Result" of "ABS". Then perform "Self Diagnostic Result" of "ABS" using CONSULT.

NO >> Recheck the terminals for damage or loose connection.

3.CHECK APPLICABLE CONTROL UNIT

Check the terminals of each harness connector for damage or loose connection.

Is the inspection result normal?

YES >> Erase "Self Diagnostic Result" of applicable control unit. Then perform "Self Diagnostic Result" of applicable control unit using CONSULT.

NO >> Recheck the terminals for damage or loose connection.

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U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000012430900

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1010	CONTROL UNIT (CAN) (Control unit [CAN communication])	When detecting error during the initial diagnosis of CAN controller of 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.

PAST DTC	CRNT DTC
- CAN communication line - Harness or connector	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

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

Is DTC "U1010" detected?

YES-1 >> "U1010" is displayed as "CRNT": Proceed to [BRC-120, "Diagnosis Procedure"](#).

YES-2 >> "U1010" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

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

Diagnosis Procedure

INFOID:000000012430901

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

Check the ABS actuator and electric unit (control unit) harness connector for disconnection and deformation.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000012430902

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY (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)		—	Voltage (Approx.)
Connector	Terminal		
E33	6	Ground	0 V

4. Turn the ignition switch ON

NOTE:

Start the engine.

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	6	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

1. Turn the ignition switch OFF.
2. Check the 10A fuse (50).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E33	6	E45	20	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		
E33	6	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

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

3.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	1	Ground	Battery voltage

3. Turn the ignition switch ON.

NOTE:

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Start the engine.

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 40A fusible link (I).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal 1 and 40A fusible link (I).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.

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

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

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	25	Ground	Battery voltage

3. Turn the ignition switch ON

NOTE:

Start the engine.

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	25	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 30A fusible link (M).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal 25 and 30A fusible link (M).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.

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

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

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

Is the inspection result normal?

YES >> GO TO 8.

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

8.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-144, "Removal and Installation"](#).

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

PARKING BRAKE SWITCH

Component Function Check

INFOID:000000012430903

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-124, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012430904

Regarding Wiring Diagram information, refer to [BRC-44, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect combination meter and parking brake switch connectors.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to [BRC-125, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to [PB-9, "Removal and Installation"](#).

3.CHECK PARKING BRAKE SWITCH SIGNAL

 With CONSULT.

1. Connect combination meter connector and parking brake switch connectors.
2. Turn ignition switch ON.
3. In "Data Monitor" select "PKB SW" and check parking brake switch signal.

Condition	DATA MONITOR
Actuate parking brake	On
Release parking brake	Off

Is the inspection result normal?

YES >> Refer to [BRC-52, "Work Flow"](#).

NO >> GO TO 4.

4.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter and parking brake switch connectors.
3. Check continuity between combination meter connector M82 (type A) or M24 (type B) terminal 10 and parking brake switch connector M17 terminal 1.

Combination meter		Parking brake switch		Continuity
Connector	Terminal	Connector	Terminal	
M82 (type A)	10	M17	1	Yes
M24 (type B)				

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

4. Check continuity between combination meter connector M82 (type A) or M24 (type B) terminal 10 and ground.

Combination meter		—	Continuity
Connector	Terminal		
M82 (type A)	10	Ground	No
M24 (type B)			

Is the inspection result normal?

YES >> Replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000012430905

1.CHECK PARKING BRAKE SWITCH

1. Turn ignition switch OFF.
2. Disconnect parking brake switch connector.
3. Check continuity between parking brake switch terminal 1 and ground.

Parking brake switch terminal	—	Condition	Continuity
1	Ground	Parking brake actuated	Yes
		Parking brake released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace parking brake switch. Refer to [PB-9, "Removal and Installation"](#).

VDC OFF SWITCH

Component Function Check

INFOID:000000012430906

1.CHECK VDC OFF SWITCH OPERATION

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-126, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012430907

Regarding Wiring Diagram information, refer to [BRC-44, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) and VDC OFF switch connectors.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to [BRC-127, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace VDC OFF switch. Refer to [BRC-146, "Removal and Installation"](#).

3.CHECK VDC OFF SWITCH SIGNAL

 With CONSULT.

1. Connect ABS actuator and electric unit (control unit) and VDC OFF switch connectors.
2. Turn ignition switch ON.
3. In "Data Monitor" select "OFF SW" and check VDC OFF switch signal.

Condition	DATA MONITOR
VDC OFF switch is pressed and released	On
VDC OFF switch is pressed and released again	Off

Is the inspection result normal?

YES >> Refer to [BRC-52, "Work Flow"](#).

NO >> GO TO 4.

4.CHECK VDC OFF SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) and VDC OFF switch connectors.
3. Check continuity between ABS actuator and electric unit (control unit) connector E33 terminal 20 and VDC OFF switch connector M34 terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E33	20	M34	1	Yes

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E33 terminal 20 and ground.

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	20	Ground	No

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch connector M34 terminal 2 and ground.

VDC OFF switch		—	Continuity
Connector	Terminal		
M34	2	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000012430908

1.CHECK VDC OFF SWITCH

1. Turn ignition switch OFF.
2. Disconnect VDC OFF switch connector.
3. Check continuity between terminals of VDC OFF switch connector.

VDC OFF switch terminals	Condition	Continuity
1 – 2	VDC OFF switch pressed	Yes
	VDC OFF switch released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch. Refer to [BRC-146, "Removal and Installation"](#).

ABS WARNING LAMP**Component Function Check**

INFOID:0000000012430909

1.CHECK ABS WARNING LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-128, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012430910

1.PERFORM THE SELF DIAGNOSTIC

 With CONSULT.

Perform "Self Diagnostic Result".

Are any DTCs detected?

YES >> Refer to [BRC-43, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-10, "METER SYSTEM : System Description"](#) (TYPE A) or [MWI-61, "METER SYSTEM : System Description"](#) (TYPE B).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

BRAKE WARNING LAMP

Component Function Check

INFOID:0000000012430911

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

Check that brake warning lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-129, "Diagnosis Procedure"](#).

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check parking brake switch system. Refer to [BRC-124, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012430912

BRC

1.PERFORM THE SELF DIAGNOSTIC

 With CONSULT.

Perform "Self Diagnostic Result".

Are any DTCs detected?

YES >> Refer to [BRC-43, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-10, "METER SYSTEM : System Description"](#) (TYPE A) or [MWI-61, "METER SYSTEM : System Description"](#) (TYPE B).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:0000000012430913

1.CHECK VDC OFF INDICATOR LAMP FUNCTION

Check that VDC OFF indicator lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-130, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012430914

1.PERFORM THE SELF DIAGNOSTIC

 With CONSULT.

Perform "Self Diagnostic Result".

Are any DTCs detected?

YES >> Refer to [BRC-43, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-10, "METER SYSTEM : System Description"](#) (TYPE A) or [MWI-61, "METER SYSTEM : System Description"](#) (TYPE B).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

SLIP INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

SLIP INDICATOR LAMP

Component Function Check

INFOID:0000000012430915

1.CHECK SLIP INDICATOR LAMP FUNCTION

Check that slip indicator lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-131, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012430916

1.PERFORM THE SELF DIAGNOSTIC

 With CONSULT.

Perform "Self Diagnostic Result".

Are any DTCs detected?

YES >> Refer to [BRC-43, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-10, "METER SYSTEM : System Description"](#) (TYPE A) or [MWI-61, "METER SYSTEM : System Description"](#) (TYPE B).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-54, "Removal and Installation"](#) (TYPE A) or [MWI-115, "Removal and Installation"](#) (TYPE B).

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000012430917

If ABS warning lamp and SLIP indicator lamp turn ON, perform self diagnostic.

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-133, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-134, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-135, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-136, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-137, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-138, "Diagnosis Procedure"
	TCM	
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal:
 - When shifting gears
 - When driving on slippery road
 - During cornering at high speed
 - When passing over bumps or grooves [approximately 50 mm (1.97 in) or more]
 - When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000012430918

1.CHECK START

Check front and rear brake force distribution using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: [FAX-7. "Inspection"](#), rear: [RAX-5. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following:

- Wheel sensor installation for damage
- Sensor rotor installation for damage
- Wheel sensor connector
- Wheel sensor harness

Is the inspection result normal?

YES >> GO TO 4.

- NO >>
- Replace wheel sensor [BRC-140. "FRONT WHEEL SENSOR : Removal and Installation"](#) (front) or [BRC-141. "REAR WHEEL SENSOR : Removal and Installation"](#) (rear).
 - Replace sensor rotor [BRC-143. "FRONT SENSOR ROTOR : Removal and Installation"](#) (front) or [BRC-143. "REAR SENSOR ROTOR : Removal and Installation"](#) (rear).
 - Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving.

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform "Self Diagnostic Result". Refer to [BRC-31. "CONSULT Function \(ABS\)"](#).

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000012430919

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to [BR-9, "Inspection and Adjustment"](#).

Is the stroke too big?

- YES >> • Bleed air from brake line and hose. Refer to [BR-13, "Bleeding Brake System"](#).
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: [BR-9, "Inspection and Adjustment"](#) or brake booster assembly [BR-15, "Inspection"](#).

NO >> GO TO 2.

2.CHECK ABS FUNCTION

1. Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS.
2. Check if braking force is normal in this condition.
3. Reconnect connector after inspection.

Is the inspection result normal?

- YES >> Inspection End.
NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000012430920

CAUTION:

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

1. CHECK ABS FUNCTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS.
3. Check stopping distance.
4. After inspection, reconnect connector.

Is the inspection result normal?

- YES >> Inspection End.
NO >> Check brake system.

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000012430921

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving.

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform "Self Diagnostic Result". Refer to [BRC-31, "CONSULT Function \(ABS\)"](#).

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000012430922

CAUTION:

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

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

1. SYMPTOM CHECK 1

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

Do symptoms occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal.

2. SYMPTOM CHECK 2

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

Do symptoms occur?

YES >> GO TO 3.

NO >> Perform "Self Diagnostic Result". Refer to [BRC-31, "CONSULT Function \(ABS\)".](#)

3. SYMPTOM CHECK 3

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

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000012430923

1. SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

Is the inspection result normal?

- YES >> Inspection End.
NO >> GO TO 2.

2. CHECK SELF DIAGNOSTIC RESULT

Perform "Self Diagnostic Result" of "ABS" actuator and electric unit (control unit). Refer to [BRC-31, "CONSULT Function \(ABS\)"](#).

Are self diagnostic results indicated?

- YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) "Self Diagnostic Result" again. Refer to [BRC-31, "CONSULT Function \(ABS\)"](#).
NO >> GO TO 3.

3. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, etc.
4. Securely reconnect connector and perform "Self Diagnostic Result" of "ABS". Refer to [BRC-31, "CONSULT Function \(ABS\)"](#).

Are self diagnostic results indicated?

- YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace.
NO >> GO TO 4.

4. CHECK ECM AND TCM SELF DIAGNOSTIC RESULT

1. Perform ECM "Self Diagnostic Result". Refer to [EC-60, "CONSULT Function"](#).
2. Perform TCM "Self Diagnostic Result". Refer to [TM-93, "CONSULT Function"](#).

Are self diagnostic results indicated?

- YES >> Check the corresponding items.
 - ECM: Refer to [EC-87, "DTC Index"](#).
 - TCM: Refer to [TM-93, "CONSULT Function"](#).

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-144, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

NORMAL OPERATING CONDITION

Description

INFOID:000000012430924

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

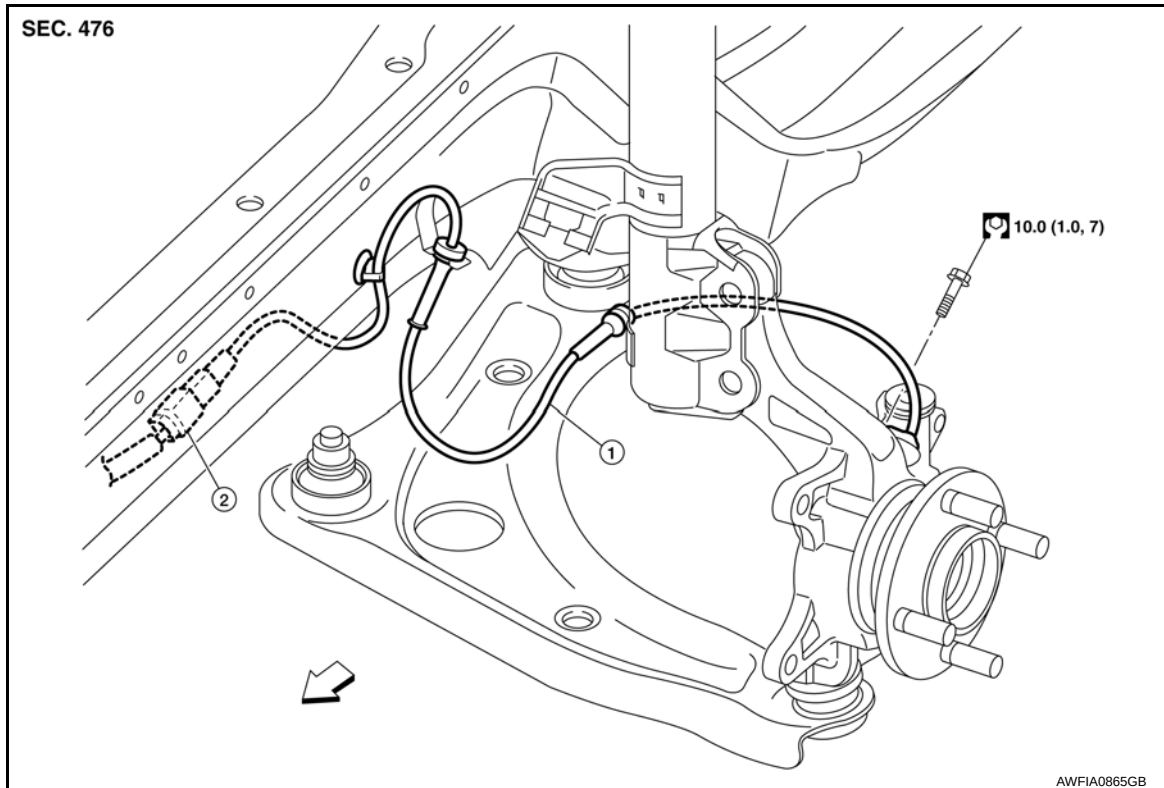
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:0000000012430925



1. Front wheel sensor

2. Harness connector

⇐ Front

FRONT WHEEL SENSOR : Removal and Installation

INFOID:0000000012430926

CAUTION:

- Be careful not to damage front wheel sensor edge and sensor rotor teeth.
- When removing the front wheel hub, first remove the front wheel sensor from the steering knuckle. Failure to do so may result in damage to the front wheel sensor, making the front wheel sensor inoperative.
- Pull out the front wheel sensor, being careful to turn it as little as possible. Do not pull on the front wheel sensor harness.
- Before installation, check if foreign objects, such as iron fragments, are adhered to the pick-up part of the front wheel sensor or to the inside of the hole in the steering knuckle for the front wheel sensor, or if a foreign object is caught in the surface of the sensor rotor. Fix as necessary and then install the front wheel sensor.

REMOVAL

1. Remove wheel and tire using power tool. Refer to [WT-48, "Removal and Installation"](#).
2. Remove fender protector. Refer to [EXT-38, "Removal and Installation"](#).
3. Disconnect the harness connector from the front wheel sensor.
4. Remove bolt and front wheel sensor from steering knuckle.
5. Release front wheel sensor harness clips from the vehicle.

INSTALLATION

Installation is in the reverse order of the removal.

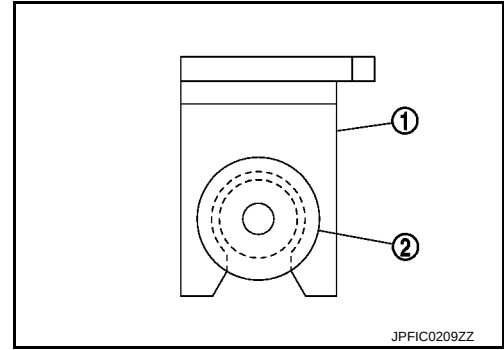
WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

CAUTION:

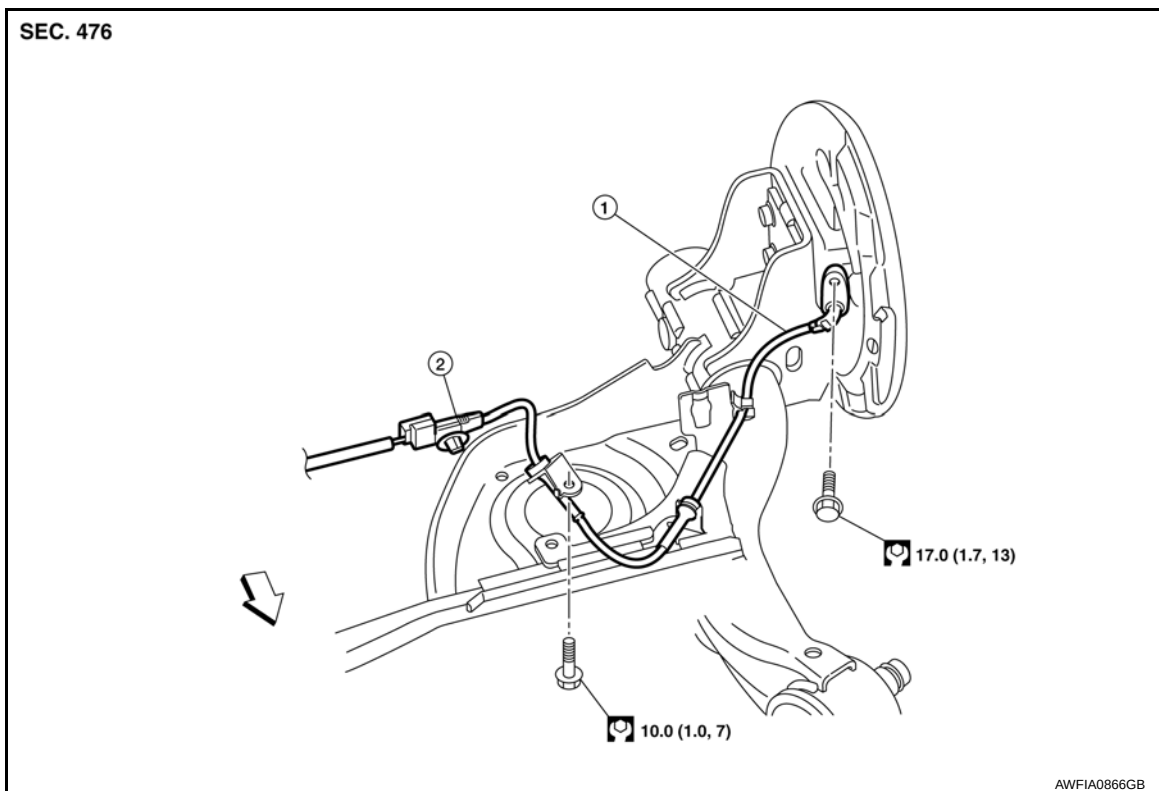
Do not twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.



REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000012430927



1. Rear wheel sensor

2. Harness connector

↔ Front

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000012430928

CAUTION:

- Be careful not to damage rear wheel sensor edge and sensor rotor teeth.
- When removing the rear wheel hub, first remove the rear wheel sensor from the back plate. Failure to do so may result in damage to the rear wheel sensor, making the rear wheel sensor inoperative.
- Pull out the rear wheel sensor, being careful to turn it as little as possible. Do not pull on the rear wheel sensor harness.
- Before installation, check if foreign objects, such as iron fragments, are adhered to the pick-up part of the rear wheel sensor or to the inside of the hole in the back plate for the rear wheel sensor, or if a foreign object is caught in the surface of the sensor rotor. Fix as necessary and then install the rear wheel sensor.

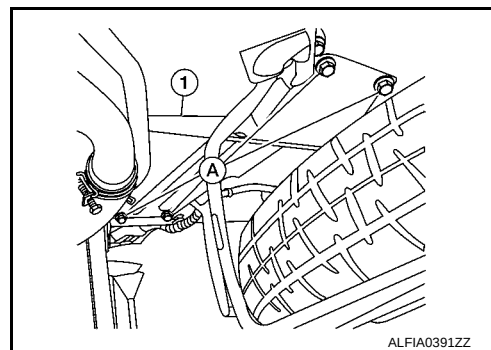
REMOVAL

WHEEL SENSOR

[VDC/TCS/ABS]

< REMOVAL AND INSTALLATION >

1. Remove bolts (A) and support bracket (1) (LH side only).



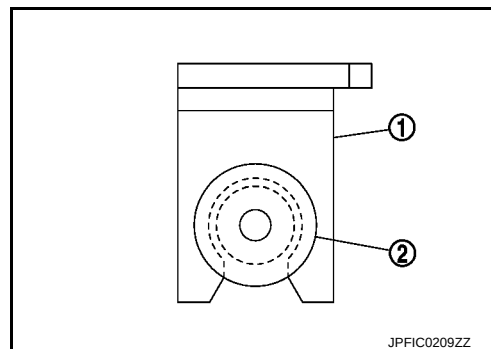
2. Disconnect the harness connector from the rear wheel sensor.
3. Release rear wheel sensor harness clips from the vehicle.
4. Remove bolts and rear wheel sensor from back plate.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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 >

[VDC/TCS/ABS]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000012430929

REMOVAL

Remove sensor rotor from steering knuckle. Refer to [FAX-9, "Exploded View"](#).

INSTALLATION

Installation is in the reverse order of removal.

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000012430930

REMOVAL

Remove sensor rotor from brake drum. Refer to [RAX-6, "Exploded View"](#).

CAUTION:

Do not reuse rear sensor rotor.

INSTALLATION

Installation is in the reverse order of removal.

A

B

C

D

E

BRC

G

H

I

J

K

L

M

N

O

P

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

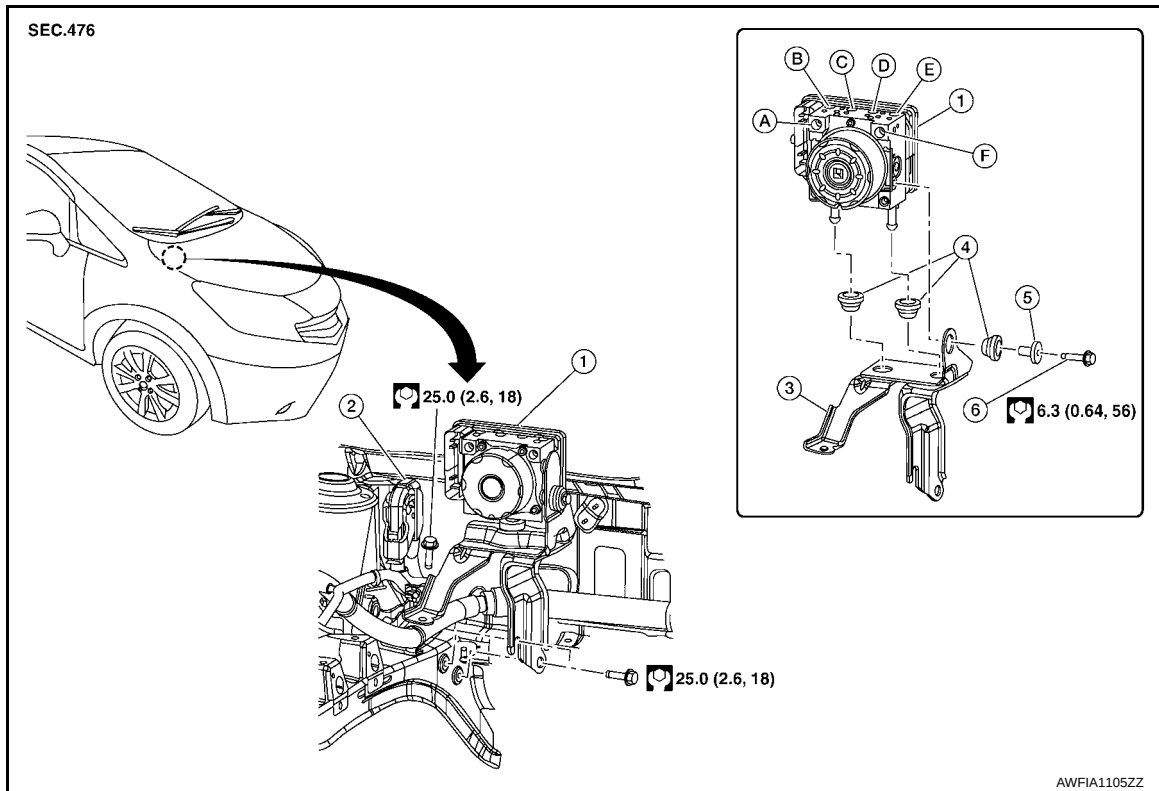
< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000012430931



Removal and Installation

INFOID:000000012430932

REMOVAL

CAUTION:

- Before servicing, disconnect the battery cable from negative terminal.
- 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.

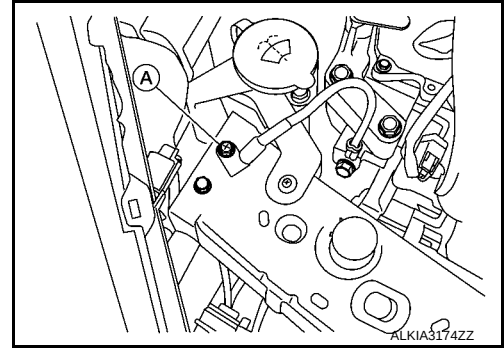
1. Disconnect negative battery cable. Refer to [PG-70, "Removal and Installation \(Battery\)"](#).
2. Disconnect vacuum hose from intake manifold. Refer to [BR-33, "Exploded View"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

3. Remove ground harness bolt (A) and ground harness from radiator core support.



4. Disconnect high-pressure pipe from expansion valve. Refer to [HA-28, "Exploded View"](#).
CAUTION:
Cap or wrap the joint of the A/C piping and expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove low-pressure flexible hose. Refer to [HA-28, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).
6. Loosen flare nut from brake tubes using a flare nut wrench, then remove brake tubes from ABS actuator and electric unit (control unit). Refer to [BR-22, "FRONT : Exploded View"](#).
7. Disconnect the harness connector from the ABS actuator and electric unit (control unit).
8. Remove ABS actuator and electric unit (control unit) bracket bolts.
9. Remove the ABS actuator and electric unit (control unit) and bracket as an assembly.
10. Remove bracket and bushing from ABS actuator and electric unit (if necessary).

INSTALLATION

Installation is in the reverse order of removal.

- Bleed the brake system. Refer to [BR-13, "Bleeding Brake System"](#).
- Adjust the neutral position of steering angle sensor. Refer to [BRC-55, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

CAUTION:

- Replace the ABS actuator electric unit (control unit) if it has been dropped or sustained an impact.
- Do not install actuator by holding harness.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.

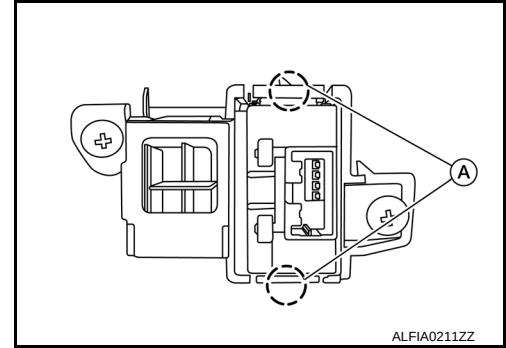
VDC OFF SWITCH

Removal and Installation

INFOID:000000012430933

REMOVAL

1. Remove the instrument lower panel LH. Refer to [IP-24. "Removal and Installation"](#).
2. Release pawls (A) using suitable tool and remove the VDC OFF switch.



INSTALLATION

Installation is in the reverse order of removal.

STEERING ANGLE SENSOR

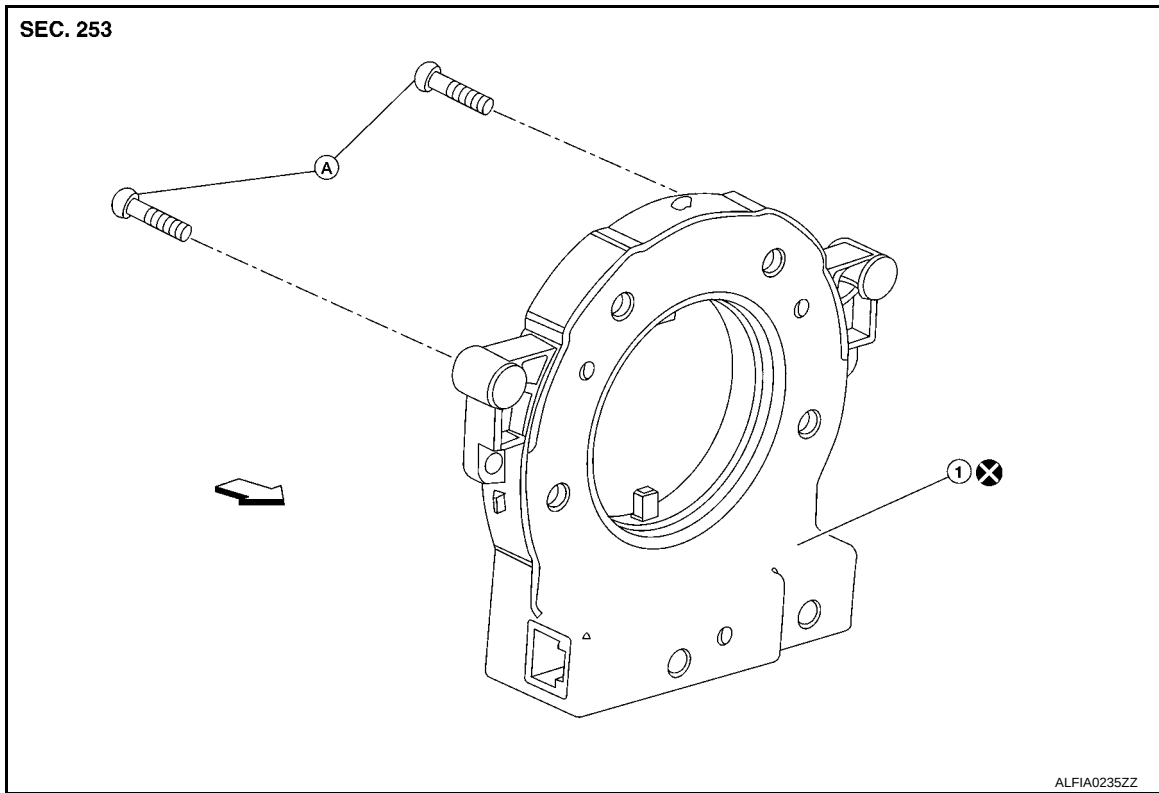
< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

STEERING ANGLE SENSOR

Exploded View

INFOID:000000012430934

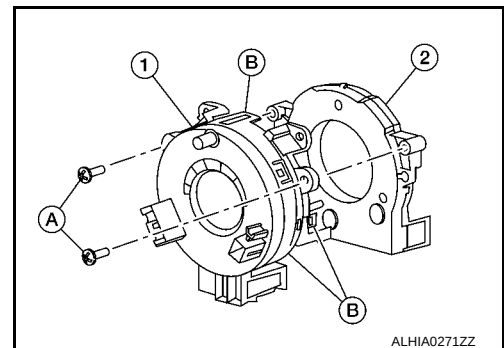


Removal and Installation

INFOID:000000012430935

REMOVAL

1. Remove the spiral cable. Refer to [SR-16, "Removal and Installation"](#).
2. Remove the screws (A), then release the pawls (B) and remove the steering angle sensor (2) from the spiral cable (1).



INSTALLATION

Installation is in the reverse order of removal.

Adjust the neutral position of the steering angle sensor. Refer to [BRC-55, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

CAUTION:

Do not reuse steering angle sensor.