SECTION BRAKE CONTROL SYSTEM

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< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

WARNING:

Always observe the following items for preventing accidental activation.

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

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

WARNING:

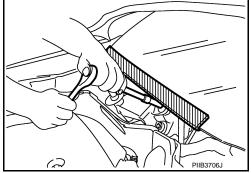
Always observe the following items for preventing accidental activation.

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

Precaution for Procedure without Cowl Top Cover

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



PRECAUTIONS

Precautions for Removing of Battery Terminal

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

NOTE:

< PRECAUTION >

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

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

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

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

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

Precaution for Brake System

WARNING:

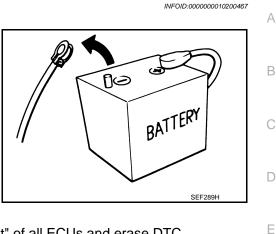
Since dust covering the front and rear brakes has an affect on human body, the dust must be removed ^G with a dust collector. Never splatter the dust with an air blow gun.

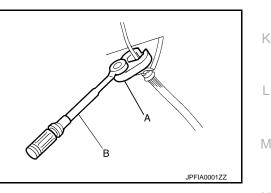
- Brake fluid use refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening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

Precaution for Brake Control system

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

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PRECAUTIONS

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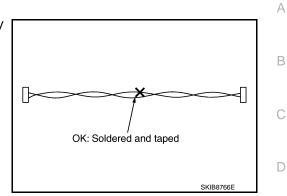
- When a malfunction is indicated, always collect information from the customer about conditions of occurrence, estimate cause and perform operation. Check brake booster operation, brake fluid level and brake fluid leakage, as well as electrical system.
- The optimum performance is achieved by control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

PRECAUTIONS

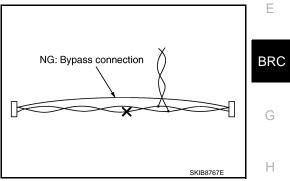
< PRECAUTION >

Precaution for Harness Repair

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



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





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PREPARATION

Commercial Service Tool

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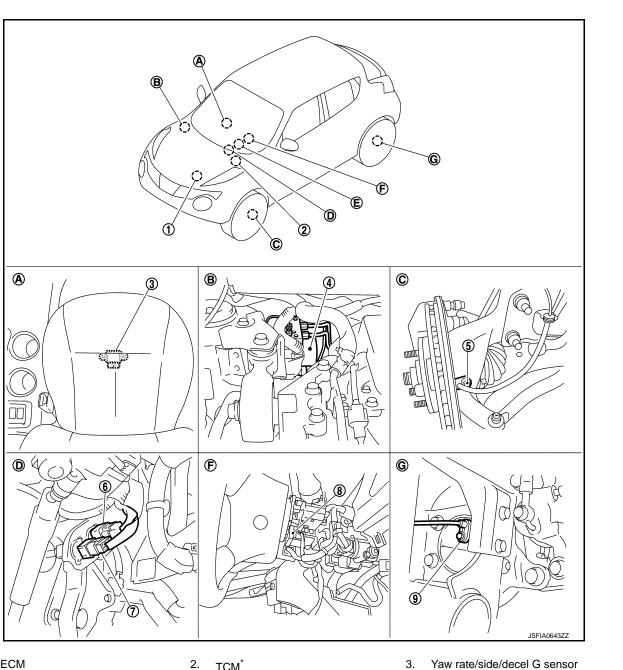
| Tool name | | Description |
|------------|-----------|--------------------------|
| Power tool | PBIC0190E | Loosening bolts and nuts |

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION **COMPONENT PARTS**

Component Parts Location

2WD



- 1. ECM Refer to EC-14, "ENGINE CON-TROL SYSTEM : Component Parts Location".
- 4. ABS actuator and electric unit (con-5. trol unit)
- 7. Brake pedal position switch
- Α. Under floor carpet (front seat right side)
- TCM^{*} Refer to TM-150, "CVT CONTROL SYSTEM : Component Parts Location".
- Front wheel sensor
- 8. Steering angle sensor
 - Inside engine room

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- Yaw rate/side/decel G sensor
- 6. Stop lamp switch
- 9. Rear wheel sensor
- C. Steering knuckle

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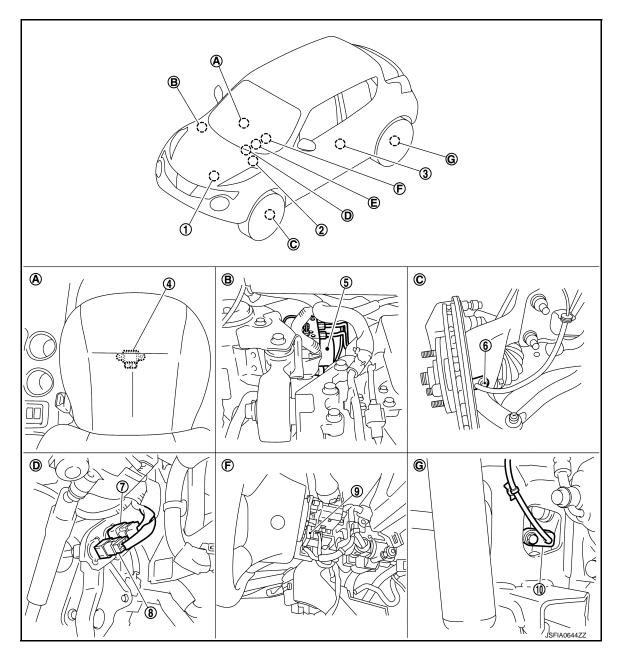
D. Brake pedal

- E. ABS warning lamp, brake warning F. lamp, VDC warning lamp, VDC OFF indicator lamp (in combination meter)
- Back of spiral cable assembly

[WITH VDC]

- G. Rear wheel hub and bearing assembly
- *: Models with CVT

AWD



- 1. ECM Refer to EC-14, "ENGINE CON-TROL SYSTEM : Component Parts Location".
- 4. Yaw rate/side/decel G sensor
- 7. Stop lamp switch
- 10. Rear wheel sensor

- 2. TCM Refer to <u>TM-150, "CVT CONTROL</u> <u>SYSTEM : Component Parts Loca-</u> <u>tion"</u>.
- 5. ABS actuator and electric unit (con- 6. trol unit)
- 8. Brake pedal position switch
- 3. AWD control module Refer to <u>DLN-10, "Component Parts</u> <u>Location"</u>.
 - Front wheel sensor
- 9. Steering angle sensor

< SYSTEM DESCRIPTION >

| Α. | Under floor carpet (front seat right side) | В. | Inside engine room | C. | Steering knuckle |
|----|--|----|--|----|-------------------------------|
| D. | Brake pedal | E. | ABS warning lamp, brake warning lamp, VDC warning lamp, VDC OFF indicator lamp (in combination | F. | Back of spiral cable assembly |

meter)

G. Rear axle housing

Component Description

| Component | Reference/Function | |
|---|--|--|
| ABS actuator and electric unit (control unit) | BRC-12, "ABS Actuator and Electric Unit (Control Unit)" | |
| Wheel sensor | BRC-11, "Wheel Sensor and Sensor Rotor" | |
| Stop lamp switch | BRC-13, "Stop Lamp Switch" | |
| Brake pedal position switch | BRC-13, "Brake Pedal Position Switch" | |
| Steering angle sensor | BRC-13. "Steering Angle Sensor" | |
| Yaw rate/side/decel G sensor | BRC-13, "Yaw Rate/Side/Decel G Sensor" | |
| VDC OFF switch | BRC-13, "VDC OFF Switch" | |
| Brake fluid level switch | BRC-13, "Brake Fluid Level Switch" | |
| Parking brake switch | BRC-13, "Parking Brake Switch" | |
| VDC warning lamp | | |
| ABS warning lamp | BRC-14, "System Description" | |
| Brake warning lamp | | |
| VDC OFF indicator lamp | | |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal | |
| TCM ^{*1} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal | |
| AWD control module ^{*2} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Current AWD mode signal | |

*1: Models with CVT

*2: AWD models

Wheel Sensor and Sensor Rotor

NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated in wheel hub and bearing assembly.
- Wheel sensor of rear wheel is installed on wheel hub and bearing assembly. (2WD)
- Wheel sensor of rear wheel is installed on axle housing. (AWD)
- Sensor rotor of rear wheel is integrated in wheel hub and bearing assembly. (2WD)
- Sensor rotor of rear wheel is integrated on drive shaft. (AWD)
- Never measure resistance and voltage value using a tester because sensor is active sensor.

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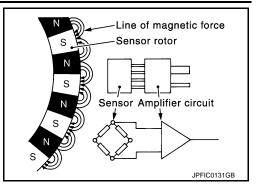
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- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field changes. Magnetic field change is converted to current signals (rectangular wave) and is transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed.



ABS Actuator and Electric Unit (Control Unit)

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

ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

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

NOTE:

Valve is a solenoid valve.

ABS OUT Valve

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

NOTE:

Valve is a solenoid valve.

Cut Valve 1, Cut Valve2

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

Suction Valve 1, Suction Valve 2

Supplies the brake fluid from master cylinder to the pump, when VDC function, TCS function and brake limited slip differential (BLSD) function are activated.

Inlet Valve

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

NOTE:

Valve is a check valve.

Outlet Valve Brake fluid discharged from the pump does not backflow. **NOTE:**

Valve is a check valve.

Return Check Valve Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released.

Revision: 2013 October

< SYSTEM DESCRIPTION >

Reservoir

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

Stop Lamp Switch

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

Brake Pedal Position Switch

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

Steering Angle Sensor

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

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

Yaw Rate/Side/Decel G Sensor

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)

VDC OFF Switch

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

Brake limited slip differential (BLSD) function control operates.

- TCS function
- 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

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

Parking Brake Switch

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

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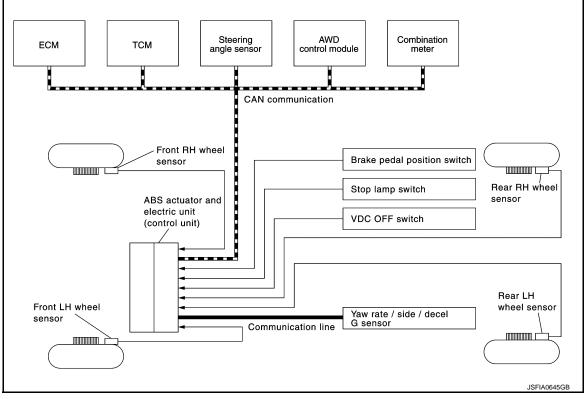
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System Description

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

SYSTEM DIAGRAM **NOTE**:

- TCM is CVT models only.
- AWD control module is AWD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

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[WITH VDC]

< SYSTEM DESCRIPTION >

| Component | Signal description | | | | |
|----------------------------------|---|--|--|--|--|
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Steering angle sensor signal | | | | |
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via com- munication line ^{*1} • Yaw rate signal • Side G sensor signal • Decel G sensor signal | | | | |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal | | | | |
| TCM ^{*2} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal | | | | |
| AWD control module ^{*3} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current AWD mode signal | | | | |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. ABS warning lamp signal Brake warning lamp signal VDC warning lamp signal VDC OFF indicator lamp signal | | | | |

*2: Models with CVT *3: AWD models

VALVE OPERATION [VDC FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFEREN- $_$ TIAL (BLSD) FUNCTION

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

When VDC Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is in Operation (During Pres-

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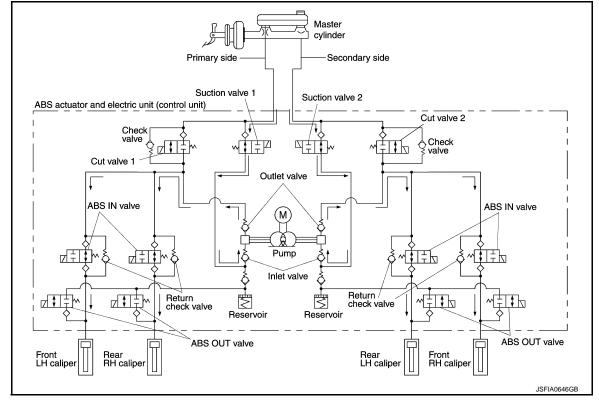
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< SYSTEM DESCRIPTION >

[WITH VDC]

sure Increases)



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

During pressure front RH brake caliper increases

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

During pressure front LH brake caliper increases

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

During pressure rear RH brake caliper increases

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

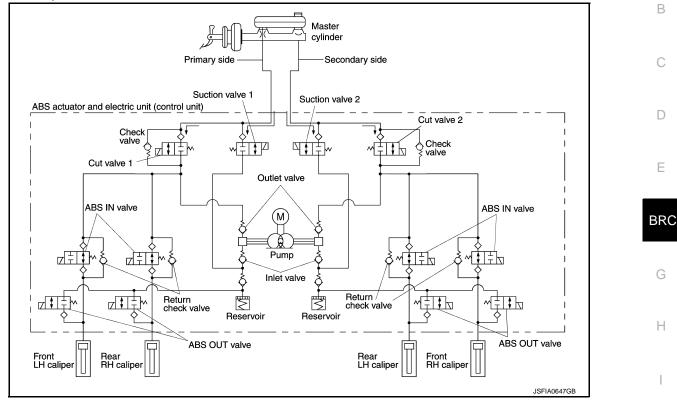
During pressure rear LH brake caliper increases

 Brake fluid is conveyed to the pump from the master cylinder through suction valve 2 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the rear LH brake caliper through the ABS IN

< SYSTEM DESCRIPTION >

valve. For the right caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right caliper is controlled separately from the left caliper.

When VDC Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is Starts Operating (During Pressure Holds)



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

During pressure front RH brake caliper holds

Since the cut valve 2 and the suction valve 2 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.

During pressure front LH brake caliper holds

 Since the cut valve 1 and the suction valve 1 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.

During pressure rear RH brake caliper holds

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

During pressure rear LH brake caliper holds

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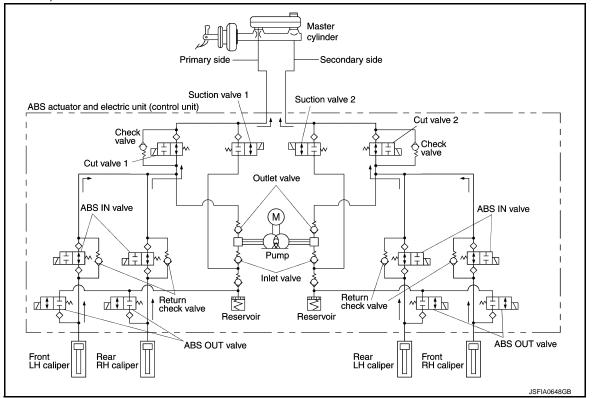
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< SYSTEM DESCRIPTION >

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

When VDC Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is in Operation (During Pressure Decreases)



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

During pressure front RH brake caliper decreases

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

During pressure front LH brake caliper decreases

 Since the suction value 1 and the ABS OUT value close and the cut value 1 and the ABS IN value 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 value and the cut value 2. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear RH brake caliper decreases

• Since the suction value 1 and the ABS OUT value close and the cut value 1 and the ABS IN value open, the fluid pressure applied on the rear RH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN value and the cut value 2. The pressurization for the right caliper is controlled separately from the left caliper.

< SYSTEM DESCRIPTION >

During pressure rear LH brake caliper decreases
Since the suction valve 2 and the ABS OUT valve close and the cut valve 2 and the ABS IN valve open, the fluid pressure applied on the rear LH brake caliper is reduced by supplying the fluid pressure to the 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.

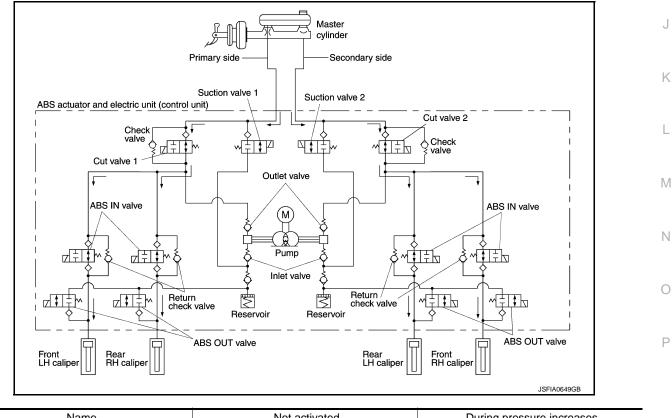
Component Parts and Function

| Component | Function | C |
|------------------------------------|---|----|
| 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. | E |
| 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. | |
| Inlet valve | Brake fluid sucked from the reservoir by the pump does not backflow. | Bł |
| Outlet valve | Brake fluid discharged from the pump does not backflow. | |
| Return check valve | Returns the brake fluid from brake caliper and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released. | (|
| Reservoir | Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper and wheel cylinder. | |

VALVE OPERATION (ABS FUNCTION AND EBD FUNCTION)

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

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



| Name | Not activated During pressure increase | |
|-------------|--|-------------------------------------|
| 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) |

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< SYSTEM DESCRIPTION >

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

During pressure front RH brake caliper increases

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

During pressure front LH brake caliper increases

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

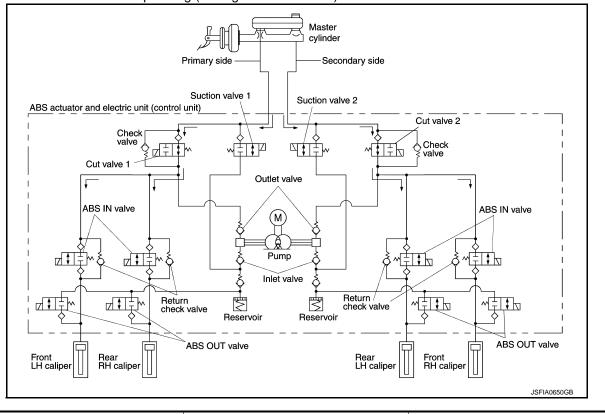
During pressure rear RH brake caliper increases

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

During pressure rear LH brake caliper increases

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





| Name | Not activated | ated 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) | |

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< SYSTEM DESCRIPTION >

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

During pressure front RH brake caliper holds

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

During pressure front LH brake caliper holds

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

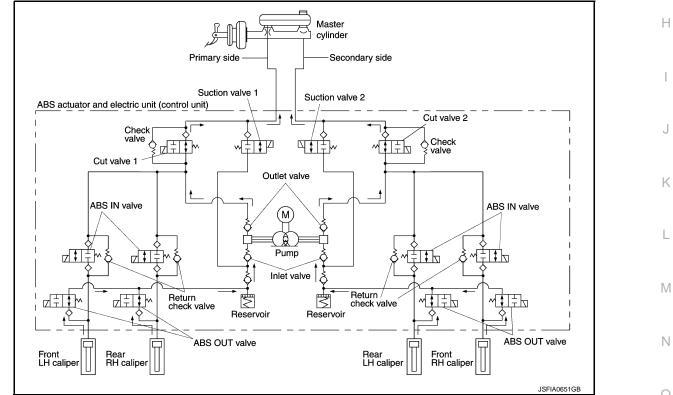
During pressure rear RH brake caliper holds

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

During pressure rear LH brake caliper holds

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

When ABS Function is in Operation (During Pressure Decreases)



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

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During pressure front RH brake caliper decreases

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

During pressure front LH brake caliper decreases

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

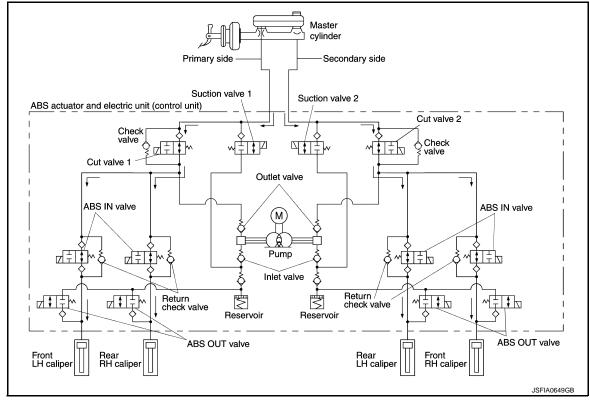
During pressure rear RH brake caliper decreases

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

During pressure rear LH brake caliper decreases

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

When ABS Function is in Operation (During Pressure Increases)



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

During pressure front RH brake caliper increases

< SYSTEM DESCRIPTION >

• Brake fluid is supplied to the front RH brake caliper from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve 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).

During pressure front LH brake caliper increases

• Brake fluid is supplied to the front LH brake caliper from the master cylinder through the cut valve 1 and the ABS IN valve. Since the suction valve 1 and the ABS OUT valve 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).

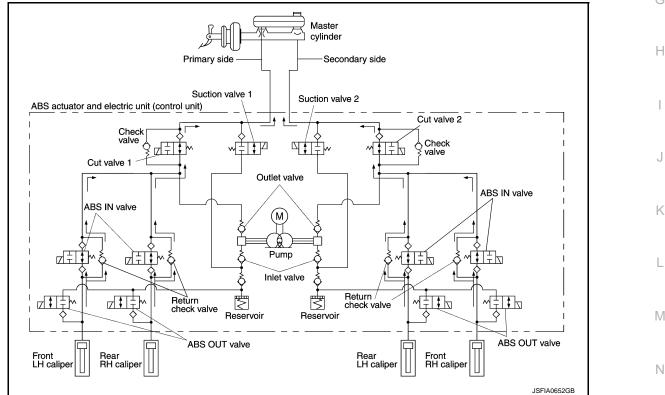
During pressure rear RH brake caliper increases

Brake fluid is supplied to the rear 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 rear RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure rear LH brake caliper increases

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

When Brake Release



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

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< SYSTEM DESCRIPTION >

During front RH brake caliper release

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

During front LH brake caliper release

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

During rear RH brake caliper release

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

During rear LH brake caliper release

• Brake fluid is supplied to the rear LH brake caliper through the return check valve of the ABS IN valve and the cut valve 2, and returns to the master 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. |
| Inlet valve | Brake fluid sucked from the reservoir by the pump does not backflow. |
| Outlet valve | Brake fluid discharged from the pump does not backflow. |
| Return check valve | Returns the brake fluid from brake caliper and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released. |
| Reservoir | Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper and wheel cylinder. |

CONDITION FOR TURN ON THE WARNING LAMP Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

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

CONDITION FOR TURN ON THE INDICATOR LAMP

< SYSTEM DESCRIPTION >

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

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

| Condition (status) | VDC OFF indicator lamp | B |
|--|------------------------|---|
| Ignition switch OFF | OFF | _ |
| For approx. 1 second after the ignition switch is turned ON | ON | |
| Approx. 1 second after ignition switch is turned ON (when the system is in normal operation) | OFF | С |
| When VDC OFF switch is ON (VDC function and TCS function are OFF) | ON | D |

Fail-safe

INFOID:000000009752895

[WITH VDC]

VDC FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION VDC warning lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and

electric unit (control unit)]. The control is suspended for VDC function, TCS function and brake limited slip dif-BRC ferential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally.

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

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< SYSTEM DESCRIPTION >

| DTC | Malfunction detected condition | Fail-safe condition | |
|-------|---|---|--|
| C1101 | When an open circuit is detected in rear RH wheel sensor circuit. | | |
| 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ 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. | The following functions are suspended. VDC function TCS function ABS function EBD function (only when both rear wheels are malfunctioning | |
| 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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ 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. | Brake limited slip differential (BLSD) function | |
| 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. | The following functions are suspended. VDC function TCS function ABS function EBD function Brake limited slip differential (BLSD) function | |
| C1110 | When there is an internal malfunction in the ABS actuator and electric unit (control unit). | | |
| C1111 | When a malfunction is detected in motor or motor relay. | The following functions are suspended. VDC function TCS function ABS function Brake limited slip differential (BLSD) function | |

< SYSTEM DESCRIPTION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|-------|--|---|
| C1113 | When a malfunction is detected in decel G signal, or signal line of yaw rate/side/de- cel G sensor is open or shorted. | The following functions are suspended. VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function |
| C1115 | When difference in wheel speed between any wheel and others is detected the ve- hicle is driven, because of installation of other tires than specified. | The following functions are suspended. VDC function TCS function ABS function EBD function Brake limited slip differential (BLSD) function |
| C1116 | When stop lamp switch signal is not input when brake pedal operates. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |
| C1120 | When a malfunction is detected in front LH ABS IN valve. | |
| C1121 | When a malfunction is detected in front LH ABS OUT valve. | The following functions are sus- |
| C1122 | When a malfunction is detected in front RH ABS IN valve. | pended.VDC function |
| C1123 | When a malfunction is detected in front RH ABS OUT valve. | TCS function |
| C1124 | When a malfunction is detected in rear LH ABS IN valve. | ABS function EBD function |
| C1125 | When a malfunction is detected in rear LH ABS OUT valve. | Brake limited slip differential |
| C1126 | When a malfunction is detected in rear RH ABS IN valve. | (BLSD) function |
| 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 function TCS function Brake limited slip differential (BLSD) function |
| C1140 | When a malfunction is detected in actuator relay. | The following functions are suspended. VDC function TCS function ABS function EBD function Brake limited slip differential (BLSD) function |
| C1143 | When a malfunction is detected in steering angle sensor. | The following functions are suspended. VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function |
| C1144 | When neutral position adjustment of steering angle sensor is not complete. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |

< SYSTEM DESCRIPTION >

| DTC | Malfunction detected condition | Fail-safe condition | |
|-------|---|---|--|
| C1145 | When a malfunction is detected in yaw rate signal, or signal line of yaw rate/side/ decel G sensor is open or shorted. | The following functions are suspended. VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function | |
| C1146 | When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted. | | |
| C1155 | When brake fluid level low signal is detected. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function | |
| C1164 | When a malfunction is detected in cut valve 1. | The following functions are sus- | |
| C1165 | When a malfunction is detected in cut valve 2. | pended.VDC function | |
| C1166 | When a malfunction is detected in suction valve 1. | TCS function | |
| C1167 | When a malfunction is detected in suction valve 2. | ABS function EBD function Brake limited slip differential (BLSD) function | |
| C1170 | When the information in ABS actuator and electric unit (control unit) is not the same. | The following functions are suspended. VDC function TCS function ABS function Brake limited slip differential (BLSD) function | |
| C1176 | When brake pedal position switch signal is not input when brake pedal operates. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function | |
| U1000 | When CAN communication signal is not continuously transmitted or received for 2 seconds or more. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function | |
| U1010 | When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit). | | |

VDC FUNCTION

VDC FUNCTION : System Description

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

< SYSTEM DESCRIPTION >

[WITH VDC]

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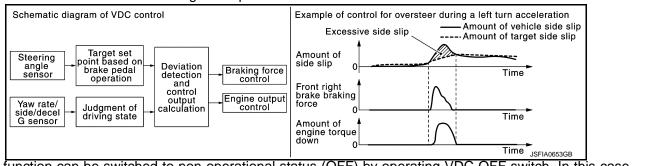
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ing conditions (conditions of understeer or oversteer) are judged and vehicle stability is improved by brake force control on all 4 wheels and engine output control.



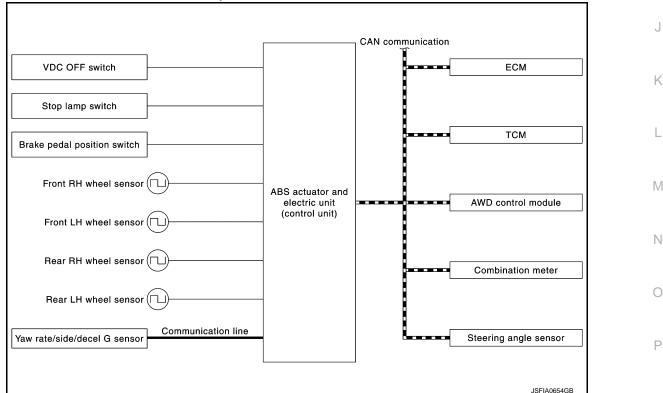
- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-25</u>, "Fail-safe".
 NOTE:

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

SYSTEM DIAGRAM

NOTE:

- TCM is CVT models only.
- AWD control module is AWD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

BRC-29

< SYSTEM DESCRIPTION >

| Component | Signal description |
|----------------------------------|--|
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line^{*1}. Yaw rate signal Side G sensor signal Decel G sensor signal |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Acceleration pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal |
| TCM*2 | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal |
| AWD control module ^{*3} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current AWD mode signal |
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. VDC warning lamp signal VDC OFF indicator lamp signal |

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

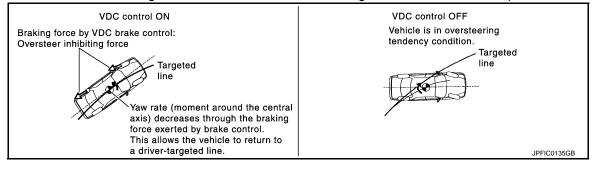
*2: Models with CVT

*3: AWD models

OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

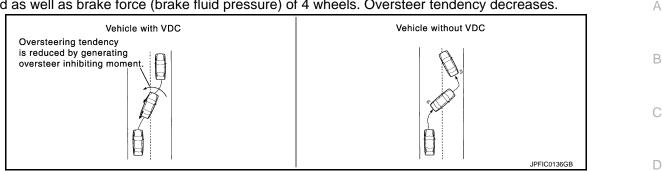
• During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the outer side of turn. Moment directing towards the outer side of turn is generated. Oversteer is prevented.



< SYSTEM DESCRIPTION >

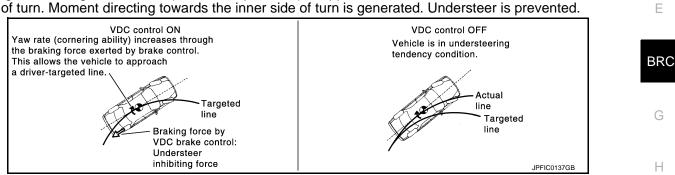
[WITH VDC]

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

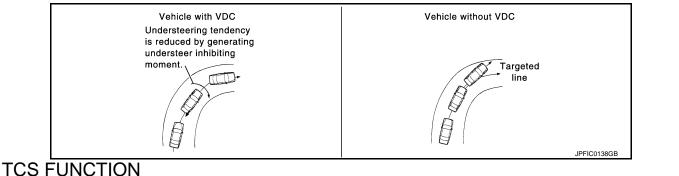


VDC Function That Prevents Understeer Tendency

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



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



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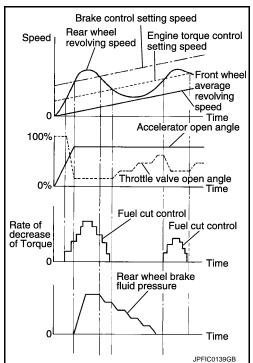
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< SYSTEM DESCRIPTION >

TCS FUNCTION : System Description

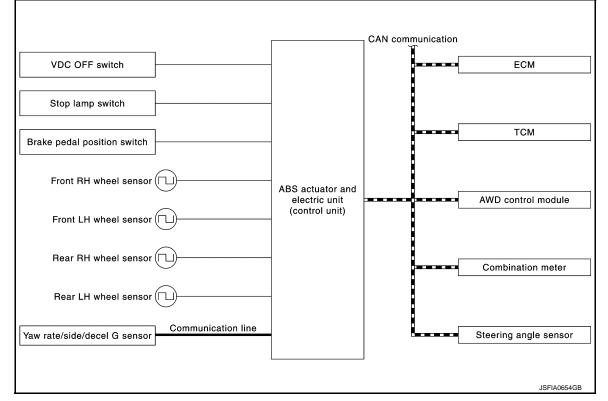
- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-25, "Fail-safe"</u>.



SYSTEM DIAGRAM

NOTE:

- TCM is CVT models only.
- AWD control module is AWD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

[WITH VDC]

BRC-32

< SYSTEM DESCRIPTION >

| Component | Signal description |
|----------------------------------|--|
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line^{*1}. Yaw rate signal Side G sensor signal Decel G sensor signal |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal |
| TCM ^{*2} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal |
| AWD control module ^{*3} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current AWD mode signal |
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. VDC warning lamp signal VDC OFF indicator lamp signal |

ABS FUNCTION

ABS FUNCTION : System Description

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

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< SYSTEM DESCRIPTION >

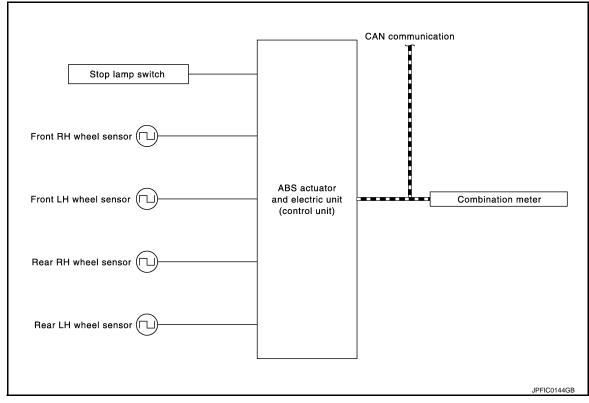
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and brake limited slip differential (BLSD) function. However, EBD function is operated normally. Refer to <u>BRC-25</u>, "Fail-safe".

NOTE:

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

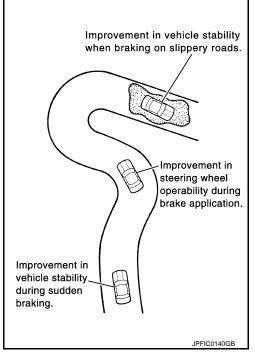
sis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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



[WITH VDC]

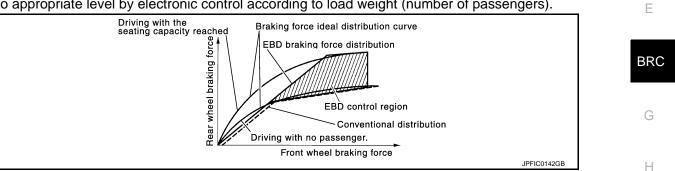
< SYSTEM DESCRIPTION >

| Component | Signal description |
|-------------------|---|
| Combination meter | Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. VDC warning lamp signal ABS warning lamp signal |

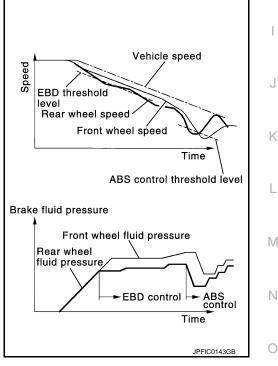
EBD FUNCTION

EBD FUNCTION : System Description

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



- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. Refer to <u>BRC-25, "Fail-safe"</u>.



[WITH VDC]

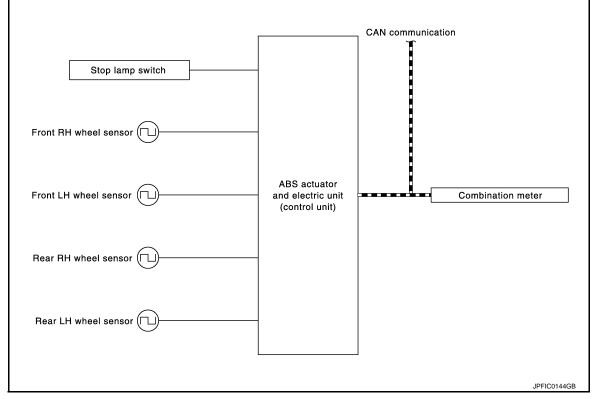
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< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION : System Description

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- LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved.
- Brake limited slip differential (BLSD) function operates while VDC function is in non-operational status (OFF) by VDC OFF switch.
- VDC warning lamp blinking while brake limited slip differential (BLSD) function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when brake limited slip differential (BLSD) function operates. This is not a malfunction because it is caused by brake limited slip differential (BLSD) function that is normally operated.
- Fail-safe function is adopted. When a malfunction occurs in brake limited slip differential (BLSD) function, the control is suspended for VDC function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without VDC function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-</u><u>25</u>, "Fail-safe".

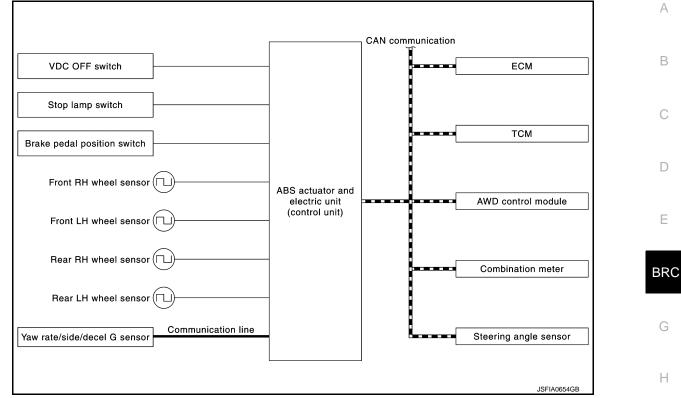
SYSTEM DIAGRAM NOTE:

• TCM is CVT models only.

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< SYSTEM DESCRIPTION >

AWD control module is AWD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

| Component | Signal description | |
|----------------------------------|--|--|
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line^{*1}. Yaw rate signal Side G sensor signal Decel G sensor signal | |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal | |
| TCM ^{*2} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal | |
| AWD control module ^{*3} | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current AWD mode signal | |

SYSTEM

< SYSTEM DESCRIPTION >

| Component | Signal description | |
|-----------------------|---|--|
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Steering angle sensor signal | |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Brake fluid level switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. VDC warning lamp signal | |

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

*2: Models with CVT *3: AWD models

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

< SYSTEM DESCRIPTION >

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

CONSULT Function

APPLICATION ITEMS

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

| Mode | Function description | |
|-----------------------------|---|-----|
| ECU identification | Parts number of ABS actuator and electric unit (control unit) can be read. | |
| Self Diagnostic Result | Self-diagnostic results and freeze frame data can be read and erased quickly.*1 | D |
| DATA MONITOR | Input/Output data in the ABS actuator and electric unit (control unit) can be read. | |
| ACTIVE TEST | Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and elec- tric unit (control unit) and also shifts some parameters in a specified range. | E |
| Function Test ^{*2} | This mode can show results of self-diagnosis of ECU with either "OK" or "NG". For engine, more prac- tical tests regarding sensors/switches and/or actuators are available. | BRC |
| Work support | Components can be quickly and accurately adjusted. | |

DTC

Freeze frame data (FFD)

*2: Although "Function Test" is selectable, do not use its.

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT Refer to BRC-50, "DTC Index".

When "CRNT" is displayed on self-diagnosis result

The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

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

Freeze frame data (FFD)

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

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

DATA MONITOR NOTE:

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

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

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

< SYSTEM DESCRIPTION >

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| ltom (Linit) | Monitor item selection | | Note | |
|--------------------------------|------------------------|--------------|---|--|
| Item (Unit) | ECU INPUT SIGNALS | MAIN SIGNALS | - Nole | |
| RR LH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by rear LH wheel sensor is displayed. | |
| RR RH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by rear RH wheel sensor is displayed. | |
| DECEL G-SEN (G) | × | × | Decel G detected by decel G sensor is displayed. | |
| FR RH IN SOL (On/Off) | | × | Operation status of front RH wheel ABS IN valve is displayed. | |
| FR RH OUT SOL (On/Off) | | × | Operation status of front RH wheel ABS OUT valve is displayed. | |
| FR LH IN SOL (On/Off) | | × | Operation status of front LH wheel ABS IN valve is displayed. | |
| FR LH OUT SOL (On/Off) | | × | Operation status of front LH wheel ABS OUT valve is displayed. | |
| RR RH IN SOL (On/Off) | | × | Operation status of rear RH wheel ABS IN valve is displayed | |
| RR RH OUT SOL (On/Off) | | × | Operation status of rear RH wheel ABS OUT valve is displayed. | |
| RR LH IN SOL (On/Off) | | × | Operation status of rear LH wheel ABS IN valve is displayed. | |
| RR LH OUT SOL (On/Off) | | × | Operation status of rear LH wheel ABS OUT valve is displayed. | |
| EBD WARN LAMP (On/Off) | | | Brake warning lamp ON/OFF status is displayed. * | |
| STOP LAMP SW (On/Off) | × | × | Stop lamp switch signal input status is displayed. | |
| MOTOR RELAY (On/Off) | | × | ABS motor and motor relay status is displayed. | |
| ACTUATOR RLY (On/Off) | | × | ABS actuator relay status is displayed. | |
| ABS WARN LAMP (On/Off) | | × | ABS warning lamp ON/OFF status is displayed. * | |
| OFF LAMP (On/Off) | | × | VDC OFF indicator lamp ON/OFF status is displayed. * | |
| OFF SW (On/Off) | × | × | VDC OFF switch signal input status is displayed. | |
| SLIP/VDC LAMP (On/Off) | | × | VDC warning lamp ON/OFF status is displayed. * | |
| BATTERY VOLT (V) | × | × | Voltage supplied to ABS actuator and electric unit (control unit) is displayed. | |
| GEAR | × | × | Current gear position judged from current gear position signal is displayed. | |
| ENGINE SPEED [tr/min (rpm)] | × | × | Engine speed status is displayed. | |
| YAW RATE SEN (d/s) | × | × | Yaw rate detected by yaw rate sensor is displayed. | |
| R POSI SIG (On/Off) | | | R range signal input status judged from R range signal is displayed. | |
| 4WD MODE MON (2WD/AUTO) | × | × | AWD control status is displayed. | |
| N POSI SIG (On/Off) | | | N range signal input status judged from N range signal is displayed. | |

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

< SYSTEM DESCRIPTION >

[WITH VDC]

| Item (Unit) | Monitor item | selection | Note | |
|---------------------------|-------------------|--------------|--|--|
| item (Onit) | ECU INPUT SIGNALS | MAIN SIGNALS | - Note | |
| P POSI SIG (On/Off) | | | P range signal input status judged from P range signal is displayed. | |
| CV1 (On/Off) | | | Cut valve 1 operation status is displayed. | |
| CV2 (On/Off) | | | Cut valve 2 operation status is displayed. | |
| SV1 (On/Off) | | | Suction valve 1 operation status is displayed. | |
| SV2 (On/Off) | | | Suction valve 2 operation status is displayed. | |
| STOP LAMP SW2 (On/Off) | | | Brake pedal position switch signal input status is displayed. | |
| ACCEL POS SIG (%) | × | | Displays the Accelerator pedal position | |
| SIDE G-SENSOR (m/s2) | × | | Side G detected by side G sensor is displayed. | |
| STR ANGLE SIG (deg) | × | | Steering angle detected by steering angle sensor is displayed. | |
| EBD SIGNAL (On/Off) | | | EBD operation status is displayed. | |
| ABS SIGNAL (On/Off) | | | ABS operation status is displayed. | |
| TCS SIGNAL (On/Off) | | | TCS operation status is displayed. | |
| VDC SIGNAL (On/Off) | | | VDC operation status is displayed. | |
| EBD FAIL SIG (On/Off) | | | EBD fail-safe signal status is displayed. | |
| ABS FAIL SIG (On/Off) | | | ABS fail-safe signal status is displayed. | |
| TCS FAIL SIG (On/Off) | | | TCS fail-safe signal status is displayed. | |
| VDC FAIL SIG (On/Off) | | | VDC fail-safe signal status is displayed. | |
| CRANKING SIG (On/Off) | | | Cranking status is displayed. | |
| FLUID LEV SW (On/Off) | × | | Brake fluid level signal input status via CAN communica- tion is displayed. | |

ACTIVE TEST

The active test is used to determine and identify details of a malfunction, based on self-diagnosis test result 0 sand data obtained in the DATA MONITOR. In response to instructions from CONSULT, instead of those from ABS actuator and electric unit (control unit) on the vehicle, a drive signal is sent to the actuator to check its operation.

CAUTION:

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

NOTE:

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

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

< SYSTEM DESCRIPTION >

[WITH VDC]

• ABS warning lamp and brake warning lamp may turn ON during active test. This is not a malfunction.

ABS IN Valve and ABS OUT Valve

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

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

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

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

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

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

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

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

< SYSTEM DESCRIPTION >

[WITH VDC]

ABS Motor

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

| Test item | Display item | Display | |
|-----------|--------------|---------|-----|
| iest item | Display item | On | Off |
| ABS MOTOR | MOTOR RELAY | On | Off |
| ABS MOTOR | ACTUATOR RLY | On | On |

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< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000009752902

[WITH VDC]

CONSULT DATA MONITOR STANDARD VALUE

NOTE:

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

| Monitor item | Condition | Reference values in normal operation |
|-----------------------------|--|---|
| | Vehicle stopped | 0.00 km/h (MPH) |
| FR LH SENSOR | When driving straight ahead ^{*1} | Nearly matches the speedometer display (within ±10%) |
| | Vehicle stopped | 0.00 km/h (MPH) |
| FR RH SENSOR | When driving straight ahead ^{*1} | Nearly matches the speedometer display (within $\pm 10\%$) |
| | Vehicle stopped | 0.00 km/h (MPH) |
| RR LH SENSOR | When driving straight ahead ^{*1} | Nearly matches the speedometer display (within ±10%) |
| | Vehicle stopped | 0.00 km/h (MPH) |
| RR RH SENSOR | When driving straight ahead ^{*1} | Nearly matches the speedometer display (within ±10%) |
| | When stopped | -0.11 - 0.11 G |
| DECEL G-SEN | During acceleration | Negative value |
| | During deceleration | Positive value |
| FD DU IN 001 *2 | Active | On |
| FR RH IN SOL ^{*2} | Not activated | Off |
| | Active | On |
| FR RH OUT SOL ^{*2} | Not activated | Off |
| FR LH IN SOL ^{*2} | Active | On |
| FR LH IN SOL - | Not activated | Off |
| FR LH OUT SOL*2 | Active | On |
| FR LH OUT SOL - | Not activated | Off |
| RR RH IN SOL*2 | Active | On |
| RR RH IN SOL - | Not activated | Off |
| RR RH OUT SOL ^{*2} | Active | On |
| KK KH OUT SOL | Not activated | Off |
| RR LH IN SOL ^{*2} | Active | On |
| RR LH IN SOL - | Not activated | Off |
| RR LH OUT SOL ^{*2} | Active | On |
| | Not activated | Off |
| | When brake warning lamp is ON ^{*3} | On |
| EBD WARN LAMP | When brake warning lamp is OFF ^{*3} | Off |
| | Brake pedal depressed | On |
| STOP LAMP SW | Brake pedal not depressed | Off |
| | Active | On |
| MOTOR RELAY | Not activated | Off |

Revision: 2013 October

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| Monitor item | Condition | Reference values in normal operation |
|-------------------|---|--------------------------------------|
| ACTUATOR RLY | Active | On A |
| ACTUATOR REF | Not activated (in fail-safe mode) | Off |
| | When ABS warning lamp is ON ^{*3} | On |
| ABS WARN LAMP | When brake warning lamp is OFF*3 | Off |
| | When VDC OFF indicator lamp is ON ^{*3} | On |
| OFF LAMP | When VDC OFF indicator lamp is OFF ^{*3} | Off |
| | VDC OFF switch ON | On |
| OFF SW | VDC OFF switch OFF | Off |
| | When VDC warning lamp is ON ^{*3} | On |
| SLIP/VDC LAMP | When VDC warning lamp is OFF ^{*3} | Off |
| BATTERY VOLT | Ignition switch ON | 10 – 16 V |
| GEAR | Driving | 1 – 8 Depending on shift status |
| ENGINE SPEED | Engine stopped | 0 rpm |
| | Engine running | Almost same reading as tachometer |
| | Vehicle stopped | Approx. 0 d/s |
| YAW RATE SEN | Turning right | Negative value |
| | Turning left | Positive value |
| R POSI SIG | When selector lever is in the R position | On |
| | When selector lever is in the other position than R | Off |
| 4WD MODE MON | Always | Depending on AWD control status |
| N POSI SIG | When selector lever is in the N position | On |
| | When selector lever is in the other position than N | Off |
| P POSI SIG | When selector lever is in the P position | On |
| | When selector lever is in the other position than P | Off |
| CV1*2 | Active | On |
| 001 | Not activated | Off |
| CV2 ^{*2} | Active | On |
| | Not activated | Off |
| SV1 ^{*2} | Active | On |
| | Not activated | Off |
| SV2 ^{*2} | Active | On |
| | Not activated | Off |
| STOP LAMP SW2 | Brake pedal depressed | On |
| | Brake pedal not depressed | Off |
| ACCEL POS SIG | Never depress accelerator pedal (with ignition switch ON) | 0% |
| | Depress accelerator pedal (with ignition switch ON) | 0 – 100% |
| | Vehicle stopped | Approx. 0 m/s ² |
| SIDE G-SENSOR | Turning right | Negative value |
| | Turning left | Positive value |
| | When driving straight | 0±2.5° |
| STR ANGLE SIG | When steering wheel is steered to RH by 90° | Approx. +90° |
| | When steering wheel is steered to LH by 90° | Approx. –90° |

< ECU DIAGNOSIS INFORMATION >

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

*1: Confirm tire pressure is standard value.

*2: Refer to "valve operation" in <u>BRC-14. "System Description"</u> for valve operation of each valve.
*3: Refer to <u>BRC-14. "System Description"</u> for ON/OFF conditions of each warning lamp and indicator lamp.

Fail-safe

INFOID:000000009752903

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition | |
|-------|--|---|---|
| C1101 | When an open circuit is detected in rear RH wheel sensor circuit. | | • |
| 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ Rear LH wheel sensor power supply voltage When distance between rear LH wheel sensor and rear LH wheel sensor rotor is | The following functions are sus- pended. • VDC function • TCS function • ABS function | |
| | large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. | EBD function (only when both 2 rear wheels are malfunctioning) Brake limited slip differential | |
| 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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ Front RH wheel sensor power | (BLSD) function | |
| CTIO | er 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. | The following functions are sus- pended. • VDC function • TCS function | • |
| C1110 | When there is an internal malfunction in the ABS actuator and electric unit (control unit). | ABS function EBD function Brake limited slip differential (BLSD) function | _ |
| C1111 | When a malfunction is detected in motor or motor relay. | The following functions are suspended. VDC function TCS function ABS function Brake limited slip differential (BLSD) function | |

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|-------|---|---|
| C1113 | When a malfunction is detected in decel G signal, or signal line of yaw rate/side/de- cel G sensor is open or shorted. | The following functions are suspended. VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function |
| C1115 | When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified. | The following functions are sus- pended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function |
| C1116 | When stop lamp switch signal is not input when brake pedal operates. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |
| C1120 | When a malfunction is detected in front LH ABS IN valve. | |
| C1121 | When a malfunction is detected in front LH ABS OUT valve. | The following functions are sus- |
| C1122 | When a malfunction is detected in front RH ABS IN valve. | pended.VDC function |
| C1123 | When a malfunction is detected in front RH ABS OUT valve. | TCS function |
| C1124 | When a malfunction is detected in rear LH ABS IN valve. | ABS function EBD function |
| C1125 | When a malfunction is detected in rear LH ABS OUT valve. | Brake limited slip differential |
| C1126 | When a malfunction is detected in rear RH ABS IN valve. | (BLSD) function |
| 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 function TCS function Brake limited slip differential (BLSD) function |
| C1140 | When a malfunction is detected in actuator relay. | The following functions are suspended. VDC function TCS function ABS function EBD function Brake limited slip differential (BLSD) function |
| C1143 | When a malfunction is detected in steering angle sensor. | The following functions are suspended. VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function |
| C1144 | When neutral position adjustment of steering angle sensor is not complete. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|-------|---|---|
| C1145 | When a malfunction is detected in yaw rate signal, or signal line of yaw rate/side/ decel G sensor is open or shorted. | The following functions are suspended. |
| C1146 | When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted. | VDC function TCS function ABS function (AWD) Brake limited slip differential (BLSD) function |
| C1155 | When brake fluid level low signal is detected. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |
| C1164 | When a malfunction is detected in cut valve 1. | The following functions are sus- |
| C1165 | When a malfunction is detected in cut valve 2. | pended.VDC function |
| C1166 | When a malfunction is detected in suction valve 1. | TCS function |
| C1167 | When a malfunction is detected in suction valve 2. | ABS function EBD function Brake limited slip differential (BLSD) function |
| C1170 | When the information in ABS actuator and electric unit (control unit) is not the same. | The following functions are suspended. VDC function TCS function ABS function Brake limited slip differential (BLSD) function |
| C1176 | When brake pedal position switch signal is not input when brake pedal operates. | The following functions are suspended. VDC function TCS function Brake limited slip differential (BLSD) function |
| U1000 | When CAN communication signal is not continuously transmitted or received for 2 seconds or more. | The following functions are suspended. |
| U1010 | When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit). | VDC function TCS function Brake limited slip differential (BLSD) function |

DTC Inspection Priority Chart

INFOID:000000009752904

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

| Priority | Detected item (DTC) | |
|----------|--|--|
| 1 | U1000 CAN COMM CIRCUIT U1010 CONTROL UNIT (CAN) | |
| 2 | C1110 CONTROLLER FAILURE C1170 VARIANT CODING | |
| 3 | C1130 ENGINE SIGNAL 1 C1144 ST ANG SEN SIGNAL | |
| 4 | C1109 BATTERY VOLTAGE [ABNORMAL] C1111 PUMP MOTOR C1140 ACTUATOR RLY | |

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| Priority | Detected item (DTC) |
|----------|--|
| 5 | C1101 RR RH SENSOR-1 C1102 RR LH SENSOR-1 C1103 FR RH SENSOR-1 C1104 FR LH SENSOR-1 C1105 RR HS SENSOR-2 C1106 RR LH SENSOR-2 C1107 FR RH SENSOR-2 C1108 FR LH SENSOR-2 C1113 G-SENSOR 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 FR RH OUT ABS SOL C1128 FR RH OUT ABS SOL C1127 FR RH OUT ABS SOL C1127 FR RH OUT ABS SOL C1128 FR RH IN ABS SOL C1127 FR RH SENSOR C1126 RR RH IN ABS SOL C1127 FR RH OUT ABS SOL C1126 RR HI NABS SOL C1146 SU A C1145 YAW RATE SENSOR C1146 SIDE G SEN CIRCUIT C1166 SV 1 C1167 SV 2 C1176 STOP LAMP SW2 |
| 6 | C1155 BR FLUID LEVEL LOW |

DTC Index

INFOID:000000009752905

| DTC | Display Item | Refer to |
|-------|------------------------------|---------------------|
| C1101 | RR RH SENSOR-1 | |
| C1102 | RR LH SENSOR-1 | PDC 64 "DTC Logic" |
| C1103 | FR RH SENSOR-1 | BRC-64, "DTC Logic" |
| C1104 | FR LH SENSOR-1 | |
| C1105 | RR RH SENSOR-2 | |
| C1106 | RR LH SENSOR-2 | BRC-67, "DTC Logic" |
| C1107 | FR RH SENSOR-2 | BRC-67, DTC Logic |
| C1108 | FR LH SENSOR-2 | |
| C1109 | BATTERY VOLTAGE [ABNORMAL] | BRC-73, "DTC Logic" |
| C1110 | CONTROLLER FAILURE | BRC-75, "DTC Logic" |
| C1111 | PUMP MOTOR | BRC-76, "DTC Logic" |
| C1113 | G-SENSOR | BRC-78, "DTC Logic" |
| C1115 | ABS SENSOR [ABNORMAL SIGNAL] | BRC-81, "DTC Logic" |
| C1116 | STOP LAMP SW | BRC-87, "DTC Logic" |
| C1120 | FR LH IN ABS SOL | BRC-91, "DTC Logic" |
| C1121 | FR LH OUT ABS SOL | BRC-93, "DTC Logic" |
| C1122 | FR RH IN ABS SOL | BRC-91, "DTC Logic" |
| C1123 | FR RH OUT ABS SOL | BRC-93, "DTC Logic" |
| C1124 | RR LH IN ABS SOL | BRC-91, "DTC Logic" |
| C1125 | RR LH OUT ABS SOL | BRC-93, "DTC Logic" |
| C1126 | RR RH IN ABS SOL | BRC-91, "DTC Logic" |

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Display Item | Refer to | • |
|-------|--------------------|----------------------|-----|
| C1127 | RR RH OUT ABS SOL | BRC-93, "DTC Logic" | A |
| C1130 | ENGINE SIGNAL 1 | BRC-95, "DTC Logic" | - |
| C1140 | ACTUATOR RLY | BRC-96, "DTC Logic" | В |
| C1143 | ST ANG SEN CIRCUIT | BRC-98, "DTC Logic" | - |
| C1144 | ST ANG SEN SIGNAL | BRC-100, "DTC Logic" | - |
| C1145 | YAW RATE SENSOR | BRC-78, "DTC Logic" | С |
| C1146 | SIDE G SEN CIRCUIT | BRC-78, DTC LOgic | |
| C1155 | BR FLUID LEVEL LOW | BRC-101, "DTC Logic" | D |
| C1164 | CV 1 | BRC-104, "DTC Logic" | _ |
| C1165 | CV 2 | BRC-104, DTC Logic | |
| C1166 | SV 1 | BRC-106, "DTC Logic" | E |
| C1167 | SV 2 | BRC-100, DTC LOgic | |
| C1170 | VARIANT CODING | BRC-75, "DTC Logic" | BRC |
| C1176 | STOP LAMP SW2 | BRC-108, "DTC Logic" | BRO |
| U1000 | CAN COMM CIRCUIT | BRC-112, "DTC Logic" | - |
| U1010 | CONTROL UNIT (CAN) | BRC-113, "DTC Logic" | G |

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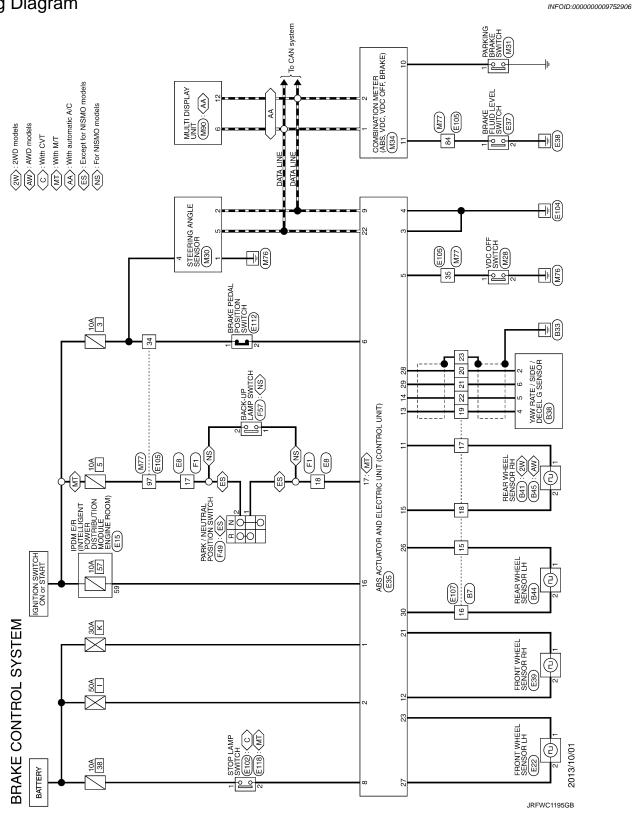
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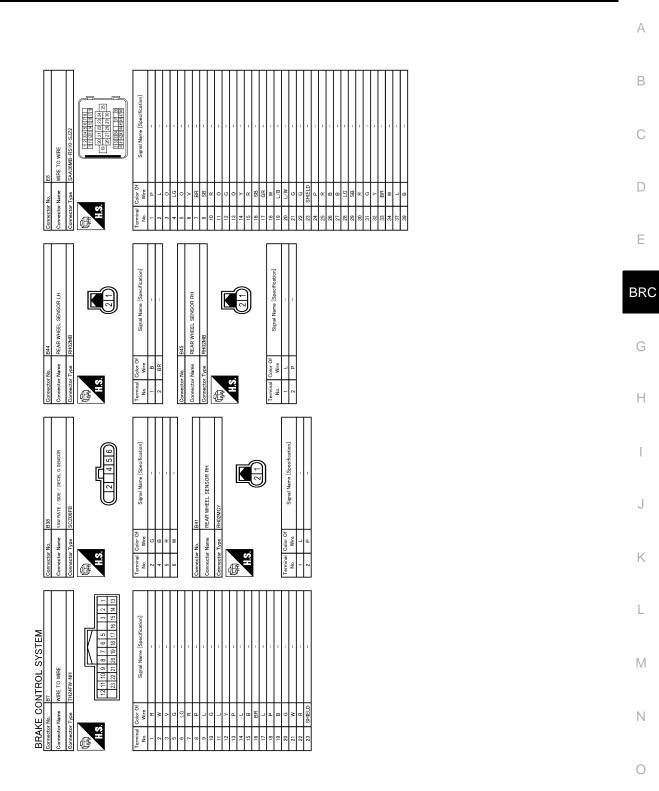
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WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

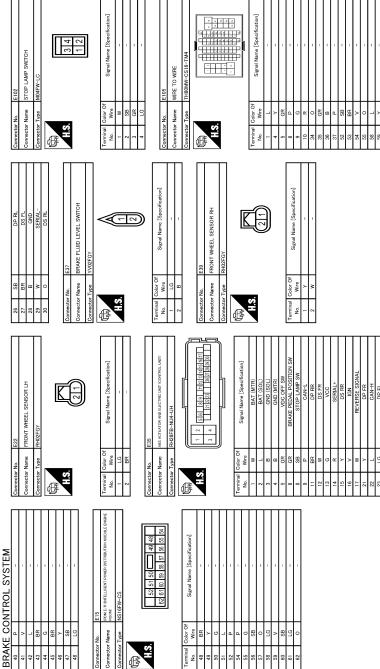




JRFWC1196GB

Р

BRAKE CONTROL SYSTEM



JRFWC1197GB

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|---|-----|
| | В |
| F40 | С |
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| Terminal (International Connector Manage) Connector Manage) Conn | Н |
| EI13 Signal Name Especification | I |
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BRAKE CONTROL SYSTEM

[WITH VDC]

| | SB - | - | - | | | | - | - | - | R - | - A | | GR - | - | | - 10 | - ^ | - 1 | , | | BR - | | SHIELD - | X | | R – [Without Intelligent Key] | Y – [With Intelligent Key] | | - | - M | TG | | | Γ | me MULTI DISPLAY UNIT | oe TH12FW-NH | | | K | | 1 2 5 6 | | | | | | | |
|---|--|-------------------------------------|------------------------|---|---|---|-------------------|-------------------------------|---|--------------------------|-------------------------------|---|--|--------------------------------------|-----|--|-----|--|---|--|--------------------------|---|------------------------|------|--|---|-----------------------------|--------------------------------------|--------------------------|----------|-----------|-----------|--|--------------------------------------|-----------------------|----------------|-------------------------------------|-----------------------------|---|--|-----------------------------------|--------------------------------------|--|---|---|--|-----------------------|--|
| 53 | 54 5 | \vdash | ┝ | ╀ | | + | ╉ | + | + | 68 | 70 | | 72 0 | ┝ | ┝ | ┞ | ┝ | ┝ | | | ┝ | ┝ | ⊢ | 91 | - | | 95 06 | ╀ | ┝ | \vdash | 100 | | -N- | | Connector Name | Connector Type | | ĺ | | 2 | | | | | | | | |
| 16 W MANUAL MODE SHIFT DOWN SIGNAL [Without front fog lamp] | 17 G WASHER LEVEL SWITCH SIGNAL [Wthhout front fog lamp] | > | t | | | 3 | LA AMBIENI SENSOR | 20 | 8 | 23 B GROUND | 24 L FUEL LEVEL SENSOR GROUND | 8 | 26 V PADDLE SHIFTER DOWN SWITCH SIGNAL | 5 | B | 29 LG PASSENGER SEAT BELT WARNING SIGNAL [With front fog lamp] | ┝ | 31 P A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL | 9 | 36 Y MANUAL MODE SIGNAL [Without front fog lamp] | 0 | > | 38 P ALTERNATOR SIGNAL | | | Connector No. M77 | Connector Name WIRE TO WIRE | Connector Type TH80EW-CS16-TM4 | | | × | | | | 1 | Γ | No. Wire Signal Name Copecification | | 4 V – | 5 W - | - - | 9 R | 10 R – | 34 LG – | 35 SB - | | 37 P - | 52 R - |
| Connector No. M31 | | Connector Name PARKING BRAKE SWITCH | Connector Type D01EB_A | 1 | Q | | | Г. С.П. | |] | | | Terminal Color Of | No. Wire Signal Name [Specification] | - | | | Connector No. M34 | | Connector Name COMBINATION METER | Connector Type TH40FW-NH | 1 | | F | 1.5. 2019/18/17/18/15/14/13 11/10/9 8/7/6/5/4/ 2/1 | 38 37 36 31 29 28 27 28 28 24 28 22 22 27 | | | Terminal Color Of | | 1 L CAN-H | 2 P CAN-L | 4 V VEHICLE SPEED SIGNAL (8-PULSE) [With front fog lamp] | 5 C PADDIE SHIFTER IID SWITCH SIGNAL | , ₈ | | 8 P – [Without front fog lamp] | 8 Y = [With front fog lamp] | 9 0 SEAT BELT BUCKLE SWITCH SIGNAL OPENER SIDEI (With freet fag land) | 9 W SEAT BELT BUCKLE SMITCH SIGNAL (ORIVER SIDE) [INDIOLI from fog lamp] | 10 SB PARKING BRAKE SWITCH SIGNAL | 11 G BRAKE FLUID LEVEL SWITCH SIGNAL | 13 B ILLUMINATION CONTROL SIGNAL [With front fog lamp] | 13 GR ILLUMINATION CONTROL SIGNAL [Without front fog Isrue] | 14 R MANUAL MODE SHIFT UP SIGNAL [Without front fog lamp] | 14 V MANUAL MODE SHIFT UP SIGNAL [With front fog lamp] | 15 L ACC POWER SUPPLY | 16 O MANUAL MODE SHIFT DOWN SIGNAL [With front fog lamp] |
| Terminal Color Of Simul Name [Searching] | | - 5 | g | 3 | | | CONTECTOR NO. MLO | Connector Name VDC OFF SWITCH | | Connector Type TH08FB-NH | | | R | | 4 3 | • | | | | No. Wire Signal Name [Specification] | SB - | | - ^ | GR - | | | M30 | Connector Name STEERING ANGLE SENSOR | Connector Tyne TH08FW-NH | 1 | | | 1 2 4 | 4 | | | Color Of Simul Name [Secretion] | | | P CAN-L | IGN | | | | | | | |

| BRAKE CONTROL SYSTEM | Signal Name [Specification] | BAT | ILL+ | ILL CONT | CAN-H | IGN | GND | GND | CAN-L |
|----------------------|-----------------------------|-----|------|----------|-------|-----|-----|-----|-------|
| (E CO | Color Of Wire | Y | > | GR | - | SB | 8 | 8 | ٩ |
| BRAK | Terminal No. | | 2 | 2 | 9 | 7 | 10 | 11 | 12 |

JRFWC1200GB

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000009752907

IWITH VDC1

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing <u>BRC-59</u>, "<u>Diagnostic</u> <u>Work Sheet</u>" and reproduce the symptom as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to <u>BRC-46, "Fail-safe"</u>.

CAUTION:

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

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ABS".

Is DTC detected?

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

NO >> GO TO 6.

4.RECHECK THE SYMPTOM

(B) With CONSULT

1. Erase self-diagnostic results for "ABS".

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

NOTE:

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

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-46</u>, <u>"Intermittent Incident"</u>.

5.REPAIR OR REPLACE ERROR-DETECTED PART

• Repair or replace error-detected parts.

- Reconnect part or connector after repairing or replacing.
- When DTC is detected, erase self-diagnostic result for "ABS".

>> GO TO 7.

O.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

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

BRC-58

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH VDC]

- YES >> GO TO 7. NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-46, А "Intermittent Incident". **7.**FINAL CHECK В With CONSULT 1. Check the reference value for "ABS". 2. Recheck the symptom and check that the symptom is not reproduced on the same conditions. Is the symptom reproduced? YES >> GO TO 3. NO >> INSPECTION END D Diagnostic Work Sheet INFOID:000000009752908 Description Ε
- 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 | MR/MS | Registration number | | | Initial year registration | | | | | | |
| name | | Vehicle type | | | VIN | | | | | | |
| Storage date | | Engine | | | Mileage | km | (| Mile) | | | |
| | | Does not op | perate (| | | |) fu | nction | | | |
| | | U Warning lar | mp for (| | | |) turn | s ON. | | | |
| Symptom | | D Noise | | | □ Vibration | | | | | | |
| | | □ Other (| | | | | |) | | | |
| First occurren | се | □ Recently | D Other (| | | | |) | | | |
| Frequency of | occurrence | □ Always □ Under a certain conditions of □ Sometimes (time(s)/day) | | | | | | | | | |
| | | □ Irrelevant | | | | | | | | | |
| Climate con- | Weather | □ Fine □ | I Cloud □ Rair | n 🗆 S | Snow □ Ot | hers (| |) | | | |
| ditions | Temperature | □ Hot □W | /arm □ Cool | □ Cold | Tempera | ature [Approx. | °C (| °F)] | | | |
| | Relative humidity | 🗆 High | ☐ Moderate | [| ⊐ Low | | | | | | |
| Road conditio | ns | □ Urban area □ Mountainou | □ Suburb a us road (uphill or dov | | □ Highw □ Rough | • | | | | | |
| Operating cor | idition, etc. | - | ng 🛛 🗆 During a | left curve |) | constant speed c | lriving | | | | |

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BRC

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

| | | Interview shee | t | | |
|--------------|-------|------------------------|-----|------|-------|
| Customer | MR/MS | Registration number | - | | |
| name | Ve | Vehicle type | VIN | | |
| Storage date | | Engine Mileage | | km (| Mile) |

Memo

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

< BASIC INSPECTION >

[WITH VDC]

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

Description

INFOID:000000009752909

When replaced the ABS actuator and electric unit (control unit), Perform steering angle sensor neutral position. Refer to <u>BRC-62, "Work Procedure"</u>.

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000009752910

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

| <: | Required | -: Not | required |
|----|----------|--------|----------|
|----|----------|--------|----------|

>

| Procedure | Adjust the neutral position of steering angle sensor |
|--|--|
| Removing/ installing ABS actuator and electric unit (control unit) | _ |
| Replacing ABS actuator and electric unit (control unit) | × |
| Removing/installing steering angle sensor | × |
| Replacing steering angle sensor | × |
| Removing/installing steering components | × |
| Replacing steering components | × |
| Removing/installing suspension components | × |
| Replacing suspension components | × |
| Removing/installing tire | - |
| Replacing tire | - |
| Tire rotation | - |
| Adjusting wheel alignment. | X |

Work Procedure

INFOID:000000009752911

ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

CAUTION:

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

1.CHECK THE VEHICLE STATUS

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

Does the vehicle stay in the straight-ahead position?

YES >> GO TO 2.

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

2.ADJUST NEUTRAL POSITION OF STEERING ANGLE SENSOR

(I) With CONSULT

1. Turn the ignition switch ON. CAUTION:

Never start engine.

- 2. Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in this order.
- 3. Select "START". CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

- 4. After approx. 10 seconds, select "END".
- 5. Turn ignition switch OFF, and then turn it ON again. CAUTION:

Be sure to perform the operation above.

>> GO TO 3.

3.CHECK DATA MONITOR

With CONSULT

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

BRC-62

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION [WITH VDC]

< BASIC INSPECTION >

| 2. | Select "ABS", "DATA MONITOR", "ECU INPUT SIGNALS" and "STR ANGLE SIG" in the order. Check that the signal is within the specified value. | A |
|---------|--|---|
| | STR ANGLE SIG : 0±2.5° | |
| ls t | he inspection result normal? | B |
| YI N | ES >> GO TO 4. O >> GO TO 1. | |
| 4. | ERASE SELF-DIAGNOSIS MEMORY | С |

With CONSULT Erase self-diagnosis result of "ABS". D Are the memories erased? YES >> INSPECTION END

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

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

DTC Logic

INFOID:000000009752912

[WITH VDC]

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|----------------|--|---|
| C1101 | RR RH SENSOR-1 | When an open circuit is detected in rear RH wheel sensor circuit. | |
| C1102 | RR LH SENSOR-1 | When an open circuit is detected in rear LH wheel sensor circuit. | Harness or connectorWheel sensor |
| C1103 | FR RH SENSOR-1 | When an open circuit is detected in front RH wheel sensor circuit. | ABS actuator and electric unit (control unit) |
| C1104 | FR LH SENSOR-1 | When an open circuit is detected in front LH wheel sensor circuit. | |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

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

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

YES >> Proceed to <u>BRC-64, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check the 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)

(I) With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-132</u>, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-135, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.

BRC-64

INFOID:000000009752913

| C1101, C1102, C1103, C1104 WHEEL SENSOR |
|--|
| < DTC/CIRCUIT DIAGNOSIS > [WITH VDC] |
| 7. Perform self-diagnosis for "ABS". |
| <u>Is DTC "C1101", "C1102", "C1103" or "C1104" detected?</u> |
| YES >> GO TO 3. |
| NO >> INSPECTION END |
| 3.CHECK CONNECTOR |
| Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Check the wheel sensor harness connector for disconnection or looseness. Is the inspection result normal? YES >> GO TO 5. NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 4. PERFORM SELF-DIAGNOSIS (1) |
| |
| With CONSULT Erase self-diagnosis result for "ABS". |
| 2. Turn the ignition switch OFF, and wait 10 seconds or more. |
| Start the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. |
| 5. Stop the vehicle. |
| 6. Perform self-diagnosis for "ABS". |
| Is DTC "C1101", "C1102", "C1103" or "C1104" detected? |
| YES >> GO TO 5. NO >> INSPECTION END |
| 5. CHECK TERMINAL |
| |
| Turn the ignition switch OFF. 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. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector. |
| Is the inspection result normal? |
| YES >> GO TO 7. |
| NO >> Repair or replace error-detected parts and GO TO 6. |
| 6.PERFORM SELF-DIAGNOSIS (2) |
| With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Connect wheel sensor harness connector. Erase self-diagnosis result for "ABS". |
| 4. Turn the ignition switch OFF, and wait 10 seconds or more. |
| 5. Start the engine. |
| Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. |
| 8. Perform self-diagnosis for "ABS". |
| Is DTC "C1101", "C1102", "C1103" or "C1104" detected? |
| YES >> GO TO 7. |
| NO >> INSPECTION END |
| CHECK WHEEL SENSOR HARNESS |
| Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector. Disconnect wheel sensor harness connector. |

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Measurement connector and terminal for power supply circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|----------|--|----------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| | 23 | E22 (Front LH wheel) | | |
| | 21 | E39 (Front RH wheel) | | |
| E35 | 26 | B44 (Rear LH wheel) | 1 | Existed |
| | 11 | B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel) | | |

*1: 2WD

*2: AWD

Measurement connector and terminal for signal circuit

| ABS actuator and electric unit (control unit) | | Wheel s | Continuity | |
|---|----------|--|------------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| E35 | 27 | E22 (Front LH wheel) | | |
| | 12 | E39 (Front RH wheel) | | |
| | 30 | B44 (Rear LH wheel) | 2 | Existed |
| | 15 | $B41^{*1}$ (Rear RH wheel) $B45^{*2}$ (Rear RH wheel) | | |

*1: 2WD

*2: AWD

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Repair or replace error-detected parts and GO TO 8.

8. PERFORM SELF-DIAGNOSIS (3)

(I) With CONSULT

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

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

- YES >> GO TO 9.
- NO >> INSPECTION END

9.REPLACE WHEEL SENSOR (2)

With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to BRC-132, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-135, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

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

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> INSPECTION END

BRC-66

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes | |
|-------|----------------|---|--|-------------|
| C1105 | RR RH SENSOR-2 | 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage: 16 V ≤ 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. | | C D E |
| C1106 | RR LH SENSOR-2 | 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage. Rear LH wheel sensor power supply voltage: 16 V ≤ 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. | Harness or connector Wheel sensor ABS actuator and electric unit | G |
| C1107 | FR RH SENSOR-2 | 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: 7.5 V ≥ Front RH wheel sensor power supply voltage: 16 V ≤ 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. | (control unit) • Sensor rotor • Tire | J K L |
| C1108 | FR LH SENSOR-2 | 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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. | | M N O |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

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В

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

2. CHECK DTC DETECTION

With CONSULT

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

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

YES >> Proceed to <u>BRC-68, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check the between wheel sensor harness connector terminals.

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

Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-114. "Diagnosis</u> <u>Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check the tire air pressure, wear and size. Refer to WT-54. "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.

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

3.CHECK DATA MONITOR (1)

()With CONSULT

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

NOTE:

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

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

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

YES >> GO TO 4.

NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

With CONSULT

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5.CHECK WHEEL SENSOR

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

INFOID:000000009752915

| < DTC/CIRCUIT DIAGNOSIS > [WIT | TH VDC] |
|---|--------------------|
| Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector thr wheel sensor mounting hole. CAUTION: | rough the A |
| Install wheel sensor with no backlash and float, and tighten the mounting bolt to the s | specified |
| torque. Front: Refer to <u>BRC-132, "FRONT WHEEL SENSOR : Exploded View"</u>. | В |
| Rear: Refer to <u>BRC-133, "REAR WHEEL SENSOR : Exploded View"</u> . | |
| Is the inspection result normal? | |
| YES >> GO TO 8. | C |
| NO $>>$ GO TO 6. | |
| 6.REPLACE WHEEL SENSOR (1) | D |
| | |
| Replace wheel sensor. Front: Refer to <u>BRC-132</u>, "FRONT WHEEL SENSOR : Removal and Installation". | E |
| - Rear: Refer to BRC-135. "REAR WHEEL SENSOR : Removal and Installation". | |
| 2. Erase self-diagnosis result for "ABS". | |
| Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. | BF |
| Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH S and "RR RH SENSOR". | SENSOR" |
| NOTE: Set the "DATA MONITOR" recording speed to "10 msec". | 0 |
| 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. | |
| Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error | |
| wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is t ence within 5%, respectively? | <u>the differ-</u> |
| YES $>>$ GO TO 7. | |
| NO $>>$ GO TO 19. | |
| 7. PERFORM SELF-DIAGNOSIS (2) | |
| | J |
| 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. | |
| Stop the vehicle. Perform self-diagnosis for "ABS". | |
| S. Perform self-diagnosis for ABS. Is DTC "C1105", "C1106", "C1107" or "C1108" detected? | k |
| YES >> GO TO 19. | |
| NO >> INSPECTION END | L |
| 8. CHECK CONNECTOR | |
| 1. Turn the ignition switch OFF. | |
| 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or lo | oseness. |
| 3. Check the wheel sensor harness connector for disconnection or looseness. | |
| Is the inspection result normal? | ١ |
| YES >> GO TO 11. NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO | |
| 9. CHECK DATA MONITOR (2) | 0. |
| | |
| With CONSULT Erase self-diagnosis result for "ABS". | |
| Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. | - |
| 3. Start the engine. | F |
| Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH S and "RR RH SENSOR". | SENSOR" |
| NOTE: | |

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

With CONSULT

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

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

YES >> GO TO 11.

NO >> INSPECTION END

11.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 14.

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

12. CHECK DATA MONITOR (3)

With CONSULT

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

NOTE:

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

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

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

- YES >> GO TO 13.
- NO >> GO TO 14.
- **13.**PERFORM SELF-DIAGNOSIS (4)

With CONSULT

- T. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 14.

- NO >> INSPECTION END
- 14.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 the ground.

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< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and ele | ectric unit (control unit) | _ | Continuity | | А |
|---|--|------------------------|------------------------|---|-------|
| Connector | Terminal | | | <u>.</u> | |
| | 23, 27 | _ | | | В |
| E35 | 21, 12 | Ground | Not existed | | |
| | 26, 30 | | | | |
| | 11, 15 | | | | С |
| Is the inspection res | | | | | |
| YES >> GO TO NO >> Repair of | 15. or replace error-deted | ted parts and GO T | O 15 | | D |
| 15. CHECK DATA | • | | 0 10. | | |
| - <u>-</u> | | | | | _ |
| With CONSULT Connect ABS address | ctuator and electric u | nit (control unit) har | ness connector | | E |
| 2. Connect wheels | sensor harness conn | ector. | | | |
| | nosis result for "ABS" switch OFF, and wa | | r0 | 1 | BRC |
| 5. Start the engine | | | 16. | | |
| | | , check the "FR LH S | SENSOR", "FR RH S | ENSOR", "RR LH SENSOR" | |
| and "RR RH SE NOTE: | NSOR". | | | | G |
| Set the "DATA N | IONITOR" recording | | | | |
| • | • • | | ors and error-detectin | - | Н |
| | | | | ected by the error detecting wheel sensors, is the differ- | |
| ence within 5%, resp | | m wheel speed dea | | wheel sensors, is the differ- | |
| YES >> GO TO | | | | | I |
| NO >> GO TO | | | | | |
| 16. PERFORM SE | LF-DIAGNOSIS (5) | | | | J |
| With CONSULT | | | | | |
| Drive the vehicle Stop the vehicle | e at approx. 30 km/h | (19 MPH) or more f | or approx. 1 minute. | | К |
| | gnosis for "ABS". | | | | IX |
| <u>ls DTC "C1105", "C1</u> | 106", "C1107" or "C1 | 108" detected? | | | |
| YES >> GO TO | | | | | L |
| NO >> INSPEC | | | | | |
| 17.REPLACE WH | EEL SENSOR | | | | Μ |
| With CONSULT | | | | | 1 V I |
| Replace wheels Front: Refer to E | | HEEL SENSOR : F | Removal and Installat | ion". | |
| - Rear: Refer to E | <u> 3RC-135, "REAR WH</u> | IEEL SENSOR : Re | moval and Installation | | Ν |
| | nosis result for "ABS" switch OFF, and wa | | ro | | |
| 4. Start the engine | | | 16. | | 0 |
| 5. Select "ABS" an | d "DATA MONITOR" | , check the "FR LH S | SENSOR", "FR RH S | ENSOR", "RR LH SENSOR" | 0 |
| and "RR RH SE NOTE: | NSUK". | | | | |
| Set the "DATA N | IONITOR" recording | | | | Ρ |
| • | • • | | ors and error-detectin | - | |
| | | | | ected by the error detecting wheel sensors, is the differ- | |
| ence within 5%, resp | | | colou by the normal | | |
| YES >> GO TO | | | | | |
| NO >> GO TO | 19. | | | | |

< DTC/CIRCUIT DIAGNOSIS >

18.PERFORM SELF-DIAGNOSIS (6)

(B) With CONSULT

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

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

- YES >> GO TO 19.
- NO >> INSPECTION END
- **19.**REPLACE SENSOR ROTOR (2)

With CONSULT

- 1. Replace sensor rotor.
- Front: Refer to BRC-132, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-135</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

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

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> INSPECTION END

C1109 POWER AND GROUND SYSTEM

Malfunction detected condition

• Ignition power supply voltage: 10 V ≥ Ignition pow-

When ignition power supply voltage is in following

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

state.

DTC Logic

C1109

1.

 ${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

- 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 |
|---|----------|--------|-------------|
| Connector | Terminal | _ | voltage |
| E35 | 16 | Ground | Approx. 0 V |

Turn the ignition switch ON. 4. CAUTION:

Turn the ignition switch OFF.

Never start engine.

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

BRC-73

2014 JUKE

Ρ

| C1109 | [ABNORMAL] | er supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. | FuseIgnition power supply systemBattery | D |
|---------------|---|--|---|-----|
| DTC CO | ONFIRMATION PROCED | URE | | Е |
| 1.PRE | CONDITIONING | | | |
| | CONFIRMATION PROCEDU east 10 seconds before cond | JRE" has been previously conducted, always ducting the next test. | turn ignition switch OFF and | BRC |
| | >> GO TO 2. | | | |
| 2.сне | CK DTC DETECTION | | | G |
| 1. Turi | CONSULT n the ignition switch OFF to (form self-diagnosis for "ABS | | | Н |
| | "C1109" detected? | | | |
| YES NO | >> Proceed to <u>BRC-73, "Di</u> >> INSPECTION END | agnosis Procedure". | | |
| Diagno | osis Procedure | | INFOID:000000009752917 | I |
| 1. CHE | CK CONNECTOR | | | J |
| | n the ignition switch OFF. eck the ABS actuator and ele | ectric unit (control unit) harness connector for | disconnection or looseness. | Κ |
| | spection result normal? | | | |
| YES NO | >> GO TO 3. >> Repair or replace error- | detected parts, securely lock the harness cor | nnector, and GO TO 2. | L |
| 2.per | FORM SELF-DIAGNOSIS | | | |
| Perform | self-diagnosis for "ABS" aga | ain. | | M |
| | "C1109" detected? | | | |
| YES NO | >> GO TO 3. >> INSPECTION END | | | Ν |

DTC DETECTION LOGIC DTC

Display Item

BATTERY VOLTAGE

[WITH VDC]

Possible causes

· ABS actuator and electric unit

· Harness or connector

(control unit)

INFOID:000000009752916

А

В

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

| ABS actuator and electric unit (control unit) | | | Voltago | |
|---|----------|--------|-----------|--|
| Connector | Terminal | | Voltage | |
| E35 | 16 | Ground | 10 – 16 V | |

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

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

- 1. Turn the ignition switch OFF.
- 2. Check the 10A fuse (#57).
- 3. Disconnect IPDM E/R harness connector.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/ R harness connector.

| ABS actuator and ele | electric unit (control unit) IPDM E/R | | Continuity | |
|----------------------|---------------------------------------|--------------------|------------|------------|
| Connector | Terminal | Connector Terminal | | Continuity |
| E35 | 16 | E15 | 59 | Existed |

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

| ABS actuator and electric unit (control unit) | | | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E35 | 16 | Ground | Not existed |

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-41, "Wiring Diagram IGNITION</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and electric unit (control unit) | | | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | Continuity |
| E35 | 3 | Ground | Existed |
| 200 | 4 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < DTC/CIRCUIT DIAGNOSIS > [WITH VDC]

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000009752918

А

| DTC | Display Item | Malfunction detected condition | Possible causes |
|---|---|--|--------------------------------|
| C1110 | tuator and electric unit (control unit). ABS actuator and el | | ABS actuator and electric unit |
| C1170 | VARIANT CODING | When the information in ABS actuator and electric unit (control unit) is not the same. | (control unit) |
| | ONFIRMATION PROCED | DURE | |
| .PRE | CONDITIONING | | |
| | CONFIRMATION PROCED east 10 seconds before con | URE" has been previously conducted, always | s turn ignition switch OFF a |
| valtati | | ducting the flext test. | |
| _ | >> GO TO 2. | | |
| 2.CHE | CK DTC DETECTION | | |
| | CONSULT | <u></u> | |
| | n the ignition switch OFF to form self-diagnosis for "ABS | | |
| | _ | | |
| | "C1110" or "C1170" detected | <u>92</u> | |
| YES | >> Proceed to <u>BRC-75, "D</u> | | |
| YES NO | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END | | |
| YES NO Diagno | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END osis Procedure | iagnosis Procedure". | INFOID:0000000097 |
| YES NO Diagno 1.сне | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END osis Procedure CK SELF-DIAGNOSIS RES | iagnosis Procedure". SULTS | |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END Dsis Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric o | iagnosis Procedure". | |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END osis Procedure CK SELF-DIAGNOSIS RES | iagnosis Procedure". SULTS | |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | iagnosis Procedure". SULTS | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |
| YES NO Diagno 1.CHE Replace | >> Proceed to <u>BRC-75, "D</u> >> INSPECTION END DSIS Procedure CK SELF-DIAGNOSIS RES ABS actuator and electric to iagnosis for "ABS". >> Replace ABS actuator | BULTS ULTS unit (control unit) even if other display than "C | 1110" or "C1170" is display |

Ρ

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Logic

INFOID:000000009752920

[WITH VDC]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

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

Is DTC "C1111" detected?

YES >> Proceed to <u>BRC-76, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009752921

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1111" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

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

| ABS actuator and ele | ectric unit (control unit) | | Voltage |
|----------------------|----------------------------|--------|-----------|
| Connector Terminal | | | voltage |
| E35 | 1 | Ground | 10 – 16 V |

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and ele | ctric unit (control unit) | | | • |
|----------------------------|----------------------------|------------------|--------------------|---|
| Connector | Terminal | _ | Voltage | |
| E35 | 1 | Ground | 10 – 16 V | - |
| s the inspection re | sult normal? | | | • |
| YES >> GO TO | | | | |
| NO >> GO TO | - | | | |
| CHECK ABS M | OTOR AND MOTO | OR RELAY PO | WER SUPPLY C | CIRCUIT |
| . Turn the ignitic | | | | |
| | A fusible link (K). | ircuit between | ABS actuator a | nd electric unit (control unit) harness con- |
| | I (1) and 30A fusib | | ADS actuator a | nd electric drift (control drift) harness con- |
| the inspection re | | | | |
| | | s for battery po | ower supply. Ref | fer to <u>PG-11, "Wiring Diagram - BATTERY</u> |
| | <u>ER SUPPLY -"</u> . | ata ata dina sta | | |
| - | or replace error-d | • | | |
| | | | (CONTROL UN | NIT) GROUND CIRCUIT |
| . Turn the ignitic | | | ad alaatuiait | |
| . Check the cor ground. | itinuity between A | BS actuator a | na electric unit | (control unit) harness connector and the |
| ground. | | | | |
| ABS actuator and ele | ectric unit (control unit) | | | - |
| Connector | Terminal | | Continuity | |
| _ | 3 | | | - |
| E35 | 4 | Ground | Existed | |
| the inspection re | sult normal? | | | - |
| YES >> GO TO | | | | |
| NO >> Repair | r or replace error-d | etected parts. | | |
| CHECK TERMI | NAL | | | |
| heck the ABS ac | tuator and electric | unit (control ur | nit) pin terminals | for damage or loose connection with har- |
| ess connector. | | · | | - |
| s the inspection re | | | | |
| | ce ABS actuator a | nd electric unit | (control unit). F | Refer to <u>BRC-138, "Removal and Installa-</u> |
| NO >> Repair | or replace error-d | etected parts. | | |
| | ee. u | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

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

< DTC/CIRCUIT DIAGNOSIS >

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

DTC Logic

INFOID:000000009752922

[WITH VDC]

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|-------|--------------------|---|----------------|
| C1113 | G SENSOR | When a malfunction is detected in decel G signal, or sig- nal line of yaw rate/side/decel G sensor is open or short- ed. | |
| C1145 | YAW RATE SENSOR | When a malfunction is detected in yaw rate signal, or sig- nal line of yaw rate/side/decel G sensor is open or short- ed. | |
| C1146 | SIDE G-SEN CIRCUIT | When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted. | |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(I) With CONSULT

Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

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

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

Diagnosis Procedure

INFOID:000000009752923

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

Check the ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-114, "Diagnosis</u> <u>Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK CONNECTOR

1. Turn ignition switch OFF.

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

3. Check the yaw rate/side/decel G sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 4.

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

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

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

YES >> GO TO 4.

NO >> INSPECTION END

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

1. Turn ignition switch OFF.

BRC-78

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

< DTC/CIRCUIT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

 ${f 5.}$ CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND SIRCUIT

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

| ABS actuator and ele | ctric unit (control unit) | Yaw rate/side/ | decel G sensor | Continuity | BRC |
|----------------------|---------------------------|----------------|----------------|------------|-----|
| Connector | Terminal | Connector | Terminal | Continuity | DRC |
| E35 | 28 | B38 | 2 | Existed | |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

${f 6}.$ CHECK YAW RATE/SIDE/DECEL G SENSOR SIGNAL CIRCUIT

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

| ABS actuator and e | ectric unit (control unit) | Yaw rate/side/ | decel G sensor | Continuity |
|--------------------|----------------------------|----------------|----------------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| E35 | 14 | B38 | 5 | Existed |
| E33 | 29 | D 30 | 6 | |

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

I.CHECK YAW RATE/SIDE/DECEL G SENSOR CIRCUIT

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

| Yaw rate/side/d | ecel G sensor | Continuity |
|-----------------|---------------|-------------|
| Connector | Terminal | Continuity |
| | 2 – 4 | |
| - | 2 – 5 | |
| B38 - | 2 – 6 | Not existed |
| D 30 | 4 – 5 | |
| - | 4 – 6 | |
| | 5 - 6 | |

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

f 8.CHECK YAW RATE/SIDE/DECEL G SENSOR 1

With CONSULT

1. Connect yaw rate/side/decel G sensor harness connector.

[WITH VDC]

G

Н

Κ

D

А

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

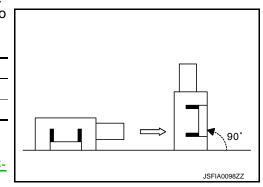
< DTC/CIRCUIT DIAGNOSIS >

- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Turn the ignition switch ON.
- 4. Select "ABS", "DATA MONITOR" and "DECEL G-SEN" in order.
- 5. Move yaw rate/side/decel G sensor as shown in the figure to check the output of before and after moving the sensor.

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

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-140</u>, "Removal and Installation".



[WITH VDC]

9.CHECK YAW RATE/SIDE/DECEL G SENSOR 2

- 1. Turn ignition switch OFF.
- 2. Connect following terminals between yaw rate/side/decel G sensor and harness connector.

| | Yaw rate/side/decel G | Harness | connector |
|---|-----------------------|-------------|-----------|
| | sensor | Connector | Terminal |
| | 2 | | 2 |
| | 4 | B38 | 4 |
| | 5 | D 30 | 5 |
| - | 6 | | 6 |
| | | | |

3. Turn ignition switch ON.

CAUTION:

- Never start the engine.
- 4. Check the voltage between yaw rate/side/decel G sensor harness connector terminals. CAUTION:

Never short out the terminals while measuring voltages.

| Yaw rate/side/ | decel G sensor | Voltaga |
|----------------|----------------|-------------|
| connector | Terminal | Voltage |
| B38 | 5 – 2 | 2.5 – 4.5 V |
| B00 | 6 – 2 | 0.5 – 2.5 V |

Is the inspection result normal?

YES >> Replace ABS actuator end electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".

NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-140</u>, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

DTC Logic

[WITH VDC]

INFOID:000000009752924

А

В

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|----------------------|--|---|---|
| C1115 | ABS SENSOR [ABNORMAL SIGNAL] | When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified. | Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire |
| DTC CO | ONFIRMATION PROCED | URE | |
| 1.PRE | CONDITIONING | | E |
| | CONFIRMATION PROCED east 10 seconds before con | URE" has been previously conducted, always ducting the next test. | s turn ignition switch OFF and BR |
| _ | >> GO TO 2. | | |
| 2.сне | CK DTC DETECTION | | G |
| With | CONSULT | | |
| | t the engine. the vehicle at approx. 30 | km/h (19 MPH) or more for approx. 1 minute. | Н |
| 3. Stop | o the vehicle. | | |
| | form self-diagnosis for "ABS ' <u>C1115" detected?</u> |). | I |
| YES | >> Proceed to <u>BRC-81, "D</u> | iagnosis Procedure". | |
| NO | >> INSPECTION END | | J |
| Diagno | osis Procedure | | INF0ID:00000009752925 |
| CAUTIC | | | K |
| | | ensor harness connector terminals. | |
| | | ELECTRIC UNIT (CONTROL UNIT) POWER | |
| Check the Procedu | | ic unit (control unit) power supply system. R | efer to <u>BRC-114, "Diagnosis</u> |
| | spection result normal? | | |
| YES | >> GO TO 2. | | M |
| NO | >> Repair or replace error- | detected parts. | |
| | CK TIRE | | N |
| | n the ignition switch OFF. | nd size. Refer to <u>WT-54, "Tire Air Pressure"</u> . | |
| | spection result normal? | IU SIZE. Refer to <u>W1-54, The Air Tressure</u> . | |
| YES | >> GO TO 5. | | 0 |
| NO | >> Adjust air pressure or re | eplace tire and GO TO 3. | |
| 3.CHE | CK DATA MONITOR (1) | | P |
| | CONSULT | | |
| | se self-diagnosis result for " the ignition switch OFE ar | ABS". Id wait 10 seconds or more. | |
| 3. Star | t the engine. | | |
| 4. Sele | ect "ABS" and "DATA MONI | ΓOR", check the "FR LH SENSOR", "FR RH S | SENSOR", "RR LH SENSOR" |

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

BRC-81

< DTC/CIRCUIT DIAGNOSIS >

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

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

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

YES >> GO TO 4.

NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

(D) With CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5.CHECK WHEEL SENSOR

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

CAUTION:

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

- Front: Refer to BRC-132, "FRONT WHEEL SENSOR : Exploded View".
- Rear: Refer to <u>BRC-133, "REAR WHEEL SENSOR : Exploded View"</u>.

Is the inspection result normal?

YES >> GO TO 8. NO >> GO TO 6.

6.REPLACE WHEEL SENSOR (1)

(B) With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-132</u>, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-135</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

YES >> GO TO 7. NO >> GO TO 19.

7. PERFORM SELF-DIAGNOSIS (2)

With CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

[WITH VDC]

| 8. CHECK CONNECTOR | А |
|--|-----|
| Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Check the wheel sensor harness connector for disconnection or looseness. | В |
| Is the inspection result normal? | D |
| YES >> GO TO 11. NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 9. | С |
| 9.CHECK DATA MONITOR (2) | |
| With CONSULT Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" | D |
| and "RR RH SENSOR". NOTE: Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. | BRC |
| Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting | |
| wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ- ence within 5%, respectively? | G |
| YES >> GO TO 10. NO >> GO TO 11. | 0 |
| 10.perform self-diagnosis (3) | Н |
| With CONSULT Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. | |
| 2. Stop the vehicle. | 1 |
| 3. Perform self-diagnosis for "ABS". | |
| <u>Is DTC "C1115" detected?</u> YES >> GO TO 11. | J |
| NO >> INSPECTION END | |
| 11.CHECK TERMINAL | К |
| 1. Turn the ignition switch OFF. | r\. |
| 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. Disconnect wheel sensor harness connector and check the each wheel sensor pin terminals for damage or loose connection with harness connector. | L |
| Is the inspection result normal? | M |
| YES >> GO TO 14. NO >> Repair or replace error-detected parts and GO TO 12. | |
| 12. CHECK DATA MONITOR (3) | |
| | Ν |
| With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Connect wheel sensor harness connector. Erase self-diagnosis result for "ABS". | 0 |
| 4. Turn the ignition switch OFF, and wait 10 seconds or more. | |
| Start the engine. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR". | Ρ |
| NOTE: Set the "DATA MONITOR" reporting speed to "10 mean" | |
| Set the "DATA MONITOR" recording speed to "10 msec". 7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. | |
| Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting | |
| wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ- | |

ence within 5%, respectively?

< DTC/CIRCUIT DIAGNOSIS >

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< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 14.

13.PERFORM SELF-DIAGNOSIS (4)

() With CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 14.

NO >> INSPECTION END

14. 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.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

| ABS actuator and ele | ectric unit (control unit) | Wheel | sensor | Continuity |
|----------------------|----------------------------|--|----------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| | 23 | E22 (Front LH wheel) | | |
| | 21 | E39 (Front RH wheel) | | |
| E35 | 26 | B44 (Rear LH wheel) | 1 | Existed |
| | 11 | B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel) | | |

Measurement connector and terminal for power supply circuit

*1: 2WD

*2: AWD

Measurement connector and terminal for signal circuit

| ABS actuator and ele | ectric unit (control unit) | Wheel se | ensor | Continuity |
|----------------------|----------------------------|--|----------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| | 27 | E22 (Front LH wheel) | | |
| | 12 | E39 (Front RH wheel) | | |
| E35 | 30 | B44 (Rear LH wheel) | 2 | Existed |
| | 15 | B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel) | | |

*1: 2WD *2: AWD

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

| ABS actuator and ele | ectric unit (control unit) | | Continuity |
|----------------------|----------------------------|--------|-------------|
| Connector | Terminal | | Continuity |
| | 23, 27 | | |
| E35 | 21, 12 | Ground | Not existed |
| 200 | 26, 30 | Clound | NOT EXISTED |
| | 11, 15 | | |

Is the inspection result normal?

YES >> GO TO 15.

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

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< DTC/CIRCUIT DIAGNOSIS >

15. CHECK DATA MONITOR (4)

With CONSULT

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

NOTE:

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

- 7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
- Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-F ence within 5%, respectively?
- YES >> GO TO 16. NO >> GO TO 17. BRC 16.PERFORM SELF-DIAGNOSIS (5) (P)With CONSULT 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- Perform self-diagnosis for "ABS". 3.

Is DTC "C1115" detected?

- YES >> GO TO 17.
- NO >> INSPECTION END
- 17.REPLACE WHEEL SENSOR

With CONSULT

- 1. Replace wheel sensor.
- Front: Refer to BRC-132, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-135, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Select "ABS" and "DATA MONITOR", check the "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR". NOTE:
 - Set the "DATA MONITOR" recording speed to "10 msec".
- Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Μ Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively? YES >> GO TO 18. Ν NO >> GO TO 19. **18.**PERFORM SELF-DIAGNOSIS (6)

With CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR (2)

- (P)With CONSULT
- Replace sensor rotor. 1

Н

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L

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В

D

< DTC/CIRCUIT DIAGNOSIS >

- Front: Refer to BRC-132, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-135, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Start the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> INSPECTION END

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:000000009752926

[WITH VDC]

DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** · Harness or connector · Stop lamp switch When stop lamp switch signal is not input when brake C1116 STOP LAMP SW · ABS actuator and electric unit pedal operates. (control unit) D · Battery power supply system DTC CONFIRMATION PROCEDURE Е 1.PRECONDITIONING If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. BRC >> GO TO 2. 2. CHECK DTC DETECTION (P)With CONSULT Turn the ignition switch OFF, and wait 10 seconds or more. 1. Н 2. Start the engine. **CAUTION:** Never start the vehicle. Depress the brake pedal several times. Perform self-diagnosis for "ABS". Is DTC "C1116" detected? >> Proceed to BRC-87, "Diagnosis Procedure". YES NO >> INSPECTION END Diagnosis Procedure INFOID:000000009752927 Κ 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. L 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. Μ Is there such a history? YES >> GO TO 2. NO >> GO TO 3. Ν 2.PERFORM SELF-DIAGNOSIS

With CONSULT

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

Never start the vehicle.

- 4. Depress the brake pedal several times.
- 5. Perform self-diagnosis for "ABS".

Is DTC "C1116" detected?

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

BRC-87

Ρ

А

< DTC/CIRCUIT DIAGNOSIS >

3. STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

Does stop lamp turn ON?

- YES >> GO TO 5.
- NO >> Check the stop lamp system. Refer to <u>EXL-68. "Diagnosis Procedure"</u>. GO TO 4.

4.CHECK DATA MONITOR (1)

With CONSULT

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

CAUTION: Never start the vehicle.

 Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44, "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK STOP LAMP SWITCH CLEARANCE

1. Turn the ignition switch OFF.

2. Check the stop lamp switch clearance. Refer to <u>BR-7, "Inspection and Adjustment"</u>.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Adjust stop lamp switch clearance. Refer to <u>BR-7</u>, "Inspection and Adjustment". GO TO 6.

6.CHECK DATA MONITOR (2)

With CONSULT

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

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44</u>, "<u>Reference Value</u>".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7. CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to BRC-90, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace stop lamp switch. Refer to <u>BR-18, "Removal and Installation"</u>. GO TO 8.

8.CHECK DATA MONITOR (3)

(D) With CONSULT

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

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44, "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 9.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| DTC/CIRCUIT D | | | | |
|--|---|--|--|---|
| . CHECK CONNE | CTOR AND TERM | INAL | | |
| Check the ABS Check the ABS harness connect Disconnect stop Check the stop Check the stop Sthe inspection res YES >> GO TO | S actuator and elect actuator and elect actuator and elect ctor. b lamp switch harned lamp switch harned lamp switch pin ter sult normal? 11. | ric unit (control ric unit (control ess connector. ss connector for rminals for dama | unit) harness connector. unit) harness connector for disc unit) pin terminals for damage o r disconnection or looseness. age or loose connection with ha | or loose connection with |
| NO >> Repair | or replace error-de | tected parts. GC | D TO 10. | |
| Connect stop la Erase self-diag Turn the ignition Start the engine | amp switch harness nosis result for "AB n switch OFF, and v | s connector. S". | nit) harness connector. | |
| displays "On" o <u>Is the inspection res</u> YES >> INSPEC NO >> GO TO 11. CHECK STOP 1. Turn the ignition 2. Disconnect AB | DATA MONITOR" a r "Off" when brake <u>sult normal?</u> CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect | pedal is depress IRCUIT (1) stric unit (control | IP SW" according to this order. s or release. Refer to <u>BRC-44, "</u> unit) harness connector. | <u>Reference Value"</u> . |
| Never start the 6. Select "ABS", " displays "On" o Is the inspection res YES >> INSPEC NO >> GO TO 11.CHECK STOP 1. Turn the ignition 2. Disconnect AB 3. Check the volta | DATA MONITOR" a r "Off" when brake <u>sult normal?</u> CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a | pedal is depress IRCUIT (1) stric unit (control | s or release. Refer to <u>BRC-44, "</u> | <u>Reference Value"</u> . |
| Never start the displays "On" os the inspection resYESNO>> GO TO11.CHECK STOP1. Turn the ignition2. Disconnect ABS | DATA MONITOR" a r "Off" when brake <u>sult normal?</u> CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a | pedal is depress IRCUIT (1) stric unit (control | s or release. Refer to <u>BRC-44, "</u> unit) harness connector. | <u>Reference Value"</u> . |
| Never start the 6. Select "ABS", " displays "On" o s the inspection res YES >> INSPEC NO >> GO TO 11.CHECK STOP 1. Turn the ignition 2. Disconnect ABS 3. Check the volta ABS actuator and elect Connector | DATA MONITOR" a r "Off" when brake <u>sult normal?</u> CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a etric unit (control unit) Terminal | pedal is depress IRCUIT (1) stric unit (control sctuator and elec | s or release. Refer to <u>BRC-44, "</u> unit) harness connector. ctric unit (control unit) harness c | connector and ground. |
| Never start the Select "ABS", " displays "On" o s the inspection res YES >> INSPEC NO >> GO TO 11.CHECK STOP 1. Turn the ignition 2. Disconnect ABS 3. Check the volta ABS actuator and elect Connector E35 | DATA MONITOR" a r "Off" when brake <u>sult normal?</u> CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a tric unit (control unit) Terminal | pedal is depress IRCUIT (1) stric unit (control | s or release. Refer to <u>BRC-44,</u> " unit) harness connector. ctric unit (control unit) harness c Condition | connector and ground. |
| Never start the Select "ABS", " displays "On" o Is the inspection res YES >> INSPEC NO >> GO TO 11.CHECK STOP 1. Turn the ignition 2. Disconnect ABS 3. Check the volta ABS actuator and elect Connector E35 4. Turn the ignition | DATA MONITOR" a r "Off" when brake sult normal? CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a tric unit (control unit) Terminal 8 n switch ON. age between ABS a | Pedal is depress IRCUIT (1) stric unit (control ictuator and elec — Ground | s or release. Refer to <u>BRC-44,</u> " unit) harness connector. ctric unit (control unit) harness c Condition Brake pedal depressed | Connector and ground. Voltage Battery voltage Approx. 0 V |
| Never start the Select "ABS", " displays "On" o Is the inspection res YES >> INSPEC NO >> GO TO 11.CHECK STOP 1. Turn the ignition 2. Disconnect AB 3. Check the volta ABS actuator and elect Connector E35 4. Turn the ignition 5. Check the volta | DATA MONITOR" a r "Off" when brake sult normal? CTION END 11. LAMP SWITCH C n switch OFF. S actuator and elect age between ABS a ctric unit (control unit) Terminal 8 n switch ON. age between ABS a tric unit (control unit) | Pedal is depress IRCUIT (1) stric unit (control ictuator and elec — Ground | s or release. Refer to <u>BRC-44, "</u> unit) harness connector. ctric unit (control unit) harness c Condition Brake pedal depressed Brake pedal not depressed ctric unit (control unit) harness c | Connector and ground. Voltage Battery voltage Approx. 0 V Connector and ground. |

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

12. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.

tion".

- 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.

Ρ

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

| ABS actuator and ele | ABS actuator and electric unit (control unit) | | Stop lamp switch | |
|----------------------|---|--|------------------|------------|
| Connector | Terminal | Connector | Terminal | Continuity |
| E35 | 8 | E102 ^{*1} E118 ^{*2} | 2 | Existed |

*1: Models with CVT

*2: Models with M/T

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

| ABS actuator and ele | ctric unit (control unit) | | Continuity | |
|----------------------|---------------------------|--------|-------------|--|
| Connector | Terminal | — | Continuity | |
| E35 | 8 | Ground | Not existed | |

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts. GO TO 13.

13.CHECK DATA MONITOR (5)

()With CONSULT

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

Never start the vehicle.

6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44</u>, "<u>Reference Value</u>".

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".

Component Inspection

INFOID:000000009752928

1.CHECK STOP LAMP SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the continuity between stop lamp switch connector terminals.

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

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace stop lamp switch. Refer to <u>BR-18</u>, "Removal and Installation".

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

[WITH VDC]

INFOID:000000009752929

А

| DTC | Display Item | Malfunction detected condition | Possible causes |
|--------------------|---|---|---|
| C1120 | FR LH IN ABS SOL | When a malfunction is detected in front LH ABS IN valve. | |
| C1122 | FR RH IN ABS SOL | When a malfunction is detected in front RH ABS IN valve. | Harness or connector ABS actuator and electric unit (control unit) |
| C1124 | RR LH IN ABS SOL | When a malfunction is detected in rear LH ABS IN valve. | Fusible link Battery power supply system |
| C1126 | RR RH IN ABS SOL | When a malfunction is detected in rear RH ABS IN valve. | |
| DTC CC | ONFIRMATION PROC | CEDURE | |
| 1.PREG | CONDITIONING | | |
| | | CEDURE" has been previously conducted, alway conducting the next test. | vs turn ignition switch OFF and |
| 2.сне | >> GO TO 2. CK DTC DETECTION | | |
| 1. Turr 2. Perl | CONSULT n the ignition switch OF form self-diagnosis for ' fC1120", "C1122", "C112 | | |
| YES NO | >> Proceed to <u>BRC-9</u> >> INSPECTION END | , "Diagnosis Procedure". | |
| Diagno | osis Procedure | | INF01D:0000000097529 |
| 1. CHE | CK CONNECTOR | | |
| 2. Che | n the ignition switch OF the ABS actuator an spection result normal? | d electric unit (control unit) harness connector for | or disconnection or looseness |
| NO | • • | rror-detected parts, securely lock the harness co | onnector, and GO TO 2. |
| | FORM SELF-DIAGNOS | | |
| | self-diagnosis for "ABS | [.] " again. 24" or "C1126" detected? | |
| YES NO | >> GO TO 3. >> INSPECTION END | | |
| - | CK ABS IN VALVE POV | | |
| 2. Disc | | F. nd electric unit (control unit) harness connector. ABS actuator and electric unit (control unit) har | ness connector and ground. |

| ABS actuator and electric unit (control unit) | | | Voltage |
|---|----------|--------|-----------|
| Connector | Terminal | — | voltage |
| E35 | 2 | Ground | 10 – 16 V |

BRC-91

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

- 4. Turn the ignition switch ON. CAUTION: Never start 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 |
|---|----------|--------|-----------|
| Connector | Terminal | | vollage |
| E35 | 2 | Ground | 10 – 16 V |

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ABS IN VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5.CHECK ABS IN VALVE GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check 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 | | Continuity |
| E35 | 3 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

[WITH VDC]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

[WITH VDC]

INFOID:000000009752931

А

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-----------------|--------------------------------------|---|---|
| C1121 | FR LH OUT ABS SOL | When a malfunction is detected in front LH ABS OUT valve. | |
| C1123 | FR RH OUT ABS SOL | When a malfunction is detected in front RH ABS OUT valve. | Harness or connector ABS actuator and electric unit (control unit) |
| C1125 | RR LH OUT ABS SOL | When a malfunction is detected in rear LH ABS OUT valve. | (control unit)Fusible linkBattery power supply system |
| C1127 | RR RH OUT ABS SOL | When a malfunction is detected in rear RH ABS OUT valve. | |
| TC CO | ONFIRMATION PROC | EDURE | |
| .PRE | CONDITIONING | | |
| | | EDURE" has been previously conducted, always | turn ignition switch OFF and |
| vait at le | east 10 seconds before o | conducting the next test. | |
| | >> GO TO 2. | | |
| | CK DTC DETECTION | | |
| | | | |
| | CONSULT n the ignition switch OFF | to ON. | |
| | form self-diagnosis for "A | | |
| s DTC ' | <u>C1121", "C1123", "C112</u> | 5" or "C1127" detected? | |
| YES | >> Proceed to <u>BRC-93.</u> | "Diagnosis Procedure". | |
| NO | >> INSPECTION END | | |
| Diagno | osis Procedure | | INFOID:000000097529 |
| 1. CHE | CK CONNECTOR | | |
| | the ignition switch OFF. | | |
| | | electric unit (control unit) harness connector for | disconnection or looseness |
| <u>s the in</u> | spection result normal? | | |
| - | >> GO TO 3. | | |
| NO | | or-detected parts, securely lock the harness con | nector, and GO TO 2. |
| 2.PER | FORM SELF-DIAGNOSI | S | |
| Perform | self-diagnosis for "ABS" | again. | |
| <u>s DTC '</u> | <u>'C1121", "C1123", "C112</u> | 5" or "C1127" detected? | |
| YES | >> GO TO 3. | | |
| NO 2 auto | >> INSPECTION END | | |
| D. CHE | CK ABS OUT VALVE PC | | |
| l. Turi | n the ignition switch OFF. | | |
| | | d electric unit (control unit) harness connector. | |

| ABS actuator and | electric unit (control unit) | | Voltage |
|------------------|------------------------------|--------|-----------|
| Connector | Terminal | — | voltage |
| E35 | 2 | Ground | 10 – 16 V |

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

- 4. Turn the ignition switch ON. CAUTION: Never start 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 |
|---|--------------------|--------|-----------|
| Connector | Connector Terminal | | voltage |
| E35 | 2 | Ground | 10 – 16 V |

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-11, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5.CHECK ABS OUT VALVE GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check 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 | | Continuity | |
| E35 | 3 | Ground | Existed | |
| 200 | 4 | Sibula | Existed | |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

[WITH VDC]

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Logic

INFOID:000000009752933

А

[WITH VDC]

DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** • ECM · ABS actuator and electric unit C1130 **ENGINE SIGNAL 1** When a malfunction is detected in ECM system. (control unit) CAN communication line D DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING Е If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. BRC >> GO TO 2. 2. CHECK DTC DETECTION With CONSULT Turn the ignition switch OFF to ON. 1. Perform self-diagnosis for "ABS". 2. Н Is DTC "C1130" detected? YES >> Proceed to BRC-95, "Diagnosis Procedure". >> INSPECTION END NO **Diagnosis** Procedure INFOID:00000009752934 1.CHECK ENGINE SYSTEM (P)With CONSULT Perform self-diagnosis for "ENGINE". Κ Is any DTC detected? YES >> Check the DTC. NO >> GO TO 2. **2.**CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) L (P)With CONSULT

- Erase Self-diagnosis result for "ABS".
 Turn the ignition switch OFF and wait 10 second or more.
- Turn the ignition switch OFF and wait 10 second or more.
 Start the engine and drive the vehicle for a short period of time.
- 4. Stop the vehicle.
- 5. Check that the malfunction indicator lamp (MIL) turns OFF.
- 6. After the vehicle stops, perform self-diagnosis for "ABS".

Is DTC "C1130" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> (<u>tion</u>".
- NO >> Check the pin terminals and connection of each harness connector for abnormal conditions. Repair or replace error-detected parts.

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C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000009752935

[WITH VDC]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

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

Is DTC "C1140" detected?

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

Diagnosis Procedure

INFOID:000000009752936

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

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

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

| ABS actuator and ele | ectric unit (control unit) | _ | Voltage | |
|----------------------|----------------------------|--------|-----------|--|
| Connector | Terminal | | voltage | |
| E35 | 2 | Ground | 10 – 16 V | |

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and elec | ctric unit (control unit) | | Voltage | |
|---------------------------------------|---------------------------------------|------------------|-------------------|--|
| Connector | Terminal | — | voltage | |
| E35 | 2 | Ground | 10 – 16 V | |
| s the inspection re | esult normal? | | | |
| YES >> GO TO NO >> GO TO | | | | |
| | | | | |
| | TOR RELAY POW | ER SUPPLY | | |
| . Turn the ignitic . Check the 50A | on switch OFF. A fusible link (I). | | | |
| | | ircuit between | ABS actuator a | nd electric unit (control unit) harness con- |
| | I (2) and 50A fusib | le link (I). | | |
| s the inspection re | | | | |
| | m trouble diagnosi R SUPPLY -". | s for battery po | ower supply. Re | fer to <u>PG-11. "Wiring Diagram - BATTERY</u> |
| | or replace error-d | etected parts. | | |
| 5. CHECK ACTUA | TOR RELAY GRO | UND CIRCUIT | Г | |
| 1. Turn the ignitic | on switch OFF. | | | |
| 2. Check the cor | | BS actuator a | and electric unit | (control unit) harness connector and the |
| ground. | | | | |
| | | | | |
| | ctric unit (control unit) | | Continuity | |
| Connector | Terminal 3 | | | - |
| E35 | 4 | Ground | Existed | |
| s the inspection re | - | | | - |
| YES >> GO TO | | | | |
| | or replace error-d | etected parts. | | |
| 6. CHECK TERMI | NAL | - | | |
| Check the ABS act | tuator and electric | unit (control u | nit) pin terminal | for damage or loose connection with har- |
| ness connector. | | | | |
| s the inspection re | sult normal? | | | |
| | ce ABS actuator a | nd electric unit | t (control unit). | Refer to BRC-138, "Removal and Installa- |
| NO >> Repair | or replace error-d | etected parts | | |
| | | | | |
| | | | | |
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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

DTC Logic

INFOID:000000009752937

[WITH VDC]

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------------|---|--|
| C1143 | ST ANG SEN CIRCUIT | When a malfunction is detected in steering angle sen- sor. | Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Fuse Ignition power supply system CAN communication line |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(I) With CONSULT

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

Is DTC "C1143" detected?

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

Diagnosis Procedure

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.
- 3. Check the steering angle sensor harness connector for disconnection or looseness.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected parts, securely lock the harness connector, and GO TO 2.

2. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1143" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.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 a | ngle sensor | | Voltage | |
|------------|-------------|--------|-------------|--|
| Connector | Terminal | | | |
| M30 | 4 | Ground | Approx. 0 V | |

4. Turn the ignition switch ON.

BRC-98

INEOID 000000009752938

C1143 STEERING ANGLE SENSOR

| < DTC/CIRCUIT | | > | | [WITH VDC] |
|--|---|----------------------|--------------------------|--|
| CAUTION: Never start 5. Check the ve | | steering angle | e sensor harnes | s connector and ground. |
| Steering and | gle sensor | |) (alta a a | |
| Connector | Terminal | _ | Voltage | |
| M30 | 4 | Ground | Battery voltage | |
| Is the inspection YES >> GO NO >> GO 4.CHECK STER | TO 5. TO 4. | | WER SUPPLY | CIRCUIT |
| 2. Check the 1 | | | ween steering a | angle sensor harness connector terminal (4) and |
| Is the inspection | - | | | |
| NO >> Rep | <u>VER SUPPLY</u> air or replace e ERING ANGLE | rror-detected p | parts. | bly. Refer to <u>PG-41, "Wiring Diagram - IGNITION</u> |
| Turn the ign Check the comparison | ition switch OF ontinuity betwe | F. en steering an | gle sensor harr | ess connector and ground. |
| Steering and | _ | _ | Continuity | |
| Connector | Terminal | | _ | |
| M30 | 1 | Ground | Existed | |
| Is the inspection YES >> GO NO >> Rep 6.CHECK TERI | TO 6. air or replace e | | oarts. | |
| Check the steeri | ng angle senso | or pin terminals | for damage or | loose connection with harness connector. |
| Is the inspection | | | | |
| YES >> GO NO >> Rep | TO 7. air or replace e | rror-datacted r | varte | |
| 7.CHECK CAN | • | • | ai 13. | |
| | | | Defer to LANC | |
| Is the inspection | | | Refer to <u>LAN-5</u> | 1, "Diagnosis Procedure". |
| YES >> Rep tion | lace ABS actua | ator and electr | , | unit). Refer to <u>BRC-138. "Removal and Installa-</u> |
| NO >> Rep | air or replace e | error-detected p | oarts. Refer to <u>E</u> | RC-7, "Precaution for Harness Repair". |
| | | | | |

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C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:000000009752939

[WITH VDC]

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-------------------|--|---|
| C1144 | ST ANG SEN SIGNAL | When neutral position adjustment of steering angle sensor is not complete. | Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Incomplete neutral position ad- justment of steering angle sen- sor |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

()With CONSULT

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

Is DTC "C1144" detected?

YES >> Proceed to <u>BRC-100, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009752940

1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to BRC-62, "Work Procedure".

>> GO TO 2.

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

With CONSULT

Perform self-diagnosis for "ABS".

Is DTC "C1144" detected?

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

3.CHECK STEERING ANGLE SENSOR SYSTEM

- 1. Turn the ignition switch OFF.
- 2. Check the steering angle sensor system. Refer to BRC-98, "Diagnosis Procedure".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|--------------------------|---|---|--|
| C1155 | BR FLUID LEVEL LOW | When brake fluid level low signal is detected. When an open circuit is detected in brake fluid level switch circuit. | Harness or connector ABS actuator and electric unit (control unit) Brake fluid level switch Combination meter |
| отс со | ONFIRMATION PROCED | URE | |
| 1.PREC | CONDITIONING | | |
| | | JRE" has been previously conducted, always | turn ignition switch OFF and |
| wait at le | east 10 seconds before cond | ducting the next test. | E |
| | >> GO TO 2. | | |
| 2.сне | CK DTC DETECTION | | |
| With C | CONSULT | | |
| | the ignition switch OFF to (| | |
| | orm self-diagnosis for "ABS C1155" detected? | | |
| | >> Proceed to BRC-101, "E | Diagnosis Procedure". | |
| NO | >> INSPECTION END | | |
| Diagno | sis Procedure | | INFOID:00000009752942 |
| 1.сне | CK BRAKE FLUID LEVEL | | |
| | the ignition switch OFF. | | |
| | ck the brake fluid level. Refe spection result normal? | er to <u>BR-10, "Inspection"</u> . | |
| YES | >> GO TO 2. | | |
| NO | >> Refill brake fluid. Refer | - | |
| Z. PERF | FORM SELF-DIAGNOSIS (1 |) | |
| | CONSULT se self-diagnosis result for "/ | NRS" | |
| 2. Turr | the ignition switch OFF, an | | |
| | the ignition switch ON. | | |
| Nev | er start the engine. | | |
| | orm self-diagnosis for "ABS C1155" detected? | | |
| YES | >> INSPECTION END | | |
| NO | >> GO TO 3. | | |
| 3. CHE | CK BRAKE FLUID LEVEL S | WITCH | |
| | | Refer to <u>BRC-103, "Component Inspection"</u> . | |
| <u>ls the ins</u> YES | spection result normal? >> GO TO 5. | | |
| NO | | Refer to BR-35. "Disassembly and Assembly | <u>/"</u> . GO TO 4. |
| 4.PERF | FORM SELF-DIAGNOSIS (2 | 2) | |

INFOID:000000009752941

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< DTC/CIRCUIT DIAGNOSIS >

(I) With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Turn the ignition switch ON. CAUTION:
- Never start the engine.4. Perform self-diagnosis for "ABS".
- Is DTC "C1155" detected?
- YES >> INSPECTION END
- NO >> GO TO 5.

5.CHECK CONNECTOR AND TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- 3. Check the brake fluid level switch harness connector for disconnection or looseness.
- 4. Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- 5. Disconnect combination meter harness connector.
- 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 7 | |
|-----|------------|--|
|-----|------------|--|

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

6. PERFORM SELF-DIAGNOSIS (3)

() With CONSULT

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

CAUTION: Never start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> INSPECTION END

NO >> GO TO 7.

7.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

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

| Brake fluid | Brake fluid level switch | | Combination meter | | |
|-------------|--------------------------|--------------------|-------------------|------------|--|
| Connector | Terminal | Connector Terminal | | Continuity | |
| E37 | 1 | M34 | 11 | Existed | |

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

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

Is the inspection result normal?

YES >> GO TO 8.

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

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

8.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

| Brake flui | d level switch | | Continuitu | | В |
|----------------------|--|-----------------------------|-------------------------|--------------------------|-----|
| Connector | Terminal | | Continuity | | |
| E37 | 2 | Ground | Existed | | |
| Is the inspection re | sult normal? | | | | С |
| YES >> GO TC | - | | | | |
| NO >> Repair | or replace error-dete | cted parts. GO TO 9 | | | D |
| 9.CHECK COMBI | NATION METER | | | | D |
| Check the combina | tion meter. Refer to <u>N</u> | IWI-21, "CONSULT | Function". | | |
| Is the inspection re | sult normal? | | | | E |
| YES >> Replac | e ABS actuator and | electric unit (control | unit). Refer to BRC-138 | , "Removal and Installa- | |
| tion". | | | | | |
| NO >> Repair | or replace combination | on meter. Refer to <u>M</u> | WI-61, "Removal and Ins | stallation". | BRC |
| Component Ins | spection | | | INFOID:00000009752943 | |
| 1.CHECK BRAKE | FLUID LEVEL SWIT | СН | | | G |
| | n switch OFF. Ike fluid level switch h tinuity between brake | | nnector terminals. | | Н |

| Brake fluid level switch | Condition | Continuity | |
|--------------------------|--|-------------|---|
| Terminal | Condition | Continuity | 1 |
| | When brake fluid level in reservoir tank is within the specified level. | Not existed | - |
| 1 – 2 | When brake fluid level in reservoir tank is less than the specified level. | Existed | J |
| Is the inspection result | normal? | | • |
| | | | k |

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to <u>BR-35, "Disassembly and Assembly"</u>.

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C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

DTC Logic

INFOID:000000009752944

[WITH VDC]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

()With CONSULT

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

Is DTC "C1164" or "C1165" detected?

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

Diagnosis Procedure

INFOID:000000009752945

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK CUT VALVE POWER SUPPLY

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

| ABS actuator and ele | ectric unit (control unit) | _ | Voltage |
|----------------------|----------------------------|--------|-----------------|
| Connector | Terminal | | |
| E35 | 2 | Ground | Battery voltage |

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

BRC-104

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and elec | . , | _ | Voltage | |
|--|---|------------------|---------------------|--|
| Connector | Terminal | Onerred | Detterrusterre | |
| E35 | 2 | Ground | Battery voltage | |
| <u>s the inspection re</u> YES >> GO TO | | | | |
| NO >> GO TO | | | | |
| CHECK CUT V | ALVE POWER SUF | PPLY CIRCUI | Г | |
| Turn the ignitic Check the 50A | | | | |
| | tiouity and short ci | rcuit between | ABS actuator a | nd electric unit (control unit) harness con- |
| | l (2) and 50A fusibl | | ADS actuator at | |
| the inspection re | sult normal? | | | |
| | | s for battery po | ower supply. Ref | er to PG-11, "Wiring Diagram - BATTERY |
| | <u>R SUPPLY -"</u> . or replace error-de | etected parts. | | |
| | ALVE GROUND CII | • | | |
| Turn the ignition | | | | |
| | | BS actuator a | and electric unit | (control unit) harness connector and the |
| ground. | | | | |
| APS actuator and all | ectric unit (control unit) | | | - |
| Connector | Terminal | | Continuity | |
| Connector | 3 | | | - |
| E35 | 4 | Ground | Existed | |
| the inspection re | sult normal? | | | - |
| YES >> GO TO | | | | |
| - | or replace error-de | etected parts. | | |
| .CHECK TERMI | NAL | | | |
| | tuator and electric u | unit (control u | nit) pin terminals | for damage or loose connection with har- |
| ess connector. the inspection re | sult normal? | | | |
| - | | nd electric unit | t (control unit). F | Refer to BRC-138, "Removal and Installa- |
| tion". | | | (, | |
| NO >> Repair | or replace error-de | etected parts. | | |
| | | | | |
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C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1166, C1167 SV SYSTEM

DTC Logic

INFOID:000000009752946

[WITH VDC]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

()With CONSULT

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

Is DTC "C1166" or "C1167" detected?

YES >> Proceed to <u>BRC-106, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009752947

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1166" or "C1167" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK SUCTION VALVE POWER SUPPLY

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

| ABS actuator and ele | ectric unit (control unit) | | Voltage |
|----------------------|----------------------------|--------|-----------------|
| Connector | Terminal | | |
| E35 | 2 | Ground | Battery voltage |

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

BRC-106

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and elec | tric unit (control unit) | | | |
|-------------------------------------|-------------------------------------|-----------------|---------------------|---|
| Connector | Terminal | _ | Voltage | |
| E35 | 2 | Ground | Battery voltage | |
| the inspection re | sult normal? | | L | |
| YES >> GO TC | | | | |
| NO >> GO TC | | | | |
| CHECK SUCTION | ON VALVE POWER | R SUPPLY CI | RCUIT | |
| Turn the ignitio | | | | |
| Check the 50A Check the con | | rcuit between | ABS actuator an | electric unit (control unit) harness con- |
| | l (2) and 50A fusibl | | | |
| the inspection re | | | | |
| | n trouble diagnosis R SUPPLY -". | s for battery p | ower supply. Refe | to PG-11, "Wiring Diagram - BATTERY |
| | or replace error-de | etected parts. | | |
| CHECK SUCTIO | ON VALVE GROUN | D CIRCUIT | | |
| Turn the ignitio | | | | |
| Check the con | | BS actuator a | and electric unit (| ontrol unit) harness connector and the |
| ground. | | | | |
| APS actuator and ala | ectric unit (control unit) | | | |
| Connector | Terminal | | Continuity | |
| Connector | 3 | | | |
| E35 | 4 | Ground | Existed | |
| the inspection re | sult normal? | | | |
| /ES >> GO TC | | | | |
| NO >> Repair | or replace error-de | etected parts. | | |
| .CHECK TERMI | NAL | | | |
| | uator and electric u | unit (control u | nit) pin terminals | r damage or loose connection with har- |
| ess connector. | | | | |
| the inspection re (ES >> Replace | | d alactria uni | t (control unit) D | er to BRC-138, "Removal and Installa- |
| tion". | | | | el lo <u>BRC-136, Removal and Installa-</u> |
| | or replace error-de | etected parts. | | |
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C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

C1176 STOP LAMP SW2

DTC Logic

INFOID:000000009752948

[WITH VDC]

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|-------|---------------|---|--|
| C1176 | STOP LAMP SW2 | When brake pedal position switch signal is not input when brake pedal operates. | Harness or connector Brake pedal position switch ABS actuator and electric unit (control unit) Ignition power supply system |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

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

CAUTION: Never start the vehicle.

- 3. Depress the brake pedal several times.
- 4. Perform self-diagnosis for "ABS".

Is DTC "C1176" detected?

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

Diagnosis Procedure

NOTE:

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

1.INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

| YES | >> GO TO 2 |
|-----|------------|
| NO | |

NO >> GO TO 3.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

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

Never start the vehicle.

- 4. Depress the brake pedal several times.
- 5. Perform self-diagnosis for "ABS".

Is DTC "C1176" detected?

YES >> GO TO 3.

NO >> INSPECTION END

BRC-108

INFOID:000000009752949

C1176 STOP LAMP SW2

| < DTC/CIRCUIT DIAGNOSIS > | [WITH VDC] |
|--|-----------------|
| 3.CHECK BRAKE PEDAL POSITION SWITCH CLEARANCE | |
| Turn the ignition switch OFF. Check the brake pedal position switch clearance. Refer to <u>BR-7</u>, "Inspection and Adjustment" | ent". |
| Is the inspection result normal? | |
| YES >> GO TO 5. NO >> Adjust brake pedal position switch clearance. Refer to <u>BR-7, "Inspection and Adjus</u> 4. | stment". GO TO |
| 4.CHECK DATA MONITOR (1) | |
| With CONSULT Erase self-diagnosis result for "ABS". | |
| Erase self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. | |
| 3. Start the engine. | |
| CAUTION: Never start the vehicle. | |
| 4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check the displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44</u> , "Reference | |
| Is the inspection result normal? | |
| YES >> INSPECTION END NO >> GO TO 5. | |
| 5. CHECK BRAKE PEDAL POSITION SWITCH | |
| Check the brake pedal position switch. Refer to <u>BRC-90, "Component Inspection"</u> . | |
| Is the inspection result normal? | |
| YES >> GO TO 7. | |
| NO >> Replace brake pedal position switch. Refer to <u>BR-18, "Removal and Installation"</u> . | GO TO 6. |
| 6.CHECK DATA MONITOR (2) | |
| With CONSULT | |
| 1. Erase self-diagnosis result for "ABS". | |
| Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. | |
| CAUTION: | |
| Never start the vehicle. | at data manitar |
| Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check the displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44</u>, "<u>Reference</u> | |
| Is the inspection result normal? | |
| YES >> INSPECTION END | |
| NO $>>$ GO TO 7. | |
| CHECK CONNECTOR AND TERMINAL | |
| 1. Turn the ignition switch OFF. | |
| Disconnect ABS actuator and electric unit (control unit) harness connector. Check the ABS actuator and electric unit (control unit) harness connector for disconnection | n or looseness. |
| 4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose | |
| harness connector. | |
| Disconnect brake pedal position switch harness connector. Check the brake pedal position switch harness connector for disconnection or looseness. | |
| 7. Check the brake pedal position switch pin terminals for damage or loose connection with h | arness connec- |
| tor. | |
| Is the inspection result normal? | |
| YES >> GO TO 9. NO >> Repair or replace error-detected parts. GO TO 8. | |
| 8. CHECK DATA MONITOR (3) | |
| | |

With CONSULTConnect ABS actuator and electric unit (control unit) harness connector.

BRC-109

C1176 STOP LAMP SW2

< DTC/CIRCUIT DIAGNOSIS >

- 2. Connect brake pedal position switch harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine. CAUTION: Never start the vehicle.

Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-44, "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 11.

9.CHECK BRAKE PEDAL POSITION 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 |
|---|----------|--------|---------------------------|-------------|
| Connector | Terminal | | | |
| E35 6 | | Ground | Brake pedal depressed | Approx. 0 V |
| | 0 | Ground | Brake pedal not depressed | |

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 | Voltago | |
|---|----------|-----------------------------------|-----------------------|-------------|--|
| Connector | Terminal | — | Condition | Voltage | |
| E35 | 6 | Ground | Brake pedal depressed | Approx. 0 V | |
| E35 0 | Gibana | Brake pedal not depressed Battery | Battery voltage | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".

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

10. CHECK BRAKE PEDAL POSITION SWITCH CIRCUIT (2)

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

| ABS actuator and electric unit (control unit) | | Brake pedal | Continuity | | |
|---|----------|-------------|------------|------------|--|
| Connector | Terminal | Connector | Terminal | Continuity | |
| E35 | 6 | E112 | 2 | Existed | |

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

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|-------------|--|
| Connector | Terminal | | Continuity | |
| E35 | 6 | Ground | Not existed | |

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> <u>tion</u>".
- NO >> Repair or replace error-detected parts. GO TO 11.

BRC-110

C1176 STOP LAMP SW2

IWITH VDC1

| DTC/CIRCUIT DIAGNOSIS > | | [WI | ITH VDC] |
|--|--|---|-------------------|
| 1. CHECK DATA MONITOR (4) | | | |
| With CONSULT Connect ABS actuator and electric Connect brake pedal position switcl Erase self-diagnosis result for "ABS Turn the ignition switch OFF, and w Start the engine. CAUTION: Never start the vehicle. Select "ABS", "DATA MONITOR" ar displays "On" or "Off" when brake p the inspection result normal? (ES >> INSPECTION END IO >> Replace ABS actuator and tion". | h harness connector. 3". ait 10 seconds or more. nd "STOP LAMP SW2" according | to this order. Check that da to <u>BRC-44, "Reference Va</u> | <u>lue"</u> . |
| Omponent Inspection | SWITCH | INFOI | D:000000009752950 |
| Turn ignition switch OFF. Disconnect brake pedal position sw Check the continuity between brake | ritch harness connector. | terminals. | |
| Brake pedal position switch | Condition | Continuity | |
| Terminal | | | |
| 1 – 2 | Brake pedal is fully released. | Not existed | |
| | Brake pedal is slightly depressed. | Existed | |
| he inspection result normal? ES >> INSPECTION END O >> Replace brake pedal positio | on switch. Refer to <u>BR-18, "Remo</u> | val and Installation". | |
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U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000009752952

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(B) With CONSULT

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

Is DTC "U1000" detected?

- YES >> Proceed to <u>BRC-112, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

Proceed to LAN-15, "Trouble Diagnosis Flow Chart".

INFOID:000000009752953

INFOID:000000009752951

U1010 CONTROL UNIT (CAN)

Description

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

DTC Logic

INFOID:000000009752955

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible causes | E |
|---------------|--|---|---|----|
| U1010 | CONTROL UNIT (CAN) | When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit). | ABS actuator and electric unit (control unit) | BR |
| DTC CC | ONFIRMATION PROCE | DURE | | |
| 1.PREC | CONDITIONING | | | G |
| | | DURE" has been previously conducted, always | turn ignition switch OFF and | |
| wait at le | east 10 seconds before co | onducting the next test. | | Н |
| | >> GO TO 2. | | | |
| 2.сне | CK DTC DETECTION | | | 1 |
| (P)With (| CONSULT | | | |
| | n the ignition switch OFF t orm self-diagnosis for "A | | | |
| | U1010" detected? | | | J |
| YES | >> Proceed to BRC-113, | "Diagnosis Procedure". | | |
| NO | >> INSPECTION END | | | K |
| Diagno | osis Procedure | | INFOID:00000009752956 | |
| 1. CHE | CK ABS ACTUATOR AND | DELECTRIC UNIT (CONTROL UNIT) | | L |
| | | tric unit (control unit) harness connector for disc | connection and deformation. | |
| Is the in: | spection result normal? | | | M |
| YES | >> Replace ABS actuato tion". | or and electric unit (control unit). Refer to <u>BRC-</u> | -138, "Removal and Installa- | |
| NO | >> Repair or replace error | pr-detected parts. | | N |
| | | | | |
| | | | | |
| | | | | C |

INFOID:000000009752954

А

Ρ

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000009752957

[WITH VDC]

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

1. Turn the ignition switch OFF.

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

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

| ABS actuator and ele | actuator and electric unit (control unit) | | Voltage |
|----------------------|---|--------|-------------|
| Connector | Terminal | | vollage |
| E35 | 16 | Ground | Approx. 0 V |

4. Turn the ignition switch ON

CAUTION: Never start engine.

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

| ABS actuator and ele | ctric unit (control unit) | | Voltago | |
|----------------------|---------------------------|--------|-----------|--|
| Connector | Terminal | | Voltage | |
| E35 | 16 | Ground | 10 – 16 V | |

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

1. Turn the ignition switch OFF.

2. Check the 10A fuse (#57).

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 harness connector.

| ABS actuator and electric unit (control unit) | | IPDM E/R | | Continuity |
|---|----------|--------------------|----|------------|
| Connector | Terminal | Connector Terminal | | Continuity |
| E35 | 16 | E15 | 59 | Existed |

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

| ABS actuator and electric unit (control unit) | | | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | Continuity |
| E35 | 16 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-41, "Wiring Diagram - IGNITION</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

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

1. Turn the ignition switch OFF.

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

| ABS actuator and ele | ectric unit (control unit) | | Voltage |
|----------------------|----------------------------|--------|-----------|
| Connector | Terminal | | voltage |
| E35 | 1 | Ground | 10 – 16 V |

POWER SUPPLY AND GROUND CIRCUIT

| < DTC/CIRCUIT I | | | | [WITH VDC] |
|--|---|---|---|---|
| 3. Turn the igniti | | | | [|
| CAUTION: | | | | |
| 4. Check the vol | | actuator and el | ectric unit (cor | ntrol unit) harness connector and ground. |
| . Oneek the voi | lage between Abe | | | |
| ABS actuator and el | ectric unit (control unit) | | | _ |
| Connector | Terminal | | Voltage | |
| E35 | 1 | Ground | 10 – 16 V | — |
| Is the inspection re | esult normal? | | | |
| YES >> GO T | | | | |
| NO >> GO T | | _ | | |
| 4.CHECK MOTO | R AND MOTOR RE | LAY POWER | SUPPLY CIRC | CUIT |
| | on switch OFF. | | | |
| | A fusible link (K). atinuity and short ci | rcuit between | ABS actuator : | and electric unit (control unit) harness con- |
| | al (1) and 30A fusibl | | | |
| s the inspection re | esult normal? | | | |
| | | s for battery po | wer supply. Re | efer to <u>PG-11, "Wiring Diagram - BATTERY</u> |
| | <u>ER SUPPLY -"</u> . r or replace error-de | etected parts | | |
| _ ' | ATOR RELAY, ABS | | S OUT VALVE | POWER SUPPLY |
| | | | | |
| Turn the igniti- | on switch OFF. | (| | |
| Check the vol | tage between ABS : | actuator and ei | ectric unit (cor | ntrol unit) harness connector and ground. |
| 2. Check the vol | tage between ABS | actuator and el | ectric unit (cor | ntrol unit) harness connector and ground. |
| | tage between ABS | actuator and ei | | ntrol unit) harness connector and ground. |
| | - | - | Voltage | ntrol unit) harness connector and ground. |
| ABS actuator and ele | ectric unit (control unit) | Ground | | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti | ctric unit (control unit) Terminal 2 | _ | Voltage | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: | Terminal 2 on switch ON | _ | Voltage | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e | Terminal 2 on switch ON ngine. | — Ground | Voltage 10 – 16 V | · · · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e | Terminal 2 on switch ON ngine. | — Ground | Voltage 10 – 16 V | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol | Terminal 2 on switch ON ngine. | — Ground | Voltage 10 – 16 V ectric unit (cor | · · · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol | retric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS | — Ground | Voltage 10 – 16 V | · · · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS | — Ground | Voltage 10 – 16 V ectric unit (cor | · · · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 | Ground actuator and el | Voltage 10 – 16 V ectric unit (cor Voltage | · · · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 esult normal? O 7. | Ground actuator and el | Voltage 10 – 16 V ectric unit (cor Voltage | · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. | Ground actuator and el Ground | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. | Ground actuator and el Ground | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V | · · · |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te 6.CHECK ACTU/ 1. Turn the igniti | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. | Ground actuator and el Ground | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te O.CHECK ACTU/ 1. Turn the igniti 2. Check the 50/ | ectric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). | Ground actuator and el Ground | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te O.CHECK ACTU/ 1. Turn the igniti 2. Check the 50/ 3. Check the col | Terminal 2 on switch ON ngine. tage between ABS ectric unit (control unit) Terminal 2 ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). ntinuity and short ci | Ground actuator and el Ground IN VALVE, AB | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES $>>$ GO TO NO $>>$ GO TO O.CHECK ACTU, 1. Turn the igniti 2. Check the 50, 3. Check the con nector termina | actric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS tage between ABS actric unit (control unit) Terminal 2 actric unit (control unit) Terminal 2 esult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). ntinuity and short cial (2) and 50A fusible | Ground actuator and el Ground IN VALVE, AB | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te 6.CHECK ACTU/ 1. Turn the igniti 2. Check the 50/ 3. Check the con nector terminal | actric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS actric unit (control unit) Terminal 2 ectric unit (control unit) Terminal 2 esult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). ntinuity and short ci al (2) and 50A fusible esult normal? | Ground actuator and el Ground IN VALVE, AB IN VALVE, AB rcuit between A e link (I). | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE ABS actuator a | ntrol unit) harness connector and ground. |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO Te NO >> GO Te 6.CHECK ACTU/ 1. Turn the igniti 2. Check the 50/ 3. Check the con nector termina Is the inspection re YES >> Perfor POWI | Terminal 2 on switch ON ngine. tage between ABS bettric unit (control unit) Terminal 2 bettric unit (control unit) Terminal 2 bettric unit (control unit) Terminal 2 besult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). ntinuity and short ci al (2) and 50A fusible esult normal? rm trouble diagnosis ER SUPPLY -". | Ground Ground actuator and el Ground IN VALVE, AB rcuit between A e link (I). | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE ABS actuator a | and electric unit (control unit) harness con- |
| ABS actuator and ele Connector E35 3. Turn the igniti CAUTION: Never start e 4. Check the vol ABS actuator and ele Connector E35 Is the inspection re YES >> GO To ABS ACTUAL 1. Turn the igniti 2. Check the 50/ 3. Check the con nector termina Is the inspection re YES >> Perfor POWI NO >> Repai | actric unit (control unit) Terminal 2 on switch ON ngine. tage between ABS actric unit (control unit) Terminal 2 actric unit (control unit) Terminal 2 actric unit (control unit) Terminal 2 assult normal? O 7. O 6. ATOR RELAY, ABS on switch OFF. A fusible link (I). ntinuity and short cial (2) and 50A fusible esult normal? rm trouble diagnosis ER SUPPLY -". r or replace error-de | Ground Ground actuator and el Ground IN VALVE, AB rcuit between A e link (I). s for battery po etected parts. | Voltage 10 – 16 V ectric unit (cor Voltage 10 – 16 V S OUT VALVE ABS actuator a wer supply. Re | and electric unit (control unit) harness con- |

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

| ABS actuator and ele | ectric unit (control unit) | | Continuity |
|----------------------|----------------------------|--------|------------|
| Connector | Terminal | | Continuity |
| E35 | 3 | Ground | Existed |
| L33 | 4 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8. CHECK TERMINAL

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

PARKING BRAKE SWITCH

| | | FARN | ING DRAKE | Зинсп | |
|--------------------------------|---|-------------------|-----------------------|--------------------------------------|------------------------|
| < DTC/CIRCUIT | | | | | [WITH VDC] |
| PARKING B | RAKE SWI | СН | | | |
| Component F | unction Chec | k | | | INFOID:000000009752958 |
| 1.CHECK PARK | (ING BRAKE SW | ITCH OPE | RATION | | |
| | ing brake lever. T | hen check | < that the brake w | varning lamp in the combina | ation meter turns ON/ |
| OFF correctly. | result normal? | | | | |
| YES >> INSF | PECTION END | | | | |
| | eed to <u>BRC-117,</u> | "Diagnosis | <u>s Procedure"</u> . | | |
| Diagnosis Pro | ocedure | | | | INFOID:000000009752959 |
| 1.CHECK PARK | ING BRAKE SW | ITCH CIR | CUIT | | |
| | tion switch OFF. | | | | |
| | arking brake swit | | | | |
| | | | | ness connector and combir | nation meter harness |
| connector. | ontandity bothoor | r parting t | | | |
| | and a second second | | Quality | · | |
| Connector | ake switch Terminal | (| Combina | tion meter Terminal | Continuity |
| M31 | 1 | | M34 | 10 | Existed |
| - | ontinuity between | parking br | - | ess connector and ground. | |
| | | p = | | | |
| Park | king brake switch | | _ | Continuity | |
| Connector | Termi | nal | | | |
| M31 | 1 | | Ground | Not existed | |
| Is the inspection YES >> GO | | | | | |
| | air or replace erro | r-detected | parts. | | |
| 2.CHECK PARK | ING BRAKE SW | ІТСН | | | |
| Check the parkin | g brake switch. R | efer to <u>BR</u> | C-117, "Compon | ent Inspection". | |
| Is the inspection | | | | | |
| YES >> GO T NO >> Repl | | owitch P | Pofor to DR 6 "D | emoval and Installation". | |
| 3.CHECK COM | | | | <u>Emoval and installation</u> . | |
| Check the combi | | | -21. "CONSULT I | Function". | |
| Is the inspection | | <u></u> | | | |
| YES >> Cheo | ck the each pin te | | | e connection with harness c | onnector. If any items |
| | lamaged, repair c air or replace com | | | irts. NI-61, "Removal and Install | ation". |
| Component Ir | | | - ··· <u></u> | | INFOID:000000009752960 |
| 1.CHECK PARK | • | псн | | | |
| I JUNEUR PARM | AING DRAKE SW | | | | |

1. Turn the ignition switch OFF.

Disconnect parking brake switch harness connector.
 Check the continuity between parking brake switch connector terminal and ground.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

| Parking brake switch | | Condition | Continuity |
|----------------------|--------|--|-------------|
| Terminal | — | When the parking brake switch is operated. | Existed |
| 1 | Ground | When the parking brake switch is not operated. | Not existed |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to <u>PB-6, "Removal and Installation"</u>.

VDC OFF SWITCH

[WITH VDC]

| | JIT DIAGNO | DSIS > | | | [WITH VDC] |
|---|--|--|--|---|---|
| VDC OFF | SWITCI | | | | |
| Componen | t Functior | n Check | | | INFOID:00000009752961 |
| 1. снеск vi | DC OFF SWI | ITCH OPER | ATION | | |
| Check that VI | DC OFF indic | cator lamp in | o combina | tion meter tui | ns ON/OFF when VDC OFF switch is operated. |
| Is the inspecti | ion result nor | rmal? | | | |
| | NSPECTION | | | | |
| | | • | edure. Re | efer to <u>BRC-1</u> | <u>19, "Diagnosis Procedure"</u> . |
| Diagnosis 4 | | | | | INFOID:000000009752962 |
| 1. CHECK VI | DC OFF SWI | ITCH CIRCL | JIT | | |
| | gnition switc | | stria unit (| oontrol unit) h | |
| | ct VDC OFF | | | | arness connector. |
| 4. Check the | e continuity | between AB | | | c unit (control unit) harness connector and VDC |
| OFF swite | ch harness c | connector. | | | |
| ABS actuator a | nd electric unit | | FF switch | | - |
| (contro | | | | Continuity | |
| Connector | Terminal | Connector | Terminal | | - |
| E35 | 5 | M28 | 1 | Existed | - |
| Check the | e continuity b | between ABS | S actuator | and electric | unit (control unit) harness connector and ground. |
| | | | | | |
| APS actuator a | nd alastria unit / | (000 | | | |
| ABS actuator a | nd electric unit (ol unit) | (con- | _ | Continuity | - |
| | | - | _ | Continuity | - |
| tro | ol unit) | - | | Continuity Not existed | - |
| Connector E35 Is the inspecti | ol unit) Termina 5 ion result nor | ıl Grc | | - | • - |
| tro Connector E35 Is the inspecti YES >> G | ol unit) Termina 5 ion result nor 60 TO 2. | II Gro rmal? | | Not existed | - |
| tro Connector E35 Is the inspecti YES >> G NO >> R | ol unit) Termina 5 ion result nor O TO 2. epair or repla | rmal? ace error-de | tected pa | Not existed | - |
| tro E35 Is the inspecti YES >> G NO >> R 2.CHECK VI | ol unit) Termina 5 ion result nor O TO 2. epair or repla | rmal? ace error-de | tected pa | Not existed rts. | - |
| tro E35 Is the inspecti YES >> G NO >> R 2.CHECK VI | ol unit) Termina 5 ion result nor O TO 2. epair or repla | rmal? ace error-de | tected pa | Not existed rts. | nector and ground. |
| tro E35 Is the inspection YES >> G NO >> R 2.CHECK VI Check the cor | ol unit) Termina 5 ion result nor O TO 2. epair or repla | rmal? ace error-de | tected pa | Not existed rts. UIT harness conr | nector and ground. |
| tro E35 Is the inspection YES >> G NO >> R 2.CHECK VI Check the cor | ol unit) Termina 5 ion result nor O TO 2. epair or repla DC OFF SWI ntinuity betwo | ace error-de ITCH GROU een VDC OF | tected pa | Not existed rts. | nector and ground. |
| tro Connector E35 Is the inspecti YES >> G NO >> R 2.CHECK VI Check the cor VDC C | ol unit) Termina 5 ion result nor GO TO 2. epair or repla DC OFF SWI ntinuity betwo | ace error-de ITCH GROU een VDC OF | tected pa | Not existed rts. UIT harness conr | nector and ground. |
| tro Connector E35 Is the inspecti YES >> G NO >> R 2.CHECK VI Check the cor VDC C Connector | ol unit) Termina 5 ion result nor GO TO 2. epair or repla DC OFF SWI ntinuity betwo DFF switch Termina 2 | ace error-de ITCH GROU een VDC OF | itected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity | nector and ground. |
| tro Connector E35 Is the inspecti YES >> G NO >> R 2.CHECK VI Check the cor VDC C Connector M28 Is the inspecti YES >> G | ol unit) Termina 5 ion result nor iO TO 2. iepair or repla DC OFF SWI ntinuity betwo DFF switch Termina 2 ion result nor iO TO 3. | ace error-de ITCH GROU een VDC OF | otected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity Existed | nector and ground. |
| tro E35 Is the inspection YES >> G NO >> R 2.CHECK VI Check the correction VDC C Connector M28 Is the inspection YES >> G NO >> R | ol unit) Termina 5 ion result nor ion result nor ion TO 2. epair or repla DC OFF SWI ntinuity betwo DFF switch Termina 2 ion result nor ion result nor ion TO 3. epair or repla | ace error-de ITCH GROU een VDC OF | otected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity Existed | hector and ground. |
| tro Connector E35 Is the inspecti YES >> G NO >> R 2.CHECK VI Check the cor VDC C Connector M28 Is the inspecti YES >> G | ol unit) Termina 5 ion result nor ion result nor ion TO 2. epair or repla DC OFF SWI ntinuity betwo DFF switch Termina 2 ion result nor ion result nor ion TO 3. epair or repla | ace error-de ITCH GROU een VDC OF | otected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity Existed | nector and ground. |
| $\frac{Connector}{E35}$ Is the inspecti YES >> G NO >> R 2.CHECK VI Check the cor VDC C Connector M28 Is the inspecti YES >> G NO >> R 3.CHECK VI Check the VD | ol unit) Termina 5 ion result nor ion result nor ion TO 2. ion replation DC OFF SWI DFF switch Termina 2 ion result nor ion result nor ion replation ion repl | ace error-de ITCH GROU een VDC OF I Gro I Gro I Gro I Gro I Gro I CH I CH | etected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity Existed rts. | - |
| $\frac{Connector}{E35}$ Is the inspective of the second secon | ol unit) Termina 5 ion result nor 0 TO 2. epair or repla DC OFF SWI ntinuity betwo DFF switch COFF switch 2 ion result nor 0 TO 3. epair or repla DC OFF SWI 0 TO 5. epair or repla 0 TO 3. epair or repla 0 TO 5. epair or repla | ace error-de ITCH GROU een VDC OF I Gro I Gro I Gro I Gro I Gro I CH I CH | etected pa IND CIRC FF switch | Not existed rts. UIT harness conr Continuity Existed rts. | - |
| $\frac{Connector}{E35}$ $\frac{ s the inspecti}{YES} >> G$ $NO >> R$ $2.CHECK VI$ $Check the cor$ $\frac{VDCC}{Connector}$ $\frac{VDCC}{M28}$ $\frac{ s the inspecti}{YES} >> G$ $3.CHECK VI$ $Check the VD$ $b the inspecti$ $YES >> G$ | ol unit) Termina 5 ion result nor 0 TO 2. epair or repla DC OFF SWI ntinuity betwo DFF switch CFF switch 2 ion result nor 0 TO 3. epair or repla DC OFF SWI 0 TO 3. epair or repla 0 TO 3. epair or repla 0 C OFF SWI 0 TO 3. epair or repla 0 TO 3. epair or repla | ace error-de ITCH GROU een VDC OF al Gro rmal? ace error-de ITCH ch. Refer to <u>F</u> rmal? | etected pa IND CIRC F switch | Not existed rts. UIT harness conr Continuity Existed rts. "Component | Inspection". |
| $\frac{Connector}{E35}$ $\frac{ s the inspecti}{YES} >> G$ $NO >> R$ $2.CHECK VI$ $Check the cor$ $\frac{VDCC}{Connector}$ $\frac{VDCC}{M28}$ $\frac{ s the inspecti}{YES} >> G$ $3.CHECK VI$ $Check the VD$ $b the inspecti$ $YES >> G$ | ol unit) Termina 5 ion result nor ion result nor ion 70 2. iepair or repla DC OFF SWI ntinuity betwo DFF switch C OFF switch ion result nor ion re | ace error-de ITCH GROU een VDC OF al Gro rmal? ace error-de ITCH ch. Refer to <u>F</u> rmal? OFF switch | etected pa IND CIRC F switch | Not existed rts. UIT harness conr Continuity Existed rts. "Component | - |

2. Connect VDC OFF switch harness connector.

BRC-119

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

3. Select "ABS", "DATA MONITOR" and "OFF SW" according to this order. Check the VDC OFF switch signal.

| Condition | DATA MONITOR |
|--|--------------|
| When VDC OFF switch is pressed and VDC OFF indicator lamp in combination meter is in ON status | On |
| When VDC OFF switch is pressed and VDC OFF indicator lamp in combination meter is in OFF status | Off |
| Is the inspection result normal? | |

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

5.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000009752963

[WITH VDC]

1.CHECK VDC OFF SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect triple switch harness connector.
- 3. Check the continuity between VDC OFF switch connector terminals.

| VDC OFF switch | Condition | Continuity |
|----------------|------------------------------------|-------------|
| Terminal | Condition | Continuity |
| 1-2 | When VDC OFF switch is pressed | Existed |
| 1 – 2 | When VDC OFF switch is not pressed | Not existed |

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace VDC OFF switch. Refer to <u>BRC-142</u>, "Removal and Installation".

ABS WARNING LAMP

| < DTC/CIRCUIT DIAGNOSIS > [WITH VDC] | |
|---|-----|
| ABS WARNING LAMP | А |
| Component Function Check | 1 |
| 1. CHECK ABS WARNING LAMP FUNCTION | В |
| Check that ABS warning lamp in combination meter turns ON for approx. 1 second after ignition switch is turned ON. CAUTION: | С |
| Never start engine. | |
| <u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Proceed to <u>BRC-121, "Diagnosis Procedure"</u> . | D |
| Diagnosis Procedure | _ |
| 1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIR- | E |
| CUIT | BRC |
| Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-114, "Diagnosis Procedure"</u> . | BRG |
| Is the inspection result normal? | G |
| YES >> GO TO 2. NO >> Repair or replace error-detected parts. | |
| 2. PERFORM SELF-DIAGNOSIS | Н |
| With CONSULT Perform self-diagnosis for "ABS". | |
| Is any DTC detected? | |
| YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . NO >> GO TO 3. | |
| 3. CHECK ABS WARNING LAMP SIGNAL | J |
| With CONSULT Select "ABS", "DATA MONITOR" and "ABS WARN LAMP" according to this order. | |
| 2. Turn the ignition switch OFF. | K |
| 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON and then changes to "Off". | |
| CAUTION: Never start engine. | L |
| Is the inspection result normal? | Ъ.Л |
| YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>. NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> | M |
| tion". | Ν |
| | |
| | 0 |

Ρ

< DTC/CIRCUIT DIAGNOSIS >

BRAKE WARNING LAMP

Component Function Check

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

Check that brake warning lamp in combination meter turns ON for approx. 1 second after ignition switch is turned ON.

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to <u>BRC-122</u>, "Diagnosis Procedure".

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check the parking brake switch system. Refer to <u>BRC-117</u>, "Diagnosis Procedure".

 $\mathbf{3}.$ CHECK BRAKE WARNING LAMP FUNCTION (3)

Check that brake warning lamp in combination meter turns ON/OFF when brake fluid level switch is operated while brake fluid level in reservoir tank is with the specified level.

NOTE:

Brake warning lamp turns ON when brake fluid is less than the specified level (when brake fluid level switch is ON).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the brake fluid level switch system. Refer to <u>BRC-101, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000009752967

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-114</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK COMBINATION METER

Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-61, "Removal and Installation"</u>.

VDC WARNING LAMP

| CDTC/CIRCUIT DIAGNOSIS > [WITH] VDC WARNING LAMP Component Function Check 1.CHECK VDC WARNING LAMP FUNCTION Check that VDC warning lamp in combination meter turns ON for approx. 1 second after ignition sw turned ON. CAUTION: Never start engine. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to BRC-123 , "Diagnosis Procedure". Diagnosis Procedure I.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUNICUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground Refer to BRC-114 . "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.PERFORM SELF-DIAGNOSIS @With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to BRC-50 , "DTC Index". NO >> GO TO 3. | |
|---|-----------------|
| Component Function Check 1.CHECK VDC WARNING LAMP FUNCTION Check that VDC warning lamp in combination meter turns ON for approx. 1 second after ignition sw turned ON. CAUTION: Never start engine. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to BRC-123, "Diagnosis Procedure". Diagnosis Procedure 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUNI CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground refer to BRC-114, "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.PERFORM SELF-DIAGNOSIS @With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to BRC-50, "DTC Index". | VDC] |
| 1.CHECK VDC WARNING LAMP FUNCTION Check that VDC warning lamp in combination meter turns ON for approx. 1 second after ignition sw turned ON. CAUTION: Never start engine. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to <u>BRC-123, "Diagnosis Procedure"</u> . Diagnosis Procedure 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUNI CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground refer to <u>BRC-114, "Diagnosis Procedure"</u> . Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.PERFORM SELF-DIAGNOSIS With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | |
| Check that VDC warning lamp in combination meter turns ON for approx. 1 second after ignition sw turned ON. CAUTION: Never start engine. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to <u>BRC-123</u> , "Diagnosis Procedure". Diagnosis Procedure I.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUNI CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground of Refer to <u>BRC-114</u> , "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.PERFORM SELF-DIAGNOSIS @With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | 00009752968 |
| turned ON. CAUTION: Never start engine. Is the inspection result normal? YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to <u>BRC-123</u> , "Diagnosis Procedure". Diagnosis Procedure 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUNI CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground a Refer to <u>BRC-114</u> , "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.PERFORM SELF-DIAGNOSIS @With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | |
| YES >> INSPECTION END NO >> Proceed to diagnosis procedure. Refer to BRC-123, "Diagnosis Procedure". Diagnosis Procedure | itch is |
| Diagnosis Procedure 1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground of Refer to <u>BRC-114</u> , "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. PERFORM SELF-DIAGNOSIS With CONSULT Perform self-diagnosis for "ABS". Is any DTC detected? YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | |
| CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground Refer to <u>BRC-114. "Diagnosis Procedure"</u> . <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. PERFORM SELF-DIAGNOSIS (B)With CONSULT Perform self-diagnosis for "ABS". <u>Is any DTC detected?</u> YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | 00009752969 |
| Refer to <u>BRC-114. "Diagnosis Procedure"</u> . <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. PERFORM SELF-DIAGNOSIS With CONSULT Perform self-diagnosis for "ABS". <u>Is any DTC detected?</u> YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | D CIR- |
| Perform self-diagnosis for "ABS". <u>Is any DTC detected?</u> YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u> . | circuit. |
| 3. CHECK VDC WARNING LAMP SIGNAL | |
| With CONSULT Select "ABS", "DATA MONITOR" and "SLIP/VDC LAMP" according to this order. Turn the ignition switch OFF. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON, an changes to "Off". | d then |
| CAUTION: Never start engine. | |
| Is the inspection result normal? YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u> . NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138, "Removal and In tion"</u> . | <u>ıstalla-</u> |
| tion". | |

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VDC OFF INDICATOR LAMP

Component Function Check

1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp in combination meter turns ON for approx. 1 second after ignition switch is turned ON.

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-124, "Diagnosis Procedure"</u>.

2.CHECK VDC OFF INDICATOR LAMP FUNCTION (2)

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

YES >> INSPECTION END

NO >> Check the VDC OFF switch system. Refer to <u>BRC-119</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000009752971

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-114</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)

With CONSULT

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

CAUTION: Never start engine.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138. "Removal and Installa-</u> tion".

 $\mathbf{3.}$ CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

With CONSULT

- i. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order.
- 2. Check that data monitor displays "On" or "Off" each time when VDC OFF switch is operated.

Is the inspection result normal?

- YES >> Check the combination meter. Refer to <u>MWI-21, "CONSULT Function"</u>.
- NO >> Check the VDC OFF switch system. Refer to <u>BRC-142, "Removal and Installation"</u>.

INFOID:000000009752970

EXCESSIVE OPERATION FREQUENCY [WITH VDC] < SYMPTOM DIAGNOSIS > SYMPTOM DIAGNOSIS А EXCESSIVE OPERATION FREQUENCY Description INFOID:000000009752972 VDC function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function operates in excessive operation frequency. Diagnosis Procedure INFOID:000000009752973 **1.**CHECK BRAKING FORCE D Check the brake force using a brake tester. Is the inspection result normal? Е YES >> GO TO 2. NO >> Check the brake system. 2.CHECK FRONT AND REAR AXLE BRC Check that there is no excessive looseness in front and rear axle. Front axle: Refer to <u>FAX-7, "Inspection"</u>. Rear axle - 2WD: Refer to RAX-6, "Inspection". - AWD: Refer to RAX-14, "Inspection". Is the inspection result normal? Н YES >> GO TO 3. NO >> Repair or replace error-detected parts. ${ m 3.check}$ wheel sensor Check the wheel sensor. • Check installation and damage of wheel sensor. Check connection of wheel sensor harness connector. Check terminal of wheel sensor harness connector. Is the inspection result normal? YES >> GO TO 4. Κ NO >> Repair or replace wheel sensor. Front wheel sensor: Refer to <u>BRC-132, "FRONT WHEEL SENSOR : Removal and Installation"</u>. • Rear wheel sensor: Refer to BRC-135, "REAR WHEEL SENSOR : Removal and Installation". L 4.CHECK SENSOR ROTOR Check that there is no looseness, damage or foreign material on sensor rotor. Is the inspection result normal? M YES >> GO TO 5. NO

- >> Repair installation or replace sensor rotor.
 - Front sensor rotor: Refer to BRC-137, "FRONT SENSOR ROTOR : Removal and Installation". Ν
 - Rear sensor rotor. Refer to BRC-137, "REAR SENSOR ROTOR : Removal and Installation".

5.CHECK WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 1 second after key switch is turned ON and stay in OFF status during driving. **CAUTION:**

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake P fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

YES >> Normal

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

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

UNEXPECTED BRAKE PEDAL REACTION

Description

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

Diagnosis Procedure

CHECK FRONT AND REAR AXLE

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

- Front axle: Refer to <u>FAX-7, "Inspection"</u>.
- Rear axle
- 2WD: Refer to RAX-6, "Inspection".
- AWD: Refer to RAX-14, "Inspection".

Is the inspection result normal?

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

2.CHECK DISC ROTOR

Check the disc rotor runout.

- Front: Refer to BR-14, "DISC ROTOR : Inspection and Adjustment".
- Rear: Refer to BR-16, "DISC ROTOR : Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 3.

NO

- >> Refinish disc rotor.
 - Front: Refer to BR-14, "DISC ROTOR : Inspection and Adjustment".
 - Rear: Refer to BR-16, "DISC ROTOR : Inspection and Adjustment".

3.CHECK BRAKE FLUID LEAKAGE

Check the fluid leakage.

- Front: Refer to <u>BR-24, "FRONT : Inspection"</u>.
- Rear: Refer to BR-32, "REAR : Inspection".

Is the inspection result normal?

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

4.CHECK BRAKE PEDAL

Check the each item of brake pedal. Refer to BR-7, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust each item of brake pedal. Refer to BR-7, "Inspection and Adjustment".

5. CHECK BRAKING FORCE

Check the brake force using a brake tester.

Is the inspection result normal?

YFS >> GO TO 6.

NO >> Check the each components of brake system.

O.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) harness connector so that ABS does not operate. Check that brake force is normal in this condition. Connect harness connectors after checking. Is the inspection result normal?

YES >> Normal

NO >> Check the each components of brake system. [WITH VDC]

INFOID:000000009752974

INFOID:000000009752975

THE BRAKING DISTANCE IS LONG

| THE BRAKING DISTANCE IS LONG | |
|---|------------------------|
| < SYMPTOM DIAGNOSIS > | [WITH VDC] |
| THE BRAKING DISTANCE IS LONG | А |
| Description | INFOID:000000009752976 |
| Brake stopping distance is long when ABS function is operated. | В |
| Diagnosis Procedure | |
| CAUTION: Brake stopping distance on slippery road like rough road, gravel road or snowy longer when ABS is operated than when ABS is not operated. 1.CHECK BRAKING FORCE | road may become |
| Check the brake force using a brake tester. <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Check the each components of brake system. 2. CHECK BRAKE PERFORMANCE | E |
| Disconnect ABS actuator and electric unit (control unit) harness connector so that ABS | BR |
| Check the brake stopping distance in this condition. Connect harness connectors after che <u>Is the inspection result normal?</u> YES >> Normal NO >> Check the each components of brake system. | |
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< SYMPTOM DIAGNOSIS >

DOES NOT OPERATE

Description

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

Diagnosis Procedure

INFOID:000000009752979

CAUTION:

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

1.CHECK WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF approx. 1 second after key switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp and stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

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

INFOID:000000009752978

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS > BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

А Description INFOID:000000009752980 Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the В engine starts. Brake pedal vibrates during braking. **CAUTION:** Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal. When shifting gears When driving on slippery road D During cornering at high speed When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more] When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher] Е **Diagnosis** Procedure INFOID:000000009752981 **1.**SYMPTOM CHECK 1 BRC Check that there are pedal vibrations when the engine is started. Do vibrations occur? YES >> GO TO 2. NO >> Check brake pedal. Refer to BR-19, "Inspection and Adjustment". 2.SYMPTOM CHECK 2 Н Check that motor noise from ABS actuator and electric unit (control unit) occurs when the engine starts. Does the operation sound occur? YES >> GO TO 3. NO >> Perform self-diagnosis for "ABS" with CONSULT. 3.SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated. Does the symptom occur? >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS YES Κ actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit). NO >> Normal L Μ Ν

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[WITH VDC]

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING

Description

The vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake limited slip differential (BLSD) function operates.

Diagnosis Procedure

INFOID:000000009752983

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function or brake limited slip differential (BLSD) function operates.

Is the inspection result normal?

YES >> Normal NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

() With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-50, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK CONNECTOR

With CONSULT

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check connector terminal for deformation, disconnection and looseness.
- 4. Connect harness connector and perform self-diagnosis for "ABS" again.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Poor connection of connector terminal. Repair or replace connector terminal.

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

With CONSULT

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" (for CVT models).

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-138</u>, "<u>Removal and Installa-</u> tion".

INFOID:000000009752982

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

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INFOID:000000009752984

[WITH VDC]

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

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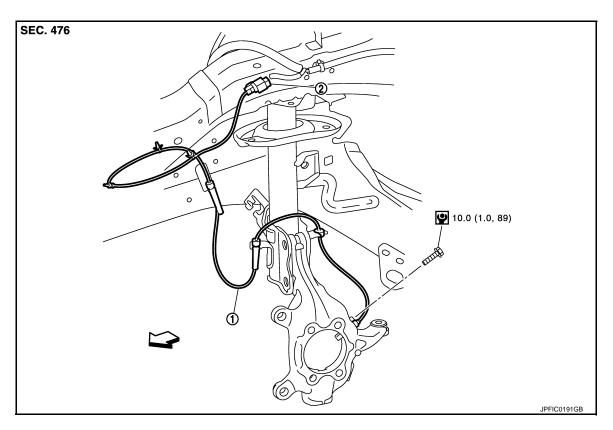
< REMOVAL AND INSTALLATION >

[WITH VDC]

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000009752985



1. Front LH wheel sensor

2. Front LH wheel sensor harness connector

<>☐: Vehicle front

L N·m (kg-m, in-lb)

NOTE:

Front RH wheel sensor is symmetrically opposite of LH.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000009752986

REMOVAL

- 1. Remove tires.
- 2. Remove the fender protector (front). Refer to EXT-27, "Removal and Installation".
- Remove front wheel sensor from steering knuckle.
 CAUTION:
 Never rotate and never null front wheel sensor a

Never rotate and never pull front wheel sensor as much as possible, when pulling out.

 Remove front wheel sensor harness from the vehicle.
 CAUTION: Never twist or pull front wheel sensor harness, when removing.

INSTALLATION

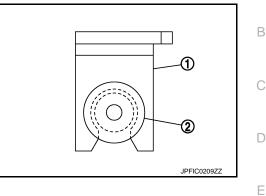
Note the following, and install in the reverse order of the removal.

BRC-132

< REMOVAL AND INSTALLATION >

• Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.

• Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.

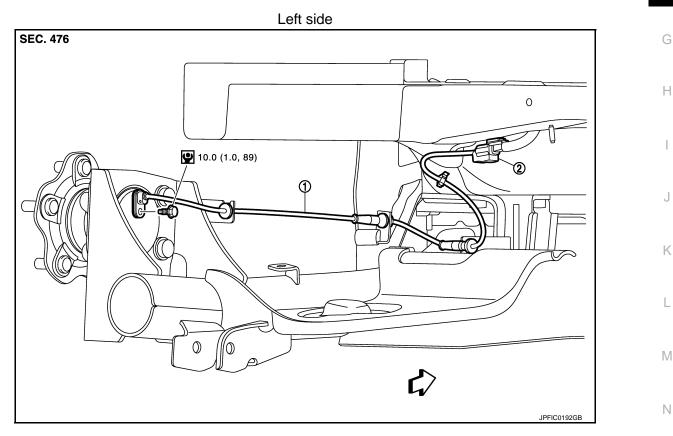


REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:000000009752987

2WD



- 1. Rear LH wheel sensor
- Rear LH wheel sensor harness connector

<⊐: Vehicle front

L N·m (kg-m, in-lb)

[WITH VDC]

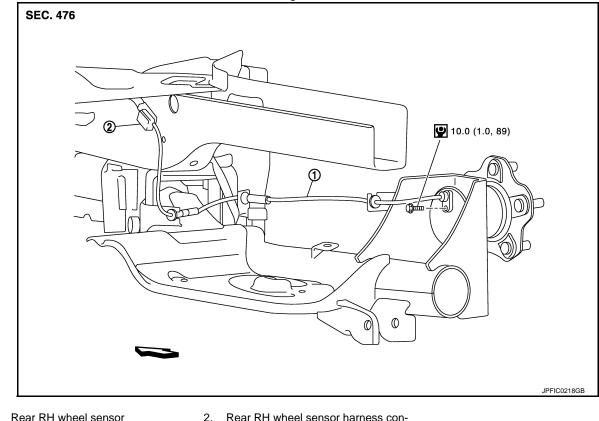
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< REMOVAL AND INSTALLATION >

Right side



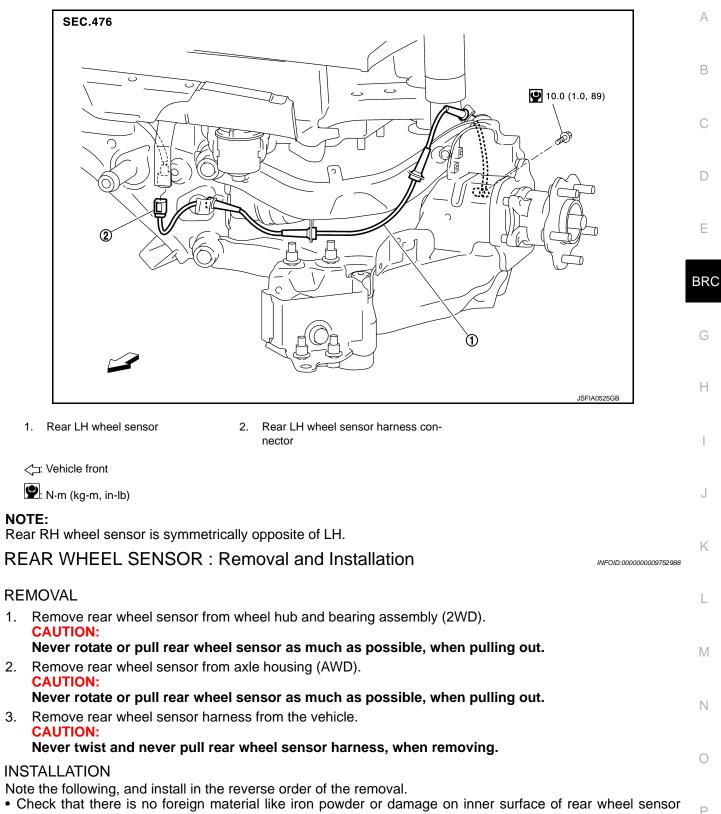
- 1. Rear RH wheel sensor
- 2. Rear RH wheel sensor harness connector

<□: Vehicle front

E: N·m (kg-m, in-lb)



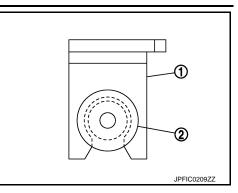
< REMOVAL AND INSTALLATION >



mounting hole of wheel hub and bearing assembly and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.

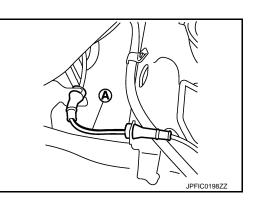
< REMOVAL AND INSTALLATION >

 Never twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.



CAUTION:

Check that the identification line (A) of the rear wheel sensor is faced upward.



| SENSOR ROTOR |
|---|
| < REMOVAL AND INSTALLATION > [WITH VDC] |
| SENSOR ROTOR |
| FRONT SENSOR ROTOR |
| FRONT SENSOR ROTOR : Removal and Installation |
| REMOVAL Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to <u>FAX-9, "Removal and Installation"</u> . |
| INSTALLATION Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to FAX-9, "Removal and Installation". REAR SENSOR ROTOR |
| REAR SENSOR ROTOR : Removal and Installation |
| REMOVAL |
| 2WD Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to <u>RAX-7, "Removal and Installation"</u> . AWD |
| Remove drive shaft. Refer to <u>RAX-19, "Removal and Installation"</u>. Remove sensor rotor from drive shaft. Refer to <u>RAX-20, "WHEEL SIDE : Disassembly and Assembly"</u>. |
| Note the following, and install in the reverse order of the removal. • Never reuse sensor rotor. (AWD) |
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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

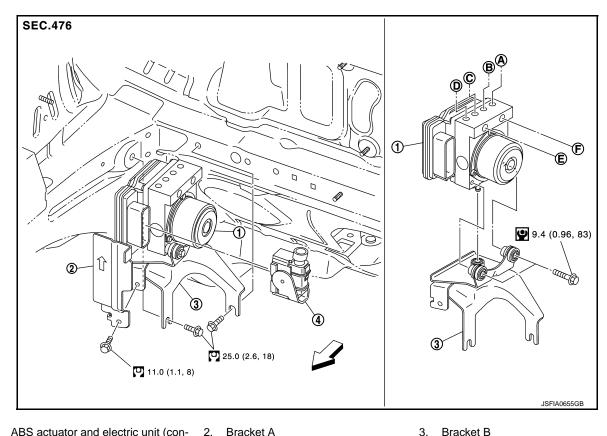
< REMOVAL AND INSTALLATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000009752991

[WITH VDC]



- 1. ABS actuator and electric unit (con- 2. Bracket A trol unit)
- 4. ABS actuator and electric unit (control unit) harness connector
- A. To front LH caliper
- D. To front RH caliper
- <□: Vehicle front

: N·m (kg-m, ft-lb)

Let N·m (kg-m, in-lb)

Removal and Installation

REMOVAL

- 1. Disconnect battery cable from negative terminal.
- 2. Drain brake fluid. Refer to <u>BR-10, "Draining"</u>.
- 3. Remove bracket A.

- B. To rear RH caliper
- E. To master cylinder secondary side
- C. To rear LH caliper
- F. To master cylinder primary side

INFOID:000000009752992

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

- Disconnect ABS actuator and electric unit (control unit) harness connector (1), follow the procedure described below.
- a. Push the pawl (A).
- b. Move the lever (B) in the direction (C) until locked.
- c. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Loosen flare nut of brake tube using a flare nut wrench, and then remove brake tube from ABS actuator and electric unit (control unit). Refer to <u>BR-21, "FRONT : Exploded View"</u>.
- 6. Remove ABS actuator and electric unit (control unit) and bracket B.

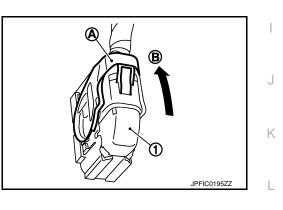
CAUTION:

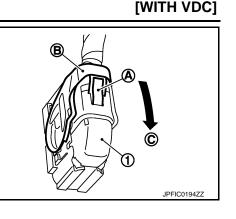
- Never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.
- Be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.
- 7. Remove bracket B and bushing from ABS actuator and electric unit (control unit).

INSTALLATION

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

- When replacing with a new ABS actuator and electric unit (control unit), never remove the protector of the brake tube mounting hole until right before the brake tube is installed.
- When installing brake tube, tighten to the specified torque using a crowfoot and torque wrench so that flare nut and brake tube are not damaged. Refer to <u>BR-21</u>, "FRONT : Exploded View".
- Never remove and install ABS actuator and electric unit (control unit) by holding actuator harness.
- Bleed air from brake piping after installation. Refer to <u>BR-11, "Bleeding Brake System"</u>.
- Never apply excessive impact to actuator, such as by dropping it.
- After installing the ABS actuator and electric unit (control unit) harness connector (1), move the lever (A) in the direction (B) to secure the locking.
- Perform steering angle sensor neutral position adjustment when ABS actuator and electric unit (control unit) is replaced. Refer to BRC-62, "Work Procedure".





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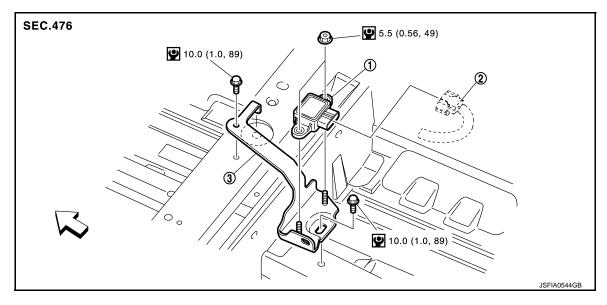
< REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:000000009752993

[WITH VDC]



1. Yaw rate/side/decel G sensor

2. Yaw rate/side/decel G sensor har- 3. Bracket ness connector

 \triangleleft : Vehicle front

L: N·m (kg-m, in-lb)

Removal and Installation

INFOID:000000009752994

REMOVAL

CAUTION:

Never drop or strike yaw rate/side/decel G sensor, because it has little endurance to impact. Never use a pneumatic tool.

- 1. Remove front seat (right side). Refer to <u>SE-20, "Removal and Installation"</u>.
- 2. Remove floor carpet. Refer to INT-24, "Removal and Installation".
- 3. Disconnect yaw rate/side/decel G sensor harness connector.
- 4. Remove yaw rate/side/decel G sensor.

INSTALLATION

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

• Never drop or strike yaw rate/transverse/decel G sensor, because it has little endurance to impact. Never use a power tool.

STEERING ANGLE SENSOR

[WITH VDC]

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

Removal and Installation
REMOVAL
1. Remove spiral cable assembly. Refer to <u>SR-14, "Removal and Installation"</u>.
2. Remove steering angle sensor.
INSTALLATION
Note the following, and install in the reverse order of removal.

 Perform steering angle sensor neutral position adjustment when steering angle sensor is removed and installed, or replaced. Refer to <u>BRC-62, "Work Procedure"</u>.

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< REMOVAL AND INSTALLATION >

VDC OFF SWITCH

INFOID:000000009752996

[WITH VDC]

Removal and Installation

REMOVAL

- 1. Remove lower instrument panel. Refer to <u>IP-13, "Removal and Installation"</u>.
- 2. Remove VDC OFF switch.

INSTALLATION

Installation is the reverse order of removal.