

BRC

SECTION

BRAKE CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000010099751

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:

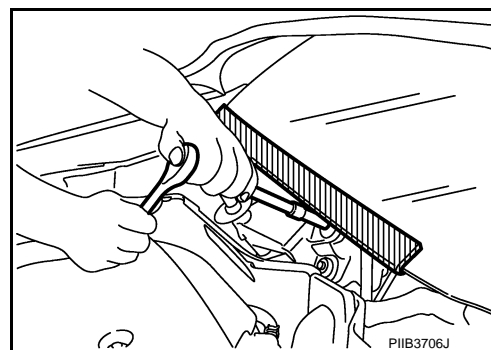
Always observe the following items for preventing accidental activation.

- 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

INFOID:000000010099753

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



PRECAUTIONS

< PRECAUTION >

[WITH VDC]

Precautions for Removing of Battery Terminal

INFOID:0000000010227983

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

NOTE:

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.

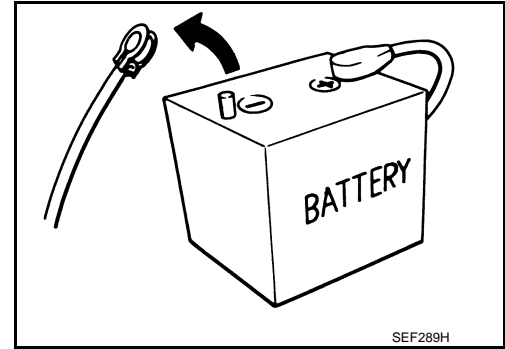
NOTE:

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.



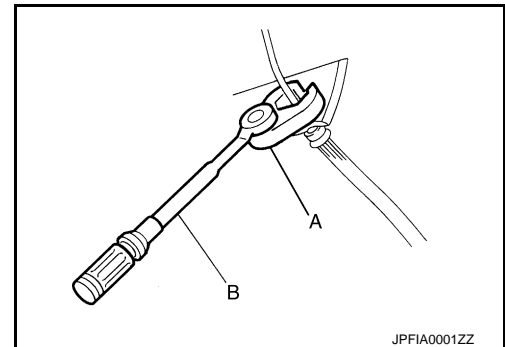
Precaution for Brake System

INFOID:0000000010099754

WARNING:

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

- Brake fluid use refer to [MA-16, "FOR NORTH AMERICA : Fluids and Lubricants"](#) (for USA and Canada), [MA-18, "FOR MEXICO : Fluids and Lubricants"](#) (for Mexico).
- 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 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.
- Never damage caliper (made by aluminum).
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten flare nut of brake tube to the specified torque using a crow-foot (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

INFOID:0000000010099755

- Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function or Active trace control function operates. This is not a malfunction because it is caused by VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function or Active trace control 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.

PRECAUTIONS

[WITH VDC]

< PRECAUTION >

- 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. A
- The optimum performance is achieved by control for VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control 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. B
- 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. C
- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. D
- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. E
- Suspension component parts (shock absorber, spring, bushing and others) BRC
- 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) G
- When suspension, tire and brake related 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. H
- 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. I
- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. Ordinary brake operates. After power supply returns to normal, ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF. The control becomes operative for VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. J
- Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function or Active trace control function is operated. This is not a malfunction because it is caused by VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function or Active trace control function that is operated normally. K
- VDC warning lamp may turn ON and VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function and Active trace control 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, Rise-up & Build-up function, Brake force distribution function and Active trace control function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory. L
- 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, Rise-up & Build-up function, Brake force distribution function and Active trace control 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, Rise-up & Build-up function, Brake force distribution function and Active trace control function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory. M
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PRECAUTIONS

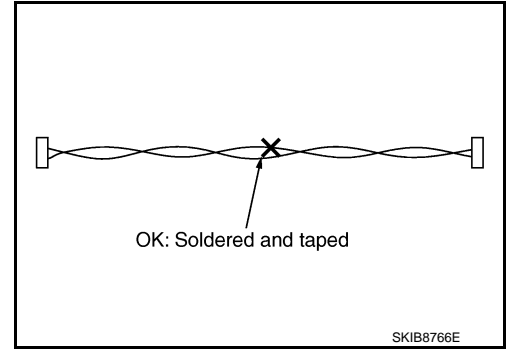
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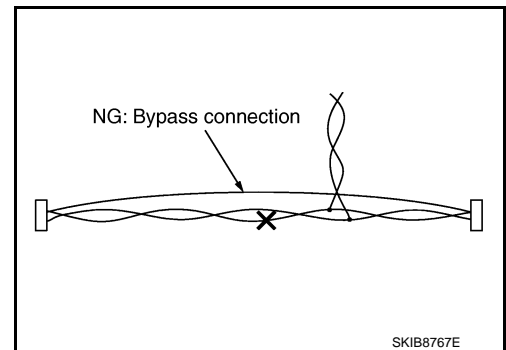
Precaution for Harness Repair

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



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



PREPARATION

< PREPARATION >

[WITH VDC]

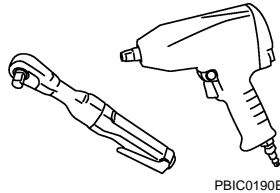
PREPARATION

PREPARATION

Commercial Service Tools

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



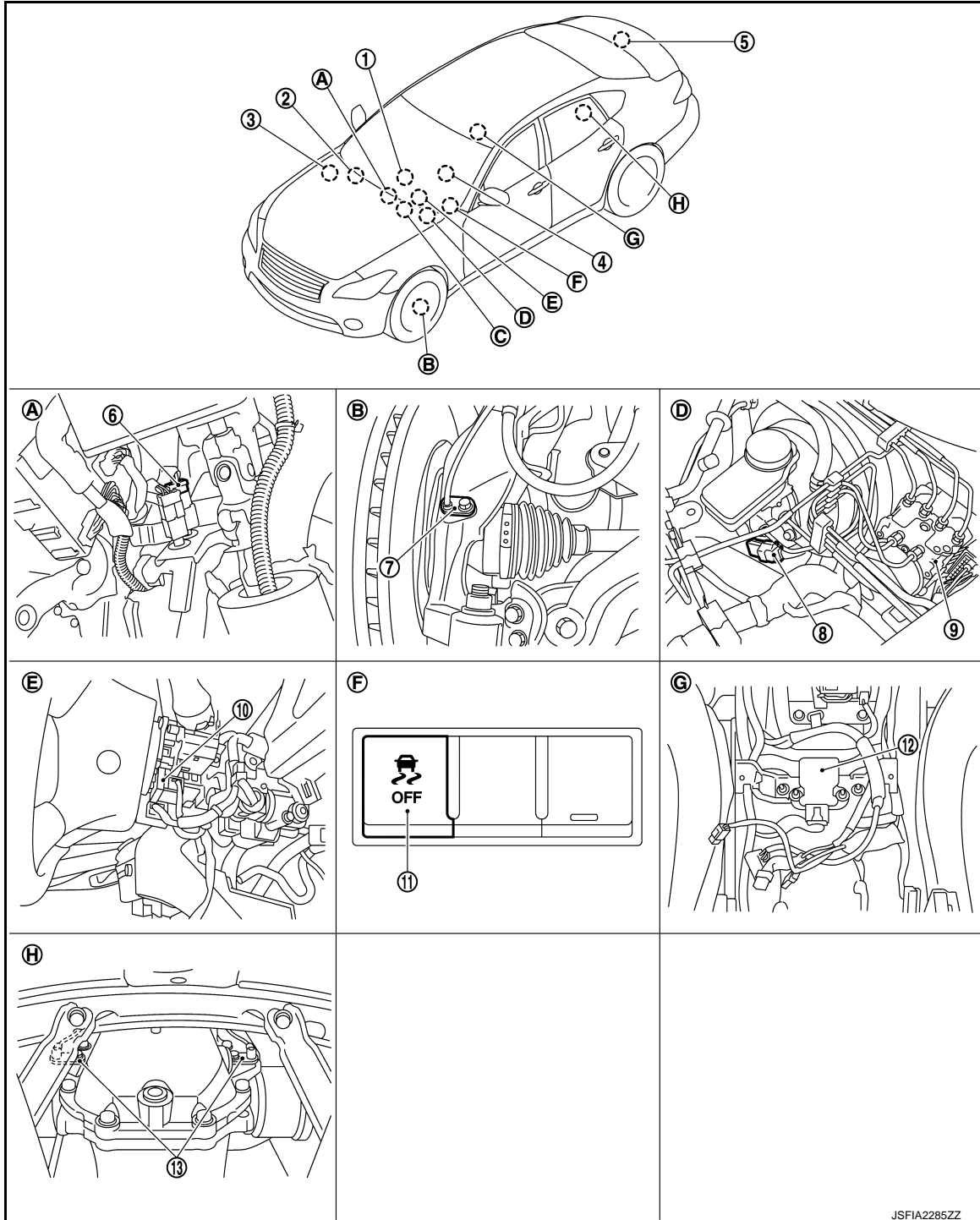
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH VDC]

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| 1. Drive mode select switch Refer to DMS-3, "Component Parts Location" . | 2. A/C auto AMP. Refer to HAC-6, "AUTOMATIC AIR CONDITIONING SYSTEM : Component Parts Location" (automatic air conditioning system), HAC-9, "FOREST AIR SYSTEM : Component Parts Location" (forest air system). | 3. ECM Refer to EC-37, "ENGINE CONTROL SYSTEM : Component Parts Location" (VQ37VHR for USA and Canada), EC-567, "ENGINE CONTROL SYSTEM : Component Parts Location" (VQ37VHR for Mexico), EC-984, "ENGINE CONTROL SYSTEM : Component Parts Location" (VK56VD for USA and Canada), EC-1577, "ENGINE CONTROL SYSTEM : Component Parts Location" (VK56VD for Mexico). | A |
| 4. TCM Refer to TM-11, "A/T CONTROL SYSTEM : Component Parts Location" . | 5. ADAS control unit* Refer to DAS-14, "Component Parts Location" . | 6. Stop lamp switch | B |
| 7. Front wheel sensor | 8. Vacuum sensor | 9. ABS actuator and electric unit (control unit) | C |
| 10. Steering angle sensor | 11. VDC OFF switch | 12. Yaw rate/side/decel G sensor | D |
| 13. Rear wheel sensor | | | E |
| A. Brake pedal | B. Steering knuckle | C. ABS warning lamp, brake warning lamp, VDC warning lamp, VDC OFF indicator lamp (in combination meter) | BRC |
| D. Inside of brake master cylinder cover | E. Back of spiral cable assembly | F. Instrument driver lower panel | G |
| G. Under of center console | H. Rear final drive assembly | | H |

*: Models with ICC system

Component Description

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| Component | | Reference/Function |
|---|------------------------------|---|
| ABS actuator and electric unit (control unit) | Pump | BRC-12, "ABS Actuator and Electric Unit (Control Unit)" |
| | Motor | |
| | Actuator Relay (Main relay) | |
| | ABS IN valve | |
| | ABS OUT valve | |
| | Cut valve 1 (Primary line) | |
| | Cut valve 2 (Secondary line) | |
| | Pressure Sensor | |
| Wheel sensor | | BRC-12, "Wheel Sensor and Sensor Rotor" |
| Yaw rate/side/decel G sensor | | BRC-13, "Yaw Rate/Side/Decel G Sensor" |
| Steering angle sensor | | BRC-13, "Steering Angle Sensor" |
| Vacuum sensor | | BRC-13, "Vacuum Sensor" |
| Stop lamp switch | | BRC-13, "Stop Lamp Switch" |
| VDC OFF switch | | BRC-13, "VDC OFF Switch" |
| ABS warning lamp | | BRC-15, "System Description" |
| Brake Warning Lamp | | |
| VDC warning lamp | | |
| VDC OFF indicator lamp | | |

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH VDC]

| Component | Reference/Function |
|--------------------------|---|
| ECM | EC-57. "ENGINE CONTROL SYSTEM : System Description" (VQ37VHR for USA and Canada) EC-585. "ENGINE CONTROL SYSTEM : System Description" (VQ37VHR for Mexico) EC-1005. "ENGINE CONTROL SYSTEM : System Description" (VK56VD for USA and Canada) EC-1597. "ENGINE CONTROL SYSTEM : System Description" (VK56VD for Mexico) |
| TCM | TM-43. "A/T CONTROL SYSTEM : System Description" |
| ADAS control unit* | DAS-15. "System Description" |
| A/C auto AMP. | HAC-15. "AUTOMATIC AIR CONDITIONING SYSTEM : System Description" (Automatic air conditioning system) HAC-23. "FOREST AIR SYSTEM : System Description" (Forest air system) |
| Drive mode select switch | DMS-5. "Infiniti Drive Mode Selector : System Description" |

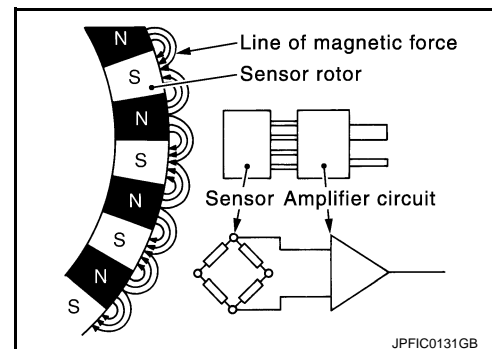
*: Models with ICC system

Wheel Sensor and Sensor Rotor

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NOTE:

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



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ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000010099761

Electric unit (control unit) is integrated with actuator and comprehensively controls VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function and Brake force distribution function.

ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

Motor

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

Motor Relay

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

Actuator Relay

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

ABS IN Valve and ABS OUT Valve

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH VDC]

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

Pressure Sensor

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

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

Shuts off the ordinary brake line from master cylinder, when VDC function, TCS function, hill start assist function, Rise-up & Build-up function and Brake force distribution function are activated.

ADAS Control Unit

INFOID:0000000010099762

Controls Active trace control function in ADAS control unit and transmits Active trace control signal to ABS actuator and electric unit (control unit) via CAN communication.

NOTE:

Models with ICC system

Stop Lamp Switch

INFOID:0000000010099763

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

Steering Angle Sensor

INFOID:0000000010099764

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

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

Yaw Rate/Side/Decel G Sensor

INFOID:0000000010099765

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

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

Brake Fluid Level Switch

INFOID:0000000010099766

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

Vacuum Sensor

INFOID:0000000010099767

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

Parking Brake Switch

INFOID:0000000010099768

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

VDC OFF Switch

INFOID:0000000010099769

- 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) control operates.
- TCS function
- Active trace control function

A

B

C

D

E

BRC

G

H

I

J

K

L

M

N

O

P

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[WITH VDC]

- 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).

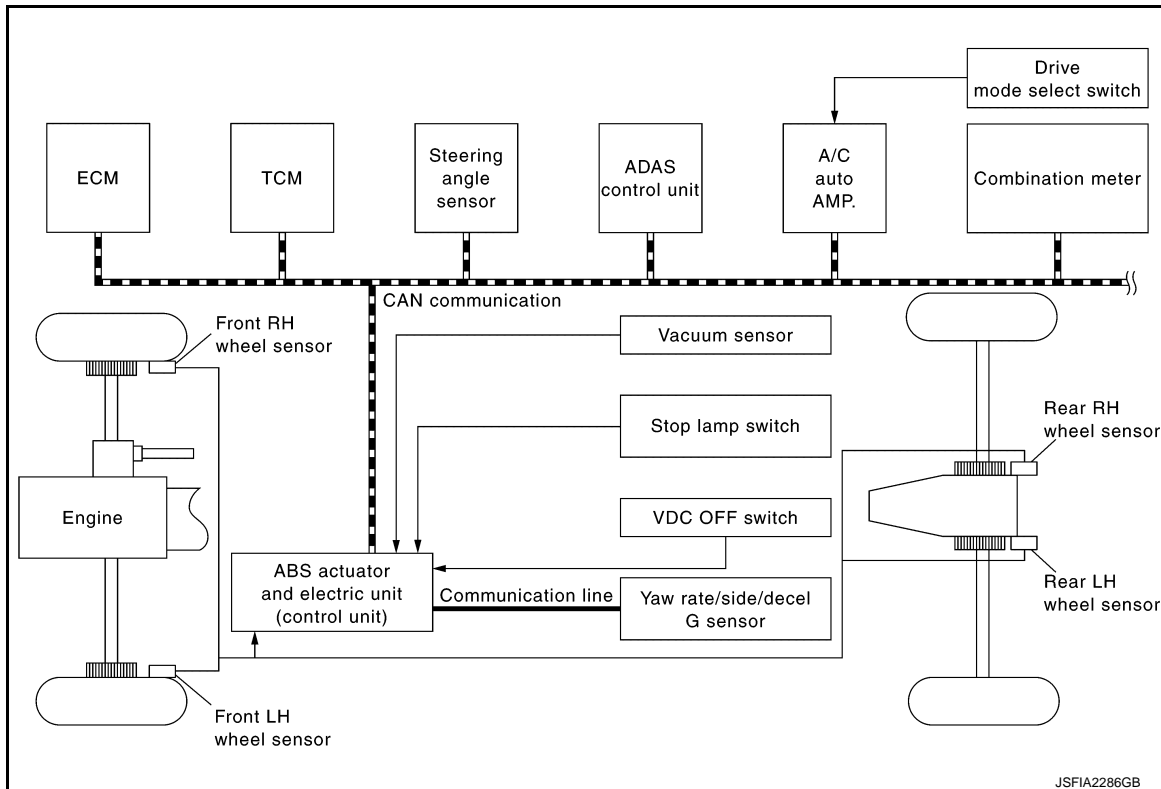
SYSTEM

System Description

INFOID:000000010099770

- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

VDC function, TCS function, ABS function, EBD function, Rise-up & Build-up function and Brake force distribution function

| Component | Signal description |
|------------------------------|---|
| Yaw rate/side/decel G sensor | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*.</p> <ul style="list-style-type: none"> • Yaw rate signal • Side G sensor signal • Decel G sensor signal |
| ECM | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal <p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Target throttle position signal |
| TCM | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Shift position signal |

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

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

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

Active trace control function

| Component | Signal description |
|---|---|
| ADAS control unit | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Active trace control signal |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Target throttle position signal |
| ABS actuator and electric unit (control unit) | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Vehicle speed signal (ABS) Stop lamp switch signal (brake signal) VDC OFF switch signal Yaw rate signal Side G sensor signal Decel G sensor signal |
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *. <ul style="list-style-type: none"> Yaw rate signal Side G sensor signal Decel G sensor signal |
| Drive mode select switch | Outputs ON/OFF status of STANDARD, SPORT, ECO, SNOW mode to A/C auto AMP. |
| A/C auto AMP. | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Drive mode select switch signal |
| Steering angle sensor | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Steering angle sensor signal |
| Combination meter | Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> VDC OFF indicator lamp signal VDC warning lamp signal Mainly receives the following signals from ADAS control unit via CAN communication. <ul style="list-style-type: none"> IBA warning lamp signal |

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

VALVE OPERATION (ABS AND EBD)

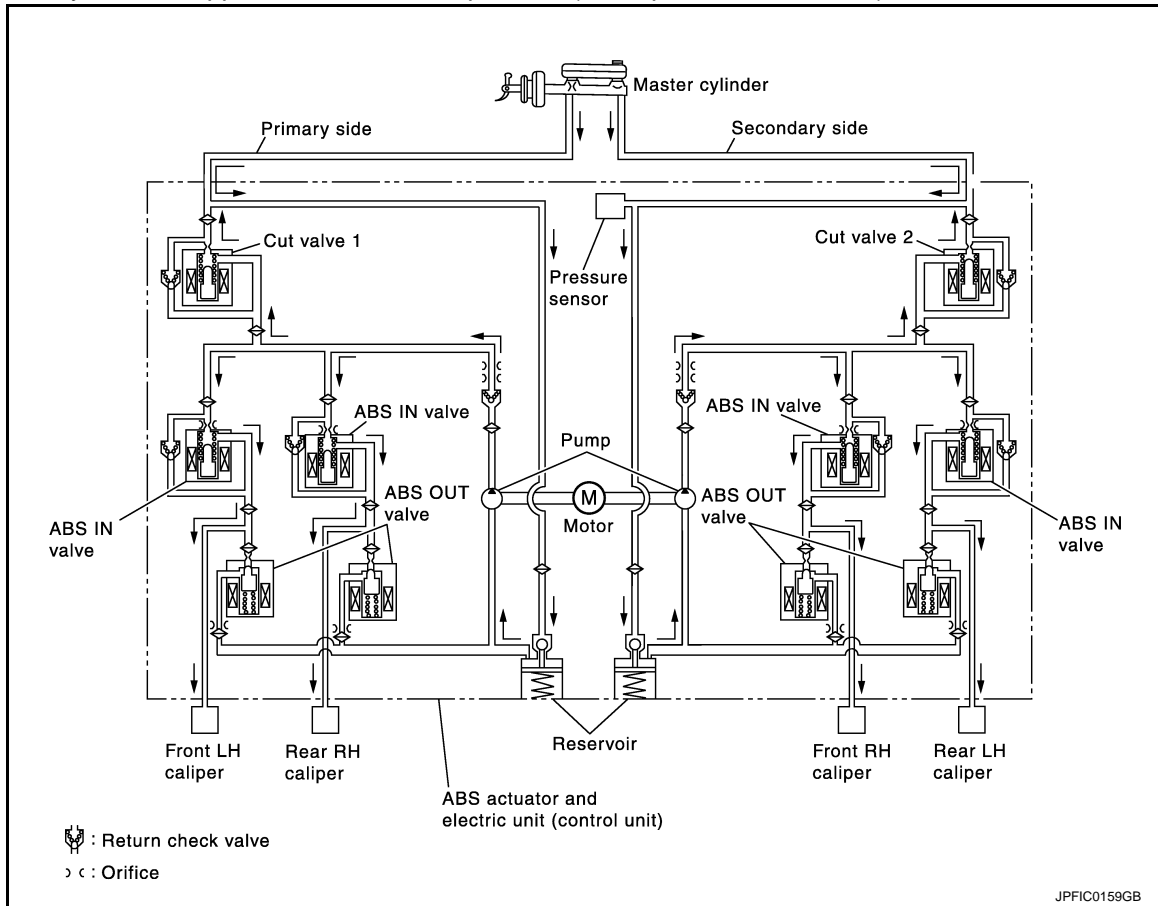
Each valve is operated and fluid pressure of brake caliper is controlled.

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

When ordinary brake is applied and ABS is in operation (when pressure increases).



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

When front RH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, pressurized brake fluid is supplied to front RH caliper through ABS IN valve.

When front LH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, pressurized brake fluid is supplied to front LH wheel caliper through ABS IN valve.

When rear RH wheel caliper pressure increases

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, pressurized brake fluid is supplied to rear RH wheel caliper through ABS IN valve.

When rear LH wheel caliper pressure increases

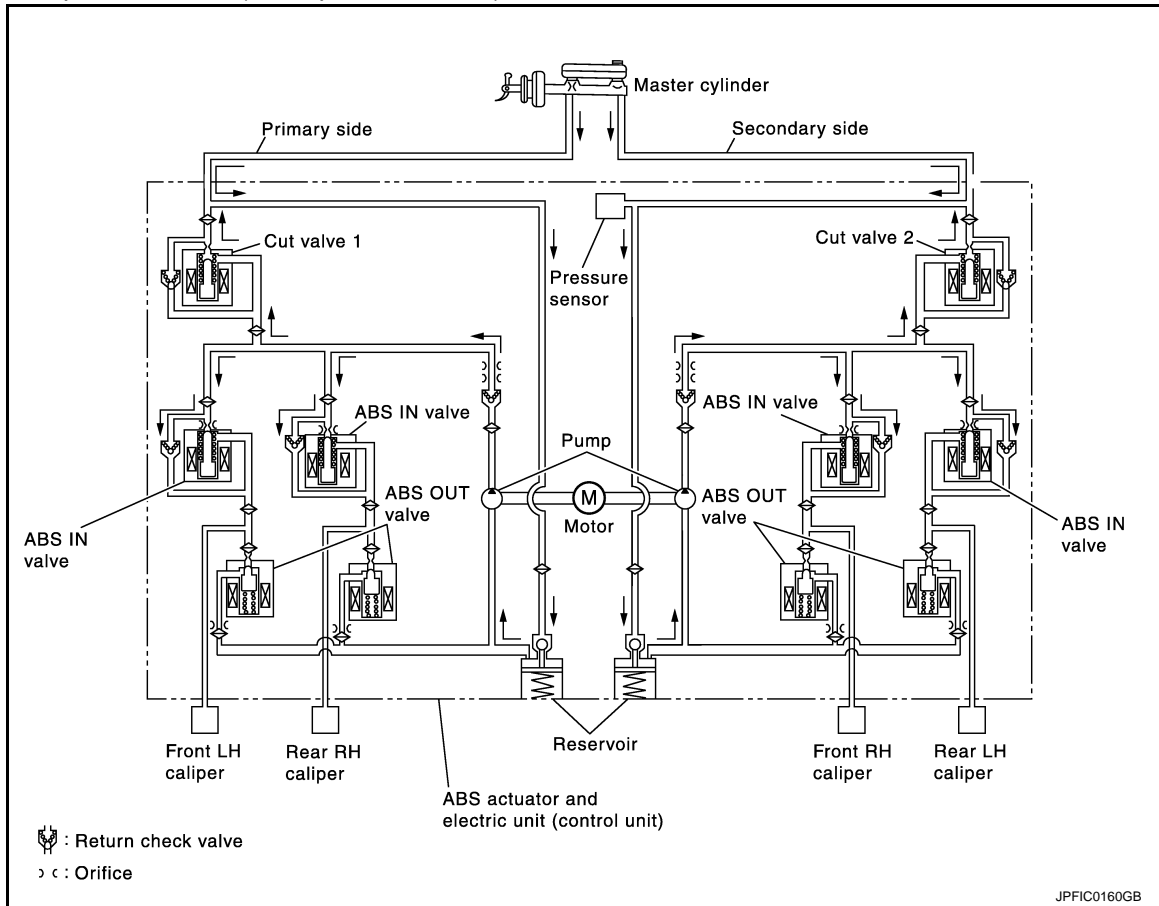
- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, pressurized brake fluid is supplied to rear LH wheel caliper through ABS IN valve.

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

When ABS operation starts (when pressure holds)



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

When front RH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

When front LH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

When rear RH wheel caliper pressure holds

- Motor is activated. Brake fluid is pressurized by pump and is sent to primary line through cut valve 1. At the same time, because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

When rear LH wheel caliper pressure holds

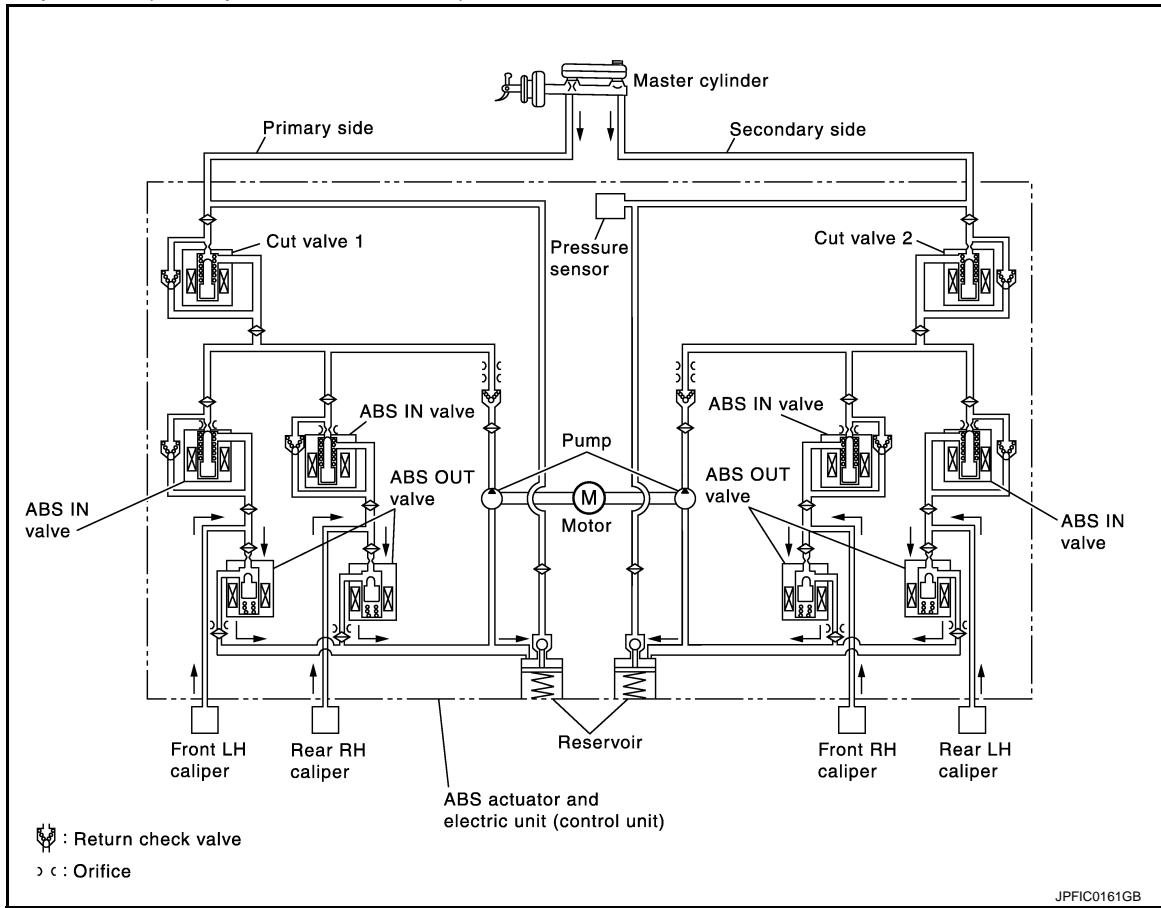
- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, because ABS IN valve and ABS OUT valve are closed, fluid pressure holds.

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

ABS is in operation (when pressure decreases)



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

When front RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

Component Parts and Function

| Component | FUNCTION |
|--------------|--|
| Reservoir | Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper. |
| Pump | Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure. |
| Motor | Drives the pump according to signals from control unit. |
| ABS IN valve | Switches the fluid pressure line to increase or hold according to signals from control unit. |

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| Component | FUNCTION |
|----------------------------|--|
| ABS OUT valve | Switches the fluid pressure line to increase, hold or decrease according to signals from control unit. |
| Return check valve | Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released. |
| Cut valve 1 Cut valve 2 | Performs the duty control of fluid pressure increased by pump according to signals from control unit. |
| Pressure Sensor | Detects the brake pedal operation amount. |

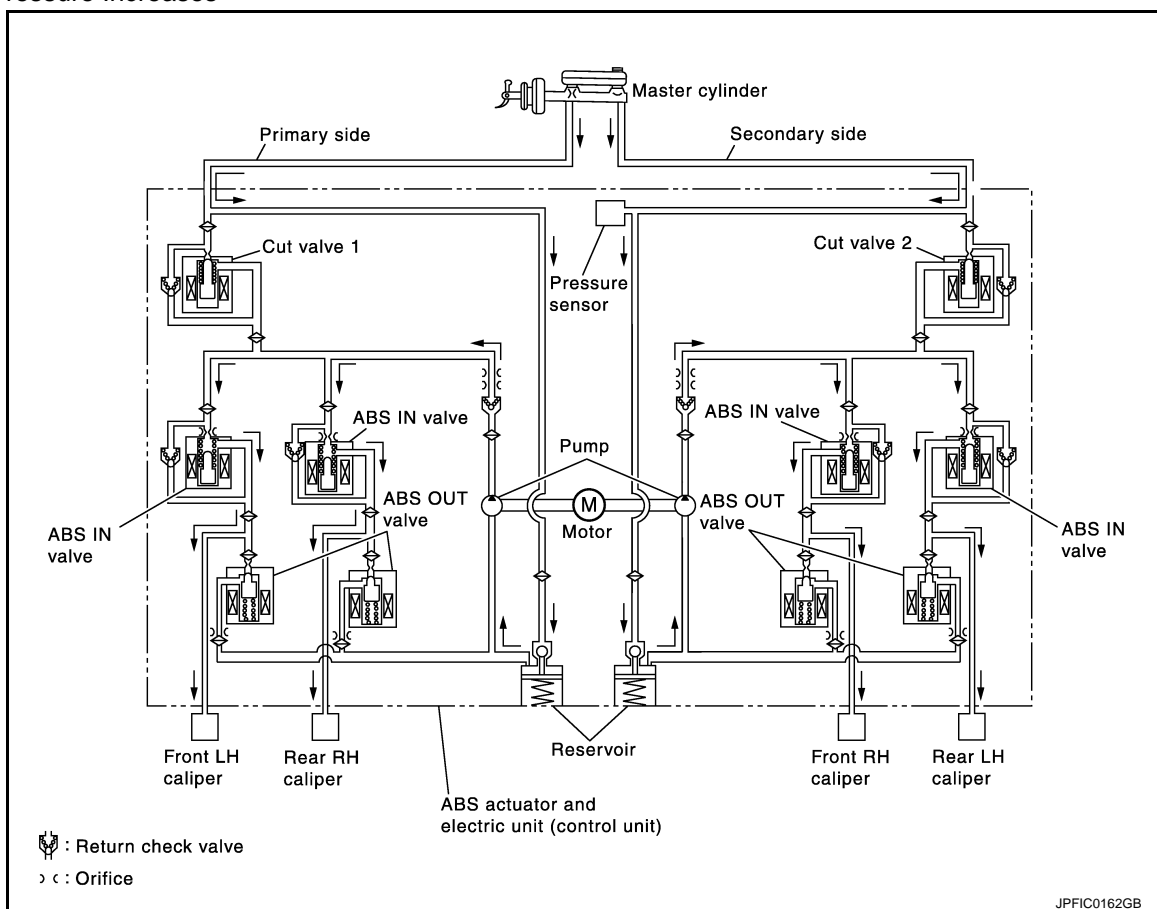
VALVE OPERATION (OTHER THAN ABS AND EBD)

Each valve is operated and fluid pressure of brake caliper is controlled.

NOTE:

There is no operation to hold and increase pressure for functions other than ABS and EBD.

When Pressure Increases



| Name | Not activated | When Pressure Increases |
|-------------|-------------------------------------|---|
| Cut valve 1 | Power supply is not supplied (open) | Wheel other than the one that the pressure is to be increased: Power supply is not supplied (open) Only wheel that the pressure is to be increased: Power supply is supplied (close) |
| Cut valve 2 | Power supply is not supplied (open) | Wheel other than the one that the pressure is to be increased: Power supply is not supplied (open) Only wheel that the pressure is to be increased: Power supply is supplied (close) |

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| Name | Not activated | When Pressure Increases |
|-------------------------------|--------------------------------------|---|
| ABS IN valve | Power supply is not supplied (open) | Only wheel that the pressure is to be increased: Power supply is not supplied (open) Wheel other than the one that the pressure is to be increased: Power supply is supplied (close) |
| ABS OUT valve | Power supply is not supplied (close) | Power supply is not supplied (close) |
| Each caliper (fluid pressure) | — | Pressure increases |

When front RH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front RH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

When front LH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front LH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

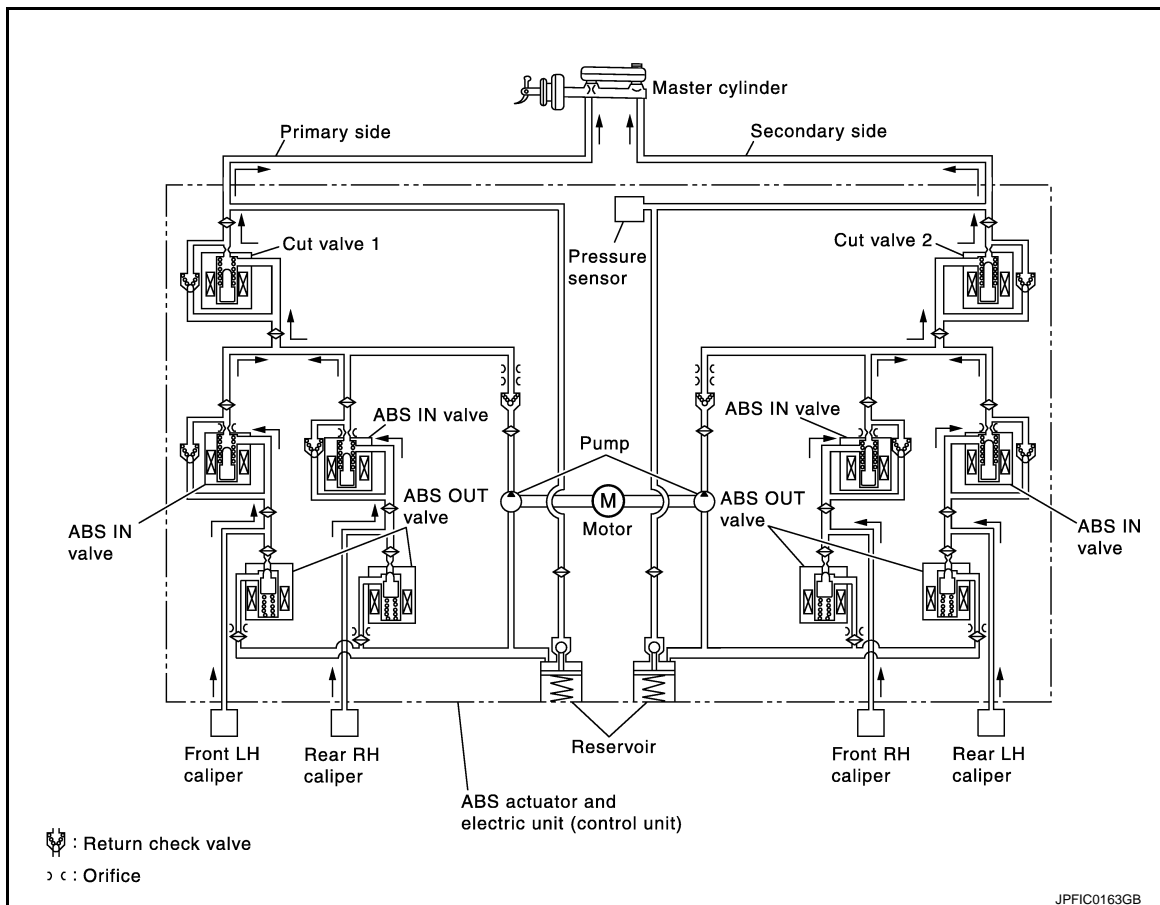
When rear RH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front RH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

When rear LH wheel caliper pressure increases

- Motor is activated. Brake fluid from pump is supplied to front LH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

Released



SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

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

When front RH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being returned to master cylinder through ABS IN valve, fluid pressure of brake caliper is decreased.

Component Parts and Function

| Component | Function |
|----------------------------|--|
| Reservoir | Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper. |
| Pump | Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure. |
| Motor | Drives the pump according to signals from control unit. |
| ABS IN valve | Switches the fluid pressure line to increase or hold according to signals from control unit. |
| ABS OUT valve | Switches the fluid pressure line to increase, hold or decrease according to signals from control unit. |
| Return check valve | Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released. |
| Cut valve 1 Cut valve 2 | Performs the duty control of fluid pressure increased by pump according to signals from control unit. |
| Pressure Sensor | Detects the brake pedal operation amount. |

CONDITION FOR TURN ON THE WARNING LAMP

ABS Warning Lamp

- Turns ON at the same time as VDC warning lamp when either ABS function or EBD function is malfunctioning.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

| Condition (status) | ABS warning lamp |
|---|------------------|
| Ignition switch OFF | OFF |
| For approx. 1 seconds after the ignition switch is turned ON | ON |
| Approx. 1 seconds after ignition switch is turned ON (when the system is in normal operation) | OFF |
| ABS function is malfunctioning | ON |
| EBD function is malfunctioning | ON |

Brake Warning Lamp

- Turns ON at the same time as ABS warning lamp and VDC warning lamp when EBD function is malfunctioning.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

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

VDC Warning Lamp

- Turns ON when either VDC function, TCS function, ABS function or EBD function is malfunctioning.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

| Condition (status) | VDC warning lamp |
|--|------------------|
| Ignition switch OFF. | OFF |
| For approx. 1 seconds after the ignition switch is turned ON | ON |
| Approx. 1 seconds after ignition switch is turned ON (when the system is in normal operation). | OFF |
| VDC function is malfunctioning | ON |
| TCS function is malfunctioning | ON |
| ABS function is malfunctioning | ON |
| EBD function is malfunctioning | ON |
| VDC function is operating | Blinking |
| TCS function is operating | Blinking |

IBA OFF indicator lamp

- Turns ON when Active trace control function is malfunctioning.

NOTE:

Lamp ON condition of intelligent brake assistance OFF indicator lamp is that intelligent brake assistance OFF switch is in the pressed and not turned ON status.

CONDITION FOR TURN ON THE INDICATOR LAMP

VDC OFF indicator lamp

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

| Condition (status) | VDC OFF indicator lamp |
|--|------------------------|
| Ignition switch OFF. | OFF |
| For approx. 1 seconds after the ignition switch is turned ON | ON |
| Approx. 1 seconds after ignition switch is turned ON (when the system is in normal operation). | OFF |
| When VDC OFF switch is ON (VDC function, TCS function and Active trace control function are OFF) | ON |

Fail-Safe

INFOID:0000000010099771

VDC FUNCTION, TCS FUNCTION, hill start assist FUNCTION, RISE-UP & BUILD-UP FUNCTION

AND BRAKE FORCE DISTRIBUTION 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, hill start assist function, Rise-up & Build-up function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, hill start assist function, Rise-up & Build-up function and Brake force distribution 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, hill start assist function, Rise-up & Build-up function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, hill start assist function, Rise-up & Build-up function and Brake force distribution 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, hill start assist function, Rise-up & Build-up function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function and Brake force distribution function.

ACTIVE TRACE CONTROL FUNCTION

- Intelligent brake assistance OFF indicator lamp turns ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for Active trace control function. The vehicle becomes the same as models without Active trace control function.

CAUTION:

Lamp ON condition of intelligent brake assistance OFF indicator lamp is that intelligent brake assistance OFF switch is in the pressed and not turned ON status.

- Mode is fixed to the mode when a malfunction occurs if CAN communication malfunction (DTC "U1000", DTC "U1010", DTC "U0424") occurs between ADAS control unit and A/C auto AMP. The mode is fixed to STANDARD mode after ignition switch turns OFF to ON.

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition | |
|-------|---|--|-----|
| C1101 | When an open circuit is detected in rear RH wheel sensor circuit. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function • Rise-up & Build-up function • Brake force distribution function | A |
| 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. | | B |
| C1104 | When an open circuit is detected in front LH wheel sensor circuit. | | |
| C1105 | <ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. | | C |
| C1106 | <ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. | | D |
| C1107 | <ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. | | E |
| C1108 | <ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. | | |
| C1109 | <ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function | BRC |
| C1111 | When a malfunction is detected in motor or motor relay. | | G |
| C1115 | When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified. | | H |
| C1116 | When stop lamp switch signal is not input when brake pedal operates. | | I |
| C1120 | When a malfunction is detected in front LH ABS IN valve. | | J |
| C1121 | When a malfunction is detected in front LH ABS OUT valve. | | K |
| C1122 | When a malfunction is detected in front RH ABS IN valve. | | L |
| C1123 | When a malfunction is detected in front RH ABS OUT valve. | | M |
| C1124 | When a malfunction is detected in rear LH ABS IN valve. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function | N |
| C1125 | When a malfunction is detected in rear LH ABS OUT valve. | | |
| C1126 | When a malfunction is detected in rear RH ABS IN valve. | | O |
| C1127 | When a malfunction is detected in rear RH ABS OUT valve. | | P |
| C1130 | When a malfunction is detected in ECM system. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function | |

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|--------|--|--|
| C1140 | When a malfunction is detected in actuator relay. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1142 | When a malfunction is detected in pressure sensor. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1143 | When a malfunction is detected in steering angle sensor. | |
| C1144 | When neutral position adjustment of steering angle sensor is not complete. | |
| C1145 | When a malfunction is detected in yaw rate signal. | |
| C1146 | When a malfunction is detected in side/decel G signal. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1155 | When brake fluid level low signal is detected. | |
| C1160 | When calibration of yaw rate/side/decel G sensor is not complete. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1164 | When a malfunction is detected in cut valve 1. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1165 | When a malfunction is detected in cut valve 2. | |
| C1170 | When the information in ABS actuator and electric unit (control unit) is not the same. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1197 | When a malfunction is detected in vacuum sensor. | Electrical vacuum assistance of brake booster is suspended. |
| C1198 | <ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. | |
| C1199 | When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running. | — |
| C119A | When a malfunction is detected in supply power voltage of vacuum sensor. | Electrical vacuum assistance of brake booster is suspended. |
| U1000 | When CAN communication signal is not continuously received for 2 seconds or more. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| U0424* | When signal that is transmitted from A/C auto AMP. is not the latest information. | Mode is fixed to the mode when a malfunction of drive mode selector occurs. The mode is fixed to STANDARD mode after ignition switch turns OFF to ON. |

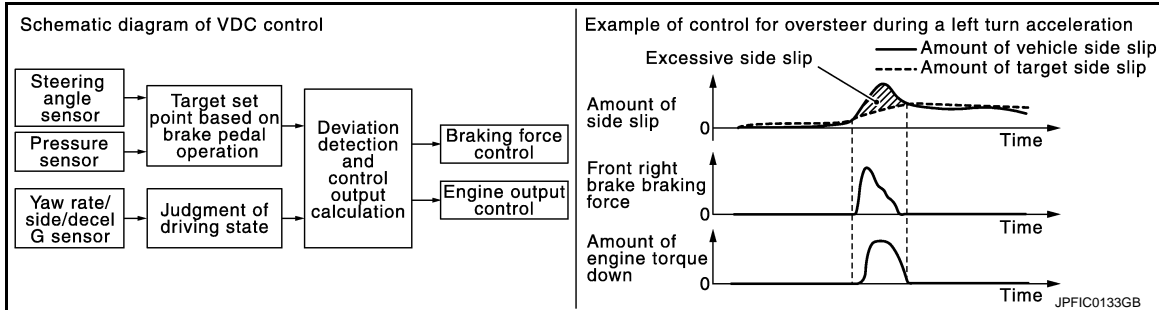
*: This is DTC that is detected in ADAS control unit side.

VDC FUNCTION

VDC FUNCTION : System Description

INFOID:0000000010099772

- 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 and brake operation amount from brake pressure sensor. By comparing this information with vehicle side slip amount that is calculated from information from yaw rate/side/decel G sensor and wheel sensor, vehicle driving conditions (conditions of understeer or oversteer) are judged and vehicle stability is improved by brake force control on all 4 wheels and engine output control.

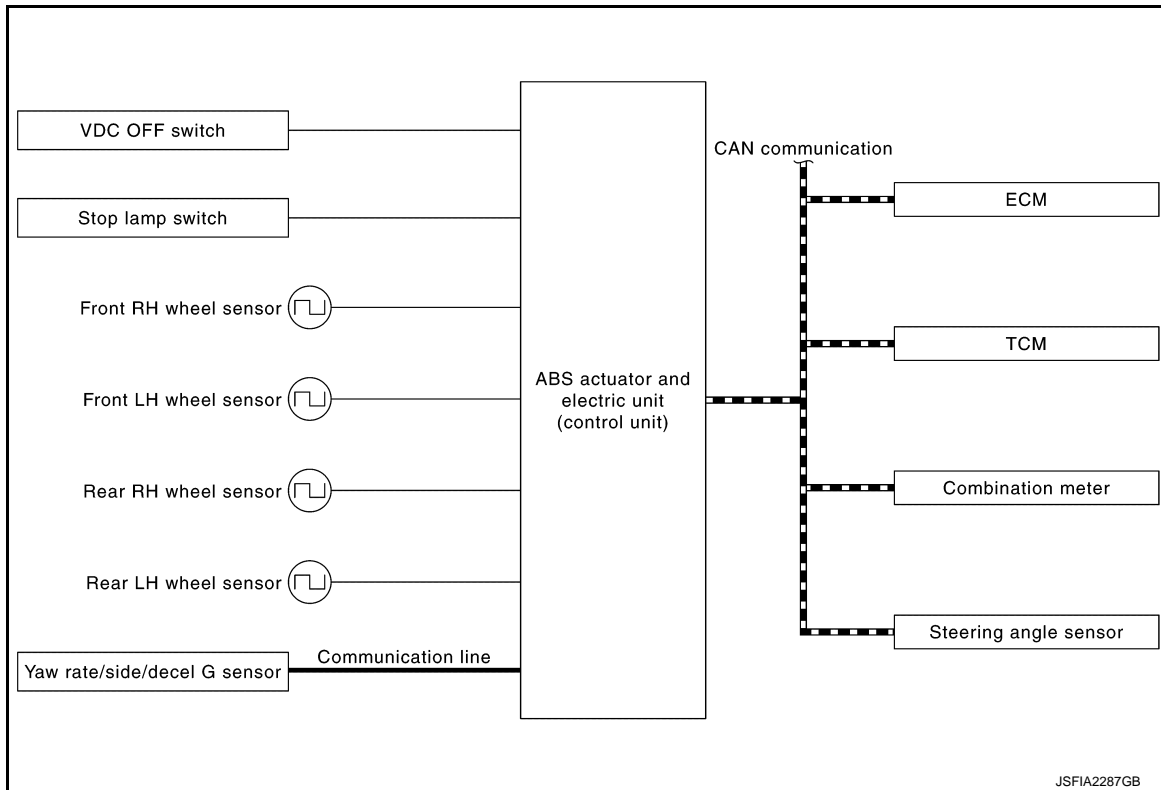


- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to 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.
- VDC function has brake limited slip differential (BLSD) function. 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 turns ON when Brake limited slip differential (BLSD) function is in operation. Noises and vibration may be generated due to brake operation. This is not a malfunction.
- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. The vehicle status becomes the same as models without VDC function, TCS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. However, ABS function and EBD function are operated normally. Refer to [BRC-23. "Fail-Safe"](#).

NOTE:

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

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

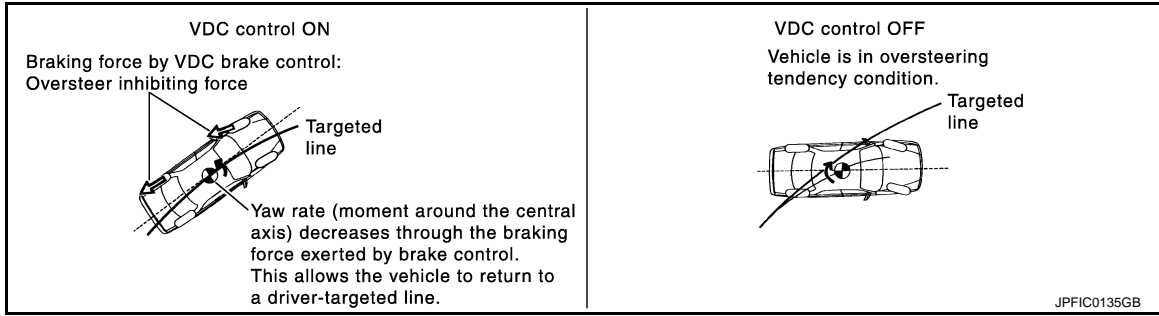
| Component | Signal description |
|------------------------------|--|
| Yaw rate/side/decel G sensor | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*.</p> <ul style="list-style-type: none"> • Yaw rate signal • Side G sensor signal • Decel G sensor signal |
| ECM | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Acceleration pedal position signal • Engine speed signal <p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Target throttle position signal |
| TCM | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Shift position signal |
| Steering angle sensor | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Steering angle sensor signal |
| Combination meter | <p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal <p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal |

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

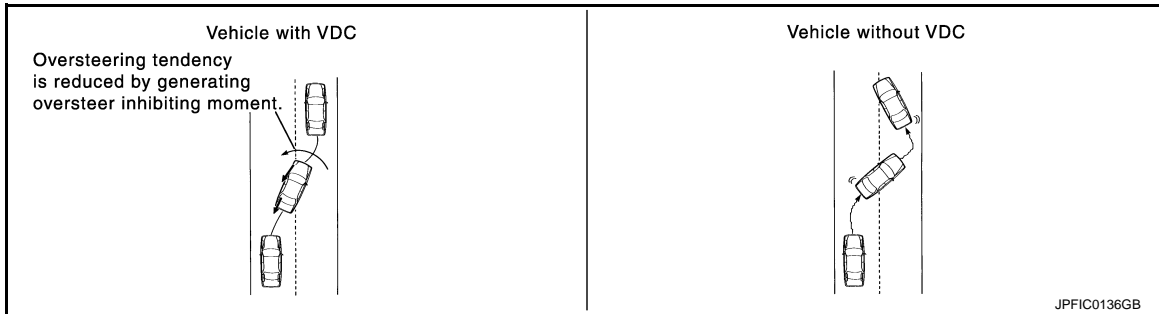
OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

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

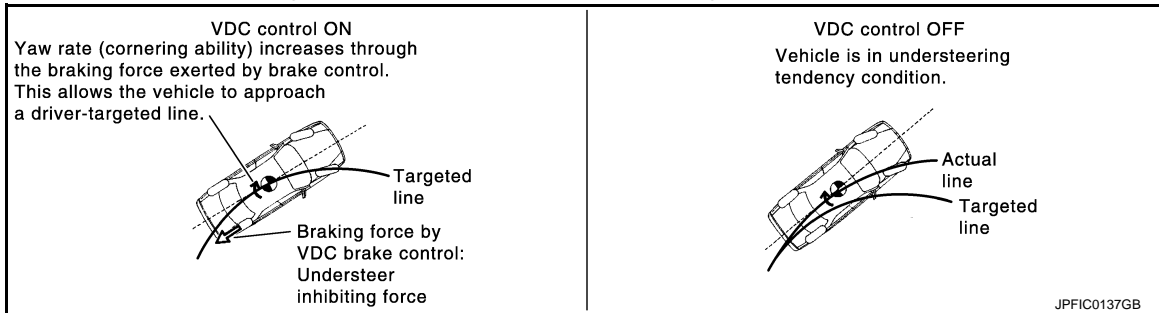


- Changing driving lane on a slippery road, when oversteer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

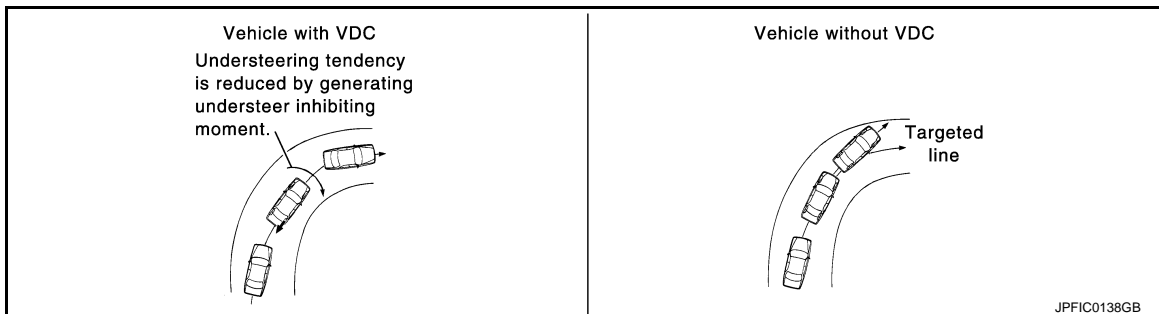


VDC Function That Prevents Understeer Tendency

- 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.

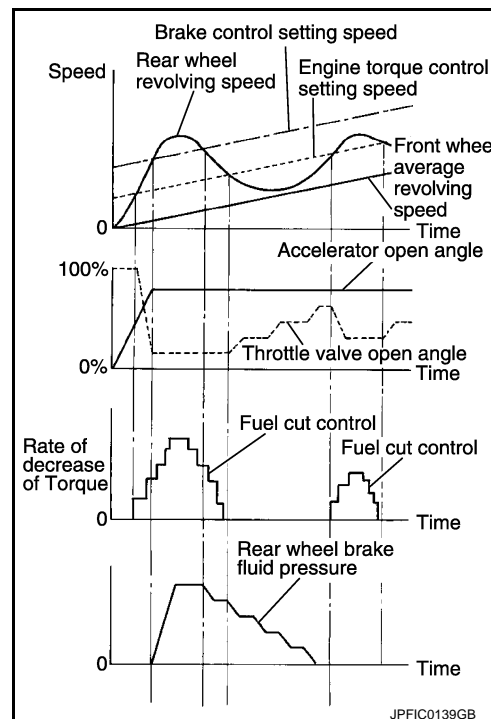


TCS FUNCTION

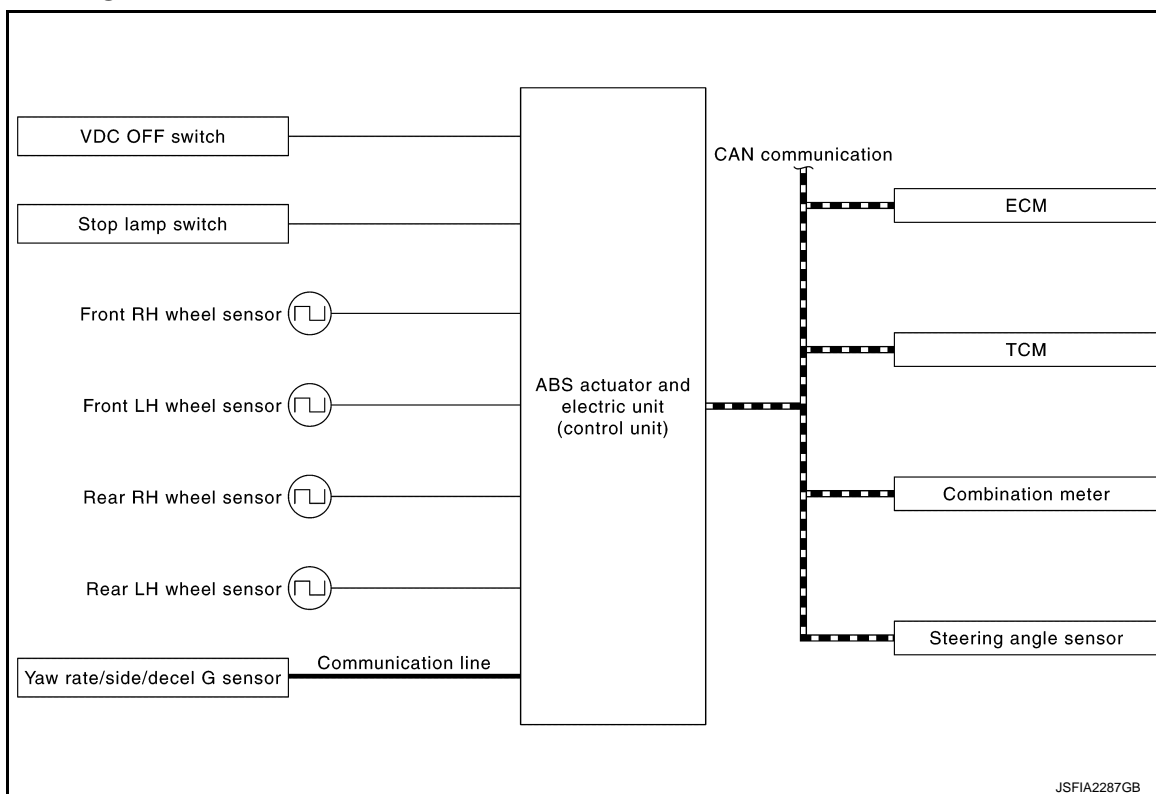
TCS FUNCTION : System Description

INFOID:000000010099773

- 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. The vehicle status becomes the same as models without VDC function, TCS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. However, ABS function and EBD function are operated normally. Refer to [BRC-23, "Fail-Safe"](#).



SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| Component | Signal description |
|------------------------------|--|
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Target throttle position signal |
| TCM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Shift position signal |
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Steering angle sensor signal |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal |

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

ABS FUNCTION

ABS FUNCTION : System Description

INFOID:0000000010099774

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

SYSTEM

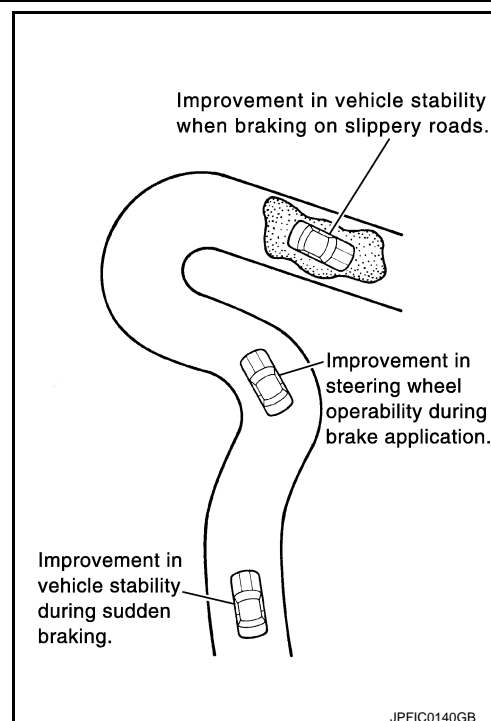
< SYSTEM DESCRIPTION >

[WITH VDC]

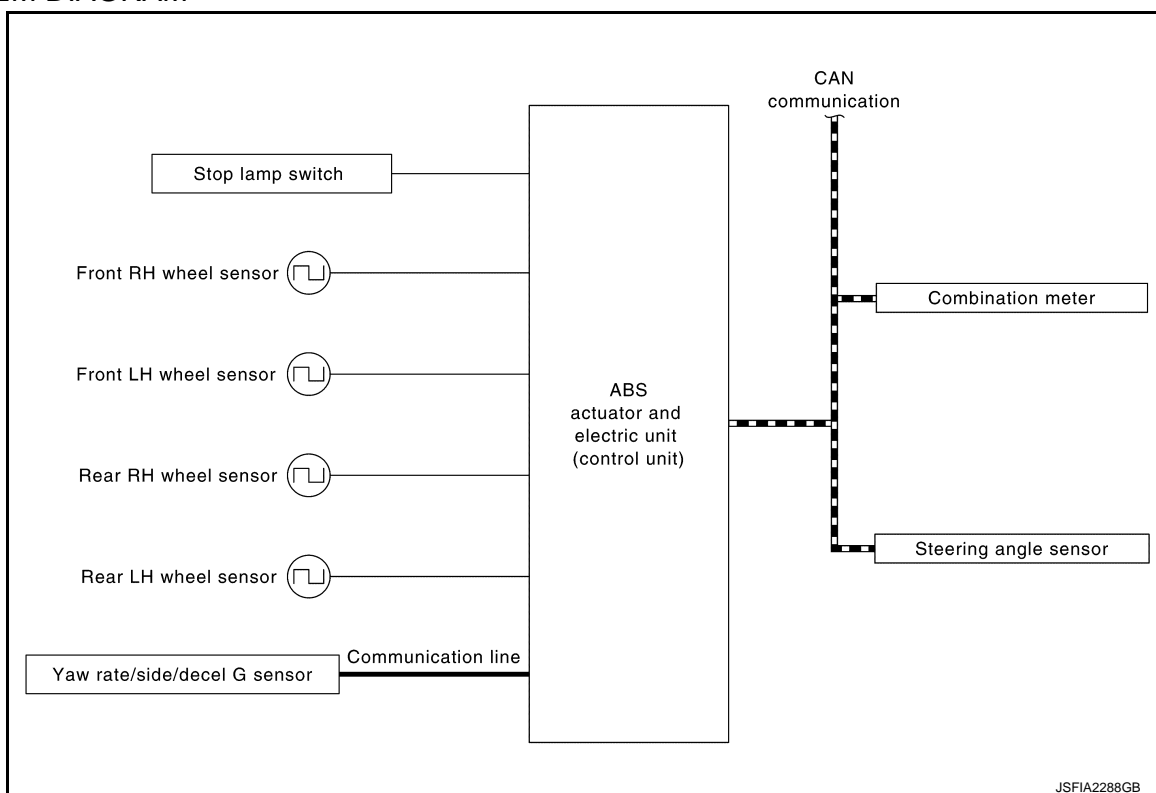
- The following effects are obtained by preventing wheel lock during braking.
 - Vehicle tail slip is prevented during braking when driving straight.
 - Understeer and oversteer tendencies are moderated during braking driving on a corner.
 - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. However, EBD function is operated normally. Refer to [BRC-23. "Fail-Safe"](#).

NOTE:

- ABS has the characteristic as described here, This 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 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 MPH)]. Motor sounds are generated during self-diagnosis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.



SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

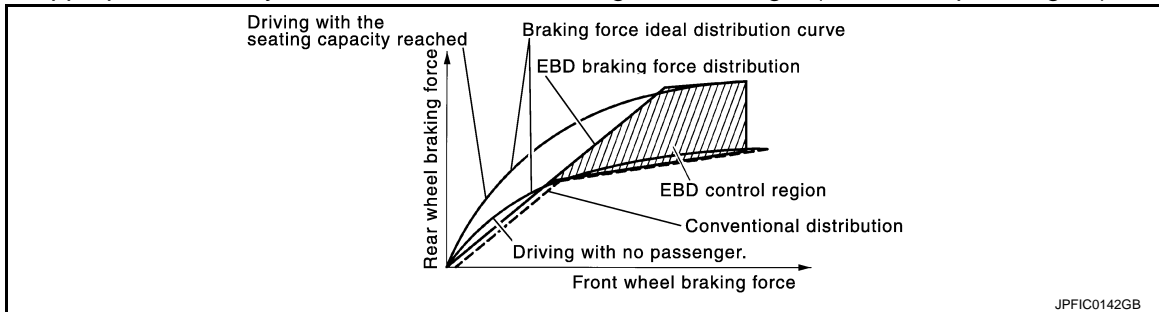
| Component | Signal description |
|-----------------------|--|
| Steering angle sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Steering angle sensor signal |
| Combination meter | Mainly receives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

EBD FUNCTION

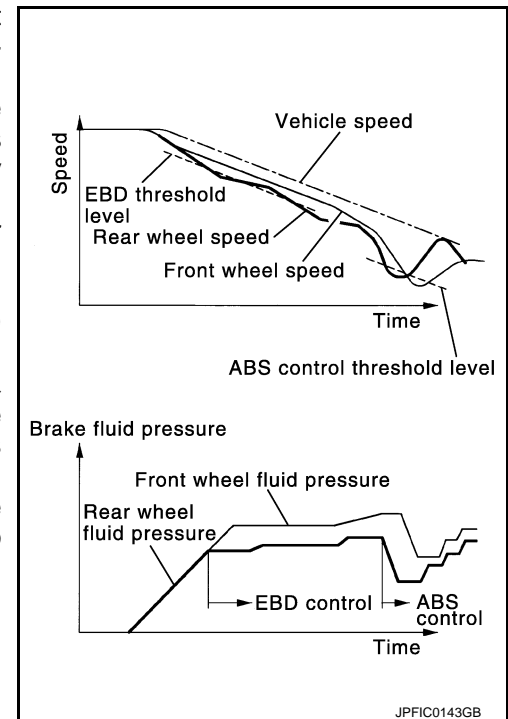
EBD FUNCTION : System Description

INFOID:000000010099775

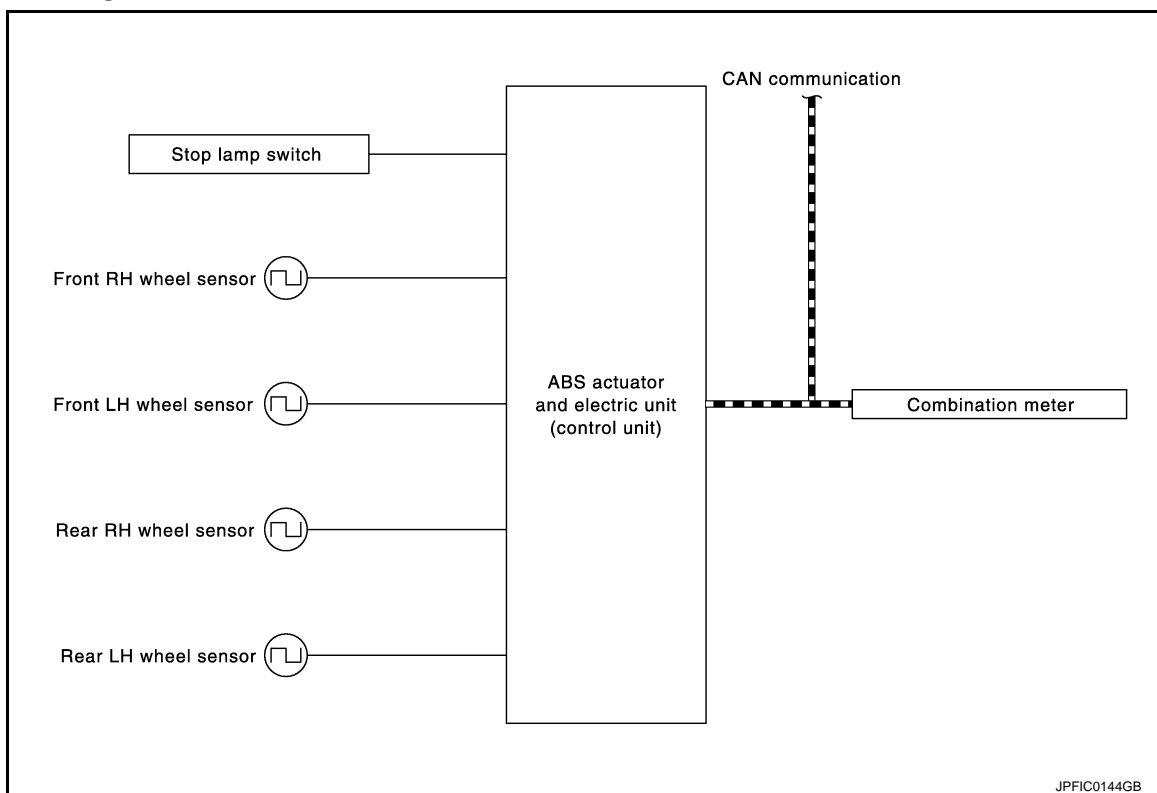
- By preventing rear wheel slip increase through rear wheel brake force (brake fluid pressure) control that is electronically controlled when slight skip on front and rear wheels are detected during braking, stability during braking is improved.
- EBD function is expanded and developed from conventional 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, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. Refer to [BRC-23. "Fail-Safe"](#).



SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

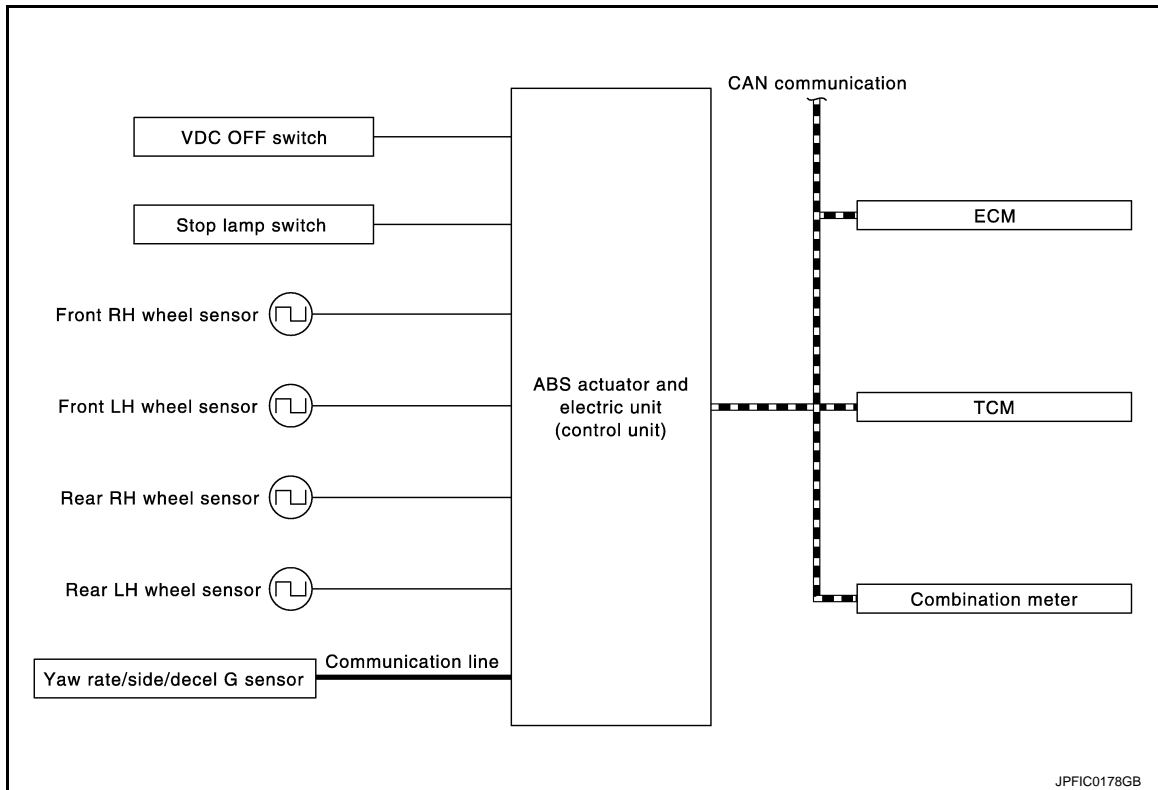
Hill start assist FUNCTION

Hill start assist FUNCTION : System Description

INFOID:0000000010099776

- This function maintains brake fluid pressure so that the vehicle does not move backwards even if brake pedal is released to depress accelerator pedal to start the vehicle while it is stopped on an uphill slope by depressing brake pedal.
- This function operates when the vehicle is in stop status on a uphill slope of slope ratio 10% or more and selector lever is in the position other than P or N.
- hill start assist function is only for the start aid. It maintains the brake fluid pressure for approx. 2 seconds after releasing the brake pedal, and then decreases the pressure gradually. If the vehicle can start by the accelerator operation, the brake is released automatically and a smooth start can be performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. The vehicle status becomes the same as models without VDC function, TCS function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function. However, ABS function and EBD function are operated normally. Refer to [BRC-23, "Fail-Safe"](#).

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

| Component | Signal description |
|------------------------------|--|
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Target throttle position signal |
| TCM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Shift position signal |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal |

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

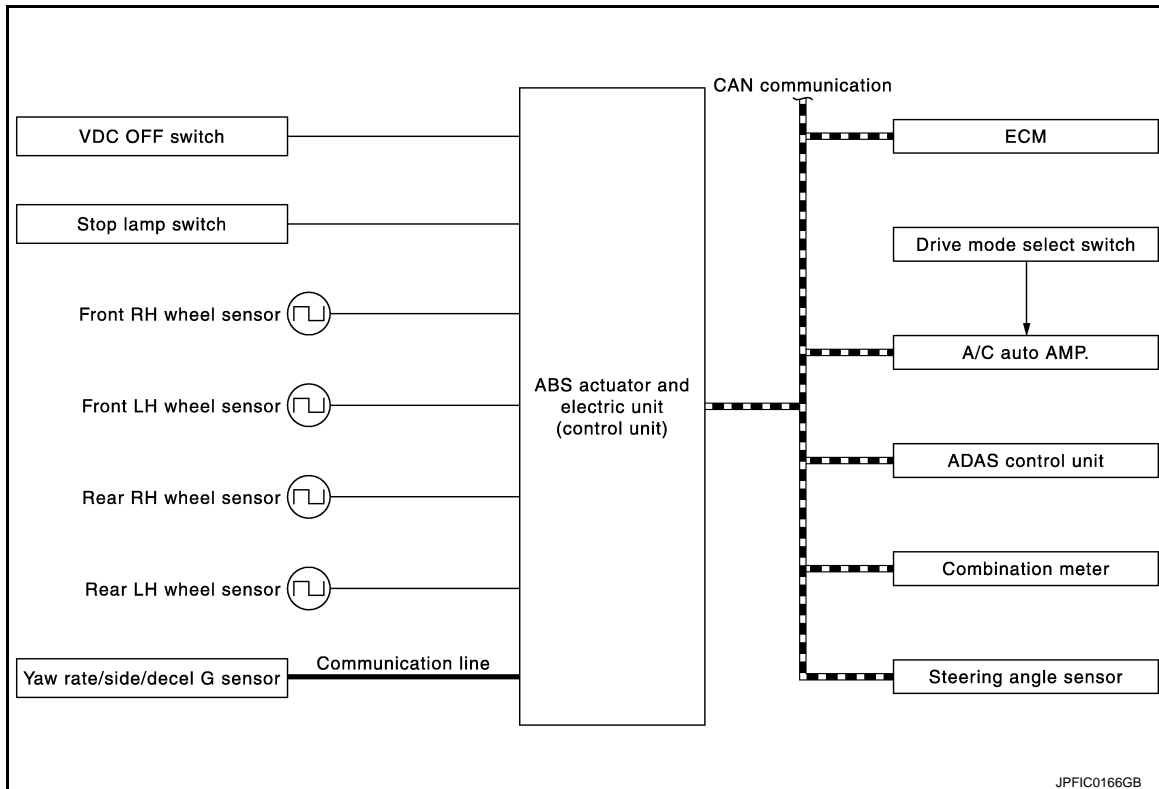
ACTIVE STABILITY ASSIST

ACTIVE STABILITY ASSIST : System Description

INFOID:000000010099777

- Combination of Active trace control function, Rise-up & Build-up function and Brake force distribution function is named to as Active stability assist. Active trace control function is available for models with ICC system.
- Active stability assist system is aimed to smooth the vehicle movement utilizing VDC function for enjoyable driving with reliable feeling of the driver.
- Active trace control function
- Active Trace Control helps enhance the transition from braking into and then accelerating out of corners. Active Trace Control utilizes the vehicle's VDC system to help improve cornering feel by automatically applying brakes, or smoothening engine torque characteristics while accelerating. Furthermore, Active Trace Control will apply selective braking to help create increased steering response in S-turns. For example, if driving through an S-turn that starts with steering to the right, the right-side brakes are engaged to create a yaw moment and help turn the vehicle. When steering back to the left, left-side brakes are engaged. Refer to [BRC-37, "ACTIVE STABILITY ASSIST : Active Trace Control Function"](#).
- Rise-up & Build-up function
- Rise-up & Build-up gives the drivers secure brake feeling with optimized braking characteristics according to the amount of brake operation and the behavior of vehicle. Refer to [BRC-39, "ACTIVE STABILITY ASSIST : Rise-up & Build-up Function"](#).
- Brake Force Distribution function
- During braking, Brake force Distribution optimizes the distribution of brake force to each of the four wheels depending on the state of the turn detected by driver's steering and some sensors. Brake force Distribution helps provide a more stable and secure feeling. Refer to [BRC-39, "ACTIVE STABILITY ASSIST : Brake Force Distribution Function"](#).
- Active trace control can be switched to operational status or non-operational status by operating VDC OFF switch to ON/OFF.

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >

[WITH VDC]

| Component | Signal description |
|---|--|
| ADAS control unit | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Active trace control signal |
| ECM | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Target throttle position signal |
| ABS actuator and electric unit (control unit) | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Vehicle speed signal (ABS) Stop lamp switch signal (brake signal) VDC OFF switch signal Yaw rate signal Side G sensor signal Decel G sensor signal |
| Yaw rate/side/decel G sensor | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *. <ul style="list-style-type: none"> Yaw rate signal Side G sensor signal Decel G sensor signal |
| Drive mode select switch | Outputs ON/OFF status of STANDARD, SPORT, ECO, SNOW mode to A/C auto AMP. |
| A/C auto AMP | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Drive mode select switch signal |
| Steering angle sensor | Mainly transmits the following signals to ADAS control unit via CAN communication. <ul style="list-style-type: none"> Steering angle sensor signal |
| Combination meter | Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> Brake fluid level switch signal Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> VDC OFF indicator lamp signal VDC warning lamp signal Mainly receives the following signals from ADAS control unit via CAN communication. <ul style="list-style-type: none"> IBA warning lamp signal |

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

ACTIVE STABILITY ASSIST : Active Trace Control Function

INFOID:0000000010099778

- Active trace control function is calculated by ADAS control unit and transmits command to ABS actuator and electric unit (control unit).
- This system senses driving based on the driver's steering and acceleration/braking patterns, and individually controls the braking and application of engine torque to each of the four wheels to help smooth vehicle response.
- When the drive mode selector switch is set to the "SPORT" mode, the amount of brake control provided by Active trace control function is reduced.
- When the VDC OFF switch is turn OFF the VDC function, the Active trace control function is also turned OFF.
- Active trace control function is malfunctioning properly, the IBA OFF indicator lamp turns ON.

NOTE:

Effect to decrease delay of vehicle yaw rate in response to steering operation may not always be obtained in all driving conditions (example: when road surface resistance is low).

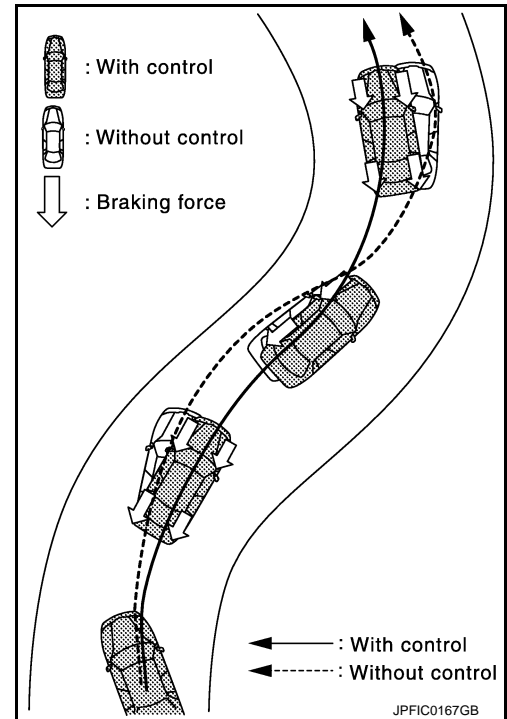
OPERATION CHARACTERISTICS

SYSTEM

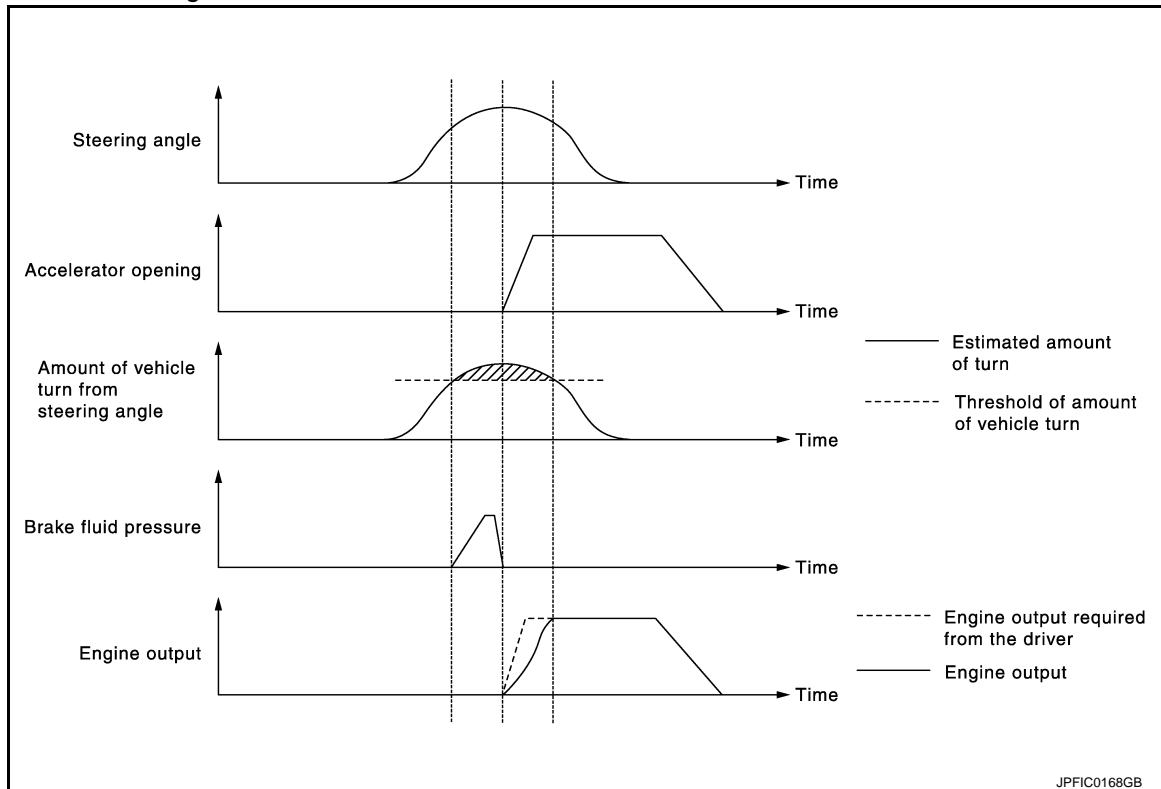
< SYSTEM DESCRIPTION >

[WITH VDC]

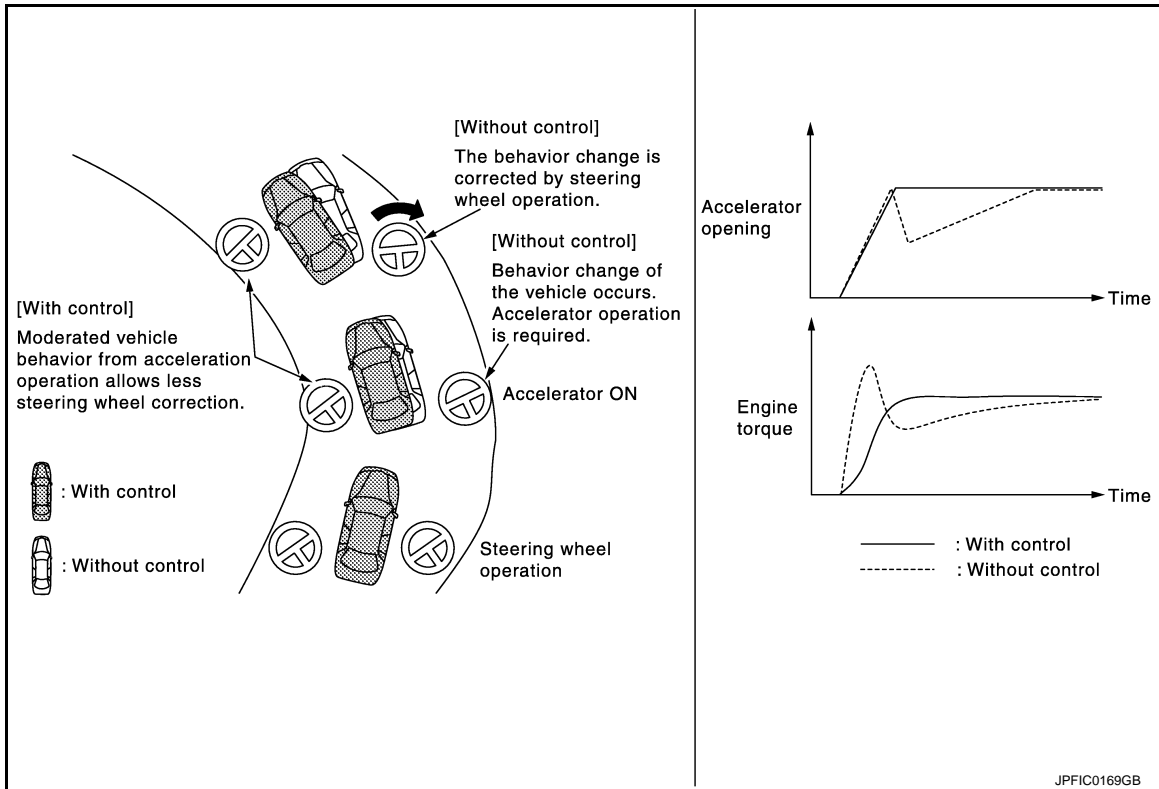
Active Trace Control helps enhance the transition from braking into and then accelerating out of corners. Active Trace Control utilizes the vehicle's VDC system to help improve cornering feel by automatically applying brakes, or smoothening engine torque characteristics while accelerating. Furthermore, Active Trace Control will apply selective braking to help create increased steering response in S-turns. For example, if driving through an S-turn that starts with steering to the right, the right-side brakes are engaged to create a yaw moment and help turn the vehicle.



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



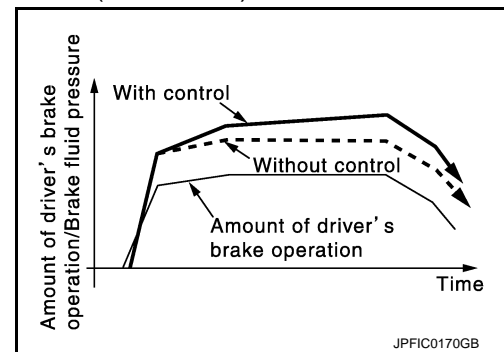
- By preventing a sudden torque change, vehicle behavior moderates. As a result, accelerator pedal operation by the driver is improved.



ACTIVE STABILITY ASSIST : Rise-up & Build-up Function

INFOID:0000000010099779

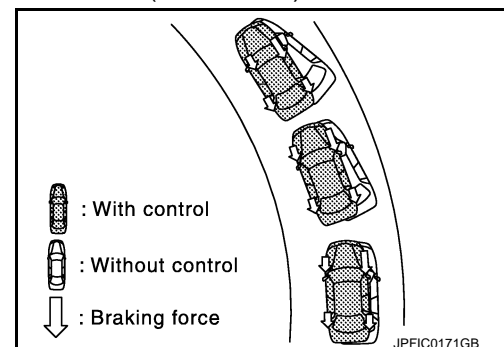
- Rise-up & Build-up function is controlled by ABS actuator and electric unit (control unit).
- The system gradually adjusts braking power during normal braking to help provide an enhanced brake feel.
- VDC warning lamp turns ON when Rise-up & Build-up function is malfunctioning.



ACTIVE STABILITY ASSIST : Brake Force Distribution Function

INFOID:0000000010099780

- Brake force distribution function is controlled by ABS actuator and electric unit (control unit).
- Brake force distribution function helps provide a more stable and secure feeling.



SYSTEM

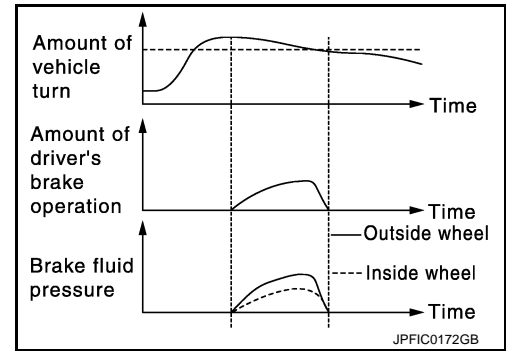
< SYSTEM DESCRIPTION >

[WITH VDC]

- During cornering, when brake operation is performed brake fluid pressure of each wheel is controlled based on steering operation amount by the driver and vehicle cornering status amount detected by each sensor.
- VDC warning lamp turn ON when Brake force distribution function is malfunctioning.

NOTE:

Brake force distribution function may not always be operates in all driving conditions.



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

< SYSTEM DESCRIPTION >

[WITH VDC]

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

CONSULT Function

INFOID:0000000010099781

APPLICATION ITEMS

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

| Mode | Function description |
|------------------------|--|
| ECU identification | Parts number of ABS actuator and electric unit (control unit) can be read. |
| Self Diagnostic Result | Self-diagnostic results and freeze frame data can be read and erased quickly.* |
| DATA MONITOR | Input/Output data in the ABS actuator and electric unit (control unit) can be read. |
| ACTIVE TEST | Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range. |
| WORK SUPPORT | Components can be quickly and accurately adjusted. |

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Refer to [BRC-52, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result,

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result,

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

Freeze frame data (FFD)

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

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

ACTIVE TEST

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

CAUTION:

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

NOTE:

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

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

< SYSTEM DESCRIPTION >

[WITH VDC]

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

ABS IN Valve and ABS OUT Valve

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

| Test item | Display Item | Display | | |
|-----------|---------------|---------|------|------|
| | | Up | Keep | Down |
| FR RH SOL | FR RH IN SOL | Off | On* | On* |
| | FR RH OUT SOL | Off | Off | On* |
| | CV2 | Off | Off | Off |
| FR LH SPL | FR LH IN SOL | Off | On* | On* |
| | FR LH OUT SOL | Off | Off | On* |
| | CV1 | Off | Off | Off |
| RR RH SOL | RR RH IN SOL | Off | On* | On* |
| | RR RH OUT SOL | Off | Off | On* |
| | CV1 | Off | Off | Off |
| RR LH SOL | RR LH IN SOL | Off | On* | On* |
| | RR LH OUT SOL | Off | Off | On* |
| | CV2 | Off | Off | Off |

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

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

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

ABS MOTOR

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

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

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

< SYSTEM DESCRIPTION >

[WITH VDC]

NOTE:

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

DATA MONITOR

NOTE:

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

×: Applicable

| Item (Unit) | Monitor item selection | | Note |
|------------------------------|------------------------|------------|---|
| | INPUT SIGNALS | MAIN ITEMS | |
| FR LH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by front LH wheel sensor is displayed. |
| FR RH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by front RH wheel sensor is displayed. |
| RR LH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by rear LH wheel sensor is displayed. |
| RR RH SENSOR [km/h (MPH)] | × | × | Wheel speed calculated by rear RH wheel sensor is displayed. |
| BATTERY VOLT (V) | × | × | Voltage supplied to ABS actuator and electric unit (control unit) is displayed. |
| STOP LAMP SW (On/Off) | × | × | Stop lamp switch signal input status is displayed. |
| OFF SW (On/Off) | × | × | VDC OFF switch signal input status is displayed. |
| YAW RATE SEN (d/s) | × | × | Yaw rate detected by yaw rate sensor is displayed. |
| FR RH IN SOL (On/Off) | | × | Operation status of front RH wheel ABS IN valve is displayed. |
| FR RH OUT SOL (On/Off) | | × | Operation status of front RH wheel ABS OUT valve is displayed. |
| FR LH IN SOL (On/Off) | | × | Operation status of front LH wheel ABS IN valve is displayed. |
| FR LH OUT SOL (On/Off) | | × | Operation status of front LH wheel ABS OUT valve is displayed. |
| RR RH IN SOL (On/Off) | | × | Operation status of rear RH wheel ABS IN valve is displayed. |
| RR RH OUT SOL (On/Off) | | × | Operation status of rear RH wheel ABS OUT valve is displayed. |
| RR LH IN SOL (On/Off) | | × | Operation status of rear LH wheel ABS IN valve is displayed. |
| RR LH OUT SOL (On/Off) | | × | Operation status of rear LH wheel ABS OUT valve is displayed. |
| MOTOR RELAY (On/Off) | | × | ABS motor and motor relay status is displayed. |
| ACTUATOR RLY (On/Off) | | × | ABS actuator relay status is displayed. |
| ABS WARN LAMP (On/Off) | | × | ABS warning lamp ON/OFF status is displayed. (Note 1) |
| OFF LAMP (On/Off) | | × | VDC OFF indicator lamp ON/OFF status is displayed. (Note 1) |
| SLIP/VDC LAMP (On/Off) | | × | VDC warning lamp ON/OFF status is displayed. (Note 1) |
| ACCEL POS SIG (%) | × | | Displays the Accelerator pedal position |

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

< SYSTEM DESCRIPTION >

[WITH VDC]

| Item (Unit) | Monitor item selection | | Note |
|--|------------------------|------------|--|
| | INPUT SIGNALS | MAIN ITEMS | |
| SIDE G -ENSOR (m/s ²) | × | | Side G detected by side G sensor is displayed. |
| DECEL G-SEN (m/s ²) | × | | Decel G detected by decel G sensor is displayed. |
| STR ANGLE SIG (°) | × | | Steering angle detected by steering angle sensor is displayed. |
| ENGINE SPEED (tr/min) | × | | Engine speed status is displayed. |
| PRESS SENSOR (bar) | × | | Brake fluid pressure detected by pressure sensor is displayed. |
| FLUID LEV SW (On/Off) | × | | Brake fluid level signal input status via CAN communication is displayed. |
| PARK BRAKE SW (On/Off) | × | | Parking brake switch signal input status via CAN communication is displayed. |
| CV1 (On/Off) | | | Cut valve 1 operation status is displayed. |
| CV2 (On/Off) | | | Cut valve 2 operation status is displayed. |
| 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. |
| EBD WARN LAMP (On/Off) | | | Brake warning lamp ON/OFF status is displayed. (Note 1) |
| GEAR | × | × | Current gear position judged from current gear position signal is displayed. |
| N POSI SIG (On/Off) | | | N range signal input status judged from N range signal is displayed. |
| R POSI SIG (On/Off) | | | R range signal input status judged from R range signal is displayed. |
| 4WD MODE MON (Note 2) (AUTO/LOCK/2WD) | × | × | AWD control status is displayed. |
| USS SIG (Note 3) (On/Off) | | | hill start assist operation status is displayed. |

Note 1: Refer to [BRC-15. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 2: AWD models

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

< SYSTEM DESCRIPTION >

[WITH VDC]

Note 3: USS means “hill start assist”

WORK SUPPORT

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

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000010099782

CONSULT DATA MONITOR STANDARD VALUE

NOTE:

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

| Monitor item | Condition | Reference values in normal operation |
|---------------|----------------------------------|---|
| FR LH SENSOR | Vehicle stopped | 0.00 km/h (MPH) |
| | When driving ^(Note 1) | Nearly matches the speedometer display (within $\pm 10\%$) |
| FR RH SENSOR | Vehicle stopped | 0.00 km/h (MPH) |
| | When driving ^(Note 1) | Nearly matches the speedometer display (within $\pm 10\%$) |
| RR LH SENSOR | Vehicle stopped | 0.00 km/h (MPH) |
| | When driving ^(Note 1) | Nearly matches the speedometer display (within $\pm 10\%$) |
| RR RH SENSOR | Vehicle stopped | 0.00 km/h (MPH) |
| | When driving ^(Note 1) | Nearly matches the speedometer display (within $\pm 10\%$) |
| BATTERY VOLT | Ignition switch ON | 10 – 16 V |
| STOP LAMP SW | Brake pedal depressed | On |
| | Brake pedal not depressed | Off |
| OFF SW | VDC OFF switch ON | On |
| | VDC OFF switch OFF | Off |
| YAW RATE SEN | Vehicle stopped | Approx. 0 d/s |
| | Turning right | Negative value |
| | Turning left | Positive value |
| FR RH IN SOL | Active | On |
| | Not activated | Off |
| FR RH OUT SOL | Active | On |
| | Not activated | Off |
| FR LH IN SOL | Active | On |
| | Not activated | Off |
| FR LH OUT SOL | Active | On |
| | Not activated | Off |
| RR RH IN SOL | Active | On |
| | Not activated | Off |
| RR RH OUT SOL | Active | On |
| | Not activated | Off |
| RR LH IN SOL | Active | On |
| | Not activated | Off |
| RR LH OUT SOL | Active | On |
| | Not activated | Off |

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| Monitor item | Condition | Reference values in normal operation |
|---------------|--|--------------------------------------|
| MOTOR RELAY | Active | On |
| | Not activated | Off |
| ACTUATOR RLY | Active | On |
| | When not operating (in fail-safe mode) | Off |
| ABS WARN LAMP | When ABS warning lamp is ON ^(Note 2) | On |
| | When ABS warning lamp is OFF ^(Note 2) | Off |
| OFF LAMP | When VDC OFF indicator lamp is ON ^(Note 2) | On |
| | When VDC OFF indicator lamp is OFF ^(Note 2) | Off |
| SLIP/VDC LAMP | When VDC warning lamp is ON ^(Note 2) | On |
| | When VDC warning lamp is OFF ^(Note 2) | Off |
| ACCEL POS SIG | Never depress accelerator pedal (with ignition switch ON) | 0% |
| | Depress accelerator pedal (with ignition switch ON) | 0 – 100% |
| SIDE G-SENSOR | Vehicle stopped | Approx. 0 m/s ² |
| | Right turn | Negative value |
| | Left turn | Positive value |
| DECEL G-SEN | When stopped | Approx. 0 m/s ² |
| | During acceleration | Positive value |
| | During deceleration | Negative value |
| STR ANGLE SIG | When driving straight | 0±2.5° |
| | When steering wheel is steered to LH by 90° | Approx. -90° |
| | When steering wheel is steered to RH by 90° | Approx. +90° |
| ENGINE SPEED | Engine stopped | 0 tr/min |
| | Engine running | Almost same reading as tachometer |
| PRESS SENSOR | Brake pedal not depressed | Approx. 0 bar |
| | Brake pedal depressed | (-40) – (+300 bar) |
| 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 |
| PARK BRAKE SW | When parking brake is active | On |
| | Parking brake is released | Off |
| CV1 | Active | On |
| | Not activated | Off |
| CV2 | Active | On |
| | Not activated | Off |
| EBD SIGNAL | EBD activated | On |
| | EBD not activated | Off |
| ABS SIGNAL | ABS is activated | On |
| | ABS is not activated | Off |
| TCS SIGNAL | TCS activated | On |
| | TCS not activated | Off |
| VDC SIGNAL | VDC activated | On |
| | VDC not activated | Off |

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[WITH VDC]

| Monitor item | Condition | Reference values in normal operation |
|----------------------------------|---|---|
| EBD FAIL SIG | In EBD fail-safe | On |
| | EBD is normal | Off |
| ABS FAIL SIG | In ABS fail-safe | On |
| | ABS is normal | Off |
| TCS FAIL SIG | In TCS fail-safe | On |
| | TCS is normal | Off |
| VDC FAIL SIG | In VDC fail-safe | On |
| | VDC is normal | Off |
| CRANKING SIG | At cranking | On |
| | Other than at cranking | Off |
| EBD WARN LAMP | When brake warning lamp is ON ^(Note 2) | On |
| | When brake warning lamp is OFF ^(Note 2) | Off |
| GEAR | Driving | 1 – 7 Depending on shift status |
| N POSI SIG | When selector lever is in the N position | On |
| | When selector lever is in the other position than N | Off |
| 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 ^(Note 3) | Always | AUTO, LOCK, 2WD (depending on AWD control status) |
| USS SIG ^(Note 4) | When hill start assist is active | On |
| | When hill start assist is not active | Off |

Note 1: Confirm tire pressure is standard value.

Note 2: Refer to [BRC-15. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 3: AWD models

Note 4: USS means "hill start assist"

Fail-Safe

INFOID:000000010099783

VDC FUNCTION, TCS FUNCTION, hill start assist FUNCTION, RISE-UP & BUILD-UP FUNCTION AND BRAKE FORCE DISTRIBUTION 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, hill start assist function, Rise-up & Build-up function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, hill start assist function, Rise-up & Build-up function and Brake force distribution 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, hill start assist function, Rise-up & Build-up function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, hill start assist function, Rise-up & Build-up function and Brake force distribution 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, hill start assist function, Rise-up & Build-up function and

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function and Brake force distribution function.

| DTC | Malfunction detected condition | Fail-safe condition |
|-------|---|--|
| C1101 | When an open circuit is detected in rear RH wheel sensor circuit. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1102 | When an open circuit is detected in rear LH wheel sensor circuit. | |
| C1103 | When an open circuit is detected in front RH wheel sensor circuit. | |
| C1104 | When an open circuit is detected in front LH wheel sensor circuit. | |
| C1105 | <ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. | |
| C1106 | <ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. | |
| C1107 | <ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. | |
| C1108 | <ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. | |
| C1109 | <ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. | |
| C1111 | When a malfunction is detected in motor or motor relay. | |
| C1115 | When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified. | <p>The following functions are suspended.</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1116 | When stop lamp switch signal is not input when brake pedal operates. | |
| C1120 | When a malfunction is detected in front LH ABS IN valve. | |
| C1121 | When a malfunction is detected in front LH ABS OUT valve. | |
| C1122 | When a malfunction is detected in front RH ABS IN valve. | |
| C1123 | When a malfunction is detected in front RH ABS OUT valve. | |
| C1124 | When a malfunction is detected in rear LH ABS IN valve. | |
| C1125 | When a malfunction is detected in rear LH ABS OUT valve. | |
| C1126 | When a malfunction is detected in rear RH ABS IN valve. | |
| C1127 | When a malfunction is detected in rear RH ABS OUT valve. | |

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|-------|--|--|
| C1130 | When a malfunction is detected in ECM system. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1140 | When a malfunction is detected in actuator relay. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1142 | When a malfunction is detected in pressure sensor. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1143 | When a malfunction is detected in steering angle sensor. | |
| C1144 | When neutral position adjustment of steering angle sensor is not complete. | |
| C1145 | When a malfunction is detected in yaw rate signal. | |
| C1146 | When a malfunction is detected in side/decel G signal. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1155 | When brake fluid level low signal is detected. | |
| C1160 | When calibration of yaw rate/side/decel G sensor is not complete. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1164 | When a malfunction is detected in cut valve 1. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1165 | When a malfunction is detected in cut valve 2. | |
| C1170 | When the information in ABS actuator and electric unit (control unit) is not the same. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| C1197 | When a malfunction is detected in vacuum sensor. | Electrical vacuum assistance of brake booster is suspended. |
| C1198 | <ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. | |
| C1199 | When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running. | |
| C119A | When a malfunction is detected in supply power voltage of vacuum sensor. | Electrical vacuum assistance of brake booster is suspended. |

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

| DTC | Malfunction detected condition | Fail-safe condition |
|--------|---|--|
| U1000 | When CAN communication signal is not continuously received for 2 seconds or more. | The following functions are suspended. <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function • Rise-up & Build-up function • Brake force distribution function |
| U0424* | When signal that is transmitted from A/C auto AMP. is not the latest information. | Mode is fixed to the mode when a malfunction of drive mode selector occurs. The mode is fixed to STANDARD mode after ignition switch turns OFF to ON. |

*: This is DTC that is detected in ADAS control unit side.

DTC Inspection Priority Chart

INFOID:0000000010099784

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

| Priority | Detected item (DTC) |
|----------|--|
| 1 | <ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT • U0424 HVAC CAN CIR 1* |
| 2 | <ul style="list-style-type: none"> • C1170 VARIANT CODING |
| 3 | <ul style="list-style-type: none"> • C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL |
| 4 | <ul style="list-style-type: none"> • C1109 BATTERY VOLTAGE [ABNOMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY |
| 5 | <ul style="list-style-type: none"> • C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT |
| 6 | <ul style="list-style-type: none"> • C1155 BR FLUID LEVEL LOW |

*: This is DTC that is detected in ADAS control unit side.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[WITH VDC]

DTC Index

INFOID:000000010099785

| DTC | Display Item | Refer to |
|--------|------------------------------|--------------------------------------|
| C1101 | RR RH SENSOR-1 | BRC-73, "DTC Logic" |
| C1102 | RR LH SENSOR-1 | |
| C1103 | FR RH SENSOR-1 | |
| C1104 | FR LH SENSOR-1 | |
| C1105 | RR RH SENSOR-2 | BRC-76, "DTC Logic" |
| C1106 | RR LH SENSOR-2 | |
| C1107 | FR RH SENSOR-2 | |
| C1108 | FR LH SENSOR-2 | |
| C1109 | BATTERY VOLTAGE [ABNOMAL] | BRC-81, "DTC Logic" |
| C1111 | PUMP MOTOR | BRC-83, "DTC Logic" |
| C1115 | ABS SENSOR [ABNORMAL SIGNAL] | BRC-85, "DTC Logic" |
| C1116 | STOP LAMP SW | BRC-91, "DTC Logic" |
| C1120 | FR LH IN ABS SOL | BRC-96, "DTC Logic" |
| C1121 | FR LH OUT ABS SOL | BRC-98, "DTC Logic" |
| C1122 | FR RH IN ABS SOL | BRC-96, "DTC Logic" |
| C1123 | FR RH OUT ABS SOL | BRC-98, "DTC Logic" |
| C1124 | RR LH IN ABS SOL | BRC-96, "DTC Logic" |
| C1125 | RR LH OUT ABS SOL | BRC-98, "DTC Logic" |
| C1126 | RR RH IN ABS SOL | BRC-96, "DTC Logic" |
| C1127 | RR RH OUT ABS SOL | BRC-98, "DTC Logic" |
| C1130 | ENGINE SIGNAL 1 | BRC-100, "DTC Logic" |
| C1140 | ACTUATOR RLY | BRC-101, "DTC Logic" |
| C1142 | PRESS SEN CIRCUIT | BRC-103, "DTC Logic" |
| C1143 | ST ANG SEN CIRCUIT | BRC-105, "DTC Logic" |
| C1144 | ST ANG SEN SIGNAL | BRC-107, "DTC Logic" |
| C1145 | YAW RATE SENSOR | BRC-108, "DTC Logic" |
| C1146 | SIDE G SEN CIRCUIT | |
| C1155 | BR FLUID LEVEL LOW | BRC-111, "DTC Logic" |
| C1160 | DECEL G SEN SET | BRC-114, "DTC Logic" |
| C1164 | CV 1 | BRC-115, "DTC Logic" |
| C1165 | CV 2 | |
| C1170 | VARIANT CODING | BRC-117, "DTC Logic" |
| C1197 | VACUUM SENSOR | BRC-118, "DTC Logic" |
| C1198 | VACUUM SEN CIR | BRC-120, "DTC Logic" |
| C1199 | BRAKE BOOSTER | BRC-122, "DTC Logic" |
| C119A | VACUUM SEN VOLT | BRC-124, "DTC Logic" |
| U1000 | CAN COMM CIRCUIT | BRC-126, "DTC Logic" |
| U0424* | HVAC CAN CIR 1 | BRC-127, "DTC Logic" |

*: This is DTC that is detected in ADAS control unit.

ADAS CONTROL UNIT

List of ECU Reference

INFOID:0000000010099786

| ECU name | Refer to |
|-------------------|---|
| ADAS control unit | DAS-33, "Reference Value" |
| | DAS-38, "Fail-safe" |
| | DAS-39, "DTC Inspection Priority Chart" |
| | DAS-40, "DTC Index" |

ACTIVE TRACE CONTROL FUNCTION

Intelligent brake assist OFF indicator lamp turns ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for Active trace control function. The vehicle becomes the same as models without Active trace control function. Refer to [DAS-15, "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

CAUTION:

Lamp ON condition of intelligent brake assist OFF indicator lamp is that intelligent brake assist OFF switch is in the pressed and not turned ON status.

A
B
C
D
E
BRC
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P

BRAKE CONTROL SYSTEM

[WITH VDC]

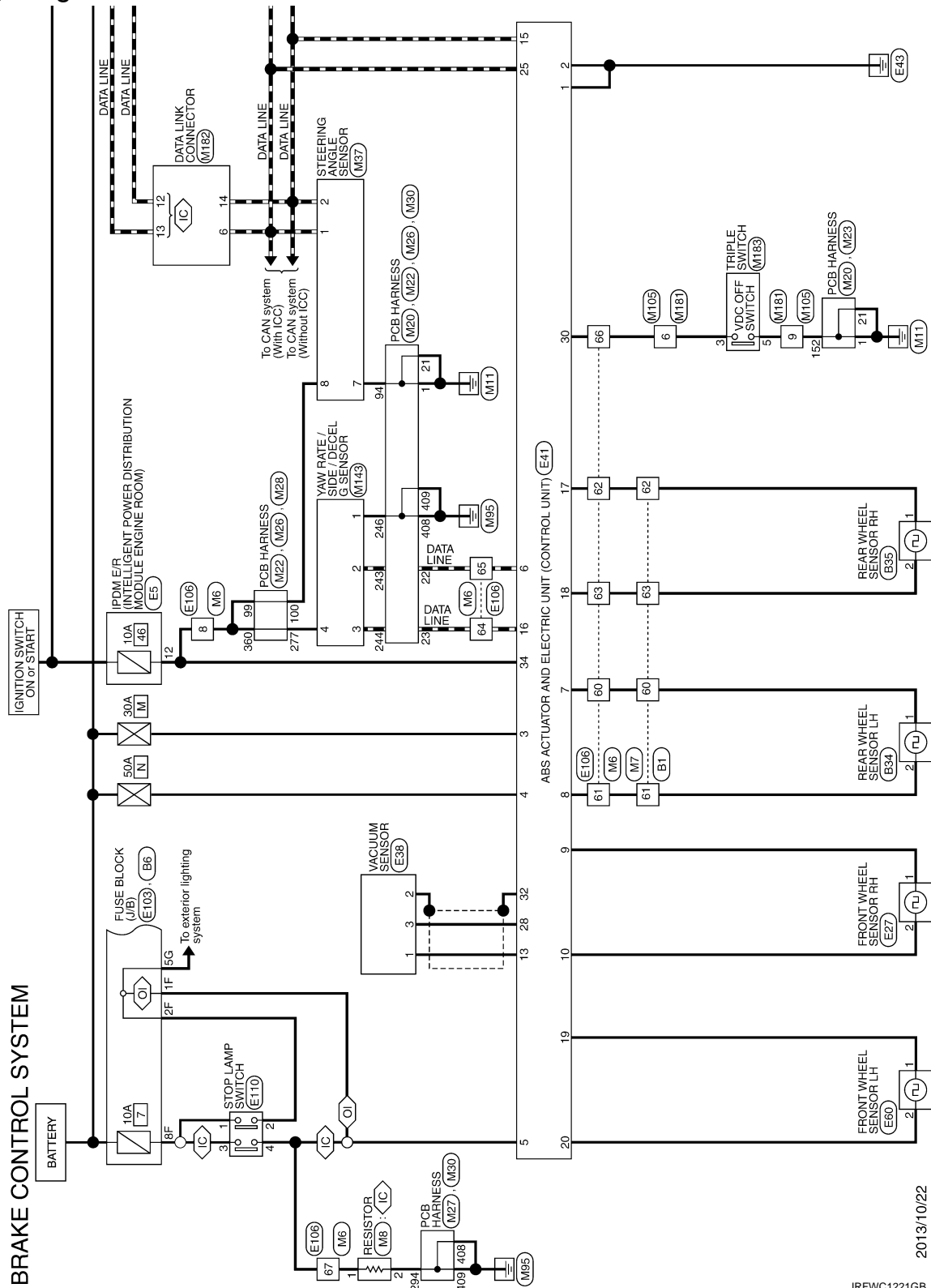
< WIRING DIAGRAM >

WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000010099787



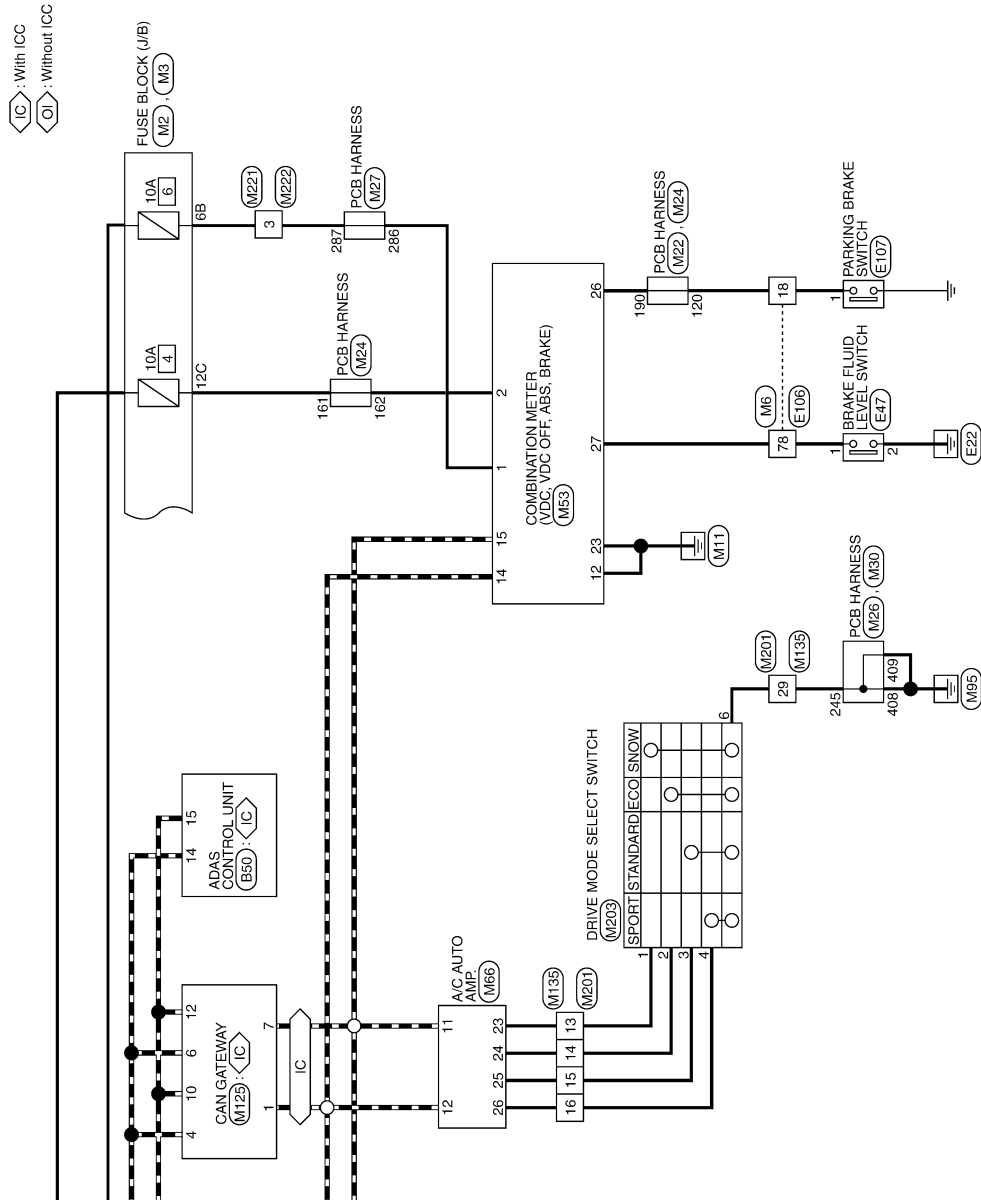
2013/10/22

JRFFWC1221GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]



JRFWC1222GB

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[WITH VDC]

BRAKE CONTROL SYSTEM

| | |
|----------------|-----------------|
| Connector No. | B1 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80FW-CS16-TM4 |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|--|
| 1 | R | - |
| 2 | W | - |
| 3 | LG | - |
| 4 | B | - |
| 5 | Y | - |
| 6 | GR | - |
| 7 | GR | - |
| 8 | Y | - |
| 9 | LG | - |
| 10 | V | - |
| 11 | GR | - [With climate controlled seat] - [With heated seat] |
| 12 | LG | - [With heated seat] |
| 13 | P | - [With climate controlled seat] |
| 14 | R | - |
| 15 | O | - |
| 16 | V | - |
| 17 | B | - |
| 18 | R | - |
| 19 | W | - |
| 20 | R | - |
| 21 | B | - |
| 22 | LG | - |
| 23 | V | - |
| 24 | Y | - |
| 25 | G | - |
| 26 | GR | - |
| 27 | SB | - |
| 28 | L/O | - |
| 29 | W/L | - |
| 30 | SHIELD | - |
| 32 | L | - |
| 33 | R | - |
| 34 | L | - |

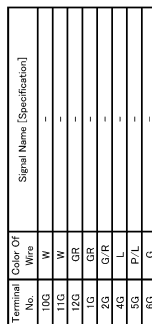
| | | |
|----|--------|---|
| 36 | G | - |
| 37 | SR | - |
| 40 | SHIELD | - |
| 41 | GR/V | - |
| 42 | W/L | - |
| 43 | L | - |
| 44 | B | - |
| 45 | W | - |
| 47 | O | - |
| 48 | Y | - |
| 49 | BR | - |
| 50 | SB | - |
| 51 | V | - |
| 52 | LG | - |
| 53 | G | - |
| 56 | B | - |
| 57 | BR | - |
| 58 | EC | - |
| 59 | V | - |
| 60 | W | - |
| 61 | B | - |
| 62 | LG | - |
| 63 | V | - |
| 65 | O | - |
| 66 | BR | - |
| 67 | V | - |
| 68 | LG | - |
| 69 | GR | - |
| 70 | R | - |
| 72 | L | - |
| 73 | P | - |
| 74 | L | - |
| 75 | P | - |
| 76 | P | - |
| 77 | R | - |
| 78 | W | - |
| 79 | G | - |
| 80 | L | - |
| 81 | LG | - |
| 82 | BR | - |
| 83 | SB | - |
| 84 | Y | - |
| 85 | W | - |
| 86 | R | - |
| 87 | G | - |
| 88 | GR | - |
| 91 | SB | - |
| 92 | G | - |

| | | |
|----|----|---|
| 97 | O | - |
| 98 | SB | - |
| 99 | LG | - |

| | |
|----------------|------------------|
| Connector No. | B6 |
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS12FBR-CS |



| | | | | |
|-----|-----|-----|----|----|
| 5G | 4G | | 2G | 1G |
| 12G | 11G | 10G | | 6G |



| | |
|----------------|----------------------|
| Connector No. | B34 |
| Connector Name | REAR WHEEL SENSOR LH |
| Connector Type | RH02FR |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | W | |
| 2 | o | |

| | |
|----------------|----------------------|
| Connector No. | B35 |
| Connector Name | REAR WHEEL SENSOR RH |
| Connector Type | RH02FGY |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | LG | - |
| 2 | V | - |



| | |
|----------------|-------------------|
| Connector No. | B50 |
| Connector Name | ADAS CONTROL UNIT |
| Connector Type | TH16FW-NH |



| | | | | | | |
|----|----|----|---|---|----|---|
| 8 | 7 | 6 | 5 | 4 | 3 | 1 |
| 16 | 15 | 14 | | | 12 | |

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | Y | WARNING SYSTEMS SW |
| 3 | BR | IBA OFF SW |
| 4 | O | WARNING SYSTEMS ON IND |
| 5 | SB | BRAKE HOLD RLY DRIVE SIGNAL |
| 6 | B/R | ITS COMM-H |
| 7 | L | GND |
| 8 | P | ITS COMM-H |
| 12 | W | WARNING BUZZER |
| 14 | L | CAN-H |
| 15 | R | CAN-L |
| 16 | GR | IGNITION |

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

BRAKE CONTROL SYSTEM

| | |
|----------------|--|
| Connector No. | E5 |
| Connector Name | ABS 5-PI INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM |
| Connector Type | TH20PW-CS12-M4-1V |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 4 | W | ENG SOL |
| 5 | P | ETC [With VQ engine] |
| 6 | R | ECM VQ [With VQ engine] |
| 7 | R | ETC [With VK engine] |
| 8 | L/Y | A/C COMP [With VK engine] |
| 9 | P | A/C COMP [With VQ engine] |
| 10 | V | ECM BAT |
| 11 | B | P-GND |
| 12 | G | ABS ECU |
| 13 | GR | FUEL PUMP [With VQ engine] |
| 14 | W | FUEL PUMP [With VK engine] |
| 15 | V | WIPER AUTOSTOP |
| 16 | Y | IGN SIGNAL |
| 17 | BR | TRIP SW |
| 22 | BR | DTRC RLY [With VQ engine] |
| 23 | SB | DTRC RLY [With VK engine] |
| 24 | O | HOOD SW |
| 25 | LG | SUB ECU |
| 30 | BR | PUSH START SW |
| 31 | BR | MP SW [With VK engine] |
| 31 | W | MP SW [With VQ engine] |
| 36 | GR | F/L IGN SW |

| | |
|----------------|-----------------------|
| Connector No. | E27 |
| Connector Name | FRONT WHEEL SENSOR RH |
| Connector Type | RH02FB |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | BR | - |
| 2 | B | - |

| | |
|----------------|---------------|
| Connector No. | E38 |
| Connector Name | VACUUM SENSOR |
| Connector Type | YE20BEDGY |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | LG | OUTPUT SIGNAL |
| 2 | SHIELD | GND |
| 3 | V | VCC (+5V) |

| | |
|----------------|---|
| Connector No. | E41 |
| Connector Name | ABS ACTUATOR AND ELECTRIC PART (CONTROL UNIT) |
| Connector Type | SA230FB-SJ24-U |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | W | ECUGND |
| 2 | B/W | MAIN PWR |
| 3 | B | SOLENOID (POWER) |
| 4 | G | MOTOR (POWER) |
| 5 | SB | STOP LAMP SW |
| 6 | Y | CANM2(-) |
| 7 | W | R-LH SEN(SIGNAL) |
| 8 | G | R-LH SEN(POWER) |
| 9 | BR | F-RH SEN(SIGNAL) |
| 10 | B | F-RH SEN(POWER) |
| 13 | LG | VAG SEN(SIGNAL) |
| 15 | P | CAN-L |
| 16 | B | CANM2(+) |
| 17 | Y | R-RH SEN(SIGNAL) |
| 18 | BR | R-RH SEN(POWER) |
| 19 | W | F-LH SEN(SIGNAL) |
| 20 | SB | F-LH SEN(POWER) |
| 25 | L | CAN-H |
| 26 | V | VAG SEN(POWER) |
| 30 | R | VDS OFF SW |
| 32 | SHIELD | VAG SENGND |
| 34 | G | IGN(POWER) |

| | |
|----------------|--------------------------|
| Connector No. | E47 |
| Connector Name | BRAKE FLUID LEVEL SWITCH |
| Connector Type | YV02EGY |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | SB | - |
| 2 | B | - |

| | |
|----------------|-----------------------|
| Connector No. | E60 |
| Connector Name | FRONT WHEEL SENSOR LH |
| Connector Type | RH02FB |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | SB | - |
| 2 | O | - |

JRFWC1224GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

BRAKE CONTROL SYSTEM

| | |
|----------------|------------------|
| Connector No. | E103 |
| Connector Name | FUSE BLOCK (J.B) |
| Connector Type | NS12FW-CS |



| | | |
|----|----|----|
| 4F | 3F | 1F |
| 2F | 1F | 1F |

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1F | SB | — |
| 2F | LG | — |
| 4F | G | — |
| 6F | O | — |
| 8F | BR | — |
| 9F | R | — |

| | |
|----------------|-----------------|
| Connector No. | E106 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH68PW-CS16-TM4 |



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 522 | 523 | 524 | 525 | 526 | 527 | 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 | 538 | 539 | 540 | 541 | 542 | 543 | 544 | 545 | 546 | 547 | 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 | 558 | 559 | 560 | 561 | 562 | 563 | 564 | 565 | 566 | 567 | 568 | 569 | 570 | 571 | 572 | 573 | 574 | 575 | 576 | 577 | 578 | 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 | 588 | 589 | 590 | 591 | 592 | 593 | 594 | 595 | 596 | 597 | 598 | 599 | 600 | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 | 616 | 617 | 618 | 619 | 620 | 621 | 622 | 623 | 624 | 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 | 635 | 636 | 637 | 638 | 639 | 640 | 641 | 642 | 643 | 644 | 645 | 646 | 647 | 648 | 649 | 650 | 651 | 652 | 653 | 654 | 655 | 656 | 657 | 658 | 659 | 660 | 661 | 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | 671 | 672 | 673 | 674 | 675 | 676 | 677 | 678 | 679 | 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 | 693 | 694 | 695 | 696 | 697 | 698 | 699 | 700 | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 | 718 | 719 | 720 | 721 | 722 | 723 | 724 | 725 | 726 | 727 | 728 | 729 | 730 | 731 | 732 | 733 | 734 | 735 | 736 | 737 | 738 | 739 | 740 | 741 | 742 | 743 | 744 | 745 | 746 | 747 | 748 | 749 | 750 | 751 | 752 | 753 | 754 | 755 | 756 | 757 | 758 | 759 | 760 | 761 | 762 | 763 | 764 | 765 | 766 | 767 | 768 | 769 | 770 | 771 | 772 | 773 | 774 | 775 | 776 | 777 | 778 | 779 | 780 | 781 | 782 | 783 | 784 | 785 | 786 | 787 | 788 | 789 | 790 | 791 | 792 | 793 | 794 | 795 | 796 | 797 | 798 | 799 | 800 | 801 | 802 | 803 | 804 | 805 | 806 | 807 | 808 | 809 | 810 | 811 | 812 | 813 | 814 | 815 | 816 | 817 | 818 | 819 | 820 | 821 | 822 | 823 | 824 | 825 | 826 | 827 | 828 | 829 | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 | 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 | 849 | 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 | 859 | 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 | 869 | 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 | 879 | 880 | 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 | 889 | 890 | 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 | 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 | 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 | 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 | 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 | 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 | 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 | 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 | 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 | 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 | 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 | 1081 | 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 | 1091 | 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 | 1101 | 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 | 1111 | 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 | 1121 | 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 | 1131 | 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1139 | 1140 | 1141 | 1142 | 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 | 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 | 1161 | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 | 1171 | 1172 | 1173 | 1174 | 1175 | 1176 | 1177 | 1178 | 1179 | 1180 | 1181 | 1182 | 1183 | 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1190 | 1191 | 1192 | 1193 | 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 | 1202 | 1203 | 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 | 1212 | 1213 | 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1220 | 1221 | 1222 | 1223 | 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1230 | 1231 | 1232 | 1233 | 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1240 | 1241 | 1242 | 1243 | 1244 | 1245 | 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1263 | 1264 | 1265 | 1266 | 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 | 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 | 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 | 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 | 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 | 1329 | 1330 | 1331 | 1332 | 1333 | 1334 | 1335 | 1336 | 1337 | 1338 | 1339 | 1340 | 1341 | 1342 | 1343 | 1344 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 | 1354 | 1355 | 1356 | 1357 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 | 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1383 | 1384 | 1385 | 1386 | 1387 | 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 | 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 | 1410 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

BRAKE CONTROL SYSTEM

| | |
|----------------|-----------------|
| Connector No. | M6 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | W | - |
| 2 | SB | - |
| 3 | LG | - |
| 4 | W | - |
| 5 | W | - |
| 6 | EG | - |
| 7 | EG | - |
| 8 | G | - |
| 9 | Y | - |
| 10 | W | - |
| 11 | R | - |
| 12 | V | - |
| 13 | LG | - |
| 14 | L | - |
| 15 | V | - |
| 16 | B | - |
| 17 | GR | - |
| 18 | V | - |
| 19 | SB | - |
| 20 | SB | - |
| 21 | BR | - |
| 22 | L | - |
| 23 | P | - |
| 27 | SHIELD | - |
| 28 | V | - |
| 29 | SB | - |
| 31 | EG | - |
| 32 | P | - |
| 33 | R | - |
| 34 | EG | - |
| 41 | BR | - |
| 44 | BR | - |
| 45 | V | - |
| 46 | EG | - |
| 47 | V | - |
| 48 | G | - |
| 49 | EG | - |
| 50 | W | - |

| | |
|----------------|-----------------|
| Connector No. | M7 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | G | - |
| 2 | Y | - |
| 4 | BR | - |
| 5 | P | - |

| | | |
|----|----|---|
| 61 | B | - |
| 62 | LG | - |
| 63 | EG | - |
| 65 | W | - |
| 66 | R | - |
| 67 | V | - |
| 68 | LG | - |
| 69 | SB | - |
| 70 | V | - |
| 72 | L | - |
| 73 | P | - |
| 74 | L | - |
| 75 | P | - |
| 76 | G | - |
| 77 | Y | - |
| 78 | SB | - |
| 79 | W | - |
| 80 | BR | - |
| 81 | LG | - |
| 82 | BR | - |
| 83 | EG | - |
| 84 | B | - |
| 85 | W | - |
| 86 | G | - |
| 87 | R | - |
| 88 | G | - |
| 91 | W | - |
| 92 | G | - |
| 96 | W | - |
| 98 | EG | - |
| 99 | Y | - |
| 99 | LG | - |

| | |
|----------------|------------|
| Connector No. | M8 |
| Connector Name | RESISTOR |
| Connector Type | IM02FBR-LG |



| | | |
|----|--------|---|
| 9 | W | - |
| 8 | Y | - |
| 9 | G | - |
| 10 | V | - |
| 11 | L | - |
| 11 | V | - |
| 12 | GR | - |
| 12 | P | - |
| 13 | BR | - |
| 14 | GR | - |
| 15 | EG | - |
| 16 | V | - |
| 17 | EG | - |
| 18 | L | - |
| 19 | R | - |
| 20 | R | - |
| 21 | B | - |
| 22 | LG | - |
| 23 | W | - |
| 24 | V | - |
| 25 | G | - |
| 26 | BR | - |
| 27 | SB | - |
| 28 | P | - |
| 29 | L | - |
| 30 | SHIELD | - |
| 32 | L | - |
| 33 | P | - |
| 34 | P | - |
| 35 | P | - |
| 36 | EG | - |
| 37 | SB | - |
| 41 | SB | - |
| 42 | V | - |
| 43 | L | - |
| 44 | B | - |
| 45 | W | - |
| 47 | L | - |
| 48 | LG | - |
| 49 | BR | - |
| 50 | V | - |
| 51 | V | - |
| 52 | P | - |
| 53 | EG | - |
| 56 | SB | - |
| 57 | P | - |
| 58 | LG | - |
| 59 | Y | - |
| 60 | GR | - |

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P

JRFWC1226GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

BRAKE CONTROL SYSTEM

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | L | - |
| 2 | B | - |

| | |
|----------------|-------------|
| Connector No. | M20 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FB-NH |



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

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | B | - |
| 11 | BR | - |
| 12 | R | - |
| 14 | L | - |
| 15 | B | - |
| 17 | R | - |
| 19 | W | - |
| 20 | R | - |
| 21 | B | - |
| 22 | R | - |
| 23 | L | - |
| 24 | L | - |
| 27 | P | - |
| 31 | V | - |
| 33 | V | - |
| 35 | L | - |
| 36 | P | - |
| 38 | L | - |
| 40 | Y | - |

| | |
|----------------|-------------|
| Connector No. | M22 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FB-NH |



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

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|--|
| 81 | L | - |
| 82 | P | - |
| 84 | B | - |
| 85 | B | - |
| 86 | B | - |
| 87 | B | - |
| 88 | B | - |
| 89 | Y | - |
| 91 | V | - |
| 92 | V | - |
| 93 | B | - |
| 94 | B | - |
| 95 | LG | - |
| 96 | BR | - |
| 97 | G | - |
| 98 | G | - |
| 100 | G | - |
| 101 | L | - |
| 102 | P | - |
| 103 | B | - |
| 104 | BR | - |
| 105 | R | - |
| 107 | Y | - |
| 108 | Y | - |
| 109 | BR | - |
| 110 | Y | - |
| 112 | B | - |
| 113 | W | - |
| 114 | L | - |
| 116 | B | - |
| 117 | B | - |
| 117 | BG | - [With VK engine] - [With VQ engine] |
| 118 | B | - |
| 119 | G | - |
| 120 | V | - |

| | |
|----------------|-------------|
| Connector No. | M23 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FW-NH |



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

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 121 | Y | - |
| 122 | V | - |
| 123 | BG | - |
| 124 | BG | - |
| 128 | BR | - |
| 130 | B | - |
| 131 | S5 | - |
| 132 | LG | - |
| 133 | L | - |
| 135 | P | - |
| 137 | Y | - |
| 138 | L | - |
| 139 | P | - |
| 140 | L | - |
| 141 | W | - |
| 142 | W | - |
| 144 | P | - |
| 145 | B | - |
| 146 | B | - |
| 147 | B | - |
| 148 | L | - |
| 149 | B | - |
| 150 | P | - |
| 151 | L | - |
| 152 | B | - |
| 153 | W | - |
| 154 | W | - |
| 155 | W | - |
| 156 | R | - |
| 158 | R | - |
| 159 | R | - |

| | |
|----------------|-------------|
| Connector No. | M24 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FW-NH |



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

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|---|
| 152 | BG | - |
| 153 | BG | - |
| 153 | G | - |
| 154 | V | - |
| 155 | V | - |
| 156 | R | - |
| 157 | LG | - |
| 158 | R | - |
| 159 | R | - |
| 170 | B | - |
| 172 | B | - |
| 174 | W | - |
| 175 | B | - |
| 176 | L | - |
| 177 | P | - |
| 178 | Y | - |
| 179 | L | - |
| 180 | LG | - |
| 182 | BR | - [With VQ engine or with VK engine without DCC] - [With VK engine with DCC] |
| 183 | R | - |
| 184 | V | - |
| 185 | P | - |
| 185 | V | - [With BOSE system] - [Without BOSE system] |
| 186 | R | - |
| 187 | L | - |
| 188 | Y | - |
| 189 | B | - |
| 190 | V | - |
| 192 | G | - |
| 192 | B | - |
| 193 | SB | - |
| 194 | BR | - |
| 195 | SB | - |
| 198 | R | - |
| 199 | B | - |

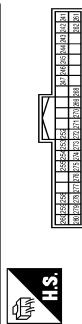
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

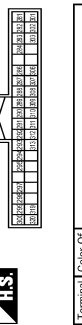
[WITH VDC]

BRAKE CONTROL SYSTEM

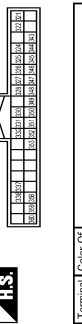
| | |
|----------------|-------------|
| Connector No. | M26 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FW-NH |



| | |
|----------------|-------------|
| Connector No. | M27 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FB-NH |



| | |
|----------------|-------------|
| Connector No. | M28 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FW-NH |



| | |
|----------------|-------------|
| Connector No. | M30 |
| Connector Name | PCB HARNESS |
| Connector Type | TH40FW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|----------------------------------|
| 241 | L | - |
| 242 | L | - |
| 243 | R | - |
| 244 | L | - |
| 245 | B | - |
| 246 | B | - |
| 247 | B | - |
| 252 | B | - |
| 253 | B | - |
| 254 | B | - [With heated seat] |
| 255 | B | - [With climate controlled seat] |
| 256 | R | - |
| 258 | L | - |
| 259 | L | - |
| 260 | BG | - |
| 261 | P | - |
| 262 | P | - |
| 268 | Y | - |
| 269 | GR | - |
| 270 | Y | - |
| 271 | BR | - |
| 272 | G | - |
| 273 | R | - |
| 274 | R | - |
| 275 | Y | - |
| 276 | B | - |
| 277 | G | - |
| 278 | R | - |
| 280 | Y | - |

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 281 | G | - |
| 282 | BG | - |
| 283 | BG | - |
| 284 | BG | - |
| 286 | W | - |
| 287 | Y | - |
| 288 | W | - |
| 289 | SHIELD | - |
| 290 | B | - |
| 291 | SHIELD | - |
| 292 | B | - |
| 293 | B | - |
| 294 | B | - |
| 295 | B | - |
| 297 | B | - |
| 298 | L | - |
| 299 | L | - |
| 300 | W | - |
| 301 | R | - |
| 302 | R | - |
| 303 | R | - |
| 306 | V | - |
| 307 | LG | - |
| 308 | SB | - |
| 309 | G | - |
| 310 | R | - |
| 311 | W | - |
| 312 | B | - |
| 313 | B | - |
| 314 | Y | - |
| 320 | W | - |

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 321 | Y | - |
| 322 | Y | - |
| 323 | B | - |
| 324 | L | - |
| 325 | L | - |
| 326 | P | - |
| 327 | P | - |
| 328 | P | - |
| 330 | B | - |
| 331 | V | - |
| 332 | V | - |
| 337 | W | - |
| 338 | W | - |
| 343 | L | - |
| 344 | B | - |
| 345 | Y | - |
| 346 | P | - |
| 347 | P | - |
| 348 | GR | - |
| 349 | V | - |
| 350 | LG | - |
| 351 | P | - |
| 352 | R | - |
| 353 | P | - |
| 358 | W | - |
| 359 | W | - |
| 360 | G | - |

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 402 | R | - |
| 403 | R | - |
| 404 | Y | - |
| 405 | Y | - |
| 408 | B | - |
| 409 | B | - |
| 411 | B | - |
| 413 | Y | - |
| 414 | BR | - |
| 416 | LG | - |
| 417 | B | - |
| 419 | SB | - |
| 420 | SHIELD | - |
| 422 | V | - |
| 427 | P | - |
| 428 | Y | - |
| 429 | P | - |
| 430 | LG | - |
| 431 | B | - |
| 432 | Y | - |
| 435 | V | - |
| 436 | BG | - |
| 437 | B | - |
| 438 | P | - |
| 439 | L | - |

JRFWC1228GB

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]

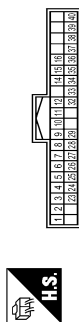
BRAKE CONTROL SYSTEM

| | |
|----------------|-----------------------|
| Connector No. | M37 |
| Connector Name | STEERING ANGLE SENSOR |
| Connector Type | TH40PW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | B | CAN-H |
| 2 | P | CAN-L |
| 7 | B | GND |
| 8 | G | GND |

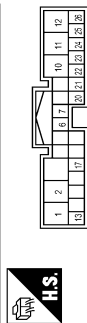
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|----------------|-------------------|
| Connector No. | M63 |
| Connector Name | COMBINATION METER |
| Connector Type | TH40PW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|--|
| 1 | W | BATTERY POWER SUPPLY |
| 2 | BG | IGNITION SIGNAL |
| 3 | GR | VEHICLE SPEED SIGNAL (2-PULSE) |
| 4 | R | VEHICLE SPEED SIGNAL (8-PULSE) |
| 5 | B | ILLUMINATION CONTROL SIGNAL |
| 6 | B | METER CONTROL SWITCH GROUND |
| 7 | SB | ENTER SWITCH SIGNAL |
| 8 | GR | SELECT SWITCH SIGNAL |
| 9 | GR | ILLUMINATION CONTROL SWITCH SIGNAL (2-PULSE) |
| 10 | GR | ILLUMINATION CONTROL SWITCH SIGNAL (2-PULSE) |
| 11 | L | TRIP RESET SWITCH SIGNAL |
| 12 | B | GROUND |
| 14 | L | CAN-H |
| 15 | P | CAN-L |
| 16 | R | AIR BAG SIGNAL |
| 23 | B | GROUND |

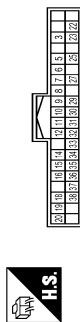
| | | |
|----|----|--|
| 24 | B | FUEL LEVEL SENSOR GROUND |
| 25 | W | ALTERNATOR SIGNAL |
| 26 | V | PARKING BRAKE SWITCH SIGNAL |
| 27 | V | WASHER FLUID LEVEL SWITCH SIGNAL |
| 28 | G | SECURITY SIGNAL |
| 29 | L | WASHER LEVEL SWITCH SIGNAL |
| 32 | G | PADDER SHIFTER DOWN SIGNAL |
| 33 | BG | PADDER SHIFTER UP SIGNAL |
| 34 | G | FUEL LEVEL SENSOR SIGNAL |
| 35 | W | SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) |
| 36 | G | PASSENGER SEAT BELT WARNING SIGNAL |
| 37 | G | NON-MANUAL MODE SIGNAL |
| 38 | V | MANUAL MODE SHIFTER DOWN SIGNAL |
| 39 | L | MANUAL MODE SHIFTER UP SIGNAL |
| 40 | W | MANUAL MODE SIGNAL |

| | |
|----------------|---------------|
| Connector No. | M66 |
| Connector Name | A/C AUTO AMP. |
| Connector Type | TH20FW-TB6 |



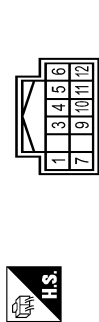
| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|---------------------------------|
| 1 | L | BATTERY POWER SUPPLY |
| 2 | W | IGNITION POWER SUPPLY |
| 6 | R | BLOWER MOTOR F/B SIGNAL |
| 7 | L | POWER TRANSISTOR CONTROL SIGNAL |
| 10 | B | GROUND |
| 11 | P | CAN-L |
| 12 | L | CAN-H |
| 13 | V | A/C POWER SUPPLY |
| 17 | BG | ECU CONTROL SIGNAL |
| 20 | R | HUMIDITY SENSOR SIGNAL |
| 21 | R | HUMIDITY SENSOR DATA SIGNAL |
| 22 | B | DRIVE MODE SELECT SW (ECU) |
| 23 | W | DRIVE MODE SELECT SW (ECU) |
| 24 | L | DRIVE MODE SELECT SW (STANDARD) |
| 25 | G | DRIVE MODE SELECT SW (SPORT) |
| 26 | Y | DRIVE MODE SELECT SW (SPORT) |

| | |
|----------------|--------------|
| Connector No. | M105 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH40FW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | B | CAN-H |
| 2 | P | CAN-L |
| 3 | GR | BATTERY |
| 4 | V | CAN-H |
| 5 | LG | - |
| 6 | P | - |
| 7 | L | - |
| 8 | P | - |
| 9 | B | - |
| 10 | W | - |
| 11 | W | - |
| 12 | SB | - |
| 14 | SB | - |
| 15 | BR | - |
| 16 | V | - |
| 18 | G | - |
| 19 | V | - |
| 20 | V | - |
| 22 | BG | - |
| 23 | B | - |
| 25 | W | - |
| 27 | SB | - |
| 29 | B | - |
| 30 | R | - |
| 31 | BR | - |
| 32 | L | - |
| 33 | P | - |
| 34 | LG | - |
| 35 | W | - |
| 36 | LG | - |
| 38 | R | - |

| | |
|----------------|-------------|
| Connector No. | M125 |
| Connector Name | CAN GATEWAY |
| Connector Type | TH12FW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | B | CAN-H |
| 2 | P | CAN-L |
| 3 | GR | BATTERY |
| 4 | V | CAN-H |
| 5 | B | GND |
| 6 | L | CAN-H |
| 7 | P | CAN-L |
| 9 | W | IGNITION |
| 10 | P | CAN-L |
| 11 | B | GND |
| 12 | P | CAN-L |

| | |
|----------------|--------------|
| Connector No. | M135 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH13FW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|----------------------------------|
| 1 | W | - |
| 2 | BG | - |
| 3 | V | - [With heated seat] |
| 5 | V | - [With climate controlled seat] |
| 6 | GR | - [With heated seat] |
| 7 | SB | - |
| 10 | G | - [With climate controlled seat] |
| 10 | GR | - [With heated seat] |
| 11 | BG | - [With heated seat] |

BRAKE CONTROL SYSTEM

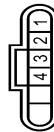
< WIRING DIAGRAM >

[WITH VDC]

BRAKE CONTROL SYSTEM

| | | |
|----|----|----------------------------------|
| 11 | L | - [With climate controlled seat] |
| 12 | W | - |
| 13 | V | - |
| 14 | L | - |
| 15 | G | - |
| 16 | Y | - |
| 17 | P | - [With heated seat] |
| 18 | BR | - [With climate controlled seat] |
| 19 | GR | - |
| 20 | B | - |
| 21 | R | - |
| 22 | B | - [With heated seat] |
| 23 | W | - [With climate controlled seat] |
| 24 | VG | - |
| 25 | B | - [With heated seat] |
| 26 | LG | - [With climate controlled seat] |
| 27 | R | - [With heated seat] |
| 28 | B | - [With climate controlled seat] |
| 29 | B | - |
| 30 | V | - |
| 32 | L | - |

| | |
|----------------|----------------------------------|
| Connector No. | M143 |
| Connector Name | YAW RATE / SIDE / DECEL G SENSOR |
| Connector Type | SAZ096FB |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | B | - |
| 2 | R | - |
| 3 | L | - |
| 4 | G | - |

| | |
|----------------|--------------|
| Connector No. | M181 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH440MW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 2 | R | - |
| 3 | R | - |
| 4 | R | - |
| 5 | BR | - |
| 6 | L | - |
| 7 | L | - |
| 8 | P | - |
| 9 | B | - |
| 10 | W | - |
| 11 | LG | - |
| 12 | SB | - |
| 14 | SB | - |
| 15 | BR | - |
| 16 | V | - |
| 18 | G | - |
| 19 | Y | - |
| 20 | B | - |
| 22 | BG | - |
| 23 | B | - |
| 25 | W | - |
| 27 | SB | - |
| 29 | B | - |
| 30 | R | - |
| 31 | BR | - |
| 32 | L | - |
| 33 | P | - |
| 34 | LG | - |
| 35 | W | - |
| 36 | LG | - |
| 37 | L | - |
| 38 | R | - |

| | |
|----------------|---------------------|
| Connector No. | M182 |
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 3 | LG | M-CAN-L |
| 4 | B | EARTH |
| 5 | B | EARTH |
| 6 | L | CAN-H |
| 7 | V | KLING |
| 8 | LG | IGN SW |
| 11 | SB | M-CAN-H |
| 12 | P | CAN-L |
| 13 | L | CAN-H |
| 14 | P | CAN-L |
| 16 | W | POWER |

| | |
|----------------|---------------|
| Connector No. | M183 |
| Connector Name | TRIPLE SWITCH |
| Connector Type | TH12FB-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | LG | - |
| 2 | SB | - |
| 3 | BR | - |
| 4 | R | - |
| 5 | B | - |
| 6 | R | - |
| 7 | B | - |
| 9 | W | - |
| 11 | B | - |
| 12 | L | - |

| | |
|----------------|--------------|
| Connector No. | M201 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH32MW-NH |



| Terminal No. | Color Of Wire | Signal Name [Specification] |
|--------------|---------------|----------------------------------|
| 1 | Y | - |
| 2 | BR | - |
| 3 | Y | - |
| 4 | P | - |
| 7 | SB | - |
| 10 | G | - |
| 11 | L | - |
| 12 | R | - |
| 13 | W | - |
| 14 | L | - |
| 15 | G | - |
| 16 | Y | - |
| 17 | W | - |
| 18 | BR | - |
| 19 | GR | - |
| 20 | B | - |
| 22 | B | - |
| 23 | BG | - |
| 24 | V | - |
| 25 | B | - |
| 26 | R | - |
| 27 | B | - [With climate controlled seat] |
| 28 | B | - [With heated seat] |
| 29 | B | - |
| 30 | B | - |
| 32 | R | - |

JRFWC1230GB

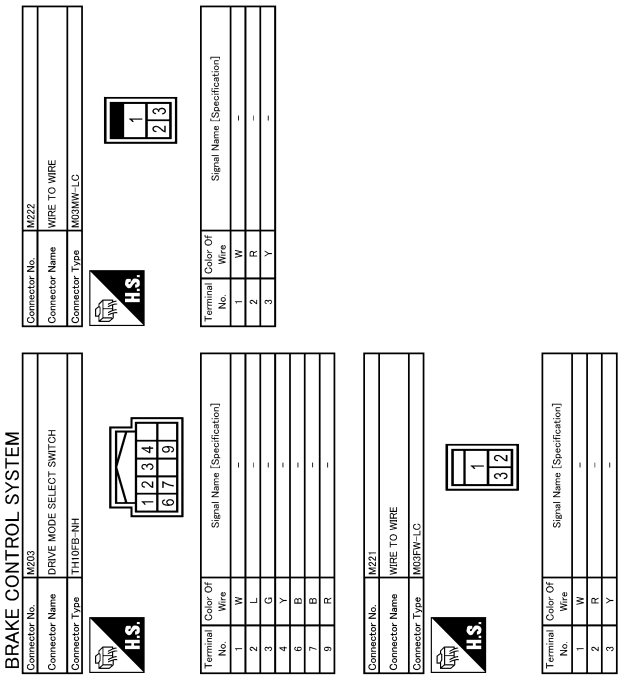
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BRC

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[WITH VDC]



BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000010099788

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [BRC-66, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-48, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM THE SELF-DIAGNOSIS

 With CONSULT


1. Perform self-diagnosis.

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

 With CONSULT

1. Erase self-diagnostic results.

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

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-51, "DTC Inspection Priority Chart"](#) [ABS actuator and electric unit (control unit)], [DAS-39, "DTC Inspection Priority Chart"](#) (ADAS control unit).

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-47, "Intermittent Incident"](#).

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.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

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

DIAGNOSIS AND REPAIR WORK FLOW

[WITH VDC]

< BASIC INSPECTION >

Can the error-detected system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-47](#).
"Intermittent Incident".

7.FINAL CHECK

Ⓔ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

Diagnostic Work Sheet

INFOID:0000000010099789

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

INTERVIEW SHEET SAMPLE

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH VDC]

| | | | | | |
|------------------|-------|---------------------|--|---------------------------|-----------|
| Interview sheet | | | | | |
| Customer name | MR/MS | Registration number | | Initial year registration | |
| | | Vehicle type | | VIN | |
| Storage date | | Engine | | Mileage | km (Mile) |
| Other conditions | | | | | |

Memo

BRC

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

< BASIC INSPECTION >

[WITH VDC]

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

Description

INFOID:0000000010099790

When replaced the ABS actuator and electric unit (control unit), Perform decel G sensor calibration. Refer to [BRC-71. "Work Procedure"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:0000000010099791

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

×: Required —: Not required

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

Work Procedure

INFOID:0000000010099792

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

 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 the 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.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[WITH VDC]

2. Select "ABS", "DATA MONITOR", "ECU INPUT SIGNALS" and "STR ANGLE SIG" in the order. Check that the signal is within the specified value.

STR ANGLE SIG : $0 \pm 2.5^{\circ}$

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 1.

4. ERASE SELF-DIAGNOSIS MEMORY

Ⓔ With CONSULT

Erase self-diagnosis result of "ABS".

Are the memories erased?

YES >> INSPECTION END

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

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[WITH VDC]

CALIBRATION OF DECEL G SENSOR

Description

INFOID:0000000010099793

CAUTION:

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

NOTE:

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

×: Required —: Not required

| Procedure | Decel G sensor calibration |
|--|----------------------------|
| Removing/ installing ABS actuator and electric unit (control unit) | — |
| Replacing ABS actuator and electric unit (control unit) | × |
| Removing/installing steering components | — |
| Replacing steering components | — |
| Removing/installing suspension components | — |
| Replacing suspension components | — |
| Removing/installing tire | — |
| Replacing tire | — |
| Tire rotation | — |
| Adjusting wheel alignment. | — |
| Removing/installing yaw rate/side/decel G sensor | × |
| Replacing yaw rate/side/decel G sensor | × |

Work Procedure

INFOID:0000000010099794

Decel G sensor calibration

CAUTION:

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

NOTE:

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

1.CHECK THE VEHICLE STATUS

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

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

YES >> GO TO 2.

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

2.PERFORM DECEL G SENSOR CALIBRATION

CAUTION:

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

☞With CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start engine.

2. Select "ABS", "WORK SUPPORT", "DECEL G SENSOR CALIBRATION" in this order.
3. Select "START".
4. After approx. 10 seconds, select "END".
5. Turn the ignition switch OFF and then turn it ON again.

CAUTION:

Be sure to perform the operation above.

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[WITH VDC]

>> GO TO 3.

3. CHECK DATA MONITOR

⑧ With CONSULT

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

DECEL G SENSOR : Approx. 0 m/s²

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 1.

4. ERASE SELF-DIAGNOSIS MEMORY

⑧ With CONSULT

Erase self-diagnosis result of "ABS".

Are the memories erased?

- YES >> GO TO 5.
NO >> Check the items indicated by the self-diagnosis.

5. PERFORM DECEL G SENSOR CALIBRATION (TRANSMISSION)

Perform decel G sensor calibration. Refer to [TM-98, "Special Repair Requirement"](#).

>> INSPECTION END

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:0000000010099795

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|----------------|--|---|
| C1101 | RR RH SENSOR-1 | When an open circuit is detected in rear RH wheel sensor circuit. | <ul style="list-style-type: none">• Harness or connector• Wheel sensor• ABS actuator and electric unit (control unit) |
| C1102 | RR LH SENSOR-1 | When an open circuit is detected in rear LH wheel sensor circuit. | |
| C1103 | FR RH SENSOR-1 | When an open circuit is detected in front RH wheel sensor circuit. | |
| C1104 | FR LH SENSOR-1 | When an open circuit is detected in front LH wheel sensor circuit. | |

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓐ With CONSULT

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self-diagnosis for "ABS".

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

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

Diagnosis Procedure

INFOID:0000000010099796

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL SENSOR

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

Is the inspection result normal?

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

2. REPLACE WHEEL SENSOR (1)

Ⓐ With CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#)
 - Rear: Refer to [BRC-147, "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?

C1101, C1102, C1103, C1104 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

3.CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (1)

Ⓔ With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
4. 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

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

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace error-detected parts and GO TO 6.

6.PERFORM SELF-DIAGNOSIS (2)

Ⓔ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for "ABS".
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 7.
NO >> INSPECTION END

7.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 continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check 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 terminal for power supply circuit | | | | |
|---|----------|----------------|----------|------------|
| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
| Connector | Terminal | Connector | Terminal | |
| E41 | 9 | E27 (Front RH) | 1 | Existed |
| | 19 | E60 (Front LH) | | |
| | 17 | B35 (Rear RH) | | |
| | 7 | B34 (Rear LH) | | |
| Measurement terminal for signal circuit | | | | |
| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
| Connector | Terminal | Connector | Terminal | |
| E41 | 10 | E27 (Front RH) | 2 | Existed |
| | 20 | E60 (Front LH) | | |
| | 18 | B35 (Rear RH) | | |
| | 8 | B34 (Rear LH) | | |

Is the inspection result normal?

YES >> GO TO 9.

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

8.PERFORM SELF-DIAGNOSIS (3)

ⓘ With CONSULT

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

ⓘ With CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#)
 - Rear: Refer to [BRC-147, "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 [BRC-150, "Removal and Installation"](#).

NO >> INSPECTION END

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

INFOID:0000000010099797

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓐ With CONSULT

- Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- Perform self-diagnosis for "ABS".

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

- YES >> Proceed to diagnosis procedure. Refer to [BRC-76, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099798

CAUTION:

Never check between wheel sensor harness connector terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to [BRC-128, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

2.CHECK TIRE

1. Turn the ignition switch OFF.
2. Check tire air pressure, wear and size. Refer to [WT-71, "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.
4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

5. Read 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 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-146, "FRONT WHEEL SENSOR : Exploded View"](#).

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

6.REPLACE WHEEL SENSOR (1)

Ⓜ With CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#)
 - Rear: Refer to [BRC-147, "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 "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

YES >> GO TO 19.

NO >> INSPECTION END

8.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

3. Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 9.

9.CHECK DATA MONITOR (2)

ⓅWith CONSULT

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

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

3. Start the engine.

4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

ⓅWith CONSULT

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.

2. Stop the vehicle.

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

3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

12.CHECK DATA MONITOR (3)

④With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-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 "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)

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 9, 10 | Ground | Not existed |
| | 19, 20 | | |
| | 17, 18 | | |
| | 7, 8 | | |

Is the inspection result normal?

YES >> GO TO 15.

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

15.CHECK DATA MONITOR (4)

④With 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. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

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

16.PERFORM SELF-DIAGNOSIS (5)

ⓅWith CONSULT

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

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

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

17.REPLACE WHEEL SENSOR

ⓅWith CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#)
 - Rear: Refer to [BRC-147, "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 "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

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

18.PERFORM SELF-DIAGNOSIS (6)

ⓅWith CONSULT

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

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

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

19.REPLACE SENSOR ROTOR

ⓅWith CONSULT

1. Replace sensor rotor.
 - Front: Refer to [BRC-149, "FRONT SENSOR ROTOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-149, "REAR SENSOR ROTOR : 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 [BRC-150, "Removal and Installation"](#).
NO >> INSPECTION END

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1109 POWER AND GROUND SYSTEM

Description

INFOID:0000000010099799

Ignition power supply is supplied to ABS actuator and electric unit (control unit).

DTC Logic

INFOID:0000000010099800

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|------------------------------|---|--|
| C1109 | BATTERY VOLTAGE [ABNOMAL] | <ul style="list-style-type: none">When ignition voltage is 10 V or less.When ignition voltage is 16 V or more. | <ul style="list-style-type: none">Harness or connectorABS actuator and electric unit (control unit)FuseIgnition power supply systemBattery |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

④ With CONSULT

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

Is DTC "C1109" detected?

YES >> Proceed to diagnosis procedure. Refer to [BRC-81. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099801

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

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 34 | Ground | Approx. 0 V |

- Turn the ignition switch ON.

CAUTION:

Never start engine.

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------|
| Connector | Terminal | | |
| E41 | 34 | Ground | 10 – 16 V |

Is the inspection result normal?

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

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

1. Turn the ignition switch OFF.
2. Check 10 A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check 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 | |
| E41 | 34 | E5 | 12 | Existed |

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 34 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to [PG-57. "Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

- Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Check 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 [BRC-150. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Logic

INFOID:0000000010099802

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------|---|---|
| C1111 | PUMP MOTOR | When a malfunction is detected in motor or motor relay. | <ul style="list-style-type: none">• 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 the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1111" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-83. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099803

1.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 voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 4 | Ground | Battery voltage |

4. Turn the ignition switch ON.
CAUTION:
Never start engine.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 4 | Ground | Battery voltage |

Is the inspection result normal?

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check 50 A fusible link (#N).
3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (4) and 50 A fusible link (#N).

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1115 WHEEL SENSOR

DTC Logic

INFOID:0000000010099804

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 during the vehicle is driven, because of installation of other tires than specified. | <ul style="list-style-type: none">• Harness or connector• Wheel sensor• Sensor rotor• ABS actuator and electric unit (control unit) |

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓐ with CONSULT

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-85, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099805

CAUTION:

For wheel sensor, never check between terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to [BRC-128, "Diagnosis Procedure"](#).

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 tire air pressure, wear and size. Refer to [WT-71, "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.
4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

- YES >> GO TO 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 "C1115" detected?

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

5.CHECK WHEEL SENSOR

1. Turn the ignition switch OFF.
2. Check 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-146, "FRONT WHEEL SENSOR : Exploded View"](#).
- Rear: Refer to [BRC-147, "REAR WHEEL SENSOR : Exploded View"](#).

Is the inspection result normal?

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

6.REPLACE WHEEL SENSOR (1)

ⒺWith CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-147, "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 "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

8.CHECK CONNECTOR

1. Turn the ignition switch OFF.

C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 9.

9.CHECK DATA MONITOR (2)

Ⓐ With CONSULT

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

NOTE:

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

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

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

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

Ⓑ With CONSULT

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

Is DTC "C1115" 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 ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

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

12.CHECK DATA MONITOR (3)

Ⓒ With CONSULT

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

NOTE:

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

7. Read 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.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

13.PERFORM SELF-DIAGNOSIS (4)

④With 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.
4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement terminal for power supply circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|----------|----------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E41 | 9 | E27 (Front RH) | 1 | Existed |
| | 19 | E60 (Front LH) | | |
| | 17 | B35 (Rear RH) | | |
| | 7 | B34 (Rear LH) | | |

Measurement terminal for signal circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|----------|----------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E41 | 10 | E27 (Front RH) | 2 | Existed |
| | 20 | E60 (Front LH) | | |
| | 18 | B35 (Rear RH) | | |
| | 8 | B34 (Rear LH) | | |

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 9, 10 | Ground | Not existed |
| | 19, 20 | | |
| | 17, 18 | | |
| | 7, 8 | | |

Is the inspection result normal?

YES >> GO TO 15.

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

15.CHECK DATA MONITOR (4)

④With 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. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

C1115 WHEEL SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

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

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

YES >> GO TO 16.

NO >> GO TO 17.

16.PERFORM SELF-DIAGNOSIS (5)

Ⓜ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 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR

ⓂWith CONSULT

1. Replace wheel sensor.
 - Front: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-147, "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 "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

YES >> GO TO 18.

NO >> GO TO 19.

18.PERFORM SELF-DIAGNOSIS (6)

ⓂWith CONSULT

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

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

ⓂWith CONSULT

1. Replace sensor rotor.
 - Front: Refer to [BRC-149, "FRONT SENSOR ROTOR : Removal and Installation"](#).
 - Rear: Refer to [BRC-149, "REAR SENSOR ROTOR : 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?

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

-
- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150. "Removal and Installation"](#).
- NO >> INSPECTION END

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:0000000010099806

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------|--|--|
| C1116 | STOP LAMP SW | When stop lamp switch signal is not input when brake pedal operates. | <ul style="list-style-type: none">• Harness or connector• Stop lamp switch• ABS actuator and electric unit (control unit)• Resistor (models without ICC system)• Battery power supply system |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

④With CONSULT

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

Is DTC "C1116" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-91. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099807

NOTE:

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

1.INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

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

2.PERFORM SELF-DIAGNOSIS

④With 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

3.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Does stop lamp turn ON?

YES >> GO TO 5.

NO >> Check stop lamp system. Refer to [EXL-45, "EXTERIOR LIGHTING SYSTEM : Wiring Diagram"](#).
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.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to [BRC-46, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-46, "Reference Value"](#).

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 stop lamp switch clearance. Refer to [BR-7, "Inspection and Adjustment"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Adjust stop lamp switch clearance. Refer to [BR-7, "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 [BRC-46, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [BRC-94, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace stop lamp switch. Refer to [BR-18, "Removal and Installation"](#). GO TO 8.

8.CHECK DATA MONITOR (3)

Ⓢ 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 [BRC-46, "Reference Value"](#).
5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-46, "Reference Value"](#).

C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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


9.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair or replace error-detected parts. GO TO 10.

10.CHECK DATA MONITOR (4)

 With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
 2. Connect stop lamp switch harness connector.
 3. Erase self-diagnosis result for "ABS".
 4. Turn the 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 [BRC-46, "Reference Value"](#).
 7. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

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

11.CHECK STOP LAMP SWITCH CIRCUIT (1)

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

| ABS actuator and electric unit (control unit) | | — | Condition | Voltage |
|---|----------|--------|---------------------------|-----------------|
| Connector | Terminal | | | |
| E41 | 5 | Ground | Brake pedal depressed | Battery voltage |
| | | | Brake pedal not depressed | Approx. 0 V |

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

| ABS actuator and electric unit (control unit) | | — | Condition | Voltage |
|---|----------|--------|---------------------------|-----------------|
| Connector | Terminal | | | |
| E41 | 5 | Ground | Brake pedal depressed | Battery voltage |
| | | | Brake pedal not depressed | Approx. 0 V |

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).
- NO >> Repair or replace error-detected parts. GO TO 12.

12.CHECK STOP LAMP SWITCH CIRCUIT (2)

C1116 STOP LAMP SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

| ABS actuator and electric unit (control unit) | | Stop lamp switch | | Continuity |
|---|----------|------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E41 | 5 | E110 | 4*1 | Existed |
| | | | 2*2 | |

*1: With ICC

*2: Without ICC

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 5 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

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

13.CHECK DATA MONITOR (5)

ⒺWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. 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 [BRC-46, "Reference Value"](#).
7. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depress. Refer to [BRC-46, "Reference Value"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

Component Inspection

INFOID:0000000010099808

1.CHECK STOP LAMP SWITCH

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

| Stop lamp switch | Condition | Continuity |
|--------------------|--|-------------|
| Terminal | | |
| 1 – 2*1 3 – 4*2 | When stop lamp switch is released (When brake pedal is depressed) | Existed |
| | When stop lamp switch is pressed (When brake pedal is released) | Not existed |

*1: Without ICC system

*2: With ICC system

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-18. "Removal and Installation"](#).

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C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

INFOID:0000000010099809

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓔ With CONSULT

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

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

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

Diagnosis Procedure

INFOID:0000000010099810

1. CHECK ABS IN VALVE POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

4. Turn the ignition switch ON.
CAUTION:
Never start engine.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

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

2. CHECK ABS IN VALVE POWER SUPPLY CIRCUIT

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

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

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

3.CHECK ABS IN VALVE GROUND CIRCUIT

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

BRC

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

INFOID:0000000010099811

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-------------------|---|---|
| C1121 | FR LH OUT ABS SOL | When a malfunction is detected in front LH ABS OUT valve. | <ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• Fusible link• Battery power supply system |
| C1123 | FR RH OUT ABS SOL | When a malfunction is detected in front RH ABS OUT valve. | |
| C1125 | RR LH OUT ABS SOL | When a malfunction is detected in rear LH ABS OUT valve. | |
| C1127 | RR RH OUT ABS SOL | When a malfunction is detected in rear RH ABS OUT valve. | |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

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

- YES >> Proceed to diagnosis procedure. Refer to [BRC-98, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099812

1.CHECK ABS OUT VALVE POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

4. Turn the ignition switch ON.

CAUTION:

Never start engine.

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

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

2.CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

3.CHECK ABS OUT VALVE GROUND CIRCUIT

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1130 ENGINE SIGNAL

DTC Logic

INFOID:0000000010099813

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-----------------|---|--|
| C1130 | ENGINE SIGNAL 1 | When a malfunction is detected in ECM system. | <ul style="list-style-type: none"> ECM ABS actuator and electric unit (control unit) CAN communication line |


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

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


Is DTC "C1130" detected?

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

Diagnosis Procedure

INFOID:0000000010099814

1. CHECK ENGINE SYSTEM


 With CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC.
 NO >> GO TO 2.

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

 With CONSULT

- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF.
- Start the engine and drive the vehicle for a short period of time.
- Check that the malfunction indicator lamp (MIL) turns OFF.
- After the vehicle stops, perform self-diagnosis for "ABS".

Is DTC "C1130" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).
 NO >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair or replace error-detected parts.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:0000000010099817

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------|---|---|
| C1140 | ACTUATOR RLY | When a malfunction is detected in actuator relay. | <ul style="list-style-type: none">• 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 the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1140" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-101. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099818

1.CHECK ACTUATOR RELAY POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

4. Turn the ignition switch ON.
CAUTION:
Never start engine.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

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

2.CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

C1140 ACTUATOR RELAY SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

3.CHECK ACTUATOR RELAY GROUND CIRCUIT

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1142 PRESS SENSOR

DTC Logic

INFOID:0000000010099819

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-------------------|--|--|
| C1142 | PRESS SEN CIRCUIT | When a malfunction is detected in pressure sensor. | <ul style="list-style-type: none">Stop lamp switch systemABS actuator and electric unit (control unit)Brake system |


DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

 With CONSULT

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

Is DTC "C1142" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-103, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099820

1.CHECK STOP LAMP SWITCH SYSTEM

Check stop lamp switch system. Refer to [BRC-91, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

2.CHECK BRAKE FLUID LEAKAGE

Check brake fluid leakage. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

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

3.CHECK BRAKE PIPING

Check brake piping. Refer to [BR-26, "FRONT : Inspection"](#) (front), [BR-31, "REAR : Inspection"](#) (rear).

Is the inspection result normal?

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

4.CHECK BRAKE PEDAL

Check brake pedal. Refer to [BR-19, "Inspection and Adjustment"](#).

Is the inspection result normal?

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

5.CHECK BRAKE MASTER CYLINDER

Check brake master cylinder. Refer to [BR-34, "Inspection"](#).

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

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

6.CHECK BRAKE BOOSTER

Check brake booster. Refer to [BR-36, "Inspection and Adjustment"](#).

Is the inspection result normal?

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

7.CHECK VACUUM PIPING

Check vacuum piping. Refer to [BR-39, "Inspection"](#).

Is the inspection result normal?

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

8.CHECK FRONT DISC BRAKE

Check front disc brake. Refer to [BR-47, "BRAKE CALIPER ASSEMBLY \(2 PISTON TYPE\) : Inspection"](#) (2 piston type), [BR-51, "BRAKE CALIPER ASSEMBLY \(4 PISTON TYPE\) : Inspection"](#) (4 piston type).

Is the inspection result normal?

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

9.CHECK REAR DISC BRAKE

Check rear disc brake. Refer to [BR-60, "BRAKE CALIPER ASSEMBLY \(1 PISTON TYPE\) : Inspection"](#) (1 piston type), [BR-64, "BRAKE CALIPER ASSEMBLY \(2 PISTON TYPE\) : Inspection"](#) (2 piston type).

Is the inspection result normal?

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

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

 With CONSULT

1. Erase self-diagnosis result for "ABS".
2. Start the engine and drive the vehicle for a short period of time.
3. Perform self-diagnosis for "ABS".

Is DTC "C1142" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).
- NO >> Check ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair or replace error-detected parts.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1143 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000010099821

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------------|--|---|
| C1143 | ST ANG SEN CIRCUIT | When a malfunction is detected in steering angle sensor. | <ul style="list-style-type: none">• 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 the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

 With CONSULT

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

Is DTC "C1143" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-105. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099822

1.CHECK STEERING ANGLE SENSOR POWER SUPPLY

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

| Steering angle sensor | | — | Voltage |
|-----------------------|----------|--------|-------------|
| Connector | Terminal | | |
| M37 | 8 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.

CAUTION:

Never start engine.

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

| Steering angle sensor | | — | Voltage |
|-----------------------|----------|--------|-----------------|
| Connector | Terminal | | |
| M37 | 8 | Ground | Battery voltage |

Is the inspection result normal?

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

2.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check 10 A fuse (#46).

C1143 STEERING ANGLE SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

3. Disconnect IPDM E/R harness connector.
4. Check continuity between steering angle sensor harness connector and IPDM E/R harness connector.

| Steering angle sensor | | IPDM E/R | | Continuity |
|-----------------------|----------|-----------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M37 | 8 | E5 | 12 | Existed |

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

| Steering angle sensor | | — | Continuity |
|-----------------------|----------|--------|-------------|
| Connector | Terminal | | |
| M37 | 8 | Ground | Not existed |

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

3.CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

| Steering angle sensor | | — | Continuity |
|-----------------------|----------|--------|------------|
| Connector | Terminal | | |
| M37 | 7 | Ground | Existed |

Is the inspection result normal?

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

4.CHECK TERMINAL

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

Is the inspection result normal?

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

5.CHECK CAN COMMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to [LAN-106, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).
- NO >> Repair or replace error-detected parts. Refer to [BRC-8, "Precaution for Harness Repair"](#).

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:0000000010099823

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-------------------|--|--|
| C1144 | ST ANG SEN SIGNAL | When neutral position adjustment of steering angle sensor is not complete. | <ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• Incomplete neutral position adjustment of steering angle sensor |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

④With CONSULT

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

Is DTC "C1144" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-107. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099824

1.AJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-69. "Work Procedure"](#).

>> GO TO 2.

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

④With 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 steering angle sensor system. Refer to [BRC-105. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150. "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

INFOID:000000010099825

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------------|--|---|
| C1145 | YAW RATE SENSOR | When a malfunction is detected in yaw rate signal. | <ul style="list-style-type: none">• Harness or connector• Yaw rate/side/decel G sensor• ABS actuator and electric unit (control unit)• Ignition power supply system• Fuse |
| C1146 | SIDE G SEN CIRCUIT | When a malfunction is detected in side/decel G signal. | |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1145" or "C1146" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-108, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000010099826

CAUTION:

- 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 is OFF (VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal after engine is started again. In that case, erase self-diagnosis result memory using CONSULT.
- When the engine is in running status and the vehicle is on a turntable at the entrance of parking lot or on a moving unit, VDC warning lamp may turn ON and "ABS" self-diagnosis may display "YAW RATE SENSOR". In this case, yaw rate sensor is not malfunctioning. The status returns to normal when the vehicle is left from the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

1.CHECK YAW RATE/SIDE/DECEL G SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect yaw rate/side/decel G sensor harness connector.
3. Check voltage between yaw rate/side/decel G sensor harness connector and ground.

| Yaw rate/side/decel G sensor | | — | Voltage |
|------------------------------|----------|--------|-------------|
| Connector | Terminal | | |
| M143 | 4 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.

CAUTION:

Never start engine.

5. Check voltage between yaw rate/side/decel G sensor harness connector and ground.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| Yaw rate/side/decel G sensor | | — | Voltage |
|------------------------------|----------|--------|-----------------|
| Connector | Terminal | | |
| M143 | 4 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

1. Turn the ignition switch OFF.
2. Check 10 A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check continuity between yaw rate/side/decel G sensor harness connector and IPDM E/R harness connector.

| Yaw rate/side/decel G sensor | | IPDM E/R | | Continuity |
|------------------------------|----------|-----------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M143 | 4 | E5 | 12 | Existed |

5. Check continuity between yaw rate/side/decel G sensor harness connector and ground.

| Yaw rate/side/decel G sensor | | — | Continuity |
|------------------------------|----------|--------|-------------|
| Connector | Terminal | | |
| M143 | 4 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

3.CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check continuity between yaw rate/side/decel G sensor harness connector and ground.

| Yaw rate/side/decel G sensor | | — | Continuity |
|------------------------------|----------|--------|------------|
| Connector | Terminal | | |
| M143 | 1 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK COMMUNICATION LINE

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

| Yaw rate/side/decel G sensor | | ABS actuator and electric unit (control unit) | | Continuity |
|------------------------------|----------|---|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M143 | 2 | E41 | 6 | Existed |
| | 3 | | 16 | |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK TERMINAL

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

- Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Check yaw rate/side/decel G sensor pin terminals for damage or loose connection with harness connector.
- Check IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6. REPLACE YAW RATE/SIDE/DECEL G SENSOR

Ⓜ With CONSULT.

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace yaw rate/side/decel G sensor. Refer to [BRC-152, "Removal and Installation"](#).
3. Erase self-diagnosis result for "ABS".
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.

CAUTION:

Never start engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1145" or "C1146" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> INSPECTION END

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

INFOID:0000000010099827

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|--------------------|--|---|
| C1155 | BR FLUID LEVEL LOW | When brake fluid level low signal is detected. | <ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• Brake fluid level switch• Combination meter |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1155" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-111, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099828

1.CHECK BRAKE FLUID LEVEL

1. Turn the ignition switch OFF.
2. Check brake fluid level. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Refill brake fluid. Refer to [BR-10, "Refilling"](#).

2.PERFORM SELF-DIAGNOSIS (1)

Ⓔ 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 3.

3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluids level switch. Refer to [BRC-113, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace reservoir tank. Refer to [BR-33, "Disassembly and Assembly"](#). GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

C1155 BRAKE FLUID LEVEL SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Ⓔ 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 brake fluid level switch harness connector for disconnection or looseness.
4. Check brake fluid level switch pin terminals for damage or loose connection with harness connector.
5. Disconnect combination meter harness connector.
6. Check combination meter harness connector for disconnection or looseness.
7. Check 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.

6. 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 continuity between brake fluid level switch harness connector and combination meter harness connector.

| Brake fluid level switch | | Combination meter | | Continuity |
|--------------------------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E47 | 1 | M53 | 27 | Existed |

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

| Brake fluid level switch | | — | Continuity |
|--------------------------|----------|--------|-------------|
| Connector | Terminal | | |
| E47 | 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 >

[WITH VDC]

8.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

| Brake fluid level switch | | — | Continuity |
|--------------------------|----------|--------|------------|
| Connector | Terminal | | |
| E47 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 9.

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

9.CHECK COMBINATION METER

Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace combination meter. Refer to [MWI-92, "Removal and Installation"](#).

Component Inspection

INFOID:0000000010099829

1.CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to [BR-33, "Disassembly and Assembly"](#).

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Logic

INFOID:0000000010099830

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-----------------|---|---|
| C1160 | DECEL G SEN SET | When calibration of yaw rate/side/decel G sensor is not complete. | <ul style="list-style-type: none">• Yaw rate/side/decel G sensor• Harness or connector• ABS actuator and electric unit (control unit)• Decel G sensor calibration is not performed |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

ⒺWith CONSULT

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

Is DTC "C1160" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-114, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099831

1.DECCEL G SENSOR CALIBRATION

Perform decel G sensor calibration. Refer to [BRC-71, "Work Procedure"](#).

>> GO TO 2.

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

ⒺWith CONSULT

Perform self-diagnosis for "ABS".

Is DTC "C1160" detected?

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

3.CHECK YAW RATE/SIDE/DECEL G SENSOR SYSTEM

1. Turn the ignition switch OFF.
2. Check yaw rate/side/decel G sensor system. Refer to [BRC-108, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

C1164, C1165 CV SYSTEM

DTC Logic

INFOID:0000000010099832

DTC DETECTION LOGIC

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


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

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

Is DTC "C1164" or "C1165" detected?

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

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099833

1. CHECK CUT VALVE POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

4. Turn the ignition switch ON.
CAUTION:
Never start engine.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK CUT VALVE POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check 30 A fusible link (#M).

C1164, C1165 CV SYSTEM

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (3) and 30 A fusible link (#M).

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

3.CHECK CUT VALVE GROUND CIRCUIT

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

C1170 VARIANT CODING

DTC Logic

INFOID:0000000010099834

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|----------------|--|---|
| C1170 | VARIANT CODING | When the information in ABS actuator and electric unit (control unit) is not the same. | ABS actuator and electric unit (control unit) |

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

BRC

 With CONSULT

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

Is DTC "C1170" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-117, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099835

1. CHECK SELF-DIAGNOSIS RESULTS

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

>> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1197 VACUUM SENSOR

DTC Logic

INFOID:0000000010099836

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|---------------|--|--|
| C1197 | VACUUM SENSOR | When a malfunction is detected in vacuum sensor. | <ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit) |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1197" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-118. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099837

1.CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.
2. Check brake booster. Refer to [BR-36. "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace brake booster. Refer to [BR-35. "Removal and Installation"](#).

2.CHECK VACUUM PIPING

Check vacuum piping. Refer to [BR-39. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Replace vacuum piping. Refer to [BR-39. "Removal and Installation"](#).

3.CHECK VACUUM SENSOR CIRCUIT

1. Disconnect vacuum sensor harness connector.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

| Vacuum sensor | | ABS actuator and electric unit (control unit) | | Continuity |
|---------------|----------|---|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E38 | 1 | E41 | 13 | Existed |
| | 2 | | 32 | |
| | 3 | | 28 | |

4. Check continuity between vacuum sensor harness connector and ground.

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| Vacuum sensor | | — | Continuity |
|---------------|----------|--------|-------------|
| Connector | Terminal | | |
| E38 | 1 | Ground | Not existed |
| | 2 | | |
| | 3 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE VACUUM SENSOR

⑧ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace vacuum sensor. Refer to [BR-35, "Removal and Installation"](#).

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

3. Erase self-diagnosis result for "ABS".
4. Turn the ignition switch OFF.
5. Start engine.
6. Perform self-diagnosis for "ABS".

Is DTC "C1197" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> INSPECTION END

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C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1198 VACUUM SENSOR

DTC Logic

INFOID:000000010099838

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|----------------|--|--|
| C1198 | VACUUM SEN CIR | <ul style="list-style-type: none">When an open circuit is detected in vacuum sensor circuit.When a short circuit is detected in vacuum sensor circuit.When a malfunction is detected in vacuum sensor noise. | <ul style="list-style-type: none">Harness or connectorVacuum sensor (brake booster)ABS actuator and electric unit (control unit) |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1198" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-120, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000010099839

1.CHECK VACUUM SENSOR CIRCUIT

- Turn the ignition switch OFF.
- Disconnect vacuum sensor harness connector.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

| Vacuum sensor | | ABS actuator and electric unit (control unit) | | Continuity |
|---------------|----------|---|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E38 | 1 | E41 | 13 | Existed |
| | 2 | | 32 | |
| | 3 | | 28 | |

- Check continuity between vacuum sensor harness connector and ground.

| Vacuum sensor | | — | Continuity |
|---------------|----------|--------|-------------|
| Connector | Terminal | | |
| E38 | 1 | Ground | Not existed |
| | 2 | | |
| | 3 | | |

Is the inspection result normal?

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

C1198 VACUUM SENSOR

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.REPLACE VACUUM SENSOR

ⓂWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace vacuum sensor. Refer to [BR-35. "Removal and Installation"](#).

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

3. Erase self-diagnosis result for "ABS".
4. Turn the ignition switch OFF.
5. Start engine.
6. Perform self-diagnosis for "ABS".

Is DTC "C1198" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150. "Removal and Installation"](#).

NO >> INSPECTION END

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C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C1199 BRAKE BOOSTER

DTC Logic

INFOID:000000010099840

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|---------------|---|--|
| C1199 | BRAKE BOOSTER | When brake booster vacuum is approx. 0 kPa (0 mm-Hg) during engine running. | <ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit) |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "C1199" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-122. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000010099841

1.CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.
2. Check brake booster. Refer to [BR-36. "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace brake booster. Refer to [BR-35. "Removal and Installation"](#).

2.CHECK VACUUM PIPING

Check vacuum piping. Refer to [BR-39. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Replace vacuum piping. Refer to [BR-39. "Removal and Installation"](#).

3.CHECK VACUUM SENSOR CIRCUIT

1. Disconnect vacuum sensor harness connector.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

| Vacuum sensor | | ABS actuator and electric unit (control unit) | | Continuity |
|---------------|----------|---|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E38 | 1 | E41 | 13 | Existed |
| | 2 | | 32 | |
| | 3 | | 28 | |

4. Check continuity between vacuum sensor harness connector and ground.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| Vacuum sensor | | — | Continuity |
|---------------|----------|--------|-------------|
| Connector | Terminal | | |
| E38 | 1 | Ground | Not existed |
| | 2 | | |
| | 3 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE VACUUM SENSOR

⑧ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace vacuum sensor. Refer to [BR-35, "Removal and Installation"](#).

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

3. Erase self-diagnosis result for "ABS".
4. Turn the ignition switch OFF.
5. Start engine.
6. Perform self-diagnosis for "ABS".

Is DTC "C1199" detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> INSPECTION END

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

C119A VACUUM SENSOR

DTC Logic

INFOID:0000000010099842

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|-----------------|--|--|
| C119A | VACUUM SEN VOLT | When a malfunction is detected in supply power voltage of vacuum sensor. | <ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit) |


DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

 With CONSULT

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

Is DTC "C119A" detected?

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

Diagnosis Procedure

INFOID:0000000010099843

1.CHECK VACUUM SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check voltage between vacuum sensor harness connector and ground.

| Vacuum sensor | | — | Voltage |
|---------------|----------|--------|---------|
| Connector | Terminal | | |
| E38 | 3 | Ground | 0 V |

4. Turn the ignition switch ON.

CAUTION:

Never start engine.

5. Check voltage between vacuum sensor harness connector and ground.

| Vacuum sensor | | — | Voltage |
|---------------|----------|--------|-----------------|
| Connector | Terminal | | |
| E38 | 3 | Ground | 4.75 V – 5.25 V |

Is the inspection result normal?

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

2.CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| Vacuum sensor | | ABS actuator and electric unit (control unit) | | Continuity |
|---------------|----------|---|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E38 | 3 | E41 | 28 | Existed |

4. Check continuity between vacuum sensor harness connector and ground.

| Vacuum sensor | | — | Continuity |
|---------------|----------|--------|-------------|
| Connector | Terminal | | |
| E38 | 3 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit.

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

NO >> Repair or replace error-detected parts.

3.CHECK VACUUM SENSOR GROUND CIRCUIT

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

| Vacuum sensor | | — | Continuity |
|---------------|----------|--------|------------|
| Connector | Terminal | | |
| E38 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000010099844

CAN communication allows a high rate of information transmission through the two communication lines (CAN-H line and CAN-L line) connecting various control units in the system. Each control unit transmits/ receives data but selectively reads required data only.

DTC Logic

INFOID:0000000010099845

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

Ⓔ With CONSULT

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

Is DTC "U1000" detected?

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

Diagnosis Procedure

INFOID:0000000010099846

Proceed to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

U0424 HVAC CAN CIRCUIT 1

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

U0424 HVAC CAN CIRCUIT 1

Description

INFOID:0000000010099847

ADUS control unit reads status of signal that is transmitted from A/C auto AMP. to ADAS control unit.

DTC Logic

INFOID:0000000010099848

DTC DETECTION LOGIC

| DTC | Display Item | Malfunction detected condition | Possible causes |
|-------|----------------|--|-----------------|
| U0424 | HVAC CAN CIR 1 | When signal that is transmitted from A/C auto AMP. is not the latest information | A/C auto AMP. |

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

ⓂWith CONSULT

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

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-127, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010099849

1.PERFORM ADAS CONTROL UNIT SELF-DIAGNOSIS

ⓂWith CONSULT

Perform self-diagnosis for "ICC/ADAS".

Are DTC "U1010" and "U0424" simultaneously detected?

- YES >> Refer to [DAS-65, "Diagnosis Procedure"](#).
NO >> Replace A/C auto AMP. Refer to [HAC-175, "Removal and Installation"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000010099850

ABS actuator and electric unit (control unit) power supply

Diagnosis Procedure

INFOID:0000000010099851

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 34 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.
CAUTION:
Never start engine.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------|
| Connector | Terminal | | |
| E41 | 34 | 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 10 A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check 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 | |
| E41 | 34 | E5 | 12 | Existed |

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 34 | Ground | Not existed |

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

3.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 4 | Ground | Battery voltage |

3. Turn the ignition switch ON.

CAUTION:

Never start engine.

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 4 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check 50 A fusible link (#N).
3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (4) and 50 A fusible link (#N).

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

3. Turn the ignition switch ON.

CAUTION:

Never start engine.

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|----------|--------|-----------------|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 7.

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

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

Is the inspection result normal?

POWER SUPPLY AND GROUND CIRCUIT

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

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

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

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|------------|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 2 | | |

Is the inspection result normal?

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

8.CHECK TERMINAL

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000010099852

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

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

Diagnosis Procedure

INFOID:0000000010099853

1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

| Parking brake switch | | Combination meter | | Continuity |
|----------------------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E107 | 1 | M53 | 26 | Existed |

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

| Parking brake switch | | — | Continuity |
|----------------------|----------|--------|-------------|
| Connector | Terminal | | |
| E107 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to [BRC-132, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to [PB-6, "Removal and Installation"](#).

3.CHECK PARKING BRAKE SWITCH SIGNAL

Ⓔ With CONSULT

1. Connect parking brake switch harness connector.
2. Connect combination meter harness connector.
3. Select "ABS", "DATA MONITOR" and "PARK BRAKE SW" according to this order. Check parking brake switch signal.

| Condition | DATA MONITOR |
|---------------------------|--------------|
| Operate parking brake | On |
| Release the parking brake | Off |

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK COMBINATION METER

Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

PARKING BRAKE SWITCH

[WITH VDC]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace combination meter. Refer to [MWI-92, "Removal and Installation"](#).

5.CHECK TERMINAL

- Check combination meter pin terminals for damage or loose connection with harness connector.
- Check parking brake switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000010099854

1.CHECK PARKING BRAKE SWITCH

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

| Parking brake switch Terminal | — | Condition | Continuity |
|----------------------------------|--------|---------------------------------------|-------------|
| 1 | Ground | When parking brake switch is pressed | Existed |
| | | When parking brake switch is released | Not existed |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to [PB-6, "Removal and Installation"](#).

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

VDC OFF SWITCH

Component Function Check

INFOID:0000000010099855

1.CHECK VDC OFF SWITCH OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to [BRC-133, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010099856

1.CHECK VDC OFF SWITCH CIRCUIT

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

| ABS actuator and electric unit (control unit) | | Triple switch | | Continuity |
|---|----------|---------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E41 | 30 | M183 | 3 | Existed |

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|----------|--------|-------------|
| Connector | Terminal | | |
| E41 | 30 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between triple switch harness connector and ground.

| Triple switch | | — | Continuity |
|---------------|----------|--------|------------|
| Connector | Terminal | | |
| M183 | 5 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to [BRC-134, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace VDC OFF switch. Refer to [BRC-154, "Removal and Installation"](#).

4.CHECK VDC OFF SWITCH SIGNAL

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect triple switch harness connector.
3. Select "ABS", "DATA MONITOR" and "OFF SW" according to this order. Check VDC OFF switch signal.

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH VDC]

| Condition | DATA MONITOR |
|---|--------------|
| When VDC OFF switch is pressed and VDC OFF indicator lamp in combination meter is in ON status | On |
| When VDC OFF switch is pressed and VDC OFF indicator lamp in combination meter is in OFF status | Off |

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000010099857

1.CHECK VDC OFF SWITCH

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

| Triple switch | Condition | Continuity |
|---------------|------------------------------------|-------------|
| Terminal | | |
| 3 – 5 | When VDC OFF switch is pressed | Existed |
| | When VDC OFF switch is not pressed | Not existed |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch. Refer to [BRC-154, "Removal and Installation"](#).

ABS WARNING LAMP

Component Function Check

INFOID:0000000010099858

1. CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp turns ON for approx. 1 second after ignition switch is turned ON.

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to [BRC-135, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010099859

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


Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-128, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF-DIAGNOSIS

 With CONSULT


Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK ABS WARNING LAMP SIGNAL

 With CONSULT

1. Select "ABS", "DATA MONITOR" and "ABS WARN 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 >> Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

BRAKE WARNING LAMP

Component Function Check

INFOID:0000000010099860

1. CHECK BRAKE WARNING LAMP FUNCTION (1)

Check that brake warning lamp 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 [BRC-136, "Diagnosis Procedure"](#).

2. CHECK BRAKE WARNING LAMP FUNCTION (2)

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

NOTE:

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check brake fluid level switch system. Refer to [BRC-131, "Diagnosis Procedure"](#).

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 brake fluid level switch system. Refer to [BRC-111, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010099861

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

Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-128, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF-DIAGNOSIS

 With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK THAT BRAKE WARNING LAMP TURNS ON

Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-92, "Removal and Installation"](#).

VDC WARNING LAMP

Component Function Check

INFOID:0000000010099862

1. CHECK VDC WARNING LAMP FUNCTION

Check that VDC warning lamp turns ON for approx. 1 second after ignition switch is turned ON.

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to [BRC-137, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010099863

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


Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-128, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM THE SELF-DIAGNOSIS

 With CONSULT


Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK VDC WARNING LAMP SIGNAL

 With CONSULT

1. Select "ABS", "DATA MONITOR" and "SLIP/VDC 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 >> Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:000000010099864

1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp 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 [BRC-138, "Diagnosis Procedure"](#).

2.CHECK VDC WARNING LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check VDC OFF switch system. Refer to [BRC-133, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000010099865

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

Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to [BRC-128, "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 [BRC-150, "Removal and Installation"](#).

3.CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

 With CONSULT

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

Is the inspection result normal?

YES >> Check combination meter. Refer to [MWI-31, "CONSULT Function"](#).

NO >> Check VDC OFF switch system. Refer to [BRC-133, "Diagnosis Procedure"](#).

SYMPTOM DIAGNOSIS

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:0000000010099866

VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function or Brake force distribution function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:0000000010099867

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

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

- Front axle
 - 2WD: Refer to [FAX-6, "Inspection"](#).
 - AWD: Refer to [FAX-15, "Inspection"](#).
- Rear axle: Refer to [RAX-6, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK WHEEL SENSOR

Check wheel sensor.

- Check installation and damage of wheel sensor.
- Check connection of wheel sensor harness connector.
- Check terminal of wheel sensor harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair installation or replace wheel sensor.

- Front wheel sensor: Refer to [BRC-146, "FRONT WHEEL SENSOR : Removal and Installation"](#).
- Rear wheel sensor: Refer to [BRC-147, "REAR WHEEL SENSOR : Removal and Installation"](#).

4.CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair installation or replace sensor rotor.

- Front sensor rotor: Refer to [BRC-149, "FRONT SENSOR ROTOR : Removal and Installation"](#).
- Rear sensor rotor: Refer to [BRC-149, "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 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.

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UNEXPECTED BRAKE PEDAL REACTION

[WITH VDC]

< SYMPTOM DIAGNOSIS >

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:0000000010099868

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

Diagnosis Procedure

INFOID:0000000010099869

1.CHECK FRONT AND REAR AXLE

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

- Front axle
 - 2WD: Refer to [FAX-6, "Inspection"](#).
 - AWD: Refer to [FAX-15, "Inspection"](#).
- Rear axle: Refer to [RAX-6, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK DISC ROTOR

Check 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 the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage.

- Front: Refer to [BR-26, "FRONT : Inspection"](#).
- Rear: Refer to [BR-31, "REAR : Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK BRAKE PEDAL

Check each item of brake pedal. Refer to [BR-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 brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check each components of brake system.

6.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Normal

NO >> Check each components of brake system.

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[WITH VDC]

THE BRAKING DISTANCE IS LONG

Description

INFOID:0000000010099870

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:0000000010099871

CAUTION:

Brake stopping distance on slippery road like rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated.

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check each components of brake system.

2.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check brake stopping distance in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal

NO >> Check each components of brake system.

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DOES NOT OPERATE**Description**

INFOID:000000010099872

VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function or Brake force distribution function does not operate.

Diagnosis Procedure

INFOID:000000010099873

CAUTION:

- VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function and Brake force distribution function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less. However, hill start assist function operates when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

1. CHECK ABS WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF 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.

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[WITH VDC]

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:000000010099874

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the engine starts.
- Brake pedal vibrates during braking.

CAUTION:

Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]

Diagnosis Procedure

INFOID:000000010099875

1.SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Check brake pedal. Refer to [BR-19, "Inspection and Adjustment"](#).

2.SYMPTOM CHECK 2

Check that motor sound from ABS actuator 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 (head lamps, etc.) switches are operated.

Does the symptom occur?

YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).

NO >> Normal

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VEHICLE JERKS DURING

Description

INFOID:000000010099876

The vehicle jerks when VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function or Brake force distribution function operates.

Diagnosis Procedure

INFOID:000000010099877

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function or Brake force distribution function operates.

Is the inspection result normal?

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

2.PERFORM THE SELF-DIAGNOSIS

 With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-52, "DTC Index"](#).
- NO >> GO TO 3.

3.CHECK CONNECTOR

 With CONSULT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check connector terminal for deformation, disconnection and looseness.
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".

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-150, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[WITH VDC]

NORMAL OPERATING CONDITION

Description

INFOID:000000010099878

| Symptom | Result |
|---|---|
| Brake pedal slightly vibrates and operation sound (motor sound and sound from suspension) occurs when VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function or Active trace control function operates. | This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD function, hill start assist function, Rise-up & Build-up function, Brake force distribution function and Active trace control function that are normally operated. |
| Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road. | |
| Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function or Active trace control function is operated. | |
| Brake pedal vibrates and motor sound from the engine room occurs, when the engine starts or the vehicle starts just after starting the engine. | This is not a malfunction, because it is caused by operation check of ABS actuator and electric unit (control unit). |
| Acceleration may be felt insufficient depending on the road conditions. | This is not a malfunction, because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability). |
| TCS function may operate momentarily, while driving on a road where friction coefficient varies, or when downshifting, or fully depressing accelerator pedal. | |
| ABS warning lamp and VDC warning lamp may turn ON, when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running. | In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT. |
| VDC warning lamp may turn ON and VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function and Active trace control function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course). | |
| A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function, TCS function, Rise-up & Build-up function, Brake force distribution function and Active trace control function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status). | |
| The vehicle speed does not increase, when the accelerator pedal is depressed while the vehicle is on a 2-wheel chassis dynamometer for speedometer check. | This is normal. (When checking the vehicle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.) |

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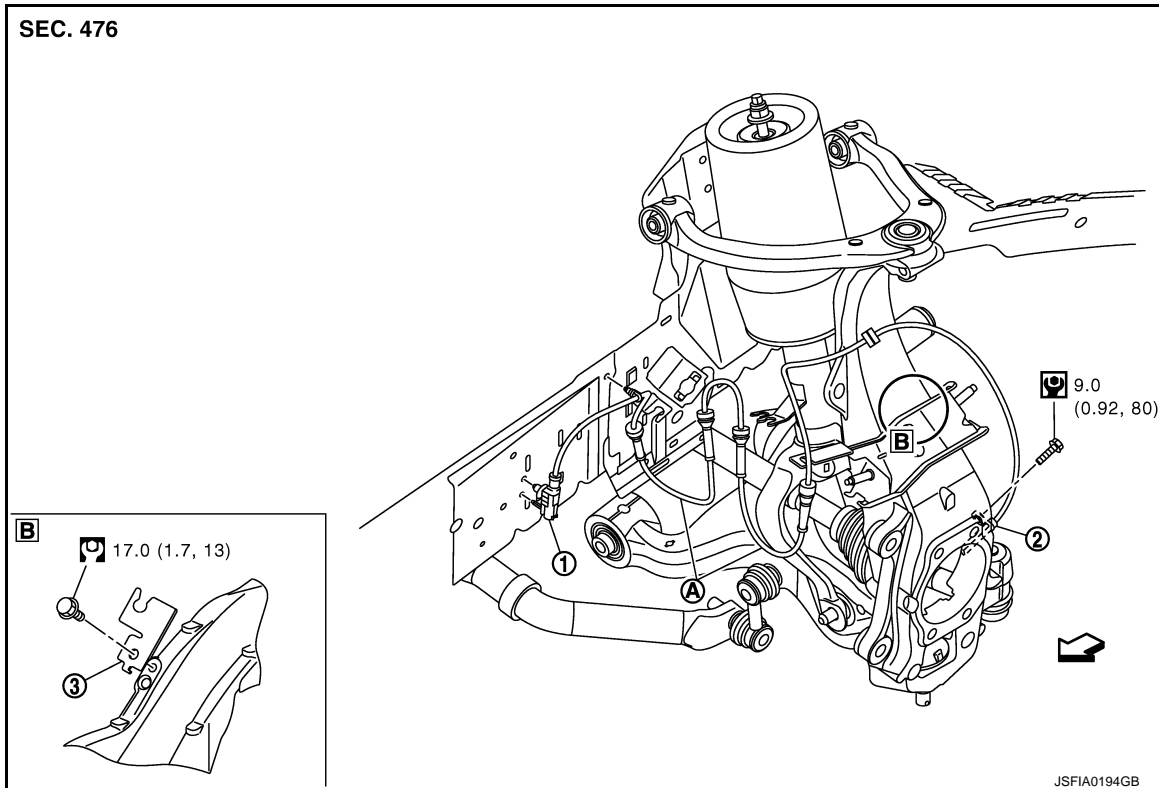
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:00000001009879



1. Front LH wheel sensor harness connector
2. Front LH wheel sensor
3. Bracket
A: Identification line

←: Vehicle front

Refer to [GI-4, "Components"](#) for symbols in the figure.

NOTE:

Front RH wheel sensor is symmetrically opposite of LH.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:00000001009880

REMOVAL

1. Remove tires with power tool.
2. Remove the fender protector (front). Refer to [EXT-26, "FENDER PROTECTOR : Removal and Installation"](#).
3. Remove front wheel sensor from steering knuckle.
CAUTION:
Never rotate and never pull front wheel sensor as much as possible, when pulling out.
4. Remove front wheel sensor harness from the vehicle.
CAUTION:
Never twist or pull front wheel sensor harness, when removing.

INSTALLATION

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

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

- Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet is fully inserted to bracket. Check that front wheel sensor harness is not twisted after installation.

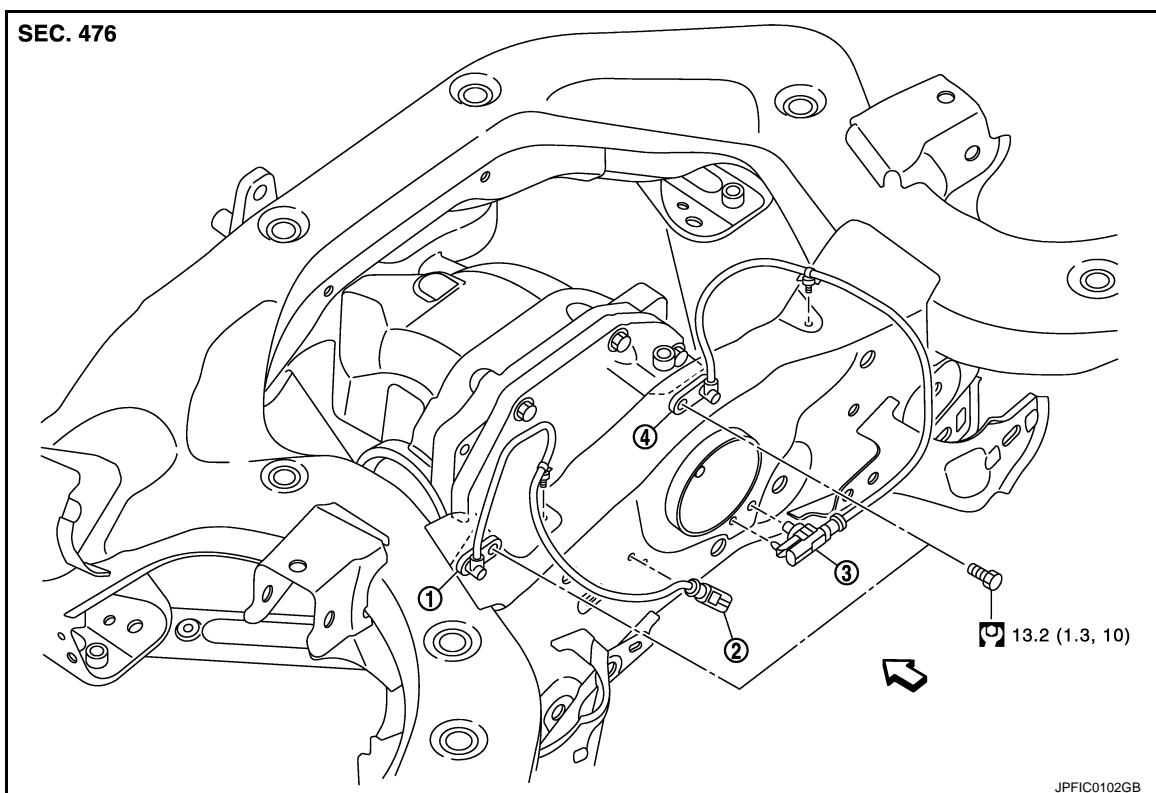
CAUTION:

Check that front wheel sensor identification line faces toward the vehicle front.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000010099881



1. Rear LH wheel sensor
2. Rear LH wheel sensor harness connector
3. Rear RH wheel sensor harness connector
4. Rear RH wheel sensor

⇐: Vehicle front

Refer to [GI-4, "Components"](#) for symbols in the figure.

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000010099882

REMOVAL

1. Remove rear wheel sensor from rear final drive.
CAUTION:
Never rotate or pull rear wheel sensor as much as possible, when pulling out.
2. Remove rear wheel sensor harness from the vehicle.
CAUTION:
Never twist and never pull rear wheel sensor harness, when removing.

INSTALLATION

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

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

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

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

SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[WITH VDC]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000010099883

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [FAX-7, "Removal and Installation"](#) (2WD models), [FAX-17, "Removal and Installation"](#) (AWD models).

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to [FAX-7, "Removal and Installation"](#) (2WD models), [FAX-17, "Removal and Installation"](#) (AWD models).

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000010099884

REMOVAL

1. Remove drive shaft. Refer to [RAX-13, "Removal and Installation"](#).
2. Remove sensor rotor from rear drive shaft. Refer to [RAX-17, "FINAL DRIVE SIDE : Disassembly and Assembly"](#).

INSTALLATION

Installation is the reverse order of removal.

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

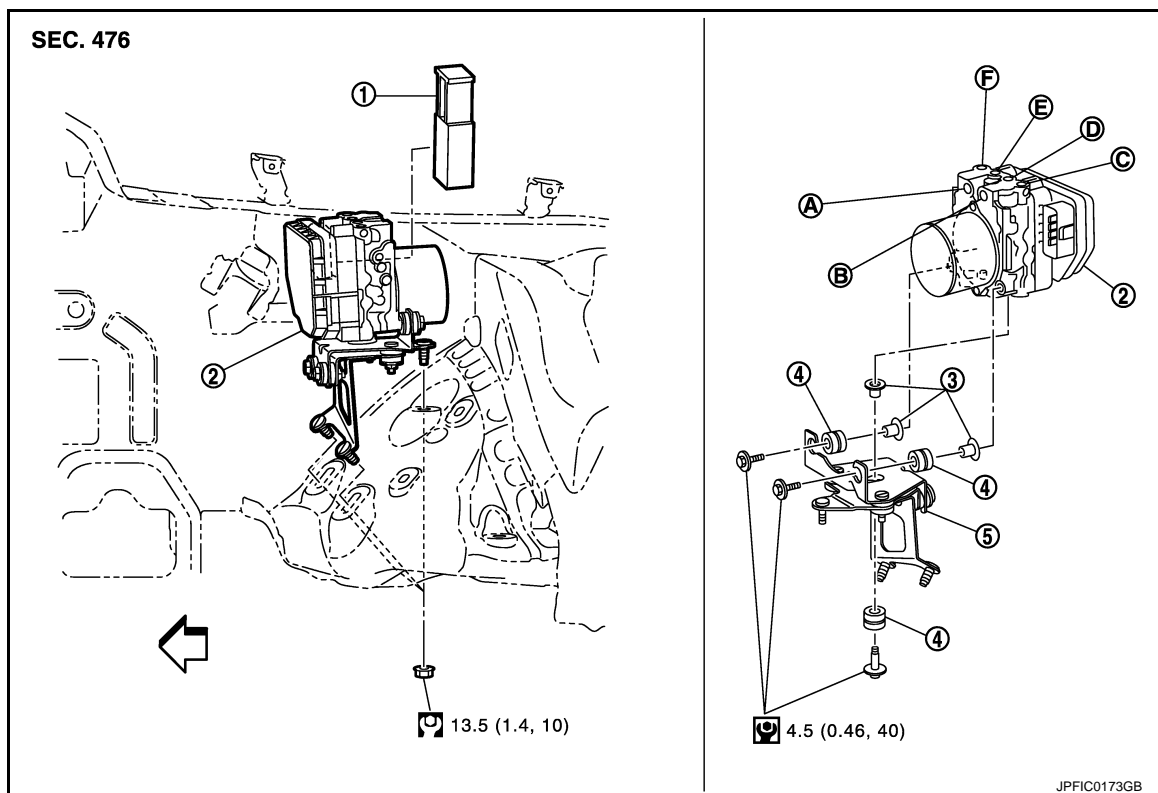
< REMOVAL AND INSTALLATION >

[WITH VDC]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000010099885



- | | | |
|--|--|------------------------|
| 1. ABS actuator and electric unit (control unit) harness connector | 2. ABS actuator and electric unit (control unit) | 3. Collar |
| 4. Bushing | 5. Bracket | |
| A: To master cylinder secondary side | B: To master cylinder primary side | C: To front LH caliper |
| D: To rear RH caliper | E: To rear LH caliper | F: To front RH caliper |

←: Vehicle front

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000010099886

REMOVAL

1. Disconnect battery cable from negative terminal.
2. Remove brake master cylinder cover and hood ledge cover. Refer to [EXT-23, "Removal and Installation"](#).
3. Drain brake fluid. Refer to [BR-10, "Draining"](#).
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Loosen flare nut of brake tube using a flare nut wrench, and then remove brake tube from ABS actuator and electric unit (control unit). Refer to [BR-20, "FRONT : Exploded View"](#).
6. Remove front RH tire with power tool.
7. Remove fender protector (rear) (front RH wheel). Refer to [EXT-26, "FENDER PROTECTOR : Removal and Installation"](#).
8. Remove ABS actuator and electric unit (control unit) and bracket.

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.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

[WITH VDC]

9. Remove bracket, bushing and collar from ABS actuator and electric unit (control unit).

INSTALLATION

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

- When installing brake tube, tighten to the specified torque using a crowfoot and torque wrench so that flare nut and brake tube are not damaged. Refer to [BR-20, "FRONT : Exploded View"](#).
- Never remove and install actuator by holding actuator harness.
- Bleed air from brake piping after installation. Refer to [BR-11, "Bleeding Brake System"](#).
- Never apply excessive impact to actuator, such as by dropping it.
- Check that connector is fully locked after ABS actuator and electric unit (control unit) harness connector is installed.
- Perform decel G sensor calibration when ABS actuator and electric unit (control unit) is replaced. Refer to [BRC-71, "Work Procedure"](#).

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YAW RATE/SIDE/DECEL G SENSOR

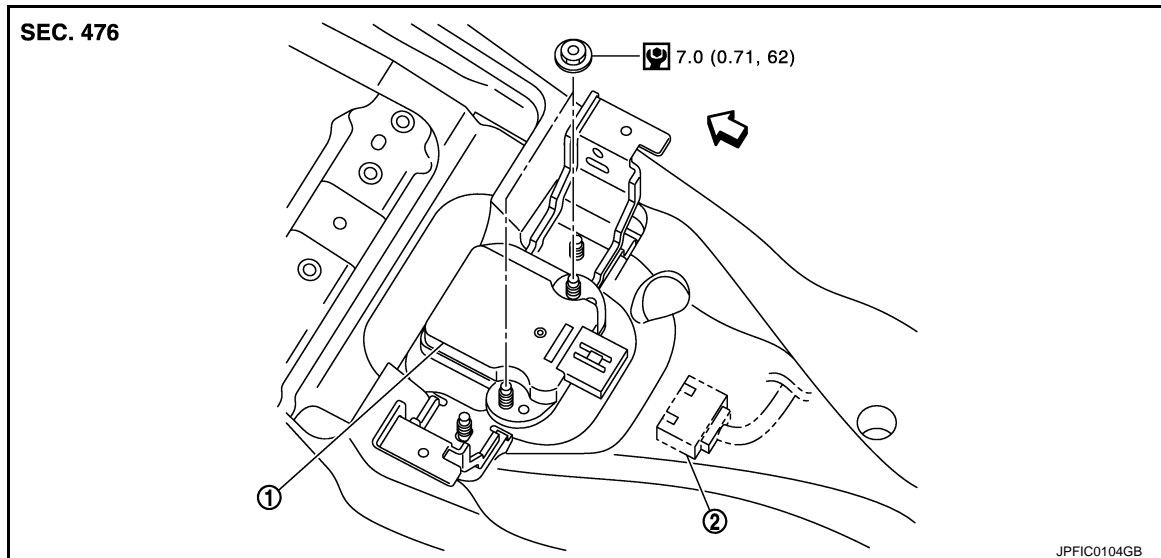
< REMOVAL AND INSTALLATION >

[WITH VDC]

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:0000000010099887



1. Yaw rate/side/decel G sensor

2. Yaw rate/side/decel G sensor harness connector

↔: Vehicle front

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:0000000010099888

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 center console. Refer to [IP-24, "Removal and Installation"](#).
2. Disconnect yaw rate/side/decel G sensor harness connector.
3. Remove yaw rate/side/decel G sensor.

INSTALLATION

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

- Never drop or strike yaw rate/transverse/decel G sensor, because it has little endurance to impact. Never use a power tool.
- Perform decel G sensor calibration when yaw rate/side/decel G sensor is replaced. Refer to [BRC-71, "Work Procedure"](#).

STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000010099889

REMOVAL

1. Remove spiral cable assembly. Refer to [SR-14, "Removal and Installation"](#).
2. Remove steering angle sensor.

INSTALLATION

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

- Perform steering angle sensor neutral position adjustment when steering angle sensor is removed and installed, or replaced.

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VDC OFF SWITCH

Removal and Installation

INFOID:0000000010099890

NOTE:

This is an integrated switch with switches for other functions.

REMOVAL

1. Remove lower instrument panel LH. Refer to [IP-13, "Removal and Installation"](#).
2. Remove switch panel. Refer to [IP-13, "Removal and Installation"](#).
3. Remove VDC OFF switch.

INSTALLATION

Installation is the reverse order of removal.

PRECAUTIONS

< PRECAUTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

PRECAUTION

PRECAUTIONS

Precautions for Removing of Battery Terminal

INFOID:0000000010261418

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

NOTE:

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.

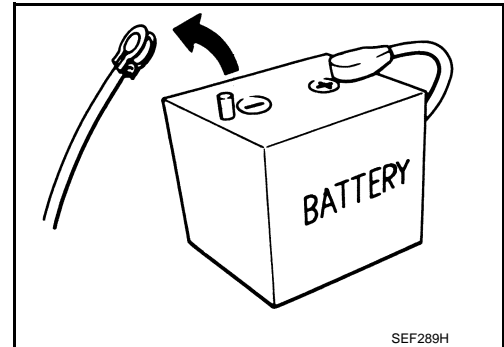
NOTE:

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.



Precautions for Preview Function Service

INFOID:0000000010099891

CAUTION:

- Never look straight into the laser beam discharger when adjusting laser beam aiming.
- Never use the ICC sensor removed from vehicle. Never disassemble or remodel.
- Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after adjusting laser beam aiming if necessary.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

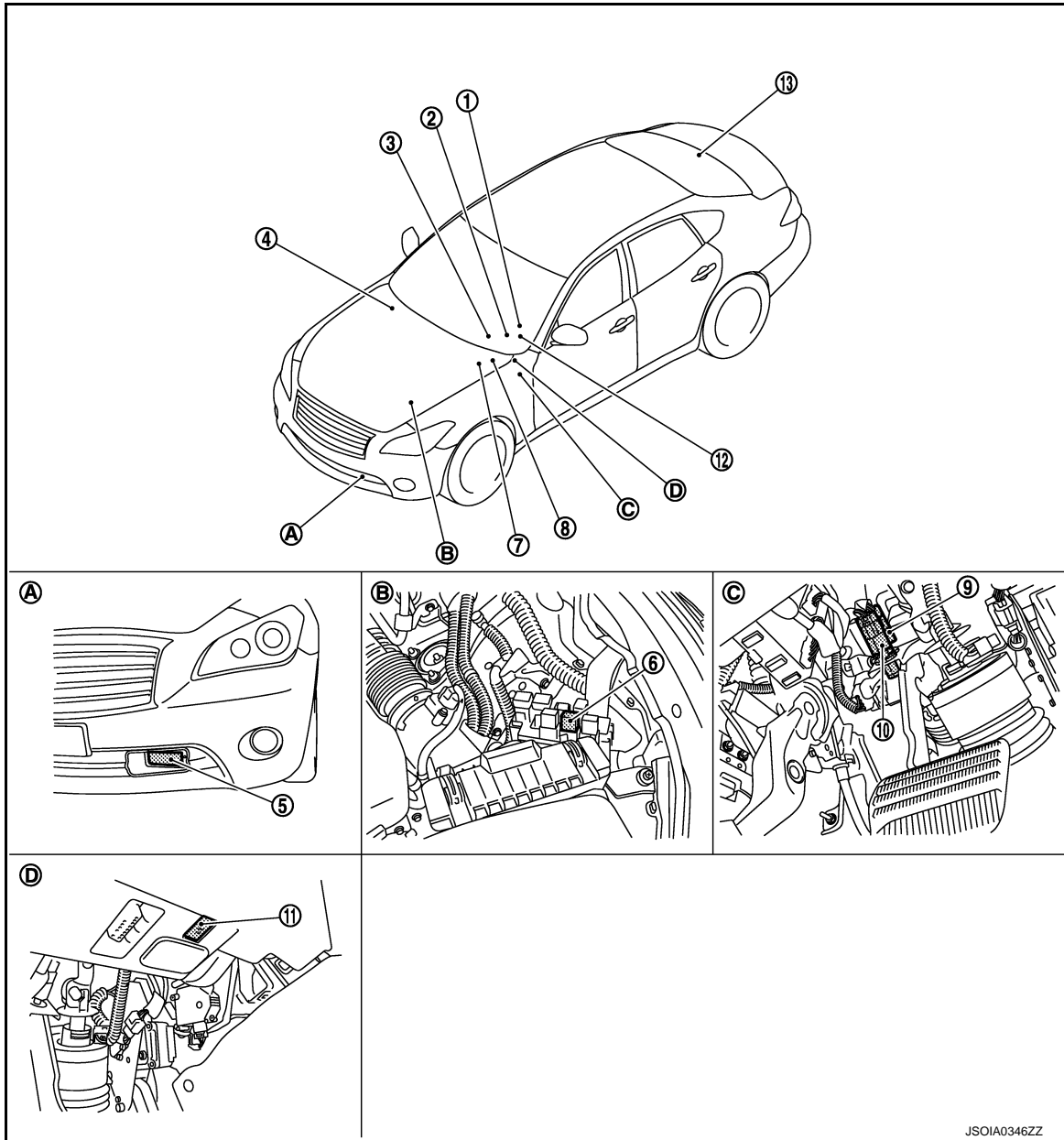
[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000010099892



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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

- | | | |
|---|--|--|
| 1. ICC steering switch | 2. Information display, ICC system warning lamp, IBA OFF indicator lamp, buzzer (On the combination meter) | 3. BCM Refer to BCS-4, "BODY CONTROL SYSTEM : Component Parts Location" |
| 4. ECM Refer to the following | 5. ICC sensor | 6. ICC brake hold relay |
| <ul style="list-style-type: none"> • VQ37VHR: EC-37, "ENGINE CONTROL SYSTEM : Component Parts Location" • VK56VD (USA and Canada): EC-984, "ENGINE CONTROL SYSTEM : Component Parts Location" • VK56VD (Mexico): EC-1577, "ENGINE CONTROL SYSTEM : Component Parts Location" | | |
| 7. ABS actuator and electric unit (control unit) Refer to BRC-10, "Component Parts Location" | 8. TCM Refer to TM-11, "A/T CONTROL SYSTEM : Component Parts Location" | 9. Stop lamp switch |
| 10. ICC brake switch | 11. IBA OFF switch | 12. Steering angle sensor Refer to BRC-10, "Component Parts Location" |
| 13. ADAS control unit Refer to DAS-14, "Component Parts Location" | | |
| A. Front bumper (LH) | B. Engine room (LH) | C. Upper side of brake pedal |
| D. Instrument lower panel (LH) | | |

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Component Description

INFOID:0000000010099893

×: Applicable

| Component | Function | | | | Description |
|-------------------|--|--|--------------------------------|--------------------------------------|---|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| ADAS control unit | × | × | × | × | <ul style="list-style-type: none"> • ADAS control unit calculates a target distance between vehicles and a target speed, based on signals received from each sensor and switch to transmit an engine torque command value to ECM and a brake fluid pressure control signal to ABS actuator and electric unit (control unit) via CAN communication • ADAS control unit transmits buzzer output signal to combination meter via CAN communication |
| ICC sensor | × | × | × | × | <ul style="list-style-type: none"> • ICC sensor detects light reflected from a vehicle ahead by irradiating laser forward and calculates a distance from the vehicle ahead and a relative speed, based on the detected signal • ICC sensor transmits the presence/absence of vehicle ahead and the distance from the vehicle to ADAS control unit via ITS communication |

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

| Component | Function | | | | Description |
|---|--|--|--------------------------------|--------------------------------------|---|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| ECM | × | × | × | × | <ul style="list-style-type: none"> ECM transmits the accelerator pedal position signal, ICC brake switch signal, stop lamp switch signal, ICC steering switch signal, etc. to ADAS control unit via CAN communication ECM controls the electric throttle control actuator based on the engine torque demand received from the ADAS control unit via CAN communication |
| ABS actuator and electric unit (control unit) | × | × | × | × | <ul style="list-style-type: none"> ABS actuator and electric unit (control unit) transmits the vehicle speed signal (wheel speed), stop lamp signal and VDC/TCS/ABS system operation condition to ADAS control unit via CAN communication ABS actuator and electric unit (control unit) controls the brake, based on a brake fluid pressure control signal received from the ADAS control unit via CAN communication |
| BCM | × | | | | Transmits the front wiper request signal to ADAS control unit via CAN communication |
| TCM | × | × | | | TCM transmits the signal related to A/T control to ADAS control unit via CAN communication |
| Combination meter | × | × | × | × | <p>Performs the following operations using the signals received from the ADAS control unit via the CAN communication</p> <ul style="list-style-type: none"> Displays the ICC system operation status using the meter display signal Illuminates the ICC system warning lamp using the ICC warning lamp signal Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal Operates the buzzer (ICC warning chime) using the buzzer output signal |
| ICC steering switch | × | × | | | <ul style="list-style-type: none"> ICC steering switch allows the ON/OFF of the intelligent cruise control and the settings of a vehicle speed and distance between vehicles ICC steering switch signal is transmitted to ECM. ECM transmits the signal to the ADAS control unit via CAN communication |
| ICC brake switch | × | × | × | × | <ul style="list-style-type: none"> ICC brake switch is turned OFF and stop lamp switch is turned ON, when depressing the brake pedal ICC brake switch signal is input to ECM. These signals are transmitted from ECM to ADAS control unit via CAN communication |
| Stop lamp switch | × | × | × | × | <ul style="list-style-type: none"> Stop lamp switch signal is input to ECM and ABS actuator and electric unit (control unit). These signals are transmitted from ECM and ABS actuator and electric unit (control unit) to ADAS control unit via CAN communication |
| ICC brake hold relay | × | | × | | ICC brake hold relay activates the stop lamp by ICC brake hold relay drive signal (stop lamp drive signal) outputted by the ADAS control unit |

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

| Component | Function | | | | Description |
|-----------------------|--|--|--------------------------------|--------------------------------------|--|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| IBA OFF switch | | | × ^{Note} | | IBA OFF switch signal is input to the ADAS control unit |
| Steering angle sensor | × | | | | Measures the rotation amount, rotation speed, and rotation direction of steering wheel, and then transmits them to ADAS control unit via CAN communication |

NOTE:

Only IBA system uses

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< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

SYSTEM

BRAKE ASSIST (WITH PREVIEW FUNCTION)

BRAKE ASSIST (WITH PREVIEW FUNCTION) : System Description

INFOID:000000001009894

FUNCTION DESCRIPTION

When the Preview Function identifies the need to apply emergency braking by sensing a vehicle ahead in the same lane and the distance and relative speed from it, it applies the brake pre-pressure before the driver depress the brake pedal and helps improve brake response by reducing pedal free play.

The Preview Function shares component parts and diagnosis with the Intelligent Cruise Control (ICC) system.

CAUTION:

This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.

OPERATION DESCRIPTION

- The system detects the distance to the vehicle in front with the ICC sensor of ICC and judges the necessity of emergency braking.
- The system detects the accelerator pedal release operation of the driver by the accelerator pedal position sensor and estimates the driver's brake operation intention.
- If the system is judged that the emergency braking is necessary and that the driver has the intention to operate the brake, the ABS actuator and electric unit (control unit) applies pre-pressure to reduce brake pedal play.

NOTE:

This system will not operate when the vehicle is moving at approximately 32 km/h (20 MPH) or less.

END OF OPERATION

The pre-pressure function ceases when the following conditions are met:

1. When the driver depresses the accelerator pedal or the brake pedal.
2. If the driver does not operate the accelerator pedal or brake pedal within approximately 1 second.

DTC/CIRCUIT DIAGNOSIS

BRAKE ASSIST (WITH PREVIEW FUNCTION)

Diagnosis Procedure

INFOID:0000000010099895

1. PREVIEW FUNCTION DIAGNOSIS

When the preview function is not operating properly, the buzzer sounds and the preview function warning lamp will come on.

NOTE:

The preview function warning lamp shares the ICC system warning lamp.

>> Go to ICC. Refer to [CCS-73, "Work Flow"](#).

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

SYMPTOM DIAGNOSIS

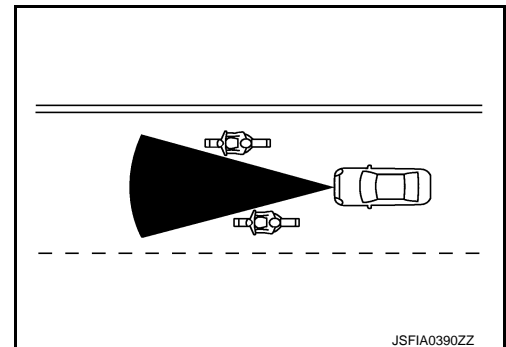
NORMAL OPERATING CONDITION

Description

INFOID:0000000010099896

PRECAUTIONS FOR PREVIEW FUNCTION

- This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- As there is a performance limit to the Preview Function, never rely solely on this system. This system does not correct careless inattentive or absent-minded driving, or overcome poor visibility in rain, fog, or other bad weather. Reduce vehicle speed by depressing the brake pedal, in order to maintain a safe distance between vehicles.
- The system may not detect a vehicle ahead, depending on road or weather conditions. While the vehicle still travels and the Brake Assist System operates under normal conditions, the Preview Function may operate improperly under the following conditions:
 - When rain, snow or dirt adhere to the system sensor
 - When strong light (for example, at sunrise or sunset) is directly shining on the front of the vehicle
 - Winding or hilly roads may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
 - Vehicle position in the lane may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
- The system will not detect:
 - Pedestrians or objects in the roadway
 - Oncoming vehicles in the same lane
 - Motorcycles traveling offset in the travel lane as illustrated



PRECAUTION

PRECAUTIONS

Precautions for Removing of Battery Terminal

INFOID:0000000010261419

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

NOTE:

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.

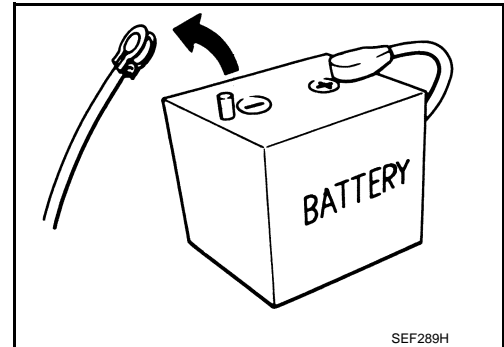
NOTE:

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.



Precautions for IBA System Service

INFOID:0000000010099897

CAUTION:

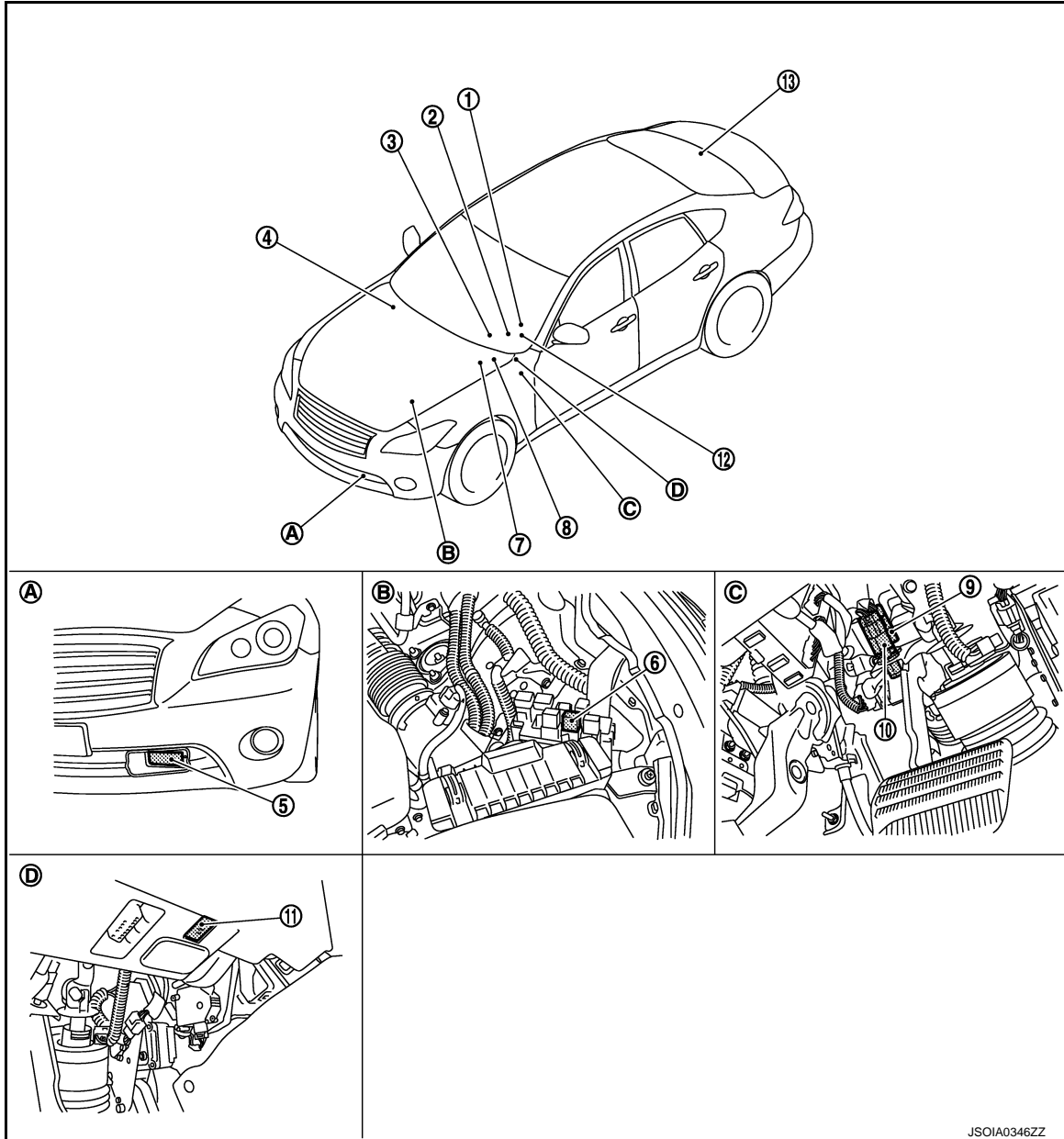
- Never look straight into the laser beam discharger when adjusting laser beam aiming.
- Never use the ICC sensor removed from vehicle. Never disassemble or remodel.
- Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after adjusting laser beam aiming if necessary.
- Never change IBA system state ON/OFF without the consent of the customer.

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000010099898



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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[INTELLIGENT BRAKE ASSIST]

- | | | | |
|---|--|--|---|
| 1. ICC steering switch | 2. Information display, ICC system warning lamp, IBA OFF indicator lamp, buzzer (On the combination meter) | 3. BCM Refer to BCS-4, "BODY CONTROL SYSTEM : Component Parts Location" | A |
| 4. ECM Refer to the following | 5. ICC sensor | 6. ICC brake hold relay | B |
| <ul style="list-style-type: none"> • VQ37VHR: EC-37, "ENGINE CONTROL SYSTEM : Component Parts Location" • VK56VD (USA and Canada): EC-984, "ENGINE CONTROL SYSTEM : Component Parts Location" • VK56VD (Mexico): EC-1577, "ENGINE CONTROL SYSTEM : Component Parts Location" | | | C |
| 7. ABS actuator and electric unit (control unit) Refer to BRC-10, "Component Parts Location" | 8. TCM Refer to TM-11, "A/T CONTROL SYSTEM : Component Parts Location" | 9. Stop lamp switch | D |
| 10. ICC brake switch | 11. IBA OFF switch | 12. Steering angle sensor Refer to BRC-10, "Component Parts Location" | E |
| 13. ADAS control unit Refer to DAS-14, "Component Parts Location" | | | F |
| A. Front bumper (LH) | B. Engine room (LH) | C. Upper side of brake pedal | G |
| D. Instrument lower panel (LH) | | | H |

BRC

Component Description

INFOID:0000000010099899

×: Applicable

| Component | Function | | | | Description |
|-------------------|--|--|--------------------------------|--------------------------------------|---|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| ADAS control unit | × | × | × | × | <ul style="list-style-type: none"> • ADAS control unit calculates a target distance between vehicles and a target speed, based on signals received from each sensor and switch to transmit an engine torque command value to ECM and a brake fluid pressure control signal to ABS actuator and electric unit (control unit) via CAN communication • ADAS control unit transmits buzzer output signal to combination meter via CAN communication |
| ICC sensor | × | × | × | × | <ul style="list-style-type: none"> • ICC sensor detects light reflected from a vehicle ahead by irradiating laser forward and calculates a distance from the vehicle ahead and a relative speed, based on the detected signal • ICC sensor transmits the presence/absence of vehicle ahead and the distance from the vehicle to ADAS control unit via ITS communication |

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[INTELLIGENT BRAKE ASSIST]

| Component | Function | | | | Description |
|---|--|--|--------------------------------|--------------------------------------|---|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| ECM | × | × | × | × | <ul style="list-style-type: none"> ECM transmits the accelerator pedal position signal, ICC brake switch signal, stop lamp switch signal, ICC steering switch signal, etc. to ADAS control unit via CAN communication ECM controls the electric throttle control actuator based on the engine torque demand received from the ADAS control unit via CAN communication |
| ABS actuator and electric unit (control unit) | × | × | × | × | <ul style="list-style-type: none"> ABS actuator and electric unit (control unit) transmits the vehicle speed signal (wheel speed), stop lamp signal and VDC/TCS/ABS system operation condition to ADAS control unit via CAN communication ABS actuator and electric unit (control unit) controls the brake, based on a brake fluid pressure control signal received from the ADAS control unit via CAN communication |
| BCM | × | | | | Transmits the front wiper request signal to ADAS control unit via CAN communication |
| TCM | × | × | | | TCM transmits the signal related to A/T control to ADAS control unit via CAN communication |
| Combination meter | × | × | × | × | <p>Performs the following operations using the signals received from the ADAS control unit via the CAN communication</p> <ul style="list-style-type: none"> Displays the ICC system operation status using the meter display signal Illuminates the ICC system warning lamp using the ICC warning lamp signal Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal Operates the buzzer (ICC warning chime) using the buzzer output signal |
| ICC steering switch | × | × | | | <ul style="list-style-type: none"> ICC steering switch allows the ON/OFF of the intelligent cruise control and the settings of a vehicle speed and distance between vehicles ICC steering switch signal is transmitted to ECM. ECM transmits the signal to the ADAS control unit via CAN communication |
| ICC brake switch | × | × | × | × | <ul style="list-style-type: none"> ICC brake switch is turned OFF and stop lamp switch is turned ON, when depressing the brake pedal ICC brake switch signal is input to ECM. These signals are transmitted from ECM to ADAS control unit via CAN communication |
| Stop lamp switch | × | × | × | × | <ul style="list-style-type: none"> Stop lamp switch signal is input to ECM and ABS actuator and electric unit (control unit). These signals are transmitted from ECM and ABS actuator and electric unit (control unit) to ADAS control unit via CAN communication |
| ICC brake hold relay | × | | × | | ICC brake hold relay activates the stop lamp by ICC brake hold relay drive signal (stop lamp drive signal) outputted by the ADAS control unit |

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[INTELLIGENT BRAKE ASSIST]

| Component | Function | | | | Description |
|-----------------------|--|--|--------------------------------|--------------------------------------|--|
| | Vehicle-to-vehicle distance control mode | Conventional (fixed speed) cruise control mode | Intelligent Brake Assist (IBA) | Brake Assist (with preview function) | |
| IBA OFF switch | | | × ^{Note} | | IBA OFF switch signal is input to the ADAS control unit |
| Steering angle sensor | × | | | | Measures the rotation amount, rotation speed, and rotation direction of steering wheel, and then transmits them to ADAS control unit via CAN communication |

NOTE:

Only IBA system uses

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SYSTEM

INTELLIGENT BRAKE ASSIST

INTELLIGENT BRAKE ASSIST : System Description

INFOID:0000000010099900

FUNCTION DESCRIPTION

Intelligent Brake Assist (IBA) system warns the driver by a vehicle ahead detection indicator and chime when there is a risk of a collision with the vehicle ahead in the traveling lane and the driver must take avoidance action immediately. The system helps reduce the rear-end collision speed by applying the brakes when it judges a collision can not be avoided.

CAUTION:

The IBA system is a not collision avoidance system. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times. As there is a performance limit, it may not provide a warning or brake in certain conditions.

NOTE:

- The IBA system shares component parts and diagnosis with the Intelligent Cruise Control (ICC) system. New parts added to the IBA system is the IBA OFF indicator lamp in the combination meter and the IBA OFF switch on the instrument lower panel.
- The IBA system will operate even when the ICC system is turned to OFF.

OPERATION DESCRIPTION

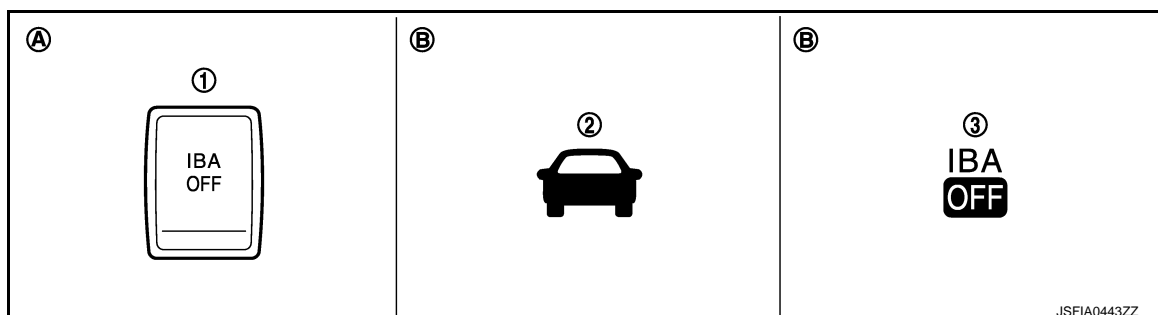
The IBA system uses a ICC sensor located below the front bumper to measure the distance to a vehicle ahead. When the system judges that the distance gets shorter, the vehicle ahead detection indicator on the combination meter blinks and the warning chime sounds.

To turn the system OFF/ON, push and hold the IBA OFF switch after starting the engine for more than 1 second.

NOTE:

- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.
- The IBA system operates under the following conditions.
- The IBA system will function when the vehicle is driven at speeds of approximately 15 km/h (10 MPH) and above, and when the vehicle's speed is approximately 15 km/h (10 MPH) faster than that of the vehicle ahead.

Switch and Indicators



1. IBA OFF switch
 2. Vehicle ahead detection indicator
 3. IBA OFF indicator lamp
- A. Under side of instrument lower panel (LH) B. On the combination meter

Fail-safe Indication

SYSTEM

< SYSTEM DESCRIPTION >

[INTELLIGENT BRAKE ASSIST]

| Condition | Description | Indication on the combination meter |
|---|--|---|
| <ul style="list-style-type: none">When the sensor window is dirtyWhen the system malfunction | The system will be cancelled automatically with a beep sound. | <div>IBA OFF</div> <div>JSFIA0392ZZ</div> |
| When driving into a strong light (i.e. sunlight) | The system is temporary unavailable. (Without the warning chime) | |

NOTE:
When the IBA turns OFF, the IBA OFF indicator lamp will illuminate.

BRC

DTC/CIRCUIT DIAGNOSIS

INTELLIGENT BRAKE ASSIST

Diagnosis Procedure

INFOID:0000000010099901

1. INTELLIGENT BRAKE ASSIST DIAGNOSIS

- The system will be cancelled automatically with a beep sound and IBA OFF indicator lamp on the combination meter will illuminate, when the system will not operate properly.
- When the IBA OFF indicator lamp continues to illuminate even if the IBA system is turned on after the engine restarts, perform the trouble-diagnosis.

NOTE:

IBA system automatically returns to ON, when erasing self-diagnosis result of "ICC/ADAS" with CONSULT.

>> Go to ICC. Refer to [CCS-73, "Work Flow"](#).

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

SYMPTOM DIAGNOSIS

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

Symptom Table

INFOID:0000000010099902

CAUTION:

Perform the self-diagnosis with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

| Symptom | | Inspection item/Reference page |
|---------------------------------|---|--|
| IBA system does not turn on/off | IBA OFF indicator lamp is not turned ON⇔OFF when operating IBA OFF switch | BRC-171, "Diagnosis Procedure" |

Description

INFOID:0000000010099903

IBA system does not turn on/off.

- IBA OFF indicator lamp does not illuminate even if the IBA OFF switch is depressed when IBA OFF indicator lamp is not illuminated.
- IBA OFF indicator lamp does not turn off even if the IBA OFF switch is depressed when IBA OFF indicator lamp is illuminated.

NOTE:

- To turn the system OFF⇔ON, push and hold the IBA OFF switch after starting the engine for more than 1 second.
- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.

Diagnosis Procedure

INFOID:0000000010099904

1.PERFORM THE SELF-DIAGNOSIS

1. Perform "All DTC Reading" with CONSULT.
2. Check if the DTC is detected in self-diagnosis results for "ICC/ADAS" with CONSULT. Refer to [DAS-40, "DTC Index"](#).

Is any DTC detected?

- YES >> GO TO 6.
- NO >> GO TO 2.

2.IBA OFF SWITCH INSPECTION

1. Start the engine.
2. Check that "IBA SW" operates normally in "DATA MONITOR" for "ICC/ADAS" with CONSULT.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> GO TO 5.

3.CHECK IBA OFF INDICATOR CIRCUIT

1. Start the engine.
2. Select the active test item "METER LAMP" for "ICC/ADAS" with CONSULT.
3. Check if the IBA OFF indicator lamp illuminates when the test item is operated.

Is the inspection result normal?

- YES >> Refer to [CCS-73, "Work Flow"](#).
- NO >> GO TO 4.

4.CHECK DATA MONITOR OF COMBINATION METER

Check that "BA W/L" operates normally in "DATA MONITOR" for "METER/M&A" with CONSULT, when the IBA OFF switch is pushed and hold for more than 1 second.

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-92, "Removal and Installation"](#).
- NO >> Replace the ADAS control unit. Refer to [DAS-68, "Removal and Installation"](#).

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SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

5.CHECK IBA OFF SWITCH

Check IBA OFF switch. Refer to [CCS-133. "Component Inspection \(IBA OFF Switch\)".](#)

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace malfunctioning parts.

>> GO TO 7.

7.CHECK IBA SYSTEM

Check that IBA OFF indicator lamp turned ON⇔OFF, when operating IBA OFF switch.

>> INSPECTION END

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

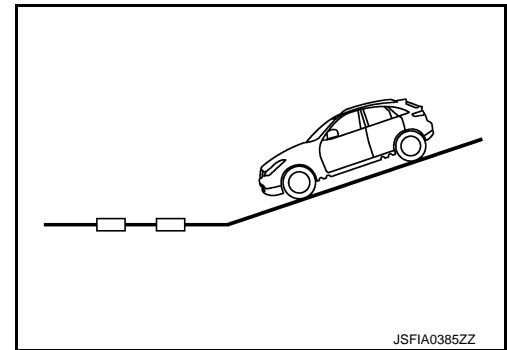
NORMAL OPERATING CONDITION

Description

INFOID:0000000010099905

PRECAUTIONS FOR INTELLIGENT BRAKE ASSIST

- The IBA system is a not collision avoidance system. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- As there is a performance limit, it may not provide a warning or brake in certain conditions.
- The system will not detect the following objects:
 - Pedestrians, animals, or obstacles in the roadway
 - Oncoming vehicles in the same lane
- The system will not detect under the following conditions:
 - When the sensor gets dirty and it is impossible to detect the distance from the vehicle ahead.
 - When driving into a strong light (i.e. sunlight)
- The sensor generally detects the signals returned from the reflectors on a vehicle ahead. Therefore, the system may not function properly under the following conditions:
 - When the reflectors of the vehicle ahead are positioned high or close each other (including a small vehicle such as motorcycles).
 - When the sensor gets dirty or and it is impossible to detect the distance from the vehicle ahead.
 - When the reflectors on the vehicle ahead is missing, damaged or covered.
 - When the reflector of the vehicle ahead is covered with dirt, snow and road spray.
 - When visibility is low (such as rain, fog, snow, etc.).
 - When snow or road spray from traveling vehicles are raised up.
 - When dense exhaust or other smoke (black smoke) from vehicles reduces the sensor visibility.
 - When excessively heavy baggage is loaded in the rear seat or the luggage room of vehicle.
 - When abruptly accelerating or decelerating.
 - On steep downhill or roads with sharp curves.
 - When there is a highly reflective object near the vehicle ahead (i.e. very close to other vehicle, signboard, etc.).
 - While towing a trailer or other vehicle.
- Depending on certain road conditions (curved, beginning of a curve), vehicle conditions (steering position, vehicle position), or preceding vehicle's conditions (position in lane, etc.), the system may not function properly.
- The system may not function in offset conditions.
- The system may not function when the distance to the vehicle ahead is extremely close.
- The system detect highly reflective objects such as reflectors, signs, white markers, and other stationary objects on the road or near the traveling lane, and when in extreme conditions, detection of these objects may cause the system to function.
- The system is designed to automatically check the sensor's functionality. If the sensor is covered with ice, a transparent or translucent plastic bag, etc., the system may not detect them. In these instances the system may not be able to warn properly. Be sure to check and clean the sensor regularly.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.
- Never step in under the brake pedal to avoid an accident when IBA system turns ON.
- Sudden appearance of the vehicle in front (i.e. it abruptly cuts in) may not be detected and the system may not warn soon enough.
- The system will be cancelled automatically with a beep sound and the IBA OFF indicator lamp will illuminate under the following conditions:
 - When the sensor window is dirty
 - When the system malfunctions



REMOVAL AND INSTALLATION

IBA OFF SWITCH

Removal and Installation

INFOID:0000000010099906

REMOVAL

1. Remove instrument lower panel (LH). Refer to [IP-12. "Exploded View"](#).
2. Disengage the pawl. Then remove IBA OFF switch.

INSTALLATION

Install in the reverse order of removal.